

**RoHS Directive compatibility information**  
<http://www.mew.co.jp/ac/e/environment/>

## FEATURES

### 1. Supports magnetron and heater loads.

Capable for switching magnetron and heater loads found in microwave ovens.

### 2. Excellent heat resistance

Ambient temperature: up to 85°C 185°F

Certified UL coil insulation class B and class F

### 3. High insulation resistance

Creepage distance and clearances between contact and coil:

Min. 8 mm .315 inch

Surge withstand voltage: 10,000V

### 4. Low operating power

Nominal operating power: 400mW/200mW (High sensitive type)

### 5. A wide variety of types

Product line consists of 4 types with different shapes and pins

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

UL/CSA, TÜV, VDE approved and SEMKO available (TMP type)  
 UL/CSA, VDE approved (PCB type)

## TYPICAL APPLICATIONS

- Microwave ovens
- Refrigerators
- OA equipment

## 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	16 A 277 V AC
	Max. switching power	4,432 V A
	Max. switching voltage	277 V AC
	Max. switching current	16 A
Expected life (min. operations)	Min. switching capacity <sup>#1</sup> (Reference value)	100 mA, 5 V DC
	Mechanical (at 180 cpm)	$2 \times 10^6$
Electrical (at 20 cpm) (Resistive load)	Electrical (at 20 cpm) (Resistive load)	$10^5$

### Coil

Type	Standard	High sensitive
Nominal operating power	400 mW	200 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.

\*\* Measurement at same location as "Initial breakdown voltage" section.

\*<sup>2</sup> Detection current: 10mA

\*<sup>3</sup> Wave is standard shock voltage of  $\pm 1.2 \times 50\mu s$  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	4,000 Vrms for 1 min.
Initial surge voltage between contact and coil <sup>*3</sup>	10,000 V	
Operate time <sup>*4</sup> (at nominal voltage) (at 20°C 68°F)	Max. 20ms	
Release time (with diode) <sup>*4</sup> (at nominal voltage) (at 20°C 68°F)	Max. 20ms Max. 25ms (200 mW type)	
Temperature rise (at nominal voltage) (resistance method, contact current 16 A, 20°C 68°F)	Max. 55°C Max. 45°C (200 mW type)	
Shock resistance	Functional <sup>*5</sup>	200 m/s <sup>2</sup> {20 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 +85°C -40°F to +185°F
	Humidity	5 to 85% R.H.
Unit weight	Approx. 17 g .60 oz Approx. 15 g .53 oz (PCB type)	

## ORDERING INFORMATION

Product name	Contact arrangement	Terminal shape	Coil insulation class	Coil voltage, V DC
LE	1: 1 Form A (400 mW) 7: 1 Form A (200 mW)	2: TMP type/PCB side three terminals (includes one dummy terminal) 3: TMP type/PCB side three terminals 4: TMP type/PCB side four terminals P: PCB type (No tab terminals)	B: Class B insulation F: Class F insulation	05: 5 18: 18 06: 6 24: 24 09: 9 48: 48 12: 12

UL/CSA, TÜV, VDE approved type is standard (TMP type). SEMKO approved types are also available, please consult us.  
UL/CSA, VDE approved type is standard (PCB type).

Note: Standard packing; Carton: 100 pcs. Case 500 pcs.

## TYPES

## 1. Standard type

Contact arrangement	Coil voltage, V DC	TMP type/PCB side three terminals (includes one dummy terminal)	TMP type/PCB side three terminals	TMP type/PCB side four terminals	PCB type (No tab terminals)
		Part No.	Part No.	Part No.	Part No.
1 Form A	5	ALE12O05	ALE13O05	ALE14O05	ALE1PO05
	6	ALE12O06	ALE13O06	ALE14O06	ALE1PO06
	9	ALE12O09	ALE13O09	ALE14O09	ALE1PO09
	12	ALE12O12	ALE13O12	ALE14O12	ALE1PO12
	18	ALE12O18	ALE13O18	ALE14O18	ALE1PO18
	24	ALE12O24	ALE13O24	ALE14O24	ALE1PO24
	48	ALE12O48	ALE13O48	ALE14O48	ALE1PO48

O: Input the following letter. Class B: B, Class F: F

## 2. High sensitive type

Contact arrangement	Coil voltage, V DC	TMP type/PCB side three terminals (includes one dummy terminal)	TMP type/PCB side three terminals	TMP type/PCB side four terminals	PCB type (No tab terminals)
		Part No.	Part No.	Part No.	Part No.
1 Form A (High sensitivity: 200mW)	5	ALE72O05	ALE73O05	ALE74O05	ALE7PO05
	6	ALE72O06	ALE73O06	ALE74O06	ALE7PO06
	9	ALE72O09	ALE73O09	ALE74O09	ALE7PO09
	12	ALE72O12	ALE73O12	ALE74O12	ALE7PO12
	18	ALE72O18	ALE73O18	ALE74O18	ALE7PO18
	24	ALE72O24	ALE73O24	ALE74O24	ALE7PO24
	48	ALE72O48	ALE73O48	ALE74O48	ALE7PO48

O: Input the following letter. Class B: B, Class F: F

## COIL DATA (at 20°C 68°F)

## 1. Standard type

Nominal voltage, V DC	Pick-up voltage, V DC (max.) (at 20°C 68°F)	Drop-out voltage, V DC (min.) (at 20°C 68°F)	Coil resistance, Ω (±10%) (at 20°C 68°F)	Nominal operating current, mA (±10%) (at 20°C 68°F)	Nominal operating power, mW (at 20°C 68°F)	Maximum allowable voltage, V DC (at 20°C 68°F)
5	3.75	0.25	63	80	400	7.25
6	4.5	0.3	90	66.7		8.7
9	6.75	0.45	203	44.4		13.05
12	9	0.6	360	33.3		17.4
18	13.5	0.9	810	22.2		26.1
24	18	1.2	1,440	16.7		34.8
48	36	2.4	5,760	8.3		69.6

# LE (ALE)

## 2. High sensitive type

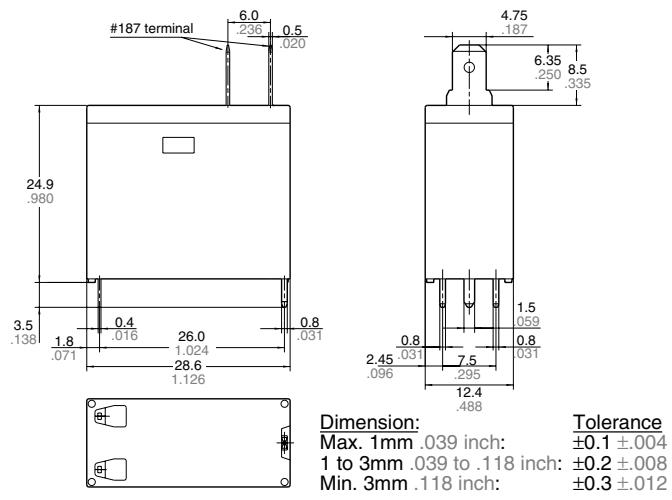
Nominal voltage, V DC	Pick-up voltage, V DC (max.) (at 20°C 68°F)	Drop-out voltage, V DC (min.) (at 20°C 68°F)	Coil resistance, Ω (±10%) (at 20°C 68°F)	Nominal operating current, mA (±10%) (at 20°C 68°F)	Nominal operating power, mW (at 20°C 68°F)	Maximum allowable voltage, V DC (at 20°C 68°F)
5	3.75	0.25	125	40	200	7.25
6	4.5	0.3	180	33.3		8.7
9	6.75	0.45	405	22.2		13.05
12	9	0.6	720	16.7		17.4
18	13.5	0.9	1,620	11.1		26.1
24	18	1.2	2,880	8.3		34.8
48	36	2.4	11,520	4.2		69.6

mm inch

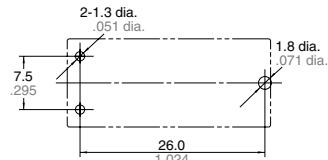
## DIMENSIONS

### 1. TMP type

PCB side three terminals  
(includes one dummy terminal)

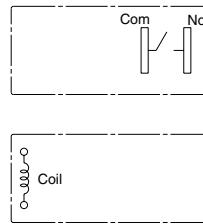


PC board pattern (Bottom view)

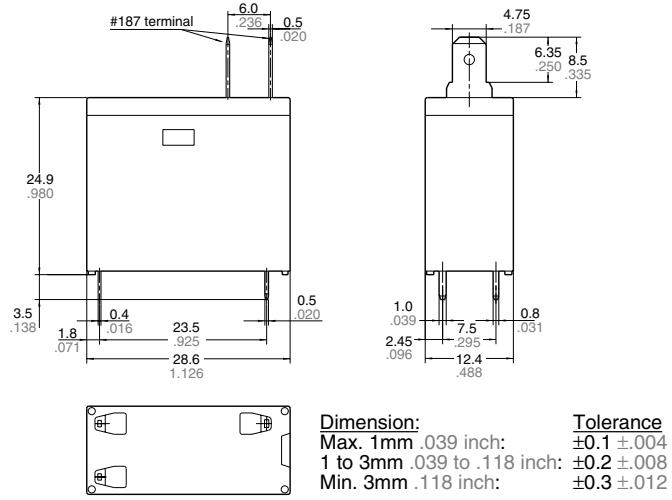


Tolerance :  $\pm 0.1 \pm .004$

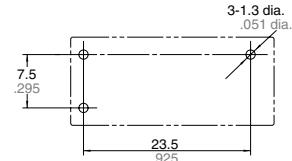
Schematic (Bottom view)



### PCB side three terminals

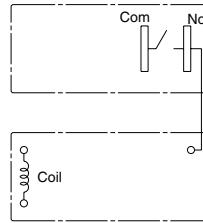


PC board pattern (Bottom view)



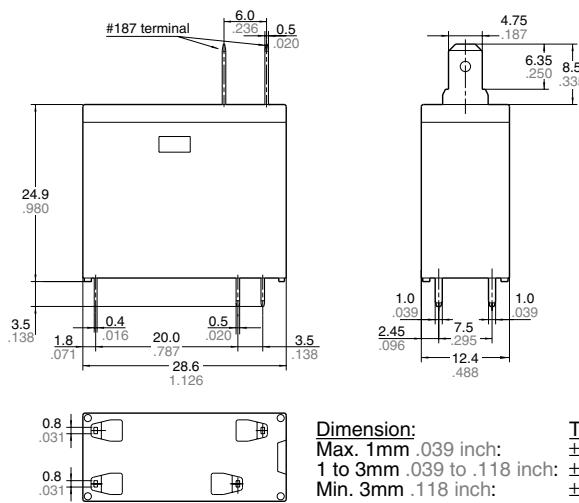
Tolerance :  $\pm 0.1 \pm .004$

Schematic (Bottom view)

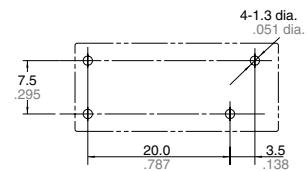


PCB side four terminals

mm inch

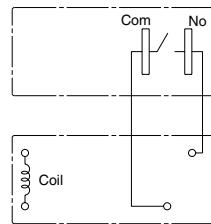


PC board pattern (Bottom view)

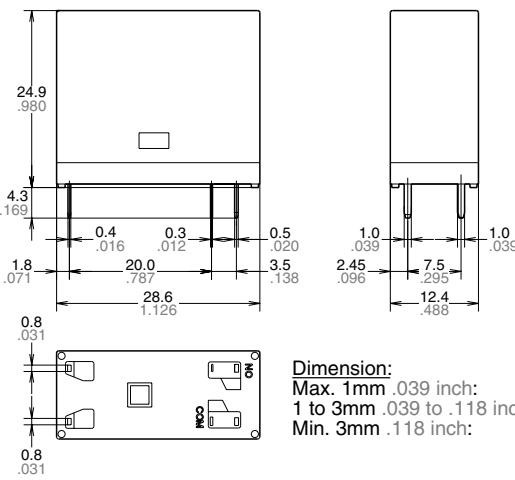


Tolerance : ±0.1 ±.004

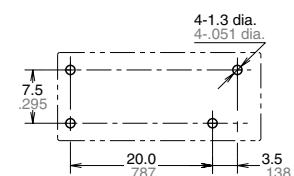
Schematic (Bottom view)



## 2. PCB type (No tab terminals)



PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

Schematic (Bottom view)



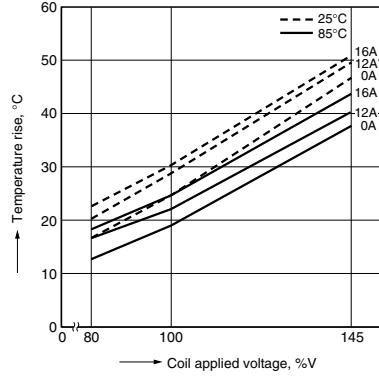
## REFERENCE DATA

### 1-1. Coil temperature rise (400mW type)

Sample: ALE14B12, 6 pcs.

Point measured: coil inside

Ambient temperature: 25°C 77°F, 85°C 185°F

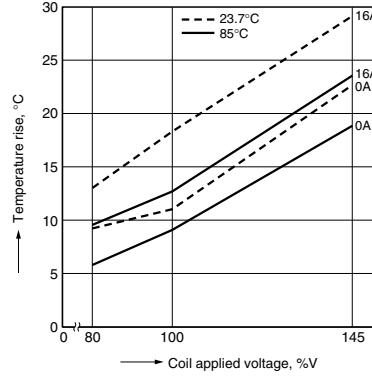


### 1-2. Coil temperature rise (200mW type)

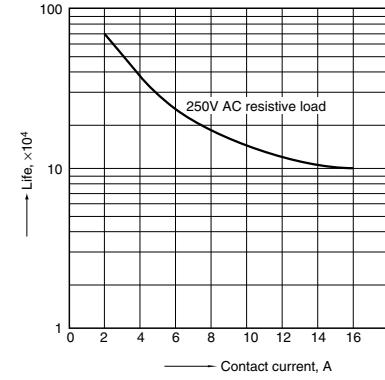
Sample: ALE74B12, 6 pcs.

Point measured: coil inside

Ambient temperature: 23.7°C 74.66°F, 85°C 185°F



### 2. Life curve



## LE (ALE)

3. Electrical life test (16 A 277 V AC, resistive load)

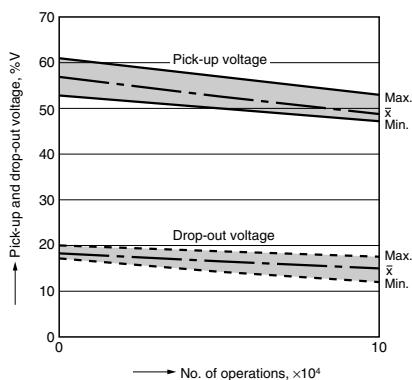
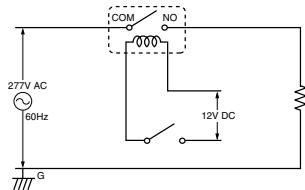
Sample: ALE14B12, 6 pcs.

Operation frequency: 20 times/min.

(ON/OFF = 1.5s: 1.5s)

Ambient temperature: Room temperature

Circuit:



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