

FEATURES

• Compact, high-capacity, and resistant to inductive loads

It can control an inductive load with inrush current of 80 A and steady state current of 20 A.

• 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, VDE and TÜV available

• The line up can support economical mounting methods.

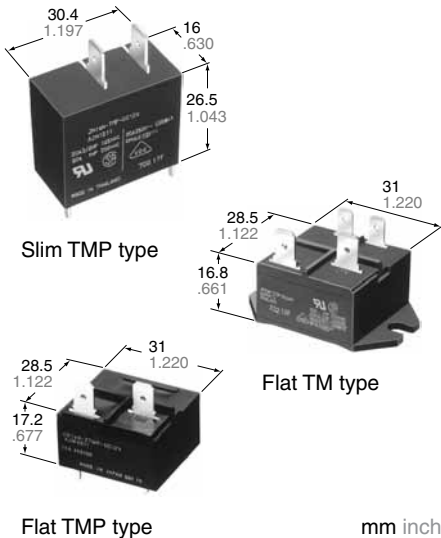
The relay are equipped with a drive terminal (coil terminal) on one side for PCBs, and a load terminal (tab terminal #250) on the reverse side. The line up includes the TM type which can be attached directly to the PCB composing a drive circuit, and the TMP type which supports economical wiring. The TMP type can also be directly attached, and a high capacity load can be wired to the tab terminal.

About Cd-free contacts

We have introduced Cadmium free type products to reduce Environmental Hazardous Substances.

(The suffix "F" should be added to the part number)

Please replace parts containing Cadmium with Cadmium-free products and evaluate them with your actual application before use because the life of a relay depends on the contact material and load.



mm inch

RoHS Directive compatibility information
<http://www.nais-e.com/>

SPECIFICATIONS

Contact

Arrangement		1 Form A	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		100 mΩ	
Contact material		AgSnO ₂ type	
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} (Reference value)		100 mA, 5 V DC	
Expected life (min. ope.)	Mechanical (at 180 cpm)		10 ⁶
	Electrical Life (at 20 cpm)	Resistive load 20 A, 250 V AC (cosφ = 1)	10 ⁵
		Inductive load	Inrush 70 A, Steady 20 A (250 V AC cosφ = 0.9)
	Inrush 80 A, Cut-off 80 A (When the motor is locked) (250 V AC cosφ = 0.7)		1.5×10 ³

Coil

Nominal operating power	900 mW
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#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 $\pm 1.2 \times 50\mu\text{s}$ 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		20 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		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	98 m/s ² {10 G}
	Destructive* ⁶	980 m/s ² {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.

Ex. JM 1a N — Z TMP — DC 24V — F

Contact arrangement	Pickup voltage	Classification of type	Mounting classification	Coil voltage	Contact material
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: AgSnO ₂ type

(Notes) 1. Standard packing: Carton: 50pcs. Case: 200pcs.

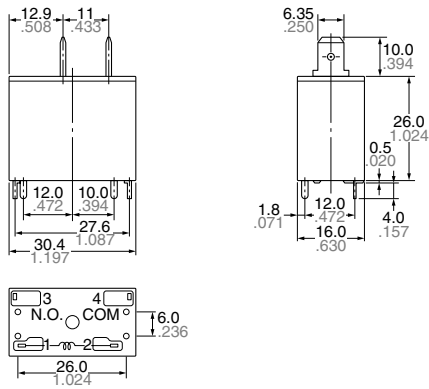
UL/CSA, VDE approved type is standard.

2. Please inquire about the previous products (Cadmium containing parts).

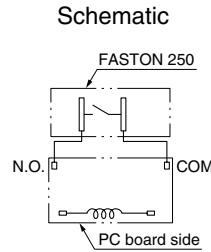
TYPES AND COIL DATA (at 20°C 68°F)

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

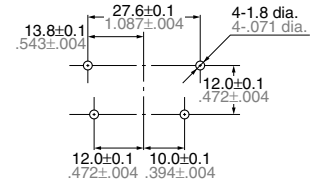
Slim TMP type



General tolerance: $\pm 0.4 \pm 0.16$

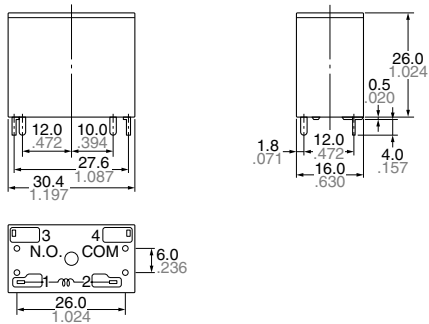


PC board pattern (Copper-side view)

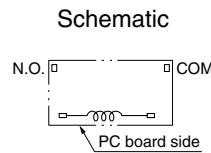


Tolerance: $\pm 0.1 \pm 0.04$

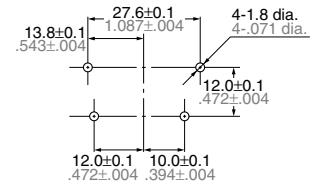
Slim PCB type



General tolerance: $\pm 0.4 \pm 0.16$

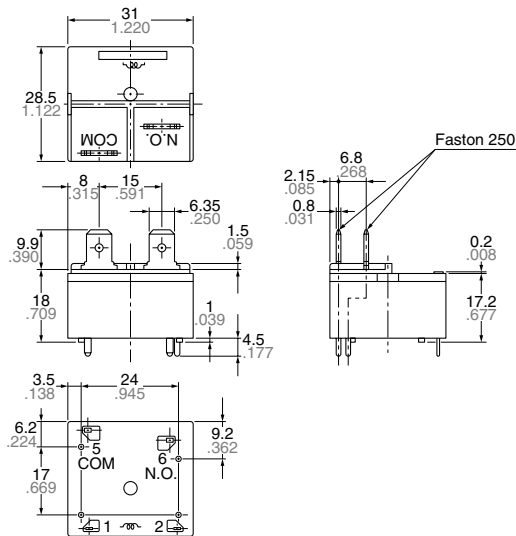


PC board pattern (Copper-side view)



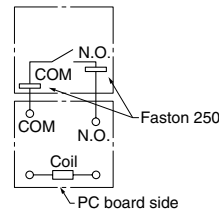
Tolerance: $\pm 0.1 \pm 0.04$

Flat TMP type

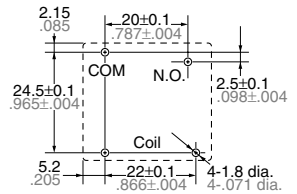


General tolerance: $\pm 0.4 \pm 0.16$

Schematic



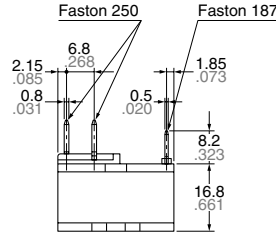
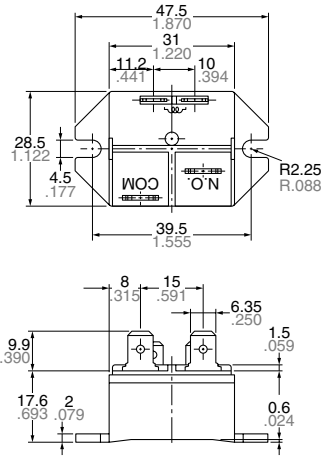
PC board pattern (Bottom view)



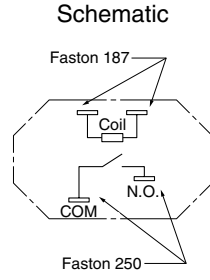
Tolerance: $\pm 0.1 \pm 0.04$

Flat TM type

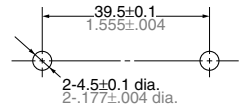
mm inch



General tolerance: $\pm 0.4 \pm 0.016$



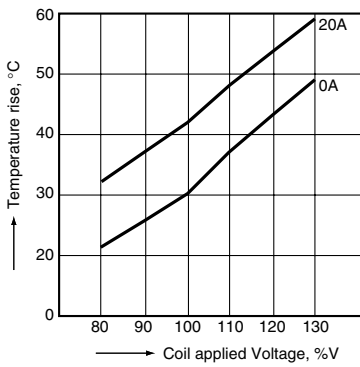
Panel cutout



REFERENCE DATA

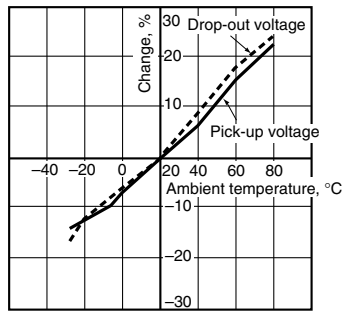
1. Coil temperature rise

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



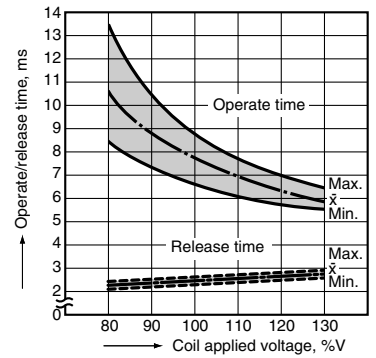
2. Ambient temperature characteristics

Sample: JM1aN-TMP-DC24V-F, 5 pcs.

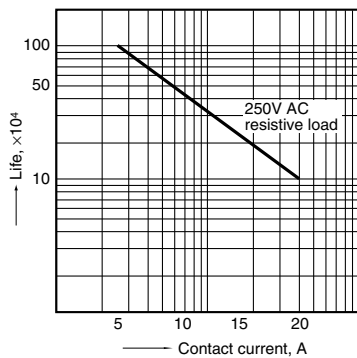


3. Operate/release time

Sample: JM1aN-TMP-DC24V-F, 5 pcs.



4. Life curve



For Cautions for Use, see Relay Technical Information