Miniature Intermediate Power Relay	SH

Features

- 12/16A switching capability
- 5kV dielectric strength (between coil and contacts)
- 1.5mm/2.0mm contact gab available
- UL insulation system: Class F
- Socket available

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(File No.:E134581)

1. COIL DATA (at 23°C)

1) Standard (1.5mm Contact Gap)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.3	3.3	266.7	11.3 x (1±10%)	800
5	3.75	0.5	5.5	160	31 x (1±10%)	
6	4.50	0.6	6.6	133.3	45 x (1±10%)	
9	6.75	0.9	9.9	88.9	101 x (1±10%)	
12	9.00	1.2	13.2	66.7	180 x (1±10%)	
15	11.25	1.5	16.5	53.3	280 x (1±10%)	
18	13.50	1.8	19.8	44.4	405 x (1±10%)	
24	18	2.4	26.4	33.3	720 x (1±10%)	
36	27	3.6	39.6	22.2	1620 x (1±10%)	
48	36	4.8	52.8	16.7	2880 x (1±10%)	
60	45	6	66	13.3	4500 x (1±10%)	
110	82.5	11	121	7.27	15100 x (1±10%)	

2) Standard (2.0mm Contact Gap)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.3	3.3	466.7	6 x (1±10%)	1400
5	3.75	0.5	5.5	280	18 x (1±10%)	
6	4.50	0.6	6.6	233.3	26 x (1±10%)	
9	6.75	0.9	9.9	155.6	58 x (1±10%)	
12	9.00	1.2	13.2	116.7	102 x (1±10%)	
15	11.25	1.5	16.5	93.3	160 x (1±10%)	
18	13.5	1.8	19.8	77.8	230 x (1±10%)	
24	18	2.4	26.4	58.3	410 x (1±10%)	
36	27	3.6	39.6	38.9	925 x (1±10%)	
48	36	4.8	52.8	29.2	1650 x (1±10%)	
60	45	6	66	23.3	2570 x (1±10%)	
110	82.5	11	121	12.7	8068 x (1±10%)	

3) High Capacity (1.5mm Contact Gap)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.4	0.15	3.3	266.7	11.3 x (1±10%)	800
5	4.0	0.25	5.5	160	31 x (1±10%)	
6	4.8	0.30	6.6	133.3	45 x (1±10%)	
9	7.2	0.45	9.9	88.9	101 x (1±10%)	
12	9.6	0.60	13.2	66.7	180 x (1±10%)	
15	12.0	0.75	16.5	53.3	280 x (1±10%)	
18	14.4	0.90	19.8	44.4	405 x (1±10%)	
24	19.2	1.20	26.4	33.3	720 x (1±10%)	
36	28.8	1.80	39.6	22.2	1620 x (1±10%)	
48	38.4	2.40	52.8	16.7	2880 x (1±10%)	
60	48	3.00	66	13.3	4500 x (1±10%)	
110	88	5.50	121	7.27	15100 x (1±10%)	

4) High Capacity (2.0mm Contact Gap)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.4	0.15	3.3	466.7	6 x (1±10%)	1400
5	4.0	0.25	5.5	280	18 x (1±10%)	
6	4.8	0.30	6.6	233.3	26 x (1±10%)	
9	7.2	0.45	9.9	155.6	58 x (1±10%)	
12	9.6	0.60	13.2	116.7	102 x (1±10%)	
15	12.0	0.75	16.5	93.3	160 x (1±10%)	
18	14.4	0.90	19.8	77.8	230 x (1±10%)	
24	19.2	1.20	26.4	58.3	410 x (1±10%)	
36	28.8	1.80	39.6	38.9	925 x (1±10%)	
48	38.4	2.40	52.8	29.2	1650 x (1±10%)	
60	48	3.00	66	23.3	2570 x (1±10%)	
110	88	5.50	121	12.7	8068 x (1±10%)	

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

2) The maximum allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) In order to meet the stated product performance, please apply rated voltage to coil.

4) For the CO version whose contact gap is 1.5mm/2.0mm, the operation voltage ≤85% of rated voltage, the coil resistance tolerance is (1±15%).

2. CONTACT DATA

Contact Ratings		Standard	High Capacity
Contact Arrangement		2 Form A, 2 Form C	
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings (Resistive Load)		12A/10A 250VAC 8A 30VDC	16A 250VAC
Max. Switching Voltage		250VAC / 30VDC	250VAC
Max. Switching Current		12A	16A
Max. Switching Power		3000VA / 360W	4000VA
Life Expectancy	Electrical	NO: 30,000 operations NC: 10,000 operations	(1.5mm) NO: 30,000 operations NC: 10,000 operations (2.0mm) NO: 30,000 operations NC: 6,000 operations
	Mechanical	(1.5mm) 500,000 operations (2.0mm) 300,000 operations	100,000 operations

Notes:

1) The data shown above are initial values

2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

3) The ambient temperature of the relay is -40℃ ~ 75℃;

(When used at 75℃ ~ 85℃, step down maintenance is required: applying rated voltage for 200ms firstly to ensure stable connection, then reduce to and maintain 45-65% of rated voltage)

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	2500VAC 1min
	Coil and Contacts	5000VAC 1min
	Contacts sets	3000VAC 1min
Surge Voltage (between coil and contacts)		10kV (1.2/50μs)
Operate Time (at nominal voltage)		20ms max.
Release Time (at nominal voltage)		5ms max. (Standard) 15ms max. (High capacity)
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 19g
Outline Dimension (L x W x H)		29.0 x 12.7 x 26.0mm

Note: The data shown above are initial values

4. SAFETY APPROVAL RATINGS

Safety Standard	Contact Ratings	Contact Rating
UL/cUL	Standard type	12A 250VAC resistive load at 85℃ 1/3HP 125VAC NO/NC at 40℃ 3/4HP 250/240VAC NO at 40℃ TV-5, 125VAC at 40℃
	High capacity type	16A 250VAC resistive load at 85℃ 1/3HP 125VAC NO/NC at 40℃ 3/4HP 250/240VAC NO at 40℃ TV-5, 125VAC at 40℃

Notes: 1) All values unspecified are at room temperature

2) Only typical loads are listed above. Other load specifications can be available upon request.

5. ORDERING INFORMATION

SH ①	22 ②	-	E ③	D12 ④	S ⑤	A ⑥	G ⑦	F ⑧

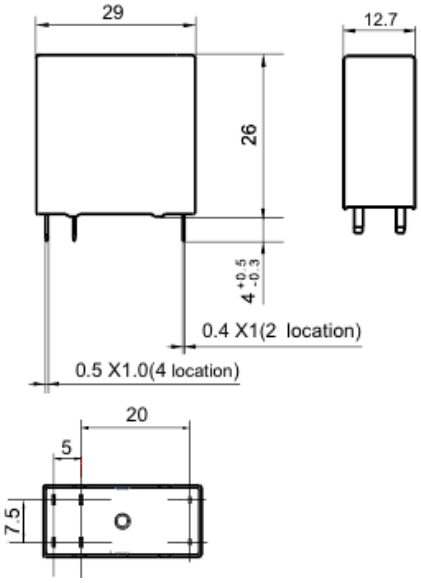
① Relay Model	SH
② Contact Arrangement	22: 2 Form A (DPST-NO) 2: 2 Form C (DPDT)
③ Contact Rating	H: 10/12A (Standard) E: 16A (High Capacity)
④ Coil Voltage	D3=3VDC, D5=5VDC, D6=6VDC, D9=9VDC, D12=12VDC, D15=15VDC, D18=18VDC, D24=24VDC, D36=36VDC, D48=48VDC, D60=60VDC, D110=110VDC
⑤ Construction	S: Sealed Type
⑥ Contact Gap	Nil: 1.5mm W: 2.0mm
⑦ Contact Plating	Nil: No gold plated G: Gold plated
⑧ Insulation Standard	Nil: Class B F: Class F

6. DIMENSIONS (Unit: mm)

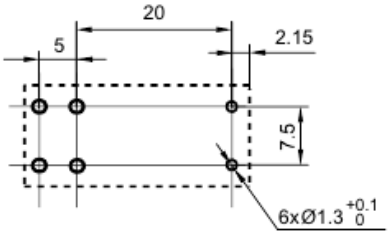
Outline Dimensions

1) Standard Type (10/12A)

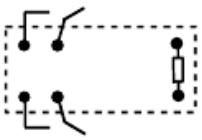
2 Form A



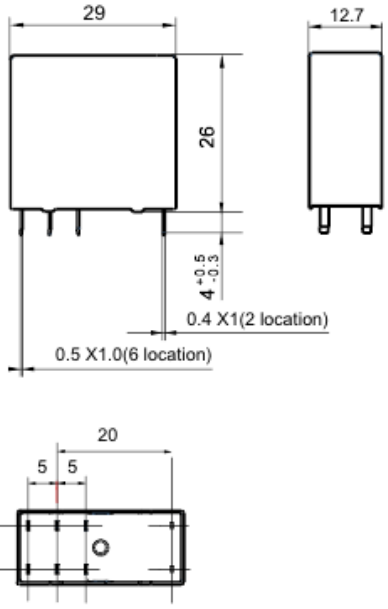
PCB Layout (Bottom View)



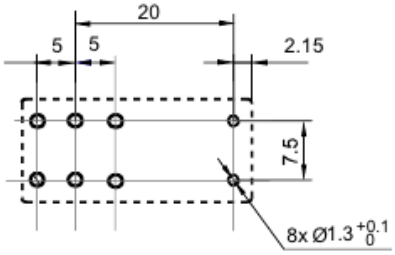
Wiring Diagram (Bottom View)



2 Form C



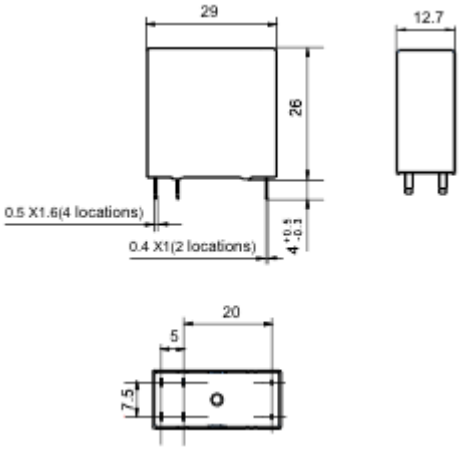
PCB Layout (Bottom View)



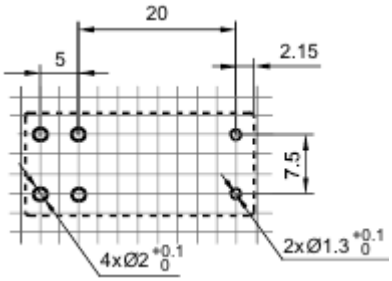
Wiring Diagram (Bottom View)

2) High Capacity Type (16A)

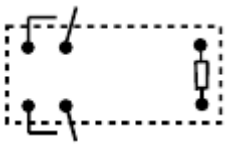
2 Form A



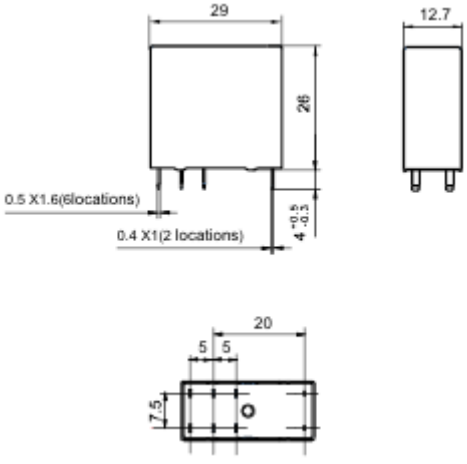
PCB Layout (Bottom View)



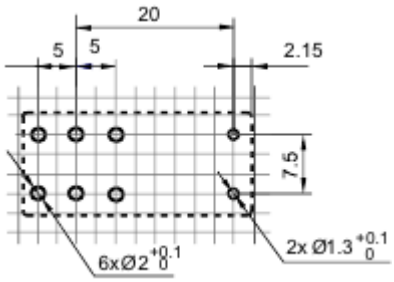
Wiring Diagram (Bottom View)



2 Form C



PCB Layout (Bottom View)



Wiring Diagram (Bottom View)

Remark: 1) The pin dimension of the product outline drawing is the size before tinning (It will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design can be mapped and adjusted according to the actual product.

2) 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.

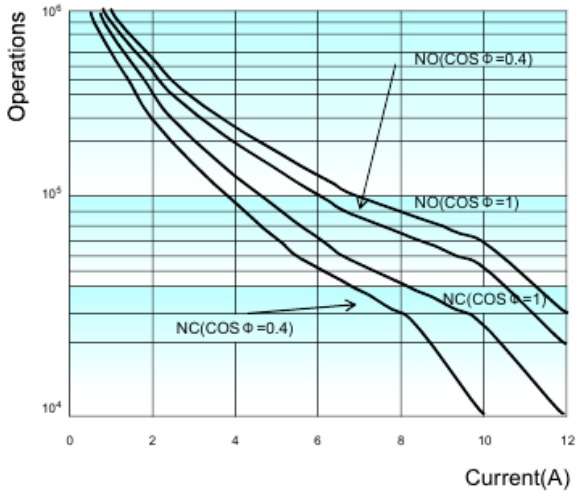
3) The tolerance without indicating for PCB layout is always ±0.1mm.

4) The width of the gridding is 2.54mm.

Electrical Durability Wiring Diagram (High Capacity)

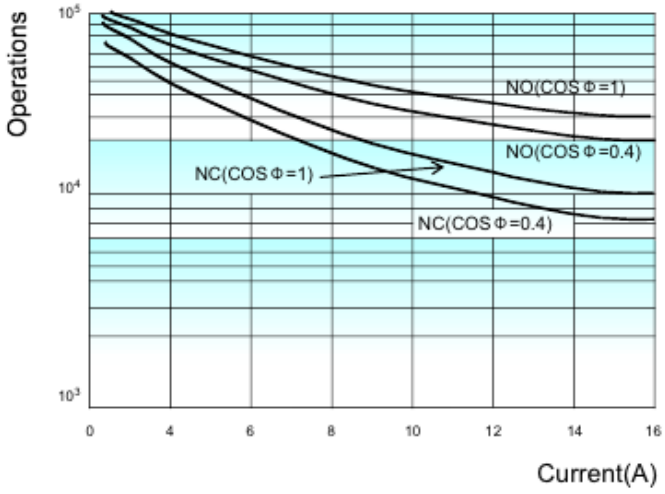
7. CHARACTERISTIC CURVES

Endurance Curve (Standard type)



250VAC resistive load/switching current

Endurance Curve (High capacity type)



250VAC resistive load/switching current