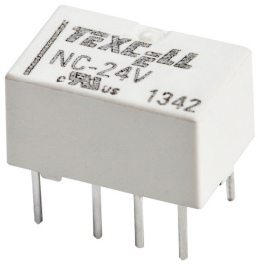
Subminiature Signal Relay	NC

Features

- Surge withstand voltage up to 2500V
- Meets EC62368-1
- Providing J-leg SMT version for intensive installation
- High temperature resistant products at 105℃ are available
- High contact capacity 2A 30VDC
- Products compliant with IEC60079 available
- Products compliant with IEC60335-1 available
- Monostable sensitive type with 100mW coil power is available
- Low halogen products conforming to IEC 61249-2-21 are available
- Single side stable and latching type available



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(File No.:E122258)

1. COIL DATA (at 23°C)

1) Single side stable and Standard type

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)
1.5	1.13	0.15	3.0	93.3	16 x (1±10%)	140
2.4	1.80	0.24	4.8	58.3	41 x (1±10%)	
3	2.25	0.30	6	46.7	64.3 x (1±10%)	
4.5	3.38	0.45	9	31.1	145 x (1±10%)	
5	3.75	0.5	10	28.0	178 x (1±10%)	
6	4.50	0.6	12	23.3	257 x (1±10%)	
9	6.75	0.9	18	15.6	579 x (1±10%)	
12	9	1.2	24	11.7	1028 x (1±10%)	
24	18	2.4	48	8.33	2880 x (1±10%)	200

2) Monostable sensitive type

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)
1.5	1.20	0.15	3.0	66.7	22.5 x (1±10%)	100
2.4	1.92	0.24	4.8	41.7	58 x (1±10%)	
3	2.40	0.30	6	33.3	90 x (1±10%)	
4.5	3.60	0.45	9	22.2	203 x (1±10%)	
5	4.00	0.5	10	20.0	250 x (1±10%)	
6	4.80	0.6	12	16.7	360 x (1±10%)	
9	7.20	0.9	18	11.1	810 x (1±10%)	
12	9.60	1.2	24	8.33	1440 x (1±10%)	
24	19.2	2.4	48	4.17	5760 x (1±10%)	

3) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	3.0	66.7	22.5 x (1±10%)	100
2.4	1.80	1.80	4.8	41.7	58 x (1±10%)	
3	2.25	2.25	6	33.3	90 x (1±10%)	
4.5	3.38	3.38	9	22.2	203 x (1±10%)	
5	3.75	3.75	10	20.0	250 x (1±10%)	
6	4.50	4.50	12	16.7	360 x (1±10%)	
9	6.75	6.75	18	11.1	810 x (1±10%)	
12	9	9	24	8.33	1440 x (1±10%)	
24	18	18	48	8.33	2880 x (1±10%)	200

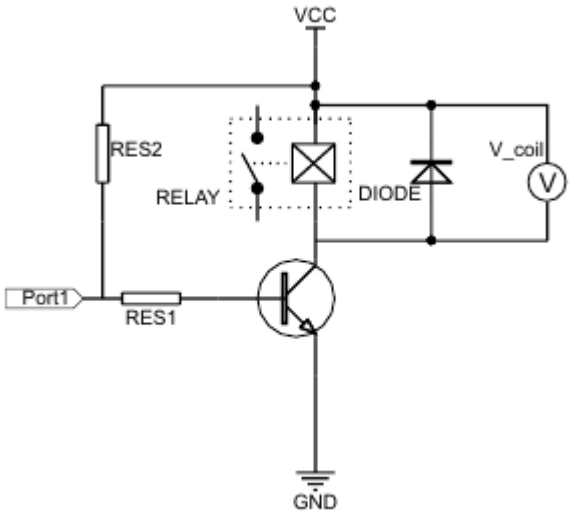
Note:

1) The data shown above are initial values.

2) To supply rated step voltage to coil is the foundation of relay proper operation.

Please make sure the applied voltage to the coil reach at rated values.

Please refer to the typical diagram below for single side stable relay. The “V_coil” is the rated voltage:



3) In case 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.

4) For monostable relays, if you need to drop down voltage and hold mode after reliably operating, make sure that the effective value of holding voltage is not less than 60% of the rated voltage.

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

6) When user’s requirements can’t be found in the above table, special order allowed.

7) During the relay pick-up or drop-out processes, there are stages of contact pressure change, contact vibration and unstable contact etc. When the voltage applied to coil is gradually changed. It will lengthen the unstable stage and affect relay endurance. To reduce this influence, please apply step voltage(switching circuit) to relay coil.

2. CONTACT DATA

Contact Arrangement		2 Form C
Contact Resistance[1)]		100mΩ max. (at 10mA 30mVDC)
Contact Material		AgNi + Au plated
Contact Ratings (Resistive load)		0.3A 125VAC / 1A 30VDC
Max. Switching Voltage		250VAC / 220VDC
Max. Switching Current		2A
Max. Switching Power		62.5VA / 60W
Min. applicable load[2)]		10mV 10μA
Life Expectancy[3)]	Electrical	100,000 operations (at 0.3A 125VAC)
	Mechanical	100,000,000 operations

Notes:

1) The data shown above are initial values.

2) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

3) Life expectancy data are collected in the NO or NC contact test.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1mm
	Coil and Contacts	1600VAC 1min
	Contact Sets	1800VAC 1min
Surge withstand voltage Between open contacts (10 x 160μs) Between coil & contacts (2 x 10μs)		1500VAC (FCC part 68) 2500VAC (Telecordia)
Operate Time (Set Time)		3ms max.
Release Time (Reset Time)		3ms max.
Temperature Rise		50K max. (at 1A load, 85℃ environment)
Temperature Range		-40℃ to 85℃ / -40℃ to 105℃[2)]
Vibration Resistance		10 ~ 55Hz 3.3mm DA
Shock Resistance	Functional	735m/s^2
	Destructive	980m/s^2
Humidity		5 ~ 85% RH
Termination		PCB (DIP, SMT)
Weight		Approx. 0.8g
Moisture sensitivity levels (Only for SMT type, JEDEC-STD-020)		MSL 3
Outline Dimension (L x W x H)		10.0 x 6.5 x 5.4mm

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

2) High temperature resistance products at 105℃ are available. If you need it, please contact us.

4. HIGH FREQUENCY

Frequency	100MHz
Insertion loss	0.04dB(Typ.)
Voltage standing wave ratio V.SWR	1.06(Typ.)
Isolation	43dB(Typ.)

Notes: 1) The characteristic impedance of the measuring system is 50Ω.

2) The data shown above are initial values.

3) If you need high frequency band, please contact us.

5. SAFETY APPROVAL

UL / cUL	1A 30VDC at 85℃ 2A 30VDC at 40℃ 0.5A 125VDC at 40℃ 0.3A 125VAC at 85℃

Notes: 1) All values unspecified are at room temperature

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

6. ORDERING INFORMATION

NC - 5V L1 S R ① ② ③ ④ ⑤	
① Relay Model	NC
② Coil Voltage	1.5V=1.5VDC, 2.4V=2.4VDC, 3V=3VDC, 4.5V=4.5VDC, 5V=5VDC,6V=6VDC, 9V=9VDC, 12V=12VDC, 24V=24VDC
③ Sort	Nil: Single side stable M: Monostable sensitive L1: 1 coil latching
④ Termination	Nil: DIP S: Standard SMT S1: Short terminal SMT J: J-legs SMT
⑤ Packing	Nil: Tube packing (only for DIP type) R: Tape & reel packing (only for SMT type)

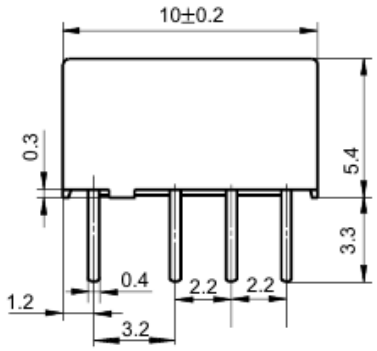
Note: R type (Tape and reel) packing is moisture-proof which meets requirement of MSL-3. Please choose R type packing for SMT products.
For R type, the letter “R” will only printed on packing tag but not on relay cover. Tube packing is normally not available for SMT products unless specially requested by customer. But, please note that tube packing is not moisture-proof so please bake the products before use according to description of Notice 10 herewith. In addition, tube packing will be adopted when the ordering quantity of R type is equal to or less than 100 pieces unless otherwise specified.

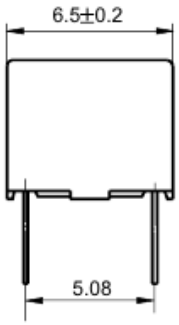
7. DIMENSIONS (Unit: mm)

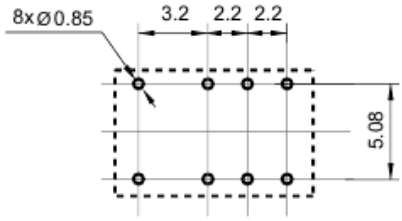
Outline Dimensions

PCB Layout (Bottom view)

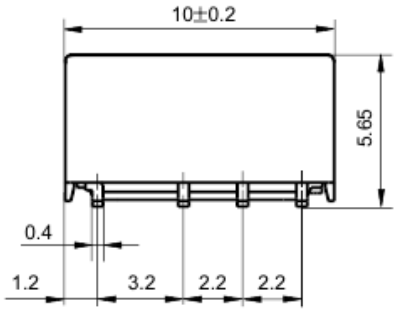
DIP type

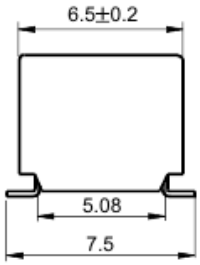


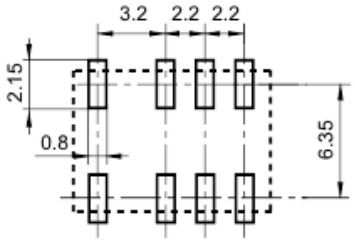




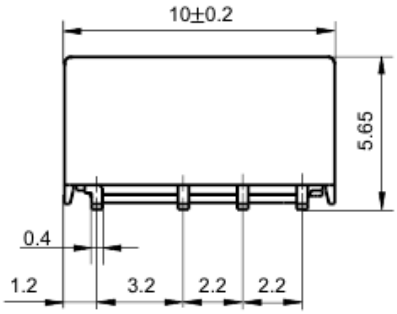
Standard SMT type

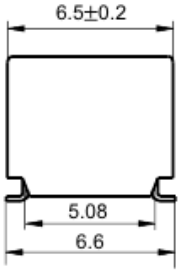


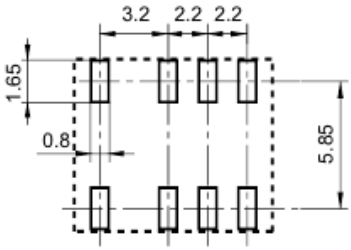




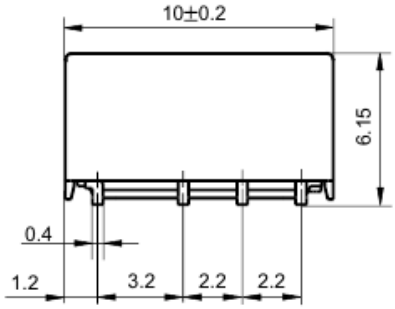
Short terminal SMT type

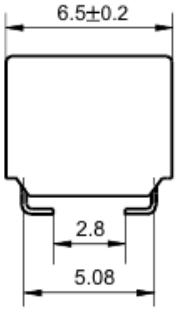


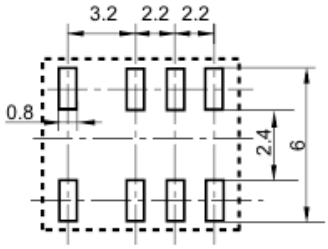




J-legs SMT Type

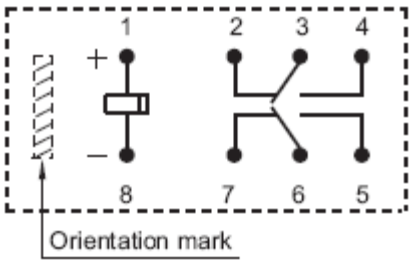






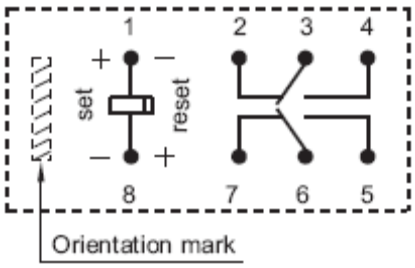
Wiring Diagram (Bottom View)

Single side stable



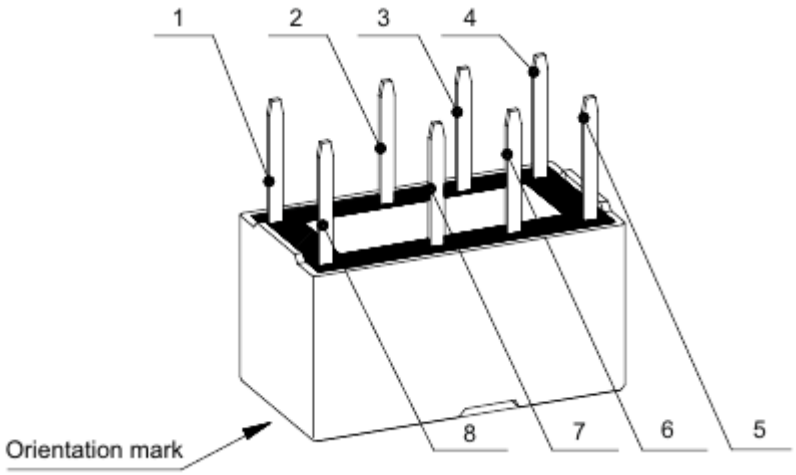
No energized condition

1 coil latching



Reset condition

Pin Layout



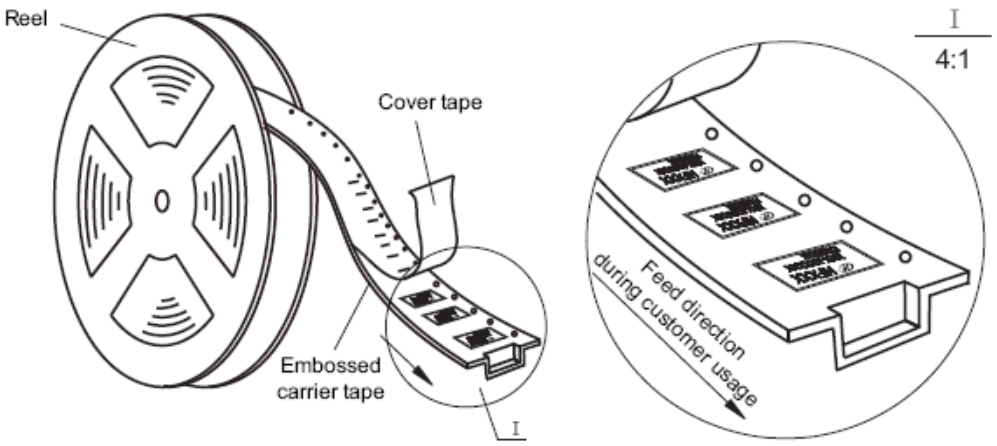
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

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

3) The width of the gridding is 2.54mm

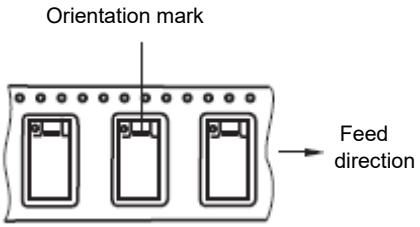
8. TAPE PACKING (Unit: mm)

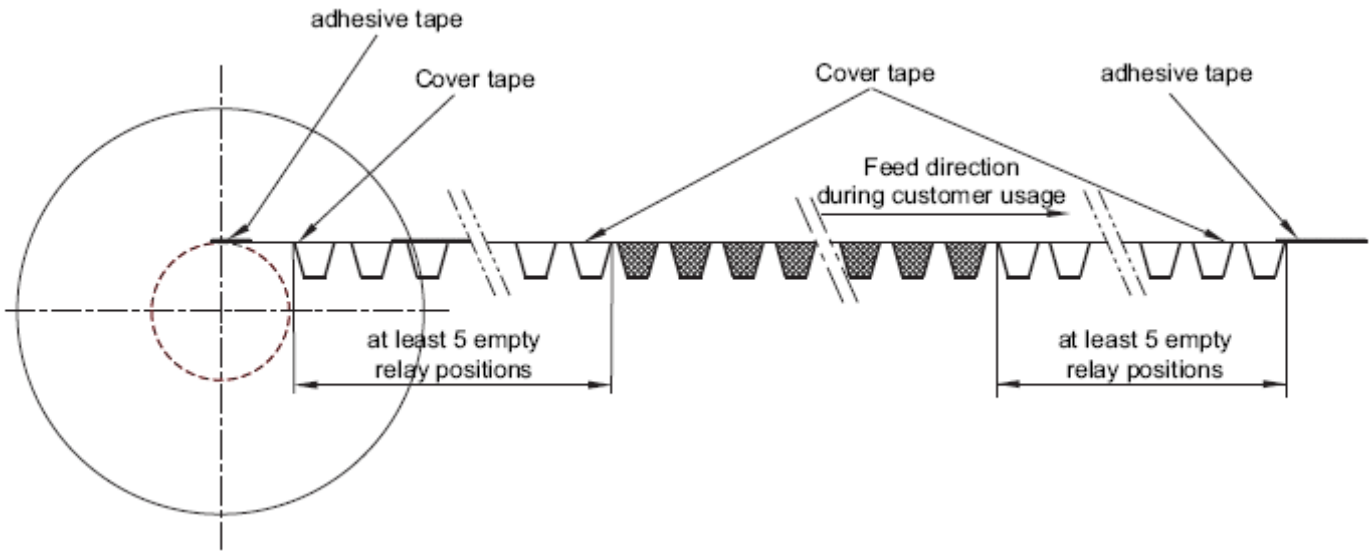
Direction of Relay Insertion



Packing:

1. S, S1 type
   1) 900pcs/reel, 4 reels/carton
   2) MOQ for reel packing is 900pcs
2. J type
   1) 850pcs/reel, 4 reels/carton
   2) MOQ for reel packing is 850pcs





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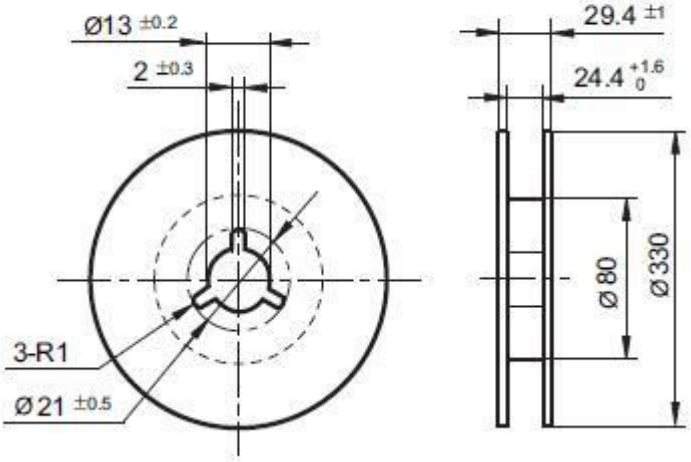
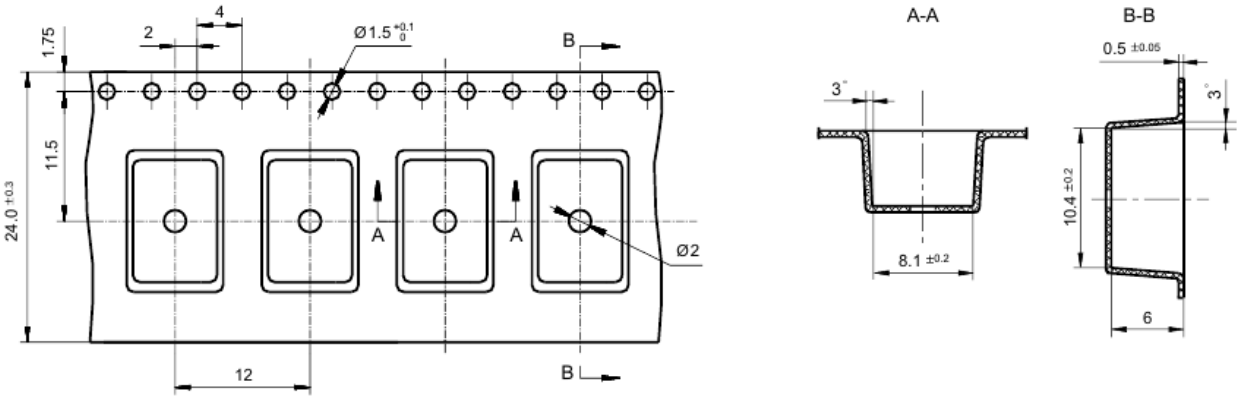
Reel Dimensions

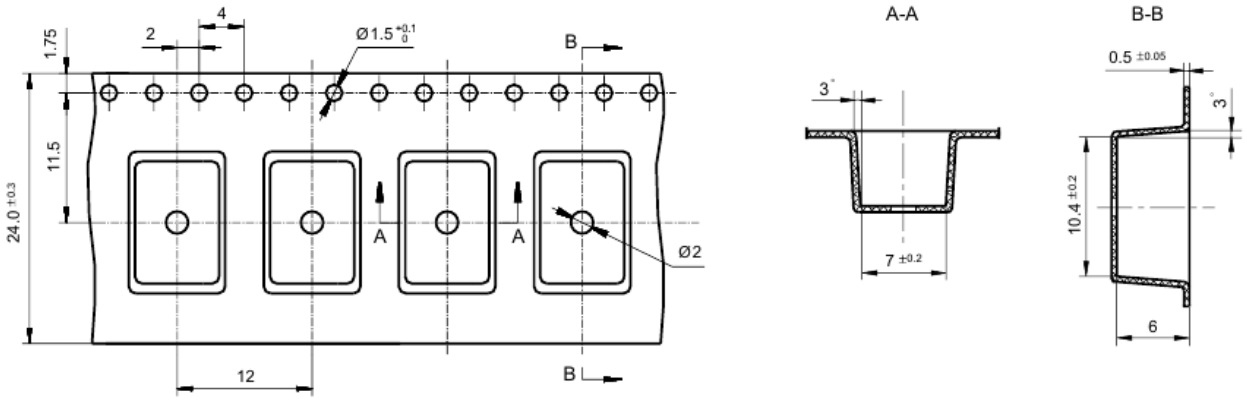


Tape Dimensions

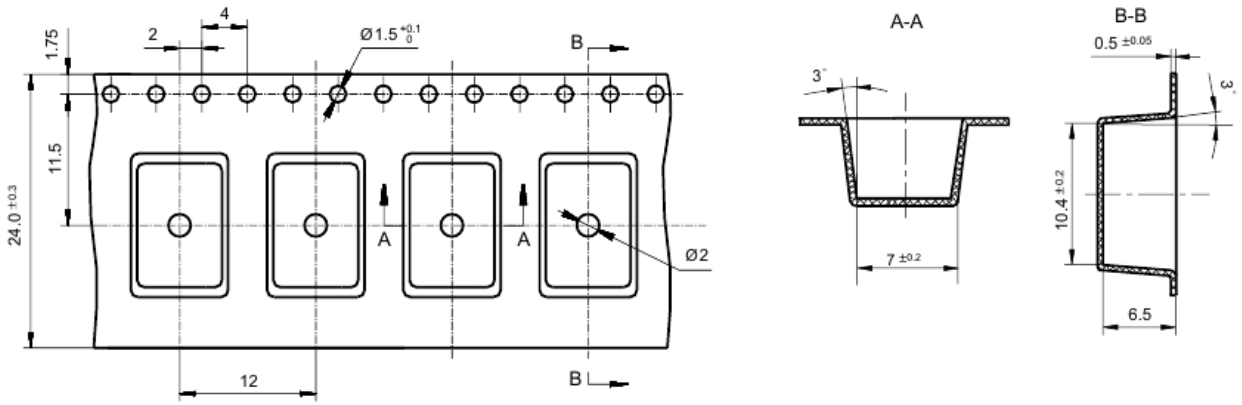
Standard
SMT type



Short terminal
SMT type

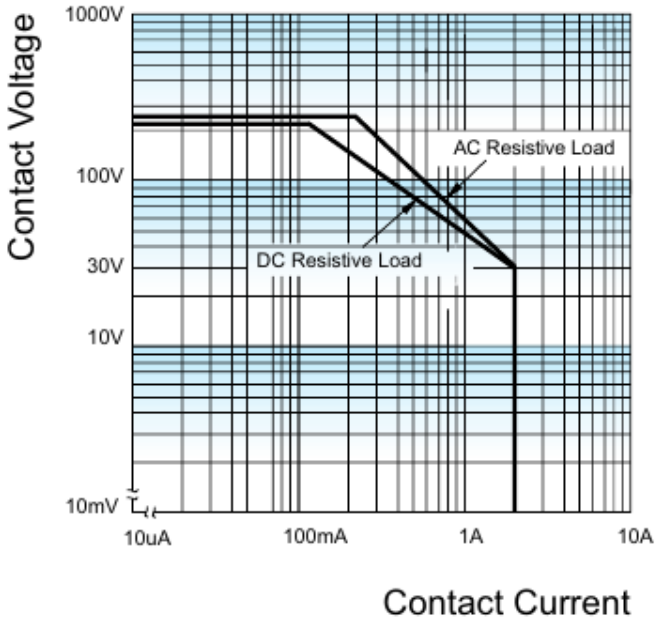


J-legs SMT
Type

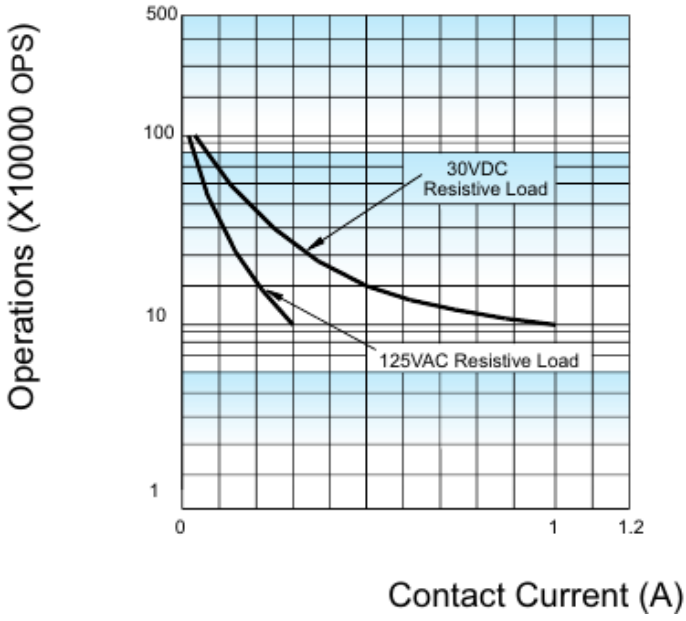


9. CHARACTERISTIC CURVES

Maximum Switching Power

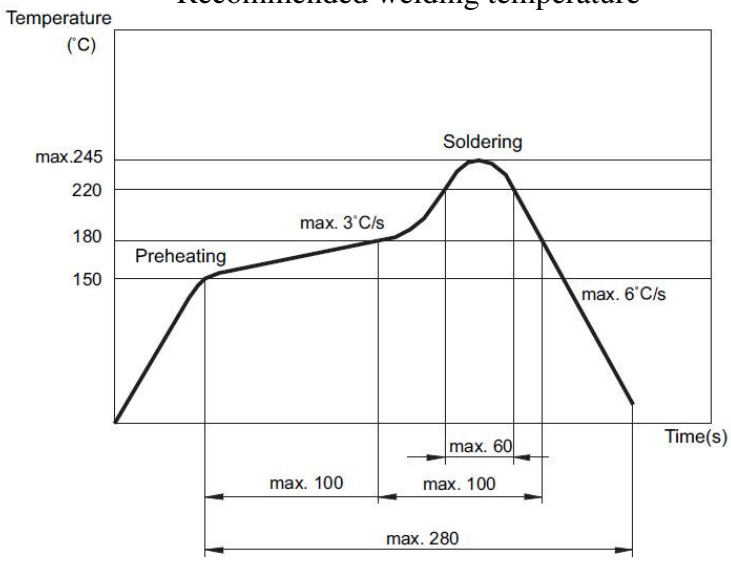


Endurance Curve



Reflow welding, temperature on PCB board

Recommended welding temperature



Notice

1) This relay is highly sensitive polarized relay. If correct polarity is not applied to the coil terminals, the relay does not operate properly.

2) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.

3) Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting. It should be changed to the “set” status when application(connecting to the power supply). Please reset the relay to “set” or “reset” status on request.

4) Energizing coil with rated voltage is basic for normal operation of a relay, please make sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the “set” or “reset” status, impulse width of the rated voltage applied to coil should be more than 5 times of “set” or “reset” time.

5) For a monosteady state relay, after the relay is reliably operated, if it needs to be kept under pressure, make sure that the effective value of the voltage is not less than 60% of the rated voltage.

6) The relay may be damaged because of falling or when shocking conditions exceed the requirement.

7) For SMT products, validation with real application should be done before your series production, if the reflow-soldering temperature curve is out of our recommendation. Generally, two-time reflow-soldering is not recommended for the relay. However, if two-time reflow-soldering is required, a 60min. interval should be guaranteed and a validation should be done before production.

8) Please use wave soldering or manual soldering for straight-in relay, If you need reflow welding, please confirm the feasibility with us.

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

10) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon and so on, which would affect the configuration of relay or influence the environment.

11) Relays packaged in moisture barrier bags meet MSL-3 requirements. The relays should be stored at ambient conditions of ≤30℃ and ≤60% RH after they are removed from their packaging, and should be used within 168 hours. If the relays cannot be used within 168 hours, please repack them or store them in a drying oven at 25℃±5℃, ≤10% RH. Otherwise, relays may be subjected to a soldering test to check their performance, or they may be used after keeping them in an oven for 72 hours at with 50℃±5℃, ≤30% RH.

12) When applied with continuous current, the heat from relay coil will age its isolation. Thus, please do not ground connected the coil to reduce electrical erosion if possible. And please provide protection circuit to avoid broken wire and losses.

13) Please make sure that there are no silicon-based substances (such as silicon rubber, silicon oil, silicon-based coating agents, silicon fillers, etc.) around the relay, because it will generates silicon-containing volatile gas, which may cause poor contact in case of silicon-containing volatile gas sticking on contact.

14) During the relay pick-up or drop-out processes, there are stages of contact pressure change, contact vibration and unstable contact etc. When the voltage applied to coil is gradually changed. It will lengthen the unstable and affect relay endurance. To reduce this influence, please apply step voltage (switching circuit) to relay coil.