

TMP type

PCB type

mm inch

## FEATURES

### 1. Ideal for compressor and inverter loads

- 1) Compressor load: 20A 250V AC
- 2) Inverter load: 20A 100V AC, 10A 200V AC

### 2. High insulation resistance

- Creepage distance and clearances between contact and coil; Creepage Min. 9.5mm .374inch/ Clearance Min. 8mm .315inch
- Surge withstand voltage: 10,000V

### 3. "PCB" and "TMP" types available

### 4. Conforms to the various safety standards:

UL, C-UL, TÜV, VDE approved

## SPECIFICATIONS

### Contact

Arrangement	1 Form A	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100 mΩ	
Contact material	AgSnO <sub>2</sub> type	
Rating (resistive load)	Nominal switching capacity	20 A 250V AC
	Max. switching power	6,250 V A
	Max. switching voltage	250V AC
	Max. switching current	25 A
	Min. switching capacity <sup>#1</sup> (Reference value)	100 mA, 5 V DC
Expected life (min. operations)	Mechanical (at 180 cpm)	2 × 10 <sup>6</sup>
	Electrical (at 20 cpm) (Resistive load)	10 <sup>5</sup>

### Coil

Nominal operating power	900 mW
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<sup>#1</sup> 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.
- <sup>#1</sup> Measurement at same location as "Initial breakdown voltage" section.
- <sup>#2</sup> Detection current: 10mA
- <sup>#3</sup> Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981
- <sup>#4</sup> Excluding contact bounce time.
- <sup>#5</sup> Half-wave pulse of sine wave: 11 ms; detection time: 10 μs
- <sup>#6</sup> Half-wave pulse of sine wave: 6 ms
- <sup>#7</sup> Detection time: 10 μs
- <sup>#8</sup> Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

### Characteristics

Max. operating speed (at rated load)	20 cpm	
Initial insulation resistance <sup>*1</sup>	Min. 1,000 MΩ (at 500 V DC)	
Initial breakdown voltage <sup>*2</sup>	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 <sup>*3</sup>	10,000 V	
Operate time <sup>*4</sup> (at nominal voltage)	Max. 20 ms (at 20°C 68°F)	
Release time (without diode) <sup>*4</sup> (at nominal voltage)	Max. 15 ms (at 20°C 68°F)	
Temperature rise (at nominal voltage)	Max. 45°C (resistance method, contact current 20 A, rated coil voltage, 60°C 140°F)	
Shock resistance	Functional <sup>*5</sup>	100 m/s <sup>2</sup> {10 G}
	Destructive <sup>*6</sup>	1,000 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional <sup>*7</sup>	10 to 55Hz at double amplitude of 1.5mm
	Destructive	10 to 55Hz at double amplitude of 1.5mm
Conditions for operation, transport and storage <sup>*8</sup> (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	Approx. 23 g .81 oz	

## TYPICAL APPLICATIONS

- Air conditioner
- Refrigerators
- OA equipment

## ORDERING INFORMATION

Ex. A LF 1 T 12

Product Name	Contact arrangement	Terminal shape	Coil voltage, V DC
LF	1: 1 Form A	T: TMP type P: PCB type	05: 5 12: 12 06: 6 18: 18 09: 9 24: 24

Note: Standard packing; Carton: 50 pcs. Case 200 pcs.  
UL, C-UL, VDE, TÜV approved type is standard.

# LF (ALF)

## TYPES

Contact arrangement	Coil voltage, V DC	TMP type	PCB type
1 Form A	5	ALF1T05	ALF1P05
	6	ALF1T06	ALF1P06
	9	ALF1T09	ALF1P09
	12	ALF1T12	ALF1P12
	18	ALF1T18	ALF1P18
	24	ALF1T24	ALF1P24

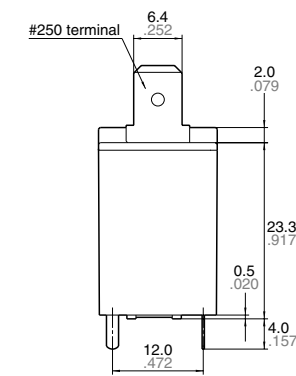
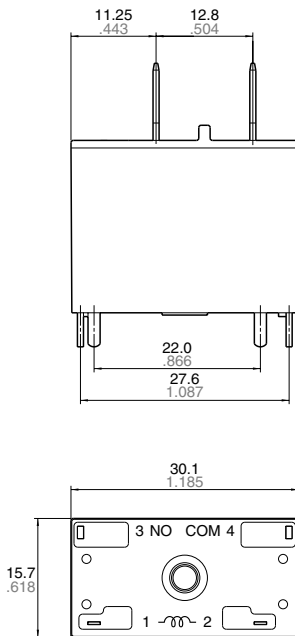
## COIL DATA

Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, $\Omega$ ( $\pm 10\%$ )	Nominal operating current, mA ( $\pm 10\%$ )	Nominal operating power, W	Maximum allowable voltage, V DC
5	3.5	0.5	27.8	180	0.9	5.5
6	4.2	0.6	40	150		6.6
9	6.3	0.9	90	100		9.9
12	8.4	1.2	160	75		13.2
18	12.6	1.8	360	50		19.8
24	16.8	2.4	640	37.5		26.4

## DIMENSIONS

mm inch

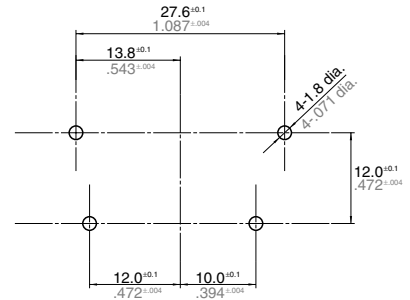
### 1. TMP type



**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

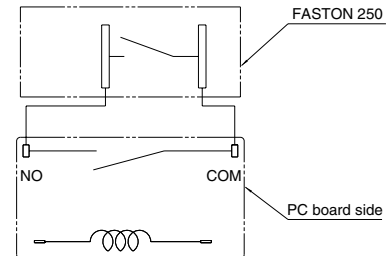
**Tolerance**  
 $\pm 0.1 \pm .004$   
 $\pm 0.2 \pm .008$   
 $\pm 0.3 \pm .012$

### PC board pattern (Bottom view)

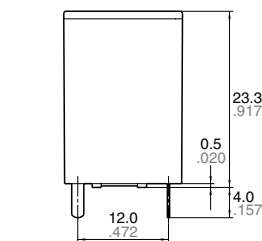
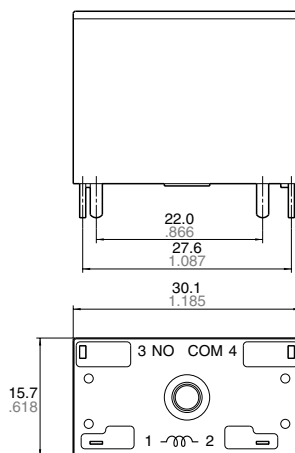


Tolerance:  $\pm 0.1 \pm .004$

### Schematic (Bottom view)



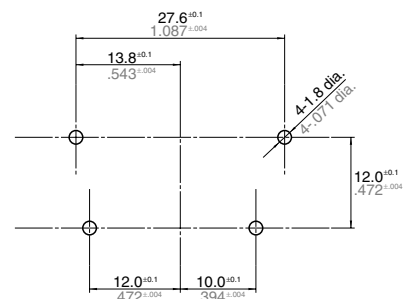
### 2. PCB type



**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

**Tolerance**  
 $\pm 0.1 \pm .004$   
 $\pm 0.2 \pm .008$   
 $\pm 0.3 \pm .012$

### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm .004$

### Schematic (Bottom view)

