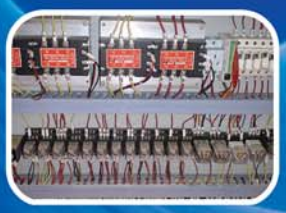
ISO9001 ISO/TS16949 ISO14001 OHSAS18001 IECQ QC080000 CERTIFIED

HONGFA RELAY ● INDUSTRIAL RELAY

HONGFA RELAY



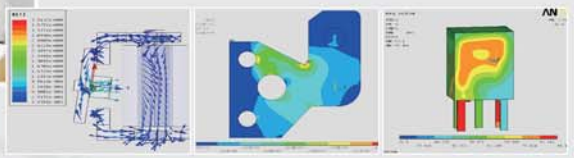
INDUSTRIAL RELAY

www.hongfa.com

RoHS compliant

ISO9001 ISO/TS16949 ISO14001 OHSAS18001 IECQ QC080000 CERTIFIED

PROFESSIONAL RELAY MANUFACTURER



COMPANY INTRODUCTION

HONGFA

HONGFA(Stock code: 600885, SSE) always conforms to its business philosophy -- "Never rest on our laurels, make more progress" and uses this philosophy as the basis of its operational policy -- "Market-oriented concept, win by high quality". The following companies are fully or partially owned by HONGFA--Zhangzhou Hongfa, Jinhai, Xi'an Hongfa, Hongyuanda, Hongfa Automotive Electronics, Hongfa Signal Electronics, Hongfa Hermetically Sealed Relays, Hongfa Power Electronics, Hongzhou, Hongfa Electrical Safety & Control, Hongfa Electric, Jinyue, Jinbo, Jinghe, Hongfa Industrial Robot, Hongfa Precision Machinery, Shanghai Hongfa, Beijing Hongfa, Sichuan Hongfa(Sales), Hongfa Hongkong, Hongfa Europe GmbH, Hongfa America Inc., KG Technologies Inc. HONGFA products include as relays, low-voltage devices, switchgears, precise parts, automatic equipment, etc..

HONGFA has a wealth of experience in relays development and manufacturing after many years of hard work. HONGFA is now the leading relays manufacturer in China and is ranked No. 1 in the industry for overall economic efficiency. HONGFA has also become one of the leading relays sellers and manufacturers in the world. From 1995, HONGFA has continuously ranked among 'China Top-100 Electronic Components Enterprises' with a current position of the 10th and has received many awards: HONGFA has recognized as one of the China Top 100 Enterprises Of Electronic Information for the first time as the first finalist in relay, in 2014. HONGFA is authorized as "the Advanced Enterprise to implement High Technology in Torch Plan" by the Ministry of Science and Technology of PRC. HONGFA has been awarded "National Export-Oriented Enterprise of Automotive Components" by the Ministry of Commerce of PRC and National Development and Reform Commission. HONGFA is the only company being awarded this honor in the Chinese relay industry.

HONGFA has a full set of quality assurance systems including ISO9001, ISO/TS16949, ISO14001, OHSAS18001, GJB9001A, IECQ QC 080000. HONGFA has also been honorably awarded "High Quality Product exempt from National Inspection". HONGFA products are UL/CUL, VDE, TÜV, CQC and CCC approved. With high performance, top quality, competitive price and excellent technical services, HONGFA Relays have become the most perfect choice for the customers.

Since the establishment, HONGFA has been focusing on technology innovation. HONGFA has introduced the most advanced relays manufacturing technology and equipment available worldwide into the factories to upgrade our technology level and the product quality. HONGFA engineers use 3-D CAD in new product development and mould tooling design. The technology and the equipment of all the mould tooling, parts manufacturing and products assembly and the production environment are in the leading position in Chinese relays industry. HONGFA Testing Centre is the biggest relays testing and analyzing laboratory with the most advanced technology in China. HONGFA Testing Centre is approved by CNAS and it is approved by America UL as a CTDP lab. It is approved by Germany VDE as a TDAP lab -For VDE's TDAP lab, there is only one in China and only six in the world. At the same time, HONGFA Testing Centre is also the unique partnership for VDE in electronic components in the world. The testing capability on RoHS compliance in the chemistry analysis laboratory is also approved by CNAS, which means that Hongfa is able to supply to the customers accurate, credible and authorized inspection data and test reports.

HONGFA has a wide range of relays, including Signal relays, Power relays, Automotive relays & modules, Latching relays, HVDC relays, Industrial relays, Safety relays and Hermetically sealed relays. The company has the annual production capacity of 1.5 billion pieces of relays.

Now HONGFA has become the world leading relays research and manufacturing base. Hongfa People are looking forward to growing, developing and prospering with all the partners andcustomers worldwide together.

PERSEVERE FOR PROGRESS.

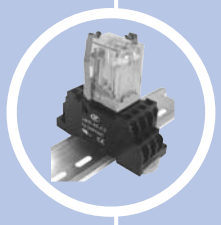
STRIVE FOR EXCELLENCE!

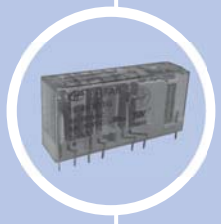
WE ARE CONTROL EXPERT

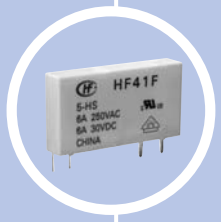
Hongfa is a professional relay manufacturer and has a wide range of relays. Hongfa relays are UL/CUL, VDE, TÜV, CQC and CCC approved. They are widely used in those fields like industrial control, automotive, telecom equipment, home appliances, metering instruments, security and alarm systems, medical appliances and aviation.

HONGFA PRODUCTS:

CONTENTS







Notice

Dear Sir or Madam,

Many thanks for your choosing Hongfa products!

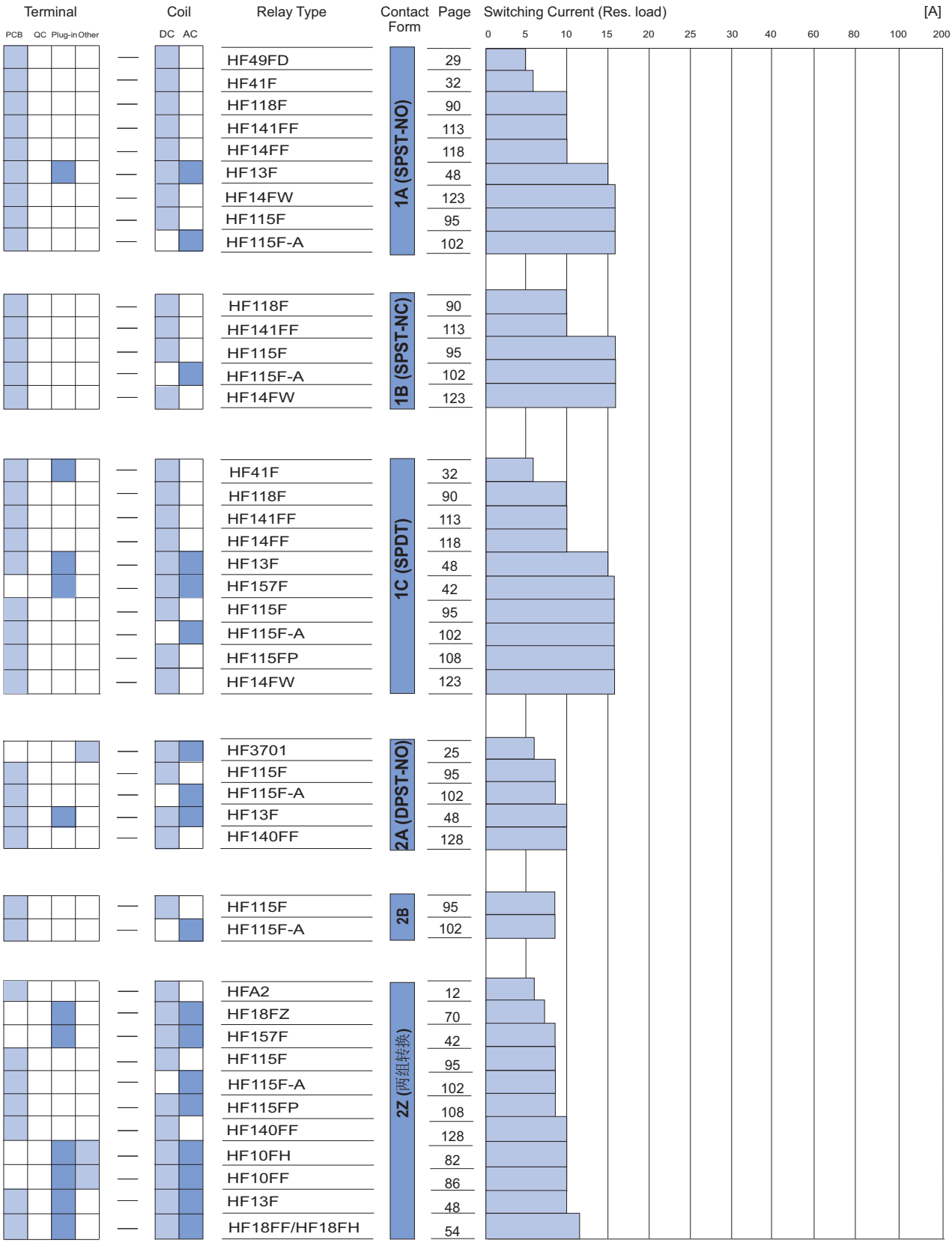
Please note the following important information:

1. Since all Hongfa products are RoHS compliant, we will remove the special code (551) or (555) from our current ordering types from April 1st, 2008. Please place your orders according to the newest ordering types. In the meantime, we hereby declare that all Hongfa products are RoHS compliant, no matter suffix (551) or (555) is used or not.
2. We have started to switch the old ordering type to the new one since 2005 (For example, the old ordering type is JQX-115F and the new one is HF115F). At the moment we strongly recommend that you should use the new ordering type for your orders. Please refer to "Comparative list between the old and new ordering type".
3. For the plastic sealed type, after welding, the relay should be cooled down below 40˚C naturally, then start washing and surface handling, the temperature of washing liquid and surface handling cleanser should be controlled also below 40˚C. When washing, please do not use washing liquid such as ultrasonic, gasoline, Freon etc. which may affect the relay structure and environment. For covers made from PC material, please prevent from contamination by some organic solvents; otherwise it is likely to bring to a chemic refection which leads to bulging or crack.

Further more, all the data sheets are subject to change without notice. For updated information please visit our website: www.hongfa.com.

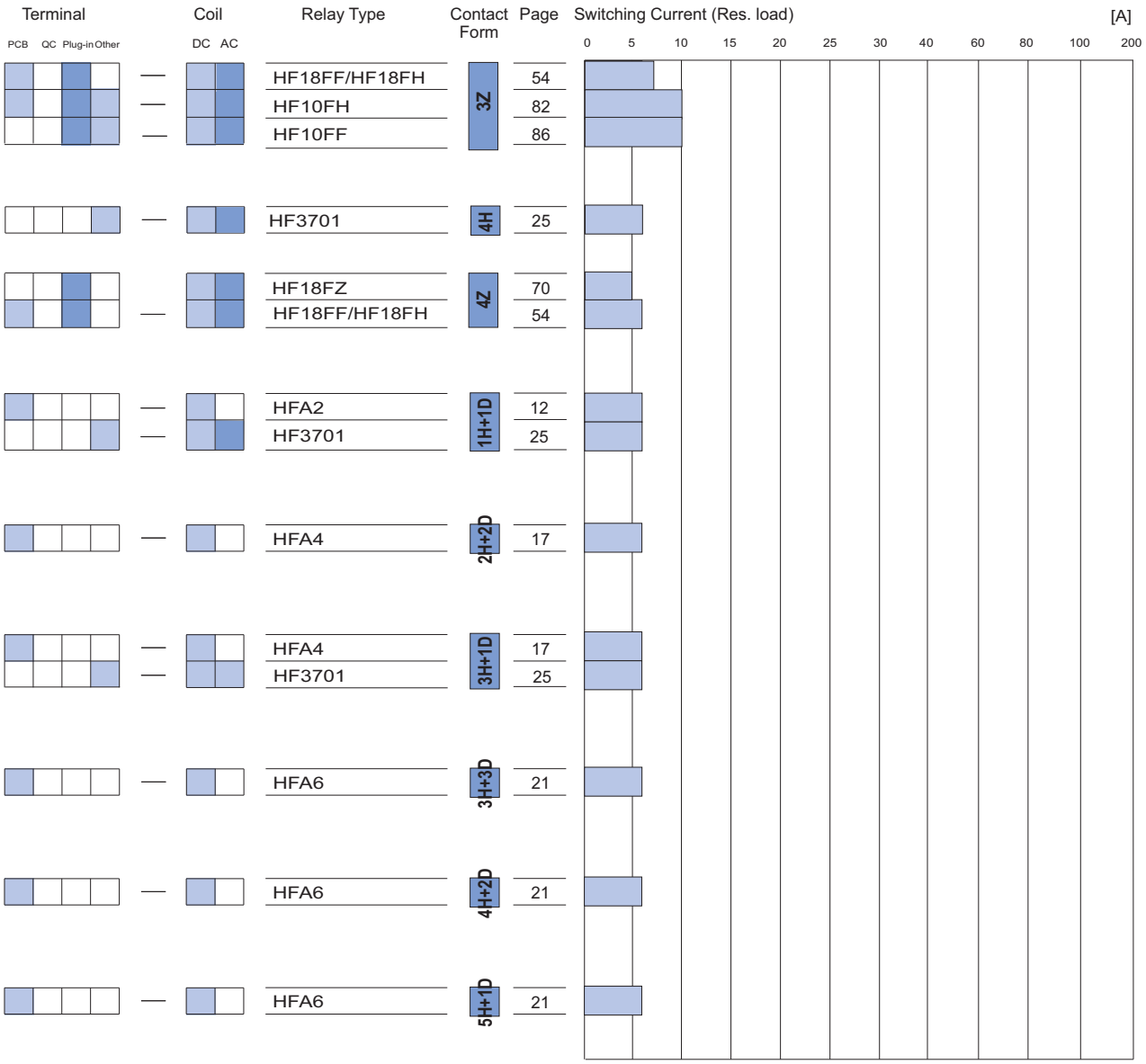
Should you have any question, please feel free to contact us.

SELECTION GUIDE



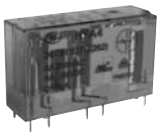
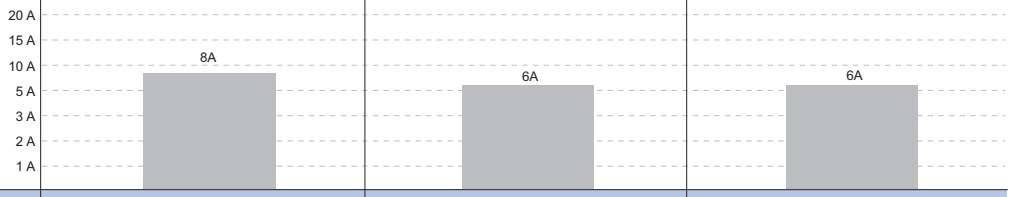
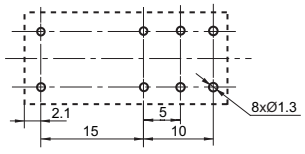
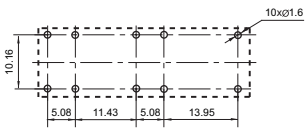
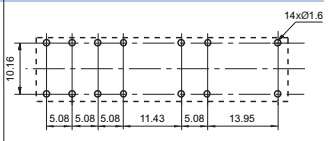
How to use the table: Please select the **CONTACT FORM**.Then choose the relay according to **SWITCHING CURRENT** and **OTHERS**(for instance,coil voltage, terminal style,etc.).

SELECTION GUIDE



How to use the table: Please select the **CONTACT FORM**.Then choose the relay according to **SWITCHING CURRENT** and **OTHERS**(for instance,coil voltage, terminal style,etc.).

SELECTION CHART

Type	HFA2	HFA4	HFA6
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.6 x 25.5	40.0 x 13.0 x 24.0	50.0 x 13.0 x 24.0
Features	• Multi contact arrangements: 2 Form C(2C type), 1NO+1NC (HD1 type), 1NO+1NC (HD2 type) • Forcibly guided contacts according to EN50205 • 8A switching capability • 10kV surge voltage between coil & contacts and 6kV between contact sets	• Multi contact arrangements: 2NO+2NC, 3NO+1NC • Forcibly guided contacts according to EN50205 • 6A switching capability • 360mW low input power • 10kV surge voltage between input and output	• Multi contact arrangements: 5NO+1NC, 4NO+2NC, 3NO+3NC • Forcibly guided contacts according to EN50205 • 6A switching capability • Low input power: 500mW • 10kV surge voltage between input and output
Contact Ratings			
Contact Form	2C, 1NO+1NC(HD1&HD2 type)	2NO+2NC, 3NO+1NC	5NO+1NC, 4NO+2NC, 3NO+3NC
Contact Material	$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
Max. Rated Switching Current			
Max. Switching Voltage	400VAC / 30VDC	400VAC / 30VDC	400VAC / 30VDC
Max. Switching Power	1500VA / 180W	1500VA / 180W	1500VA / 180W
Rated Load (Resistive load)	6A 250VAC / 30VDC	6A 250VAC / 30VDC	6A 250VAC / 30VDC
Coil Ratings			
Rated Voltage	5VDC to 110VDC	6VDC to 48VDC	6VDC to 48VDC
Nominal Operating Power	700mW	360mW	500mW
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	4000VAC
Ambient Temperature	-40˚C to 70˚C	-40˚C to 85˚C	-40˚C to 85˚C
Operate / Release Time max.	15ms / 10ms	20ms / 20ms	20ms / 20ms
Mechanical Endurance min.	1 x 10^7OPS	1 x 10^7OPS	1 x 10^7OPS
Electrical Endurance min.	NO:1 x 10^5OPS; NC:1 x 10^4OPS	6A 30VDC:1 x 10^5OPS 6A 250VAC:5 x 10^4OPS	1 x 10^5OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV	UL/CUL VDE	UL/CUL TÜV
File No.	E134517 B120753286005	E134517 40034342	E134517 B120553286004
Cross Reference	TE: SR2M HENGSTLER: K-RBS DOLD: OA5669 ELESTA: SIR282	OMRON: G7SA TE: SR4D/M PANASONIC: SFS	OMRON: G7SA TE: SR6 PANASONIC: SFS
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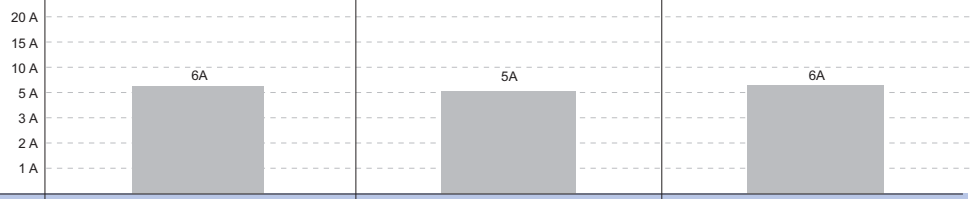
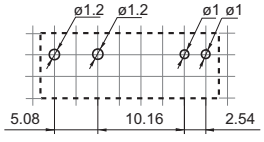
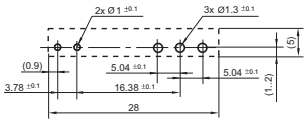
Note: Specification and dimensions in this catalog are subject to change without notice.

SELECTION CHART

Type	HF3701	HF49FD	HF41F
Appearance			
Dimensions(L x W x H) mm	113.5 x 99.0 x 22.5	20.0 x 5.0 x 12.5	28.0 x 5.0 x 15.0
Features	• Safety relay module of 2, 4 pole • Redundant design of circuit • With self-check function • Automatic or manual reset of contacts without time delay • Meet requirements of EN 60947-5-1 and EN 60204-1, with safety grade up to PLe of ISO13849-1	• 5A switching capability • 3kV dielectric strength (between coil and contacts) • Slim size (width 5mm,height 12.5mm) • High sensitive: 120mW	• Slim size (width 5mm) • 4kV dielectric strength (between coil and contacts) • Surge voltage up to 6kV (between coil and contacts) • High sensitive: 170mW
Contact Ratings			
Contact Form	2A, 1NO+1NC, 4NO, 3NO+1NC	1A	1A, 1C
Contact Material	$AgSnO_2$	$AgSnO_2$, AgNi	$AgSnO_2$, AgNi
Max. Rated Switching Current (Resistive load)			
Max. Switching Voltage	250VAC / 30VDC	250VAC / 30VDC	400VAC / 125VDC
Max. Switching Power	1500VA / 144W	1250VA / 150W	1500VA / 180W
Rated Load (Resistive load)	6A 250VAC / 24VDC	5A 250VAC 5A 30VDC	6A 250VAC 6A 30VDC
Coil Ratings			
Rated Voltage	24VAC / 24VDC	5VDC to 24VDC	5VDC to 60VDC
Nominal Operating Power		0.12W to 0.18W	0.17W (48VDC to 60VDC:0.21W)
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)		3000VAC	4000VAC
Ambient Temperature	-20˚C to 55˚C	-40˚C to 85˚C	-40˚C to 85˚C
Operate / Release Time max.	45ms / 20ms(dual-channel)	10ms / 5ms	8ms / 4ms
Mechanical Endurance min.	1 x 10^7OPS	2 x 10^7OPS	1 x 10^7OPS
Electrical Endurance min.	1 x 10^5OPS	1 x 10^5OPS(3A 250VAC/30VDC)	1A: 6 x 10^4ops (at 85˚C) 1C: NO: 3 x 10^4ops (at 85˚C) NC: 1 x 10^4ops(at 85˚C)
Layout (Bottom view)			
Terminal Type	DIN 35 Rail (Mounting Type)	PCB	PCB
Approved Standards	CE	UL/CUL TÜV CQC	UL/CUL VDE CQC
File No.	N8130453286010	E133481 R50149334 CQC10002049162	E133481 40020043 CQC09002035072
Cross Reference	OMRON: G9SA-301 PILZ: PNOZ x2 PHOENIX: ESM4 SCHNEIDER: XPS AC	OMRON: G6DS PANASONIC: PA FUJITSU: RB/NY SCHRACK: PCN	PANASONIC: PE FUJITSU: FTR-LY SCHRACK: V23092/SNR FINDER: 34.51
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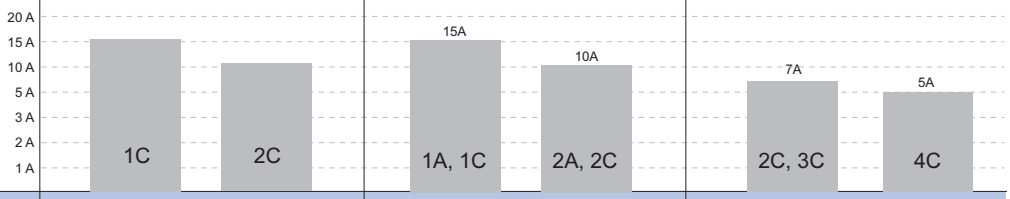
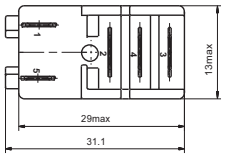
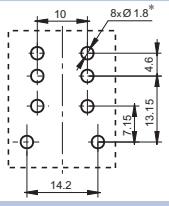
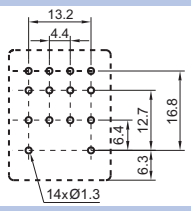
Note: Specification and dimensions in this catalog are subject to change without notice.

SELECTION CHART

Type	HF157F	HF13F	HF18FF
Appearance			
Dimensions(L x W x H) mm	（without button）29.0×13.0×30.0 （with button） 29.0×13.0×35.5	28.0 x 21.5 x 35.0	28.0 x 21.5 x 35.0
Features	• High capacity (2 pole: 10 A) • Various types available • 2 pole configurations • 5kV dielectric strength (between coil and contacts) • Sockets available • Environmental friendly product (RoHS compliant)	• 1C:15A; 2C:10A switching capability • Various terminals available • 1 & 2 pole configurations • Conform to the CE low voltage directive • Sockets available	• 7A switching capability (2C, 3C type) • 2 to 4 pole configurations • Conform to the CE low voltage directive • Gold plated contact available • Sockets available
Contact Ratings			
Contact Form	1C, 2C	1A, 2A,1C, 2C	2C, 3C, 4C
Contact Material	$AgSnO_2In_2O_3$	AgCe, AgCdO	$AgSnO_2$, AgCe
Max. Rated Switching Current			
Max. Switching Voltage	250VAC / 30VDC	250VAC / 30VDC	250VAC / 30VDC
Max. Switching Power	1C:4000VA / 480W 2C:2500VA / 300W	1A,1C: 3750VA / 450W 2A,2C: 2500VA / 300W	2C,3C: 1750VA / 210W 4C: 1250VA / 150W
Rated Load (Resistive load)	1C:12A 250VAC / 30VDC 2C: 8A 250VAC / 30VDC	1A,1C:15A 250VAC/30VDC 2A,2C:10A 250VAC/30VDC	2C,3C: 7A 250VAC/30VDC 4C: 5A 250VAC/30VDC
Coil Ratings			
Rated Voltage	(5 ~ 110)VAC / (6 ~ 240)VDC	6VAC to 240VAC 5VDC to 220VDC	6VAC to 240VAC 5VDC to 110VDC
Nominal Operating Power	0.9VA (AC type) 0.53W (DC type)	1.2VA to 1.8VA, 0.9W to 1.1W	1.2VA to 1.8VA, 0.9W to 1.1W
Specifications			
Insulation Resistance	1000MΩ	500MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	1500VAC	1500VAC
Ambient Temperature	-40˚C to 70˚C	-40˚C to 70˚C	-40˚C to 70˚C
Operate / Release Time max.	15ms / 20ms(AC type),10ms(DC type)	25ms / 25ms(DC type)	25ms / 25ms(DC type)
Mechanical Endurance min.	DC type: 5 x 10^7OPS AC type: 3 x 10^7OPS	1 x 10^7OPS	2 x 10^7OPS
Electrical Endurance min.	1 x 10^5OPS	1 x 10^5OPS	1 x 10^5OPS
Layout (Bottom view)			
Terminal Type	Plug-in	PCB, Plug-in	PCB, Plug-in
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL TÜV CQC
File No.	E133481 R50403813 CQC18002189443	E133481 R50154518 CQC09002030028 / 09002030029	E133481 R50147087 CQC09002030026 / 09002030027
Cross Reference	OMRON: G2R-1/G2R-2 FINDER:46.61/46.52 IDEC:RJ1S/RJ2S	OMRON: LY1/2 PANASONIC: HL FUJISTU: FRL260 NEC: KML SCHRACK: TM	OMRON: MY2/3/4 FINDER: 55.32/55.33/55.34 IDEC: RM2S/ RM4S SCHNEIDER: RXM2/4 TE: KHAU-11/17
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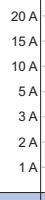
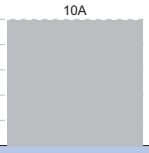
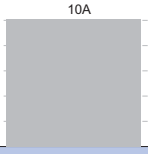
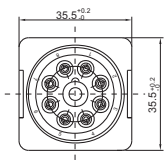
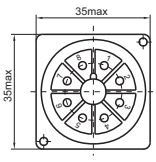
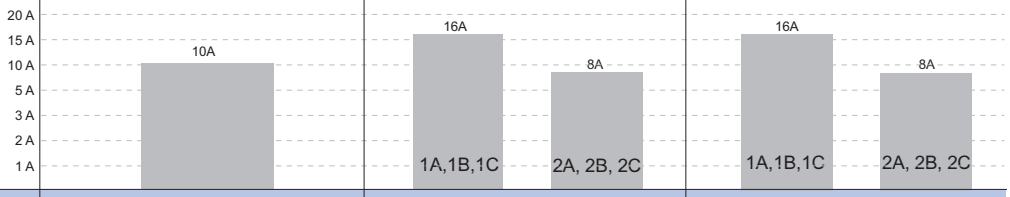
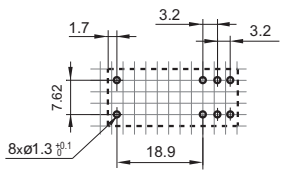
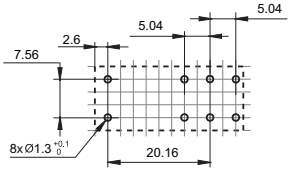
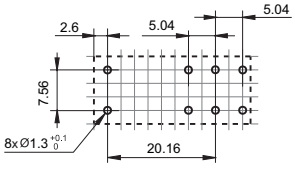
Note: Specification and dimensions in this catalog are subject to change without notice.

SELECTION CHART

Type	HF18FZ	HF10FH	HF10FF
Appearance			
Dimensions(L x W x H) mm	(Without button): 28.0 x 21.5 x 36.0 (With button): 28.0 x 21.5 x 37.5	35.5 x 35.5 x 55.3	35.0 x 35.0 x 55.0
Features	• Multiple switching capability (2C,4C type) • With LED • Conform to the CE low voltage directive • 2.0kV dielectric strength(between coil and contacts) • High electrical life • High mechanical life • With test button • Automatic production	• 10A switching capability • Long endurance • Industry standard 8 or 11round terminals • Sockets available • With push button • Smoke cover type available	• 10A switching capability • Industry standard 8 or 11 round terminals • Sockets available • Long endurance
Contact Ratings			
Contact Form	2Z, 4C	2C, 3C	2C, 3C
Contact Material		$AgSnO_2$, AgCdO	$AgSnO_2$, AgCdO
Max. Rated Switching Current			
Max. Switching Voltage	220VAC / 24VDC	250VAC / 30VDC	250VAC / 30VDC
Max. Switching Power	2C:1750VA / 210W 4C:1100VA / 120W	2500VA / 300W	2500VA / 300W
Rated Load (Resistive load)	2C: 7A 220VAC / 24VDC 5A 220VAC / 24VDC 4C: 5A 220VAC / 24VDC 3A 220VAC / 24VDC	2C: 10A 250VAC/30VDC 3C: NO: 10A 250VAC/30VDC NC: 5A 250VAC/30VDC	2C:10A 250VAC/30VDC 3C: NO: 10A 250VAC/30VDC NC: 5A 250VAC/30VDC
Coil Ratings			
Rated Voltage	(6 ~ 277)VAC / (5 ~ 220)VDC	6VAC to 230VAC 6VDC to 110VDC	6VAC to 230VAC 6VDC to 110VDC
Nominal Operating Power	DC:about (0.8~1.1)W AC:about (0.9~1.5)VA	2.7VA, 1.5W	2.7VA, 1.5W
Specifications			
Insulation Resistance	1000MΩ	500MΩ	500MΩ
Dielectric Strength (Between coil and contacts)	2000VAC	2500VAC	1500VAC
Ambient Temperature	-40˚C to 70˚C	-40˚C to 55˚C	-40˚C to 55˚C
Operate / Release Time max.	20ms / 15ms(DC type) 20ms / 25ms(AC type)	30ms / 30ms(DC type)	30ms / 30ms(DC type)
Mechanical Endurance min.	DC type: 5 x 10^7OPS AC type: 2 x 10^7OPS	1 x 10^7OPS	1 x 10^7OPS
Electrical Endurance min.	See"CONTACT DATA"	1 x 10^5OPS	1 x 10^5OPS
Layout (Bottom view)			
Terminal Type	Plug-in	Octal and Undecal Type Plug	Octal and Undecal Type Plug
Approved Standards	UL/CUL CQC VDE	UL/CUL	UL/CUL
File No.	E133481 40048406 CQC17002183722	E134517	E134517
Cross Reference	OMRON: MY2/4-GS IDEC:RU2S/RU4S	OMRON: MK2/3 SCHNEIDER: RUM C2/C3 FINDER: 60.12/ 60.13 FEME: RCP/ RCPT	OMRON: MK2/3 SCHNEIDER: RUM C2/C3 FINDER: 60.12/ 60.13
Page	70	81	85

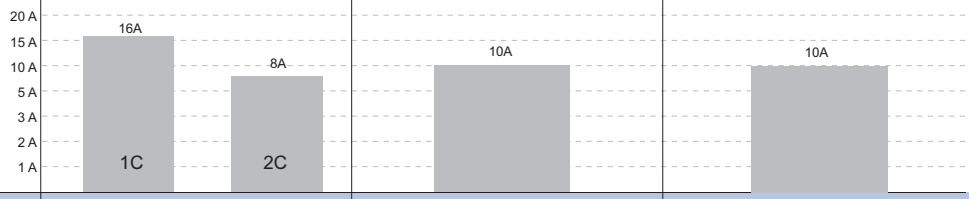
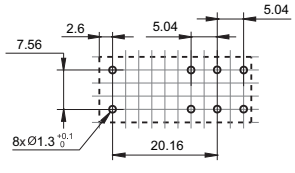
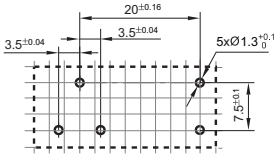
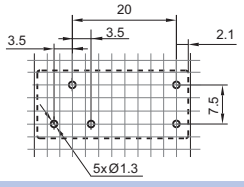
Note: Specification and dimensions in this catalog are subject to change without notice.

SELECTION CHART

Type	HF118F	HF115F	HF115F-A
Appearance			
Dimensions(L x W x H) mm	28.5 x 10.1 x 12.5	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7
Features	• 10A switching capability • 5kV dielectric strength (between coil and contacts) • Low height: 12.5 mm • Creepage distance >8mm (VDE0435/0631/0700) • Product in accordance to IEC 60335-1 available	• Low height: 15.7 mm •16A switching capability • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0435/0631/0700 • Product in accordance to IEC 60335-1 available	• AC coil voltage type • 16A switching capability • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0700/0631 • Product in accordance to IEC 60335-1 available
Contact Ratings			
Contact Form	1A, 1B, 1C	1A, 1B, 1C / 2A, 2B, 2C	1A, 1B, 1C / 2A, 2B, 2C
Contact Material	$AgSnO_2$, AgNi	$AgSnO_2$, AgNi, AgCdO	$AgSnO_2$, AgNi, AgCdO
Max. Rated Switching Current			
Max. Switching Voltage	440VAC / 125VDC	440VAC / 300VDC	440VAC/300VDC
Max. Switching Power	2500VA/300W	3000VA/4000VA / 2000VA	3000VA/4000VA / 2000VA
Rated Load (Resistive load)	10A 250VAC 10A 30VDC	16A 250VAC 12A 250VAC / 8A 250VAC	16A 250VAC 12A 250VAC / 8A 250VAC
Coil Ratings			
Rated Voltage	5VDC to 60VDC	5VDC to 110VDC	24VAC, 115VAC, 230VAC
Nominal Operating Power	0.22W to 0.29W	0.4W	0.75VA
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40˚C to 85˚C	-40˚C to 85˚C	-40˚C to 70˚C
Operate / Release Time max.	10ms / 5ms	15ms / 8ms	
Mechanical Endurance min.	1 x 10^7OPS	1 x 10^7OPS	1 x 10^6OPS
Electrical Endurance min.	1 x 10^5OPS	1 x 10^5OPS	5 x 10^4OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE
File No.	E134517 40010480 CQC09002035071	E134517 116934 CQC08002028130	E134517 116934
Cross Reference	OMRON: G6RN FUJITSU: FTR-F1 SCHRACK: RYII	OMRON: G2RL PANASONIC: JW1/JW2/DJ SCHRACK: RT FUJITSU: FTR-K1 FINDER: 41 SERIES	OMRON: G5RL-AC SCHRACK: RT/RX RELPOL: RM84/85
Page	89	94	101

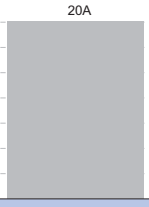
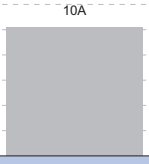
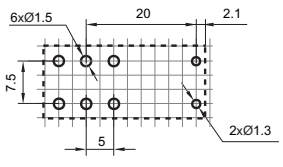
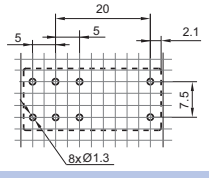
Note: Specification and dimensions in this catalog are subject to change without notice.

SELECTION CHART

Type	HF115FP	HF141FF	HF14FF
Appearance			
Dimensions(L x W x H) mm	29.0 x 13.0 x 25.5	29.0 x 12.6 x 20.6	29.0 x 13.0 x 26.0
Features	• Manual test device,Type with mechanical indicator / electrical indicator • 5kV dielectric strength (between coil to contacts) • Creepage distance:8mm • Meet VDE0700/0631 • Sockets available	• 10A switching capability • 5kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types available	• 10A switching capability • 5kV dielectric strength (between coil and contacts) • 1 Form A and 1 Form C configurations • Plastic sealed and flux proofed types available
Contact Ratings			
Contact Form	1C / 2C	1A, 1B, 1C	1A, 1C
Contact Material	AgNi	$AgSnO_2$, AgCdO	$AgSnO_2$, AgNi, AgCdO
Max. Rated Switching Current (Resistive load)			
Max. Switching Voltage	440VAC	250VAC / 30VDC	277VAC / 30VDC
Max. Switching Power	4000VA / 2000VA	2500VA / 300W	2770VA / 300W
Rated Load (Resistive load)	16A 250VAC / 8A 250VAC	Heavy: 10A 250VAC/30VDC Standard: 8A 250VAC/30VDC 10A 125VAC	10A 277VAC/30VDC TV-5 120VAC
Coil Ratings			
Rated Voltage	24VAC to 230VAC / 12VDC to 110VDC	5VDC to 48VDC	3VDC to 60VDC
Nominal Operating Power	0.75VA, 0.4W	0.55W, 0.72W	0.53W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40˚C to 70˚C	-40˚C to 70˚C	-40˚C to 70˚C
Operate / Release Time max.	15ms / 8ms(DC type)	15ms / 5ms	15ms / 5ms
Mechanical Endurance min.	DC type: 5×10^6OPS AC type:1×10^6OPS	1×10^7OPS	1×10^7OPS
Electrical Endurance min.	3×10^4OPS	1×10^5OPS	1×10^5OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE	UL/CUL CQC	UL/CUL TÜV CQC
File No.	E133481 116934	E133481 CQC09002034351	E134517 R50140759 CQC09002035073
Cross Reference	SCHRACK: XT	OMRON: G2R PANASONIC: JW FUJITSU: FTR-F1/VSB NEC: TP FINDER: 40.31	OMRON: G2R PANASONIC: JR1/JR1A FUJITSU: VS NEC: CH P&B: RKA/RKS
Page	107	112	117

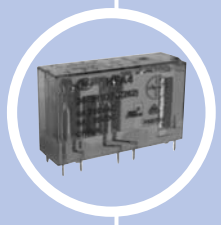
Note: Specification and dimensions in this catalog are subject to change without notice.

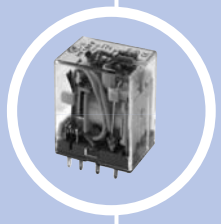
SELECTION CHART

Type	HF14FW	HF140FF
Appearance		
Dimensions(L x W x H) mm	29.0 x 13.0 x 26.5	29.0 x 13.0 x 26.3
Features	• 20A switching capability • 4kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types available	• 10A switching capability • 5kV dielectric strength (between coil and contacts) • 2.0mm contact gap available • Plastic sealed and flux proofed types available
Contact Ratings		
Contact Form	1A, 1B, 1C	2A, 2C
Contact Material	$AgSnO_2$, AgCdO	$AgSnO_2$, AgNi, AgCdO
Max. Rated Switching Current	  	
Max. Switching Voltage	277VAC / 30VDC	250VAC / 30VDC
Max. Switching Power	5540VA / 480W	2500VA / 240W
Rated Load (Resistive load)	Resistive:16A 277VAC/24VDC Motor:1HP 240VAC TV-8 125VAC (NO contact)	5A 250VAC 10A 250VAC 8A 30VDC
Coil Ratings		
Rated Voltage	5VDC to 60VDC	3VDC to 60VDC
Nominal Operating Power	0.53W, 0.72W	0.53W, 0.8W, 1.4W
Specifications		
Insulation Resistance	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	5000VAC
Ambient Temperature	-40˚C to 85˚C	-40˚C to 85˚C
Operate / Release Time max.	15ms / 5ms	15ms / 5ms
Mechanical Endurance min.	1 x 10^7OPS	Standard: 1 x 10^7OPS W Type(1.5mm):5 x 10^5OPS W Type(2.0mm):3 x 10^5OPS
Electrical Endurance min.	1 x 10^5OPS	Standard: 1 x 10^5OPS W Type(1.5mm):1 x 10^5OPS W Type(2.0mm):3 x 10^4OPS
Layout (Bottom view)		
Terminal Type	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL TÜV CQC
File No.	E134517 40023508 CQC09002030293	E134517 R50149131 CQC09002030294
Cross Reference	OMRON: G2R PANASONIC: JR1AF FUJITSU: FBR610 P&B: RKA/RKS	OMRON: G2R/G2RG PANASONIC: JR2/JR2A FUJITSU: FBR-F1/VSB NEC: TP P&B: RKA/RKS
Page	122	127

Note: Specification and dimensions in this catalog are subject to change without notice.

Industrial Relay





HFA2

SAFETY RELAY
(RELAY WITH FORCIBLY GUIDED CONTACTS)

c UL us
File No.:E134517

TÜV
File No.:B120753286005

Features

- Multi contact arrangements: 2 Form C (2Z type), 1NO+1NC (HD1 type), 1NO+1NC (HD2 type)
- Forcibly guided contacts according to EN50205
- 8A switching capability
- High insulation capability (1.2 / 50μs):10kV surge voltage between coil & contacts and 6kV between contact sets
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x12.6mm x25.5mm

CONTACT DATA

Contact arrangement	2 Form C (2Z type) 1NO+1NC (HD1 type) 1NO+1NC (HD2 type)
Forcibly guided contacts Type (according to EN50205)	HD1, HD2 type: Type A 2Z type: Type B
Contact resistance[1)]	100mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	6A 250VAC / 30VDC
Max. switching voltage	400VAC / 30VDC
Max. switching current	8A
Max. switching power	1500VA / 180W
Mechanical endurance	1 x 10^7OPS
Electrical endurance[2)]	1 x 10^5OPS (1NO: 6A 250VAC/30VDC, Resistive load, at 70°C, 1s on 9s off) 5 x 10^4OPS (1NC: 6A 250VAC/30VDC, Resistive load, at 70°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) Only 1 NO or NC is loaded in the test.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC Max.[1)]	Drop-out Voltage VDC Min.[1)]	Max. Voltage VDC[2)]	Coil resistance Ω
5	3.80	0.5	7.5	35.7 x (1±10%)
6	4.50	0.6	9.0	51 x (1±10%)
9	6.80	0.9	13.5	116 x (1±10%)
12	9.00	1.2	18	206 x (1±10%)
15	11.3	1.5	22.5	321 x (1±10%)
18	13.5	1.8	27	483 x (1±10%)
21	15.8	2.1	31.5	630 x (1±10%)
24	18.0	2.4	36	823 x (1±10%)
36	27.0	3.6	54	1851 x (1±10%)
40	30.0	4.0	60	2286 x (1±10%)
48 [2)]	36.0	4.8	72	3291 x (1±15%)
60 [2)]	45.0	6.0	90	5142 x (1±15%)
80 [2)]	64.0	8.0	120	9143 x (1±15%)
110[2)]	82.5	11.0	165	17285 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ⩾ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1 min
	Between open contacts	1500VAC 1 min
	Between contact sets	3000VAC 1 min
Surge voltage	Between coil & contacts	10kV (1.2 / 50μs)
	Between open contacts	2.5kV (1.2 / 50μs)
	Between contact sets	6.0kV (1.2 / 50μs)
Operate time (at rated voltage)		15ms max.
Release time (at rated voltage)		10ms max.
Temperature rise (at rated voltage)		⩽60K (Coil driving voltage: 1.1 times Un, Contact current -carrying: rated current, at 75 °C)
Vibration resistance		NO:10Hz to 55Hz 1.6mm DA 55Hz to 200Hz, 98m/s^2 NC:10Hz to 55Hz 0.4mm DA
Shock resistance	Functional	NO:98m/s^2 NC: 49m/s^2
	Destructive	980m/s^2
Creepage distance	Between coil & contacts	8mm
	Between contacts	5.5mm
Clearance distance	Between coil & contacts	8mm
	Between contacts	5.5mm
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 20g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 700mW

SAFETY APPROVAL RATINGS

UL/CUL	6A 250VAC / 277VAC / 30VDC at 70°C NO: Pilot duty A300, at 70°C NC: Pilot duty B300, at 70°C
TÜV	NO: 8A 250VAC at 85°C NC: 6A 250VAC at 85°C NO: 3A 240VAC(AC-15) at 55°C NC: 1.5A 240VAC(AC-15) at 55°C

Notes: 1) All values unspecified are at room temperature.
2)Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HFA2 /	12	-2Z	S	T	F	G	(XXX)
Type								
Coil voltage	5, 6, 9,12,15,18,21, 24, 36, 40, 48, 60, 80, 110VDC							
Contact arrangement			**2Z:** 2 Form C **HD1:** 1NO+1NC (Type 1) **HD2:** 1NO+1NC (Type 2)					
Construction[1)]				**S:** Plastic sealed				
Contact material					**T:** $AgSnO_2$			
Insulation class						**F:** Class F	**Nil:** Class B	
Contact plating							**G:** Gold plated[2)]	**Nil:** No gold plated
Special code[3)]								**XXX:** Customer special requirement **Nil:** Standard

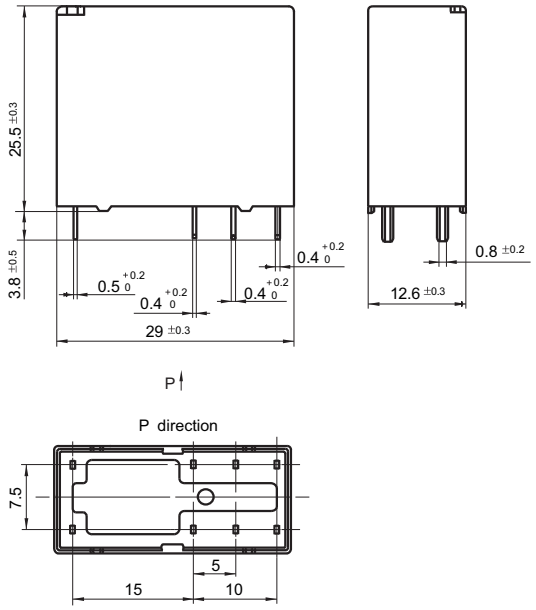
Notes: 1) If water cleaning is required after the relay is assembled on PCB, please contact us for suggestion about suitable parts.
2) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.if customers have special requirment of load. please contact us for suggestion about suitable parts.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

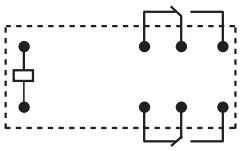
Unit: mm

HFA2/□□-2Z□T□(□□□)

Outline Dimensions

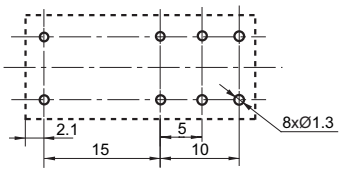


Wiring Diagram



PCB Layout

(Bottom view)

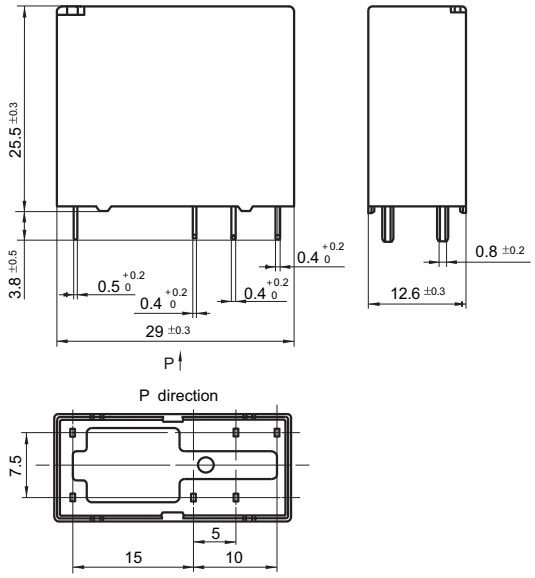


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

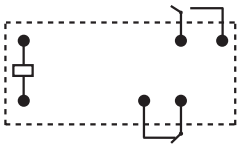
Unit: mm

HFA2/□□-HD1□T□(□□□)

Outline Dimensions

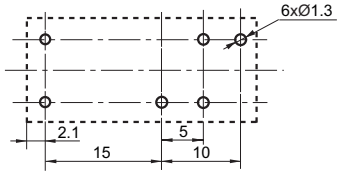


Wiring Diagram



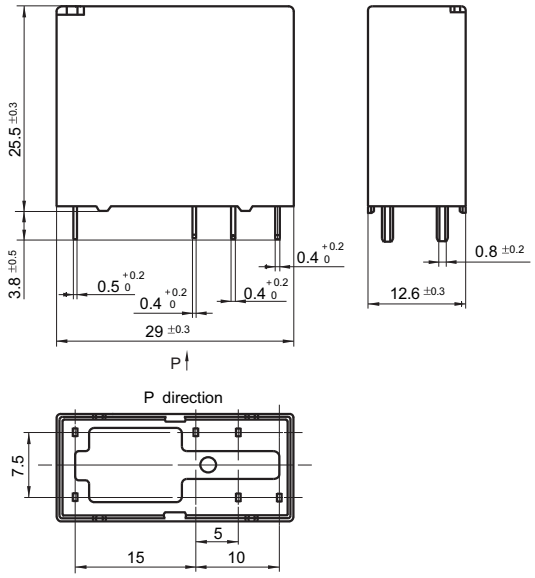
PCB Layout

(Bottom view)

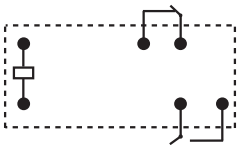


HFA2/□□-HD2□T□(□□□)

Outline Dimensions

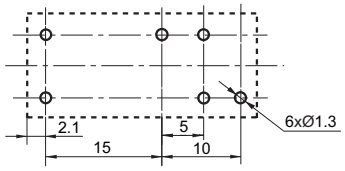


Wiring Diagram



PCB Layout

(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

Relay Sockets

File No.: E253370

Features

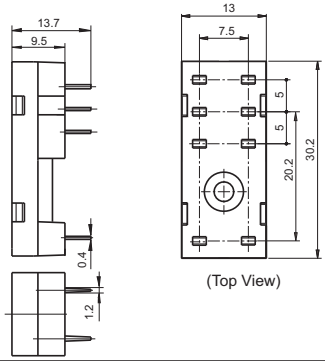
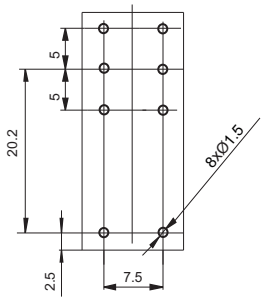
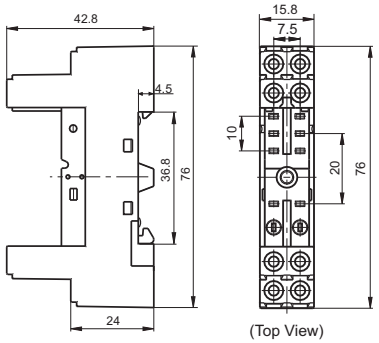
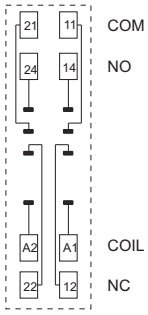
- the insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength S.	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting	 (Top View)	 (Top View)	metallic retainer 14FF-H3 remarks:the dielectric strength can reach 1500VAC that sockets mounted 14FF-H3
14FF-2Z-C2(767)  Screw terminal DIN rail or Screw mounting With finger protection device	 (Top View)	 (Top View)	plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

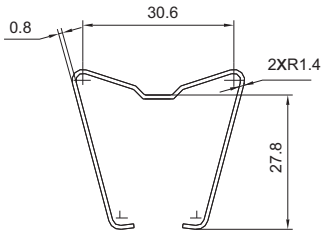
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPOENT (AVAILABLE)

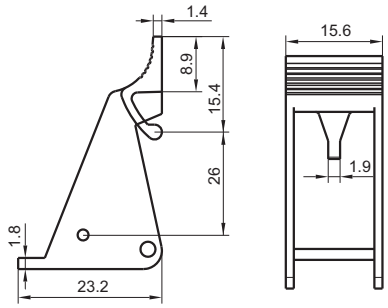
Unit: mm

Retainer

14FF-H3（Metallic retainer）

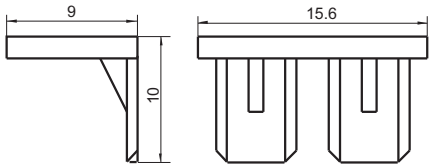


14FF-H6（Plastic retainer）



Marker

14FF-M1



Things to be noticed when selecting sockets:

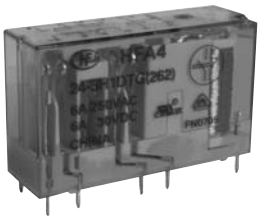
1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF115FP relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HFA4

SAFETY RELAY
(RELAY WITH FORCIBLY GUIDED CONTACTS)

c UL us
File No.:E134517

VDE
File No.:40034342



Features

- Multi contact arrangements: 2NO+2NC, 3NO+1NC
- Forcibly guided contacts according to EN50205
- 6A switching capability
- Low input power: 360mW
- High insulation capability: 10kV surge voltage between input and output
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 40.0mm x 13.0mm x 24.0mm

CONTACT DATA

Contact arrangement	2NO+2NC (2H2D type) 3NO+1NC (3H1D type)
Forcibly guided contacts Type (according to EN50205)	Type A
Contact resistance 1)	100mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	6A 250VAC / 30VDC
Max. switching voltage	400VAC / 30VDC
Max. switching current	6A
Max. switching power	1500VA /180W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (1NO: 6A 30VDC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5OPS (1NO: 6A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 360mW

COIL DATA

at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil resistance Ω
6	4.5	0.6	7.8	100 x (1±10%)
9	6.8	0.9	11.7	225 x (1±10%)
12	9.0	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
36	27.0	3.6	46.8	3600 x (1±10%)
48 3)	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ⩾ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1 min
	Between open contacts	1500VAC 1 min
	Between contact sets	2500VAC 1 min (7-8/9-10) 4000VAC 1 min (Other)
Surge voltage	Between coil & contacts	10kV (1.2 / 50μs)
	Between contact sets	5kV (1.2 / 50μs)
Operate time (at rated voltage)		20ms max.
Release time (at rated voltage)		20ms max.
Temperature rise (at rated voltage)		⩽60K (Coil driving voltage: 1.1 times Un, Contact current -carrying: rated current, at 85 ˚C)
Vibration resistance		NO/NC:10Hz to 55Hz 1.5mm DA NO:55Hz to 200Hz, 98m/s^2 NC:55Hz to 200Hz, 49m/s^2
Shock resistance	Functional	100m/s^2
	Destructive	980m/s^2
Creepage distance	Between coil & contacts	8mm
	Between contacts	5.5mm
Clearance distance	Between coil & contacts	8mm
	Between contacts	5.5mm
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 20g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) UL insulation system: Class F, Class B.

SAFETY APPROVAL RATINGS

UL/CUL	6A 277VAC / 250VAC / 125VAC at 85˚C 6A 30VDC at 85˚C Pilot duty: 2A 240VAC at room temp.
VDE	6A 250VAC at 85˚C 6A 30VDC at 85˚C AC-15: 1.5A 240VAC at room temp. AC-15: 2A 240VAC at room temp.

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

HONGFA RELAY
ISO9001、ISO/TS16949、ISO14001、OHSAS18001、IECQ QC 080000 CERTIFIED

ORDERING INFORMATION

	HFA4 /	24	-2H2D	T	G	F	(XXX)
Type							
Coil voltage	6, 9, 12, 18, 24, 36, 48VDC						
Contact arrangement	**2H2D:** 2NO+2NC **3H1D:** 3NO+1NC						
Contact material	**T:** $AgSnO_2$						
Contact plating	**G:** Gold plated						
Insulation class	**F:** Class F **Nil:** Class B						
Special code[3)]	**XXX:** Customer special requirement **Nil:** Standard						

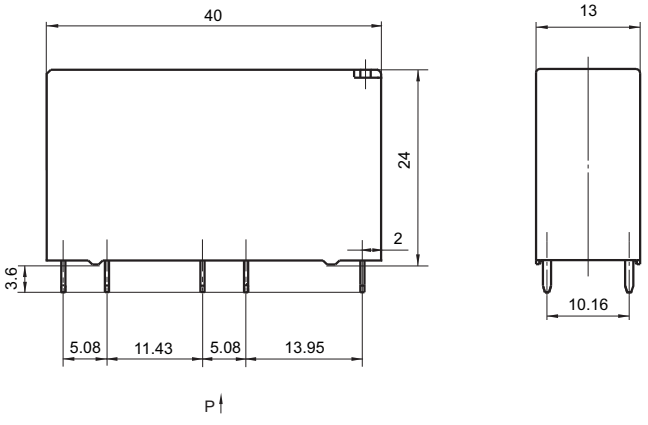
Notes: 1) This product is a soldering flux type products,when the product into the PCB plate welding.does not allow for cleaning.
2) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC. If customers have special requirment of load, please contact us for suggestion about suitable parts.
3) The customer special requirement express as special code after evaluating by Hongfa.

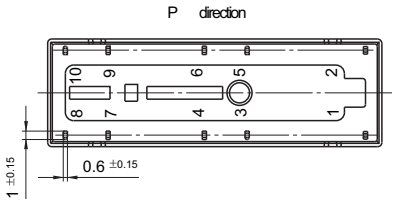
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

HFA4/□□-2H2DT□(□□□)

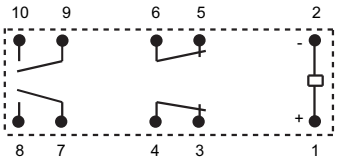
Outline Dimensions





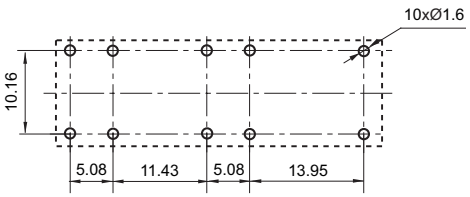
Wiring Diagram

(Bottom view)



PCB Layout

(Bottom view)

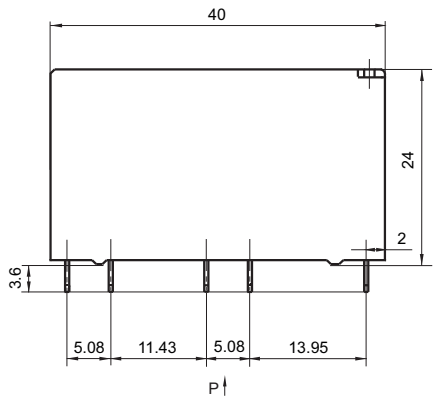


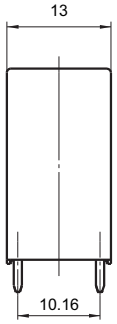
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

HFA4/□□-3H1DT□(□□□)

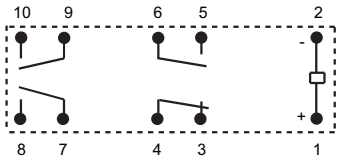
Outline Dimensions

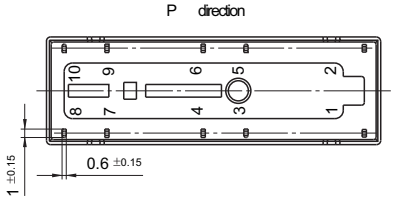




Wiring Diagram

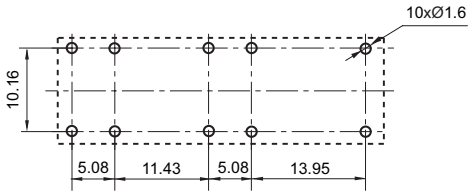
(Bottom view)





PCB Layout

(Bottom view)

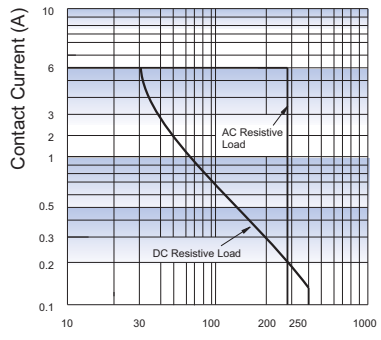


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

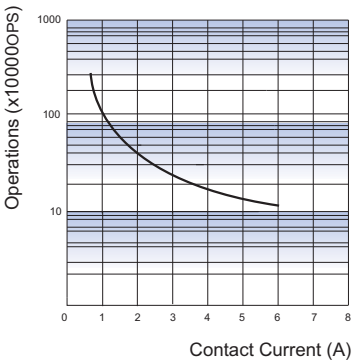
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



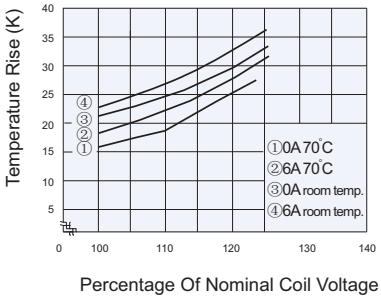
ENDURANCE CURVE



Test conditions:

1NO, Resistive load, 250VAC,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Relay Sockets

CE

c UL us

File No:E253370

Features

- The dielectric strength (between coil and contacts) can reach 2500VAC and the insulation resistance is 1000 MΩ
- DIN rail or Screw mounting
- With diode to protect the coil and to eliminate the converse current
- With finger protection device
- Buit-in retainer and exfractor

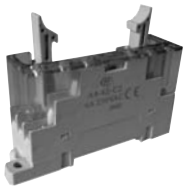
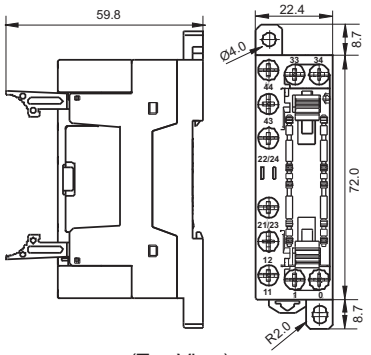
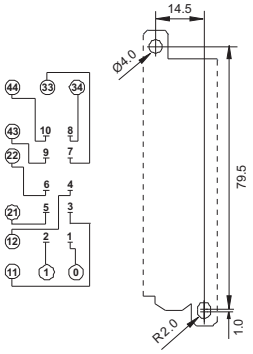
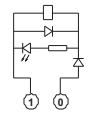
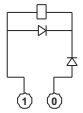
CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Applicable coil voltage of relay	Ambient Temperature	Torque*	Max.wire cross section mm^2	Wire Strip Length	Notes
A4-4Z-C2-D24	250VAC	6A	(6 to 24)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	With LED
A4-4Z-C2-D60	250VAC	6A	(36 to 60)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	With LED
A4-4Z-C2-D110	250VAC	6A	(85 to 110)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	With LED
A4-4Z-C2	250VAC	6A	(6 to 110)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	Without LED

Notes: * Refers to wire-assembled torque.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND CIRCUIT DIAGRAM

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Circuit Diagram
 Screw Terminal, DIN rail mounting, With finger protection device	 (Top View)	 (Top View)	 With LED  Without LED

Notes: 1. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.

2. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HFA6

SAFETY RELAY
(RELAY WITH FORCIBLY GUIDED CONTACTS)

c UL us
File No.:E134517

TÜV
File No.:B120553286004

Features

- Multi contact arrangements: 5NO+1NC, 4NO+2NC, 3NO+3NC
- Forcibly guided contacts according to EN50205
- 6A switching capability
- Low input power: 500mW
- High insulation capability: 10kV surge voltage between input and output
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 50.0mm x 13.0mm x 24.0mm

CONTACT DATA

Contact arrangement	5NO+1NC (5H1D type) 4NO+2NC (4H2D type) 3NO+3NC (3H3D type)
Forcibly guided contacts Type (according to EN50205)	Type A
Contact resistance1)	100mΩ (at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	6A 250VAC / 30VDC
Max. switching voltage	400VAC / 30VDC
Max. switching current	6A
Max. switching power	1500VA /180W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (1NO: 6A 30VDC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5OPS (1NO: 6A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 500mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil resistance Ω
6	4.5	0.6	6.6	72 x (1±10%)
9	6.8	0.9	9.9	162 x (1±10%)
12	9.0	1.2	13.2	288 x (1±10%)
18	13.5	1.8	21.78	648 x (1±10%)
24	18.0	2.4	26.4	1152 x (1±10%)
36	27.0	3.6	39.6	2592 x (1±10%)
48 3)	36.0	4.8	52.8	4608 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
2) For products with rated voltage ⩾ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1 min
	Between open contacts	1500VAC 1 min
	Between contact sets	2500VAC 1 min (11-12/13-14) 4000VAC 1 min (Other)
Surge voltage	Between coil & contacts	10kV (1.2 / 50μs)
	Between contact sets	5kV (1.2 / 50μs)
Operate time (at rated voltage)		20ms max.
Release time (at rated voltage)		20ms max.
Temperature rise (at rated voltage)		⩽70K (Coil driving voltage: 1.1 times Un, Contact current -carrying: rated current, at 85 °C)
Vibration resistance		NO/NC:10Hz to 55Hz 1.5mm DA NO:55Hz to 200Hz, 98m/s^2 NC:55Hz to 200Hz, 49m/s^2
Shock resistance	Functional	100m/s^2
	Destructive	980m/s^2
Creepage distance	Between coil & contacts	8mm
	Between contacts	5.5mm
Clearance distance	Between coil & contacts	8mm
	Between contacts	5.5mm
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 23g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) UL insulation system: Class F, Class B.

SAFETY APPROVAL RATINGS

UL/CUL	6A 277VAC / 250VAC / 125VAC at 85°C 6A 30VDC at 85°C Pilot duty: 1.5A 240VAC 3A 120VAC
TÜV	6A 277VAC / 30VDC 1.5A /2A 240VAC(AC-15)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HFA6 /	24	-5H1D	T	G	F	(XXX)
Type							
Coil voltage	6, 9, 12, 18, 24, 36, 48VDC						
Contact arrangement	**5H1D:** 5NO+1NC **4H2D:** 4NO+2NC **3H3D:** 3NO+3NC						
Contact material	**T:** $AgSnO_2$						
Contact plating	**G:** Gold plated						
Insulation class	**F:** Class F **Nil:** Class B						
Special code[4]	**XXX:** Customer special requirement **Nil:** Standard						

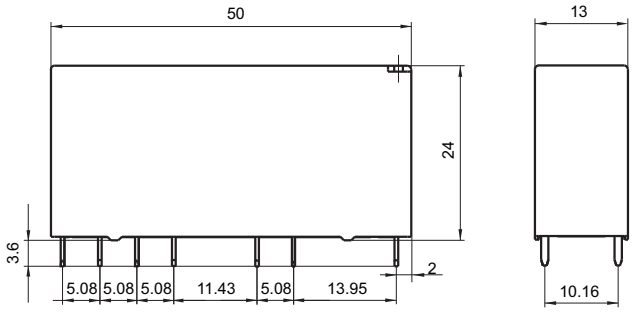
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

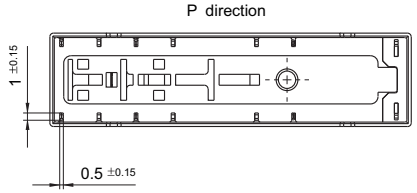
Unit: mm

HFA6/□□-5H1DT□(□□□)

Outline Dimensions

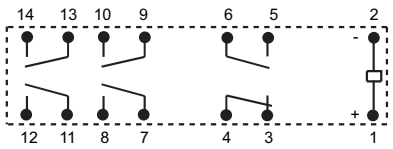


P



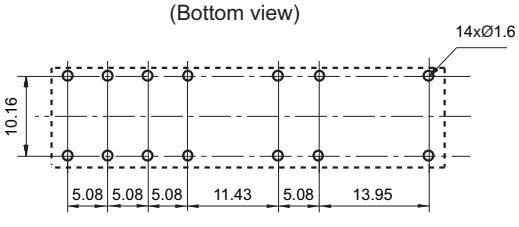
Wiring Diagram

(Bottom view)



PCB Layout

(Bottom view)

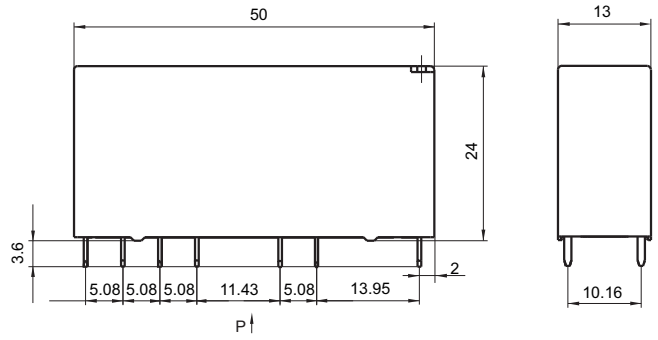


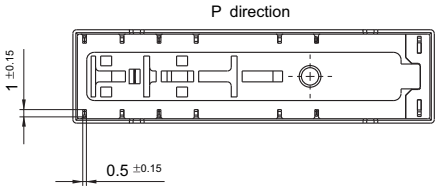
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

HFA6/□□-4H2DT□(□□□)

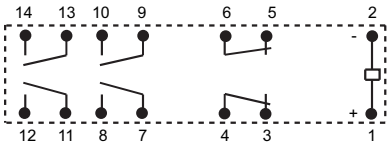
Outline Dimensions





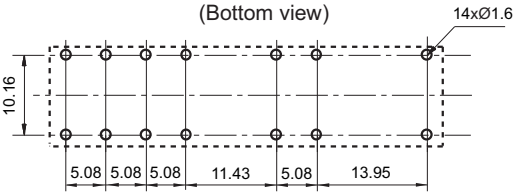
Wiring Diagram

(Bottom view)



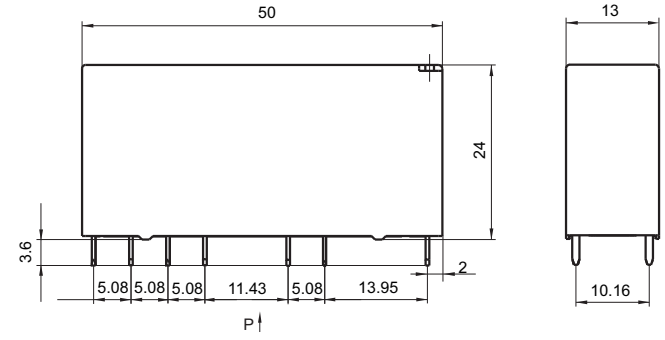
PCB Layout

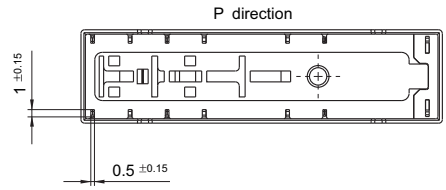
(Bottom view)



HFA6/□□-3H3DT□(□□□)

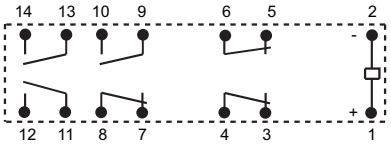
Outline Dimensions





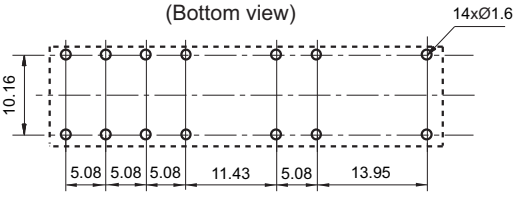
Wiring Diagram

(Bottom view)



PCB Layout

(Bottom view)

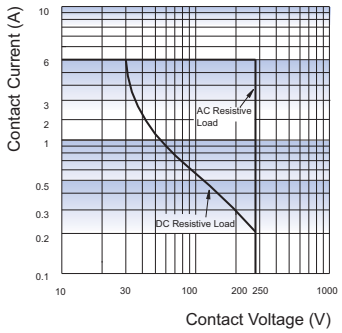


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

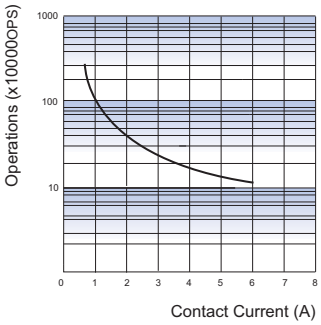
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

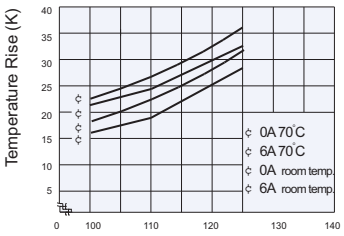


ENDURANCE CURVE



Test conditions:
1NO, Resistive load, 250VAC,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



Relay Sockets

File No.: E253370

Screw Terminal、
DIN rail mounting、
With finger protection device

Features

- The dielectric strength (between coil and contacts) can reach 2500VAC and the insulation resistance is 1000 MΩ
- DIN rail or Screw mounting
- With diode to protect the coil and to eliminate the converse current
- With finger protection device
- Buit-in retainer and exfractor

CHARACTERISTICS

Unit: mm

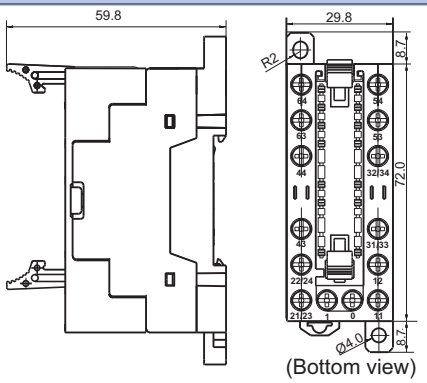
Type	Nominal Voltage	Nominal Current	Applicable coil voltage of relay	Ambient Temperature	Torque*	Max.wire cross section mm^2	Wire Strip Length	Notes
A6-6Z-C2-D24	250VAC	6A	(6 to 24)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	With LED
A6-6Z-C2-D60	250VAC	6A	(36 to 60)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	With LED
A6-6Z-C2-D110	250VAC	6A	(85 to 110)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	With LED
A6-6Z-C2	250VAC	6A	(6 to 110)VDC	-25 ˚C to 55˚C	1.0N · m	2 x1.5	7mm	Without LED

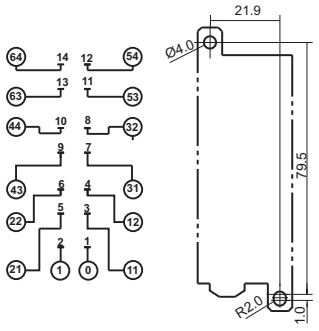
Notes: * Refers to wire-assembled torque.

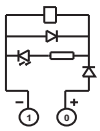
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

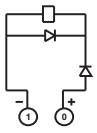
Unit: mm

Socket	Outline Dimensions	Wiring Diagram	Components Available
A6-6Z-C2-X	59.8, 29.8, R2, 8.7, 72.0, Ø4.0, (Bottom view)	21.9, Ø4.0, 79.5, R2.0, 1.0, (Bottom view)	With LED; Without LED









Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF3701 SAFETY RELAY MODULE

CE

File No.: N8130453286010

Typical application: Emergency stop button, Safety door

Features

- Redundant design of circuit, safety function can still work against some single component fault
- With self-check function. The switching status of interior relay will be checked automatically during each start-stop cycle
- Automatic or manual reset of contacts without time delay
- Meet the requirements of EN 60947-5-1 and EN 60204-1, with safety grade up to PLe of ISO13849-1
- Pluggable connectors
- LED indicator: Working status of interior relay and power supply
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 113.5mm x 99.0mm x 22.5mm

FUNCTIONS

1. Detecting under dual-channel input:
   1) short-circuit between contacts
   2) short-circuit of input circuit
   3) short-circuit between input circuit
2. Under dual-channel input, the next operation can be performed only when the switches of both channels are off one times.
3. Automatic reset: module works once the input circuit on.
4. Manual reset: input circuit on can not start the module till the reset button on.

CHARACTERISTICS

Nominal voltage	24VAC / VDC
Voltage tolerance	-15% to 10%
Frequency range	50Hz to 60Hz
Ambient temperature	-20°C to 55°C
Power consumption (at nomi. volt.)	2 pole: 3.5VA / 1.7W max. 4 pole: 5.1VA / 2.4W max.
Contact rating (Res. load)	6A 250VAC / 30VDC
Min. applicable load	10mA 17VDC
Rated impulse withstand voltage	4kV
Rated insulation voltage	250VAC
Vibration resistance	10Hz to 55Hz 1.5mm DA
Pollution level	level 2

Operate time (at nomi. volt.)	45ms max.(dual-channel)
Release time (at nomi. volt.)	20ms max.(dual-channel)
Mounting	DIN rail (35mm)
Conductor cross section	0.2mm^2 to 2.5mm^2 (24AWG to 14AWG)
Wire strip length	7mm
Terminal torque	0.4N · m
IP grade	cover IP40, terminal IP20
Electrical endurance	1 x 10^5OPS (6A 250VAC 5s on 5s off)
Mechanical endurance	1 x 10^7OPS (Switching frequency:7200 OPS./hour)
Unit weight	Approx.160g
External contact fuse protection	RT14-6(I_k=1kA, EN 60947-5-1)

Notes: 1) This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

ORDERING INFORMATION

	HF3701/	24	-2H	(XXX)
Type				
Coil voltage	24 VAC/VDC			
Contact arrangement	**2H:** 2 Form A	**1H1D:** 1 Form A + 1 Form B		
	4H: 4 Form A	**3H1D:** 3 Form A + 1 Form B		
Special code[1)]	**XXX:** Customer special requirement		**Nil:** Standard	

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

HONGFA RELAY

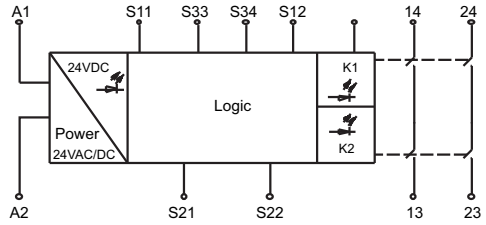
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

STRUCTURE DIAGRAM, WIRING DIAGRAM

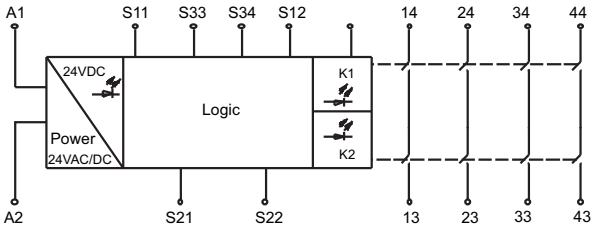
Unit: mm

Structure Diagram

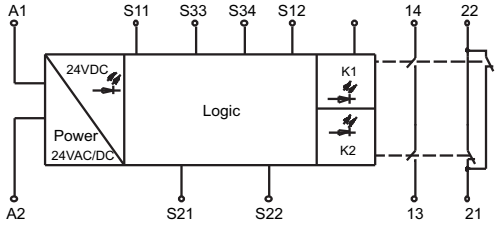
2 Form A



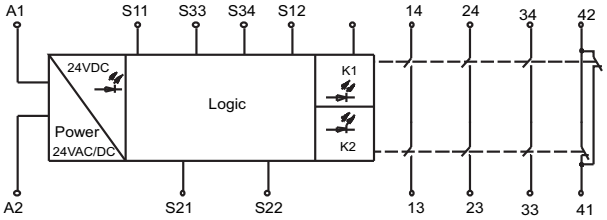
4 Form A



1 Form A +1Form B

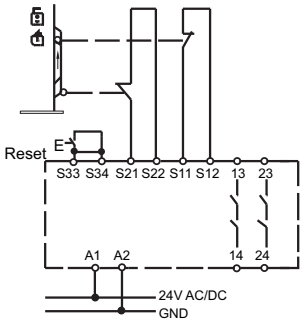


3 Form A +1Form B



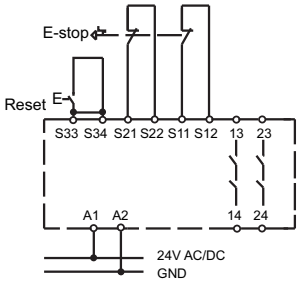
Typical Wiring Diagram (e.g. 2 Form A)

Typical application 1



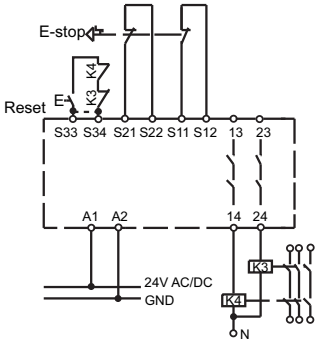
Safety door Monitor, dual-channel signal input, manual reset, highest safety grade PLe/ISO 13849-1

Typical application 2



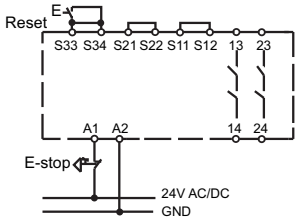
Emergency stop button monitor, dual-channel signal input, manual reset, highest safety grade PLe/ISO 13849-1

Typical application 3



Emergency stop button monitor, dual-channel signal input, with feedback manual reset, highest safety grade PLe/ISO 13849-1

Typical application 4



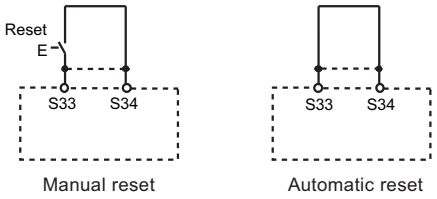
Single-channel signal input, manual reset, highest safety grade PLd/ISO 13849-1

Notes: 1) The above safety grade is determined based on our company's wiring diagram, there may be some difference in real application.
2) The safety grade is determined by the whole safety control system. Please check carefully before application.

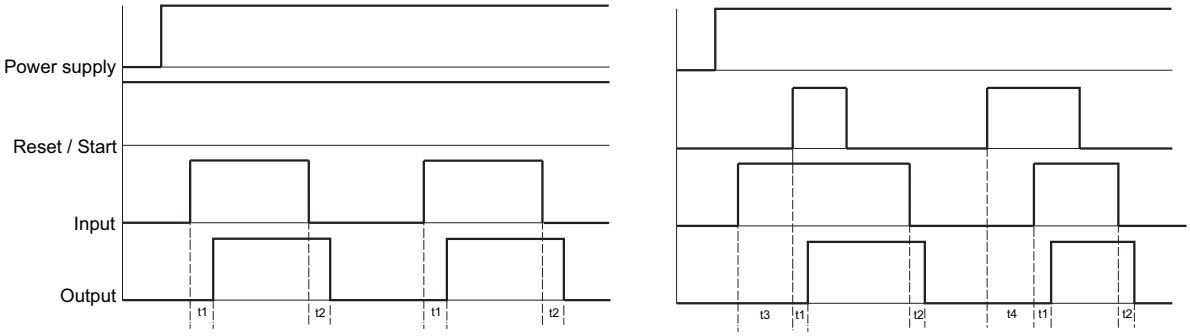
SEQUENCE DIAGRAM, TERMINAL

Unit: mm

Reset Circuit



Sequence Diagram(e.g. 2 Form A)

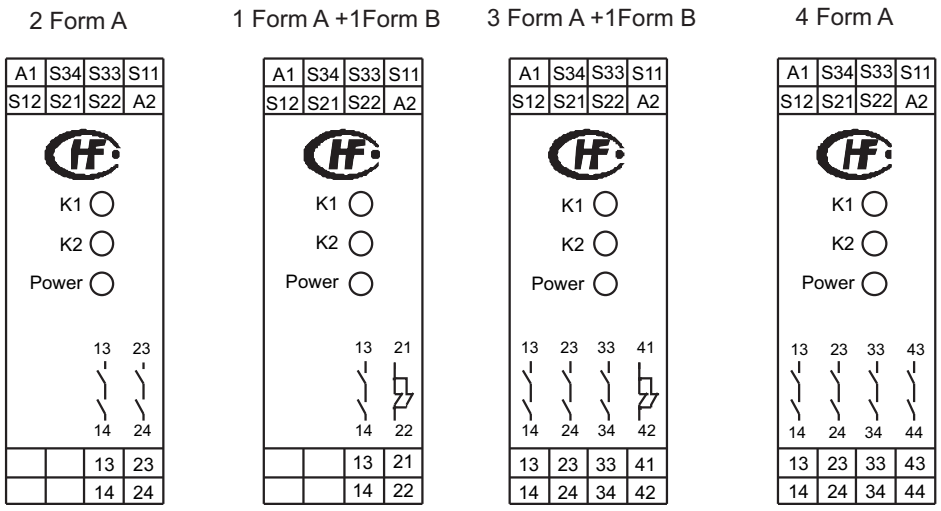


Power supply: A1-A2
Reset / Start: S33-S34
Input: S11-S12, S21-S22

Output:13-14, 23-24
t1: relay switches delay time
t2: relay releases delay time

t3 / t4: Latency time

Terminal

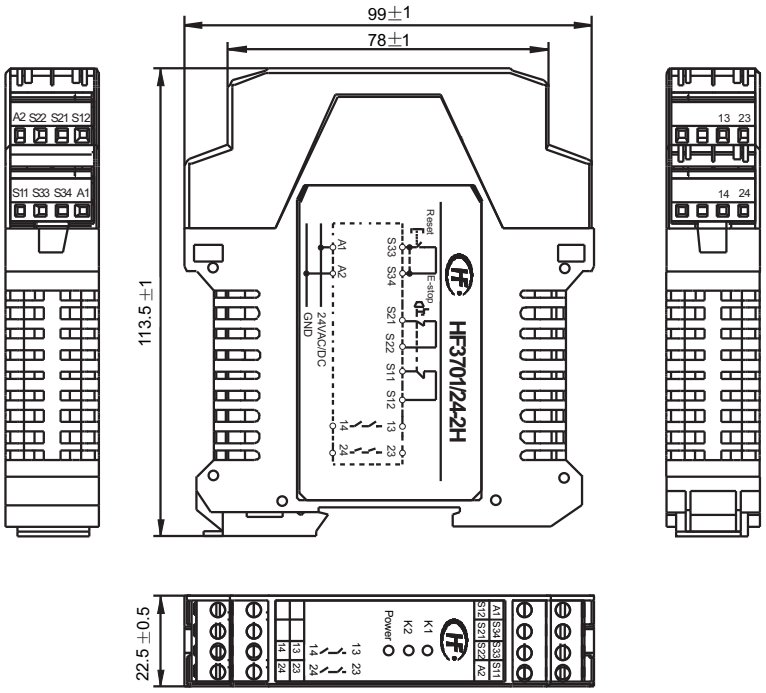


Notes: 1) The markings above are same as that of typical wiring diagram(details as per real products).

OUTLINE DIMENSIONS

Unit: mm

Outline Dimensions(e.g. HF3701/24-2H)



HF49FD MINIATURE POWER RELAY

File No. : E133481

File No. : 40033644

File No. : R50149334

File No.:CQC17002175722

Features

- 5A switching capability
- 3kV dielectric strength (between coil and contacts)
- Slim size (width 5mm, height 12.5mm)
- High sensitive: Min. 120mW
- Meets IEC61131-2 reinforce insulation
- Creepage/clearance distance: Min. 3.5mm
- Sockets available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 20.0mm x 5.0mm x 12.5mm

CONTACT DATA

Contact arrangement	1A
Contact Resistance (at 1A 6VDC)[1)]	No gold plated: 100mΩ max. Gold plated: 50mΩ max.
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	5A 250VAC/30VDC
Max. switching voltage	250VAC /30VDC
Max. switching current	5A
Max. switching power	1250VA / 150W
Min. contact load [2)]	No gold plated: 5VDC 10mA Gold plated: 5VDC 1mA
Mechanical endurance	2 x 10^7OPS
Electrical endurance	1 x 10^5OPS (3A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) 5 x 10^4OPS (5A 250VAC/30VDC, Resistive load, AgNi, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	3000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(between coil & contacts)		6kV (1.2 / 50μs)
Operate time (at nomi.volt.)		10ms max.
Release time (at nomi.volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B, Class A.

COIL

Coil power	Approx. 120mW (at 5VDC to 18VDC) Approx. 180mW (at 24VDC)

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC at 85°C [3)]	Coil Resistance Ω
5	3.50	0.25	6.0	208 x (1±10%)
6	4.20	0.30	7.2	300 x (1±10%)
9	6.30	0.45	10.8	675 x (1±10%)
12	8.40	0.60	14.4	1200 x (1±10%)
18	12.6	0.90	21.6	2700 x (1±15%)
24	16.8	1.20	28.8	3200 x (1±15%)

Notes: 1) All above data are tested when the relays terminals are downward position. Other positions of the terminals, the pick-up and drop-out voltages will have ±5% tolerance. For example, when the relay terminals are transverse position, the max. pick-up voltage change is 75% of nominal voltage.
2) The data shown above are initial values.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) 24VDC 120mW type are also available, please see ordering information for more details.

SAFETY APPROVAL RATINGS

UL/CUL	1H1	$AgSnO_2$	3A 250VAC COSØ=1 at 85°C 3A 30VDC L/R =0ms at 85°C
		AgNi	5A 250VAC COSØ=1 5A 30VDC L/R =0ms
	1H2	AgNi	3A 250VAC COSØ=1 at 85°C 3A 30VDC L/R =0ms at 85°C 5A 250VAC COSØ=1 5A 30VDC L/R =0ms
VDE			5A 250VAC COSØ=1 at 85°C 5A 30VDC L/R =0ms at 85°C
TÜV			5A 250VAC COSØ=1 at 70°C 5A 30VDC L/R =0ms at 70°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

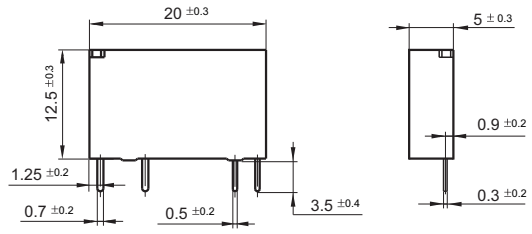
	HF49FD /	012	-1H	1	2	G	T	F	L	(XXX)
Type										
Coil voltage	5, 6, 9, 12,18, 24VDC									
Contact arrangement	**1H:** 1 Form A									
Contact version	**1:** Single contact **2:** Bifurcated contact(Only for gold plated)									
Space between terminals (See the following)	**1:** 5.08mm	**2:** 7.62mm								
Contact plating	**G:** Gold plated	**Nil:** No gold plated (Only for single contact)								
Contact material	**T:** $AgSnO_2$ (Only for single contact)	**Nil:** AgNi								
Insulation standard	**F:** Class F	**B:** Class B	**Nil:** Class A							
Coil power	**L:** Sensitive (Only for 24VDC)	**Nil:** Standard								
Special code[2)]	**XXX:** Customer special requirement	**Nil:** Standard								

Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
2) The customer special requirement express as special code after evaluating by Hongfa.
3) If customer need to fix HF49FD in 49F socket (HF49FD+49F socket) in application, please choose HF49FD relay with suffix (009) or suffix (086).

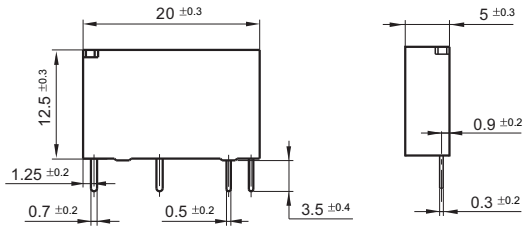
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Outline Dimensions

HF49FD/□□□-1H□1(□□□)



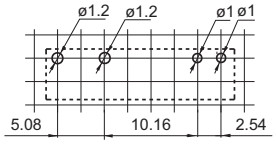
HF49FD/□□□-1H□2(□□□)



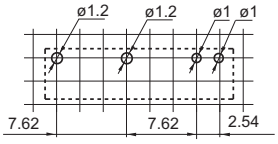
PCB Layout

(Bottom view)

HF49FD/□□□-1H□1(□□□)



HF49FD/□□□-1H□2(□□□)



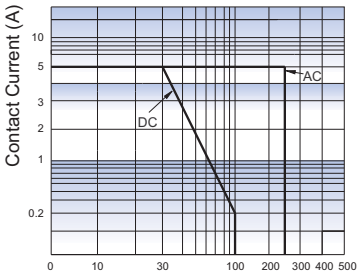
Wiring Diagram

(Bottom view)

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.54mm.

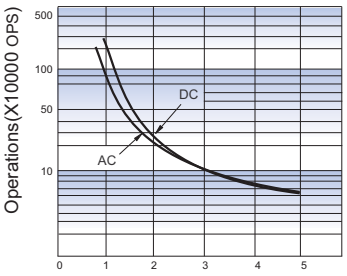
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

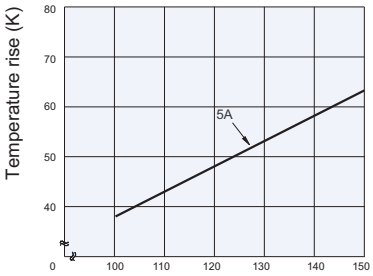
ENDURANCE CURVE



Contact Current (A)

Test conditions:
1H1: AgNi, Resistive load, 250VAC/30VDC,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

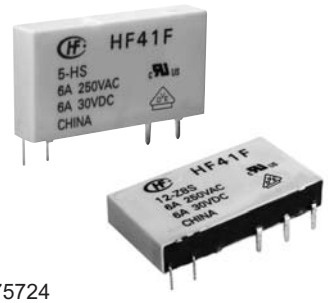
Test conditions:
5A 85℃
(Typical curve of 24VDC standard type)

HF41F SUBMINIATURE POWER RELAY

File No.: E133481

File No.: 40020043

File No.: CQC17002175724



Features

- Slim size (width 5mm)
- High breakdown voltage 4kV (between coil and contacts)
- Surge voltage up to 6kV (between coil and contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- High sensitive: Approx.170mW
- Sockets available
- 1 Form A and 1 Form C configurations
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 28.0mm x 5.0mm x 15.0mm

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max. (at 1A 6VDC) Gold plated: 30mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	6A 250VAC / 30VDC
Max. switching voltage	400VAC / 125VDC
Max. switching current	6A
Max. switching power	1500VA / 180W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	H type: 6 x 10^4OPS (6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) Z type: 3 x 10^4OPS (NO, 6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) 1 x 10^4OPS (NC, 6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1 min
	Between open contacts	1000VAC 1 min
Operate time (at nomi.volt.)		8ms max.
Release time (at nomi.volt.)		4ms max.
Shock resistance 1)	Functional	49m/s²
	Destructive	980m/s²
Vibration resistance 1)		10Hz to 55Hz 1mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 5g
Construction		Plastic sealed, Flux proofed

Notes: 1) Index is that of relay without socket.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) Please do not install a SPDT(1 Form C) type relay on either of the smallest sides or facing downward.
5) UL insulation system: Class A.

COIL

Coil power	5VDC to 24VDC: Approx. 170mW 48VDC, 60VDC: Approx. 210mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC 3)	Coil Resistance Ω
5	3.75	0.25	7.5	147 x (1±10%)
6	4.50	0.30	9.0	212 x (1±10%)
9	6.75	0.45	13.5	476 x (1±10%)
12	9.00	0.60	18	848 x (1±10%)
18	13.5	0.90	27	1906 x (1±15%)
24	18.0	1.20	36	3390 x (1±15%)
48 4)	36.0	2.40	72	10600 x (1±15%)
60 4)	45.0	3.00	90	16600 x (1±15%)

Notes: 1) The data shown above are initial values.
2) When require pick-up voltage≤70% nominal voltage, special order allowed .
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	6A 30VDC at 85°C 6A 277VAC at 85°C R300 B300
VDE	6A 30VDC at 85°C 6A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

ORDERING INFORMATION

	HF41F /	12	-H	8	S	T	G	(XXX)
Type								
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC							
Contact arrangement	**H:** 1 Form A	**Z:** 1 Form C						
Version [1]	**8:** Flat pack version	**Nil:** Vertical version						
Construction [2)3)]	**S:** Plastic sealed	**Nil:** Flux proofed						
Contact material	**T:** $AgSnO_2$	**Nil:** AgNi						
Contact plating [4)]	**G:** Gold plated	**Nil:** No gold plated						
Special code [5)]	**XXX:** Customer special requirement	**Nil:** Standard						

Notes: 1) We recommend flux proofed types for the flat pack version.

2) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).

3) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

4) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

5) The customer special requirement express as special code after evaluating by Hongfa. e.g. (210) stands for pick-up voltage less than 70% of norminal voltage. e.g. (414) stands for wide coil pin type.

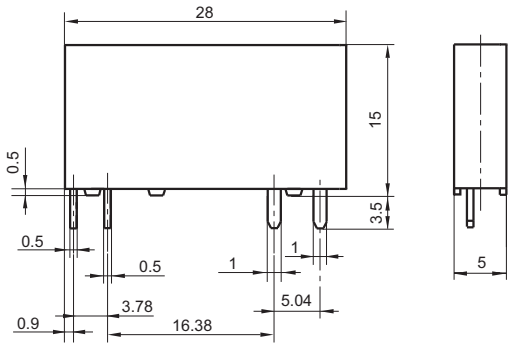
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

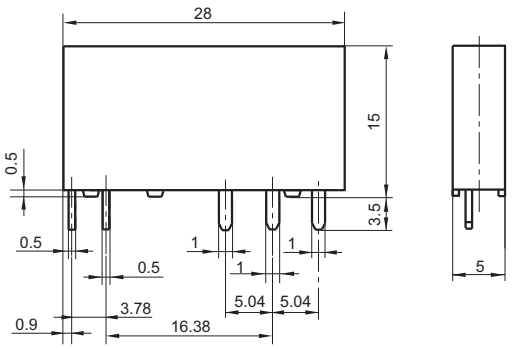
Outline Dimensions

1 Form A

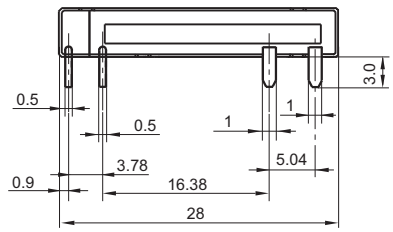
Vertical version

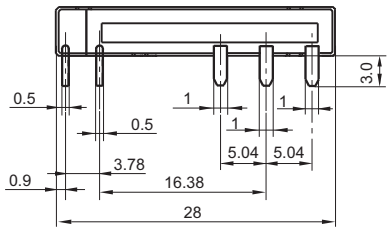


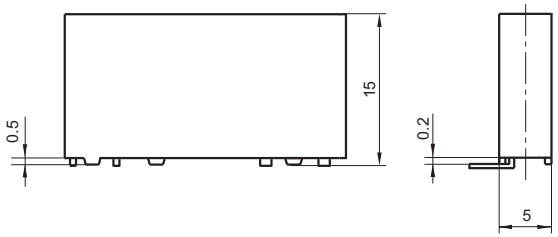
1 Form C

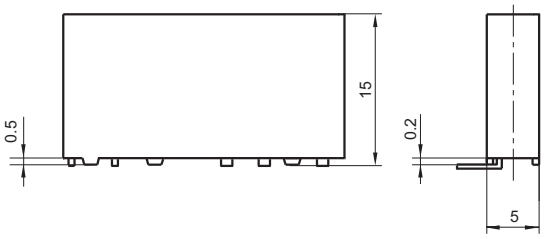


Flat pack version









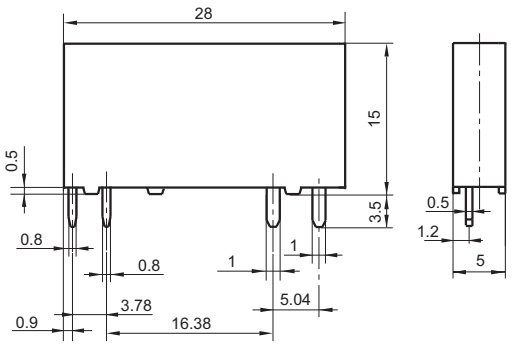
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

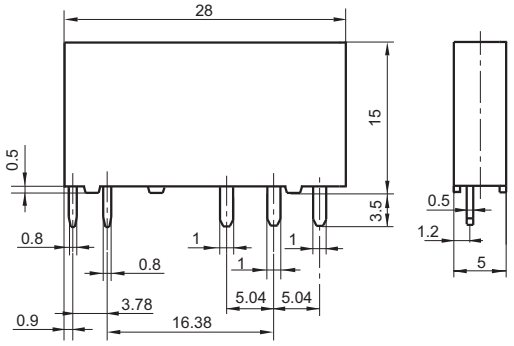
Outline Dimensions

1 Form A

Special code: (414)



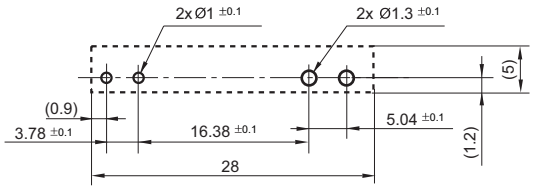
1 Form C



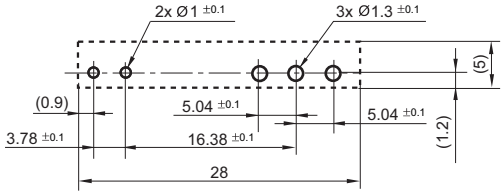
PCB Layout (Bottom view)

1 Form A

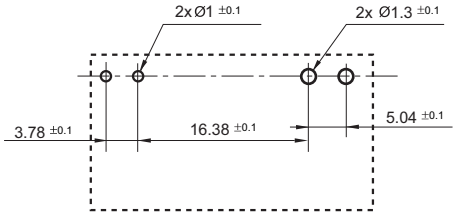
Vertical version

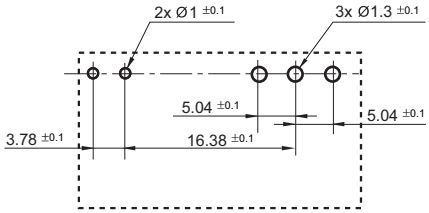


1 Form C

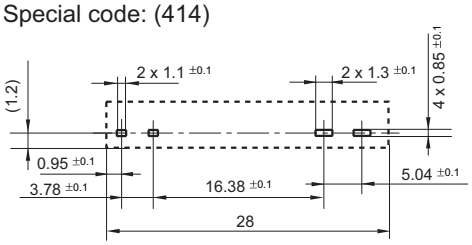


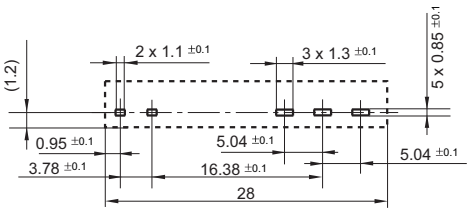
Flat pack version





Special code: (414)





Wiring Diagram (Bottom view)

1 Form A

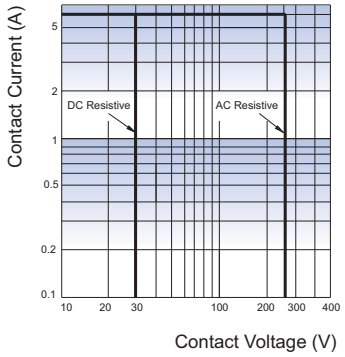
1 Form C

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

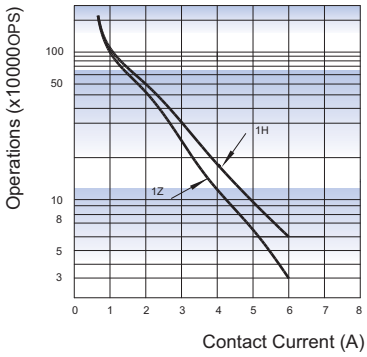
2) The tolerance without indicating for PCB layouts is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

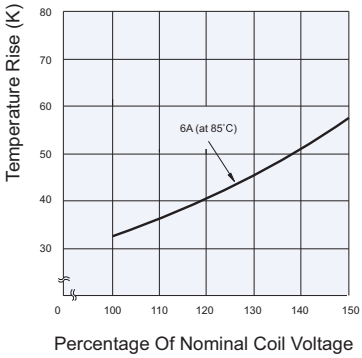


ENDURANCE CURVE



Test conditions:
NO, AgNi, Resistive load, 250VAC,
Flux proofed, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Test conditions:
6A 85℃
(Typical curve of 24VDC standard type)

Relay Sockets

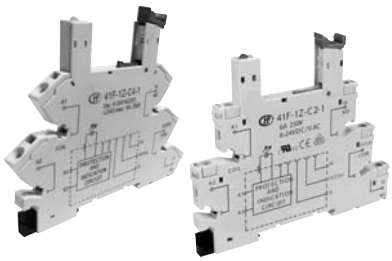
CE

c UL us

File No.: E253370

VDE

File No.: 40020043



Features

- The dielectric strength can reach 4000VAC and the insulation resistance is 1000MΩ
- With finger protection device
- Ensure secure rention and easy ejection of relays
- Built-in protection circuit can indicate the power status, protect the circuit and expand the range of relay input voltage
- Components available: marker, jumper and separator
- Environmental friendly product (RoHS compliant)

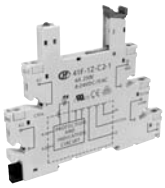
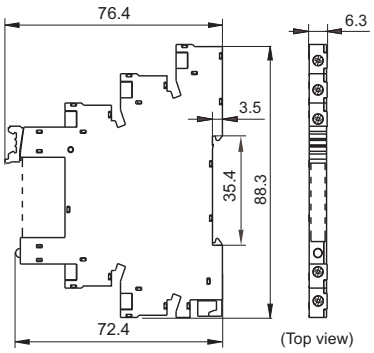
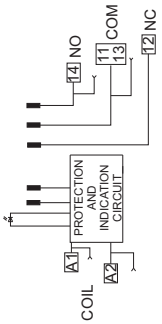
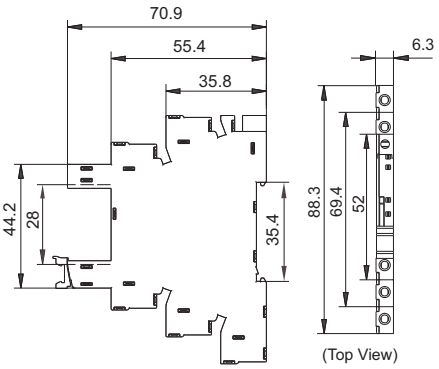
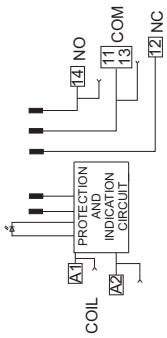
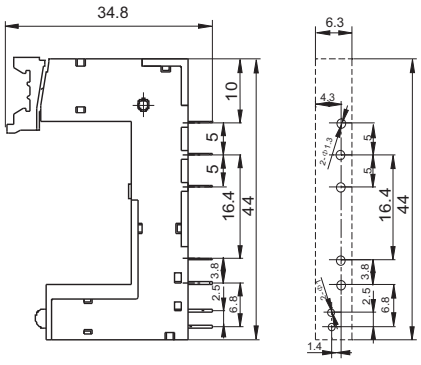
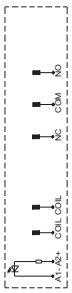
CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Input Voltage to Socket Coil	Relay Coil Voltage Applicable	Polarity of Input Voltage	Screw Torque	Wire Strip Length
41F-1Z-C2-1	250VAC	6A	-40 ˚C to 70˚C	(12 to 24)V AC/DC	(12 to 24)VDC	No requirement	0.5N · m	7mm
41F-1Z-C2-2	250VAC	6A	-40 ˚C to 70˚C	(48 to 60)V AC/DC	(48 to 60)VDC	No requirement	0.5N · m	7mm
41F-1Z-C2-3	250VAC	6A	-40 ˚C to 55˚C	(110 to 125)V AC/DC	60VDC	No requirement	0.5N · m	7mm
41F-1Z-C2-4	250VAC	6A	-40 ˚C to 55˚C	(220 to 240)V AC/DC	60VDC	No requirement	0.5N · m	7mm
41F-1Z-C2-5	250VAC	6A	-40 ˚C to 70˚C	(6 to 24)VDC	(6 to 24)VDC	Requirement	0.5N · m	7mm
41F-1Z-C4-1	250VAC	6A	-40 ˚C to 70˚C	(12 to 24)V AC/DC	(12 to 24)VDC	No requirement	-	7mm
41F-1Z-C4-2	250VAC	6A	-40 ˚C to 70˚C	(48 to 60)V AC/DC	(48 to 60)VDC	No requirement	-	7mm
41F-1Z-C4-3	250VAC	6A	-40 ˚C to 55˚C	(110 to 125)V AC/DC	60VDC	No requirement	-	7mm
41F-1Z-C4-4	250VAC	6A	-40 ˚C to 55˚C	(220 to 240)V AC/DC	60VDC	No requirement	-	7mm
41F-1Z-C4-5	250VAC	6A	-40 ˚C to 70˚C	(6 to 24)VDC	(6 to 24)VDC	Requirement	-	7mm
41F-1Z-A2-1	250VAC	6A	-40 ˚C to 70˚C	(6 to 24)V DC	(6 to 24)V DC	Requirement	-	-
41F-1Z-A2-2	250VAC	6A	-40 ˚C to 70˚C	(48 to 60)V DC	(48 to 60)V DC	Requirement	-	-

Note: When the 41F-1Z-C2/C4-1 socket is applied to the relay of 12VDC nominal voltage,the relay of which pick-up voltage =70% nominal voltage should be required and the special order of relay allowed. 41F-1Z-C2/C4-4 is not allowed in continuous electricity conditions.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	Components Available
41F-1Z-C2-1/2/3/4/5  Screw terminal, DIN rail mounting, With finger protection device Certified by VDE and UL/CUL			marker 41F-M 41F-M1 jumper 41F-J1(blue) 41F-J1R(red) 41F-J1B(black) separator 41F-S
41F-1Z-C4-1/2/3/4/5  Spring-loaded terminal, DIN rail mounting, With finger protection device			marker 41F-M 41F-M1 jumper 41F-J1(blue) 41F-J1R(red) 41F-J1B(black) separator 41F-S
41F-1Z-A2-1/2  PCB terminal, PCB mounting			*marker 41F-M

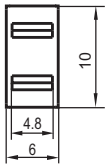
Notes: * If need accesscry,please order with type.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

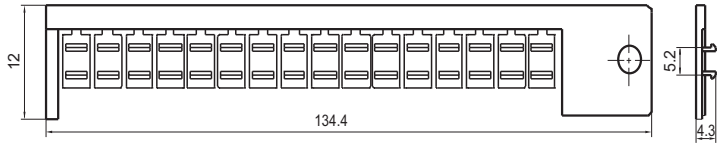
Unit: mm

Marker

41F-M

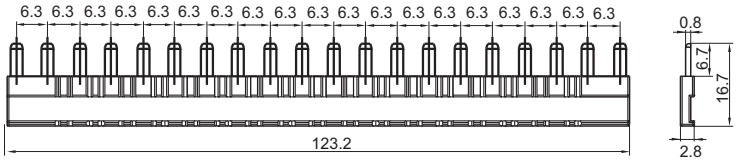


41F-M1



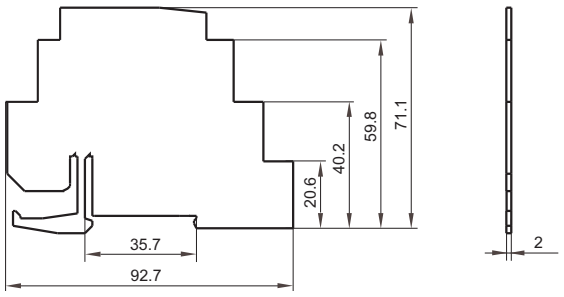
Jumper

41F-J1(blue)、41F-J1R(red)、41F-J1B(black)



Separator

41F-S



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. As for related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF41F relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Precautions For Use

1. Please use the quick-break fuse with rating of 15Amp. for short-circuit protection.
2. It may cause failure, fire or malfunction, when the sockets is continuously applied the power to for a long term In case of exceeding the upper limit ambient temperature. So please ensure that the ambient temperature is within the upper limit when using sockets.

Operating temperature upper limit：55℃：41F-1Z-C2-3/4
41F-1Z-C4-3/4
Operating temperature upper limit：70℃：41F-1Z-C2-1/2/5
41F-1Z-C4-1/2/5

3. Things to be noticed when selecting soft wiring.

1) 41F-1Z-C2-1/2/3/4/5

The soft wiring can be divided into the following types.

· Twisted line or single wire below 2.5mm² or below AGW14.

· Within 2 roots when the twisted below 1.5mm² or below AGW16.

Be sure to use this size that the front end of the wire needs to be stripped of the 7mm~8mm insulation protection layer. (Figure 1)

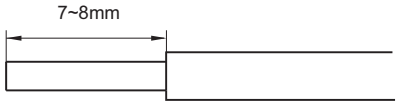


Figure 1

·Use the recommended screwdriver specifications when wiring.

Plus driver: Shaft Diameter - 3.5mm.

Single driver: Figure 2.

· Recommended tightening torque: 0.5N·m

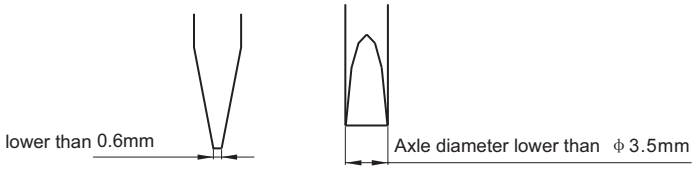


Figure 2.

b) 41F-1Z-C4-1/2/3/4/5

The soft wiring can be divided into the following types.

Twisted line or single wire greater than 0.5mm²or less than 2.5mm² or greater than AWG 20 and less than AWG14.

Be sure to use this size that the front end of the wire needs to be stripped of the 7mm~8mm insulation protection layer.

Use the recommended screwdriver specifications when wiring.

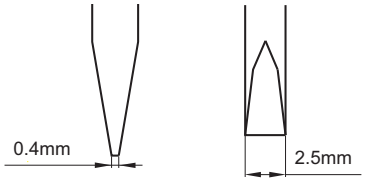


Figure 3.

Precautions For Use

The insertion position of the wire and the screwdriver and the insertion direction of the screwdriver are as shown in Figure 4.

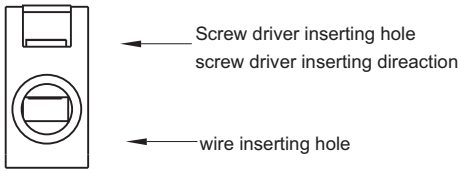


Figure 4

Please use cold pressed terminals when selecting twisted line.

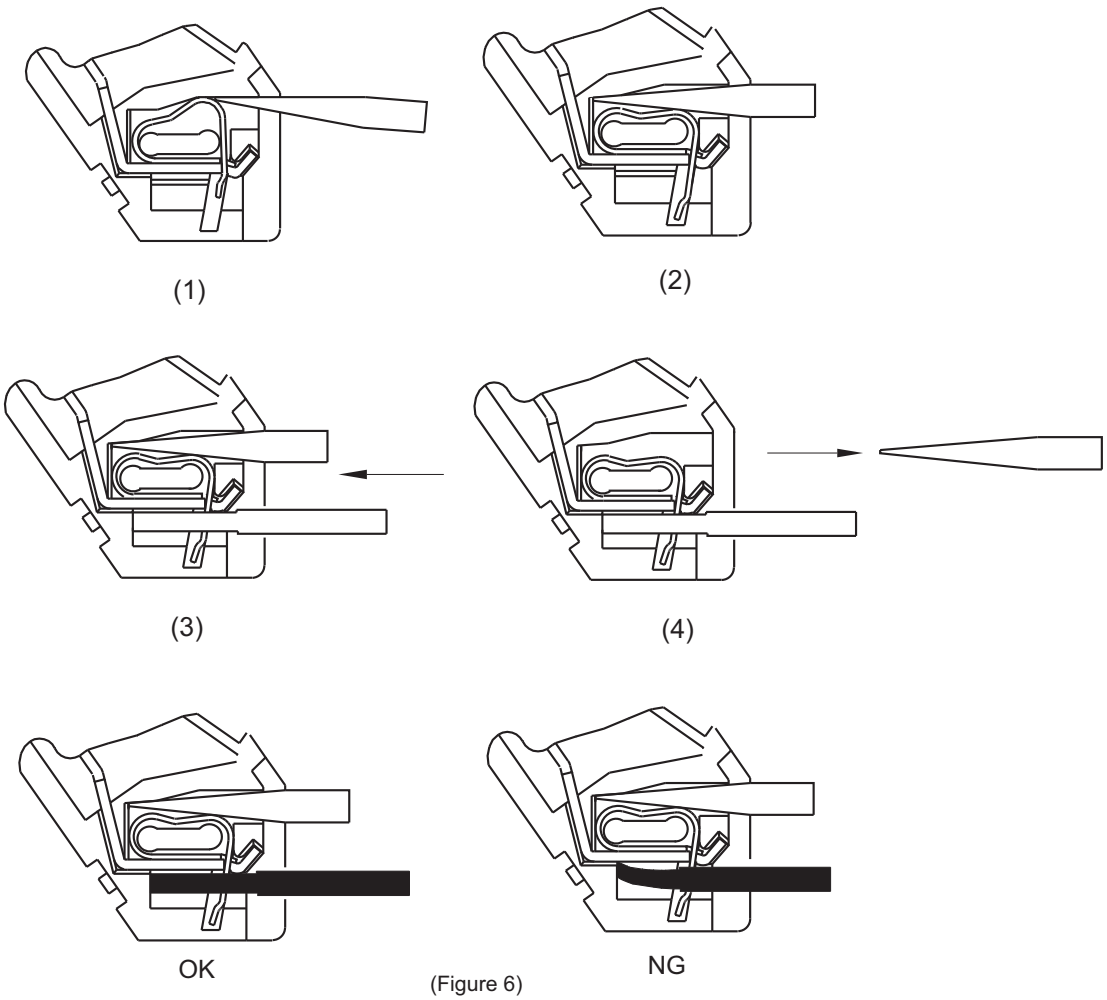
The method of Wiring as shown in figure 5.

Step 1. Insert screwdriver into socket with screwdriver patchhole.

Step 2. Push the screwdriver in until it touches the stop position inside the socket, and keep the screwdriver in this position.

Step 3. Please keep the screwdriver in this position, and wires inserted into the terminal insertion hole bottom.

Step 4. Pull out the screwdriver and the wiring is completed.



(Figure 6)

Do not insert the wire insulation.

Precautions For Use

4. Mounting relay.

Presents the socket anti-stripping spring in an open state (see Figure 7), and aligns the relay to the main socket cavity (Figure 8). Then turn the buckle counterclockwise and press the relay gently until it is fully plugged into the socket (Figure 9).

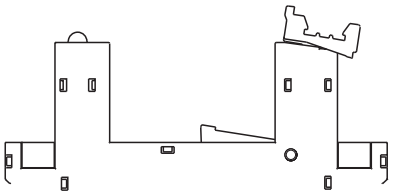


Figure 7

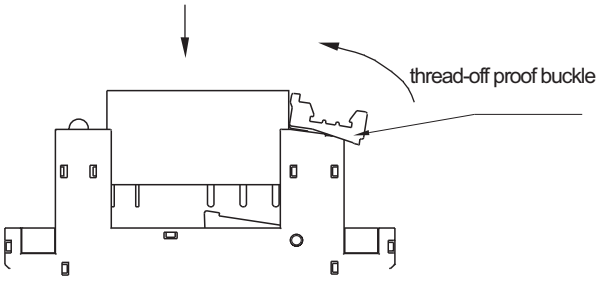


Figure 8

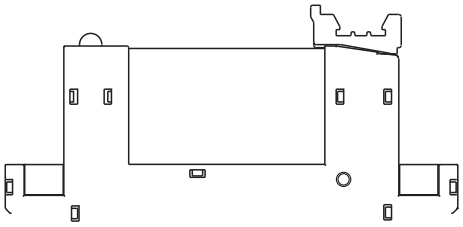
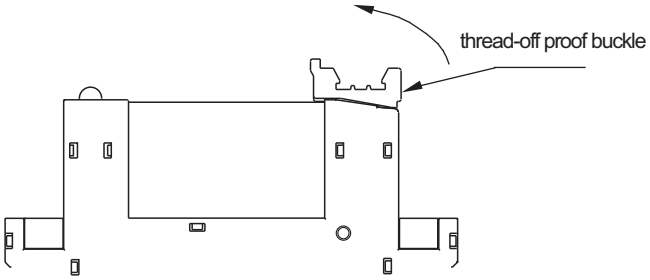
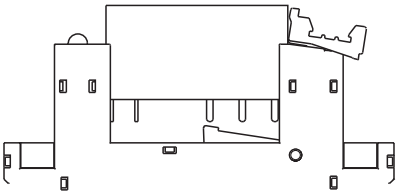


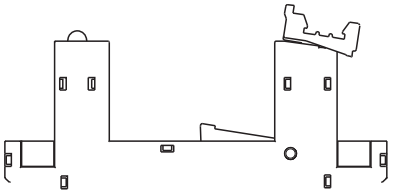
Figure 9

5. Disassembly relay.

Disconnect the relay by pulling the anti lock buckle of the socket clockwise (please refer to the pictures attached for more details)







Precautions For Use

6. Installation socket.
   Insert the A of the socket into the rail and press it in the direction of the arrow.(Figure 11)

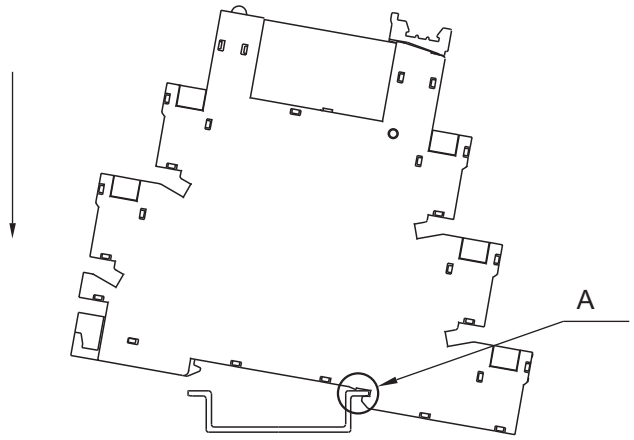


Figure 11

7. Disassembly socket.
   Insert a screwdriver into B, turn in the direction of the arrow, lift the socket and remove the socket.(Figure 12)

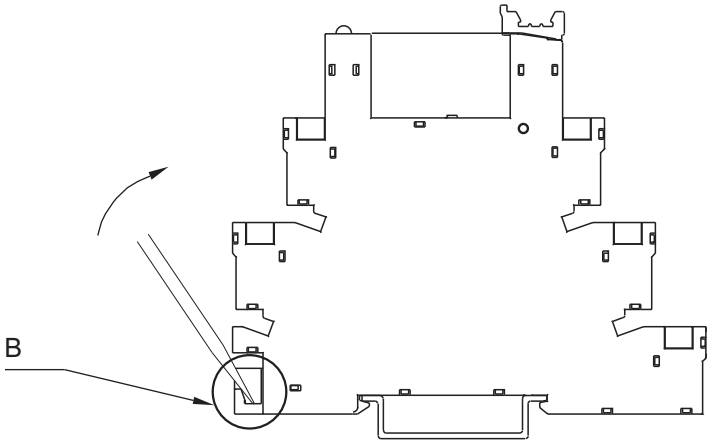


Figure 11

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF157F MINIATURE INTERMEDIATE POWER RELAY

File No.:E133481

File No.:R50403813

File No.:CQC18002189443

Features

- High capacity (2 pole: 10 A)
- Various types available
- 2 pole configurations
- 5kV dielectric strength (between coil and contacts)
- Sockets available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: without button:29.0mm x13.0mm x29.0mm with button: 29.0mm x13.0mm x34.5mm

CONTACT DATA

Contact arrangement	2C
Contact resistance 1)	100mΩ (at 1A 24VDC)
Contact material	$AgSnO_2In_2O_3$
Contact rating(Res. load)	2Z:8A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	2Z:10A
Max. switching power	2Z:2500VA / 300W
Mechanical endurance	AC:3 x 10^7OPS DC:5 x 10^7OPS
Electrical endurance	1 x 10^5OPS (2Z:8A 250VAC/30VDC,Resistive load, Room temp., 1s on 9s off,NO or NC)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	3000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		20ms max. (AC、With diode or CR circuit) DC: 10ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 70℃
Termination		Plug-in
Unit weight		Approx. 23.5g(button type) Approx.22g (without button type)
Construction		Dust protected

Notes: 1) The data shown above are initial values.

COIL

Coil power	AC: 0.53W； DC: 0.9VA

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC 1)	Drop-out Voltage VDC 1)	Max. Allowable Voltage VDC 2)	Coil Resistance Ω
5	3.5	0.5	5.5	47.2 x (1±10%)
6	4.2	0.6	6.6	67.9 x (1±10%)
12	8.4	1.2	13.2	271 x (1±10%)
24	16.8	2.4	26.4	1080 x (1±10%)
36	25.2	3.6	39.6	2445 x (1±10%)
48	33.6	4.8	52.8	4340 x (1±10%)
60	42	6	66	6792 x (1±10%)
100~110	77	11	110~121	18870 x (1±10%)

Nominal Voltage VDC	Pick-up Voltage VDC 1)	Drop-out Voltage VDC 1)	Max. Allowable Voltage VDC 2)	Coil Resistance Ω
6	4.8	1.8	6.6	16 x (1±10%)
12	9.6	3.6	13.2	62.5 x (1±10%)
24	19.2	7.2	26.4	243x (1±10%)
48	38.4	14.4	52.8	1085 x (1±10%)
60	48	18	66	1750 x (1±10%)
110	88	33	121	5270x (1±10%)
115	92	34.5	126.5	6030 x (1±10%)
120	96	36	132	6400 x (1±10%)
220	176	66	242	21530 x (1±10%)
230	184	69	253	24100 x (1±10%)
240	192	72	264	25570 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

SAFETY APPROVAL RATINGS

UL&CUL	2C	8A 250VAC/30VDC Resistive load 70°C 10A 250VAC/30VDC Resistive load 70°C
TÜV	2C	8A 250VAC/30VDC Resistive load 70°C 10A 250VAC/30VDC Resistive load 70°C

Notes: Only some typical ratings are listed above. If more details are required, please contact us.

ORDERING INFORMATION

HF157F / A 24 -2Z 2 5 F D 2 (XXX)

Type		
Coil voltage form	**A:** AC	**Nil:** DC
Coil voltage	**AC:** 5 to 110VDC **DC:** 6 to 240VAC	
Contact arrangement	**2Z:** 2 Form C	
Termination	**2:** QC	
Contact material	**5:** $AgSnO_2In_2O_3$	
Insulation standard	**F:** Class F	
Component code [1]	**D:** With LED **DJ:** With LED and diode(1:"-")	**DJ1:** With diode(1:"+") **DE:** LED、CR circuit
Mounting termination	**1:**button type	**2:**Without button type
Customer special code [2]	**XXX:** Customer special requirement	**Nil:** Standard

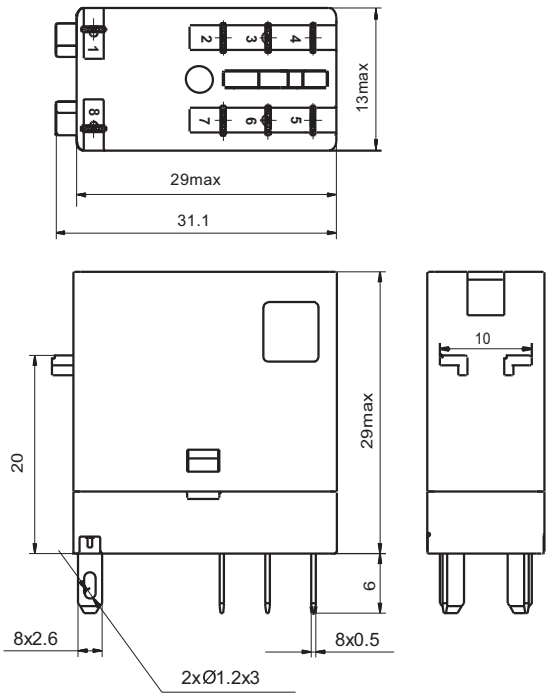
Notes: 1) Assembled component with "J"freewheel diode, applied in DC coil type, with "E" RC circuit board, applied in AC coil type.
2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

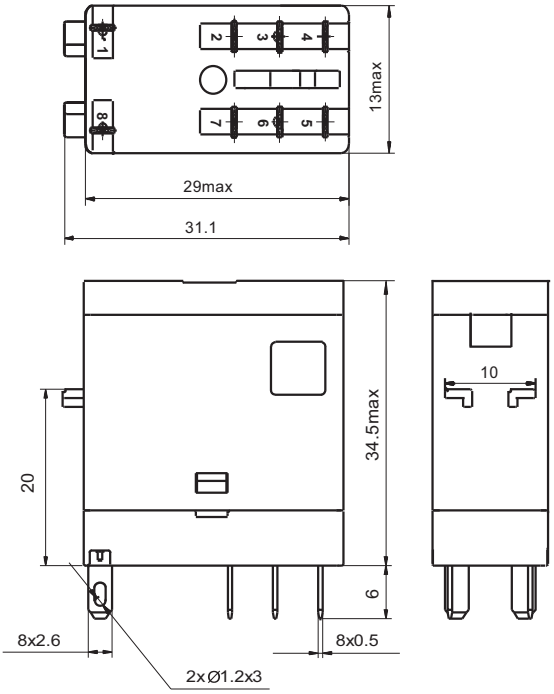
Unit: mm

Outline Dimensions

HF157F/□□□□-2Z2□F□2 (□□□)



HF157F/□□□□-2Z2□F□1(□□□)

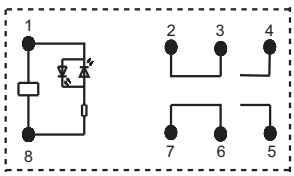


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

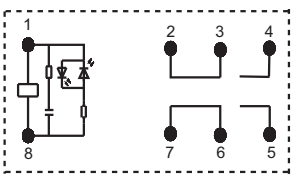
Wiring Diagram

(Bottom view)

HF157F/□□□□-2Z2□FD□(□□□)
(With LED)



HF157F/□□□□-2Z2□FDE□(□□□)
(With LED,CR circuit)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

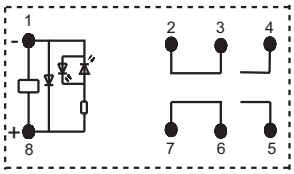
Unit: mm

Wiring Diagram

(Bottom view)

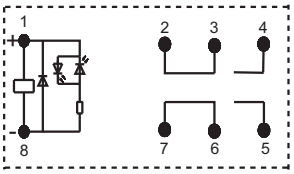
HF157F/□□□□-2Z2□FDJ□(□□□)

(With LED,fly-wheel diode1:"-")



HF157F/□□□□-1Z2□FDJ1□(□□□)

(With LED,fly-wheel diode1:"+")



Relay Socket

CE

c UL us

File No.:E253370

Features

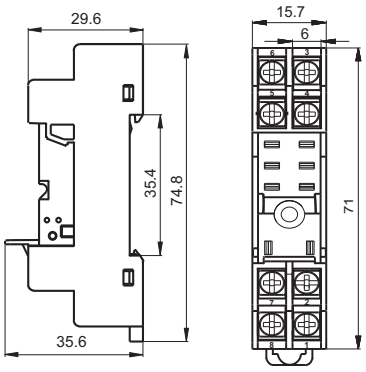
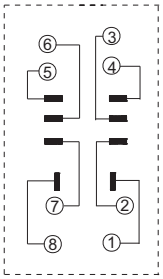
- The dielectric strength can reach 4000VAC(I/O), and the insulation resistance is 1000MΩ
- Two mounting types are available: screw mounting and DIN rail mounting.
- Components available: plastic retainer(Collocation marker), metallic reainer.
- Applicable for:HF157F
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
157F-2Z-C1	250VAC/VDC	8A/10A	-40 ˚C ~ 70˚C	4000VAC（Between coil & contacts）	1.0N · m	7mm
				1000VAC（Homopolar contacts）		
				3000VAC（Heterospolar contacts）		

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

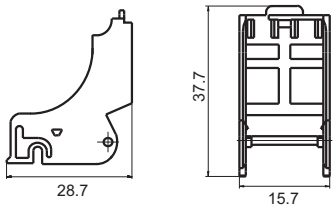
Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
157F-2Z-C1  DIN rail or Screw mounting		 (Top View)	plastic retainer 157F-H1 metallic retainer 157F-H2

DIMENSION OF RELATED COMPONENT (AVAILABLE)

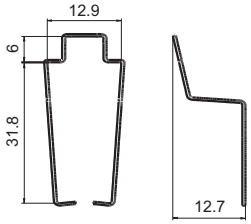
Unit: mm

Retainer

157F-H1(Plastic retainer)



157F-H2(Plastic retainer)



SELECTION OF PARTS

Type of Relay	Mounting termination	Socket	Retainer	Marker	Modules
HF157F/□□□-2Z2□□□1	With button	157F-2Z-C1	157F-H1	14FF-M1	-
HF157F/□□□-2Z2□□□2	Without button	157F-2Z-C1	157F-H1	14FF-M1	-
			157F-H2	-	

Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF157F relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ≥50mm, tolerance should be ±1mm; outline dimension >20mm and <50mm, tolerance should be ±0.5mm; outline dimension ≤20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1, 35×15×1.

HF13F MINIATURE INTERMEDIATE POWER RELAY

File No.:E133481

File No.:R50154518

File No.:CQC09002030028 (DC type)
CQC09002030029 (AC type)

Features

- 1C: 15A; 2C:10A switching capability
- Various terminals available
- Sockets available
- Conform to the CE low voltage directive
- 1 & 2 pole configurations
- UL insulation system: Class F(2 form A/2 form C)
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 28.0mm x 21.5mm x 35.0mm

CONTACT DATA

Contact arrangement	1A,1C	2A,2C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	15A 250VAC/30VDC	10A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC	
Max. switching current	15A	10A
Max. switching power	3750VA/450W	2500VA/300W
Mechanical endurance	1 x 10^7 OPS	
Electrical endurance	1Z type: 1 x 10^5OPS (15A 250VAC, Resistive load, Room temp., 1s on 9s off) 1Z type: 1 x 10^5OPS (15A 30VDC, Resistive load, Room temp., 1s on 9s off) 2Z type: 1 x 10^5OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) 2Z type: 1 x 10^5OPS (10A 30VDC, Resistive load, Room temp., 1s on 9s off)	

Notes: The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		500MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	1500VAC 1min
Operate time (at nomi. volt.)		25ms max.
Release time (at nomi. volt.)		25ms max.
Temperature rise (no-load, at nomi.volt.)		60K max.
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB, Plug-in
Unit weight		Approx. 37g
Construction		Dust protected

Notes: The data shown above are initial values.

COIL

Coil power	DC type: Approx. 0.9W to1.1W AC type: Approx. 1.2VA to 1.8VA

COIL DATA at 23˚C

1 Pole

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC[3)]	Coil Resistance Ω
5	≤4.0	≥0.5	5.5	27.5x(1±10%)
6	≤4.8	≥0.6	6.6	40x(1±10%)
9	≤7.2	≥0.9	9.9	90x(1±10%)
12	≤9.6	≥1.2	13.2	160x(1±10%)
21	≤16.8	≥2.1	23.1	490x(1±10%)
24	≤19.2	≥2.4	26.4	650x(1±10%)
30	≤24.0	≥3.0	33.0	1000x(1±10%)
36	≤28.8	≥3.6	39.6	1440x(1±10%)
48	≤38.4	≥4.8	52.8	2600x(1±15%)
60	≤48.0	≥6.0	66.0	4000x(1±15%)
110	≤88.0	≥11.0	121	11000x(1±15%)
125	≤100.0	≥12.5	137.5	14000x(1±15%)
220	≤176.0	≥22.0	242	53750x(1±15%)

Nominal Voltage VAC	Pick-up Voltage VAC max.[2)]	Drop-out Voltage VAC min.[2)]	Max. Voltage VAC[3)]	Coil Resistance Ω
6	≤4.80	≥1.8	6.6	11.5x(1±10%)
12	≤9.60	≥3.6	13.2	46x(1±10%)
24	≤19.2	≥7.2	26.4	184x(1±10%)
36	≤28.8	≥10.8	39.6	410x(1±10%)
48	≤38.4	≥14.4	52.8	735x(1±10%)
60	≤48.0	≥18.0	66.0	1100x(1±10%)
120[4)]	≤96.0	≥36.0	132	4550x(1±15%)
200	≤160	≥66.0	220	12950x(1±15%)
220	≤176	≥72.0	242	14400x(1±15%)
240[4)]	≤176	≥72.0	264	14400x(1±15%)
277	≤221.6	≥83.1	304.7	23590x(1±15%)

COIL DATA

at 23˚C

2 Pole

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC3)	Coil Resistance Ω
5	≤4.0	≥0.5	5.5	27.5x(1±10%)
6	≤4.8	≥0.6	6.6	40x(1±10%)
9	≤7.2	≥0.9	9.9	90x(1±10%)
12	≤9.6	≥1.2	13.2	160x(1±10%)
21	≤16.8	≥2.1	23.1	490x(1±10%)
24	≤19.2	≥2.4	26.4	640x(1±10%)
30	≤24.0	≥3.0	33.0	1000x(1±10%)
36	≤28.8	≥3.6	39.6	1440x(1±10%)
48	≤38.4	≥4.8	52.8	2560x(1±15%)
60	≤48.0	≥6.0	66.0	4000x(1±15%)
110[4)]	≤80.0	≥11.0	121	12250x(1±15%)
125	≤100	≥12.5	137.5	17360x(1±15%)
220	≤176	≥22.0	242	53360x(1±15%)

Nominal Voltage VAC	Pick-up Voltage VAC max.2)	Drop-out Voltage VAC min.2)	Max. Voltage VAC3)	Coil Resistance Ω
6	≤4.8	≥1.8	6.6	11x(1±10%)
12	≤9.6	≥3.6	13.2	44x(1±10%)
24	≤19.2	≥7.2	26.4	177x(1±10%)
36	≤28.8	≥10.8	39.6	400x(1±10%)
48	≤38.4	≥14.4	52.8	708x(1±10%)
60	≤48.0	≥18.0	66.0	1100x(1±10%)
100	≤80.0	≥30.0	110	3400x(1±15%)
110[4)]	≤80.0	≥33.0	121	3400x(1±15%)
120[4)]	≤88.0	≥36.0	132	4080x(1±15%)
200	≤160	≥60.0	220	13600x(1±15%)
220[4)]	≤160	≥66.0	242	13600x(1±15%)
240[4)]	≤176	≥72.0	264	16300x(1±15%)
277	≤221.6	≥83.1	304.7	23590x(1±15%)

Notes: 1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.
2) The data shown above are initial values.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) A110:Nominal Voltage(100~110)Va.c.;
A120:Nominal Voltage(110~120)Va.c.;
A220:Nominal Voltage(200~220)Va.c.;
A240:Nominal Voltage(220~240)Va.c.;
110:Nominal Voltage(100~110)Va.c.;
120:Nominal Voltage(110~120)Va.c..

SAFETY APPROVAL RATINGS

UL/CUL	AgCdO	HF13F 1Z/1H	15A 250VAC
			10A 240VAC
			15A 30VDC
			10A 30VDC
		HF13F 2Z/2H	10A 250VAC
			10A 30VDC
	AgCe	HF13F 1Z/1H	15A 250VAC
			15A 30VDC
	$AgSnO_2$	HF13F 2Z/2H	10A 250VAC
			10A 30VDC
			1/3HP,240VAC/ 120VAC
	AgNi	HF13F 2Z/2H	10A 250VAC
			10A 30VDC
TÜV	AgCdO	HF13F 2Z/2H	10A 250VAC,70˚C
			10A 30VDC,70˚C
	$AgSnO_2$	HF13F 2Z/2H	10A 250VAC,70˚C
			10A 30VDC,70˚C
	AgNi	HF13F 2Z/2H	10A 250VAC,70˚C
			10A 30VDC,70˚C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF13F /	A	012	-2Z	1	3	D	(XXX)
Type								
Coil voltage form	**A:** AC **Nil:** DC							
Coil voltage	**DC:** 5VDC to 220VDC **AC:** 6VAC to 277VAC							
Contact arrangement	**1H:** 1 Form A **2H:** 2 Form A **1Z:** 1 Form C **2Z:** 2 Form C							
Mounting termination[1]	**1:** Socket **2:** PCB **5:** Flange-Mounting							
Contact material	**3:** AgNi **T:** AgSnO **G:** AgCdO+Au plated **3G:** AgNi+Au plated **TG:** AgSnO+Au plated **Nil:** AgCdO							
LED	**D:** With LED **Nil:** Without LED **J:**with free wheeling diode **DJ:**with light emitting diode and with free wheeling diode							
Special code[2]	**XXX:** Customer special requirement **Nil:** Standard							

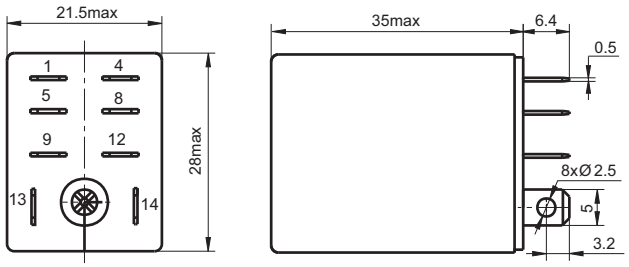
Notes: 1)No 1H2/1Z2 type products.
2)The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

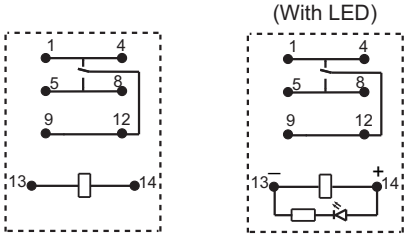
HF13F/□□□□-1Z1□

Outline Dimensions



Wiring Diagram

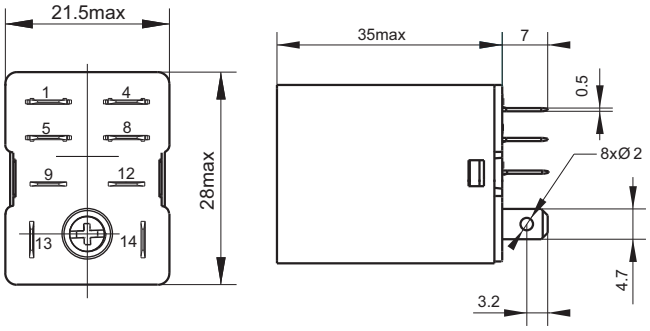
(Bottom view)



Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

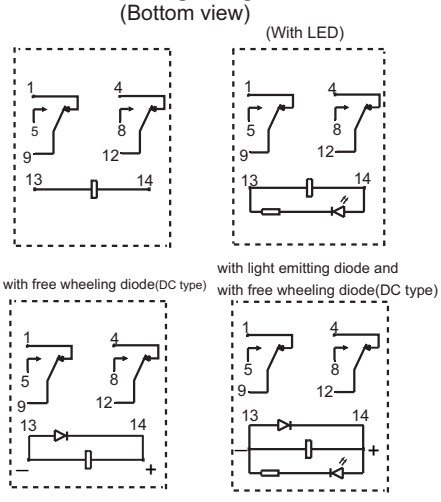
HF13F/□□□□-2Z1□

Outline Dimensions



Wiring Diagram

(Bottom view)



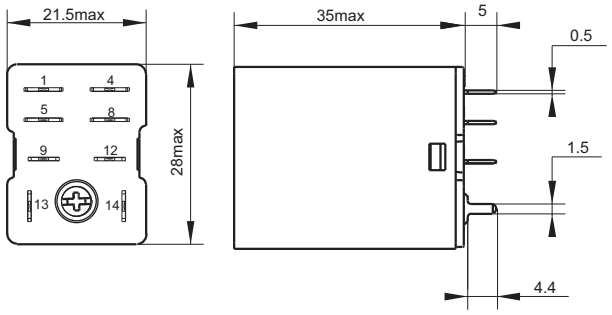
Remark:Fly-wheel diode products need to distinguish between the cathode.Only with LED products do not need to distinguish between the cathode.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

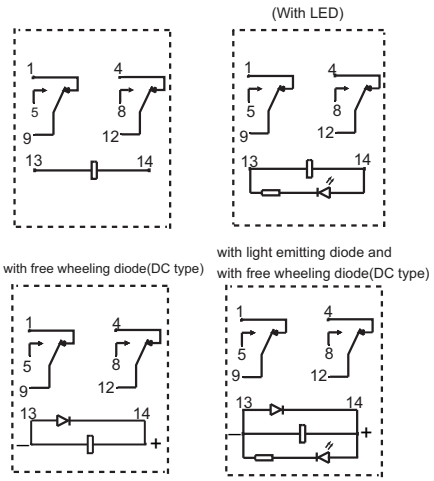
HF13F/□□□□-2Z2□

Outline Dimensions



Wiring Diagram

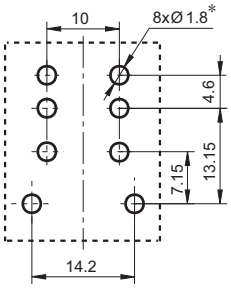
(Bottom view)



Remark:Fly-wheel diode products need to distinguish between the cathode.Only with LED products do not need to distinguish between the cathode.

PCB Layout

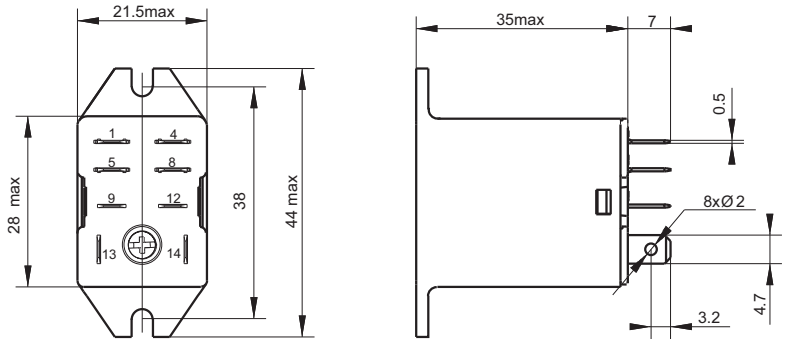
(Bottom view)



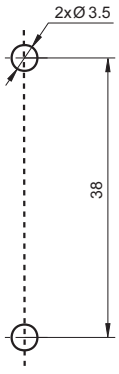
*: Please adjust the site of this diameter according to the actual applition.

HF13F/□□□□-2Z5□

Outline Dimensions



Mounting holes

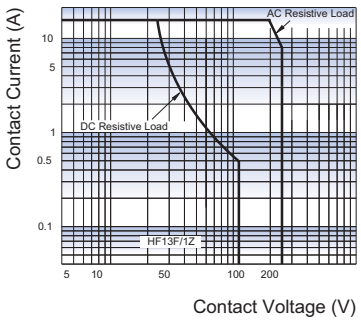


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

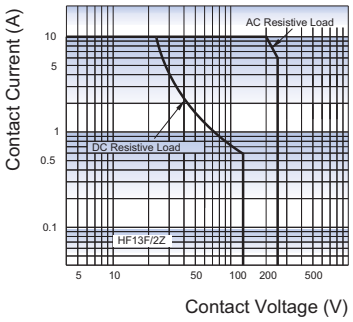
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER(1C)



MAXIMUM SWITCHING POWER(2C)



Relay Sockets

CE

c UL us

File No.: E253370

Features

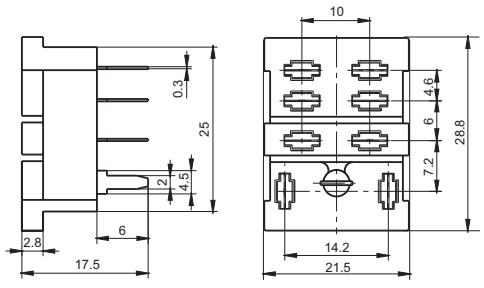
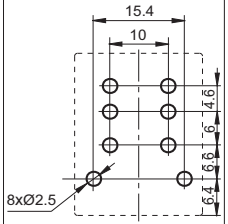
- The dielectric strength can reach 2000VAC and the insulation resistance is 1000 MΩ
- Three mounting types are available: PCB mounting, screw mounting and DIN rail mounting.
- With finger protection device
- Components available: metallic retainer
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
13F-2Z-A2	250VAC	10A/15A	-40 ˚C to 70˚C	2000VAC	—	—
13F-2Z-C1	250VAC	10A/15A	-40 ˚C to 70˚C	2000VAC	1.0N · m	7mm
13F-2Z-C2	250VAC	10A/15A	-40 ˚C to 70˚C	2000VAC	1.0N · m	7mm

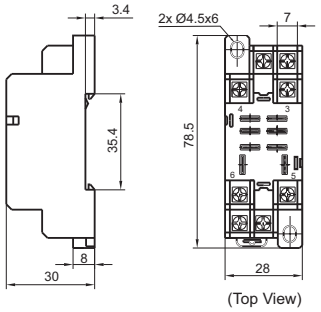
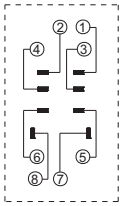
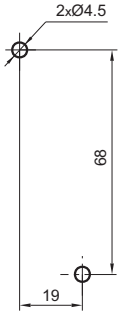
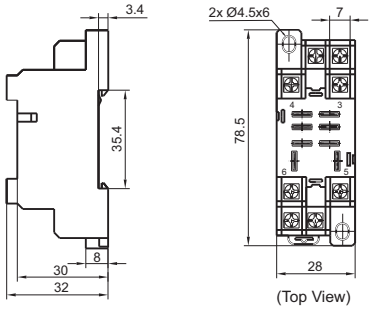
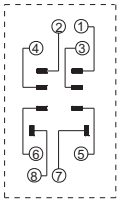
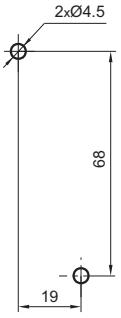
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
13F-2Z-A2  PCB terminal, PCB mounting	 (Top View)			metallic retainer 18FF-H1

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

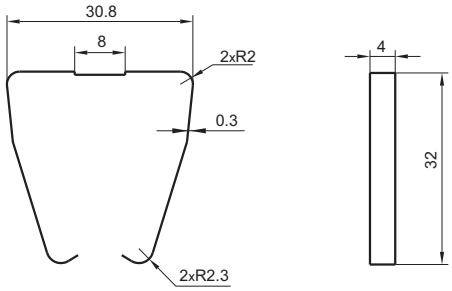
Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
13F-2Z-C1  Screw terminal, DIN rail or Screw mounting, Without finger protection device				metallic retainer 18FF-H2 (be used in sets)
13F-2Z-C2  Screw terminal, DIN rail or Screw mounting, With finger protection device				metallic retainer 18FF-H2 (be used in sets)

DIMENSION OF RELATED COMPONENT (AVAILABLE)

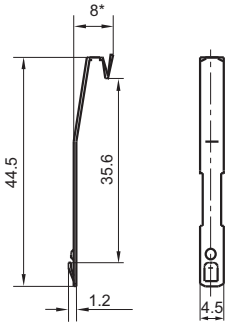
Unit: mm

Retainer

18FF-H1 (Metallic retainer)



18FF-H2 (Metallic retainer)



Note: 18FF-H2 retainer has to be used in sets, please pay special attention while placing the order.

Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. As for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF13F relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF18FF/HF18FH MINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E133481

File No.:R50147087

CQC
File No.:CQC09002030026 (DC type)
CQC09002030027 (AC type)

Features

- Various relay types,include the LED,diode,button,indicator
- 2 to 4 pole configurations
- Various terminals available
- Gold plated contact available
- Transparent dust cover ,various installation types
- Environmental friendly product (RoHS compliant)
- Automatic production
- High capacity
- Outline Dimensions: without button28.0mm x 21.5mmx 36.0mm
  with button28.0mm x 21.5mmx 37.0mm

CONTACT DATA

Contact arrangement	2C, 3C,4C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	AgNi,$AgSnO_2$
Contact rating (Res. load)	12A 250VAC/30VDC(2Z-G)
	10A 250VAC/30VDC(3Z-G)
	7A 250VAC/30VDC(2Z/3Z)
	6A 250VAC/30VDC(4Z)
Max. switching voltage	250VAC / 30VDC
Max. switching current	12A(2Z-G) , 10A(3Z-G),7A(2Z/3Z),6A(4Z)
Max. switching power	3000VA/360W(2Z-G),2500VA/300W(3Z-G) 1750VA/210W(2Z/3Z),1500VA/180W(4Z)
Mechanical endurance	2 x 10^7OPS
Electrical endurance	1 x 10^5OPS(room temperature) 5 x 10^4OPS (70˚C)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VAC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	1500VAC 1min
Operate time (at nomi. volt.)		20ms max.
Release time (at nomi. volt.)		DC type:15ms max.
		AC type:25ms max.
Temperature rise (no-load, at nomi.volt.)		85K max.
Shock resistance	Functional	100m/s²
	Destructive	1000m/s²
Vibration resistance		10Hz to 55Hz 1mm DA
Humidity		98% RH,40˚C
Ambient temperature		-40˚C to 70˚C
Termination		PCB, Plug-in
Unit weight		Approx. 35.6g
Construction		Dust protected

Notes: 1) The data shown above are initial values.

COIL

Coil power	DC type: Approx. 0.8W to 1.1W; AC type: Approx. 0.9VA to 1.5VA

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC3)	Coil Resistance Ω
5	4.0	0.5	5.5	28 x (1±10%)
6	4.8	0.6	6.6	40 x (1±10%)
9	7.2	0.9	9.9	90 x (1±10%)
12	9.6	1.2	13.2	160 x (1±10%)
21	16.8	2.1	23.1	490 x (1±10%)
24	19.2	2.4	26.4	640 x (1±10%)
30	24.0	3.0	33.0	1000 x (1±10%)
36	28.8	3.6	39.6	1440 x (1±10%)
48	38.4	4.8	52.8	2560 x (1±15%)
60	48.0	6.0	66.0	4000 x (1±15%)
110	80.0	11.0	121.0	12250 x (1±15%)
125	100.0	12.5	137.5	17360 x (1±15%)
220	176.0	22.0	242.0	53360 x (1±15%)

Nominal Voltage VAC	Pick-up Voltage VAC max.2)	Drop-out Voltage VAC min.2)	Max. Voltage VAC3)	Coil Resistance Ω
6	4.8	1.8	6.6	11 x (1±10%)
12	9.6	3.6	13.2	44 x (1±10%)
24	19.2	7.2	26.4	177 x (1±10%)
36	28.8	10.8	39.6	400 x (1±10%)
48	38.4	14.4	52.8	708 x (1±10%)
60	48.0	18.0	66.0	1100 x (1±10%)
110	80.0	33.0	121	3400 x (1±15%)
120	88.0	36.0	132	4080 x (1±15%)
220	160.0	66.0	242	13600 x (1±15%)
240	176.0	72.0	264	16300 x (1±15%)
277	221.6	83.1	304.7	23590 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

SAFETY APPROVAL RATINGS

UL/CUL	2 Form C-G	12A 250VAC/30VDC
	3 Form C-G	10A 250VAC/30VDC
	2 Form C/3 Form C	7A 250VAC/30VDC
	4 Form C	6A 250VAC/30VDC
TÜV	2 Form C-G	12A 250VAC/30VDC
	3 Form C-G	10A 250VAC/30VDC
	2 Form C/3 Form C	7A 250VAC/30VDC
	4 Form C	6A 250VAC/30VDC
CQC	2 Form C-G	12A 250VAC/30VDC
	3 Form C-G	10A 250VAC/30VDC
	2 Form C/3 Form C	7A 250VAC/30VDC
	4 Form C	6A 250VAC/30VDC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF18FF -G /A 240 -2Z 1 1 G D (XXX)

Type **HF18FF: without button**
HF18FH: with button

series code **Nil:** Standard **G:** High capacity

Coil voltage form **A:** AC **Nil:** DC

Coil voltage **DC**(1)**:** 005 ~ 220VDC
AC(2)**:** 006 ~ 277VAC

Contact arrangement **2Z:** 2 Form C **3Z:** 3 Form C **4Z:** 4 Form C

Mounting Termination (See the following) **1:** Socket **2:** PCB **5:** Flange-Mounting

Contact material **3:** AgNi **T:** $AgSnO_2$

Contact plating **Nil:** No gold plated **G:** Gold plated

Component code
D: with LED
J: with diode
R: with CR circuit
DJ: with LED and diode
DR: with LED and CR circuit

Special code3) **XXX:** Customer special requirement **Nil:** Standard

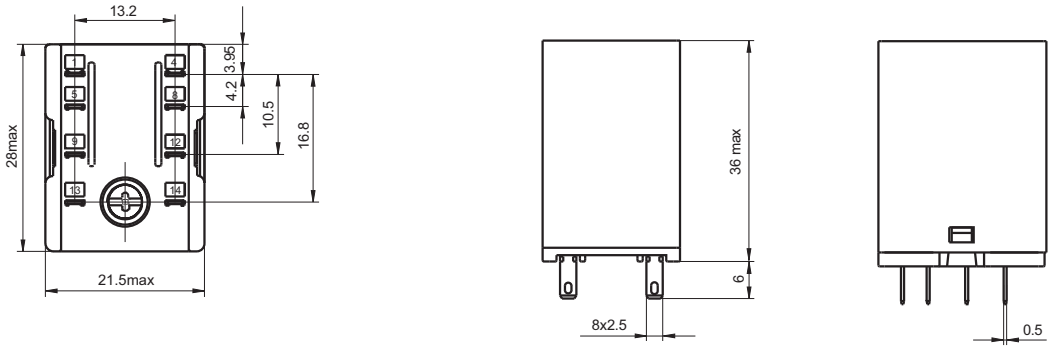
Notes: 1) DC coil specifications:005、006、009、012、021、024、030、036、048、060、110、125、220.
2) AC coil specifications:006、012、024、036、048、060、110、120、220、240、277.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

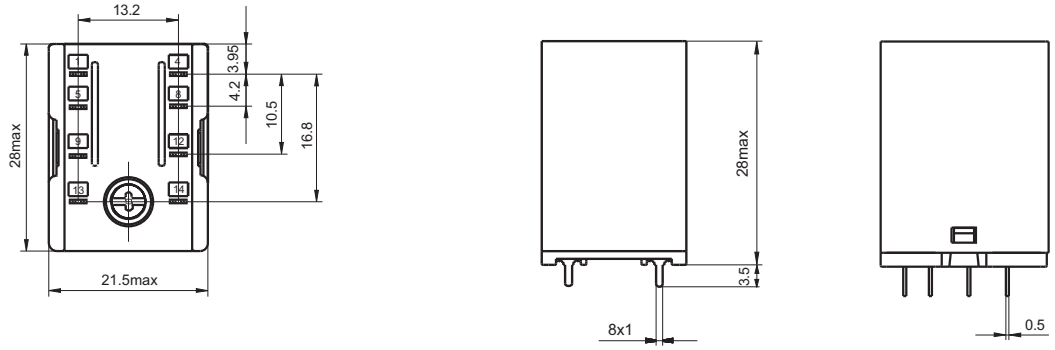
Unit: mm

Outline Dimensions

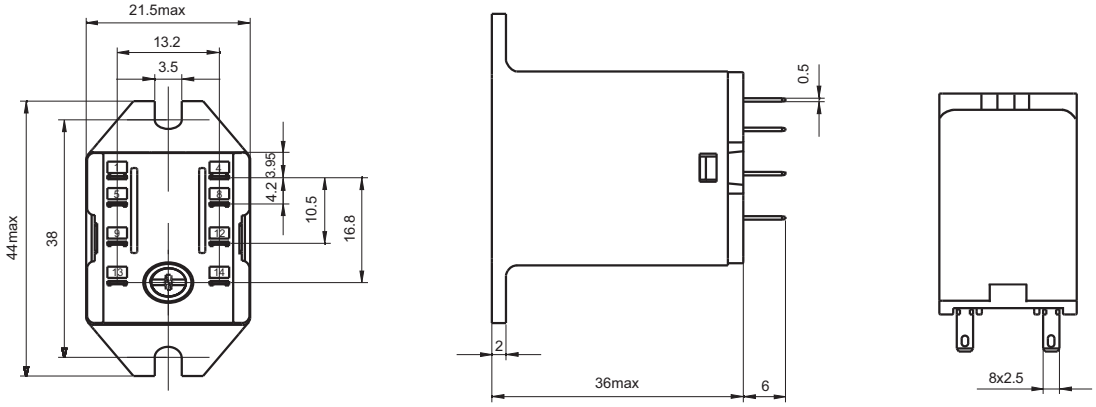
HF18FF-□/□□-2Z1□□□□



HF18FF-□/□□-2Z2□□□□



HF18FF-□/□□-2Z5□□□□

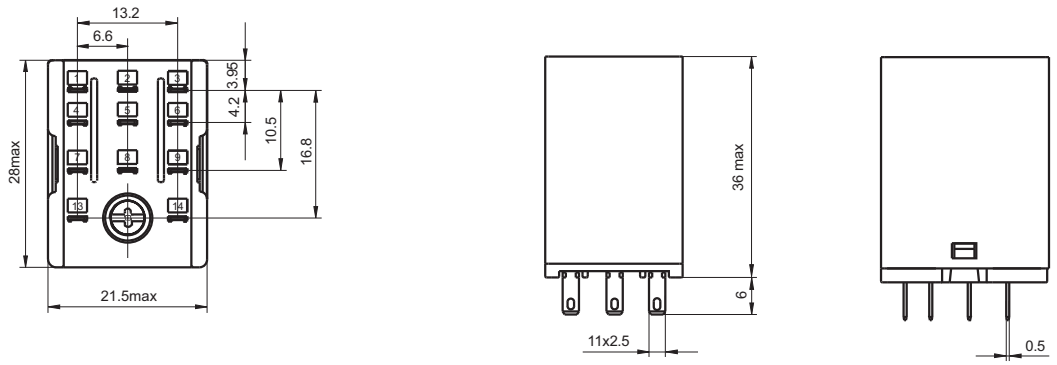


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

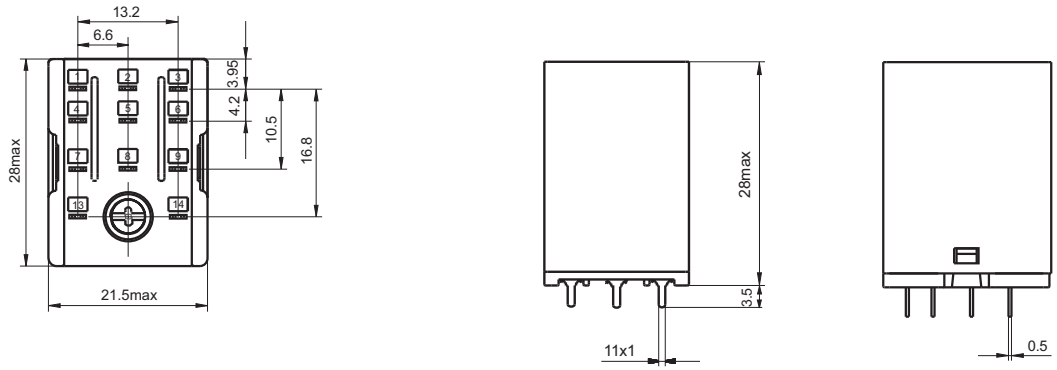
Unit: mm

Outline Dimensions

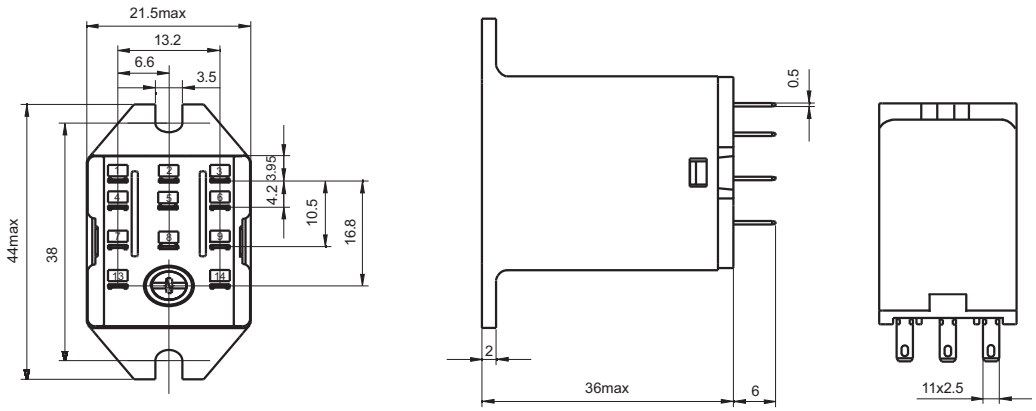
HF18FF-□/□□-3Z1□□□□



HF18FF-□/□□-3Z2□□□□



HF18FF-□/□□-3Z5□□□□

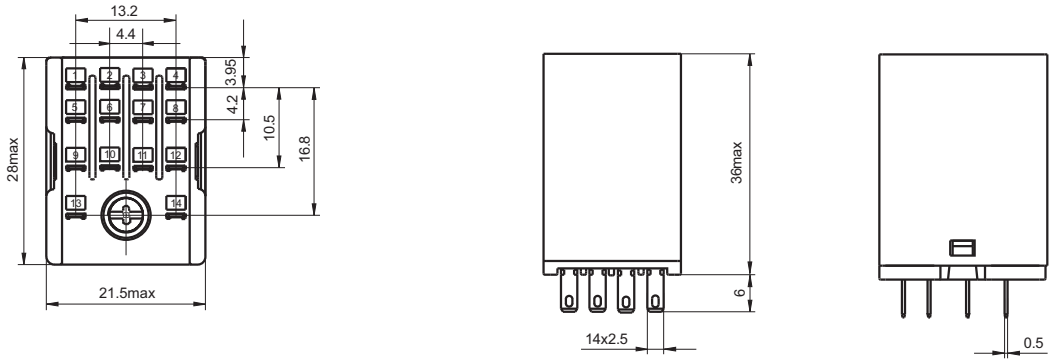


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

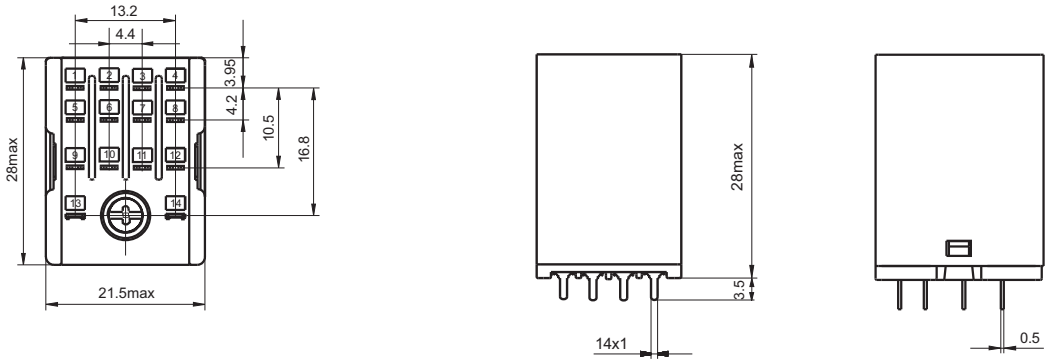
Unit: mm

Outline Dimensions

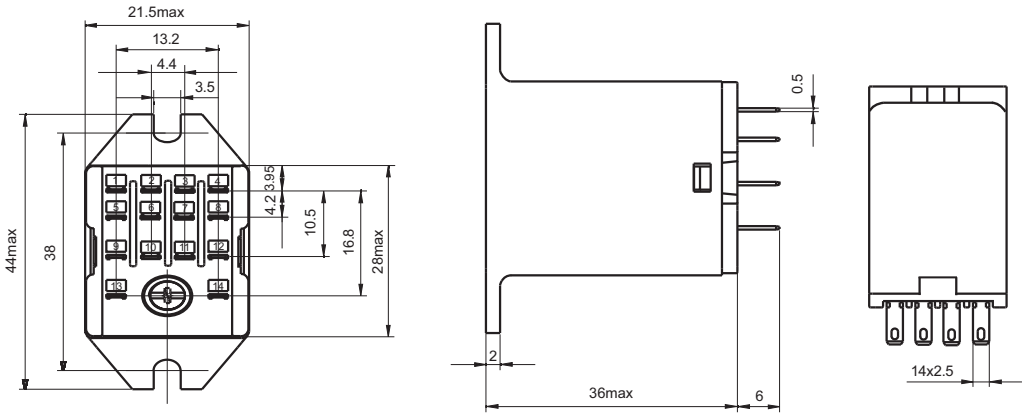
HF18FF-□/□□-4Z1□□□□



HF18FF-□/□□-4Z2□□□□



HF18FF-□/□□-4Z5□□□□

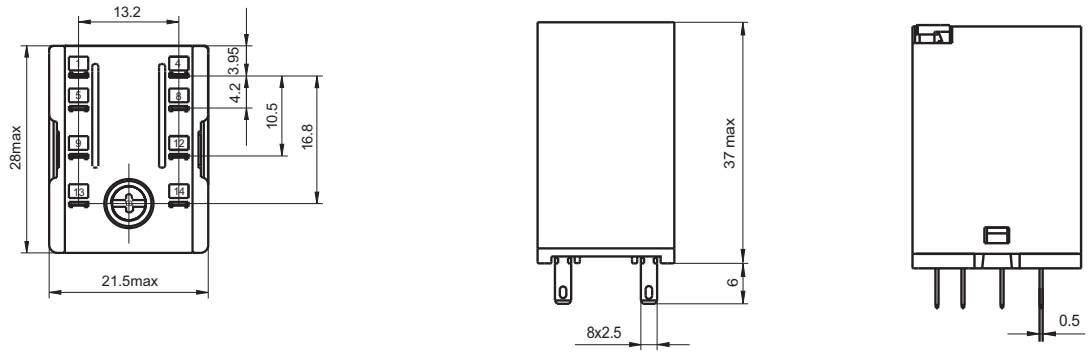


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

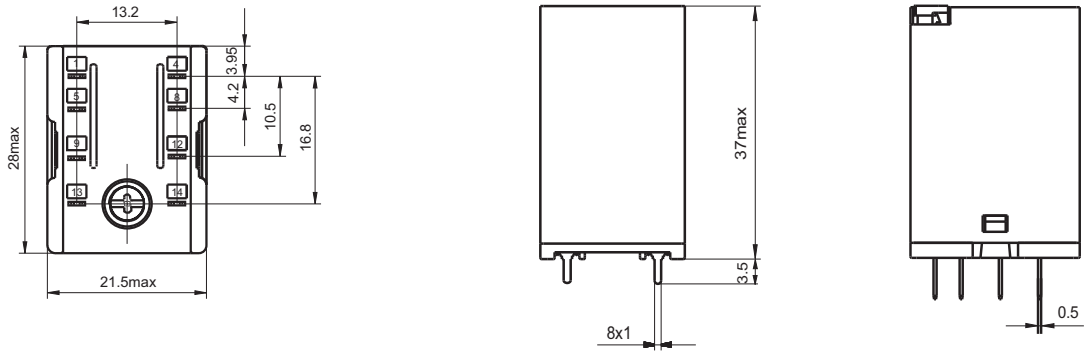
Unit: mm

Outline Dimensions

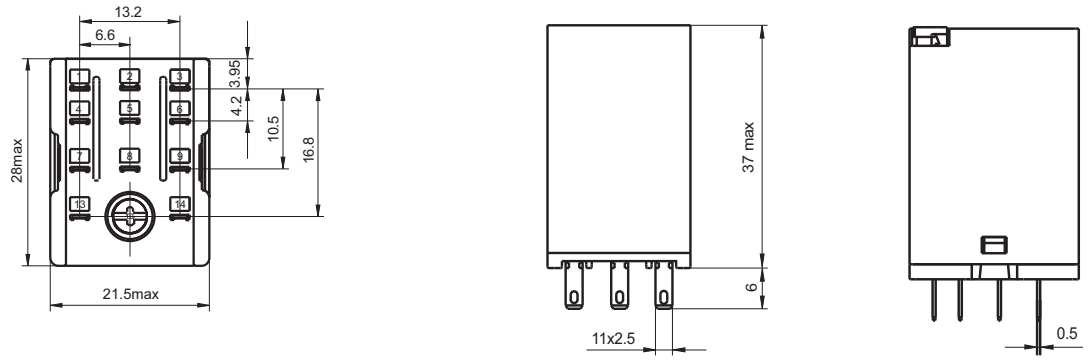
HF18FH-□/□□-2Z1□□□□



HF18FH-□/□□-2Z2□□□□



HF18FH-□/□□-3Z1□□□□

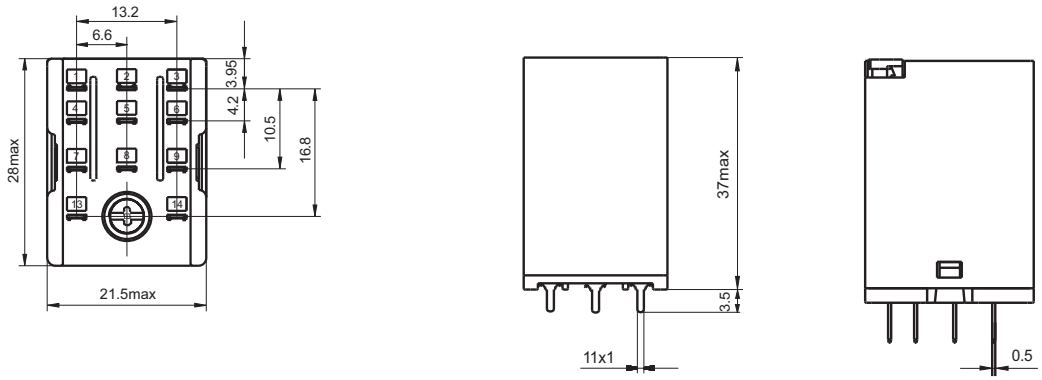


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

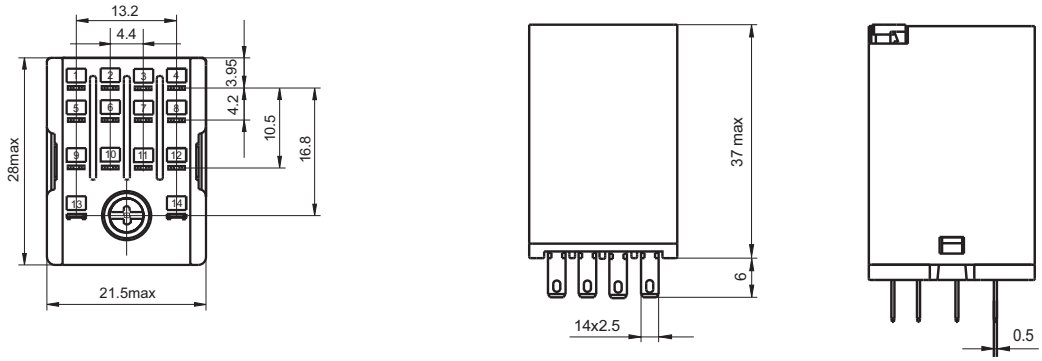
Unit: mm

Outline Dimensions

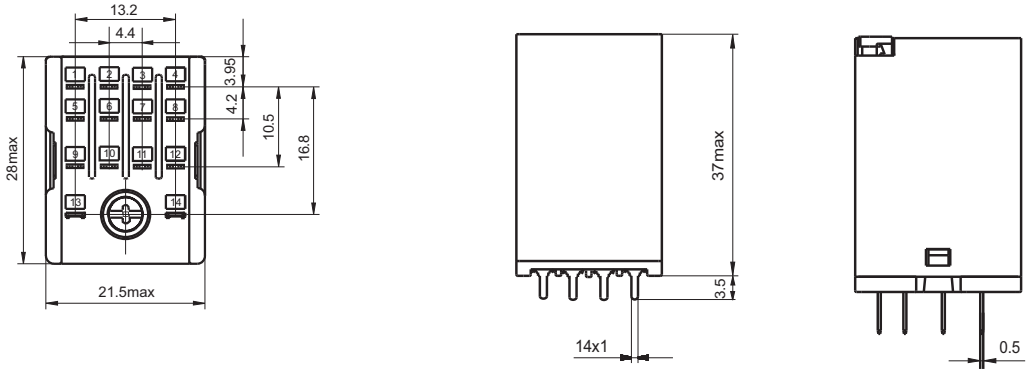
HF18FH-□/□□-3Z2□□□□



HF18FH-□/□□-4Z1□□□□



HF18FH-□/□□-4Z2□□□□



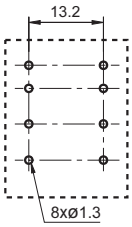
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

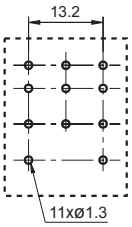
PCB Layout

(Bottom view)

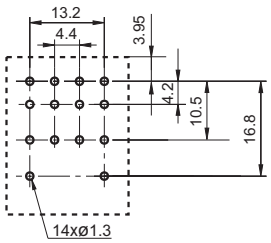
2 Form C



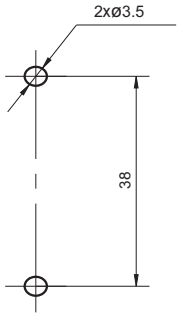
3 Form C



3 Form C



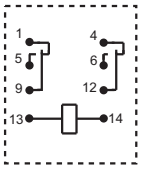
Mounting Holes



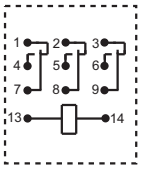
Wiring Diagram

(Bottom view)

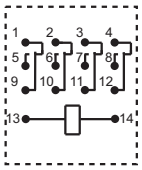
2 Form C



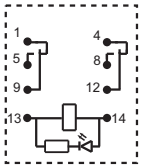
3 Form C



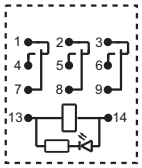
4 Form C



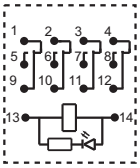
2 Form C (With LED)



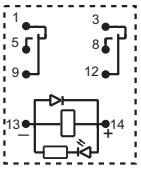
3 Form C (With LED)



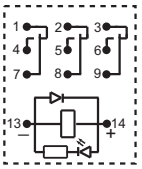
4 Form C (With LED)



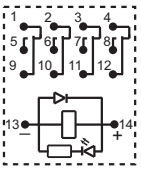
2 Form C
(DC, With fly-wheel diode)



3 Form C
(DC, With fly-wheel diode)



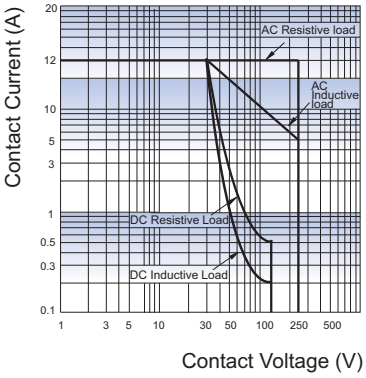
4 Form C
(DC, With fly-wheel diode)



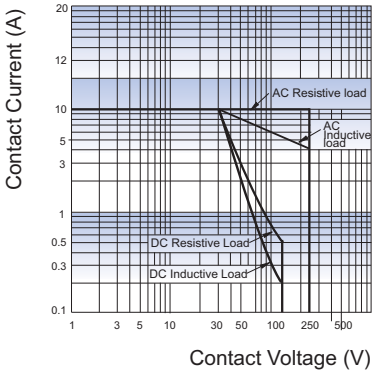
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) DC products with fly-wheel diode,please confirm the positive and negative terminals before wiring.

CHARACTERISTIC CURVES

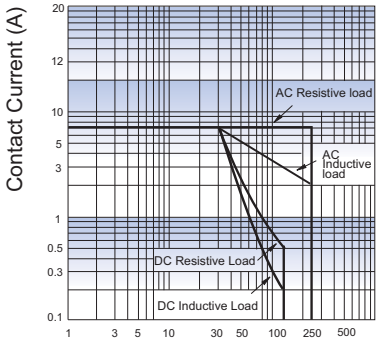
MAXIMUM SWITCHING POWER
(2 Form C-G)



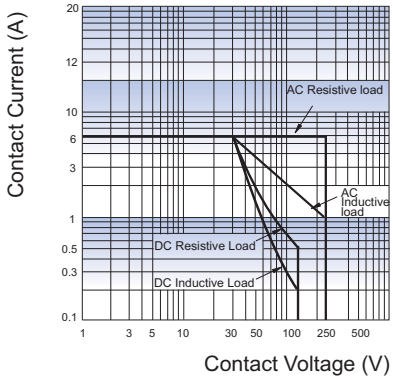
MAXIMUM SWITCHING POWER
(3 Form C-G)



MAXIMUM SWITCHING POWER
(2 Form C/3 Form C)



MAXIMUM SWITCHING POWER
(4 Form C)

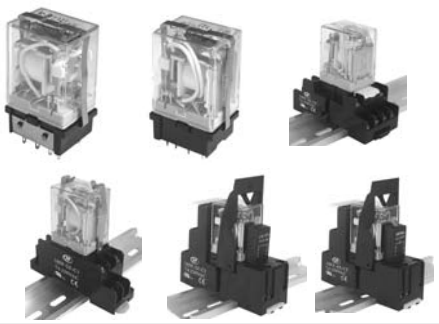


Relay Sockets

CE

cULus

File No.: E253370



Features

- The dielectric strength can reach 2000VAC and the insulation resistance is 1000MΩ
- Three mounting types are available: PCB mounting screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Components available: retainer, marker and plug-in module
- Environmental friendly product (RoHS compliant)

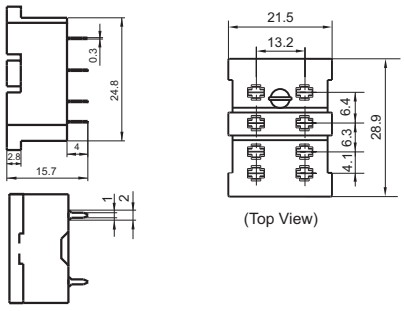
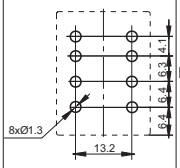
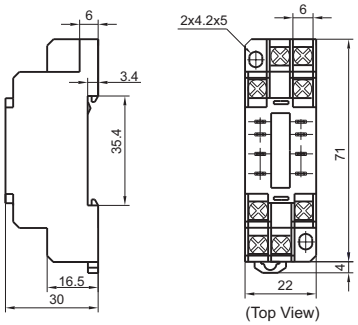
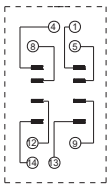
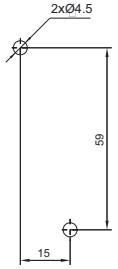
CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
18FF-2Z-A2	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	—	—
18FF-2Z-C1	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-2Z-C2	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-2Z-C4	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-C5	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-C8	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-C9	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	—	7mm
18FF-3Z-C4	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-3Z-C5	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-4Z-A2	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	—	—
18FF-4Z-C1	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-4Z-C2	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-4Z-C4	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-4Z-C5	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-4Z-C9	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	—	7mm
18FF-2Z-C5(734)	250VAC	12A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-3Z-C5(734)	250VAC	10A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm

Remark: For sockets marked *, their group of current totally should be not more than 20A.

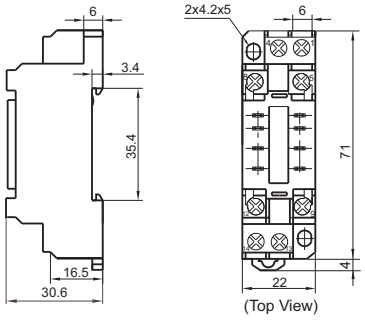
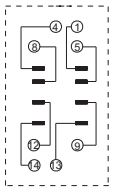
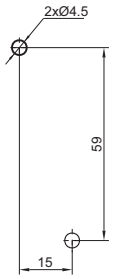
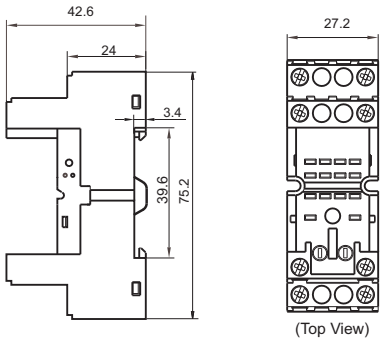
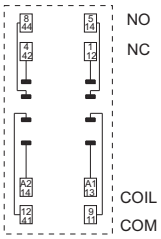
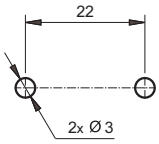
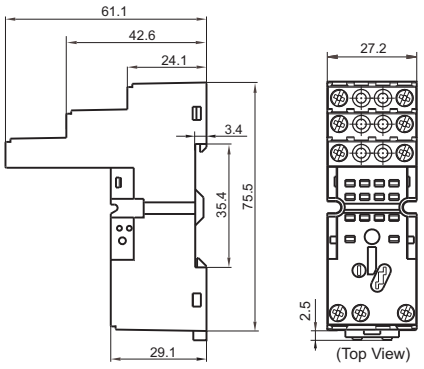
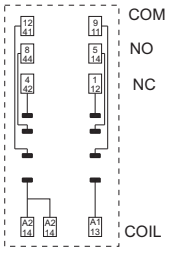
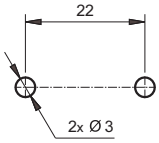
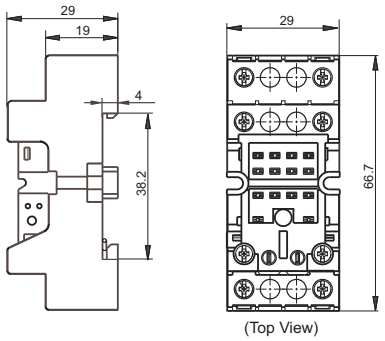
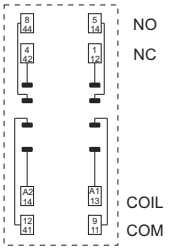
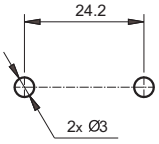
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-2Z-A2  PCB Terminal, PCB mounting Applicable for 2 poles				metallic retainer 18FF-H1
18FF-2Z-C1  Screw Terminal, DIN rail or Screw mounting, Without finger protection device Applicable for 2 poles				metallic retainer 18FF-H2 (be used in sets)

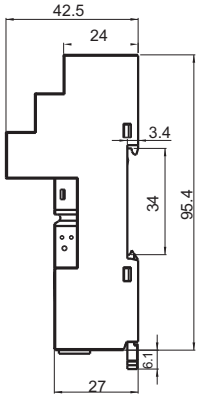
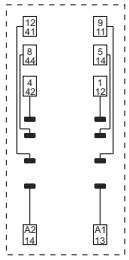
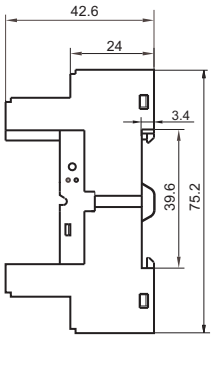
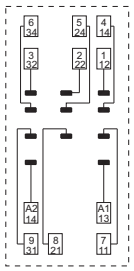
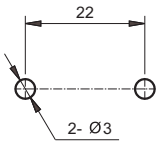
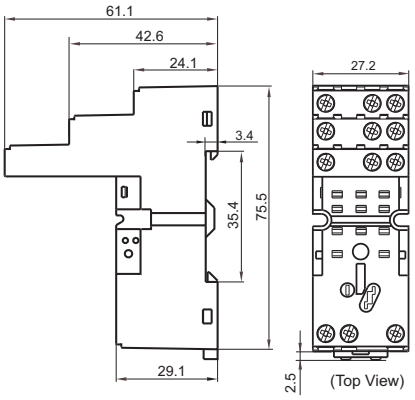
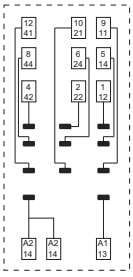
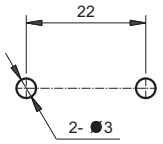
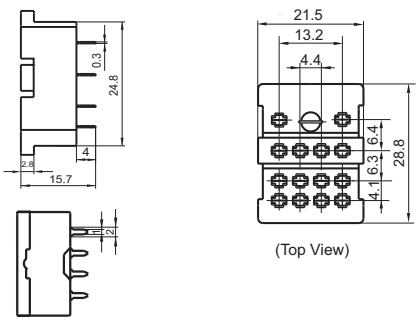
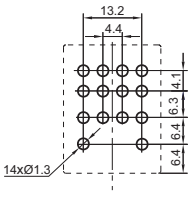
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles		 (Top View)		metallic retainer 18FF-H2 (be used in sets)
18FF-2Z-C4  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles		 (Top View)		plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-2Z-C5  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles		 (Top View)		plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-2Z-C8  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles		 (Top View)		plastic retainer 18FF-H4 marker 18FF-M3

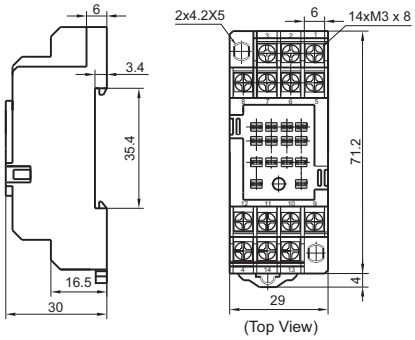
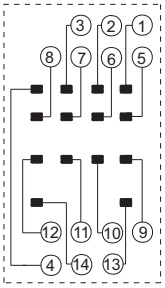
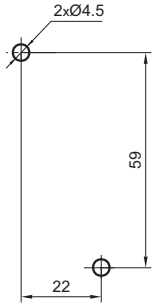
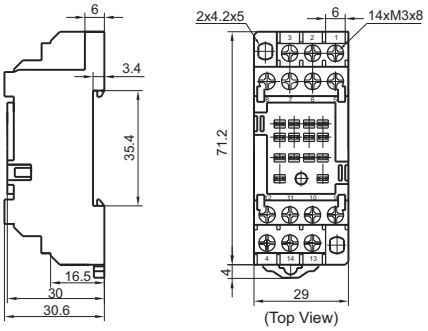
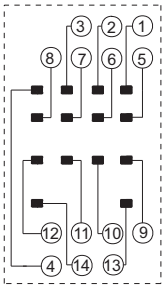
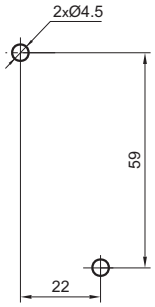
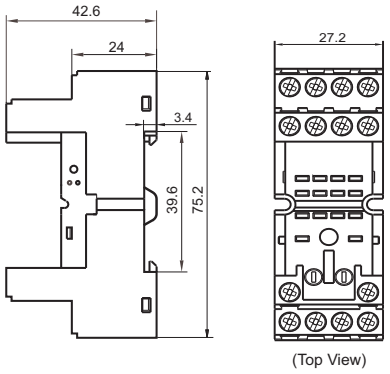
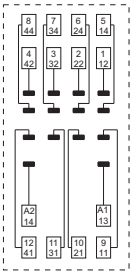
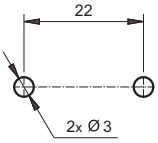
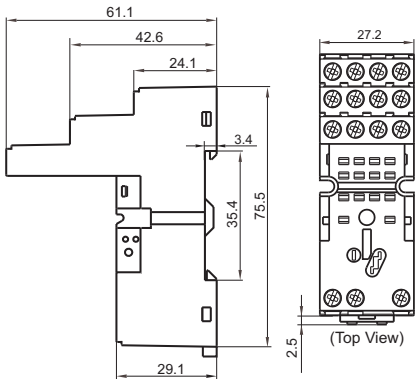
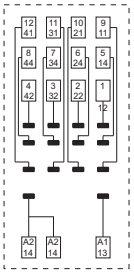
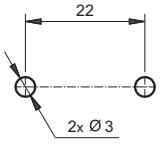
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-2Z-C9  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for 2 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 plug-in module HFAA ~ HFHU* marker 18FF-M3
18FF-3Z-C4  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 3 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-3Z-C5  Screw Terminal, DIN rail or Screw mounting, Witht finger protection device Applicable for 3 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-4Z-A2  PCB Terminal, PCB mounting Applicable for 4 poles				metallic retainer 18FF-H1

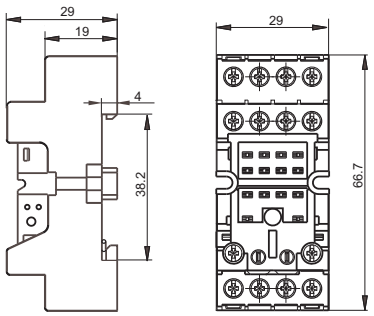
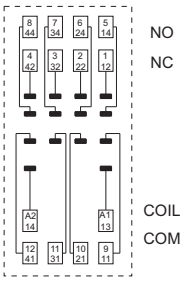
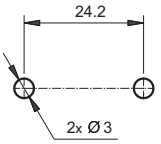
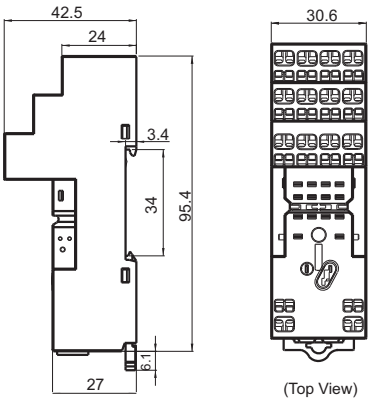
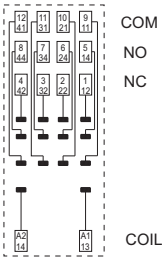
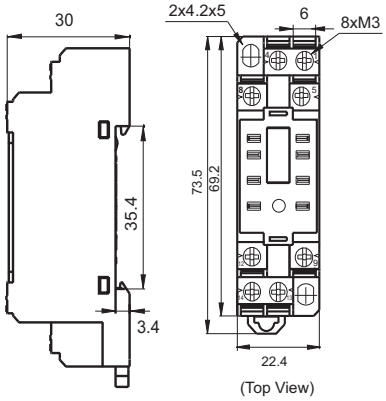
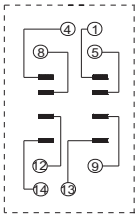
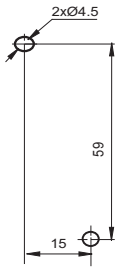
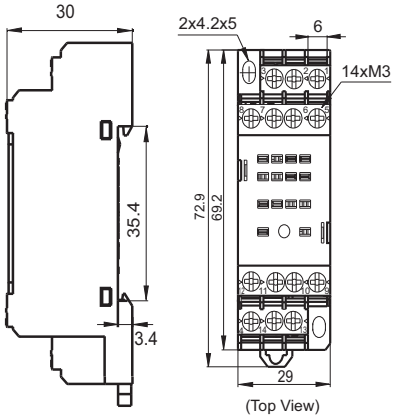
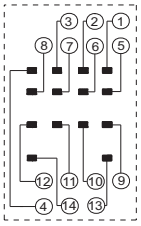
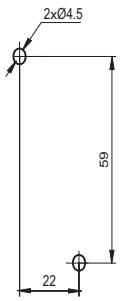
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-4Z-C1  Screw Terminal, DIN rail or Screw mounting, Withtout finger protection device Applicable for 4 poles		 (Top View)		metallic retainer 18FF-H2 (be used in sets)
18FF-4Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles		 (Top View)		metallic retainer 18FF-H2 (be used in sets)
18FF-4Z-C4  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles		 (Top View)		plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-4Z-C5  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles		 (Top View)		plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-4Z-C8  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles	 (Top View)	 (Top View)		plastic retainer 18FF-H4 marker 18FF-M3
18FF-4Z-C9  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		plastic retainer 18FF-H4 metallic retainer 18FF-H5 plug-in module HFAA ~ HFHU* marker 18FF-M3
18FZ-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device	 (Top View)	 (Top View)		metallic retainer 18FF-H2 (Used in pairs）
18FZ-4Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device	 (Top View)	 (Top View)		metallic retainer 18FF-H2 (Used in pairs）

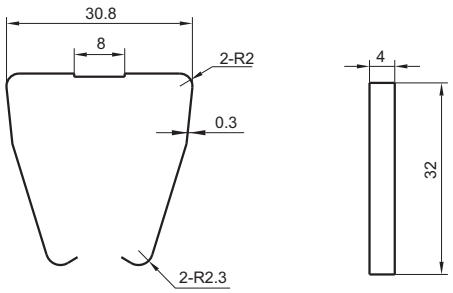
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPOENT (AVAILABLE)

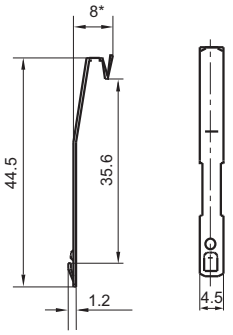
Unit: mm

Retainer

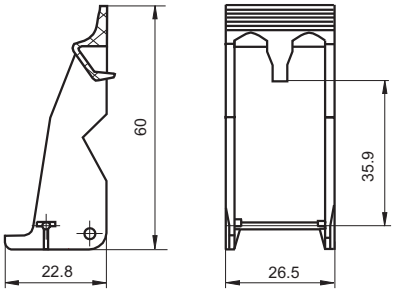
18FF-H1 (Metallic retainer)



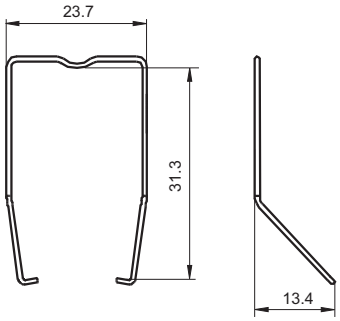
18FF-H2 (Metallic retainer)



18FF-H4 (Plastic retainer)

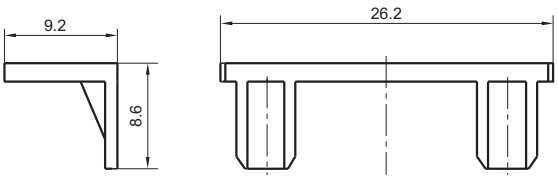


18FF-H5 (Metallic retainer)

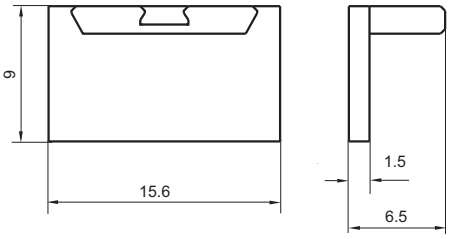


Marker

18FF-M1



18FF-M3



SELECTION OF PARTS

Type of Relay	Mounting termination	Socket	Retainer	Marker	Module
HF18FF/□□-2Z1□□□	without button	18FF-2Z-A2	18FF-H1	-	-
		18FF-2Z-C1	18FF-H2		
		18FF-2Z-C2			
		18FZ-2Z-C2			
		18FF-2Z-C4	18FF-H4/H5	18FF-M1	HFAA~HFHU
		18FF-2Z-C5			
		18FF-2Z-C8		18FF-M3	
		18FF-2Z-C9			
HF18FF/□□-3Z1□□□		18FF-3Z-C4		18FF-M1	
		18FF-3Z-C5			
HF18FF/□□-2Z1□□□		18FF-4Z-A2	18FF-H1	-	-
		18FF-4Z-C1	18FF-H2		
		18FF-4Z-C2			
		18FZ-4Z-C2			
		18FF-4Z-C4	18FF-H4/H5	18FF-M1	HFAA~HFHU
		18FF-4Z-C5			
		18FF-4Z-C8		18FF-M3	
		18FF-4Z-C9			
HF18FH/□□-2Z1□□□	with button	18FF-2Z-C4	18FF-H4/H5	18FF-M1	
		18FF-2Z-C5			
		18FF-2Z-C8		18FF-M3	
		18FF-2Z-C9			
HF18FH/□□-3Z1□□□		18FF-3Z-C4		18FF-M1	
		18FF-3Z-C5			
HF18FH/□□-2Z1□□□		18FF-4Z-C4		18FF-M1	
		18FF-4Z-C5			
		18FF-4Z-C8		18FF-M3	
		18FF-4Z-C9			
HF18FF-G/□□-2Z1□□□	without button	18FF-2Z-C5(734)	18FF-H4/H5	18FF-M1	
HF18FF-G/□□-3Z1□□□		18FF-3Z-C5(734)			
HF18FH-G/□□-2Z1□□□	with button	18FF-2Z-C5(734)			
HF18FH-G/□□-3Z1□□□		18FF-3Z-C5(734)			

Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF18FF relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ≥50mm, tolerance should be ±1mm; outline dimension >20mm and <50mm, tolerance should be ±0.5mm; outline dimension ≤20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

HF18FZ MINIATURE INTERMEDIATE POWER RELAY

File No：E133481

File No：40048406

File No：CQC17002183722

Features

- Multiple switching capability (2C, 4C type)
- With LED
- Conform to the CE low voltage directive
- 2.0kV dielectric strength(between coil and contacts)
- High electrical life
- High mechanical life
- With test button
- Automatic production
- Outline Dimensions(Without button): 28.0mm x 21.5mm x 36.0mm
  (With button): 28.0mm x 21.5mm x 37.5mm

CONTACT DATA

Contact arrangement	2C	4C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	7A 220VAC/24VDC	5A 220VAC/24VDC
	5A 220VAC/24VDC	3A 220VAC/24VDC
Max. switching voltage	220VAC / 24VDC	
Max. switching current	7A	5A
Max. switching power	1750VA/ 210W	1100VA/ 120W
Mechanical endurance	5 x 10^7OPS(DC type)	
	2 x 10^7OPS(AC type)	
Electrical endurance	see "CONTACT DATA"	

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2000VAC 1min
Operate time (at nomi. volt.)		20ms max.
Release time (at nomi. volt.)		DC type: 15ms max.
		AC type: 25ms max.
Temperature rise		85K max.
Shock resistance	Functional	200m/s²(NO), 100m/s²(NC)
	Destructive	1000m/s²
Vibration resistance		10Hz to 55Hz 1mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 70℃
Termination		Plug-in
Unit weight		Approx. 39.4g
Construction		Dust protected

Notes: 1) The data shown above are initial values.
2) The data shown above are standard type conditions.

CONTACT DATA

type	Contact arrange-ment	Contact material	Ambient Temperature	Load current	Energization value	ON/OFF Time	Cycle index
HF18FZ	2 form C	AgNi	23℃	7A	220Va.c or 24Vd.c (NO or NC)	0.5s ON, 1s OFF	1 x 10^5OPS
			70℃				5 x 10^4OPS
			23℃	5A	220Va.c（NO）（DC）		5 x 10^5OPS
					220Va.c（NC）（DC）		5 x 10^5OPS
					220Va.c（NO）（AC）		4 x 10^5OPS
					220Va.c（NC）（AC）		4 x 10^5OPS
					24Vd.c（NO）		5 x 10^5OPS
					24Vd.c（NC）		5 x 10^5OPS
	4 form C		23℃	5A	220Va.c or 24Vd.c (NO or NC)		1 x 10^5OPS
			70℃				5 x 10^4OPS
			23℃	3A	220Va.c or 24Vd.c (NO or NC)		2 x 10^5OPS
			70℃				1 x 10^5OPS

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

COIL

Coil power	DC type: Approx. 0.8W to 1.1W; AC type: Approx. 0.9VA to 1.2VA

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC[3)]	Coil Resistance Ω
6	4.8	0.60	6.6	41 x (1±15%)
12	9.6	1.20	13.2	165 x (1±15%)
24	19.2	2.40	26.4	662 x (1±15%)
48	38.4	4.80	52.8	2725 x (1±15%)
100/110	80.0	11.0	110/121	11440 x (1±15%)
220	170.0	22.0	242	53780 x (1±15%)

SAFETY APPROVAL RATINGS

UL/CUL	2 Form C	7A 220VAC/24VDC
	4 Form C	5A 220VAC/24VDC
CQC	2 Form C	7A 220VAC/24VDC
	4 Form C	5A 220VAC/24VDC
VDE	2 Form C	7A 220VAC/24VDC
	4 Form C	5A 220VAC/24VDC

COIL DATA at 23˚C

Nominal Voltage VAC	Pick-up Voltage VAC max.[2)]	Drop-out Voltage VAC min.[2)]	Max. Voltage VAC[3)]	Coil Resistance Ω
12	9.60	3.60	13.2	46 x (1±15%)
24	19.2	7.20	26.4	180 x (1±15%)
48	38.4	14.4	52.8	788 x (1±15%)
100/110	80.0	33.0	110/121	3750 x (1±15%)
110/120	88.0	36.0	121/132	4430 x (1±15%)
200/220	160.0	66.0	220/242	12950 x (1±15%)
220/240	176.0	72.0	242/264	15920 x (1±15%)

Notes: 1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.
2) The data shown above are initial values.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF18FZ/ A 12 -2Z 2 3 J 1 G (XXX)

Type	
Coil voltage form	**A:** AC **Nil:** DC
Coil voltage	**DC:** 6VDC to 220VDC **AC:** 12VAC to 240VAC
Contact arrangement	**2Z:** 2 Form C **4Z:** 4 Form C
Termination	**2:** Socket
Contact material	**3:** AgNi
Custom component code	**Nil:** Without Component **J:** With free-wheeling diode
Interface function code	**1:** No LED no button **2:** with LED no button **3:** With LED and button
Contact plating	**Nil:** No gold-plated **G:** Gold-plated
Special code[1)]	**XXX:** Customer special requirement **Nil:** Standard

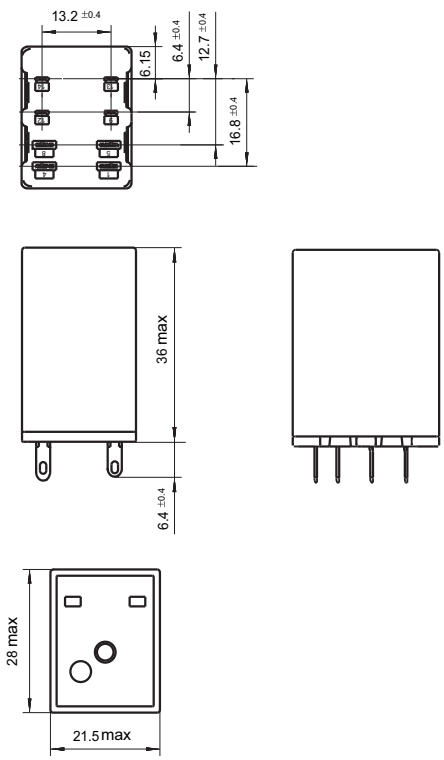
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS

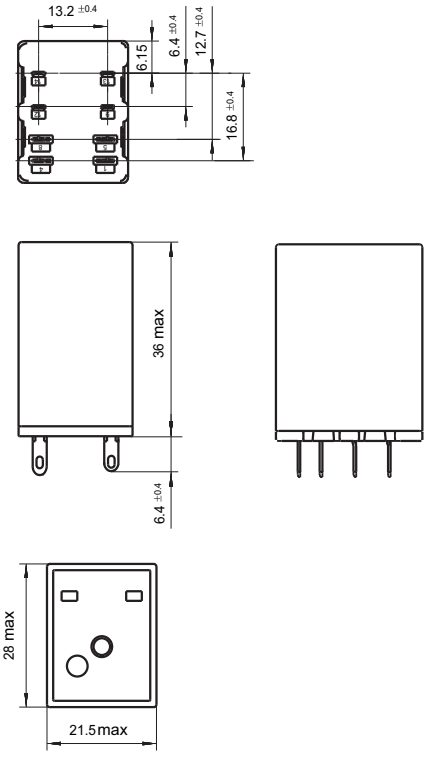
Unit: mm

Outline Dimensions

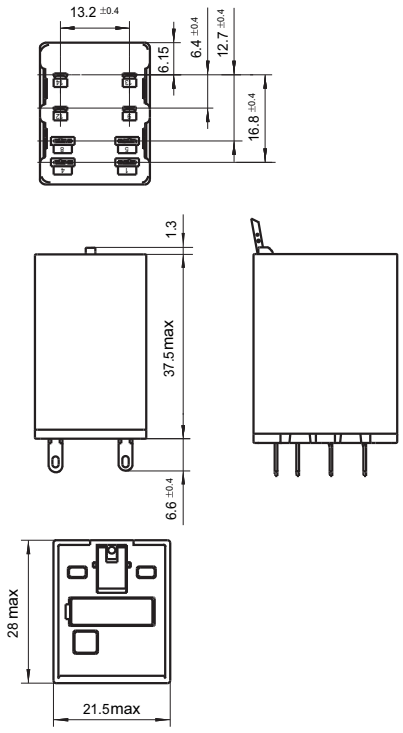
HF18FZ-□/□□□□-2Z2□□□**1**□



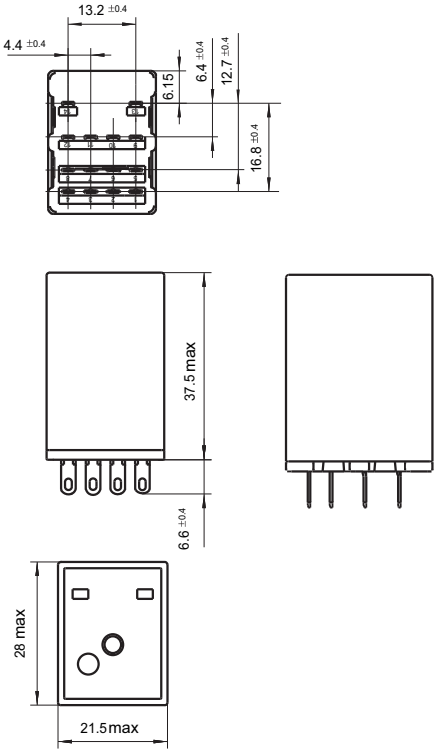
HF18FZ-□/□□□□-2Z2□□□**2**□



HF18FZ-□/□□□□-2Z2□□□**3**□



HF18FZ-□/□□□□-4Z2□□□**1**□

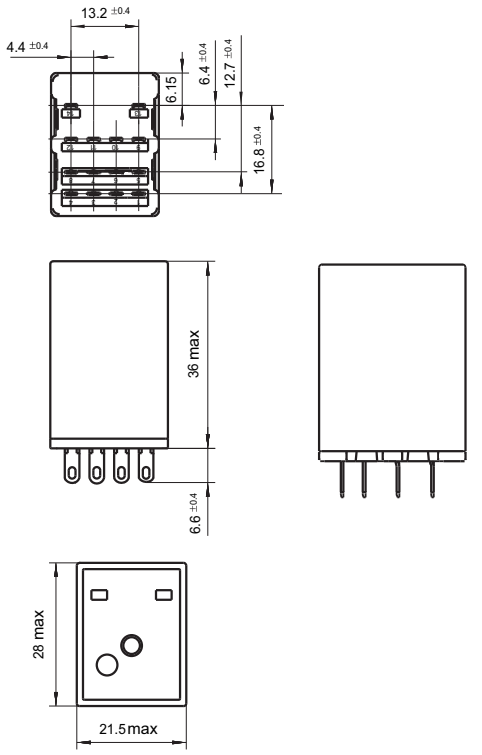


OUTLINE DIMENSIONS

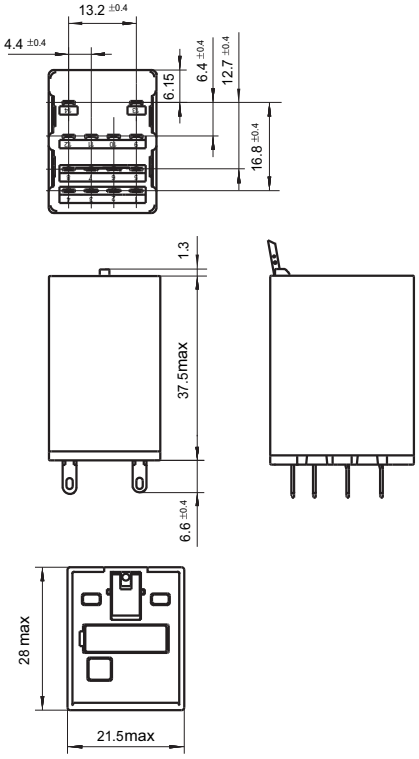
Unit: mm

Outline Dimensions

HF18FZ-□/□□□□-4Z2□□□**2**□



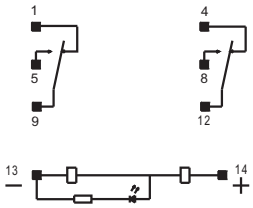
HF18FZ-□/□□□□-4Z2□□□**3**□



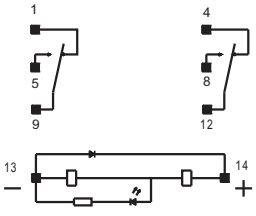
Remark: In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

WIRING DIAGRAM(BOTTOM VIEW)

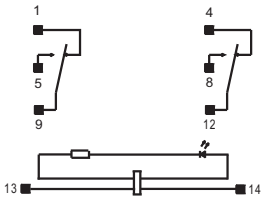
2 Form C(DC,With LED)
(Without 220VDC)



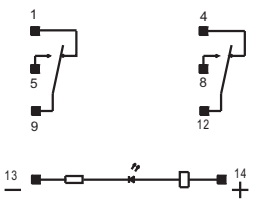
2 Form C
(DC, With fly-wheel diode and LED)
(Without 220VDC)



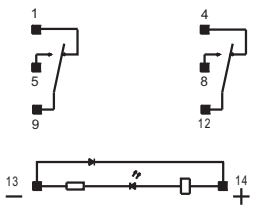
2 Form C
(AC, With LED)



2 Form C(DC, With LED)
(220VDC)

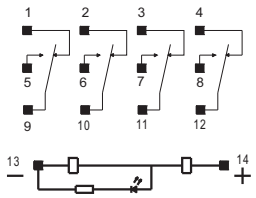


2 Form C
(DC, With fly-wheel diode and LED)
(220VDC)

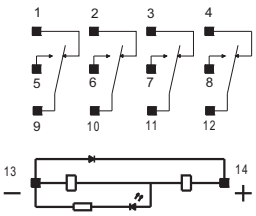


WIRING DIAGRAM(BOTTOM VIEW)

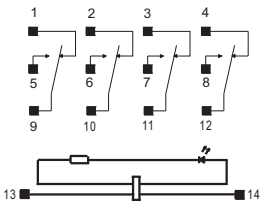
4 Form C(DC, With LED)
(Without 220VDC)



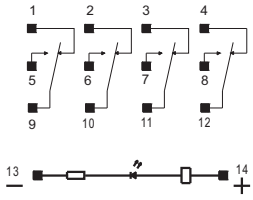
4 Form C
(DC, With fly-wheel diode and LED)
(Without 220VDC)



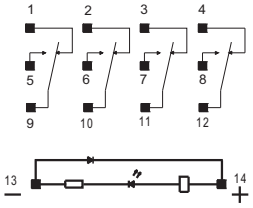
4 Form C
(AC, With LED)



4 Form C(DC, With LED)
(220VDC)

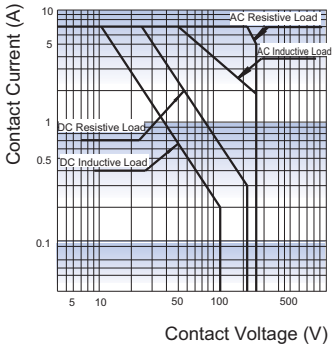


4 Form C
(DC, With fly-wheel diode and LED)
(220VDC)

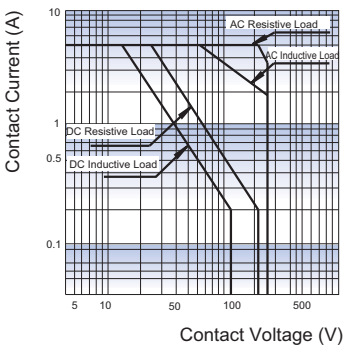


CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER
(2 Form C)

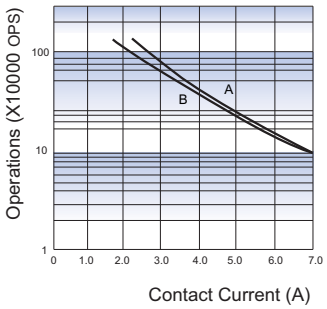


MAXIMUM SWITCHING POWER
(4 Form C)

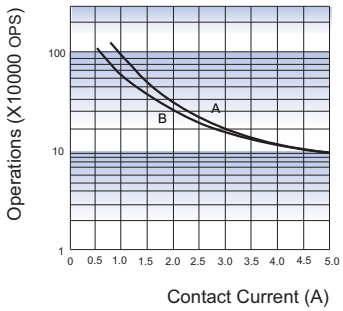


CHARACTERISTIC CURVES

ENDURANCE CURVE
(2 Form C)

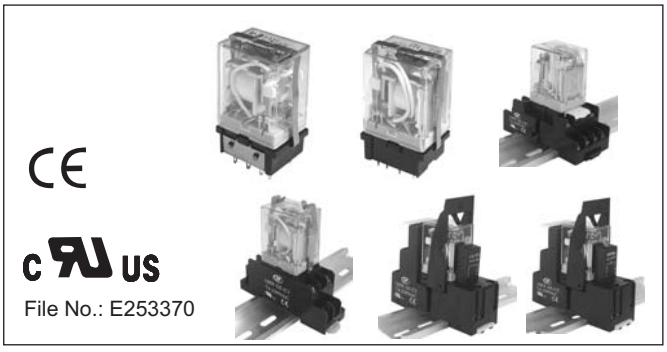


ENDURANCE CURVE
(2 Form C)



Notes: 1) Line A is Res.load 24Vd.c.
Line B is Res.load 220Va.c.
2) Switching condition:NO or NC.
3) Number of operations：AC load，50Hz，80%

Relay Sockets



File No.: E253370

Features

- The dielectric strength can reach 2000VAC and the insulation resistance is 1000MΩ
- Three mounting types are available: PCB mounting screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Components available: retainer, marker and plug-in module
- Environmental friendly product (RoHS compliant)

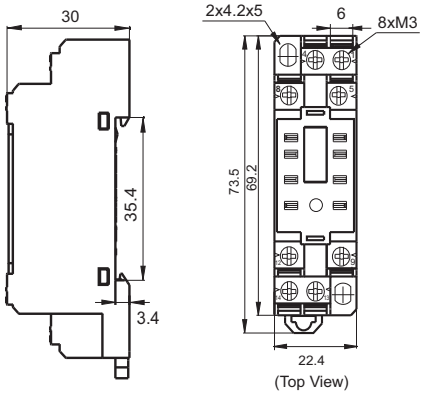
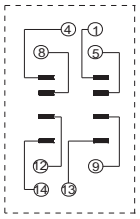
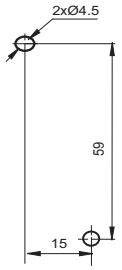
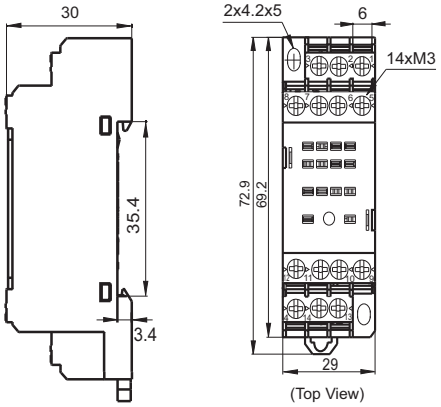
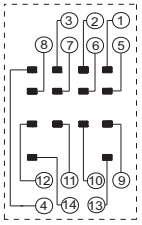
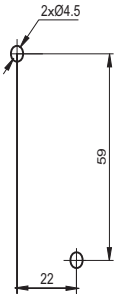
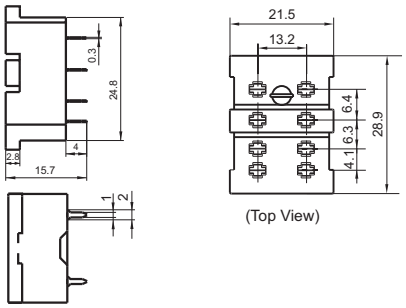
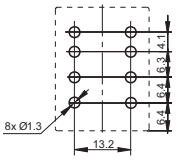
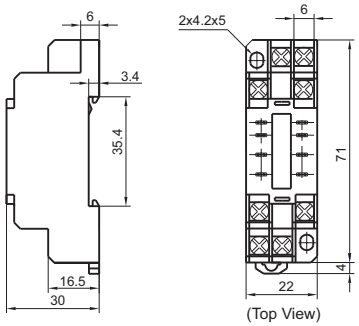
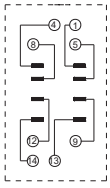
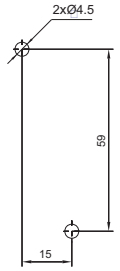
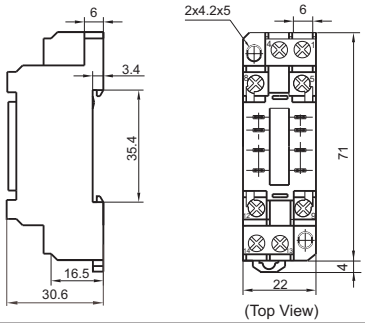
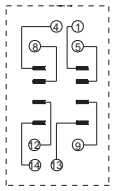
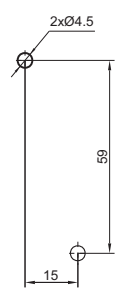
CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
18FZ-2Z-C2	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FZ-4Z-C2	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-A2	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	—	—
18FF-2Z-C1	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-2Z-C2	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-2Z-C4	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-C5	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-C8	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-2Z-C9	250VAC	7A	-40 ˚C ~ 70˚C	2000VAC	—	7mm
18FF-4Z-A2	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	—	—
18FF-4Z-C1	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-4Z-C2	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.8N · m	7mm
18FF-4Z-C4	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-4Z-C5	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	0.6N · m	7mm
18FF-4Z-C9	250VAC	7A*	-40 ˚C ~ 70˚C	2000VAC	—	7mm

Remark: For sockets marked *, their group of current totally should be not more than 20A.

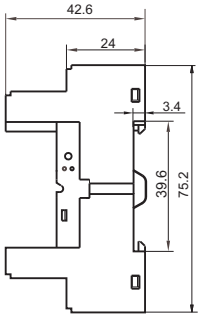
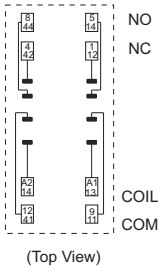
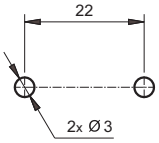
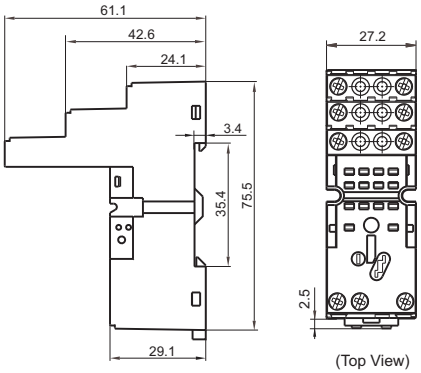
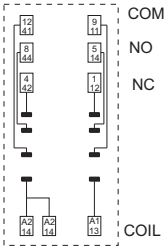
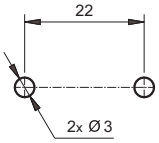
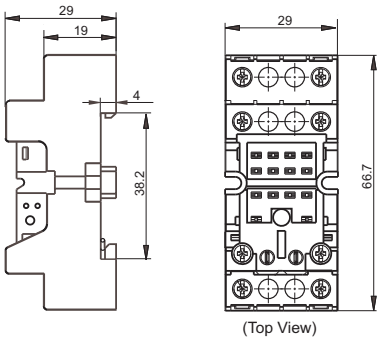
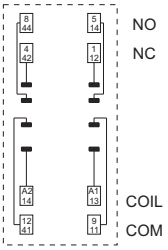
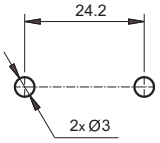
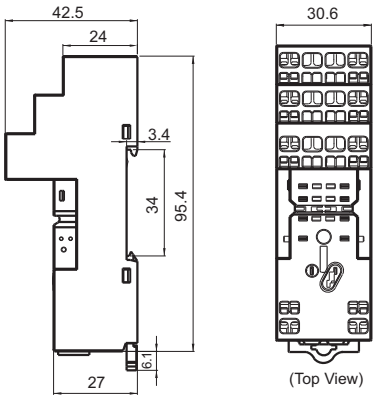
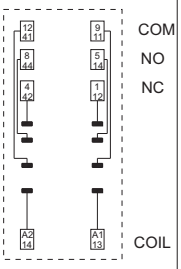
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FZ-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device	 (Top View)	 (Top View)		metallic retainer 18FZ-H1 18FF-H2 (be used in sets)
18FZ-4Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device	 (Top View)	 (Top View)		metallic retainer 18FZ-H1 18FF-H2 (be used in sets)
18FF-2Z-A2  PCB Terminal, PCB mounting Applicable for 2 poles	 (Top View)			metallic retainer 18FF-H1
18FF-2Z-C1  Screw Terminal, DIN rail or Screw mounting, Without finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		metallic retainer 18FZ-H1 18FF-H2 (be used in sets)
18FF-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		metallic retainer 18FZ-H1 18FF-H2 (be used in sets)

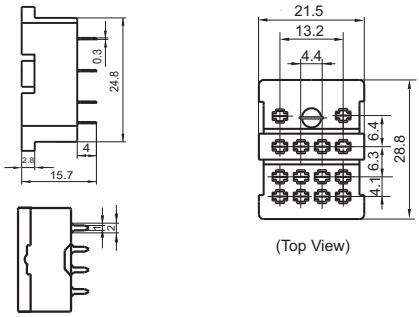
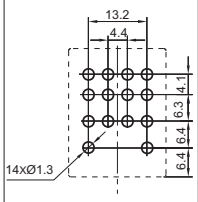
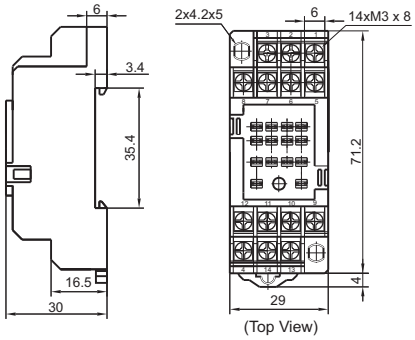
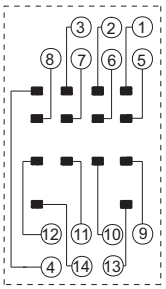
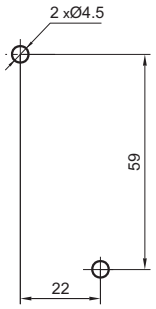
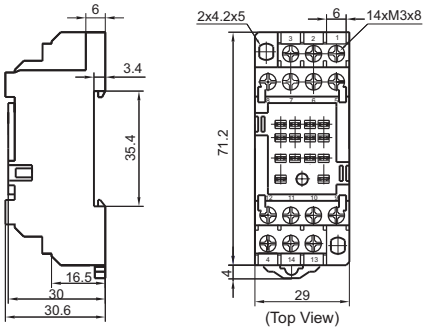
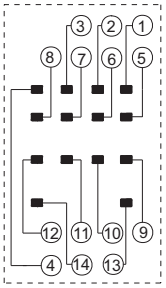
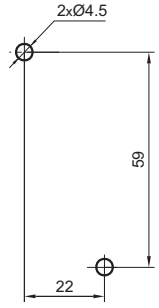
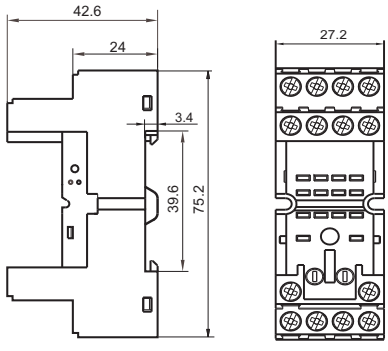
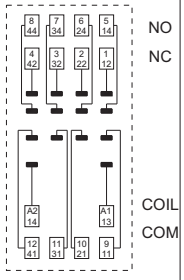
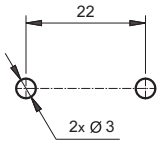
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-2Z-C4  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-2Z-C5  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-2Z-C8  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 2 poles				plastic retainer 18FF-H4 marker 18FF-M3
18FF-2Z-C9  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for 2 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 plug-in module HFAA ~ HFHU* marker 18FF-M3

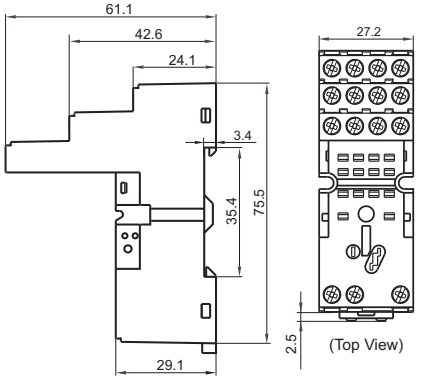
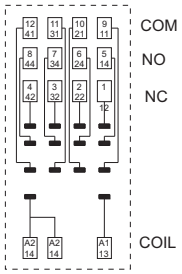
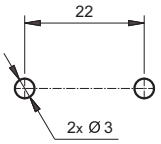
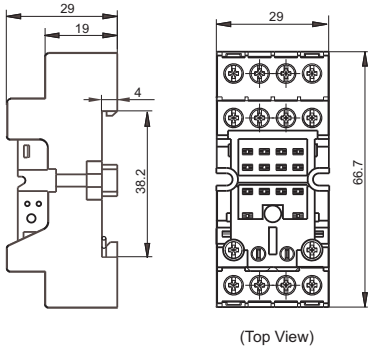
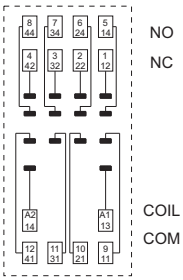
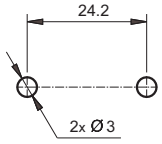
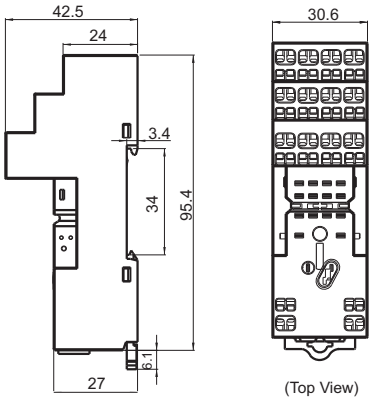
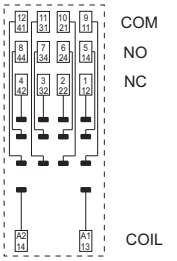
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-4Z-A2  PCB Terminal, PCB mounting Applicable for 4 poles	 (Top View)		 (Top View)	metallic retainer 18FF-H1
18FF-4Z-C1  Screw Terminal, DIN rail or Screw mounting, Withtout finger protection device Applicable for 4 poles	 (Top View)	 (Top View)		metallic retainer 18FZ-H1 18FF-H2 (be used in sets)
18FF-4Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles	 (Top View)	 (Top View)		metallic retainer 18FZ-H1 18FF-H2 (be used in sets)
18FF-4Z-C4  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles	 (Top View)	 (Top View)		plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

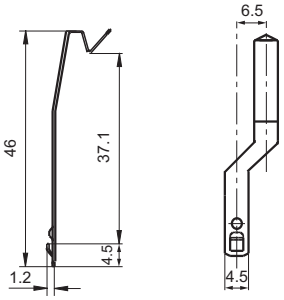
Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
18FF-4Z-C5  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 marker 18FF-M1 plug-in module HFAA to HFHU*
18FF-4Z-C8  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for 4 poles				plastic retainer 18FF-H4 marker 18FF-M3
18FF-4Z-C9  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for 2 poles				plastic retainer 18FF-H4 metallic retainer 18FF-H5 plug-in module HFAA ~ HFHU* marker 18FF-M3

DIMENSION OF RELATED COMPOENT (AVAILABLE)

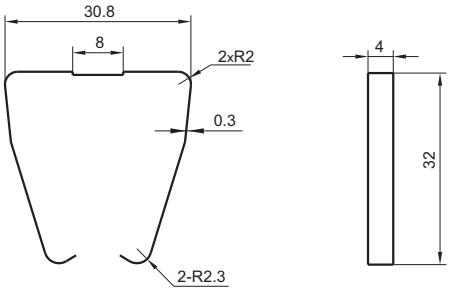
Unit: mm

Retainer

18FZ-H1(Metallic retainer)



18FF-H1(Metallic retainer)

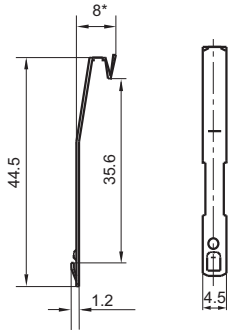


Remark:This retainer is for specific series.Please be aware before ordering.

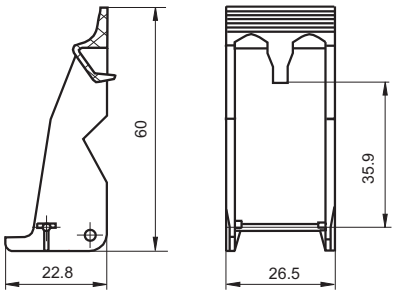
DIMENSION OF RELATED COMPOENT (AVAILABLE)

Unit: mm

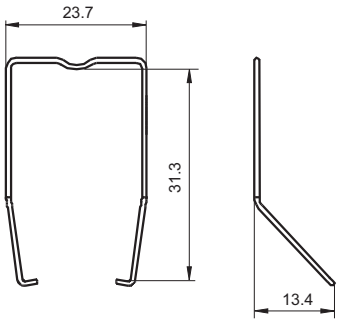
18FF-H2 (Metallic retainer)



18FF-H4 (Plastic retainer)

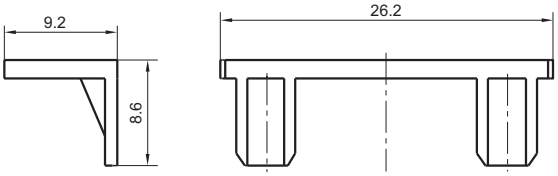


18FF-H5 (Metallic retainer)

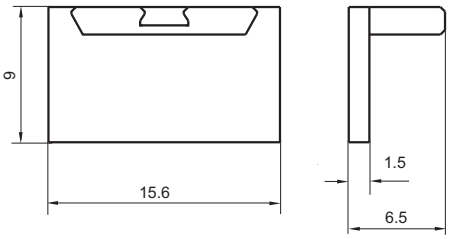


Marker

18FF-M1



18FF-M3



SELECTION OF PARTS

Type of Relay	Mounting termination	Socket	Retainer	Marker	Module
HF18FZ/□□-2Z□□□1/2□	without button	18FF-2Z-A2	18FF-H1	-	-
		18FF-2Z-C1	18FF-H2		
		18FF-2Z-C2			
		18FZ-2Z-C2			
		18FF-2Z-C4	18FF-H4/H5	18FF-M1	HFAA~HFHU
		18FF-2Z-C5			
		18FF-2Z-C8		18FF-M3	
		18FF-2Z-C9			
HF18FZ/□□-4Z□□□1/2□		18FF-4Z-A2	18FF-H1	-	-
		18FF-4Z-C1	18FF-H2		
		18FF-4Z-C2			
		18FZ-4Z-C2			
		18FF-4Z-C4	18FF-H4/H5	18FF-M1	HFAA~HFHU
		18FF-4Z-C5			
		18FF-4Z-C8		18FF-M3	
		18FF-4Z-C9			
HF18FZ/□□-2Z□□□3□	with button	18FF-2Z-C1	18FZ-H1	-	-
		18FF-2Z-C2			
		18FZ-2Z-C2			
		18FF-2Z-C4	18FF-H4	18FF-M1	HFAA~HFHU
		18FF-2Z-C5			
		18FF-2Z-C8		18FF-M3	
		18FF-2Z-C9			
HF18FZ/□□-4Z□□□3□		18FF-4Z-C1	18FZ-H1	-	-
		18FF-4Z-C2			
		18FZ-4Z-C2			
		18FF-4Z-C4	18FF-H4	18FF-M1	HFAA~HFHU
		18FF-4Z-C5			
		18FF-4Z-C8		18FF-M3	
		18FF-4Z-C9			

Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF18FZ relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ≥50mm, tolerance should be ±1mm; outline dimension >20mm and <50mm, tolerance should be ±0.5mm; outline dimension ≤20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HF10FH MINIATURE HIGH POWER RELAY

c UL us
File No.:134517

Features

- 10A switching capability
- Long endurance
- Industry standard 8 or 11 round terminals
- Sockets available
- With push button
- Smoke cover type available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 35.5mm x 35.5mm x 55.3mm

CONTACT DATA

Contact arrangement	2C, 3C
Contact resistance 1)	100mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating (Res. load)	2C: 10A 250VAC/30VDC 3C: (NO)10A 250VAC/30VDC (NC) 5A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10^7 OPS
Electrical endurance	2Z type: 1 x 10^5OPS (10A 250VAC/30VDC, Resistive load, Room temp., 1s on 9s off) 3Z type: 1 x 10^5OPS (NO:10A 250VAC/30VDC; NC:5A 250VAC/30VDC Resistive load, Room temp., 1s on 9s off)

Notes: 1)The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		500MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. volt.)		30ms max.
Release time (at nomi. volt.)		30ms max.
Temperature rise (at nomi. volt.)		100K max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 55°C
Termination		Octal and Undecal Type Plug
Unit weight		Approx. 90g
Construction		Dust protected

Notes: The data shown above are initial values.

COIL

Coil power	DC type: Approx. 1.5W; AC type: Approx. 2.7VA

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC 3)	Coil Resistance Ω
6	4.80	0.60	7.20	23.5 x (1±10%)
12	9.60	1.20	14.4	95 x (1±10%)
24	19.2	2.40	28.8	430 x (1±10%)
48	38.4	4.80	57.6	1630 x (1±10%)
60	48.0	6.00	72.0	1920 x (1±10%)
100	80.0	10.0	120	6800 x (1±10%)
110	88.0	11.0	132	7300 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max.2)	Drop-out Voltage VAC min.2)	Max. Voltage VAC3)	Coil Resistance Ω
6	4.80	1.80	7.20	3.9 x (1±10%)
12	9.60	3.60	14.4	16.9 x (1±10%)
24	19.2	7.20	28.8	70 x (1±10%)
48	38.4	14.4	57.6	315 x (1±10%)
110/120	88.0	36.0	132	1600 x (1±10%)
220/230	176	69.0	253	6800 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 250VAC/30VDC 1/3HP 240VAC 1/3HP 120VAC 1/2HP 277VAC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF10FH /	012	A	-2Z	D	T	G	(XXX)
Type								
Coil voltage	**DC:** 6, 12, 24, 48, 60, 100, 110V **AC:** 6, 12, 24, 48, 110/120, 220/230V							
Coil voltage form	**A:** AC	**D:** DC						
Contact arrangement	**2Z:** 2 Form C **3Z:** 3 Form C **3Z-1:** 3 Form C (Different Wiring Diagram)							
LED	**D:** With LED	**Nil:** Without LED						
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO						
Contact plating	**G:** Gold plated	**Nil:** No gold plated						
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard						

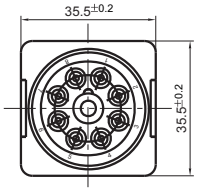
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

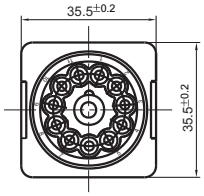
Outline Dimensions

2 Form C

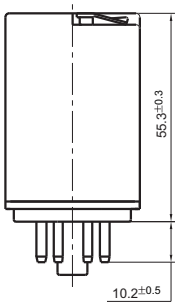


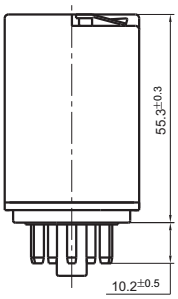
(Bottom view)

3 Form C



(Bottom view)

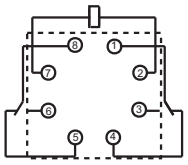




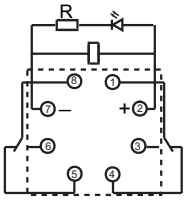
Wiring Diagram

(Bottom view)

2 Form C

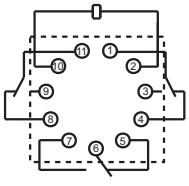


2 Form C (With LED)

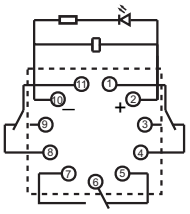


Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

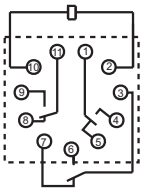
3 Form C



3 Form C (With LED)



3 Form C (Different Wiring Diagram)

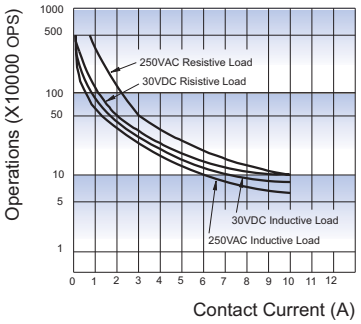


Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

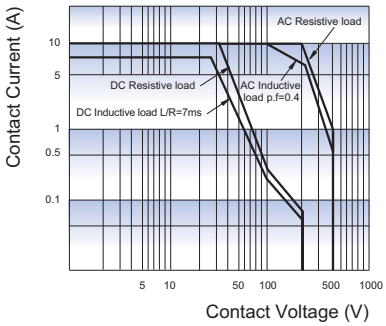
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

ENDURANCE CURVE



MAXIMUM SWITCHING POWER



Test conditions:
Room temp., 1s on 9s off

Relay Sockets

File No.: E253370

Features

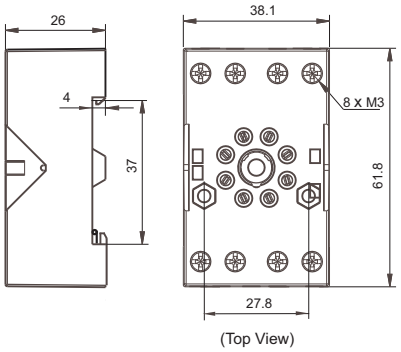
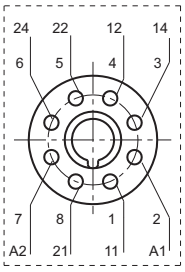
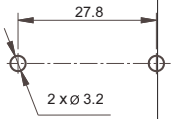
- The dielectric strength can reach 2000VAC and the insulation resistance is 1000MΩ
- Two mounting types are available: screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Components available: metallic retainer, plug-in modules
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
10FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm
10FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm
10FF-3Z-C3	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm
10FF-3Z-C4	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm

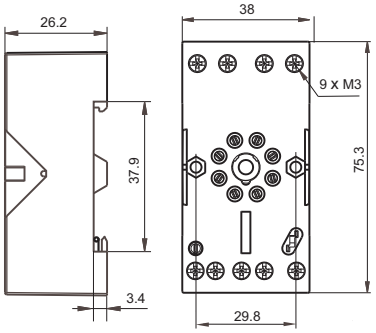
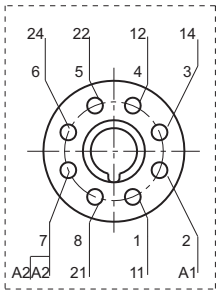
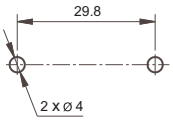
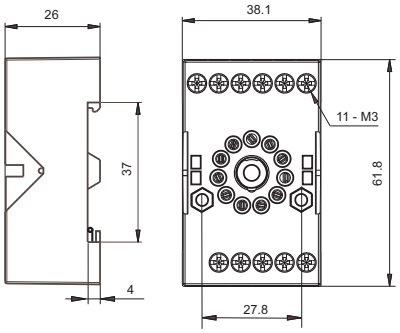
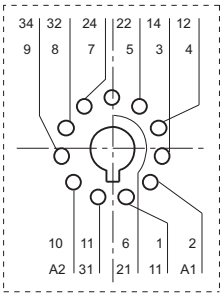
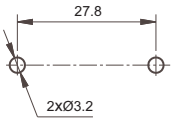
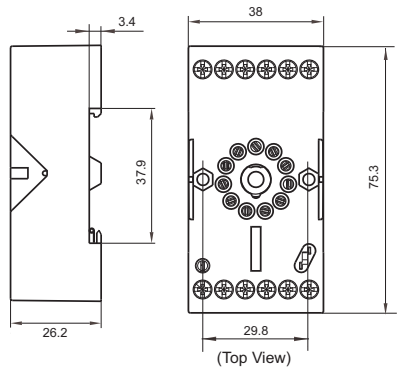
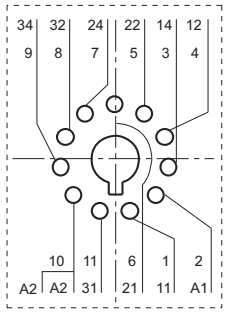
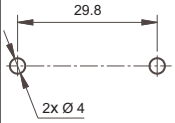
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
10FF-2Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
10FF-2Z-C4  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1 plug-in module HFFAA to HFFHU*
10FF-3Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 3 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1
10FF-3Z-C4  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 3 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1 plug-in module HFFAA to HFFHU*

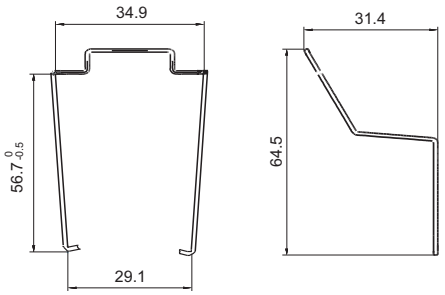
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

Retainer

10FF-H1 (Metallic retainer)



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. As for related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF10FH relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF10FF MINIATURE HIGH POWER RELAY

c UL us
File No.:134517

Features

- 10A switching capability
- Long endurance
- Industry standard 8 or 11 round terminals
- Sockets available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 35.0mm x 35.0mm x 55.0mm

CONTACT DATA

Contact arrangement	2C, 3C
Contact resistance[1)]	100mΩ max.(at 1A 24VDC)
Contact material	See ordering info.
Contact rating (Res. load)	2C: 10A 250VAC/30VDC 3C: (NO)10A 250VAC/30VDC (NC) 5A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10^7 OPS
Electrical endurance	2Z type: 1 x 10^5OPS (10A 250VAC/30VDC, Resistive load, Room temp., 1s on 9s off) 3Z type: 1 x 10^5OPS (NO:10A 250VAC/30VDC; NC:5A 250VAC/30VDC, Resistive load, Room temp., 1s on 9s off)

Notes: The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		500MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		30ms max.
Release time (at nomi. volt.)		30ms max.
Temperature rise (at nomi. volt.)		100K max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 55˚C
Termination		Octal and Undecal Type Plug
Unit weight		Approx.90g
Construction		Dust protected

Notes: The data shown above are initial values.

COIL

Coil power	DC type: Approx. 1.5W; AC type: Approx. 2.7VA

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC[3)]	Coil Resistance Ω
6	4.80	0.60	7.20	23.5 x (1±10%)
12	9.60	1.20	14.4	95 x (1±10%)
24	19.2	2.40	28.8	430 x (1±10%)
48	38.4	4.80	57.6	1630 x (1±10%)
60	48.0	6.0	72.0	1920 x (1±10%)
100	80.0	10.0	120	6800 x (1±10%)
110	88.0	11.0	132	7300 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max.[2)]	Drop-out Voltage VAC min.[2)]	Max. Voltage VAC[3)]	Coil Resistance Ω
6	4.80	1.80	7.20	3.9 x (1±10%)
12	9.60	3.60	14.4	16.9 x (1±10%)
24	19.2	7.20	28.8	70 x (1±10%)
48	38.4	14.4	57.6	315 x (1±10%)
110/120	88.0	36.0	132	1600 x (1±10%)
220/230	176	69.0	253	6800 x (1±10%)

Notes: 1) The data shown above are initial values.
2)Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 250VAC/30VDC 1/3HP 120VAC 1/3HP 240VAC 1/2HP 277VAC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

ORDERING INFORMATION

	HF10FF /	012	A	-2Z	D	T	G	(XXX)
Type								
Coil voltage	**DC:** 6, 12, 24, 48, 60, 100, 110V **AC:** 6, 12, 24, 48, 110/120, 220/230V							
Coil voltage form	**A:** AC	**D:** DC						
Contact arrangement	**2Z:** 2 Form C **3Z:** 3 Form C **3Z-1:** 3 Form C (Different Wiring Diagram)							
LED	**D:** With LED	**Nil:** Without LED						
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO						
Contact plating	**G:** Gold plated	**Nil:** No gold plated						
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard						

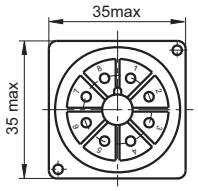
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

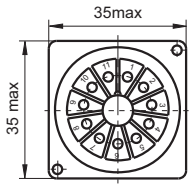
Outline Dimensions

2 Form C

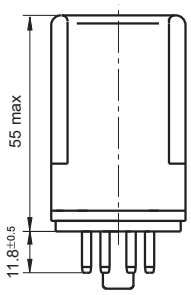


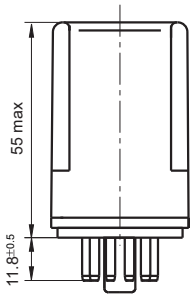
(Bottom view)

3 Form C



(Bottom view)

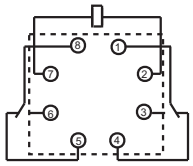




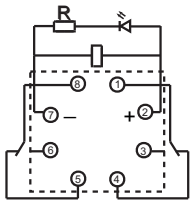
Wiring Diagram

(Bottom view)

2 Form C

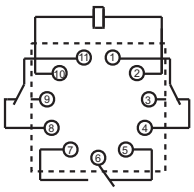


2 Form C (With LED)

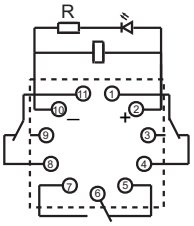


Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

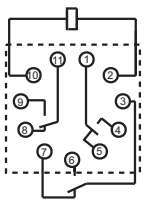
3 Form C



3 Form C (With LED)



3 Form C (Different Wiring Diagram)

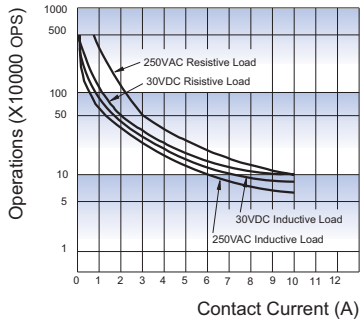


Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

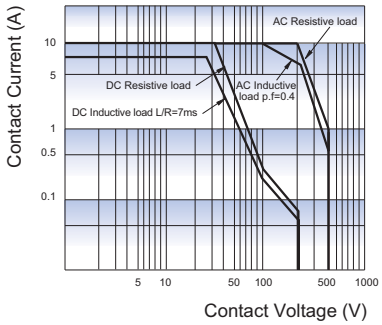
CHARACTERISTIC CURVES

ENDURANCE CURVE

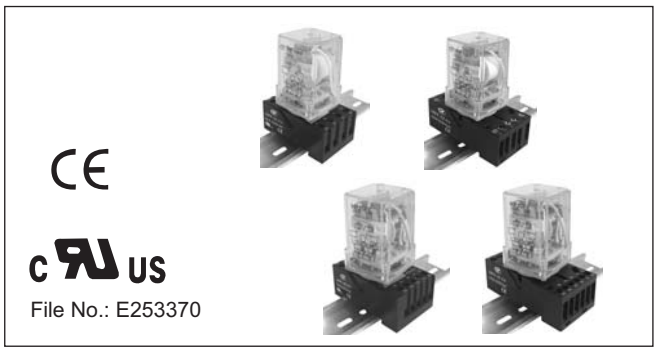


Test conditions:
Room temp., 1s on 9s off

MAXIMUM SWITCHING POWER



Relay Sockets



File No.: E253370

Features

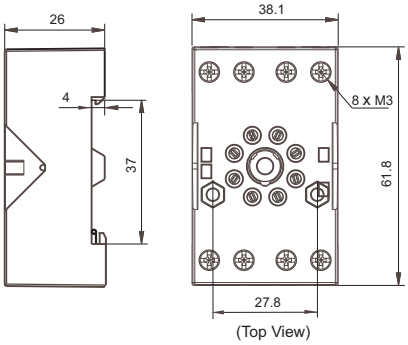
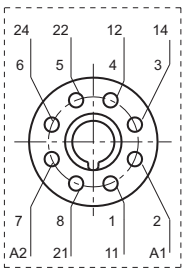
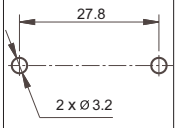
- The dielectric strength can reach 2000VAC and the insulation resistance is 1000MΩ
- Two mounting types are available: screw mounting and DIN rail mounting.
- With finger protection device are available
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Components available: metallic retainer, plug-in modules
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
10FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm
10FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm
10FF-3Z-C3	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm
10FF-3Z-C4	250VAC	10A	-40 ˚C to 70˚C	2000VAC	0.6N · m	7mm

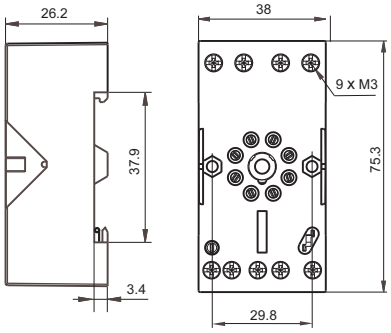
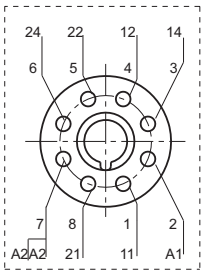
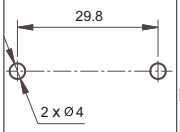
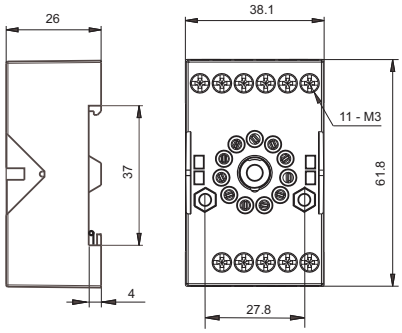
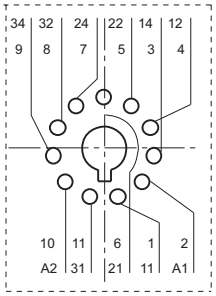
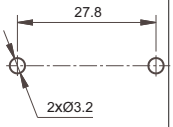
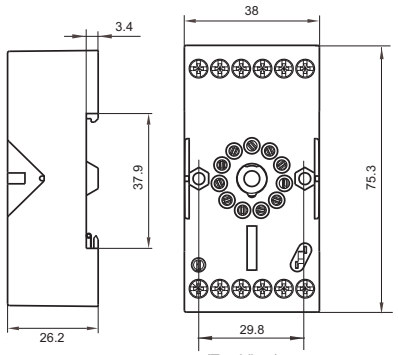
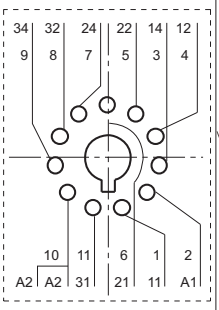
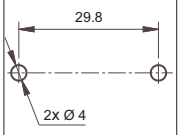
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
10FF-2Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

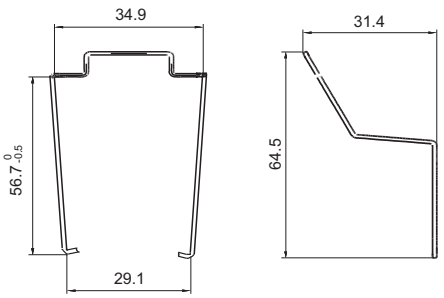
Socket	Outline Dimensions	Wiring Diagram	PCB Layout	Components Available
10FF-2Z-C4  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 2 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1 plug-in module HFFAA to HFFHU*
10FF-3Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 3 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1
10FF-3Z-C4  Screw terminal DIN rail or Screw mounting With finger protection device Applicable for 3 poles	 (Top View)	 (Top View)		metallic retainer 10FF-H1 plug-in module HFFAA to HFFHU*

Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

Retainer 10FF-H1 (Metallic retainer)



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. As for related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF10FF relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF118F MINIATURE HIGH POWER RELAY

File No.: E134517

File No.: 40010480

File No.: CQC09002035071

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Low height: 12.5 mm
- Creepage distance >8mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Sockets available
- Plastic sealed and flux proofed types available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 28.5mm x 10.1mm x 12.5mm

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact material	See ordering info.
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact rating (Res. load)	10A 250VAC/30VDC
Max. switching voltage	440VAC / 125VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1H type: 1 x 10^5OPS (8A 250VAC, Resistive load, AgNi, at 85°C, 5s on 5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. vot.)		10ms max.
Release time (at nomi. vot.)		5ms max.
Temperature rise (at nomi. Volt.)		55K max.
Shock resistance *	Functional	NC: 49m/s² NO: 98m/s²
	Destructive	980m/s²
Vibration resistance *	NC (no coil voltage)	10Hz to 55Hz 0.8mm DA
	NO	10Hz to 55Hz 1.65mm DA
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 8g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	Approx. 220mW to 290mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil Resistance Ω
5	3.50	0.5	7.5	113 x (1±10%)
6	4.20	0.6	9.0	164 x (1±10%)
9	6.30	0.9	13.5	360 x (1±10%)
12	8.40	1.2	18.0	620 x (1±10%)
18	12.60	1.8	27.0	1295 x (1±10%)
24	16.80	2.4	36.0	2350 x (1±15%)
48 3)	33.60	4.8	72.0	8000 x (1±15%)
60 3)	42.00	6.0	90.0	12500 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ⩾ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL (AgNi, $AgSnO_2$)	version 1,3,5,6	10A 250VAC at 85˚C 10A 30VDC at 85˚C B300 at 85˚C R300 at 85˚C 1/2HP 240VAC at 85˚C $AgSnO_2$: 1/3HP 120VAC at 85˚C
VDE (AgNi, AgNi+Au)	1H (;S) (1;3;5) (-;G)	8A 250VAC at 85˚C
	1D (;S) (1;3;6) (-;G)	8A 250VAC at 85˚C
	1Z (-;S) (1;3) (-;G)	8A 250VAC at 85˚C
VDE ($AgSnO_2$, $AgSnO_2$+Au)	1H (-;S) (1;3;5), T.(-;G)	8A 250VAC at 85˚C
	1D (-;S) (1;3;6), T.(-;G)	8A 250VAC at 85˚C
	1Z (-;S) (1;3), T.(-;G)	8A 250VAC at 85˚C
	1H (-;S) (1;3;5), T.(-;G)	AC-15 (Make: 30A 250VAC COS Ø=0.7 at 85˚C Break: 3A 250VAC COS Ø=0.4 at 85˚C)
	1Z (-;S) (1;3), T.(-;G)	NO: AC-15 (Make: 30A 250VAC COS Ø=0.7 at 85˚C Break: 3A 250VAC COS Ø=0.4 at 85˚C)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF118F /	012	-1H	S	1	G	(XXX)	
Type							
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC						
Contact arrangement	**1H:** 1 Form A **1D:** 1 Form B **1Z:** 1 Form C						
Construction 1) 2)	**S:** Plastic sealed **Nil:** Flux proofed						
Version (See Wiring Diagram below)	**1:** 3.2mm 1 pole 8A **3:** 3.2mm 1 pole 10A, double pinning **5:** 5mm 8A, only 1 Form A **6:** 5mm 8A, only 1 Form B						
Contact material 3)	**T:** $AgSnO_2$ **G:** AgNi+Au plated **TG:** $AgSnO_2$+Au plated **Nil:** AgNi						
Special code 4)	**XXX:** Customer special requirement **Nil:** Standard						

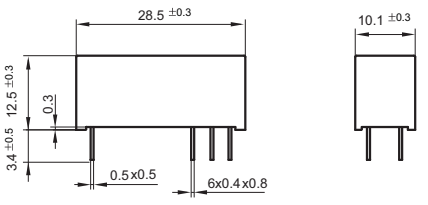
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT). e.g.(253) stands for Reflow soldering version.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

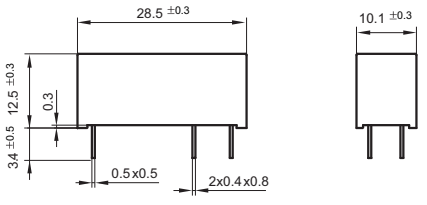
Unit: mm

Outline Dimensions

3.2mm pinning



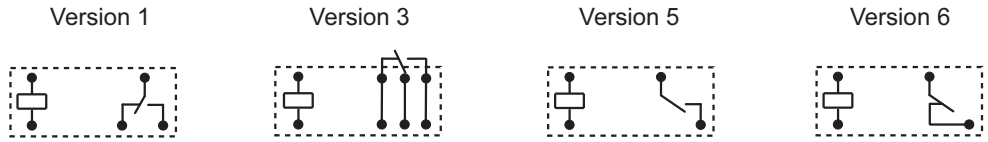
5mm pinning



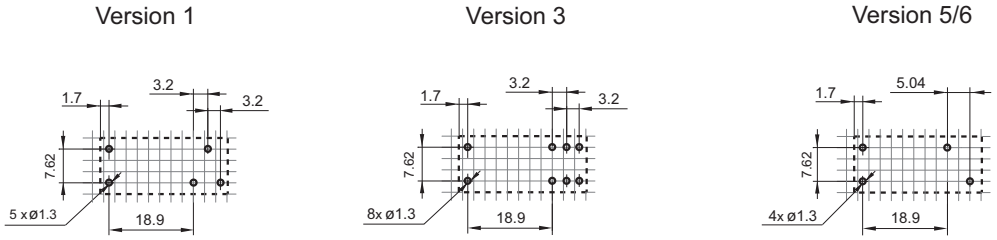
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)



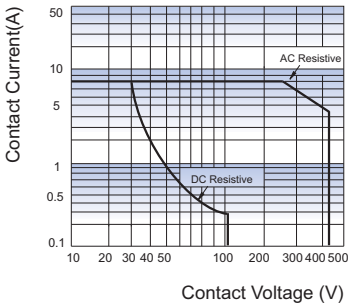
PCB Layout (Bottom view)



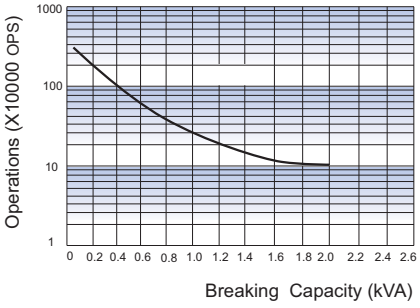
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



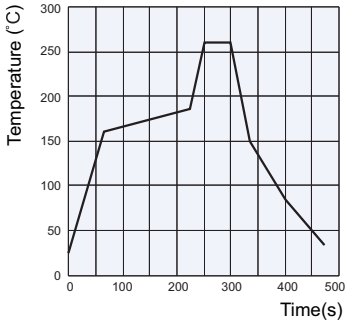
ENDURANCE CURVE



Notes:

1) Curve: 1Z1 type
2) Test conditions:
NO, Resistive load, 250VAC
Flux proofed, Room temp., 1s on 9s off.

REFLOW WELDING TEMPERATURE
(Reflow soldering version)



Relay Sockets

File No.: E253370

Features

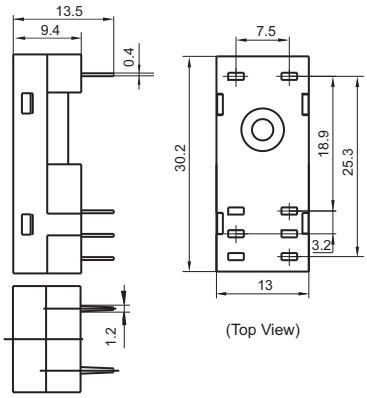
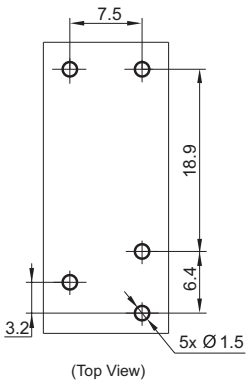
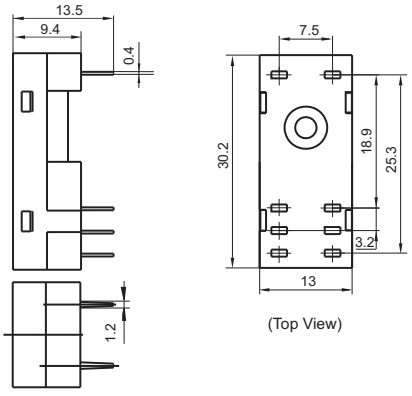
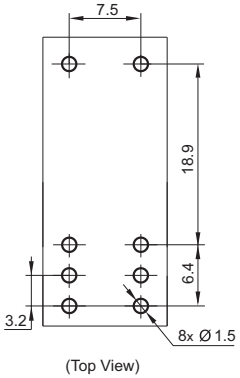
- The dielectric strength can reach 5000VAC and the insulation resistance is 1000MΩ
- Two mounting types are available: PCB and screw mounting.
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.
118F-1Z-A1-1	250VAC	10A	-40 ˚C to 70˚C	5000VAC
118F-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

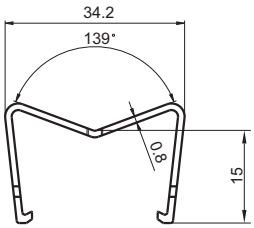
Socket	Outline Dimensions	Wiring Diagram	Components Available
118F-1Z-A1-1  PCB terminal, PCB or Screw mounting Applicable for HF118F/XXX-1XX1XX			metallic retainer 118F-H1
118F-2Z-A1  PCB terminal, PCB or Screw mounting Applicable for HF118F/XXX-1XX3XX			metallic retainer 118F-H1

DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

Retainer

118F-H1 (Metallic retainer)



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. As for related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF118F 1 poles relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ≥50mm, tolerance should be ±1mm; outline dimension >20mm and <50mm, tolerance should be ±0.5mm; outline dimension ≤20mm, tolerance should be ±0.3mm.

HF115F MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:116934

File No.:CQC17002168381

Features

- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 12.7mm x 15.7mm

CONTACT DATA

Contact arrangement	1A, 1B, 1C	2A, 2B, 2C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	12A/16A 250VAC	8A 250VAC
Max. switching voltage	440VAC / 300VDC	
Max. switching current	12A / 16A	8A
Max. switching power	3000VA / 4000VA	2000VA
Mechanical endurance	1 x 10^7OPS	
Electrical endurance	1H3B type: 1 x 10^5OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) 2H4B type: 5 x 10^4OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		8ms max.
Temperature rise (at nomi. volt.)		55K max.
Shock resistance *	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 400mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC [2)]	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.60	1.8	27	810 x (1±10%)
24	16.80	2.4	36	1440 x (1±10%)
48[3)]	33.60	4.8	72	5760 x (1±15%)
60[3)]	42.00	6.0	90	7500 x (1±15%)
110[3)]	77.00	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ⩾ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

SAFETY APPROVAL RATINGS

VDE

Contact material	Specifications	Ratings	Ambient Temperature
AgCdO	HF115F….2(H;Z)(S)4(G)(F)	8A 250VAC	at 70°C
	HF115F….1H(S)(1;2)(G)(F)	12A 250VAC	at 70°C
		10A 250VAC	at 70°C
	HF115F….1Z(S)(1;2)(G)(F)	12A 250VAC	at 70°C
	HF115F….1H(S)3(G)(F)	16A 250VAC	at 70°C
		10A 250VAC	at 70°C
		9A 250VAC COSØ =0.4	at 70°C
	HF115F….1Z(S)3(G)(F)	16A 250VAC	at 70°C
		9A 250VAC COSØ =0.4	at 70°C
AgNi	HF115F….2(H;Z)(S)4B(G)(F)	5A 400VAC	at 85°C
		8A 250VAC	at 85°C
	HF115F….1H(S)(1;2)B(G)(F)	12A 250VAC	at 85°C
	HF115F….1Z(S)(1;2)B(G)(F)	12A 250VAC	at 85°C
	HF115F….1H(S)3B(G)(F)	16A 250VAC	at 85°C
		9A 250VAC COSØ =0.4	at 70°C
	HF115F….1Z(S)3B(G)(F)	16A 250VAC (NO only)	at 85°C
		12A 250VAC	at 85°C
		9A 250VAC COSØ =0.4 (NO only)	at 70°C
		10(4)A 250VAC (NO only)	at 65°C
		12(2)A 250VAC (NO only)	at 65°C
$AgSnO_2$	HF115F….2(H;Z)(S)4A(G)(F)	8A 250VAC	at 85°C
	HF115F….1(H;Z)(S)(1;2)A(G)(F)	12A 250VAC	at 85°C
	HF115F….1H(S)3A(G)(F)	16A 250VAC	at 85°C
		9A 250VAC COSØ =0.4	at 70°C
	HF115F….1Z(S)3A(G)(F)	16A 250VAC (NO only)	at 85°C
		9A 250VAC COSØ =0.4 (NO only)	at 70°C

UL/CUL

Version 1 or 2 (AgCdO)	12A 277VAC
	1/2HP 250VAC
	1/3HP 125VAC
Version 1 or 2 ($AgSnO_2$)	12A / 277VAC
	B300
	R300
Version 1 or 2 (AgNi)	12A 277VAC
Version 3 (AgCdO)	16A 277 VAC
	9A 250VAC at 105°C
	1HP 250VAC
	1/2HP 125VAC
	TV-5 125VAC

Version 3 ($AgSnO_2$)	16A 277 VAC
	1/3HP 125VAC
	1/2HP 250VAC
	B300
	R300
Version 3 (AgNi)	16A 277VAC
	5FLA, 30LRA 250VAC
Version 4 (AgCdO)	10A 250VAC
	8A 277VAC
	1/2HP 250VAC
	1/4HP 125VAC
Version 4 ($AgSnO_2$)	8A 277VAC
Version 4 (AgNi)	8A 277VAC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF115F /	012	-1H	S	1	A	F	(XXX)
Type								
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60, 110VDC							
Contact arrangement	**1H:** 1 Form A **1D:** 1 Form B **1Z:** 1 Form C **2H:** 2 Form A **2D:** 2 Form B **2Z:** 2 Form C							
Construction [1)2)]	**S:** Plastic sealed		**Nil:** Flux proofed					
Version	**1:** 3.5mm 1 pole 12A **2:** 5.0mm 1 pole 12A **3:** 5.0mm 1 pole 16A **4:** 5.0mm 2 pole 8A							
Contact material [3)]	**A:** $AgSnO_2$ **B:** AgNi **Nil:** AgCdO **G:** AgCdO+ Au plated **AG:** $AgSnO_2$+ Au plated **BG:** AgNi+ Au plated							
Insulation standard	**F:** Class F **Nil:** Class B							
Special code [4)]	**XXX:** Customer special requirement **Nil:** Standard							

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).

2) Contact is recommend for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB

3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

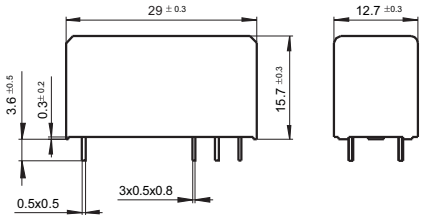
4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g. (253) stands for Reflow soldering version, for 1 pole type.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

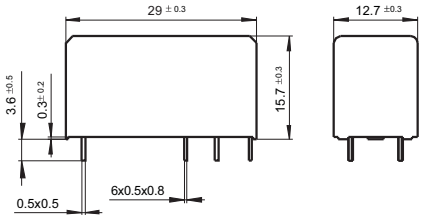
Unit: mm

Outline Dimensions

3.5mm Pinning (HF115F/□ □ □ -□ □ -□ -1-□ □)



5mm Pinning (HF115F/□ □ □ -□ □ -□ -2/3/4-□ □)



Wiring Diagram (Bottom view)

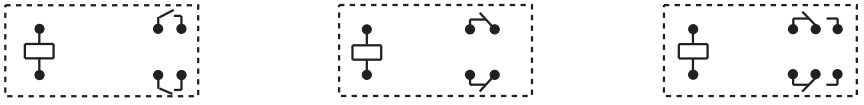
3.5/5mm Pinning, 1 Pole, 12A, HF115F/□ □ □ -1□ -□ -1/2-□ □

1 Form A　　1 Form B　　1 Form C

5mm Pinning, 1 Pole, 16A, HF115F/□ □ □ -1□ -□ -3-□ □

1 Form A　　1 Form B　　1 Form C

5mm Pinning, 2 Pole, 8A, HF115F/□ □ □ -2□ -□ -4-□ □



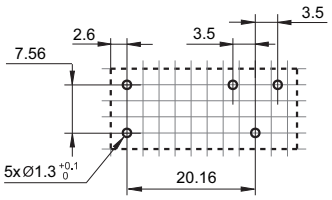
2 Form A　　2 Form B　　2 Form C

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

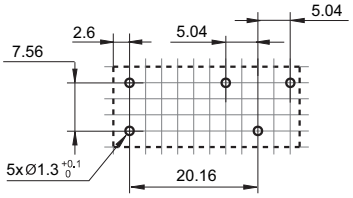
Unit: mm

PCB Layout (Bottom view)

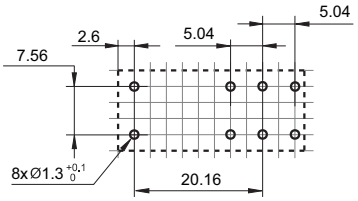
3.5mm 1Pole 12A



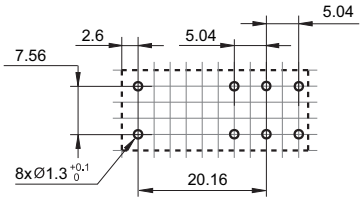
5mm 1Pole 12A



5mm 1Pole 16A



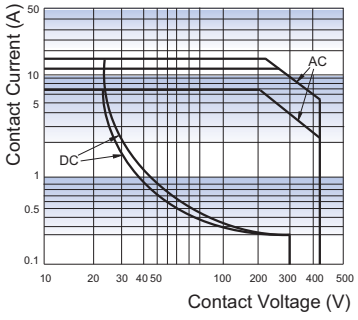
5mm 2Pole 8A



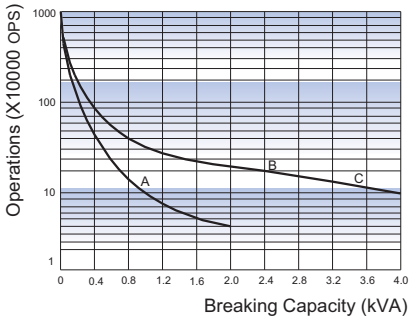
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

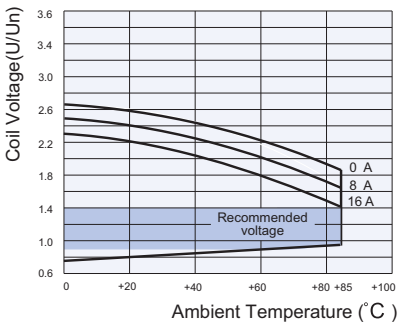


ENDURANCE CURVE



Remark:
1. Curve A: 2H4B type
   Curve B: 1H1B type(or 1H2B type)
   Curve C: 1H3B type
2. Test conditions:
   NO, Resistive load, 250VAC,
   Flux proofed, Room temp., 1s on 9s off.

COIL OPERATING RANGE (DC) *



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the abver range may damage the insulation of relay coil.

Relay Sockets

File No.: E253370

Features

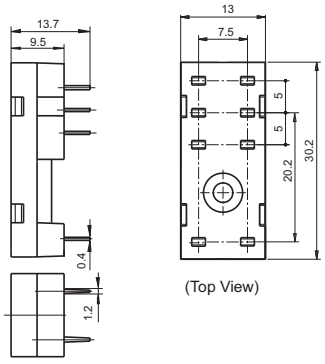
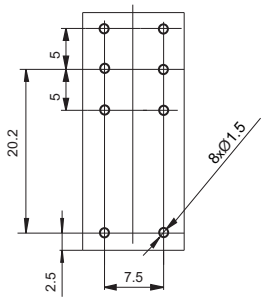
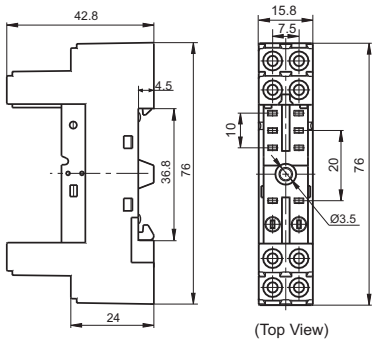
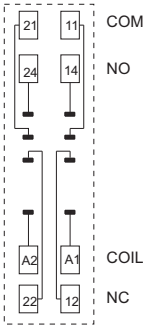
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strengths	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	9mm

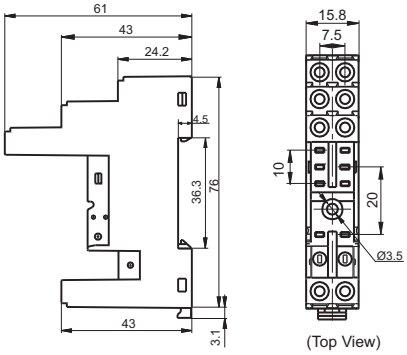
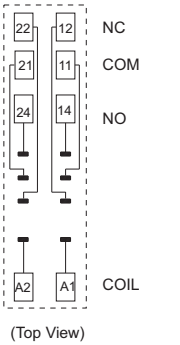
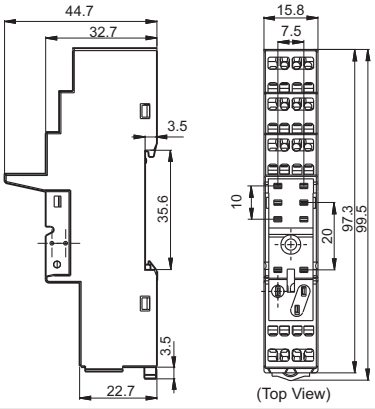
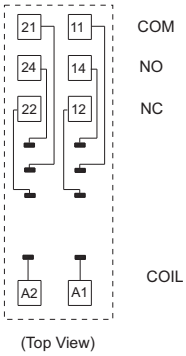
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, two pole of socket load must connect in parallel.	 (Top View)	 (Top View)	metallic retainer 14FF-H1 remarks: the dielectric strength can reach 1500VAC that sockets mounted 14FF-H1
14FF-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.	 (Top View)	 (Top View)	plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-C3  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*
14FF-2Z-C4  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*

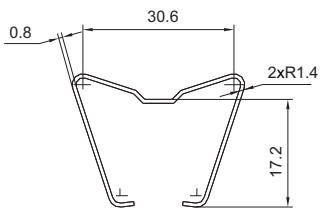
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

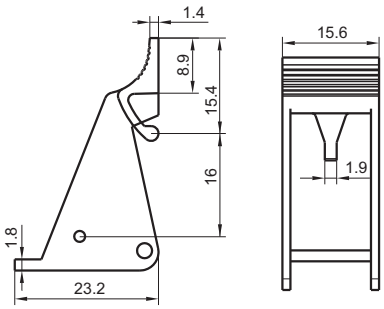
Unit: mm

Retainer

14FF-H1 (Metallic retainer)



14FF-H4 (Plastic retainer)

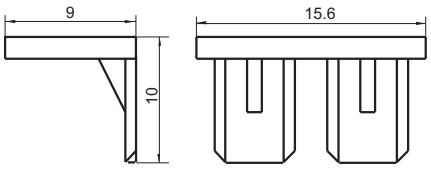


DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF115F relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HF115F-A MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:116934

File No.:CQC1702176311

Features

- AC voltage coil type
- 16A switching capability
- 1 & 2 pole configurations
- 5kV dielectric strength (between coil and contacts)
- Low height: 15.7 mm
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 12.7mm x 15.7mm

CONTACT DATA

Contact arrangement	1A, 1B, 1C	2A, 2B, 2C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	12A/16A 250VAC	8A 250VAC
Max. switching voltage	440VAC / 300VDC	
Max. switching current	12A / 16A	8A
Max. switching power	3000VA / 4000VA	2000VA
Mechanical endurance	1 x 10^6OPS	
Electrical endurance	1H3B type: 5 x 10^4OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) 2H4B type: 5 x 10^4OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Temperature rise (at nomi. volt.)		85K max.
Shock resistance *	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance *		10Hz to150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 0.75VA

COIL DATA (at 50Hz) at 23˚C

Nominal Voltage VAC	Pick-up Voltage VAC max.1)	Drop-out Voltage VAC min.1)	Coil Current mA	Coil DC Resistance Ω
24	18.00	3.60	31.6	350 x (1±10%)
115	86.30	17.30	6.6	8100 x (1±15%)
230	172.50	34.50	3.2	32500 x (1±15%)

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	12A 250VAC 16A 250VAC 8A 250VAC
VDE (AgNi, AgNi+Au)	12A 250VAC at 70˚C 16A 250VAC at 70˚C 8A 250VAC at 70˚C
VDE ($AgSnO_2$, $AgSnO_2$+Au)	12A 250VAC at 70˚C 8A 250VAC at 70˚C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF115F-A /	024	-1H	S	1	A	F	(XXX)

Type	
Coil voltage	24, 115, 230VAC
Contact arrangement	**1H:** 1 Form A **1D:** 1 Form B **1Z:** 1 Form C **2H:** 2 Form A **2D:** 2 Form B **2Z:** 2 Form C
Construction [1) 2)]	**S:** Plastic sealed **Nil:** Flux proofed
Version	**1:** 3.5mm 1 pole 12A **2:** 5.0mm 1 pole 12A **3:** 5.0mm 1 pole 16A **4:** 5.0mm 2 pole 8A
Contact material [3)]	**A:** $AgSnO_2$ **B:** AgNi **Nil:** AgCdO **G:** AgCdO+Au plated **AG:** $AgSnO_2$+Au plated **BG:** AgNi+Au plated
Insulation standard	**F:** Class F
Special code [4)]	**XXX:** Customer special requirement **Nil:** Standard

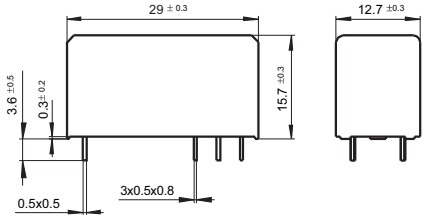
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

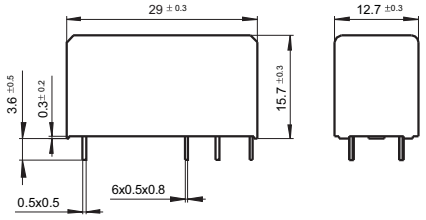
Unit: mm

Outline Dimensions

3.5mm Pinning (HF115F-A/□□□-□□-□-1-□□)

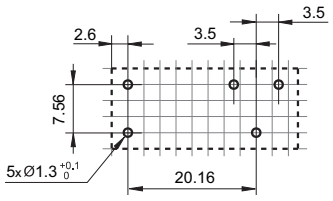


5mm Pinning (HF115F-A/□□□-□□-□-2/3/4-□□)

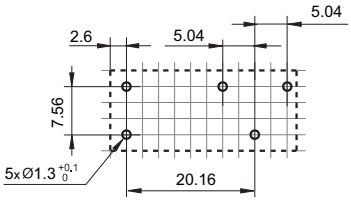


PCB Layout (Bottom view)

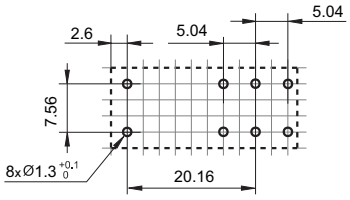
3.5mm 1Pole 12A



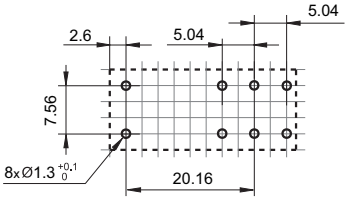
5mm 1Pole 12A



5mm 1Pole 16A



5mm 2Pole 8A



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.52mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)

HF115F-A/□□□-□□-□-1/2-□□, 3.5/5mm Pinning, 1 Pole, 12A

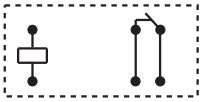
1 Form A

1 Form B

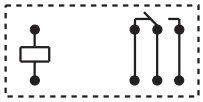
1 Form C

HF115F-A/□□□-□□-□-3-□□, 5mm Pinning, 1 Pole, 16A

1 Form A



1 Form B

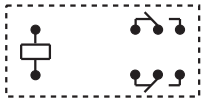


1 Form C

HF115F-A/□□□-□□-□-4-□□, 5mm Pinning, 2 Pole, 8A

2 Form A

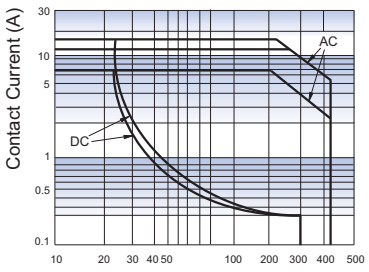
2 Form B



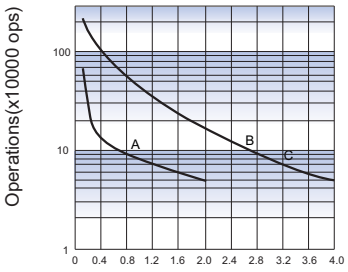
2 Form C

CHARACTERISTIC CURVES

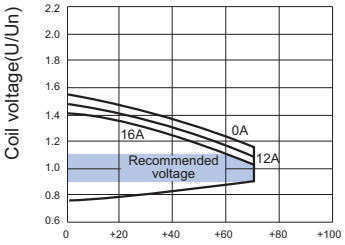
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (AC) *



Notes:

1) Curve A: 2H4B type
   Curve B: 1H1B(or 1H2B) type
   Curve C: 1H3B type
2) Test conditions:
   NO, Resistive load, 250VAC
   Flux proofed, Room temp., 1s on 9s off.

Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the abver range may damage the insulation of relay coil.

Relay Sockets

File No.: E253370

Features

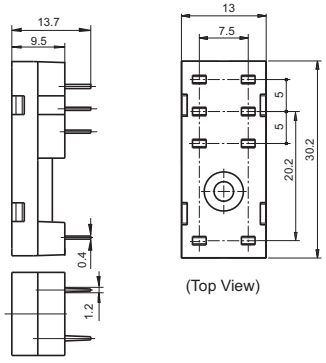
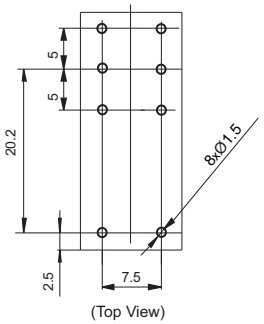
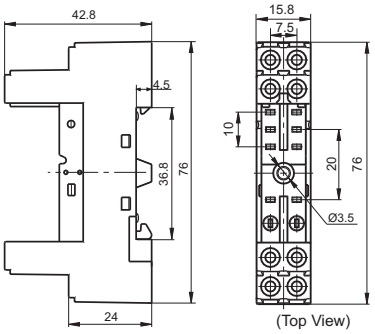
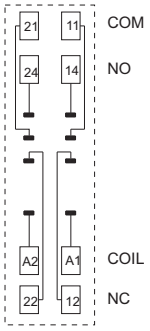
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength S.	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	9mm

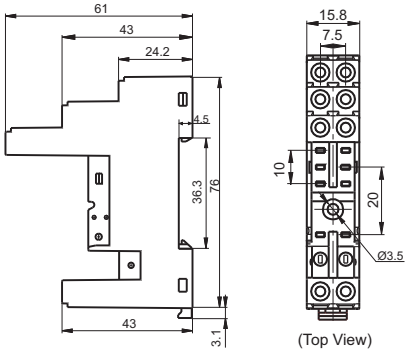
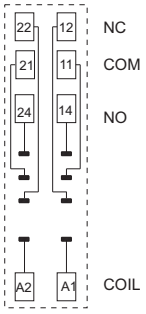
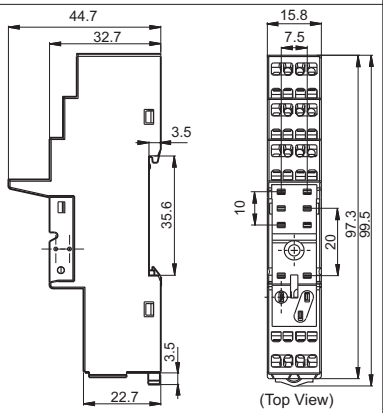
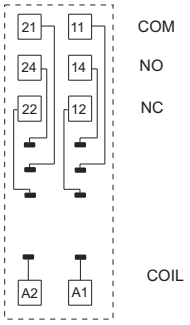
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, two pole of socket load must connect in parallel.			metallic retainer 14FF-H1 remarks:the dielectric strength can reach 1500VAC that sockets mounted 14FF-H1
14FF-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-C3  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.	 (Top View)	 (Top View)	plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*
14FF-2Z-C4  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.	 (Top View)	 (Top View)	plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*

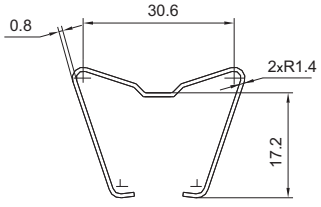
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

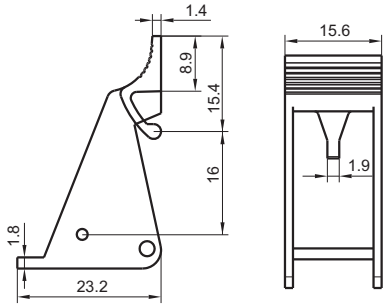
Unit: mm

Retainer

14FF-H1 (Metallic retainer)



14FF-H4 (Plastic retainer)

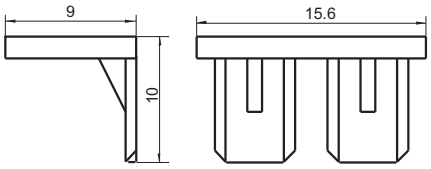


DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF115F-A relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HF115FP MINIATURE POWER RELAY

c UL us
File No.: E133481

VDE
File No.: 116934

Features

- 1 pole 16A, 2 pole 8A , 1 CO & 2 CO contacts
- 5kV dielectric, Creepage distance 8 mm (coil to contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- DC/AC coil type relay , Coil power 400mW / 0.75VA
- Manual test device
- Type with mechanical indicator / electrical indicator
- Sockets available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 13.0mm x 25.5mm

CONTACT DATA

Contact arrangement	1C	2C
Contact resistance1)	100mΩ max.(at 1A 6VDC)	
Contact material	AgNi	
Contact rating (Res. load)	16A 250VAC	8A 250VAC
Max. switching voltage	440VAC	
Max. switching current	16A	8A
Max. switching power	4000VA	2000VA
Mechanical endurance	DC type: 5 x 10^6OPS AC type: 1 x 10^6OPS	
Electrical endurance	1Z3B type: 3 x 10^4OPS (16A 250VAC, Resistive load, at 70˚C, 1s on 9s off) 2Z4B type: 5 x 10^4OPS (8A 250VAC, Resistive load, at 70˚C, 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Operate time (at nomi. volt.)		DC type: 15ms max.
Release time (at nomi. volt.)		DC type: 8ms max.
Temperature rise (at nomi. volt.)		DC type: 60K max. AC type: 85K max.
Shock resistance*	Functiona	98m/s²
	Destructive	980m/s²
Vibration resistance*	NO	10Hz to 150Hz 10g
	NC	length direction: 10Hz to 150Hz 2g other direction: 10Hz to 150Hz 5g
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 16g
Mounting distance		5mm, packing of sockets

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.
3) UL insulation system: Class A

COIL

Coil power	DC type: Approx. 400mW; AC type: Approx. 0.75VA

Notes: The data shown above don't include the power of electronic indicating circuit when the relay picks-up.

COIL DATA at 23˚C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil Resistance Ω
12	8.4	1.2	18	360 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48 3)	33.6	4.8	72	5760 x (1±15%)
110 3)	77.0	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

AC type(50Hz)

Nominal Voltage VAC	Pick-up Voltage VAC max.1)	Drop-out Voltage VAC min.1)	Coil Current mA	Coil DC Resistance Ω
24	18.0	3.6	31.6	350 x (1±10%)
115	86.3	17.25	6.6	8100 x (1±15%)
230	172.5	34.5	3.2	32500 x (1±15%)

Notes:1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	16A 250VAC at 70˚C
	2 Form C	8A 250VAC at 70˚C
VDE	1 Form C	16A 250VAC at 70˚C
	2 Form C	8A 250VAC at 70˚C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

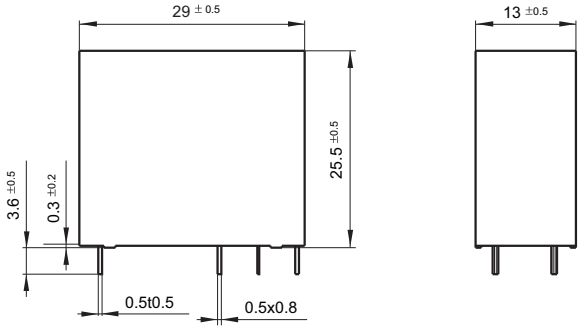
	HF115FP /	024	-1Z	3	B	(XXX)
Type						
Coil voltage	**012 to 110:** 12, 24, 48, 110 VDC **A24 to A230:** 24, 115, 230 VAC					
Contact arrangement	**1Z:** 1 Form C	**2Z:** 2 Form C				
Version	**3:** 5.0mm 1 pole 16A	**4:** 5.0mm 2 pole 8A				
Contact material	**B:** AgNi					
Special code[2)]	**XXX:** Customer special requirement	**Nil:** Standard				

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) The customer special requirement express as special code after evaluating by Hongfa.

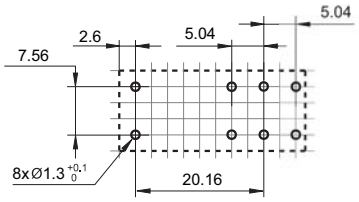
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout (Bottom view)



DIN rail Socket

Solder Socket

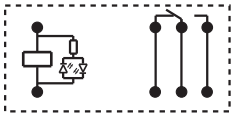
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.52mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

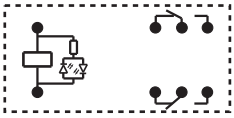
Unit: mm

Wiring Diagram (Bottom view)

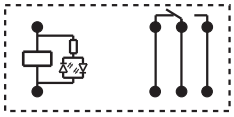
HF115FP/□□□-1Z3□



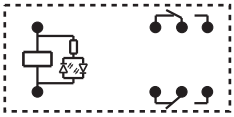
HF115FP/□□□-2Z4□



HF115FP/A□□□-1Z3□



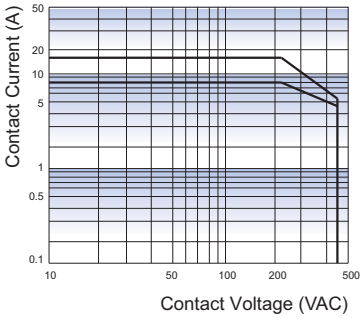
HF115FP/A□□□-2Z4□



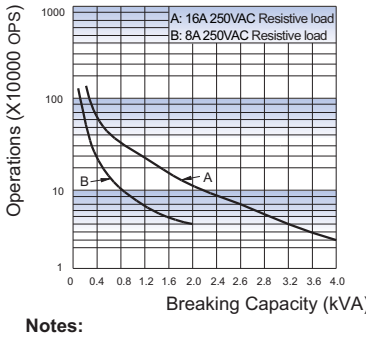
Remark: DC coil with a parrelled diode is available but the coil terminal is different in postive or cathode.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE

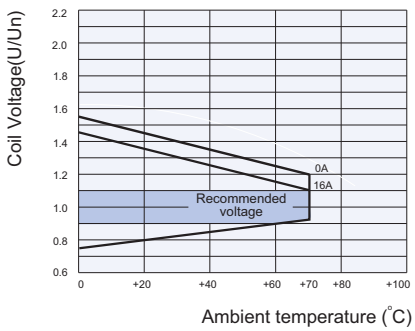


Notes:

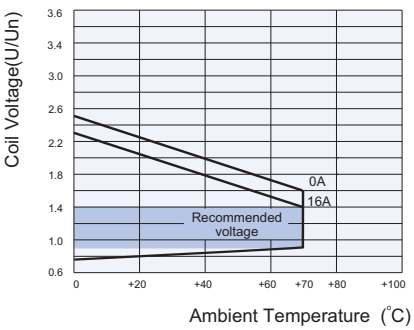
1.Curve A: 1Z3B type
Curve B: 2Z4B type

2.Test conditions:
NO, Flux proofed, Room temp.,1s on 9s off

COIL OPERATING RANGE (AC) *



COIL OPERATING RANGE (DC) *



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the abver range may damage the insulation of relay coil.

Relay Sockets

File No.: E253370

Features

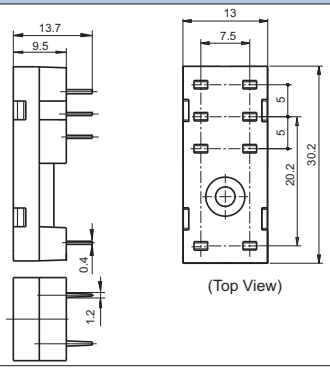
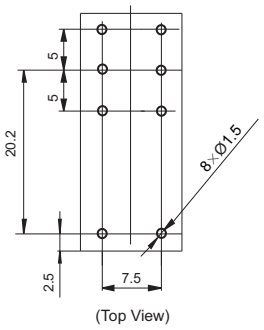
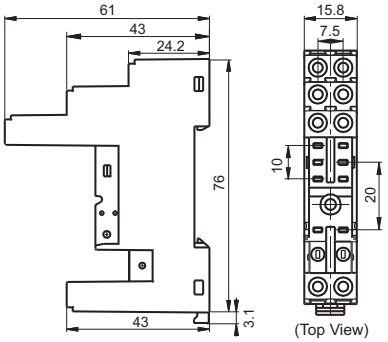
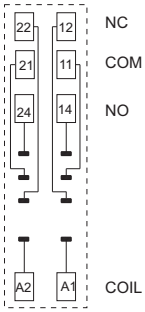
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strengths.	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	9mm

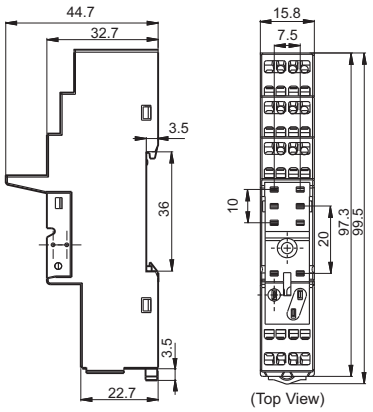
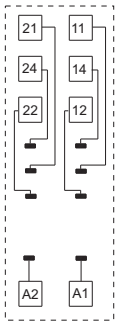
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting			metallic retainer 14FF-H3 remarks:the dielectric strength can reach 1500VAC that sockets mounted 14FF-H3
14FF-2Z-C3  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-C4  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

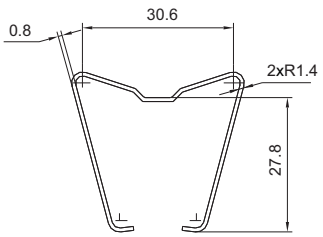
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPOENT (AVAILABLE)

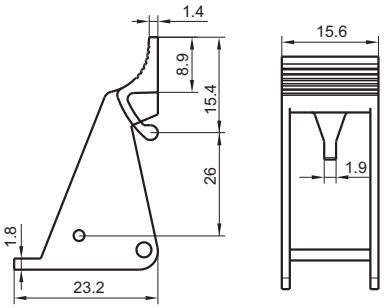
Unit: mm

Retainer

14FF-H3 (Metallic retainer)

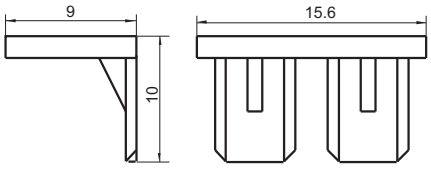


14FF-H6 (Plastic retainer)



Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF115FP relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF141FF MINIATURE HIGH POWER RELAY

c UL us
File No.:E133481

CQC
File No.:CQC09002034351

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Sockets available
- 1 Form A ,1 Form B and 1 Form C configurations
- Plastic sealed and flux proofed types available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 12.6mm x 20.6mm

CONTACT DATA

Contact arrangement	1A, 1B, 1C	
Contact resistance	50mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$, AgCdO	
Contact rating (Res.load)	Standard	High Capacity
	8A 250VAC /30VDC 10A 125VAC	10A 30VDC 10A 250VAC
Max. switching power	2000VA / 240W	2500VA / 300W
Max. switching current	10A	
Max. switching voltage	250VAC / 30VDC	
Mechanical endurance	1 x 10^7OPS	
Electrical endurance	Standard type: 1 x 10^5OPS (NO or NC, 8A 250VAC/30VDC, Resistive load, Room temp., 1s on 9s off), High capactiy type: 1 x 10^5OPS (NO or NC, 10A 250VAC/30VDC, Resistive load, Room temp., 1s on 9s off),	

Notes: 1) The data shown above are initial values.
2)For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 13g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A

COIL

Coil power	Standard: Approx. 720mW; Sensitive: Approx. 550mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC3)	Coil Resistance Ω
5	4.0	0.5	6.5	36 x (1±10%)
6	4.8	0.6	7.8	50 x (1±10%)
9	7.2	0.9	11.7	115 x (1±10%)
12	9.6	1.2	15.6	200 x (1±10%)
18	14.4	1.8	23.4	460 x (1±10%)
24	19.2	2.4	31.2	820 x (1±10%)
48	38.4	4.8	62.4	3300 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC3)	Coil Resistance Ω
5	4.0	0.5	6.5	47 x (1±10%)
6	4.8	0.6	7.8	68 x (1±10%)
9	7.2	0.9	11.7	155 x (1±10%)
12	9.6	1.2	15.6	270 x (1±10%)
18	14.4	1.8	23.4	620 x (1±10%)
24	19.2	2.4	31.2	1100 x (1±10%)
48	38.4	4.8	62.4	4400 x (1±10%)

Notes: 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
2) The data shown above are initial values.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.

SAFETY APPROVAL RATINGS

UL/CUL	High Capacity	10A 30VDC/250VAC
	Standard	8A 30VDC/250VAC 10A 125VAC

Notes: 1) All values unspecified are at room temperature.
2)Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF141FF /	012	-H	S	P	G	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	**H:**1 Form A	**D:**1 Form B	**Z:**1 Form C				
Construction [1]	**S:** Plastic sealed	**Nil:** Flux proofed					
Coil power	**P:** Standard	**Nil:** Sensitive					
Contact capacity	**G:** High capacity ($AgSnO_2$)	**Nil:** Standard type (AgCdO)					
Special code[3]	**XXX:** Customer special requirement	**Nil:** Standard					

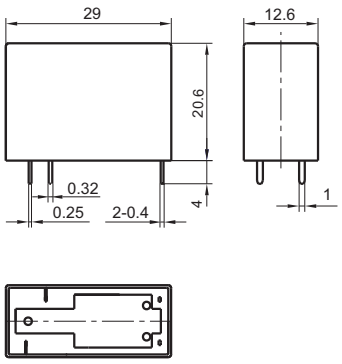
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

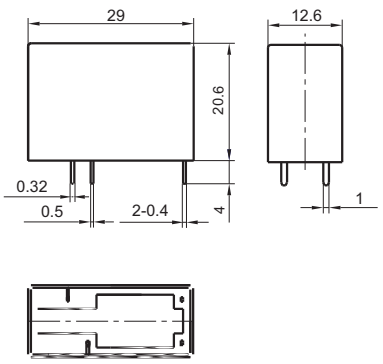
Outline Dimensions

1 Form A



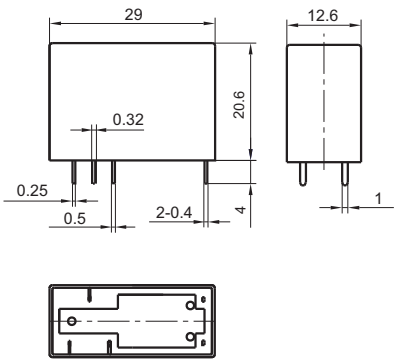
(Bottom view)

1 Form B



(Bottom view)

1 Form C



(Bottom view)

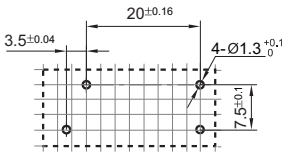
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

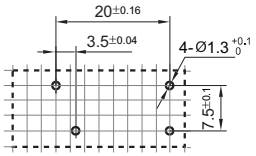
Unit: mm

PCB Layout (Bottom view)

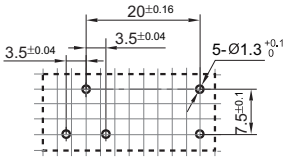
1 Form A



1 Form B



1 Form C

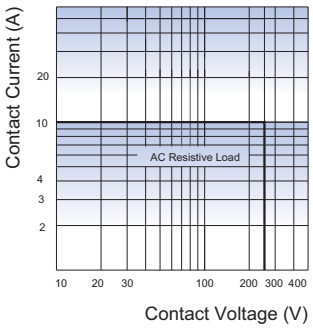


Remark: The width of the gridding is 2.5mm.

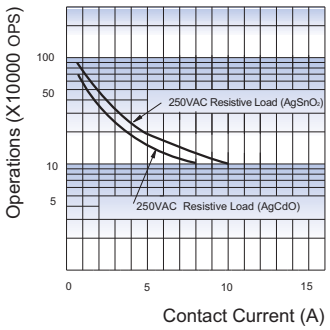
Wiring Diagram (Bottom view)

CHARACTERISTIC CURVES

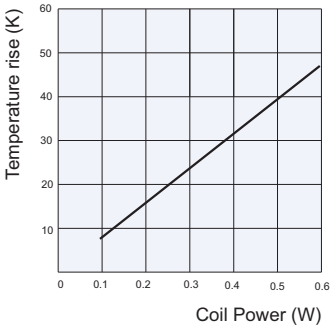
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
NO, Flux proofed,
Room temp., 1s on 9s off.

Relay Sockets

File No.: E253370

Features

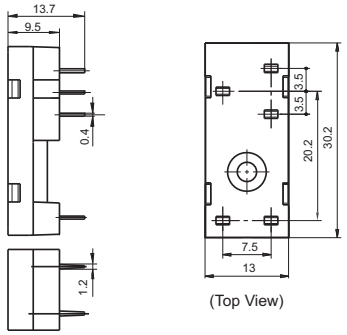
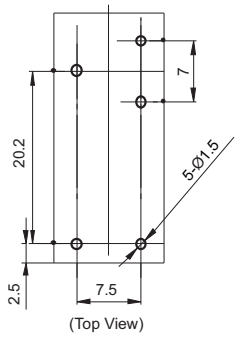
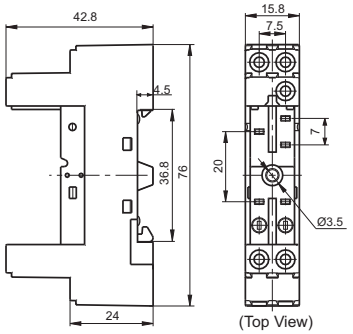
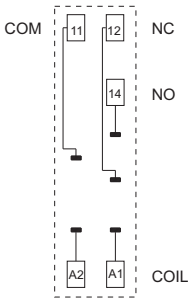
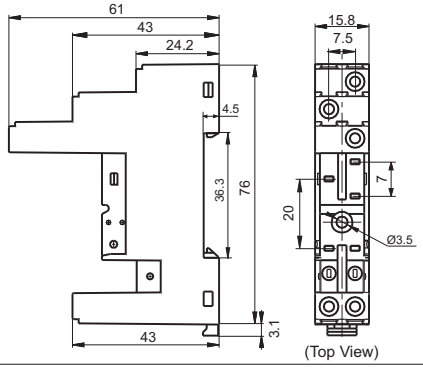
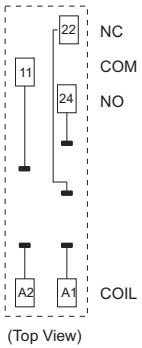
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength s.	Screw Torque	Wire Strip Length
14FF-1Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-1Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-1Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-1Z-A1  PCB terminal, PCB or Screw mounting			
14FF-1Z-C2  Screw terminal, PCB or Screw mounting With finger protection device			marker 14FF-M1 plug-in module HFAA to HFHU*
14FF-1Z-C3  Screw terminal, DIN rail or Screw mounting With finger protection device			marker 14FF-M1 plug-in module HFAA to HFHU*

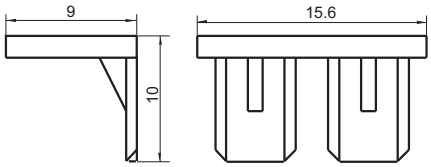
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPOENT (AVAILABLE)

Unit: mm

Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF141FF relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HF14FF MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:R50140759

File No.:CQC10002046169

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 13.0mm x 26.0mm

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance[1)]	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgNi, AgCdO
Contact rating	Resistive: 10A 277VAC/30VDC TV-5 120VAC
Max. switching voltage	277VAC / 30VDC
Max. switching current	10A
Max. switching power	2770VA / 300W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (10A 277VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5OPS (10A 30VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 18g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 530mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC[3)]	Coil Resistance Ω
3	2.25	0.3	4.2	17 x (1±10%)
5	3.75	0.5	7.0	47 x (1±10%)
6	4.50	0.6	8.4	68 x (1±10%)
9	6.75	0.9	12.6	160 x (1±10%)
12	9.00	1.2	16.8	275 x (1±10%)
18	13.5	1.8	25.2	620 x (1±10%)
24	18.0	2.4	33.6	1100 x (1±10%)
48	36.0	4.8	67.2	4170 x (1±10%)
60	45.0	6.0	84.0	7000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 75% of nominal voltage,special order allowed.
2) The data shown above are initial values.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.

SAFETY APPROVAL RATINGS

UL/CUL	AgCdO	1 Form A	TV-5 120VAC 10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC 1/4HP 125VAC
		1 Form C	TV-5 120VAC 10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC NO:1/4HP 125VAC
	$AgSnO_2$ AgNi		10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC 1/4HP 125VAC TV-5 120VAC
TÜV	AgCdO $AgSnO_2$		10A 250VAC 10A 30VDC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF14FF /	012	-1H	S	T	F	(XXX)
Type							
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48, 60VDC						
Contact arrangement	**1H:** 1 Form A **1Z:** 1 Form C						
Construction 1)	**S:** Plastic sealed(No smoky-gray cover) **Nil:** Flux proofed						
Contact material	**T:** $AgSnO_2$ **3:** AgNi **Nil:** AgCdO						
Insulation standard	**F:** Class F **Nil:** Class B						
Special code4)	**XXX:** Customer special requirement **Nil:** Standard						

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The standard type is made of black cover. If smoke cover is required, please add a special suffix (611) when ordering. Please take note that smoke cover is only availabe for flux proofed type.
4) The customer special requirement express as special code after evaluating by Hongfa.

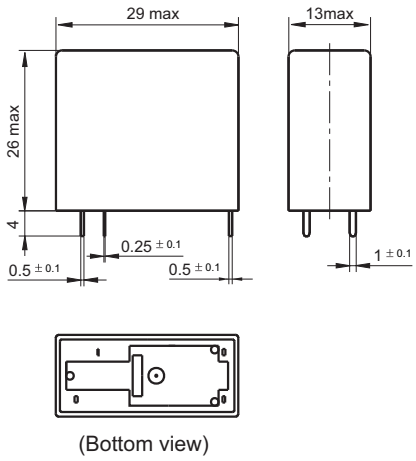
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

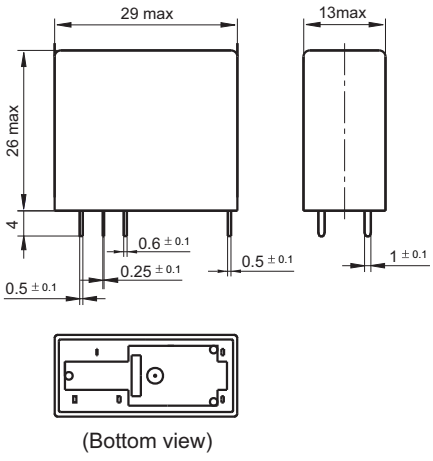
Unit: mm

1 Form A

1 Form C

Outline Dimensions



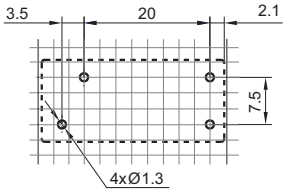


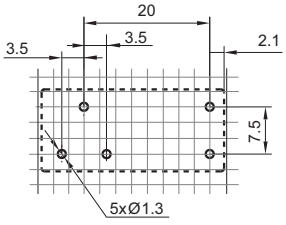
(Bottom view)

(Bottom view)

Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

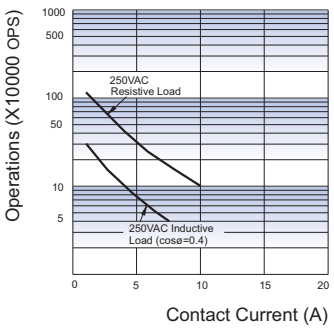




Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.5mm.

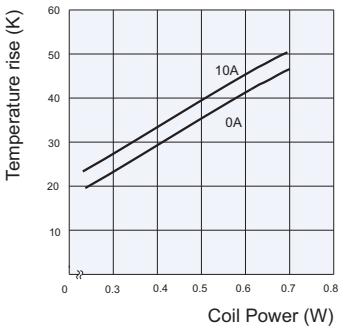
CHARACTERISTIC CURVES

ENDURANCE CURVE

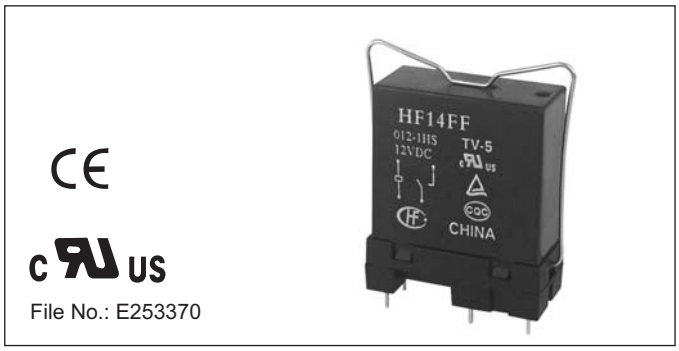


Test conditions:
NO, Resistive load,
Flux proofed, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Relay Sockets



File No.: E253370

Features

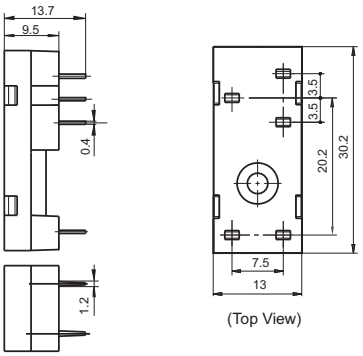
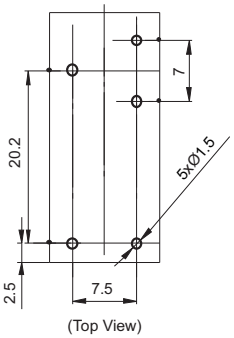
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength s.	Screw Torque	Wire Strip Length
14FF-1Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-1Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-1Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm

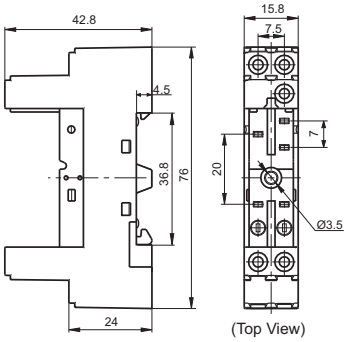
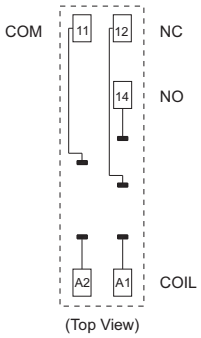
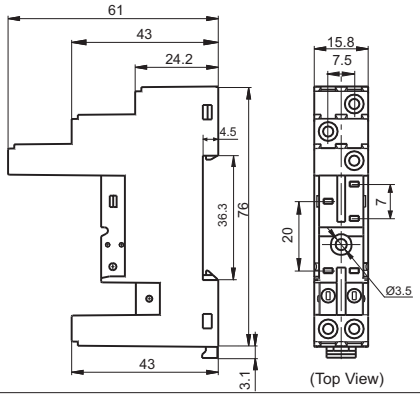
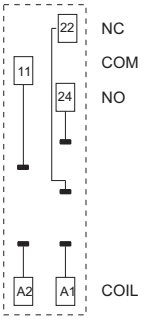
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-1Z-A1  PCB terminal, PCB or Screw mounting			metallic retainer 14FF-H2 remarks:the dielectric strength can reach 1500VAC that sockets mounted 14FF-H2

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-1Z-C2  Screw terminal, PCB or Screw mounting With finger protection device			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*
14FF-1Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

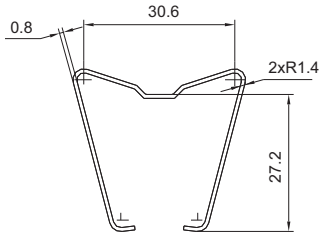
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

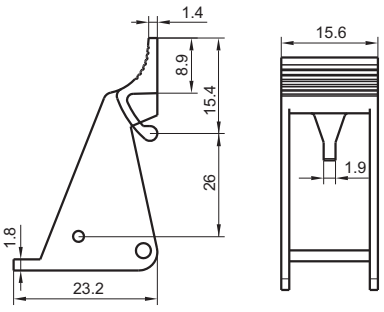
Unit: mm

Retainer

14FF-H2 (Metallic retainer)



14FF-H6 (Plastic retainer)

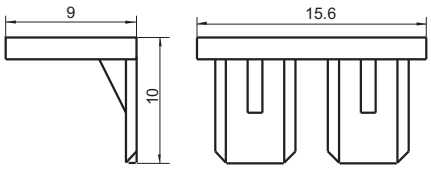


DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF14FF relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

HF14FW MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40023508

File No.:CQC10002046170

Features

- 20A switching capability
- 4kV dielectric strength (between coil and contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- 1 Form A, 1 Form B and 1 Form C configurations
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 13.0mm x 26.5mm

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance 1)	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating	Resistive: 16A 240VAC/24VDC 1HP 240VAC TV-8 125VAC (NO contact
Max. switching voltage	277VAC / 30VDC
Max. switching current	20A
Max. switching power	5540VA / 480W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (NO or NC, 16A 240VAC, Resistive load, Room temp., 1s on 9s off) 5 x 10^4OPS (NO or NC, 16A 24VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 18.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F.

COIL

Coil power	Standard: Approx.720mW Sensitive: Approx.530mW

COIL DATA at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. 3)	Drop-out Voltage VDC min. 3)	Max. Voltage VDC 4)	Coil Resistance Ω
5	3.6	0.5	5.5	36 x (1±10%)
6	4.3	0.6	6.6	50 x (1±10%)
9	6.5	0.9	9.9	115 x (1±10%)
12	8.6	1.2	13.2	200 x (1±10%)
18	13.0	1.8	19.8	460 x (1±10%)
24	17.3	2.4	26.4	820 x (1±10%)
48	34.6	4.8	52.8	3300 x (1±10%)
60	43.2	6.0	66.0	5100 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. 3)	Drop-out Voltage VDC min. 3)	Max. Voltage VDC 4)	Coil Resistance Ω
5	3.60	0.5	7.0	47 x (1±10%)
6	4.30	0.6	8.4	68 x (1±10%)
9	6.50	0.9	12.6	160 x (1±10%)
12	8.60	1.2	16.8	275 x (1±10%)
18	13.0	1.8	25.2	620 x (1±10%)
24	17.3	2.4	33.6	1100 x (1±10%)
48	34.6	4.8	67.2	4170 x (1±10%)
60	43.2	6.0	84.0	7000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 72% of nominal voltage, special order allowed.
2) Suggesting to use the sensitive type.
3) The data shown above are initial values.
4) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
5) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.

SAFETY APPROVAL RATINGS

UL/CUL	Standard, Sensitive	$AgSnO_2$	20A/16A/12A 277VAC Resistive 1HP (8 FLA) 240VAC TV-8 125VAC 16A 240VAC General Use 16A/12A 24VDC 10FLA 60LRA 250VAC
		AgCdO	20A/16A/12A 277VAC Resistive 1HP (8 FLA) 240VAC 16A 240VAC General Use 16A/12A 24VDC 20A 125VAC General Use
	(136)	$AgSnO_2$	20A 125VAC Resistive 20A 277VAC/250VAC/125VAC General Use 16A 277VAC/250VAC/125VAC Resistive 1/2HP 250VAC/125VAC TV-10 125VAC 10FLA 60LRA 250VAC
VDE (Coil power is 530mW)	$AgSnO_2$	1 Form A	20A 250VAC at 70℃ 16A 30VDC at 70℃
		1 Form C	16A 250VAC at 70℃ 16A 24VDC at 70℃ NO:20A 250VAC at 70℃

Notes: 1) All values unspecified are at room temperature.
2)Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF14FW / 012 -H S P T F (XXX)

Type		
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC	
Contact arrangement	**H:** 1Form A **D:** 1 Form B **Z:** 1 Form C	
Construction 1)	**S:** Plastic sealed(No smoky-gray cover)	**Nil:** Flux proofed
Coil power	**P:** Standard	**Nil:** Sensitive
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO
Insulation standard	**F:** Class F	
Special code 4)	**XXX:** Customer special requirement	**Nil:** Standard

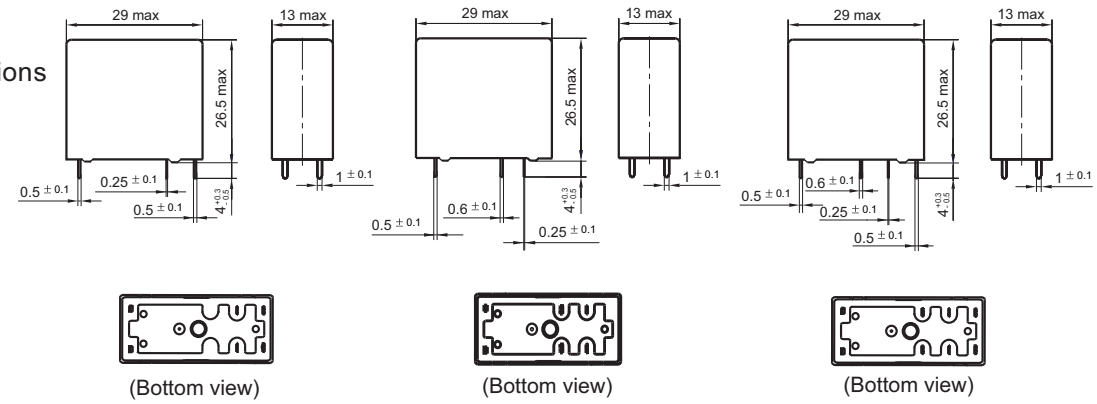
Notes:1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The standard type is made of black cover. If smoky-gray cover is required, please add a special suffix (611) when ordering. Please take note that smoky-gray cover is only availabe for flux proofed.
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form A | 1 Form B | 1 Form C

Outline Dimensions

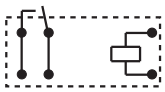


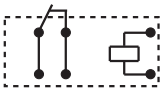
(Bottom view)

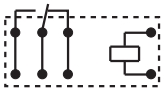
(Bottom view)

(Bottom view)

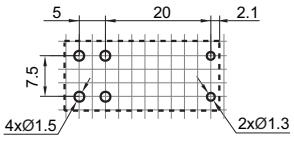
Wiring Diagram
(Bottom view)







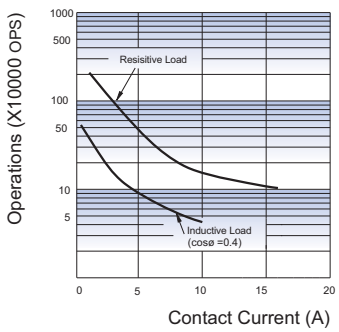
PCB Layout
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.5mm.

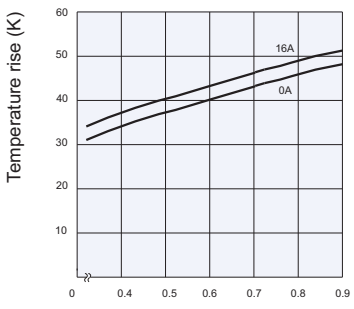
CHARACTERISTIC CURVES

ENDURANCE CURVE



Test conditions:
NO, Resistive load,
Flux proofed, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Relay Sockets

File No.: E253370

Features

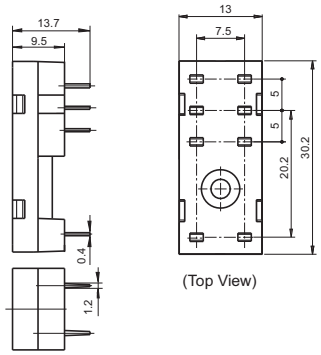
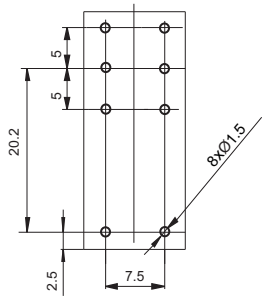
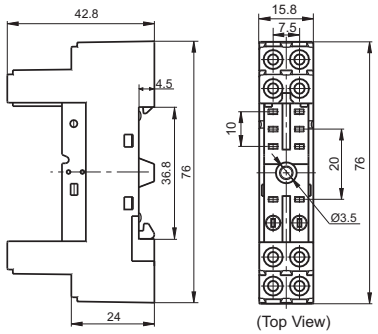
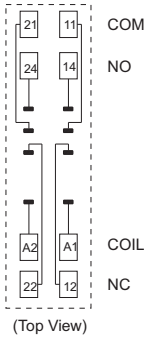
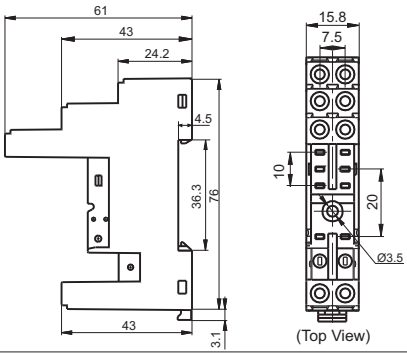
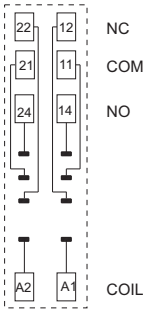
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strengths	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	9mm

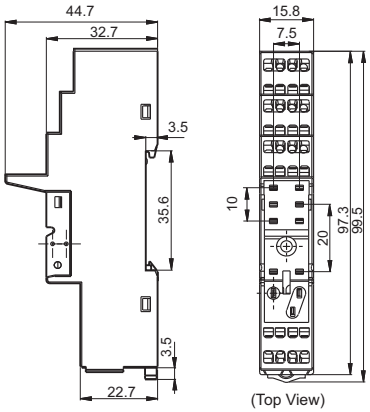
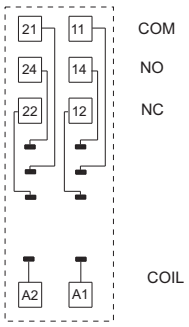
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting	 (Top View)	 (Top View)	metallic retainer 14FF-H3 remarks:the dielectric strength can reach 1500VAC that sockets mounted 14FF-H3
14FF-2Z-C2  Screw terminal DIN rail or Screw mounting With finger protection device	 (Top View)	 (Top View)	plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*
14FF-2Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device	 (Top View)	 (Top View)	plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-C4  Spring-loaded terminal DIN rail mounting With finger protection device			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

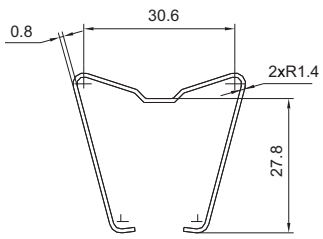
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

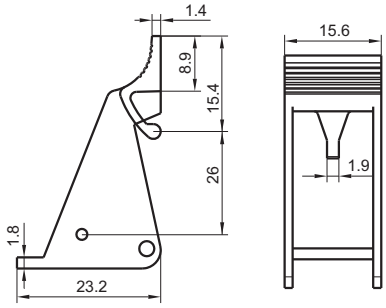
Unit: mm

Retainer

14FF-H3 (Metallic retainer)

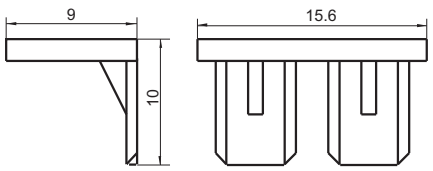


14FF-H6 (Plastic retainer)



Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF14FW relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ≥50mm, tolerance should be ±1mm; outline dimension >20mm and <50mm, tolerance should be ±0.5mm; outline dimension ≤20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF140FF MINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:R50149131

File No.:CQC10002046173

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Standard:Creepage distance >8mm
- 2.0mm contact gap available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 13.0mm x 26.3mm

CONTACT DATA

Contact arrangement	2A, 2C
Contact resistance[1)]	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgNi, AgCdO
Contact rating (Res. load)	10A 250VAC 8A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 240W
Mechanical endurance	Standard: 1 x 10^7OPS W type(1.5mm): 5 x10^5OPS W type(2.0mm): 3 x10^5OPS
Electrical endurance	2H:1 x 10^5OPS (NO or NC, 10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5OPS (NO or NC, 8A 30VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between contacts sets	3000VAC 1min
	Between open contacts	Standard:1000VAC 1min W type(1.5mm):2000VAC 1min W type(2.0mm):2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50 μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mmDA
Termination		PCB
Unit weight		Approx. 18g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Standard: Approx. 530mW W type(1.5mm): Approx. 800mW W type(2.0mm): Approx. 1.4W

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.3	3.9	17 x (1±10%)
5	3.75	0.5	6.5	47 x (1±10%)
6	4.50	0.6	7.8	68 x (1±10%)
9	6.75	0.9	11.7	160 x (1±10%)
12	9.00	1.2	15.6	275 x (1±10%)
18	13.50	1.8	23.4	620 x (1±10%)
24	18.00	2.4	31.2	1100 x (1±10%)
48	36.00	4.8	62.4	4170 x (1±10%)
60	45.00	6.0	78.0	7000 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

COIL DATA

at 23˚C

W Type (1.5mm)

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC[3)]	Coil Resistance Ω
3	2.25	0.3	3.3	11.3 x (1±10%)
5	3.75	0.5	5.5	31 x (1±10%)
6	4.50	0.6	6.6	45 x (1±10%)
9	6.75	0.9	9.9	101 x (1±10%)
12	9.00	1.2	13.2	180 x (1±10%)
18	13.5	1.8	19.8	405 x (1±10%)
24	18.0	2.4	26.4	720 x (1±10%)
48	36.0	4.8	52.8	2880 x (1±10%)
60	45.0	6.0	66.0	4500 x (1±10%)

W Type (2.0mm)

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC[3)]	Coil Resistance Ω
5	3.75	0.5	5.5	18 x (1±10%)
6	4.50	0.6	6.6	26 x (1±10%)
9	6.75	0.9	9.9	58 x (1±10%)
12	9.00	1.2	13.2	102 x (1±10%)
24	18.0	2.4	26.4	410 x (1±10%)
48	36.0	4.8	52.8	1650 x (1±10%)

Notes: 1) When require pick-up voltage < 75% of nominal voltage, special order allowed.
2) The data shown above are initial values.
3)Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coli.
5) For the CO version whose contact gap is 1.5 mm, the operation voltage ≤85% of rated voltage.

SAFETY APPROVAL RATINGS

UL/CUL	Standard	AgCdO		TV-3 125VAC 10A 250VAC 10A 30VDC 1/4HP 240VAC 1/8HP 120VAC
		AgNi		10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C
		$AgSnO_2$	2 Form A	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C 3/4HP 250VAC at 40˚C
			2 Form C	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C 3/4HP 250VAC at 40˚C
	W type	AgCdO	2 Form A	TV-3 125VAC 10A 250VAC
		$AgSnO_2$	2 Form A	12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C 3/4HP 250VAC at 40˚C
TÜV		AgCdO	2 Form A 2 Form C	10A 250VAC 10A 30VDC
		AgNi	2 Form A	12A 250VAC
			2 Form C	10A 250VAC
		$AgSnO_2$	2 Form A	12A 250VAC

Notes: 1) All values unspecified are at room temperature.
2)Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF140FF/	012	-2H	S	W	T	G	F	(XXX)
Type									
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48, 60VDC								
Contact arrangement	**2H:** 2 Form A **2Z:** 2 Form C								
Construction [1) 2)]	**S:** Plastic sealed(No smoky-gray cover) **Nil:** Flux proofed								
Contact Gap	**W:** Large contact gap [3)]		**Nil:** Standard						
Contact material	**T:** $AgSnO_2$ **3:** AgNi		**Nil:** AgCdO						
Contact plating	**G:** Gold plated		**Nil:** No gold plated						
Insulation standard	**F:** Class F		**Nil:** Class B						
Special code [5)]	**XXX:** Customer special requirement		**Nil:** Standard						

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H2S, SO2, NO2, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H2S, SO2, NO2, dust, etc).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) There are two specifications to W type: 1.5mm contact gap and 2.0mm contact gap.The default W type is 1.5mm. So please add the special code "(456)" when releasing order, if 2.0mm contact gap is required.(Only for 2 Form A).

4) The standard type is made of black cover. If smoke cover is required, please add a special suffix when ordering. Please take note that smoky-gray cover is only availabe for flux proofed types.

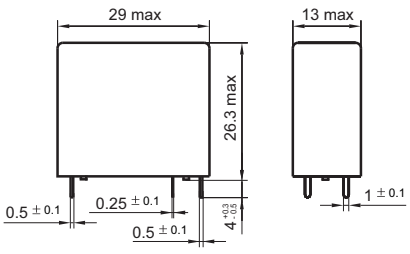
5) The customer special requirement express as special code after evaluating by Hongfa. e.g.(456) means contact gap can reach 2.0mm.

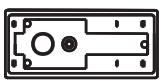
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

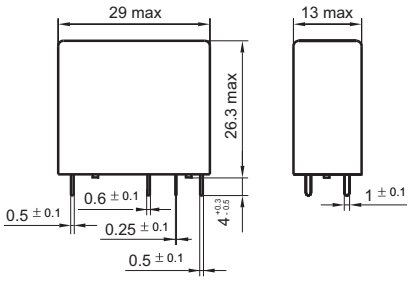
2 Form A

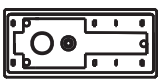




(Bottom view)

2 Form C





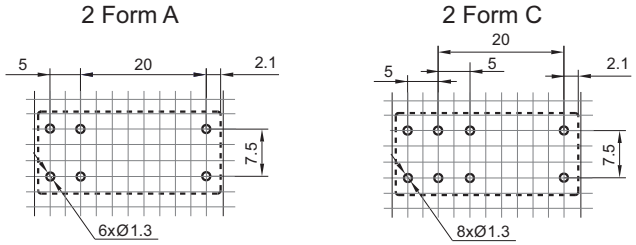
(Bottom view)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)

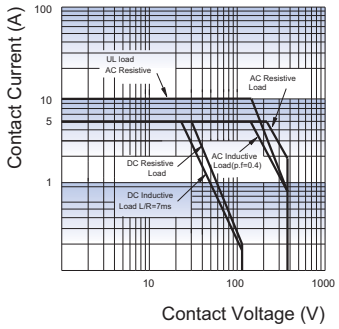
PCB Layout (Bottom view)



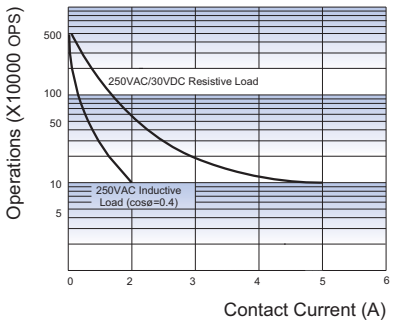
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

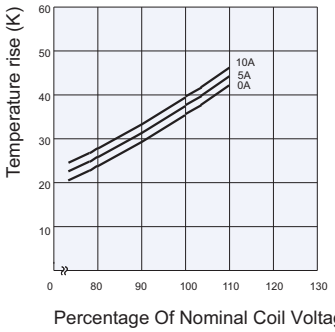


ENDURANCE CURVE



Test conditions:
NO, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Relay Sockets

File No.: E253370

Features

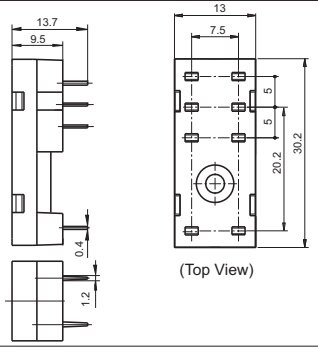
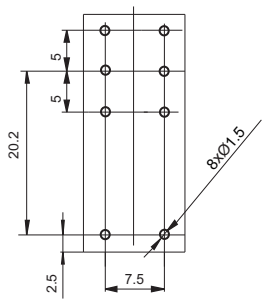
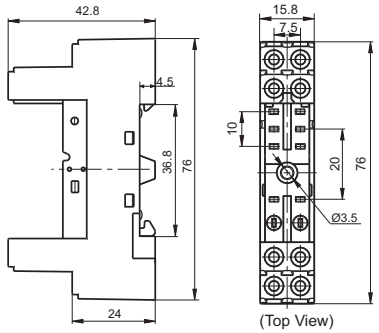
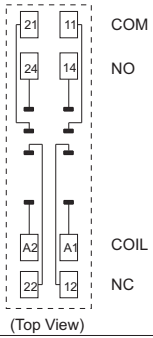
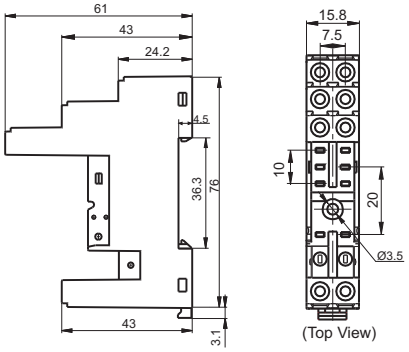
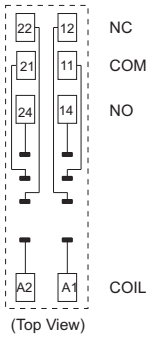
- The insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection
- Environmental friendly product (RoHS compliant)

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength s.	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	9mm

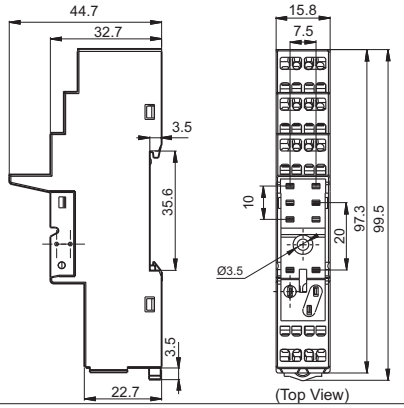
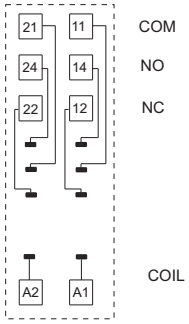
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting			metallic retainer 14FF-H3 remarks:the dielectric strength can reach 1500VAC that sockets mounted 14FF-H3
14FF-2Z-C2  Screw terminal DIN rail or Screw mounting With finger protection device			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*
14FF-2Z-C3  Screw terminal DIN rail or Screw mounting With finger protection device			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components available
14FF-2Z-C4  Spring-loaded terminal DIN rail mounting With finger protection device			plastic retainer 14FF-H6 marker 14FF-M1 plug-in module HFAA to HFHU*

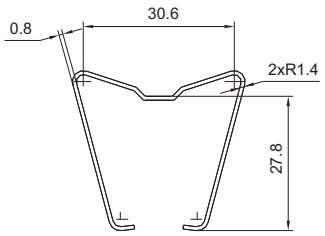
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

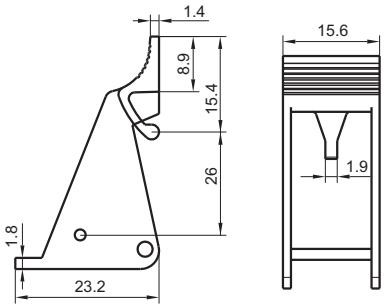
Unit: mm

Retainer

14FF-H3(Metallic retainer)

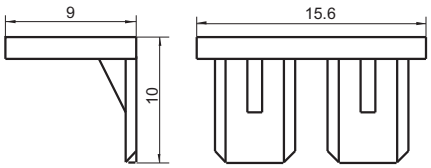


14FF-H6(Plastic retainer)



Marker

14FF-M1



Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. Socket which can be mounted with markers is furnished with a marker; as for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF140FF relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H) ⩾50mm, tolerance should be ±1mm; outline dimension ＞20mm and ＜50mm, tolerance should be ±0.5mm; outline dimension ⩽20mm, tolerance should be ±0.3mm.
5. DIN rail mounting: recommend to use standard rail 35×7.5×1mm, 35×15×1mm.

Disclaimer

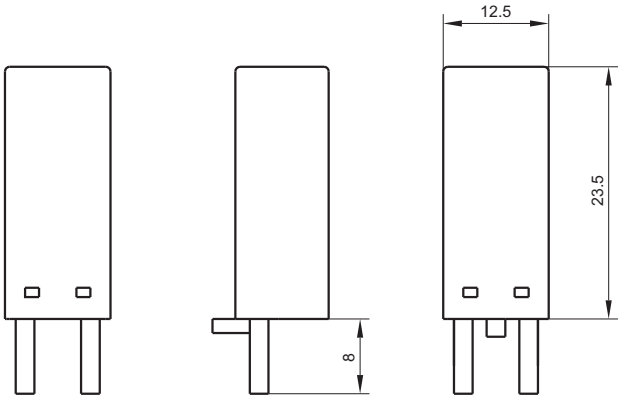
The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

Applicable socket type:

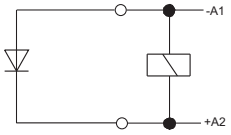
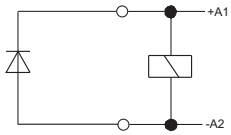
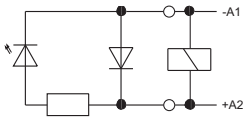
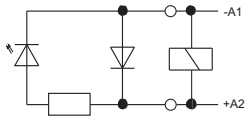
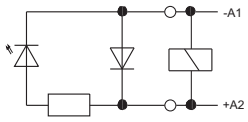
14FF-2Z-C2/C3/C4
14FF-1Z-C2/C3
18FF-4Z-C4/C5/C8
18FF-3Z-C4/C5
18FF-2Z-C4/C5/C8

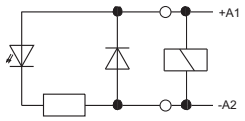
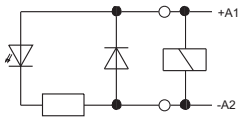
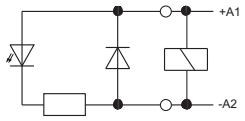
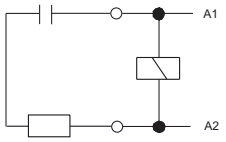
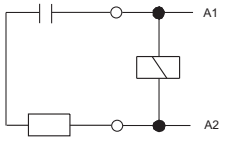
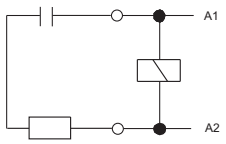
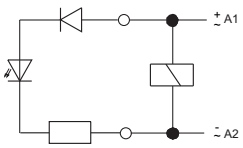
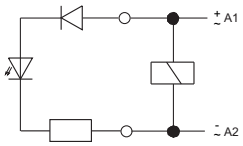
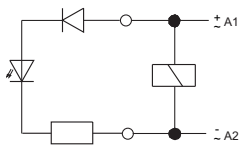
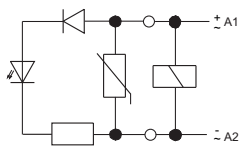
c US
File No.: E253370

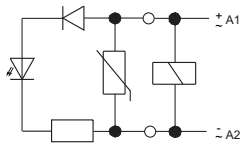
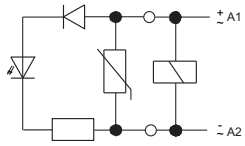
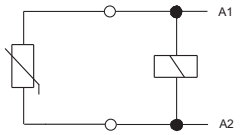
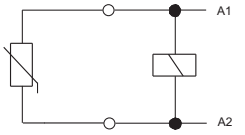
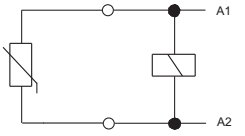
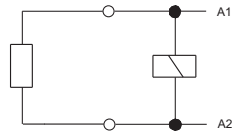
OUTLINE DIMENSIONS



SPECIFICATIONS FOR MODULES

Ordering Code [1)]	Circuit Diagram	Voltage	Components	Functions
HFAA		6VDC to 220VDC	Diode	● With diode to protect the coil and to eliminate the converse current
HFAB		6VDC to 220VDC	Diode	● With diode to protect the coil and to eliminate the converse current
HFBC (R) HFBC (G)		6VDC to 24VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFBD (R) HFBD (G)		24VDC to 60VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFBE (R) HFBE (G)		110VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage

Ordering Code [1)]	Circuit Diagram	Voltage	Components	Functions
HFCF (R) HFCF (G)		6VDC to 24VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFCG (R) HFCG (G)		24VDC to 60VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFCH (R) HFCH (G)		110VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFDI		6V to 24V AC / DC	Capacitor Resistor	● With RC to protect the coil and to absorb instant starting surge current
HFDJ		24V to 60V AC / DC	Capacitor Resistor	● With RC to protect the coil and to absorb instant starting surge current
HFDK		110V to 230V AC / DC	Capacitor Resistor	● With RC to protect the coil and to absorb instant starting surge current
HFEL (R) HFEL (G)		6V to 24V AC / DC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFEM (R) HFEM (G)		24V to 60V AC / DC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFEN (R) HFEN (G)		110VAC to 230VAC 110VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFO (R) HFFO (G)		6V to 24V AC / DC	Diode LED Resistor Varistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage ● With varistor in parallel connection to absorb instant starting surge current

Ordering Code [1)]	Circuit Diagram	Voltage	Components	Functions
HFFP (R) HFFP (G)		24V to 60V AC / DC	Diode LED Resistor Varistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage ● With varistor in parallel connection to absorb instant starting surge current
HFFQ (R) HFFQ (G)		110VAC to 230VAC 110VDC	Diode LED Resistor Varistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage ● With varistor in parallel connection to absorb instant starting surge current
HFGR		24VAC	Varistor	● With varistor in parallel connection to absorb instant starting surge current
HFGS		115VAC	Varistor	● With varistor in parallel connection to absorb instant starting surge current
HFGT		230VAC	Varistor	● With varistor in parallel connection to absorb instant starting surge current
HFHU		110VAC to 230VAC	Resistor	● With resistor to protect the coil and to spread around current

Notes: 1) When there is LED in the module, please indicate (R) or (G) to show the color of the light, for example HFBC(R) or HFBC (G). (R) means red light while (G) means green light.

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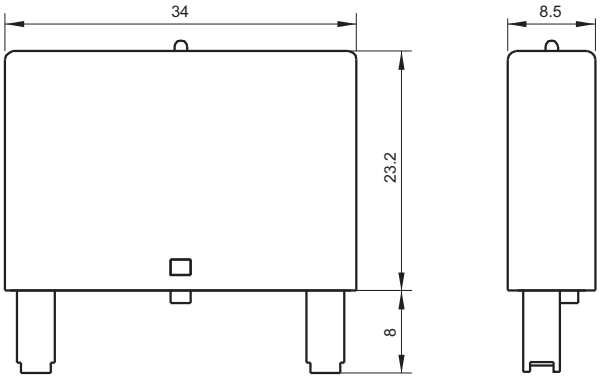
CE

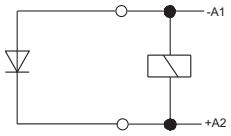
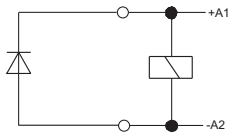
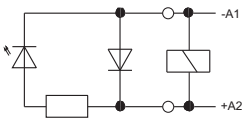
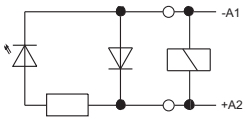
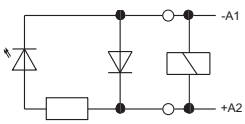
Applicable socket type:
10FF-2Z-C4
10FF-3Z-C4

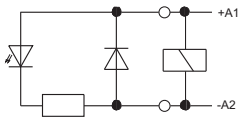
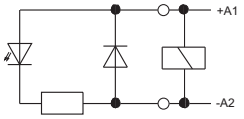
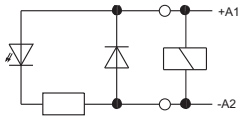
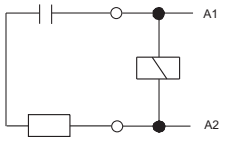
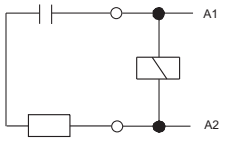
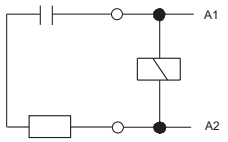
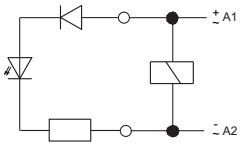
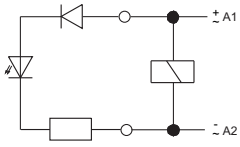
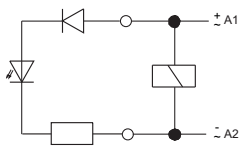
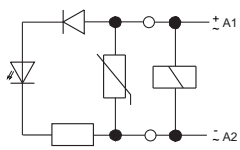
c UL us
File No.: E253370

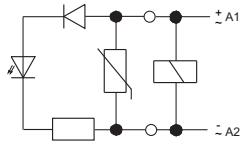
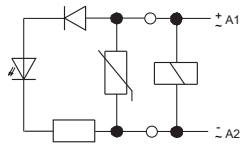
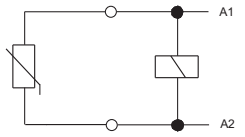
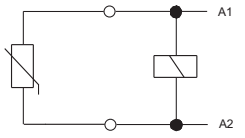
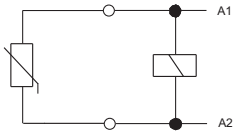
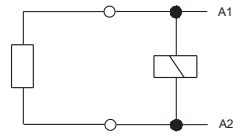
OUTLINE DIMENSIONS



SPECIFICATIONS FOR MODULES

Ordering Code [1]	Circuit Diagram	Voltage	Components	Functions
HFFAA		6VDC to 220VDC	Diode	● With diode to protect the coil and to eliminate the converse current
HFFAB		6VDC to 220VDC	Diode	● With diode to protect the coil and to eliminate the converse current
HFFBC (R) HFFBC (G)		6VDC to 24VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFBD (R) HFFBD (G)		24VDC to 60VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFBE (R) HFFBE (G)		110VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage

Ordering Code [1)]	Circuit Diagram	Voltage	Components	Functions
HFFCF (R) HFFCF (G)		6VDC to 24VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFCG (R) HFFCG (G)		24VDC to 60VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFCH (R) HFFCH (G)		110VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFDI		6V to 24V AC / DC	Capacitor Resistor	● With RC to protect the coil and to absorb instant starting surge current
HFFDJ		24V to 60V AC / DC	Capacitor Resistor	● With RC to protect the coil and to absorb instant starting surge current
HFFDK		110V to 230V AC / DC	Capacitor Resistor	● With RC to protect the coil and to absorb instant starting surge current
HFFEL (R) HFFEL (G)		6V to 24V AC / DC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFEM (R) HFFEM (G)		24V to 60V AC / DC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFEN (R) HFFEN (G)		110VAC to 230VAC 110VDC	Diode LED Resistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage
HFFFO (R) HFFFO (G)		6V to 24V AC / DC	Diode LED Resistor Varistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage ● With varistor in parallel connection to absorb instant starting surge current

Ordering Code [1]	Circuit Diagram	Voltage	Components	Functions
HFFFP (R) HFFFP (G)		24V to 60V AC / DC	Diode LED Resistor Varistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage ● With varistor in parallel connection to absorb instant starting surge current
HFFFQ (R) HFFFQ (G)		110VAC to 230VAC 110VDC	Diode LED Resistor Varistor	● With diode to protect the coil and to eliminate the converse current ● With LED to show the coil in voltage ● With varistor in parallel connection to absorb instant starting surge current
HFFGR		24VAC	Varistor	● With varistor in parallel connection to absorb instant starting surge current
HFFGS		115VAC	Varistor	● With varistor in parallel connection to absorb instant starting surge current
HFFGT		230VAC	Varistor	● With varistor in parallel connection to absorb instant starting surge current
HFFHU		110VAC to 230VAC	Resistor	● With resistor to protect the coil and to spread around current

Notes: 1) When there is LED in the module, please indicate (R) or (G) to show the color of the light, for example HFFBC(R) or HFFBC (G). (R) means red light while (G) means green light.

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CROSS REFERENCE GUIDE

HONGFA	OMRON	PANASONIC	TE			FUJITSU	FINDER
			OEG	P&B	SCHRACK		
HF157F	G2R						46 Series
HF13F	LY1/2	HL	DRET/RET	K10	TM	FRL260	56.32/56.42
HF18FF/18FH	MY2/3/4	HJ/HC					55.32/55.33 /55.34
HF18FZ	MY2/4-GS						55.32/55.34
HF10FF	MK2/3						
HF10FH	MK2/MK3						60.12/13
HF14FF	G2R	JR1/JR1A	OMI	RKA/RKS	409/cardE/RPII1	VS	40.31
HF14FW	G2R	JR1AF	OMI-H/OZ	RKA/RKS		FBR610	40.61
HF41F		PE/PF			V23092(SNR)	FTR-LY	34.51
HF49FD	G6DS	PA			PCN	RB/NY	
HF115F	G2RL	JW1/JW2/DJ		RT	RT/42900/ RT1/RT2	FTR-K1	41 Series
HF115F-A	G5RL-AC				RT/RT2/RX1/RX2		
HF115FP					XT		
HF118F	G6RN				RYII	FTR-F1	
HF140FF	G2R/G2RG	JR2/JR2A	OMI	TP	409/RPII2/SR2M	FTR-F1/VSB	40.52
HF141FF	G2R	JW	OMI	TP	RT1/RTH/429	FTR-F1/VSB	41.31
HFA2					SR2M		
HFA4	G7SA	SFS			SR4D/M		
HFA6	G7SA	SFS			SR6		
HF3701	G9SA-301						

Notes: This table is just for reference.if you have any questions,please contact us.

PACKING LIST(RELAYS)

Type	Packing Method	Carton Size L x W x H cm	QTY/CTN PCS	Approx. N.W. kg	Approx. G.W. kg	Stacking Layers Limit n
HF157F	50pcs/tray	35 x 29 x 19	400	9.4	11.2	6
HF13F (1C, 2C,1, 2 type)	30pcs/tray	35 x 29 x 19	300	11.1	12.8	6
	20pcs/box	35 x 29 x 24	320	11.8	13.3	6
HF13F (1C, 2C,5 type)	30pcs/box	35 x 29 x 23	240	8.9	10.4	6
HF18FF (1, 2 type)	30pcs/tray	35 x 29 x 19	300	11.1	12.8	6
	20pcs/box	35 x 29 x 24	320	11.8	13.3	6
HF18FF (5 type)	30pcs/box	35 x 29 x 23	240	8.9	10.4	6
HF18FA	30pcs/tray	35 x 29 x 19	300	11.1	12.8	6
HF10FF	20pcs/tray	35 x 29 x 24	100	9.5	10.5	6
HF10FH	20pcs/tray	35 x 29 x 24	100	9.5	10.5	6
HF14FF	50pcs/tray	35 x 29 x 19	500	8.3	10.3	6
HF14FW	50pcs/tray	35 x 29 x 19	500	8.7	10.6	6
HF41F	100pcs/tube	60 x 19 x 15	2000	10.8	14.1	6
HF49FD	100pcs/tube	60 x 18 x 19	3000	9	12	7
HF115F	50pcs/tray	40 x 27 x 20	500	6.8	8.3	6
HF115F-A/HF115F Series	20pcs/tube	65 x 18 x 14	1000	13.5	15.5	5
HF115F-A	50pcs/box	39 x 23 x 22	500	6.8	8.3	6
HF115FP	50pcs/tray	35 x 29 x 24	500	9	10.5	6
HF118F	20pcs/tube	64 x 17 x 15	1000	8.2	10.2	8
HF140FF	50pcs/tray	35 x 29 x 19	500	8.5	10.5	6
HF141FF	600pcs/tray	35 x 29 x 19	600	8.8	10.5	6
HFA2	40pcs/tray	40 x 27 x 20	400	8	9.5	7
HFA4	30pcs/tray	40 x 27 x 24	300	6	7.5	6
HFA6	20pcs/tray	40 x 27 x 24	200	5	6.5	6
HF3701	1pcs/box	35 x 29 x 27	36	6	8.5	5

Notes: Specification and dimensions in this catalog are subject to change without notice.

PACKING LIST(RELAY SOCKETS)

Type	Packing method	Carton Size L x W x H cm	QTY/CTN PCS	Approx.G.W. kg
157F-2C-C1	10 pcs/box	34 x 28 x 25	300	10.1
13F-2C-A2	20 pcs/box	34 x 28 x 20	600	7.1
13F-2C-C1	5 pcs/box	34 x 28 x 20	150	9.1
13F-2C-C2	5 pcs/box	34 x 28 x 20	150	9.3
18FF-2C-A2	20 pcs/box	34 x 28 x 20	600	6.5
18FF-2C-C1	6 pcs/box	34 x 28 x 20	180	7.9
18FF-2C-C2	6 pcs/box	34 x 28 x 20	180	7.8
18FF-2C-C4	30 pcs/box	34 x 28 x 23	120	8.3
18FF-2C-C5	30 pcs/box	34 x 28 x 23	90	7.6
18FF-2C-C8	30 pcs/box	34 x 28 x 23	120	6.9
18FF-3C-C4	30 pcs/box	34 x 28 x 23	120	9.0
18FF-3C-C5	30 pcs/box	34 x 28 x 23	90	7.9
18FF-4C-A2	20 pcs/box	34 x 28 x 20	600	6.8
18FF-4C-C1	5 pcs/box	34 x 28 x 20	150	9.6
18FF-4C-C2	5 pcs/box	34 x 28 x 20	150	10.0
18FF-4C-C4	30 pcs/box	34 x 28 x 23	120	9.2
18FF-4C-C5	30 pcs/box	34 x 28 x 23	90	8.3
18FF-4C-C8	30 pcs/box	34 x 28 x 23	120	8.0
18FZ-2C-C2	6 pcs/box	34 x 28 x 20	180	7.8
18FZ-4C-C2	5 pcs/box	34 x 28 x 20	150	8.6
10FF-2C-C3	60 pcs/box	34 x 28 x 23	180	10.1
10FF-2C-C4	36 pcs/box	34 x 28 x 23	144	9.8
10FF-3C-C3	60 pcs/box	34 x 28 x 23	180	10.7
10FF-3Z-C4	36 pcs/box	34 x 28 x 23	144	10.6
14FF-1C-A1	40 pcs/box	34 x 28 x 23	2000	9.8
14FF-1C-C2	50 pcs/box	34 x 28 x 23	200	8.7
14FF-1C-C3	50 pcs/box	34 x 28 x 23	150	7.7

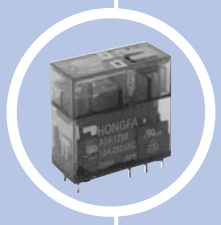
Notes: This table is just for reference.if you have any questions,please contact us.

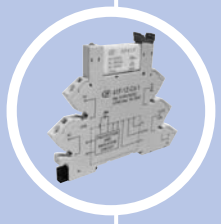
PACKING LIST(RELAY SOCKETS)

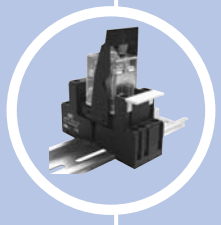
Type	Packing method	Carton Size L x W x H cm	QTY/CTN PCS	Approx.G.W. kg
14FF-2C-A1	40 pcs/tube	34 x 28 x 23	2000	9.8
14FF-2C-C2	50 pcs/box	34 x 28 x 23	200	9.7
14FF-2C-C3	50 pcs/box	34 x 28 x 23	150	8.4
14FF-2C-C4	40 pcs/box	34 x 28 x 23	160	9.5
41F-1C-C2	10 pcs/box	34 x 28 x 23	300	8.8
41F-1C-C4	10 pcs/box	34 x 28 x 23	300	8.8
118F-1C-A1-1	40 pcs/tube	34 x 28 x 23	2000	9.8
118F-1C-A1	40 pcs/tube	34 x 28 x 23	2000	9.8

Notes: This table is just for reference.if you have any questions,please contact us.

Explanation To Terminology And Guidelines







PREFACE

1. Principles

HF and its affiliates have made every effort to guarantee the accuracy of instructions and specifications. Still, errors may occur. Therefore, HF and its affiliates reserve the right to make any modification to the instructions and specifications.

HF and its affiliates claim only the responsibility of the clearly confirmed experiment clauses and condition of sale as well as the application condition and test results stated in particular specifications. We disclaim any assumptions or implications of any of our specifications and instructions.

Given the impossibility of defining all the requirements of all the relays in every application, users shall select relays accordingly and re-check through careful evaluation, or turn to HF and its affiliates for technic support if necessary. Users shall take full responsibility for relay selection.

2. Definition and Classification

Relay is a kind of component by which when the input is reached to a certain value, one or more outputs will produce the scheduled changes.
For electromagnetic relay, SSR and combined relay, it can be simply understood as the following way: it is a switch by which in the input end the speculated electrical signals are applied, the output end makes or breaks the controlled circuit.

There are many kinds of classifications about relay, we take the following classifications shown as table 1.

Table 1

Classifications		Application Fields	Advantages
Electromagnetic Relay	Signal relay	Generally for telecom and signal control	● Without leakage current in the open output end ● In the large load, it is unnecessary to add the radiators
	Power relay	Generally for home application	
	Industrial relay	Generally for industrial application	
	Latching relay	Generally for power control	
	Automotive relay	For automotive fields	
	Hermetically sealed relay	For the fields where the environment is bad and the high reliability is required	
SSR & Power Module		For the fields where the environment is bad, low noise and high reliability are required.	● With long electrical endurance ● Without noise ● Good shock and vibration capability
Combined Relay		For the fields where the certain control functions are required.	● With certain control logic

According to the classifications of relay, our catalogue can be divided into general relay fascicule, automotive relay & module fascicule, industrial relay fascicule, latching relay fascicule and hermetically sealed relay fascicule. In general relay fascicule, power relay and signal relay are included; and in automotive relay & module fascicule, plug-in relay, PCB relay and automotive module are included. We also provide the sockets which match to the relays.
This article states the basic information about the electromagnetic relay, lists the selecting principles and cautions of applications.
Generally the parameters of the instructions in the catalogue are the measured initial values under the standard, which are as following, unless otherwise stated.
1) temperature: 15˚C to 35˚C
2) relative humidity: 25% to 75%
3) air pressure: 86kPa to 106kPa

Generally the drawing stated in the catalogue is the first quadrant projection way as shown in figure 1, unless otherwise stated.

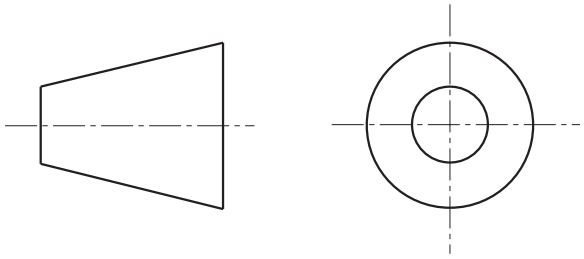


Figure 1

CHAPTER 1 THE BASIC TERMINOLOGY OF THE RELAYS

1. Contact Parameters

1.1 Contact forms are the arrangements of relay contacts. The basic contact arrangements are shown in Table 2, the multi-contact arrangements can be ratiocinated.

Table 2

Name	Symbol	Alphabet Letter	
		China	Others
Normally Open Contacts		H	A (or NO)
Normally Closed Contacts		D	B (or NC)
Change-Over Contacts		Z	C (or CO)

1.2 Contact resistance is the total resistance between the contacts, the terminals and spring jointed with contacts, generally shown in mΩ.
Unless otherwise stated in the catalogue, generally for the relay with contact load below 2A, its contact resistance is measured in 6Vd.c., 0.1A; for the relay with contact load above 2A, its contact resistance is measured in 6Vd.c., 1A. contact resistance should be tested with the max applicable voltage and current according to the correspouding load type in IEC61810-7.

1.3 Contact voltage drop generally is, in the load circuit, the total voltage drop between contacts, springs jointed with contact and the terminals. It is generally described as the voltage drop value under the regulated current, for example 50mV (measured in 10A).

1.4 Contact material is the material used in contacts and generally shown in chemistry formula, for example, AgNi represents silver-nickel alloy contacts. The material used in the relay, its characteristics and its application environment can be seen in 1.2 'Contact material' in chapter 2 'the principles for selecting relays'.

1.5 Contact rated load generally refers to the load of which the contacts can switch reliably under the certain regulated conditions. Generally it is shown as the combination of the voltage and the current. The loads listed in the catalogue are resistive loads, unless otherwise stated.

1.6 Max. switching voltage is the maximum load voltage of which the contacts can switch. In general application, this voltage value shall not be surpassed, or the relay endurance will be reduced.

1.7 Max. switching current is the maximum load current of which relay contacts can switch. In general application, this voltage value shall not be surpassed, or the relay endurance will be reduced.

1.8 Max. switching power is the maximum load power of which relay contacts can switch reliably. Generally for AC it is shown in VA while for DC it is shown in W.

1.9 Mechanical endurance refers to the operations that the relays without load or with load do not lead to failure under the rated voltage, normally switch in the specified, generally it is shown in operations.

1.10 Electrical endurance generally refers to the operations that the relay can normally switch when the specified load is applied on the contacts and the rated voltage is applied to the coil under the conditions that the relay is placed in the certain speculated environment. Generally it is shown in operations.

1.11 Surge current generally refers to the maximum transient current of which relay can endure in the specified load.

1.12 Min. applicable load generally is reference value of minimum load that the relay can switch. Please perform the confirmation test with actual load before production since reference value may change according to switching frequency, environmental condition and expected contact resistance and reliability.

2. Characteristics Parameters

2.1 Insulation resistance is the impedence when the conductors insulated with insulating material are applied to voltage and it is generally shown in "MΩ". The speculated voltage discribed above are general 500Vd.c.(or 250 Vd.c.).

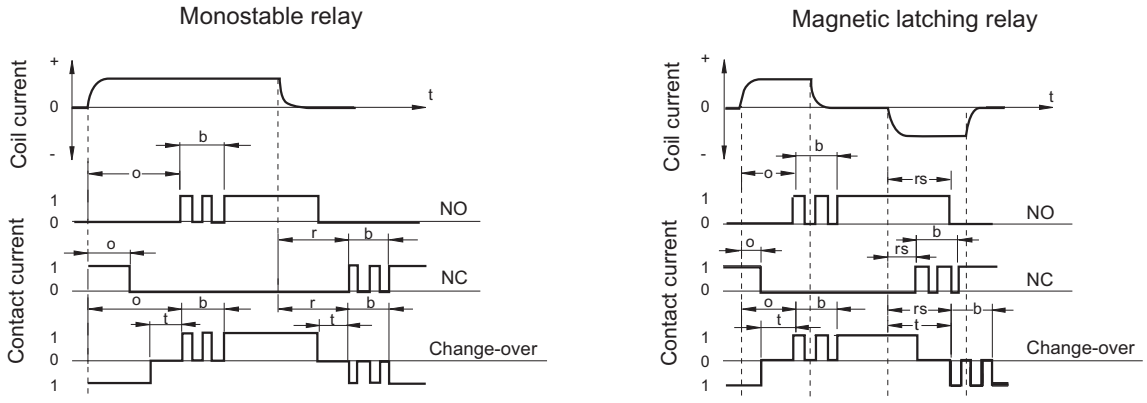
2.2 Dielectric strength is the voltage value when, within the speculated time, the conductors insulated with insulated material are applied to the voltage and the leakage current is less than the speculated current. The certain voltage above generally is the effective value of AC voltage and unless otherwise stated, the leakage current is generally less 1mA.

2.3 Operation time refers to, with the relay in the released state, the elapsed time from the initial application of power to the coil, till the closure of the normal open contacts. It does not include any bounce time, and expressed in "ms".
For the latching relays, operation time refers to, with the relay in the reset state, the elapsed time from the initial application of power to the coil, till the closure of the normal open contacts. Seen in figure 2.

2.4 Release time refers to, with the relay in the operation state, the elapsed time from the initial removal of coil power till the re-close of the normal closed contacts. It does not include bounce time and expressed in "ms". Seen in figure 2.

2.5 Reset time (only for the latching relays) refers to, with the relay in the operation state, the time from the first application of power to the reset coil till the re-close of the normally closed contacts. Seen in figure 2.

2.6 Bounce time generally refers to the time from the initial close of the contacts till the complete close and generally expressed in "ms". Seen in figure 2.



o: operation time **r:** release time **t:** switching time **b:** bounce time
rs: reset time **0:** the contacts open **1:** the contacts closed

Figure 2

2.7 Switching frequency refers to the cycling times of the operation and release in united time.

2.8 Ambient temperature refers to the temperature in which the relay can normally be applied and it is generally expressed in the range of temperature.

2.9 Coil temperature rise refers to the temperature that the coil rises by after the temperature becomes stable and under the conditions that in the suitable maximum ambient environment the rated voltage is impressed on the coil and the rated load is impressed on the contacts. Generally it refers to the maximum value, expressed

2.10 Shock is divided into shock functional and survival.

Shock functional refers to the acceleration the relay can suffer the shock value under the condition of the NC contact open time and open contact closing time at specified time. Usually it is expressed in the combination of the acceleration value "g" and the duration "ms".

Shock survival refers to the shock value that can not damage the relay construction, Usually it is expressed in the combination of the acceleration value "g" (1g=9.8m/s^2) and the duration "ms".

2.11 Vibration resistance is divided into Vibration function and survival.

Vibration function refers to the vibration the relay can suffer without causing the closed contacts to open for more than the specified time and the open contacts to close for more than the specified time. It is usually expressed in the combination of the vibration "mm" and the vibration frequency "Hz".

Vibration survival refers to the vibration the relay can suffer without damaging their construction. It is usually expressed in the combination of the vibration "mm" and the vibration frequency "Hz".

2.12 Humidity refers to the required humidity in which the relay can reliably work and generally expressed in relative humidity "%RH".

2.13 Model Of The Terminals

The terminals model of the relays also shows the applicable fields. Generally speaking, the models of terminals are PCB, THT, SMT, plug-in, QC and others.

2.14 Weight : the weight of the relay.

2.15 Enclosure type refers to the protection mode for the relay body. It is divided into enclosed, dust protected, flux proofed, plastic sealed and hermetically sealed. Seen in 3.1 'mode of encapsulation' in chapter 2 'the principles of selecting the relays'

3. Coil Parameters

3.1 The rated coil power refers to the power consumed by the coil when the coil are applied to the rated voltage. Generally for the DC relay, it is expressed in W while for the AC relay in VA.

3.2 Rated voltage is the voltage applied to the coil that can make relay work normally. It is expressed in "V". For the polarized relay, the direction in which the voltage is impressed should be notified.

3.3 Operate voltage is the voltage which closes the NO contacts when the relay is in the releasing state (for the latching relay in the reset state) and the coil voltage is increased gradually**.** Usually it is expressed in "V". It is usually the maximum value listed in the instructions, which is about 80% of rated voltage.

3.4 Release voltage is the voltage which closes the NC contacts when the relay is in the operation state and the coil voltage is gradually reduced from the rated voltage. It is usually expressed in "V". The minimum value is listed in the instructions, which is about 10% of the rated voltage.

3.5 Reset voltage is the voltage which closes the NC contacts when the latching relay is in the operation state and the reset coil voltage is increased. It is expressed in "V". The maximum value is listed in the catalogue, which is about 80% of the rated voltage.

3.6 Coil resistance generally refers to the DC resistance and is expressed in "Ω". In the catalogue the combination of the nominal value and tolerance is given.

3.7 Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time. It is expressed in V.

4. Safety Approval

4.1 UL Approval

UL, the abbreviation of Underwriter'Laboratories Inc, is a non-profitable organization founded in 1984. The electrical products authorized by this organization can be freely sold in American market, while the electrical products not authorized by this organization will be limited when they are sold in most of the states of America. Due to the authority of UL, the products approved by UL are accepted by many countries.

4.2 CSA Approval

CSA, the abbreviation of Canadian Standards Association, is the authorized approval institution. The electrical products approved by this institution can be freely sold in Canadian market. The products approved by the CSA can be only sold in Canadian market and if these products want to enter into the American market, they should get the American approval of UL.

4.3 UL&CUR

UL&CUR is the approval which simultaneously meets the American standard and the Canadian standard and can be used in North America.

4.4 VDE Approval

VDE, the abbreviation of Verband Deutscher Elektrotechniker, is one of Germany authorized organizations in electrical component and other equipment. The electric products approved by this institution will be admitted in Germany law.

4.5 TÜV Approval

TÜV, the abbreviation of Technischer überwachungsverein, has the same authority as VDE. T**Ü**V is one of the authorized institution in electric equipments. The electric products approved by this institution will be admitted in Germany law.

4.6 CQC Approval

CQC, the abbreviation of China Quality Certification, is the most authorized approval institution in China. The products not listed in the catalogue of 3C approval can make CQC approval in China Quality Certification Center.

5. Ordering Code

Ordering code is a code which is used to ensure the type and the specifications of the relay, which includes the basic information of relay, such as the type of the products, coil voltage, contacts arrangement, enclosure type etc.. The ordering code of HONGFA brand relay can be seen in Chapter 5 "the ordering code".

6. Outline Dimensions, Wiring Diagram And The Size Drawing Of The Mounting Holes

Ordering mark is a mark which is used to ensure the type and the specifications of the relay, which includes the basic information of the relays, such as the type of the products, the coil voltage, contacts arrangement, the mode of encapsulation etc.. The ordering marks of HONGFA brand relay can be seen in Chapter 5 "the ordering marks".

6.1 Outline dimensions describes the drawing of the relay outline size and the mounting space needed by relay.

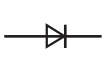
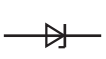
6.2 Wiring diagram describes the wiring way of the input and output terminals respondent to the terminals of the relays.

6.3 The size drawing of the mounting holes describes the position of the relay terminals and the size of their mounting holes.

6.4 Examples

The examples of the common components can be seen in table 3.

Table 3

Coil	Polarized Coil	Contact	Resistance	Capacitance	Diode	Zener Diode	LED	Varistor
								

7. Characteristic Curves

7.1 Max. switching power curves represent the loads the relay can support.

7.2 Electrical Endurance Curve: The electrical endurance curve indicates the typical endurance under rated load. The data of all the electrical endurance do not guarantee a minimum value.

1) The data of all the electrical endurance are only valid for stated contact materials, special contact materials excluded. No deductions should be made from the data.
2) No deductions should be made from the data, especially to the situation when the current is below 0.5A as contact wear is not the dominant failure mode.

7.3 Coil temperature rise curve shows the measured temperature rise value of the coil when the relay is energized with different voltage and loads under the speculated ambient temperature.

8. Monostable, Latching And Polarized Relays

8.1 Monostable Relay:

For this relay, the contacts operate when the coil is energized while the contacts will reset when the coil is deenergized.

8.2 Latching Relay:

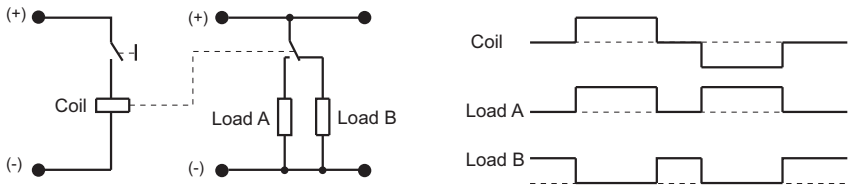
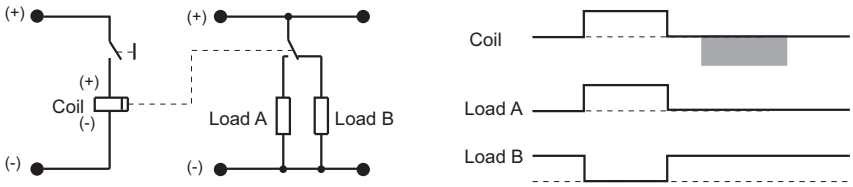
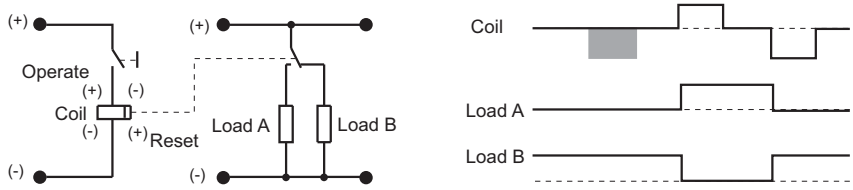
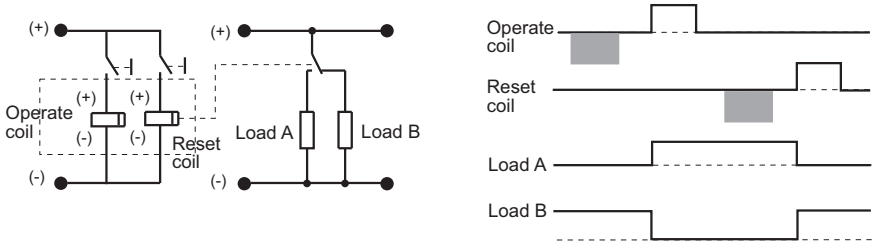
For this relay, the contacts operate when the coil is energized while the contacts will keep the state when the coil is deenergized. To reset the contacts, the counter-energization will be applied to the single-coil coil or the energization is applied to the double-coil reset coil .

8.3 Polarized Relay:

The switch of the contact state is dependent on the polarity of the energized voltage in the terminals of the coil. Part of the monostable relays and all the magnetic latching relays belong to polarized relays.

The basic circuit and operating wave of the several common relays can be seen in table 4.

Table 4

Type	The Basic Circuit And Operating Waveform
Non-Polarized Monostable	
Polarized Monostable	
Single-coil Latching	
Two-coil Latching	

Notes: the voltage with the correct polarity is required to impress on the coil of polarized relays or the relays will not work, as shown in the figures above.

CHAPTER 2 THE PRINCIPLES OF SELECTING THE RELAYS

In order to correctly select relays, customers need know the characteristics of the relays to ensure whether these characteristics meet with the practical requirements. It will be more reliable if these characteristics can be tested in the practical environment. The principles of selecting relays can be seen in table 5. In table 5,in the column "must be confirmed" the item with mark is confirmed and a type of relay can be selected. If there is further requirement, the correspondent items with the mark are required to be further confirmed.

Table 5

Item		The considered points	Confirmed	Reference	Influence factors
Contact	Contact load	AC, DC, size and types (inductive or resistive)	√		● the ambient temperature ● as for AC load, is the operation and the load synchronous or not ● Does the contact material match the load?
	Contact arrangement	NO or NC or switching? how many pairs of the contacts?	√		
	Electrical endurance	The frequency and the expected operation times?	√		
	Contact material	Which material?		√	
	Contact resistance	How much and the testing conditions?		√	
Coil	Rated voltage	How much, direction, AC, DC?	√		● the ambient temperature ● the power fluctuation ● the voltage drop driven by semi-conductor
	Coil resistance	How much? The input power consumption?	√		
	Operate voltage	How much? The influence of the power wave?		√	
	Release voltage	How much? The influence of the power fluctuation?		√	
	Max. allowable voltage	How much? How long?		√	
	Coil temperature rise	How much? Insulation level?		√	
Performance	Enclosure type	Unenclosed type, dust protected, flux proofed, or plastic sealed?	√		● the ambient atmosphere ● the safety requirements
	Dielectric strength	How much? where?	√		
	Insulation resistance	How much where?		√	
	Vibration resistance	How much? Functional or destructive?		√	
	Shock resistance	How much? Functional or strength?		√	
Practical Environment	Ambient temperature	High or low? How long?	√		● insulation level ● method of encapsulation ● the life
	Atmosphere	Humidity? Harmful gases ?		√	
Outline And Mounting	Outline	Size and dimension	√		● the required mounting size ● mounting method
	Type Of Terminals	PCB, QC, plug-in or screw fixed model?	√		
	Welding mode	Manual solder, wave solder, reflow solder ? Is cleaning needed or not?		√	
	Mounting gap	Cling or with gap?		√	
Others	Safety approval	UL、VDE、TUV、CQC etc ?		√	● zone ● the customers' requirements
	Special requirements and conditions	The requirements of the customers		√	

The following will give the further explanation about the items in the table above.

1. Contact Parameters

1.1 Contact Load

Before ensuring whether the load the relay can carry in order to meet with the application, we should confirm the type of the real load except for confirming the load value for different loads have different steady state value and inrush value. Seen in table 6. The load given in the instructions are generally the resistive load, unless otherwise stated.

Table 6

The Type Of Load	Inrush Current
Resistive Load	once steady state current
Motor Load	5-10 times steady state current
Capacitive Load	20-40 times steady state current
Transformer Load	5--15 times steady state current
Solenoid Load	10--20 times steady state current
Incandescent Lamp Load	10-15 times steady state current
Mercury Lamp Load	3 times steady state current
Sodium Vapor Lamp Load	1-3 times steady state current

Figure 3 shows the relations between the representative load and the inrush current. In addition, according to the characteristics that the polarity of different moving and stationary contacts will influence the electrical endurance. Please check in the practical application or consult the technician of HONGFA company.

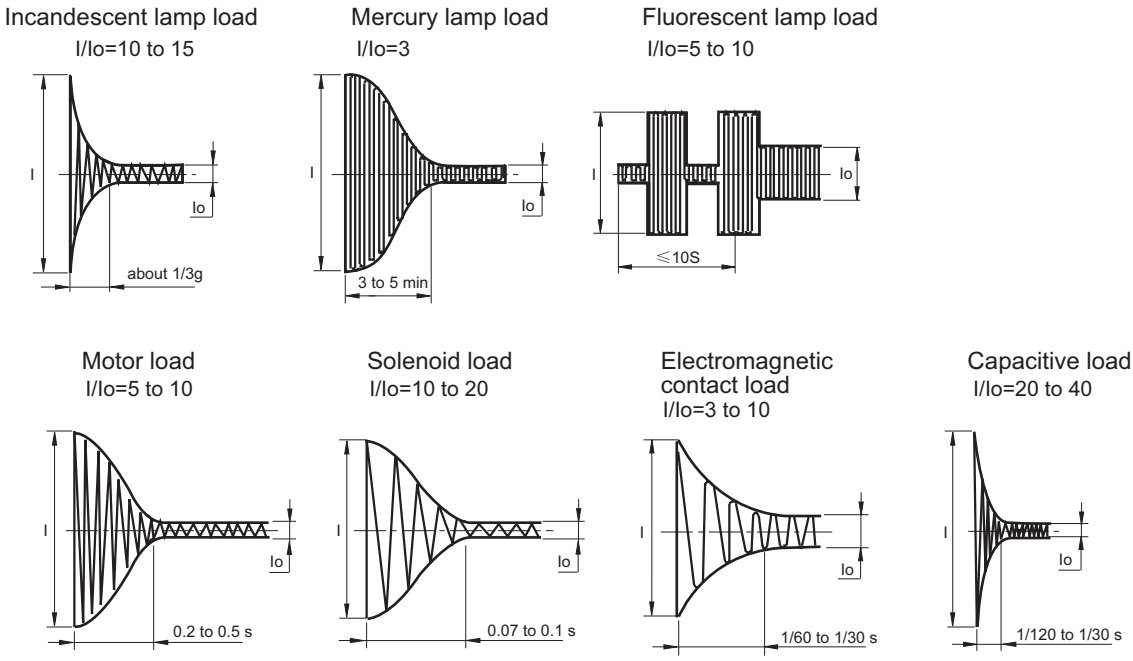


Figure 3

1.2 Contact Material

For the same type of relay, different contact materials are applicable to different load types or ranges. Seen in table 7.

Table 7

Material	Feature	Typical Application
AgNi+ Au (gold plating)	● gold plating with good resistance to erode in the air ● by contrast to other material, lower contact resistance and better consistency in low load ● high electrical conductivity and thermal conductivity	● Small load: gold plating almost not eroded, from 10mW(5V,2mA) to1.5W (24V,62.5mA) (resistive load) ● Middle load: gold plating is eroded after seve operations and AgNi functions mainly, from 2.4W (24V,100mA) to 60W (30V,2A) (resistive load) Note: Break the low load, the typical value is 1mW (0.1V 1mA) (eg. in the testing devices); Suggest to use two pairs of the contacts in parallel.
AgPd	● good resistance to erode and sulfur in room temperature ● low contact resistance and good consistency ● expensive	● the same as the above
AgNi	● the standard material of most contact material ● high electrical conductivity and thermal conductivity ● high resistance to burn ● average resistance to solder ● easily produce the sulfured film in the atmosphere with sulfid.	● resistive load and low inductive load ● rated current below 12A ● surge current below 25A
AgCdO	● high AC load ● high electrical conductivity and thermal conductivity ● good resistance to burn ● great resistance to welding ● easily produce the sulfured film in the atmosphere with sulfid	● resistive load, motor load and inductive load ● rated current below 30A ● surge current below 30A
$AgSnO_2$	● great resistance to welding ● the materials transferred less than those above3 in DC load ● easily produce the sulfured film in the atmosphere with sulfid.	● lamp load, inductive load and capacitive load ● excessively high surge current load (up to 120A)
$AgSnO_2$ (with other oxide matter)	● the same as the above	● lamp load, inductive load and capacitive load ● excessively high surge current load (up to 120A) ● with different oxide matter, the different applicable load

Notes:

1) Consider the maximum current value specified in different relays.
2) It would be better to be checked and tested in application when the conditions are catalogue allowable.
   Gold plating of the contacts shows good performance for the low loads. However, for the high load, it can only keep the initial contact performance of the contacts before the relays are used.

1.3 Electrical Endurance

Unless otherwise specified, the electrical endurance in the instruction refers to the standard value under rated load in the circumstance that:

a) standard condition
b) NO contact
c) 50Hz for AC load
d) Make-break rate 1:9
e) Resistive load
f) Flux-proof
g) Downwards PCB terminals
h) Separated installation
i) See severity level B according to IEC 61810-7 for failure modes
j) See IEC 61810-7 for unstated information

Considering the flux-proof and the dust-proof types have longer electrical endurance than the sealed type of the same relay, it is preferred to select the flux-proof and the dust-proof types if possible.

1.4 Mechanical Endurance

Unless otherwise specified, the mechanical endurance in the instruction refers to the standard value under rated load in the circumstance that:

a) no contact load
b) Rated frequence of operation, duty factor 50%
c) Downwards PCB terminals
d) 50Hz for AC load
e) See IEC 61810-7 for failure modes

2. Coil

2.1 Voltage

To make the relay work reliably, be sure that work circuit can supply the rated voltage to the coil.

In the case of transistor drive circuit, that the voltage on the coil is less than the normal voltage of the transistor drive circuit because of the voltage drop on the transistor, it is recommended to use 4.5V type relay which in 5V transistor circuit and 2.4V type relay in 3V transistor circuit.

Sometimes to shorten the operating time, the coil can be applied to maximum allowable voltage to the coil in the short time. However it should be ensured that the relay will not overheat or even be damaged.

For polarized relays, please check the polarity of the coil voltage.

2.2 Coil Resistance

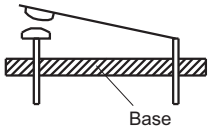
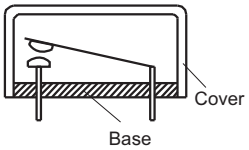
To make the relay work reliably, be sure that work circuit supplies the nominal coil power consumption to the relay. Therefore please select the suitable coil resistance.

3. Performances

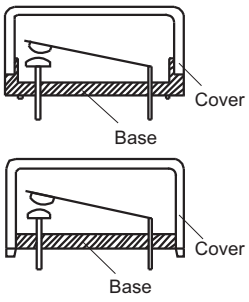
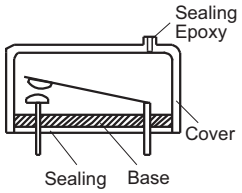
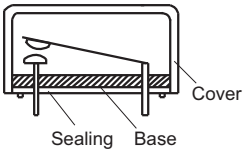
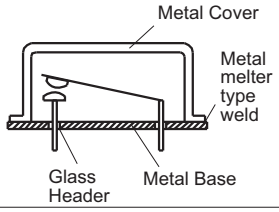
3.1 Enclosure Type

To ensure the reliability of the relay, different ways of encapsulation will require different post-processing(table 8).

Table 8

Type	Construction	Features	Auto-matic Solder	Auto-matic Clean-ing	Dust Resis-tance	Liquid Proof	Harmful Gas Resis-tance
Un-enclosed		Without the protective case	X	X	X	X	X
Dust Protected		With the dust protective case; the case and the base are fitted together and their joint is close to PCB.	X	X	√	Δ	X

To be continued

Type	Construction	Features	Auto matic solder	Auto matic clean ing	Dust resist ance	Liquid proof	Harmful Gas Resis tance
Flux Proofed		With the dust protective case; the case and the base are fitted together and their joint is close to PCB. The terminals are plastically sealed on the base or the base and the terminals are fitted with sealing epoxy; the fitted joint is far from PCB. Without exceeding the scheduled position, the flux will not penetrate the relay.	√	X	√	Δ	X
		Base, terminals and case are fitted with sealing epoxy; there is ventilating hole far from PCB. Without exceeding the scheduled position, the flux will not penetrate the relay.	√	X	Δ	Δ	X
Plastic Sealed *		Base, terminals and case are fitted with sealing epoxy; The internal of the relay is sealed in the case and base. Washable in limited condition.	√	√	√	√	√
Sealed or Hermetically		Metal case and metal base are sealed; terminals and base are sealed with glass. The leakage rate of the air in the internal of the relay meet with the requirements.	√	√	√	√	√

Notes:

1) "√" means good; "×" means not good; "Δ" means to notify.

2) Because the plastic has the certain leakage, please use hermetic relays in the conditions that there are harmful gases or the explosive proof is required.

3) * Hongfa recommends to implement washing-free soldering process to avoid washing on relay, ultrasonic cleaning is prohibited. If water cleaning is required after the relay is assembled on PCB, it is a must that you should get contact with hongfa and specify detailed washing method, we'll help you to choose suitable product.

3.2 Dielectric Strength And Insulation Resistance

Please confirm that these two parameters can meet the application requirement and will not lead to such conditions as the breakdown of the circuit, short circuit.

3.3 Vibration Resistance And Shock Resistance

Please confirm that these two parameters can meet the application requirement and will not lead to the failure of the relay in the course of the application.

4. Temperature

4.1 Ambient Temperature

Generally speaking, when the temperature does not exceed temperature range speculated in the catalogue, the relay can normally work. When the temperature in application is higher than the temperature speculated in the instructions, please contact Hongfa to ensure whether the relay can be normally used according to the loads.

4.2 Atmosphere

In the atmosphere with high humidity, moisture, even freezing dew and much dust, unsealed relays shall not be used. Under high humidity, it would easily accelerate the rust of the relay parts and the dust easily result in the failure of the relay contacts.

In the atmosphere with organic silicon, recommend to use hermetic products for the organic silicon will accelerate the failure of the contacts. In the atmosphere with moisture and harmful gases as H_2S、SO_2、NO_2 etc., the flux proofed and dust protected products can not be applied while the plastic sealed products can be used and tested in application.

In application, if the ambient atmosphere is better, recommend to use the dust protected and flux proofed relays for they can get the longer eletric endurance than plastic sealed relays.

5. Outline And Mounting

5.1 Outline And Mounting Gap

The outline sizes of the relays usually have a certain tolerance. Therefore when the circuit and the mounting gap are designed, the design is suggested to be done according to the maximum size in the instructions.

5.2 Welding Methods

Since July 1st, 2006, the terminals of the relays produced have been lead-free. The suggested welding temperature and time are respectively 240˚C to 260 ˚C, 2s to 5s.

If reflow solder is required, it should be confirmed the relay can be reflow soldered according to the instructions.

If you have questions, please contact Hongfa.

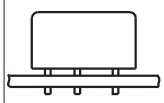
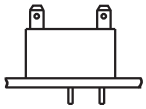
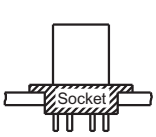
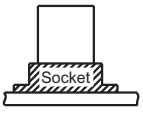
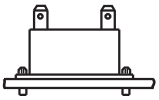
5.3 The Model Of The Terminals

Select the suitable shapes of the terminals and mounting methods according to the real conditions.

Table 9

Classification	PCB (THT)	(SMT)	(Plug-in)	(QC)	(Screw)
Terminals type					
Representative products	HFD27 HF115F HFKC	HFD3	HF13F HF18FF	HF105F HFV7 HF3501	HF116F-3

Table 10

Classification	PCB Mounting			Plug-in Mounting		Screwing Mounting
	THT	SMT	THT and QC			
Mounting type						
Representative products	HFD27 HF115F HFKC	HFD3	HF102F HF105F-4 HF2160	HF13F HFV7	HF18FF HF3501	HF105F-4 HF92F HF116F

6. Others

6.1 Safety Approval

Generally UL/CUR approvals are applicable in North America and VDE&TÜV approvals are applicable in Europe. However, due to the international authority of these approvals, most of countries also accept them. If you have questions, please contact Hongfa.

6.2 Special Requirements

Except for normal products, we accept the customer's order for the products with special specifications Please contact Hongfa when required.

CHAPTER 3 PRECAUTIONS FOR APPLYING THE RELAY

To properly use the relay, when the relay is selected and its characteristics are learnt, the precautions for using are required to be known and ensure the reliable operation of the relay.
The following precautions will be considered in application:

1) The relays are used within the range of the parameters listed in the catalogue, to the extent that it is possible.
2) The rated load and the life are the referent values, which will be different due to the different environments, load features and types. Therefore they should be tested in the practical or stimulated application.
3) DC relays are controlled by rectangle wave to the extent that it is possible while the AC relays are controlled by sine wave.
4) To maintain the performances of relays, please do not make the relay drop or be shocked strongly. Suggest that the relays dropped not be used.
5) Relays are used in the ambient temperature and normal humidity and in the atmosphere with less dust and harmful gas. The harmful gases include gases with sulfur, silicon and nitrogen oxide etc.
6) For the latching relays, please set them in the operate or reset state before they are used. Please pay attention to polarity and pulse width when energizing on the coil
7) For polarized relay, please notify the polarity (+, -) of the coil voltage.
8) Except for the above there are other precautions. In the following they will be described one by one in the order listed in table 2.

1. Precautions For The Contacts

Contacts are the most important elements of relay construction. Contact life is influenced by contact material, voltage and current value applied to the contacts (especially the voltage and current waveforms at the time of application and release), the type of load, switching frequency, ambient atmosphere, form of contact and the contact bouncing etc. The material transfer, welding，abnormal usage and the increase in contact resistance bring about the failure of the contacts. Please pay attention to them in application.
In order to better apply the relay, please refer to the following precautions of the contacts.

1.1 The Load

The resistive load value is usually listed in the catalogue, however, which is not enough. It should be checked and tested in the practical contact circuit.
The minimum load described in the instructions is not the standard lower limit value the relay can switch reliably. The reliability of this load value is different due to differences of the ON-OFF frequency, the environment, the change of the required CR and absolute values.

1.1.1 Voltage

When the inductive circuit is switched off, there are the reverse voltage which is higher than the electrical circuit. The higher this voltage is the more the energy is. Correspondently the contact wear and material transfer also increase. Therefore notify the load type and load value the contacts of the relay control.
In the same current, DC voltage value the relay can switch reliably is much less than AC voltage value for AC current exists zero point (the point when the current is zero) and the electrical arc produced easily extinguishes. However for DC current, the electrical arc extinguishes when the contact gap is up to the certain value. Therefore the duration of the arc is longer than that in AC current and the contact wear and material transfer increases.

1.1.2 Current

When the contacts are on or off, the inrush currents will greatly influence the contacts. For example, when the load is motor load or lamp load, the higher the inrush current when the contact is on, the more the contact wear and the material transfer increase, and the more easily lead to the contact weld and not to separate. Please check in practical application.

1.2 Precautions For The Application

1.2.1 Avoiding Switching Both The Large Load And The Micro Load In The Same Relay

When switching the high load, the scattered contact material is produced, which will attach to the contacts with the low load and lead to the failure of the contacts. Therefore, please avoid the same relay switching both the high load and the low load. If it is the only choice to do against this, when mounting please place the contacts switching the little load over the contacts switching the large load. However the reliability will be influenced.

1.2.2 Precautions For The Two Pairs Of Contacts Connected In Parallel

When the two poles of contacts are connected in parallel, the reliability will be improved but the load capacity could not, for the two poles of contacts could not be opened or closed at the same time.

1.2.3 The Problems About Phase Synchronism Of contact Operation And AC Load

If the operation of the relay contacts is synchronized with the phase of the AC power and the contacts always make or break in the high load voltage, seen in figure 4, the contact weld or material transfer will increase to lead the relay to prematurely fail. Please check whether the random phase are used in actual application. When the relay is driven by timer, micro computer etc., it will appear the power phase synchronism.

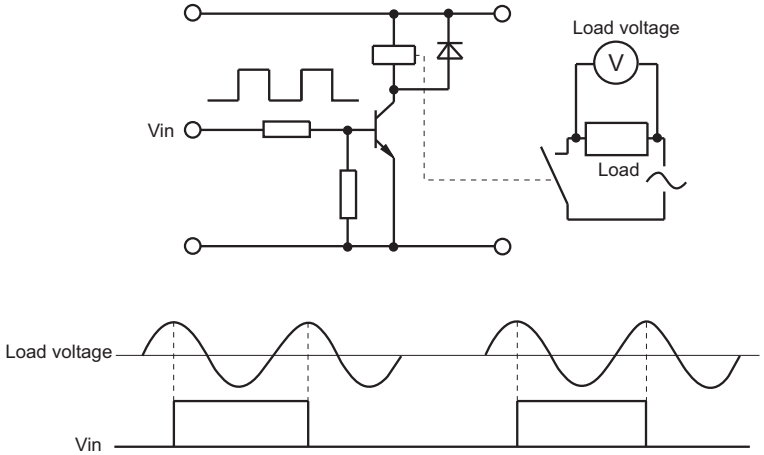


Figure 4

1.2.4 Electrical Endurance In The High Temperature

Electrical endurance of the relay will be lower in the high temperature than that in the low temperature. Please check while it is operating in the actual application.

1.2.5 Connection Of Multiple Pairs Of Contacts And The Load

Multi-contacts are arranged in the same polarity of the supply power to the extent that it is possible and the passive polarity in the other polarity of the supply power, as shown in figure 5 (a).Thus, the short circuits between the contacts, due to voltage differences between the contacts, can be possibly avoided. The wiring as shown in figure 5 (b) can be avoided.

(a) good example (b) bad example

Figure 5

1.2.6 Avoid Short Circuit Caused By Contacts Weld And Electrical Arc

In the electrical circuit, the following points should be considered (seen in the figure 6)

1) Generally the gap between the contacts are small. The reason can probably be that the electrical arc between the contacts results in the short circuit. Please do not adopt the circuit shown in figure 6(b). The circuit shown in figure 6(a) is suggested to use and the certain interval can be set in the operation between Con1 and Con2.

2) It should be considered that the overcurrent should not be generated to make the circuit overload or burn when short circuit is caused by contact welding and error operation.

3) Care should be taken that the two pairs of switching contacts are not used to build the forward circuit and the reverse circuit, as shown in figure 6(d).Suggest that the circuit shown in Figure in 6(c) is applied and the certain interval is set in the operation between Con1 and Con2.

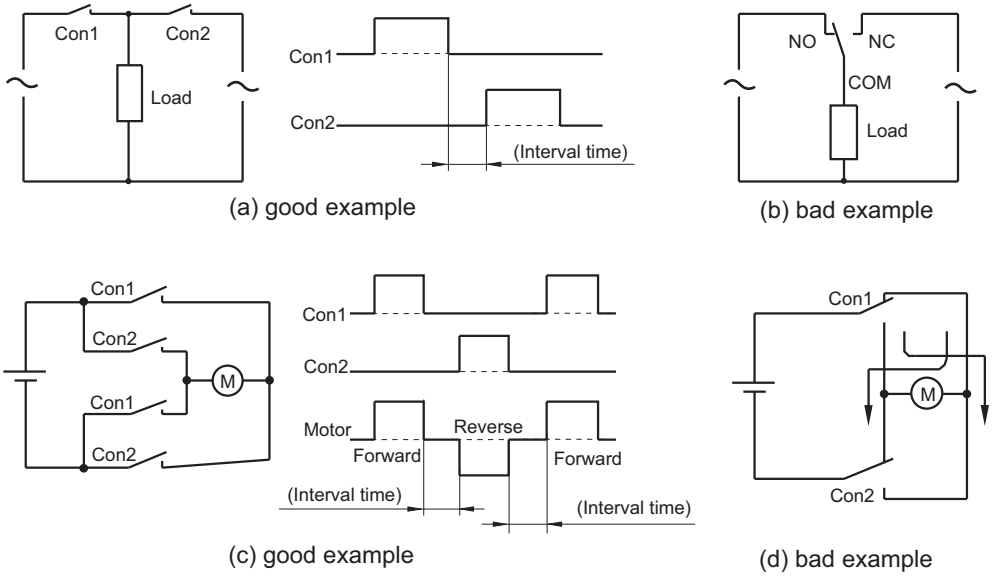


Figure 6

1.2.7 Avoid Short Circuit Between Contacts

The miniaturization of the electrical control equipments makes the control components tend to miniaturization, so the relay with multiple poles of contacts are used, care is taken of the differences of the voltage between the poles of contacts and load types. Suggest that large differences of the voltage among the contacts do not exist in order to avoid short circuit between poles of contacts.

1.2.8 Precautions For Using The Long Lead Wire

In the contact circuit of the relay, when the lead wire with more than 10m length is used, the inrush current will be generated due to the capacitance in the lead wire. Please connect in series the resistance (about 10 to 50) in the contact circuit, as shown in Figure 7.

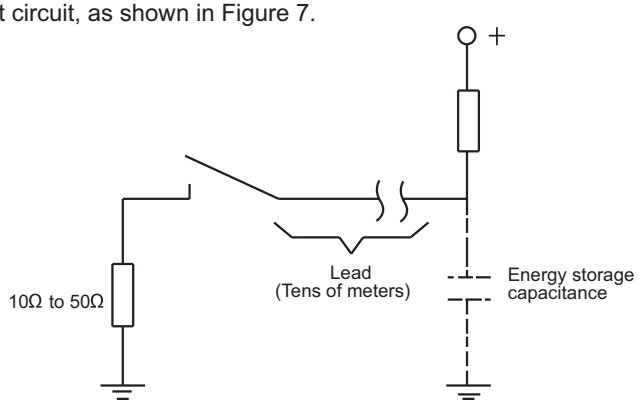


Figure 7

1.2.9 Precautions for the contacts of the magnetic latching relays

Generally the latching relays are shipped from the factory in the reset states. However during shipping or mounting relays the shock of the relay may change the operate state. Therefore suggest that in application it be set in the required state.

1.3 Contact Protection

1.3.1 Inrush Current And The Reverse Voltage

When the motor, capacitance, solenoid and lamp load make, the inrush current is generated, which is several multiple steady state currents.

When the inductive load such as solenoid, the motor, contactor, the reverse voltage which are from hundreds of to thousands of volts. Generally in the normal temperature and atmospheric pressure the critical insulation destruction voltage of the air is 200 to 300V.Therefore if the reverse voltage exceeds this value, the discharge phenomena between contacts will happen.
Both inrush current and the reverse voltage will greatly damage the contacts and obviously shorten the relay life. Therefore the proper use of the contact protection circuit may increase the life of the relay.

1.3.2 Material Transfer Of Contacts

Material transfer of contacts refers to the transfer of the contact material from one contact to the other. When material transfer becomes serious, the accidented contact surface can be seen by eyes. As shown in figure 8, the accidented surface easily causes contact welding.

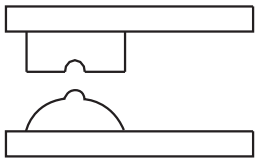


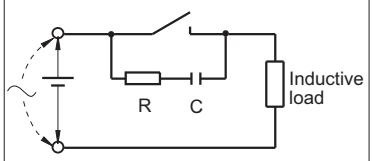
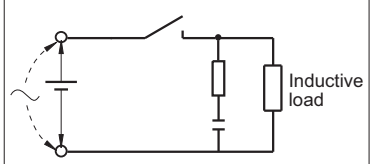
Figure 8

Generally, material transfer of contacts is caused by the one-way flowing of the large current or the inrush current of the capacitive load and often happens in DC circuit. Generally it shows the protruding shape in the passive polarity and the concave shape in the positive polarity. Therefore the proper use of the contact protection circuit or the use of AgSnO contact which has better resistance against material transfer may reduce the material transfer of contacts. The AC load with large capacity should be checked in actual application in the test.

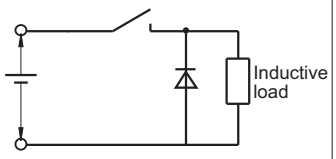
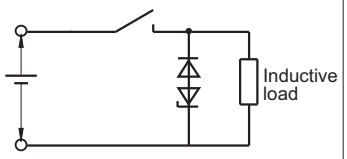
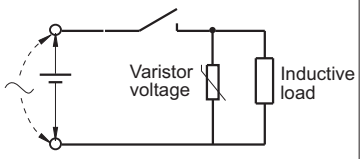
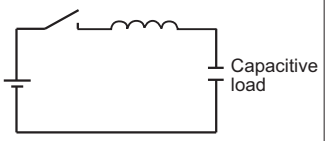
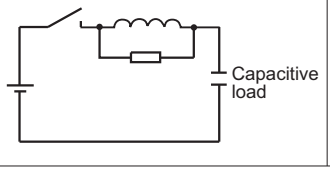
1.3.3 The Protective Circuit Of The Contacts

Generally speaking, in contrast to resistive load, inductive load more easily damages the contacts. The use of properly protective circuit may make the influence of inductive load on the contacts equal to the influence of resistive load on the contacts. Care is taken that the incorrect use will generate the counter effect. Table 11 shows the typical examples of the contact protective circuit.

Table 11

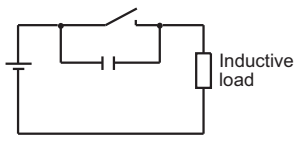
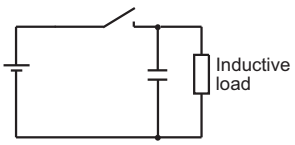
Circuits Example		Application		Featrues	Device Selection
		AC	DC		
CR Circuit		Δ	√	● The supply voltage is usu. 24 to 48V. ● The load is a timer or a contactor, the release time lengthens ● If the load is a time, leakage current flows through the CR circuit causing faulty operation. ● If used with AC voltage, be sure the impedance of the load is sufficiently smaller than that of the CR circuit.	**A:** As a guide in selecting C and R **C:** 0.5 to 1μF per 1A contact current **R:** 0.5 to 1Ω per 1V contact voltage Values vary depending on the properties of the load and variations in relay characteristics; Please check by test. Capacitor C acts to suppress the discharge the moment the contacts open. The dielectric strength of the capacitor C is usu.200 to 300V or more than two times the load voltage. Please use AC capacitor (non polaried) in AC circuit.
		√	√	● Applicable to the supply voltage of 100 to 200V ● If the load is a relay or a contactor, the release time lengthens.	

To be continued

Circuits Example		Application		Features	Device Selection
		AC	DC		
Diode Circuit		X	√	● At the terminals of the inductive load the diode is connected in parallel, which can reduce the reverse voltage. The release time is longer than that in CR circuit.	Select a diode with the reverse breakdown voltage at least 10 times the circuit voltage and a forward current at least as large as the load current. In electric circuits where the circuit voltages are not high, a diode can be used with a reverse breakdown voltage of about 2 to 3 times the supply voltage.
Diode And Zener Diode Circuit		X	√	● If the zener diode is added in the diode circuit the release time is reduced.	Use a zener diode with a zener voltage about the same as the supply voltage.
Piezo Resist-ance Circuit		√	√	● Reduce the excessive high voltage between the contacts ● If the load is a timer and a contactor, the release time lengthens ● Effective when piezo resistance is connected to both contacts if the supply voltage is 24V or 48V. ● Effective when piezo resistance is connected to the load if the supply voltage is 100V or 200V. ● Reduce the excessively high voltage between the contacts	Use the piezo resistance with control voltage Vc 1.5 times the supply voltage peak value. If the control voltage is excessively high, the effect of the reverse control is not good. Please check in application.
Inductan-ce Circuit		√	√		
Induct-ance And Resis-tance Circuit		√	√		

Notes: the mark "√" means good, the mark " X " means bad, the mark "" means notice. Please avoid using the following circuit as table 12.

Table 12

	
When the contacts are OFF, the effect on controlling the electric arc is good. However in this case the capacitor C stores the energy, so the energy in the capacitor C will release to the contacts, when the contacts are ON, will result in the easy welding of the contacts.	When the contacts are OFF, the effect on controlling the electric arc is good. However the contacts are easily welding due to the large charge current of the capacitor C when the contacts are ON.

1.3.4 Precaution For mounting Protective Elements

When the protective elements such as diode, C-R, piezo resistance are mounted, they must be mounted beside the load or the contacts. If the distance is far, the protective effect will not be good. Suggest to be mounted within 50cm.

2. Precautions For The Coil

The application of rated voltage to the coil is the basis for a relay to work normally. Only applied the voltage beyond the operate voltage, the relay can work, but the rated voltage must be applied to the coil for the changes caused by the temperature and the variation of the power voltage will influence the normal operation of the relay.

2.1 Types

2.1.1 AC Operation Type (AC type)

Generally the work voltage of the relay is always a commercial frequency (50Hz or 60Hz).Suggest that the products with standard voltage specifications listed in the instructions be selected to the extent that it is possible. If the products with other specifications are required, Please contact the technicians in HONGFA company.

For AC relays, due to the factors such as eddy current loss, hysteresis loss and lower coil efficiency, the temperature rise is greater than that for DC type. When voltage exceeds ±10% of rated voltage, the buzz is easily produced. Please notify the variation of the power voltage.

For AC relays, when the coil breaks, there should not remain any DC voltage in the circuit; otherwise the relays can not release normally.

2.1.2 DC Operation Type (DC type)

Generally the DC relays mostly are voltage drive type. Suggest that to the extent that it is impossible, the products with the standard voltages listed in the instructions should be selected. If the products with other specifications are required, Please contact the technicians.

Please check the voltage polarities of the relay coils in the instructions. If the diode for the control or the elements for displaying are added, once the opposite connection of the voltage will lead to the abnormal operation of the relays or the abnormal operation of the added elements or even short circuit. When the coil is parrelled with diode or LED, the release time will be prolonged which may reduce the electrical endurance. Please note that.

In addition, for polarized relay, the polarity of the voltage applied to the coil is opposite to that in the instruction, the relay will not work.

2.2 Input Power Of The Coil

2.2.1 Input Power For AC Coil

To make the relay work reliably, please apply rated voltage to the coil. If the voltage, which does not make the relay completely operate, is continuously applied to the coil, the coil will abnormally heat to make the coil abnormal wear.

The supply voltage of AC relay would better be sine curve. The AC coil can better control the buzz. If the waveform distorts or deforms, the control function can not be displayed better. Figure 9 shows several examples of common waveforms.

Figure 9

If the parts such as the motor, solenoid and transformer are connected in the drive circuit of the relay, when the parts work the coil voltage of the relay will reduce and then the relay contacts will shake to cause the contact welding, abnormal wear or non-conduction. The alike phenomena of the reduction of the coil voltage will happen when the miniature transformer are used, no transformer with rich capacity can be used as the power source and the wiring is long, the wiring used in the house or the shop etc. is thin. If the similar failure happens, Please use the synchro oscilloscope to check and properly adjust.

If using the loads with large variation such as the motor, Please separate the drive circuit of the coil from the power circuit according to the usage.

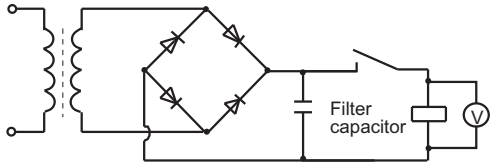
If the AC relay could not work reliably, switch AC to DC and then select the proper DC relay.

2.2.2 Input Power For DC Coil

In order to work steadily, the voltage applied to the two terminals of the coil of the DC relay is suggested to use

the coil rated voltage under ±5% or the relay could not work steadily, to cause the contact welding or abnormal wear, especially when such parts as the motor, solenoid or transformer etc. are connected in the drive circuit of the relay, the case will be more obvious

As the power source of DC relay, there are the accumulator, the full(as shown in 10) or half wave rectifier circuit of smoothing capacitor, which will influence the operating characteristics of the relays. Please check in the practical application.



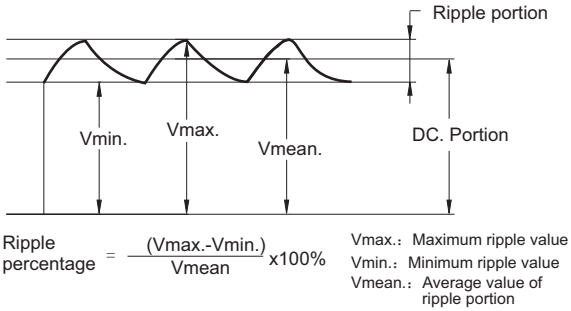


Figure 10

2.3 Maximum Voltage Of The Coil

Except for the limits from the coil temperature rise and the heat-resistant temperature of insulation material of the coil electro-magnetic wire (once beyond the heat-resistant temperature, short circuit will locally happen in the coil and even the coil burns), the maximum voltage of the coil will be influenced by heat distortion and the aging of the insulation materials. Especially it can not destroy other machines, hurt the human body or cause the fire, so it must be limited with the certain range. Therefore please do not make it beyond the regulated value in the instructions.

Maximum voltage is the maximum value of the voltage which can be applied to the coil of the relay in short time rather than the value of the voltage allowed to be continuously applied with.

2.4 The Coil Temperature Rise

2.4.1 Temperature Rise

In the course of the relay operation, the coil temperature will be increased. When a pulse voltage with ON time of less than 2 minutes is used, the coil temperature rise value is related to the ON time and the ratio of ON time to OFF time. The various relays are essentially the same in this aspect.(table 13)

Table 13

(Current Passage Time)	(%)
For Continuous Passage	Temperature Rise Value Is 100%
ON:OFF＝3:1	about 80%
ON:OFF＝1:1	about 50%
ON:OFF＝1:3	about 35%

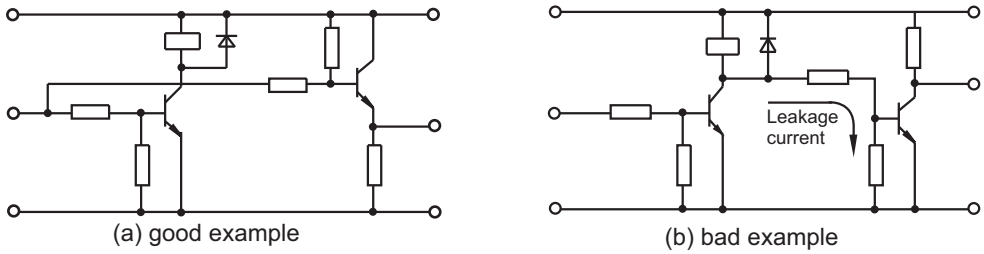
2.4.2 Pick-up Voltage Change Due To Coil Temperature Rise

The temperature rise causes the increase of the coil resistance and correspondently the pick-up voltage will increase. the resistance temperature coefficiency of the copper wire is about 0.4% per 1˚C . with this ratio, the coil resistance increases. Pick-up, release and reset voltages in the instructions are all the values in 23˚C .

When the coil temperature is beyond 23˚C, pick-up voltage surpasses sometimes the speculated value in the catalogue. Please check in the practical application.

2.5 Leakage Current

When designing the circuit, please avoid the leakage current flowing through the relay when the relay does not work.



(a) good example (b) bad example

Figure 11

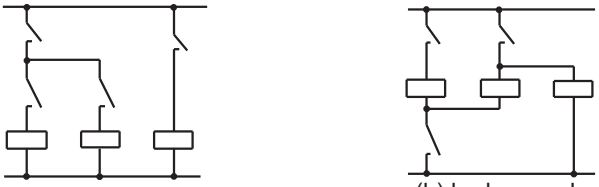
2.6 Energized Voltage Of The Coil And Operation Time

In the case of AC operation, there is extensive variation in operate time according to the difference of the phase when the coil is applied with the voltage.

In the case of the DC operation, although the voltage applied to the coil increases and operate time of the relay will properly become rapid, the contact bounce time when the contacts closes is extended to cause the reduction of the life or the contacts welding when they work in the rated load or in the large inrush current.

2.7 The Application Of The Relays Connected In Parallel And In Series.

Several relays connected in parallel, please take care of the wrong operation for the bypass current and leakage current shown as figure 12.



(a) good example (b) bad example

Figure 12

2.8 Avoid Gradual Increase Of Coil Impressed Voltage

In the course of the operation, the relay experiences such phases as contact pressure changing, contact bounce and the unstable condition of the contacts. When gradual increase of coil impressed voltage happens, the time of the unstable phase becomes longer to affect the life of the relay.

In order to reduce the influence on the relay, please impress bypass voltage to the coil, to the extent that it is possible.

2.9 Precaution For The Long Power Wire

If the power wire is longer, please select the relay according to the principles of impressing the rated voltage after testing the coil voltage of the relay.

If paralleled with the power line and long distance, when the supply power of the coil is switched, the voltage at the terminals of the coil will be generated due to the capacitance stored in the wire and then result in the release worse. In this case, Please connect the bypass resistor at the two ends of the coil.

2.10 Long Term Current Carrying

If the coil is continuously applied the power to for a long term, the self heating of the coil promotes the aging of the insulation materials of the coil and the worse characteristics, so in this case please use the latching relay. If the monostable relay must be used, please use the hermetic relay which is not easily influenced by the external environments and also use the suitably protective circuit to prevent the loss due to the contact failure or the break of the coil wire.

2.11 Low ON-OFF Frequency

When the ON-OFF frequency is below once per month, please periodically check the states of the contacts. If the contacts keep the non ON-OFF state for a long time,the organic film will be formed on the surface of the contacts and result in the contact failure.

2.12 Electrolytic Corrosion Of Coils

When the relays are placed in high temperature and high humidity atmospheres or with continuous passage of current, that the coil is grounded will make the coil electrolytic errosion to cause the break of the electro-magnetic wires. Therefore please do not make the coil grounded to the extent that it is possible. In the case where unavoidably the coil is grounded, please set the control switch of the relay coil in the positive side of the coil.

2.13 Precaution For The Coil Of The Magnetic Latching Relays

2.13.1 The Coil Voltage

Please check whether the direction of coil impressed voltage is correct or not, or the relay may not work.
Due to the characteristics of the magnetic latching relays, to prevent the relay against overheating and then burning.the long-term impressed voltage on the coil are not allowable.

2.13.2 Self-locking Of The Relays

Please avoid using the NC contacts of the relay itself to switch off its own coil. Otherwise the failure will happen

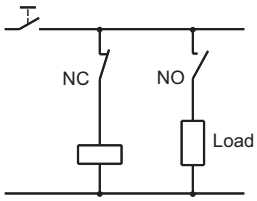


Figure 13

2.13.3 Precautions For Using The Relays Connected In Parallel

When the coil of the latching relay is connected in parallel with the coil and the solenoid of other relays, please add diode to prevent the reverse voltage from influencing the normal work of the relay.

2.13.4 Width Of Minimum Impulse In Operating And Resetting

In order to make the latching relay operate or reset, please impress the rectangle rated voltage for more than 5 times at the operate time or the reset time on the coil and then operate it. If the impulse width can not meet the requirements above, please check in the actual application.
Please avoid using in the conditions that the power source has many surges.

2.13.5 Precautions For The Double-Coil Relay

Do not impress the voltage on the set coil and reset coil at the same time, or the relay will abnormally heat, abnormally operate and even abnormally wear.
As shown in figure 14, when the terminals of either of operate coil and reset coil in the circuit are required to connect and the other terminals are connected to the same polarity of the power source, Please directly connect the terminals to connect (short circuit) and then connect to the power source. Thus the insulation between the coils can be maintained well.

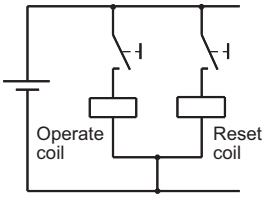


Figure 14

2.13.6 The Drive Circuit Of The Latching Single-Coil Relay

As shown in figure 15, it is one of the drive circuits of the latching single-coil relay. When the signals are input, the current charges the capacitance C and in turn charges the coil and then make the relay operate; when the signals are removed, the electric power stored in the capacitance C will discharge through trinode Tr and the coil and make the relay reset.

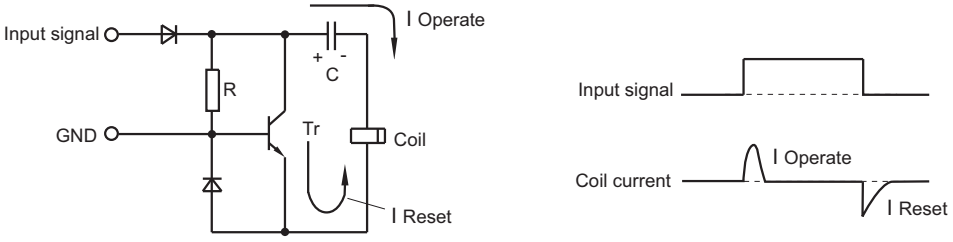


Figure 15

3. Performance

3.1 Precautions For Plastic Sealed Relays

Hermetic relays can resist under bad surrounding. However, please pay attention to the following precautions in application to avoid the failure.

3.1.1. Regarding Practical Environment

Plastic sealed relays are not suitable for using in the environment which has the special requirement for the air seal. Please avoid using them in the pressure exceeding 86kPa to 106kPa.

3.1.2. Regarding washing

When washing PC board after the terminals soldered on PC board, suggest that the washing can be done by washing solvent of alcohol series.

Please avoid supersonic washing for supersonic washing may cause the break of the coil wire and the light contact welding.

3.2 Vibration And Shock

The transient break of the contacts when the relays are shocked strongly, will lead to the false operation. Therefore, when the relays are mounted on the same board with other parts (such as electromagnetic switch, air switch et.)which can produce the shock, the measures of reducing the influence of the shock on the relay should be taken. For example, make the direction of the shock and direction of relay contacts make/break at the right angles to the moving direction of armature, or to mount these components on different boards, or using a buffer tablet, or to take some measures in the application circuit to reduce the impact of false operation of relay contacts (as illustrated by figure 16):

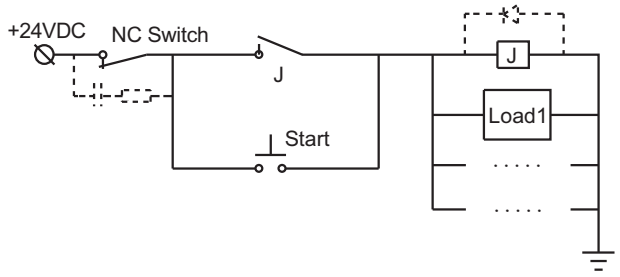


Figure 16

Remarks: in the above figure, a RC is parallel connected to NC switch, and a FWD is parallel connected to relay coil. This measure can avoid the abnormal cut-off of the circuit caused by the abrupt break of NC switch under strong shock and vibration.

In addition, for the relay in the vibration atmosphere in the long term (such as electrical car), please avoid combining with the socked in application. Suggest that the relay be directly soldered on the PC board.

3.3 The Influence Of External Magnetic Fields

If there is the strong magnetic fields around the relay, if the relay is mounted beside the large relay, transformer or the speaker, the characteristics will produce the false operation with the variation of the external magnetic fields, especially for polarized relays. Because the operation of the relay is dependent on the internal permanent magnet, it is easily influenced by the external magnetic fields. Please pay attention to the mounting position in practical application and check.

3.4 Vibration, Shock And Weight During Shipping

During shipping the relay or the equipment with the relay installed, the large vibration, shock and weight will cause the failure of the relay functions. Please use the cushion package to control the vibration and shock within the allowable range.

4. Environments

4.1 Regarding Ambient Temperature And Atmosphere

Care is taken that the ambient temperature at the installation does not exceed the value listed in the instructions. In addition, the contact surface will form sulfured film, oxide film or attached dust in an atmosphere with dust, moisture and sulfur gases (SO_2, H_2S etc.) or organic gases to cause the unstable contact and the failure of the contacts. Therefore please select sealed relays. If the plastic sealed relay is selected, it is required to check in application.

4.2 The Harmful Gases To The Relay

Please do not use the relay in the atmosphere with the following gases. In these atmospheres, plastic sealed relays can not avoid the influence of gases on the contacts. Please use the hermetic relays.

4.2.1 Silicon Atmosphere

Silicon-based substances (silicon rubber, silicon oil, silicon-based coating material and silicon caulking compound etc.) around the relay will emit volatile silicon gas, which may cause the silicon to adhere to the contacts and may result in contact failure.

4.2.2 Sulfureted Gas

Sulfured gases easily sulfur the contacts and result in the contact failure or non-conduction.

4.2.3 NO_x Gas

When a relay is used in an atmosphere high in humidity to switch a load which easily produces an arc, the NO_x created by the arc and the water absorbed from outside the relay combine to produce nitric acid. This corrodes the internal metal parts and adversely affects operation. Please do not use the relay in the atmosphere where the humidity is beyond 85%RH (at 20˚C).

4.3 The Circumstance With Water, Leechdom, Solvent And Oil

Do not use and store the relays in the atmosphere where the relays may be attached to by water, leechdom, solvent and oil etc. for water and leechdom may make the parts rusted, the plastics aging and also result in leakage current which damages the relays or the circuit and solvent and oil may make the marks disappearing or the parts aging. For covers made from PC materials, please prevent from contamination by some organic solvents; otherwise it is likely to lead to bulging or crack.

4.4 Atmosphere Of Usage, Storage And Transport

During usage, storage and transportation, avoid locations subject to direct sunlight and maintain normal temperature, humidity and pressure conditions. The allowable range of the temperature and humidity suitable for usage, storage and transportation are shown in the unshaded part in figure 17. The allowable temperature may differ with the types of the relays. In case that the condition in real application is different from that of IEC 61810-1, UL508, UL60947-4-1, GB/T21711.1, etc. the electrical endurance of the relay must be confirmed by tests.

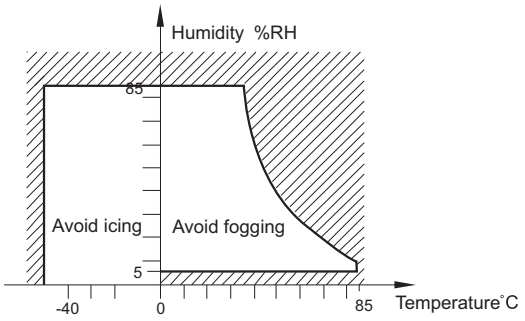


Figure 17

The suggested ranges of the temperature and humidity during usage, transportation and storage are as follows.

1) temperature: 0˚C to 40˚C
2) humidity: 5%RH to 85%RH
3) air pressure: 86kPa to 106kPa.

4.4.1 The Atmosphere High In Humidity

In the atmosphere high in humidity, when the temperature around sharply changes, the dew will be formed in the internal of the relay and result in the cracking of the insulation material, the break of the coil wire and the rust. The typical examples will happen on the ship transporting on the sea.

Dewing is a phenomena that the vapor freezes water drops in the atmosphere high in temperature when the temperature sharply reduces from the high temperature to the low temperature or the relay is moved in the high temperature from the low temperature

4.4.2 Low Temperature (under 0˚C) Environment

Please note the icing phenomena in the environment with low temperature (under 0˚C). Icing may result in the welding of the movable parts, the delay of the operation or preventing the operation etc.

Icing refer to the phenomena that water attached to the relay will freeze ice when the temperature reducing below freezing point.

4.4.3 Low Temperature , Low Humidity Environment

Note that the plastics may embrittle in low temperature, low humidity environment.

4.4.4 High Temperature, High Humidity Environment

Note that if the relay is in high temperature, high humidity environment for a long time the contact surface easily forms the oxidized film and then results in the unstable contact and the failure of the contacts. Other metal parts also are easily oxidized or rusted to result in the failure of the functions

4.4.5 SMT Environment

The relay of SMT type is sensitive to the humidity so they are packed with humidity proof package. The following points should be considered during storage.

1) Please use the humidity proof packing bags as soon as possible after they are unsealed.

2) If the humidity proof packing bags need long term storage after they are unsealed, it is suggested that the desiccator with humidity control be used to store them.

5. Outline And Mounting

5.1 Top View And Bottom View

Generally the bottom view is the projection whose projection plane is terminal side. Otherwise, the top view is the projection whose projection plane is cover side. Please take care of it when using the instructions or mounting the relays.

5.2 Mounting Direction

Unless otherwise stated, mounting direction of the relays is arbitrary. In order that the relay can work more stable and reliable, mounting direction need cosidering.

5.2.1 Vibration Resistance And Shock Resistance

It is ideal to mount the relay so that the movement of the contacts and movable parts is perpendicular to the direction of vibration or shock. Especially when the coil is not excited, the vibration or shock resistance of NC contacts is weak. If mounting direction is proper, their functions can be ensured.(figure 18)

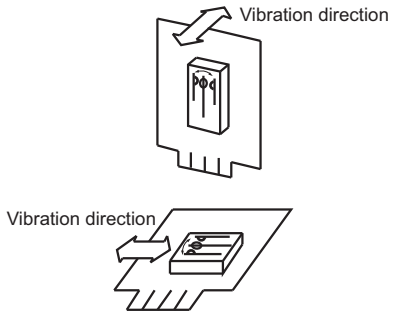


Figure 18

5.2.2 Contact Reliability

Mounting the relay so the surfaces of its contacts are vertical prevents dirt and dust as well as scattered contact material and powdered metal from adhering to them when the arc is generated.

5.3 Adjacent Mounting

When many relays are mounted close together, abnormally high temperatures may result from the combined heat generated. To prevent the heat buildup, please mount relays with sufficient spacing between them.

When many boards mounted with relays are installed in a card rack, please be sure that the ambient temperature of the relay does not exceed the value listed in the instructions.

5.4 Shroud Mounting

Use the gaskets when mounting to prevent from the damages and deforms. Keep the screwing moment in the range of 0.49 to 0.686N • m (5 to 7kgf·cm. To prevent from loosening, please use the spring gasket).

5.5 Mounting The Plug-In Terminals

When mounting the relay with plug-in terminals, the plug-in strength is based on 40N to 70N (4kgf to 7kgf).

5.6 Supersonic Cleaning

Do not clean the relay by the way supersonic cleaning, for the supersonic will result in the contact welding and the break of the coil wire.

5.7 Mounting And Soldering Of THT Relays

The mounting and soldering of the THT relay can be divided into the following steps.(figure 19)

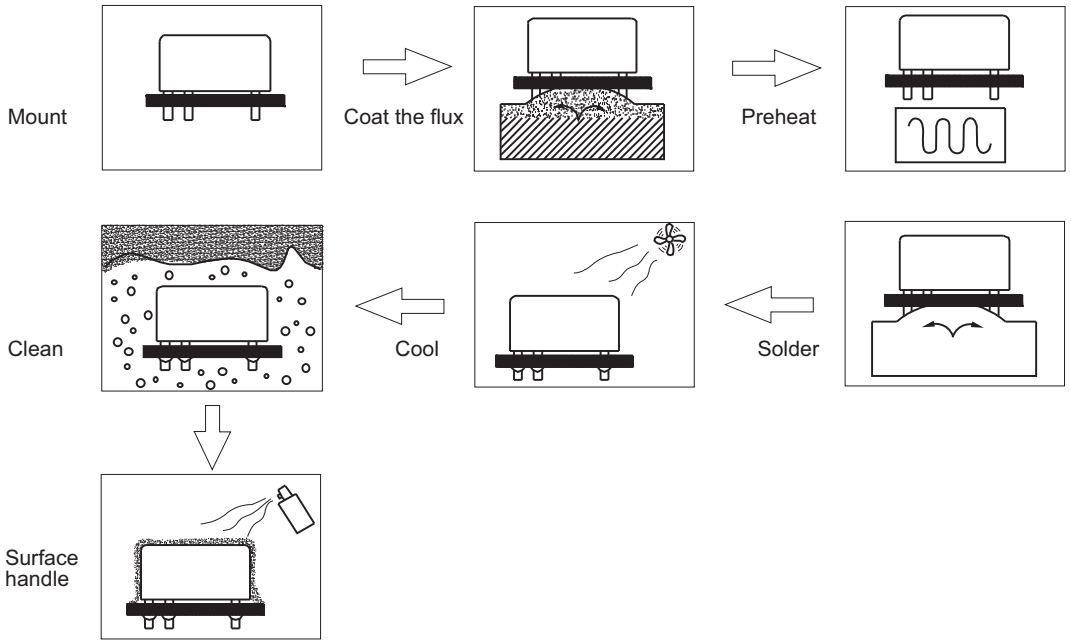


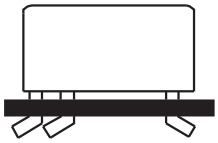
Figure 19

In the following the considered points are described when THT relay is soldered on the PC board. Please refer to them in application.

Note that if the solder entered the relay due to the carelessness, the functions of relay will be destroyed. There will be such problems as the relay not be suitable for the automatic soldering or cleaning due to the different protective constructions. Please see the details in the constructions and characteristics in 3.1 pattern of encapsulation in Chapter 2.

5.7.1 Mounting

Do not bend the terminals of the relay(figure 20) for it may destroy the initial performances of the relay.
Please correctly process the PC board according to the mounting hole drawing in the instructions.
Please maintain the balance of the relay.
Please note that the set force of the hook for mounting is too much large to result in the internal failure of the relay.



Bad example

Figure 20

5.7.2 Coating Flux

Please use the rosin flux which is not corrosive and the alcohol solvent which is less chemistry.
Please use the thin and even coating flux to prevent from penetrating the relay. As for the dipping coating, please keep the surface of the flux stable.
Please adjust the places to ensure that the flux will not overflow through the surface of PCB.
Please do not make the flux attached to the parts of the relay except for the terminals. Otherwise the insulation of the relays will be reduced.
For the dust protected relays and flux proofed relays, do not use the coating method of pushing deeply PCB from the above into the sponge absorbing the flux, as shown in figure 21.This will make the flux penetrating the relay, especially for the dust protective type.

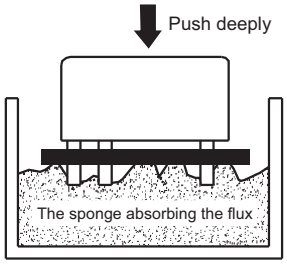


Figure 21

5.7.3 Preheating

In order to improve the soldering performance, please preheat without failure.
Please preheat under 100˚C(the soldered surface of the PC board) within 1 minute.
Do not use the relays which are placed in the high temperature for a long time due to the set failure for their initial performance may have changed.

5.7.4 Soldering

Precautions for soldering seen in table 14.

Table 14

Automatic Soldering	Manual Soldering
● To maintain the soldering stable, the suggested soldering method is wave solder. ● Adjust the height of flux liquid level to make them not overflow the PCB. ● Please do it according to following suggested conditions. Soldering temperature: 260˚C±5˚C (Applicable to Power relays) Soldering temperature: 250˚C±5˚C (Applicable to Signal relays) Soldering time: within 5s.	● Please sufficiently clean the head of searing-iron with fluxing to make the surface of it smooth. ● Please do it according to the following suggested conditions. Searing-iron: 30W or 60W The temperature of the head of searing-iron: 280˚C or 300˚C Soldering time: within 3s Use the solder with rosin fluxing.

Remarks:1.The preheating and soldering temperature and time for automatic soldering should be reduced as low as possible to avoid any change in relay performance due to excessively high temperature or too long time preheating or soldering.
2. It is normal if some relay covers become slightly bulging under right soldering conditions.
3. In the process of manual soldering it is prohibited to press or pull the relay terminals because such doing will lead to changes in product performance or even relay failures.

5.7.5 **Cooling**

After automatic soldering, please ventilate and cool them to avoid the aging of the relay or its parts caused by the heat generated when the relay soldered.
Although the sealed relay can be cleaned, it is not cleaned for the sudden connection with the cool solvent may damage the hermetic characteristics of the relay.

5.7.6 **Cleaning**

Please select the cleaning method in table 15 when cleaning.

Table 15

Dust Protected Type	Flux Proofed Type	Plastic Sealed Type
● Hot cleaning or soap cleaning not allowable ● Scrub the welding surface of PCB		● Washable in limited condition. ● Use the alcohol solvent or water. ● The temperature for cleaning is under 40˚C. ● Do not do supersonic cleaning or truncate the terminals of the relays, or the break of the coil wire and the contact welding will happen.

Due to different soldering condition, sealed relays can be impaired when mounting on PCB. If cleaning is necessary after soldering, it is recommended to solder under the condition provided by HF and to select special sealed relays (customer code: 310).

Avoid cleaning with Freon, Trichloroethane, diluent or gasoline.

5.7.7 Surface Handling

In order to prevent the insulation of PCB from worsening, Please note the following precautions when surface handling.
The dust protected type and the flux proofed type result in the failure due to the surface handling agents penetrating the relay. Therefore please do not do the surface handling or mount the relay after surface handling.
Due to the bad influence of the surface handling agents on the relay eg.melting the cover, please select carefully and check and test in application.
Spraying and brushing processes are recommended for surface treatment, and dip-coating is prohibited. Surface treatment agent should best be room-temperature liquid agent, which should be sprayed when the relay is cooled down to room-temperature. The agent can be dried naturally or under constant temperature which should not exceed 60oC. Meanwhile, the drying temperature is not allowed to be decreased when the agent is not completely dried, otherwise the agent could be absorbed into the relay and thus lead to relay failure.
Please contact us when special surface treatments processes are used so that we can provide you a suitable product.
There are the following suggestions on the coat, as shown in table 16.

Table 16

Type Of The Coat	Plastic Sealed Relay
Epoxy resin	Allowable
Polyurethane	Allowable
Silicon	Not allowable
Fluorin	Allowable

5.8 Mounting And Soldering Of SMT Relays.

The mounting and soldering of SMT relays have the following steps, as shown in figure 22. In the following the considered points are listed when the SMT relays are soldered on PCB.

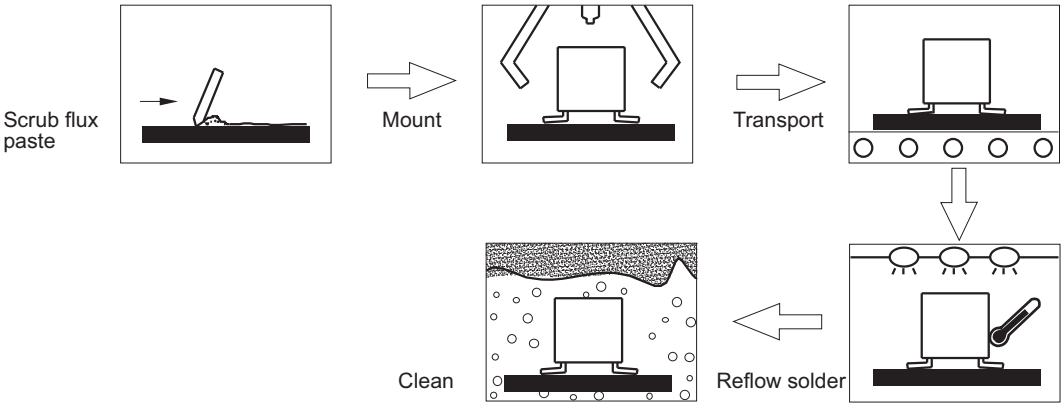


Figure 22

Please refer to these in application. Note that the relays are not damaged in processing.

5.8.1 Scrub Flux Paste

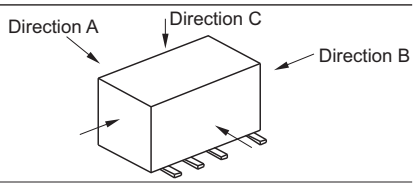
Please use the rosin and chlorin-free flux paste for chlorin may erode the terminals and circuit panel. Flux paste should be coated evenly and the thickness is 0.15mm or 0.2mm.

5.8.2 Mounting

When mounting the relays, do not set the conservative force of the finger within the range specified in table 17, unless otherwise stated in the catalogue.

Table 17

Direction	Maintaining Force
Birection A	Below 1.96N
Birection B	Below 4.9N
Birection C	Below 1.96N



5.8.3 Transportation

During the transport, the relays will not fall off due to the factors such as the shock and vibration to avoid the bad soldering produced thereby.

5.8.4 Reflow Solder

Figure 23 shows the temperature curve of the PCB surface when the infrared ray are used to reflow solder. Please consult the specification of the relays due to the different characteristics of the different relays. If there is no statement in the instructions, Please use the temperature curve as shown in the following figure.

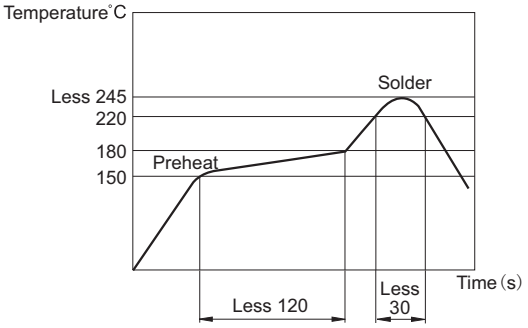


Figure 23

When just finishing soldering, please do not clean the relay immediately, for the connection with the cool solvent may damage the hermetic characteristics of the internal parts.
Do not dip the relay in the flux groove for it will deform the plastics and then result in the failure of the relays.
Please see the soldered state in figure 24.

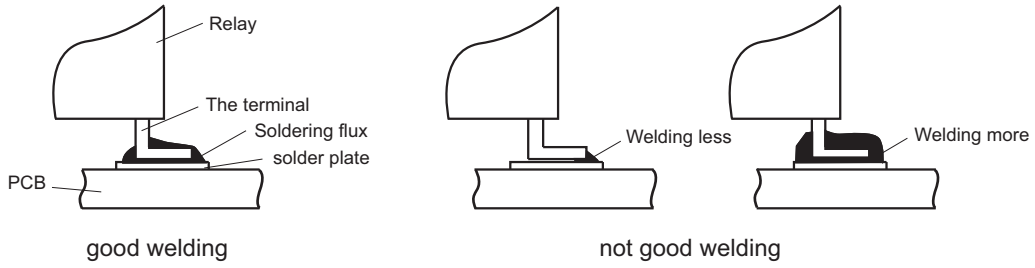


Figure 24

5.8.5 Cleaning

Hot cleaning or soap cleaning can be used and the cleaning temperature should be controlled under 40˚C.
Please use the alcohol solvent or water to clean and do not use Freon, thinner or gasoline to clean.
Do not use supersonic to clean, or the break of the coil wire and the contact welding will be resulted in.
Improper welding will decrease the relay sealing, so please do not clean the relay or do the surface treating (soaking prtector).

6. Other Precautions

6.1 Precautions For The Safety

When the relay works, do not touch the relay with hands for there is the danger of getting the electric shock.
Please switch off the power when mounting, maintaining and handling the relays (including the connecting parts such as terminals and sockets).
When connecting the terminals, firstly refer to the wiring diagram in the instructions, and then make correct connection. The false connection may result in the unexpected false operation, abnormal heating or fire.
If the contact welding, the failure of the contact or the break of the coil wire happens, other properties or lives will be threatened. Please use the double mounting sets.

6.2 Tube Packaging

When packing the relay by the tube, do not shake the tube to shock the relays, for which will result in the failure of the relays. If the package uses the stop plug, be sure to slide the stopper plug to hold the remaining relays firmly together so they would not move in the tube.

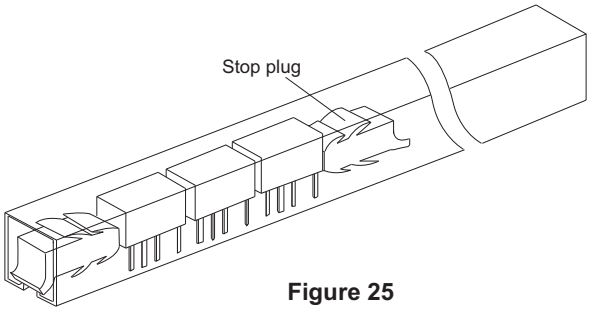


Figure 25

CHAPTER 4 QUICK ZOOM TABLE FOR REASONS FOR FAILURE

Some common failure phenomena, failure modes, and the reasons. See table 18:

Table 18

Failure Phenomena	Failure Mode	Failure Reason
Non-operation	No current at the terminals of the coil	● Breaking circuit ● Worse connected or short circuit ● Terminal welded worse
	Insufficient voltage in the circuit	● Insufficient voltage supply ● Power circuit too long ● the voltage of the chosen relay too high
	Circuit unconnected	● Welded worse ● Coil breaking
	Relay failure	● Drop, bumpped badly ● Contact failure
	Voltage polarity of the polarized relay is wrong	● Bumped during the transportation ● circuit connected badly
No Release	Surplus voltage too high	● Energy storage component's influence ● Leakage current or bypass current ● Surplus voltage of the semiconductor too high
	Relay failure	● Drop, bumped badly ● contact failure
Unsteady Operation	Unsteady power	● PARD(periodic and random deviation) ● Insufficient voltage ● Resistor beyond the tolerance
	Unsteady parameter	● Drop or bumped badly ● Short form among the coils
	False operation of the relay	● Something wrong with the control procedure ● The vibration excessively strong in application
NC/NO Contact Welding	Current excessively high	● Load excessively high ● Surge current too high
	Contact Moving abnormally	● External vibration excessively strong ● AC relay's unstable operation; with buzz ● Unstable operation
NC/NO Contact Welding	Operation frequency excessively high	
	Ambient temperature excessively high	
	Use beyond the life	
NC/NO Contact Not Closed	Contact resistance too high	● Weld worse ● Contamination in the contact ● Bad using environment, contact oxidizing or sulphidizing
	No current in the contacts surface	● Load circuit break ● Circuit connected worse or short circuit ● Terminal welded worse
	Use beyond the life	

Notes: when failure happens, if there's any question, please contact us.

CHAPTER 5 ORDERING EXAMPLE

Ordering code contains the basic information of the relays. Table 19 is an ordering example of a typical Hongfa product. Please refer to the datasheet of each product for part no. selection.

Table 19

	HF10FF /	012	A	-2Z	D	T	G	(XXX)
Type								
Coil voltage	**DC:** 6, 12, 24, 48, 60, 100, 110V **AC:** 6, 12, 24, 48, 110/120, 220/230V							
Coil voltage form			**A:** AC		**D:** DC			
Contact arrangement				**2Z:** 2 Form C **3Z:** 3 Form C **3Z-1:** 3 Form C (Different Wiring Diagram)				
LED					**D:** With LED	**Nil:** Without LED		
Contact material						**T:** $AgSnO_2$	**Nil:** AgCdO	
Contact plating							**G:** Gold plated	**Nil:** No gold plated
Customer special code								