

### 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

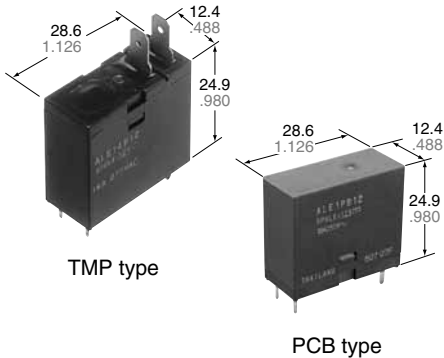
#### 6. Conforms to the various safety standards:

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

UL/CSA, VDE approved (PCB type)

### TYPICAL APPLICATIONS

- Microwave ovens
- Refrigerators
- OA equipment



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

### SPECIFICATIONS

Contact		Coil		Characteristics	
Arrangement		1 Form A		Max. operating speed (at rated load)	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		100 mΩ		20 cpm	
Contact material		AgSnO <sub>2</sub> type		Initial insulation resistance*1	
Rating (resistive load)	Nominal switching capacity	16 A 277 V AC		Initial breakdown voltage*2	Between open contacts
	Max. switching power	4,432 V A		Between contacts and coil	1,000 Vrms for 1 min.
	Max. switching voltage	277 V AC			4,000 Vrms for 1 min.
	Max. switching current	16 A		Initial surge voltage between contact and coil*3	
Expected life (min. operations)	Min. switching capacity*1 (Reference value)	100 mA, 5 V DC		Operate time*4 (at nominal voltage) (at 20°C 68°F)	
	Mechanical (at 180 cpm)	2 × 10 <sup>6</sup>		Max. 20ms	
Electrical (at 20 cpm) (Resistive load)	Electrical (at 20 cpm) (Resistive load)	10 <sup>5</sup>		Release time (with diode)*4 (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*5
					Destructive*6
				Vibration resistance	Functional*7
					Destructive
				Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature)	Ambient temp.
					Humidity
				Unit weight	
				Approx. 17 g .60 oz Approx. 15 g .53 oz (PCB type)	

#### 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: 11 ms; detection time: 10 μs
- \*6 Half-wave pulse of sine wave: 6 ms
- \*7 Detection time: 10 μs
- \*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT .

## ORDERING INFORMATION

Ex. A LE 1 2 B 12

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 06: 6 09: 9 12: 12	18: 18 24: 24 48: 48

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	ALE12005	ALE13005	ALE14005	ALE1P005
	6	ALE12006	ALE13006	ALE14006	ALE1P006
	9	ALE12009	ALE13009	ALE14009	ALE1P009
	12	ALE12012	ALE13012	ALE14012	ALE1P012
	18	ALE12018	ALE13018	ALE14018	ALE1P018
	24	ALE12024	ALE13024	ALE14024	ALE1P024
	48	ALE12048	ALE13048	ALE14048	ALE1P048

○: 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	ALE72005	ALE73005	ALE74005	ALE7P005
	6	ALE72006	ALE73006	ALE74006	ALE7P006
	9	ALE72009	ALE73009	ALE74009	ALE7P009
	12	ALE72012	ALE73012	ALE74012	ALE7P012
	18	ALE72018	ALE73018	ALE74018	ALE7P018
	24	ALE72024	ALE73024	ALE74024	ALE7P024
	48	ALE72048	ALE73048	ALE74048	ALE7P048

○: 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

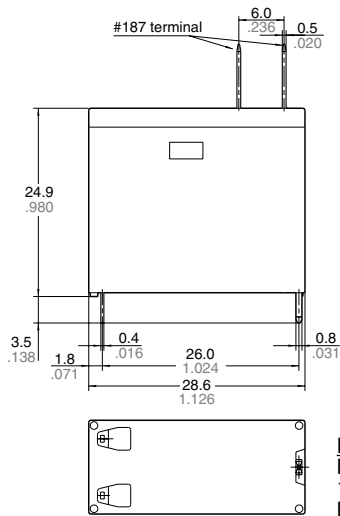
Nominal voltage, V DC	Pick-up voltage, V DC (max.) (at 20°C 68°F)	Drop-out voltage, V DC (min.) (at 20°C 68°F)	Coil resistance, Ω (±10%) (at 20°C 68°F)	Nominal operating current, mA (±10%) (at 20°C 68°F)	Nominal operating power, mW (at 20°C 68°F)	Maximum allowable voltage, V DC (at 20°C 68°F)
5	3.75	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

## DIMENSIONS

mm inch

### 1. TMP type

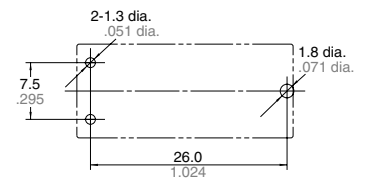
PCB side three terminals  
(includes one dummy terminal)



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

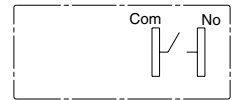
**Tolerance**  
 ±0.1 ±.004  
 ±0.2 ±.008  
 ±0.3 ±.012

PC board pattern (Bottom view)

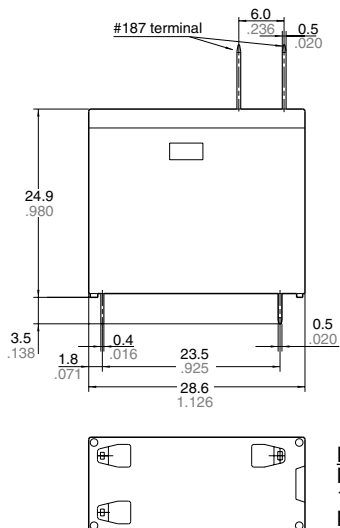


Tolerance : ±0.1 ±.004

Schematic (Bottom view)



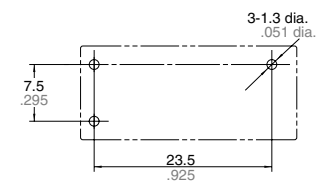
PCB side three terminals



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

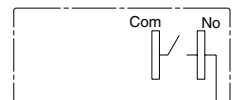
**Tolerance**  
 ±0.1 ±.004  
 ±0.2 ±.008  
 ±0.3 ±.012

PC board pattern (Bottom view)



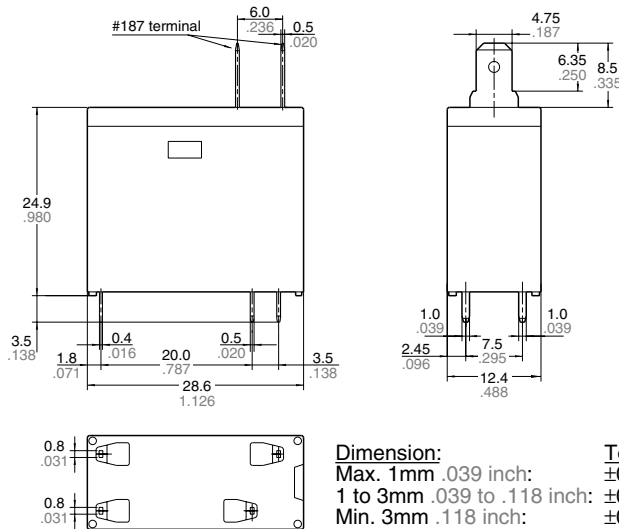
Tolerance : ±0.1 ±.004

Schematic (Bottom view)

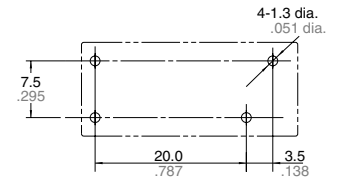


PCB side four terminals

mm inch

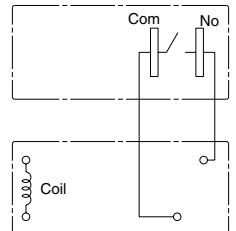


PC board pattern (Bottom view)

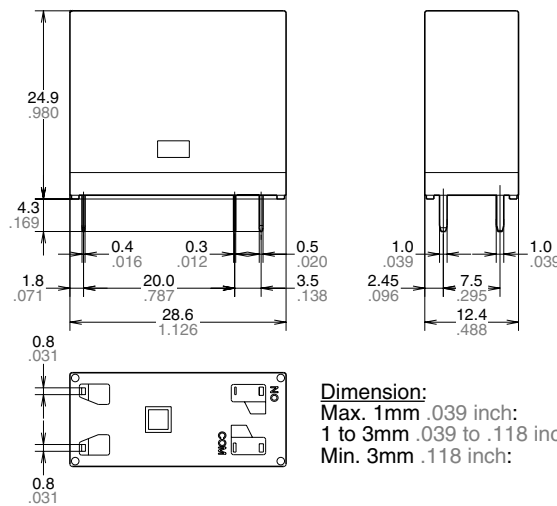


Tolerance :  $\pm 0.1 \pm .004$

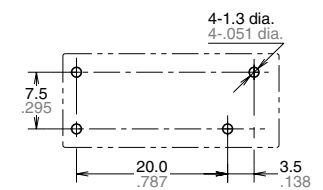
Schematic (Bottom view)



## 2. PCB type (No tab terminals)



PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm .004$

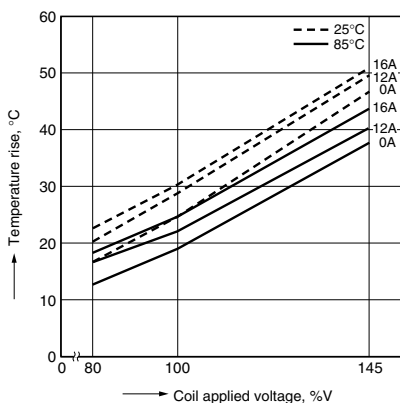
Schematic (Bottom view)



## REFERENCE DATA

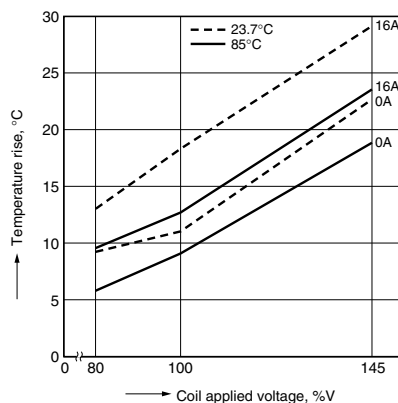
1-1. Coil temperature rise (400mW type)

Sample: ALE14B12, 6 pcs.  
 Point measured: coil inside  
 Ambient temperature: 25°C 77°F, 85°C 185°F

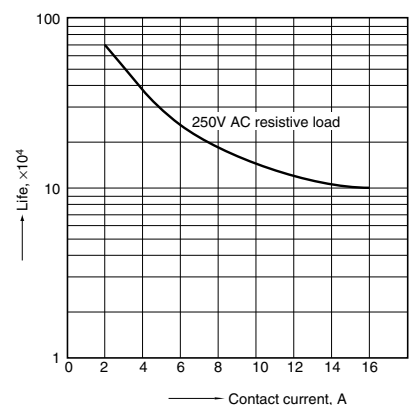


1-2. Coil temperature rise (200mW type)

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)

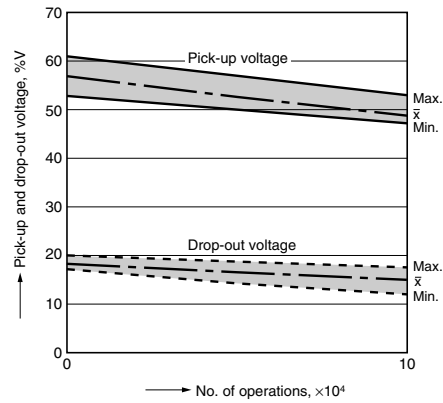
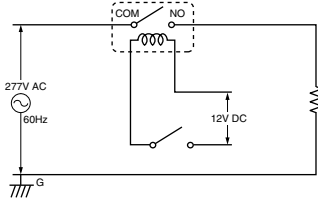
Sample: ALE14B12, 6 pcs.

Operation frequency: 20 times/min.

(ON/OFF = 1.5s: 1.5s)

Ambient temperature: Room temperature

Circuit:



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

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