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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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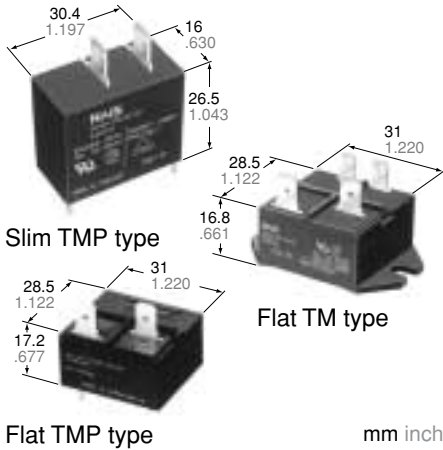
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



**Panasonic**  
ideas for life

**COMPACT POWER RELAY  
FOR INDUCTIVE LOAD**

**JM RELAYS**



- **Excellent contact welding resistance**  
High contact pressure, a forced opening mechanism, and a forced wiping mechanism realizes an excellent contact welding resistance.
- **High breakdown voltage and surge resistant relay**  
More than 6.4 mm .252 inch maintained for the insulation distance between contacts and coil, and the breakdown voltage between contacts and coil is 5,000 V for 1 minute. In addition, the surge resistance between contacts and coil is greater than 10,000 V.
- **Resistant to external force**  
An absorber mechanism is used on the load terminals, giving a large improvement in characteristics variations caused by the external force during FASTON placement/removal.

- **Flux resistance mechanism**  
The terminal area is plugged with resin to prevent flux seepage during PCB mounting. (TMP type)
- **Conforms to the various safety standards**  
UL, CSA approved.  
TÜV, VDE under application.
- **The line up can support economical mounting methods.**  
The relay are equipped with a drive terminal (coil terminal) on one side for PCBs, and a load terminal (tab terminal #250) on the reverse side. The line up includes the TM type which can be attached directly to the PCB composing a drive circuit, and the TMP type which supports economical wiring. The TMP type can also be directly attached, and a high capacity load can be wired to the tab terminal.

**FEATURES**

• **Compact, high-capacity, and resistant to inductive loads**  
The relay is a compact 16×30.4×26.5 mm .630×1.197×1.043 inch. It can control an inductive load (cosφ = 0.7) with inrush current of 70 A and steady state current of 20 A.

**SPECIFICATIONS**

Contact			
Arrangement		1 Form A	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		30 mΩ (Cd free type: 100 mΩ)	
Contact material		Silver alloy	
Rating (resistive load)	Nominal switching capacity		20 A 250 V AC
	Max. switching power		5,000 VA
	Max. switching voltage		250 V AC
	Max. switching current		20 A
	Min. switching capacity#1		100 mA, 5 V DC
Mechanical (at 180 cpm)		10 <sup>6</sup>	
Expected life (min. ope.)	Electrical Life (at 20 cpm)	Resistive load 20 A, 250 V AC (cosφ = 1)	10 <sup>5</sup>
			Inductive load
		Inrush 80 A, Cut-off 80 A (When the motor is locked) (250 V AC cosφ = 0.7)	

Coil	
Nominal operating power	900 mW

#1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

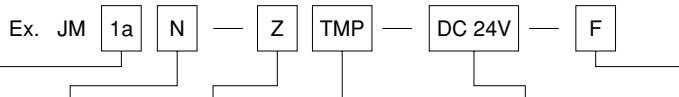
- Remarks**
- \* Specifications will vary with foreign standards certification ratings.
  - \*1 Measurement at same location as "Initial breakdown voltage" section
  - \*2 Detection current: 10mA
  - \*3 Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981
  - \*4 Excluding contact bounce time
  - \*5 Half-wave pulse of sine wave: 11ms; detection time: 10μs
  - \*6 Half-wave pulse of sine wave: 6ms
  - \*7 Detection time: 10μs
  - \*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

Characteristics		
Max. operating speed		180 cpm
Initial insulation resistance*1		Min. 100 MΩ (at 500 V DC)
Initial breakdown voltage*2	Between open contacts	1,000 Vrms for 1 min.
	Between contacts and coil	5,000 Vrms for 1 min.
Surge voltage between contact and coil*3		Min. 10,000 V
Operate time*4 (at nominal voltage)(at 20°C)		Max. 20ms (Approx. 8 ms)
Release time (without diode)*4 (at nominal voltage)(at 20°C)		Max. 10ms (Approx. 3 ms)
Temperature rise (at 60°C)		Max. 55°C (Contact switching current: 20 A/voltage applied to coil: 100%V)
Shock resistance	Functional*5	Min. 98 m/s <sup>2</sup> {10 G}
	Destructive*6	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional*7	10 to 55 Hz at double amplitude of 1.6 mm
	Destructive	10 to 55 Hz at double amplitude of 2 mm
Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature)	Ambient temp.	-40°C to +60°C -40°F to +140°F
	Humidity	5 to 85% R.H.
Unit weight	Slim TMP	Approx. 28 g .99 oz
	Flat TMP	Approx. 32 g 1.13 oz
	Flat TM	Approx. 33 g 1.16 oz



## TYPICAL APPLICATIONS ORDERING INFORMATION

- Compressor and heater control in air conditioners
- Power control in hot air type heaters
- Magnetron control in microwave ovens
- Lamp and motor control in OA equipment such as copiers and facsimiles.



Contact arrangement	Pickup voltage	Classification of type	Mounting classification	Coil voltage	Environmental support
1a: 1 Form A	N: 70% of nominal voltage	Nil: Slim type Z: Flat type	TMP: TMP type TM: TM type (Flat type) P: PCB type(Slim type)	DC 5, 6, 9, 12, 24, 48 V	F: RoHS Directive conforming type (AgSnO <sub>2</sub> type) Nil: RoHS Directive non-conforming type (AgCdO type)

(Note) 1. Standard packing: Carton: 50pcs. Case: 200pcs.  
UL/CSA, VDE approved type is standard.

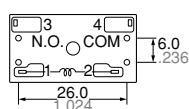
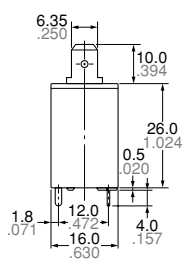
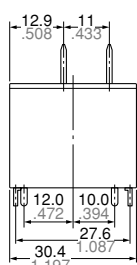
## TYPES AND COIL DATA (at 20°C 68°F)

Part No.				Nominal voltage, V DC	Pick-up voltage	Drop-out voltage,	Nominal operating current, mA	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
Slim		Flat								
TMP	PCB	TMP	TM							
JM1aN-TMP-DC5V (-F)	JM1aN-P-DC5V (-F)	JM1aN-ZTMP-DC5V (-F)	JM1aN-ZTM-DC5V (-F)	5	3.5	0.5	180	27.8	900	5.5
JM1aN-TMP-DC6V (-F)	JM1aN-P-DC6V (-F)	JM1aN-ZTMP-DC6V (-F)	JM1aN-ZTM-DC6V (-F)	6	4.2	0.6	150	40	900	6.6
JM1aN-TMP-DC9V (-F)	JM1aN-P-DC9V (-F)	JM1aN-ZTMP-DC9V (-F)	JM1aN-ZTM-DC9V (-F)	9	6.3	0.9	100	90	900	9.9
JM1aN-TMP-DC12V (-F)	JM1aN-P-DC12V (-F)	JM1aN-ZTMP-DC12V (-F)	JM1aN-ZTM-DC12V (-F)	12	8.4	1.2	75	160	900	13.2
JM1aN-TMP-DC24V (-F)	JM1aN-P-DC24V (-F)	JM1aN-ZTMP-DC24V (-F)	JM1aN-ZTM-DC24V (-F)	24	16.8	2.4	37.5	640	900	26.4
JM1aN-TMP-DC48V (-F)	JM1aN-P-DC48V (-F)	JM1aN-ZTMP-DC48V (-F)	JM1aN-ZTM-DC48V (-F)	48	33.6	4.8	18.75	2,560	900	52.8

## DIMENSIONS

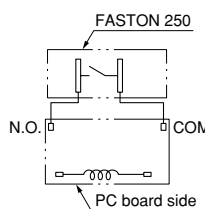
mm inch

### Slim TMP type



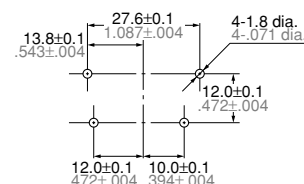
General tolerance: ±0.4 ±.016

### Schematic

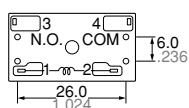
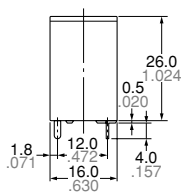
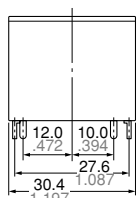


PC board pattern

### (Copper-side view)

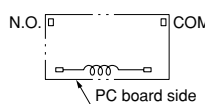


### Slim PCB type



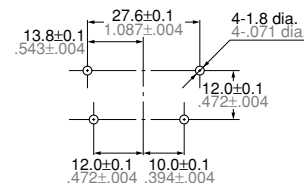
General tolerance: ±0.4 ±.016

### Schematic

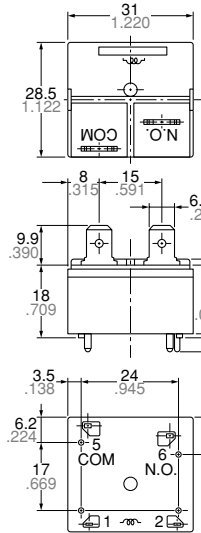


PC board pattern

### (Copper-side view)

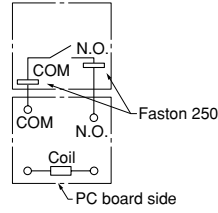


Tolerance: ±0.1 ±.004

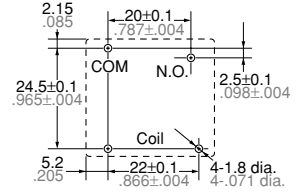


General tolerance:  $\pm 0.4 \pm 0.16$

Schematic

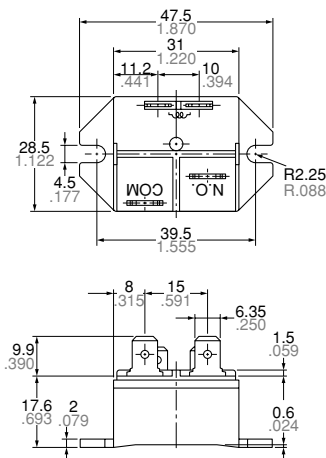


PC board pattern (Bottom view)



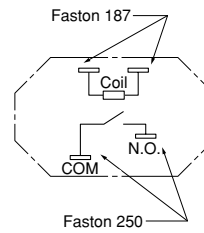
Tolerance:  $\pm 0.1 \pm 0.04$

## Flat TM type

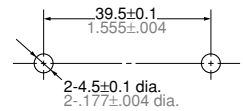


General tolerance:  $\pm 0.4 \pm 0.16$

Schematic



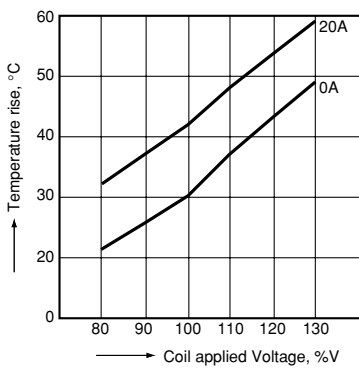
Panel cutout



## REFERENCE DATA

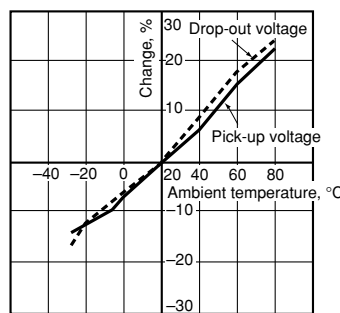
### 1. Coil temperature rise

Place to be measured: Inside of coil  
Ambient temperature: 25°C 77°F



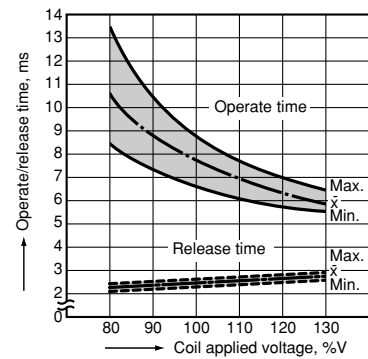
### 2. Ambient temperature characteristics

Sample: JM1aN-TMP-DC24V, 5 pcs.

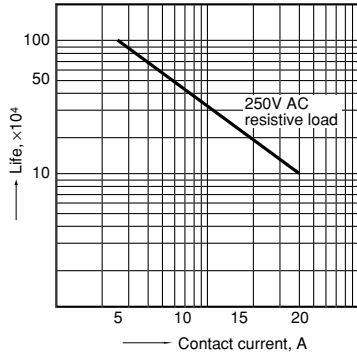


### 3. Operate/release time

Sample: JM1aN-TMP-DC24V, 5 pcs.

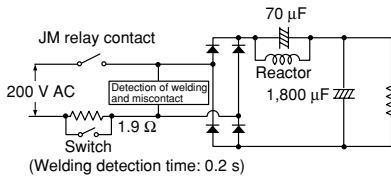


4. Life curve

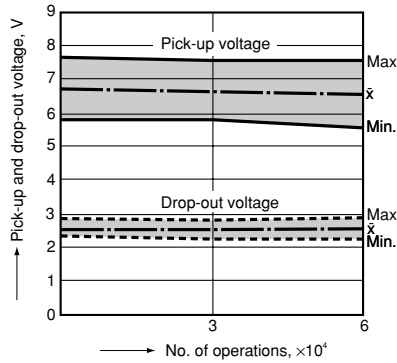


5-(1). 200 V AC electrical life test (200 V AC inverter dummy load)

Sample: JM1aN-TMP-DC12V, 6 pcs.  
 Load: Inrush 108 A, Steady 15 A,  
 Inverter dummy 200 V AC  
 Switching frequency: ON 5 s, OFF 5 s  
 Circuit



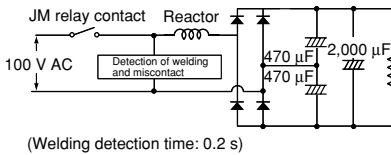
Change of pick-up and drop-out voltage



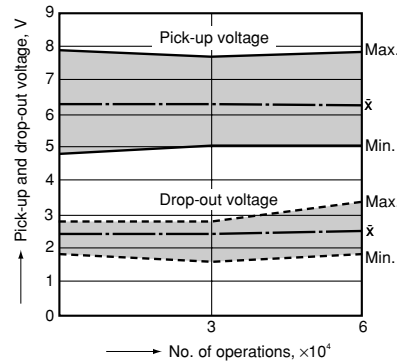
Contact welding: 0 time  
 Miscontact: 0 time

5-(2). 100 V AC electrical life test (100 V AC inverter dummy load)

Sample: JM1aN-TMP-DC12V, 20 pcs.  
 Load: Inrush 224 A, Steady 20A,  
 Inverter dummy 100 V AC  
 Switching frequency: ON 10 s, OFF 10 s  
 Circuit



Change of pick-up and drop-out voltage

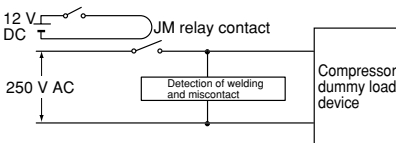


Contact welding: 0 time  
 Miscontact: 0 time

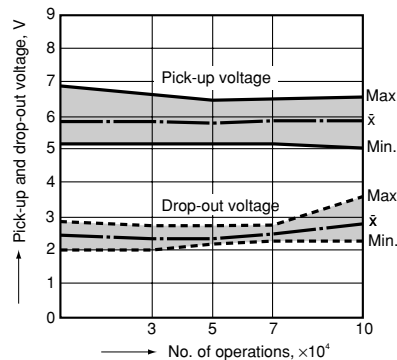
5-(3). Inrush 70 A, Steady 20 A, 250 V AC compressor dummy load

Sample: JM1aN-TMP-DC12V, 6 pcs.  
 Load: (Endurance) inrush 70 A  $\cos\phi = 0.7$  (0.3 s),  
 steady 20A  $\text{pf} = 0.9$ ,  
 250V AC compressor dummy  
 (Overload) 80A  $\cos\phi = 0.7$ , 250 V AC  
 No. of operations: (Endurance)  $10^5$  times  
 (Overload) 1,000 times (after endurance test)  
 Switching frequency: (Endurance) ON 1.5 s,  
 OFF 1.5 s  
 (Overload) ON 3 s,  
 OFF 2 min., 57 s

Circuit (endurance)



Change of pick-up and drop-out voltage



Contact welding: 0 time  
 Miscontact: 0 time

**For Cautions for Use, see Relay Technical Information**