

NAIS

16A Power Relay For Micro wave oven

LE-RELAYS

FEATURES

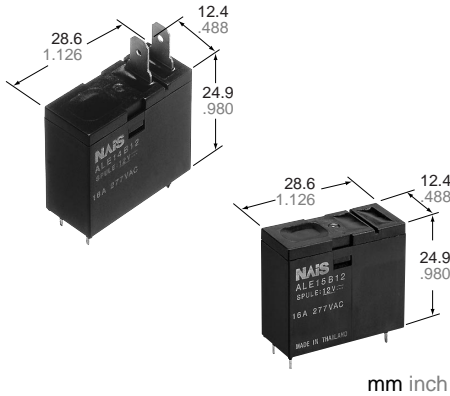
- 1. Ideal for magnetron and heater loads**
- 2. Excellent heat resistance**
 - This satisfies UL coil insulation class B
- 3. High insulation resistance**
 - Creepage distance and clearances between contact and coil: Min. 8 mm .315 inch
 - Surge withstand voltage: Min. 10,000V
- 4. Low operating power**
 - Nominal operating power: 400mW

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, approved and VDE, SEMKO pending



mm inch

SPECIFICATIONS

Contact

Arrangement	1 Form A	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100 mΩ	
Contact material	Silver alloy	
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)	Mechanical (at 180 cpm)	2 × 10 ⁶
	Electrical (at 20 cpm) (Resistive load)	10 ⁵

Coil

Nominal operating power	400 mW
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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 $\pm 1.2 \times 50\mu s$ 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 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61).

Characteristics

Max. operating speed (at rated load)	20 cpm	
Initial insulation resistance* ₁	Min. 1,000 MΩ (at 500 V DC)	
Initial breakdown voltage* ₂	Between open contacts	1,000 Vrms for 1 min.
	Between contacts and coil	4,000 Vrms for 1 min.
Surge voltage between contact and coil* ₃	Min. 10,000 V	
Operate time* ₄ (at nominal voltage)	Approx. 20ms	
Release time (without diode)* ₄ (at nominal voltage)	Approx. 20ms	
Temperature rise (at nominal voltage)	Max. 55°C (resistance method, contact current 16 A, rated coil voltage, 20°C 68°F)	
Shock resistance	Functional* ₅	Min. 200 m/s ² {20 G}
	Destructive* ₆	Min. 1,000 m/s ² {100 G}
Vibration resistance	Functional* ₇	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* ₈ (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	

TYPICAL APPLICATIONS

- Microwave ovens
- Refrigerators
- OA equipment

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	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 5: PCB type (No tab terminals)	B: Class B insulation	05: 5 18: 18 06: 6 24: 24 09: 9 48: 48 12: 12

UL/CSA, TÜV approved type is standard.
Note: Standard packing; Carton: 100 pcs. Case 500 pcs.

TYPES

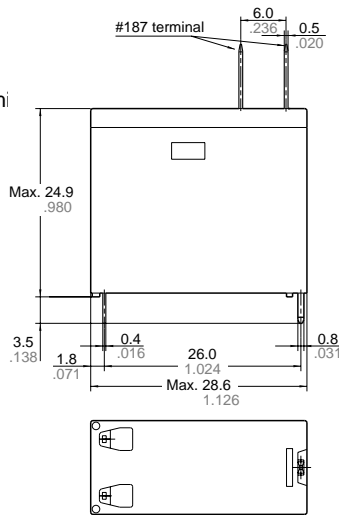
Contact arrangement	Coil voltage, V DC	TMP type/PCB side three terminals (includes one dummy terminal)	TMP type/PCB side three terminals	TMP type/PCB side four terminals	PCB type (No tab terminals)
		Part No.	Part No.	Part No.	Part No.
1 Form A	5	ALE12B05	ALE13B05	ALE14B05	ALE15B05
	6	ALE12B06	ALE13B06	ALE14B06	ALE15B06
	9	ALE12B09	ALE13B09	ALE14B09	ALE15B09
	12	ALE12B12	ALE13B12	ALE14B12	ALE15B12
	18	ALE12B18	ALE13B18	ALE14B18	ALE15B18
	24	ALE12B24	ALE13B24	ALE14B24	ALE15B24
	48	ALE12B48	ALE13B48	ALE14B48	ALE15B48

COIL DATA

Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω(±10%)	Nominal operating current, mA (±10%)	Nominal operating power, W	Maximum allowable voltage, V DC
5	3.8	0.3	63	80	0.4	7.2
6	4.5	0.3	90	66.7		8.7
9	6.8	0.5	203	44.4		13.0
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	

DIMENSIONS

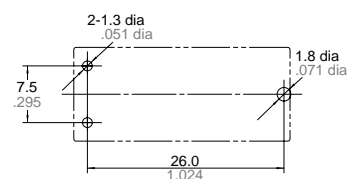
1. TMP type
PCB side three terminals
(includes one dummy term)



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

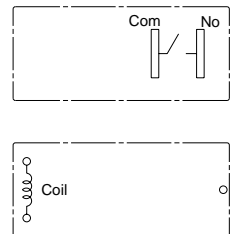
Tolerance
±0.1 ±.004
±0.2 ±.008
±0.3 ±.012

PC board pattern (Bottom view)

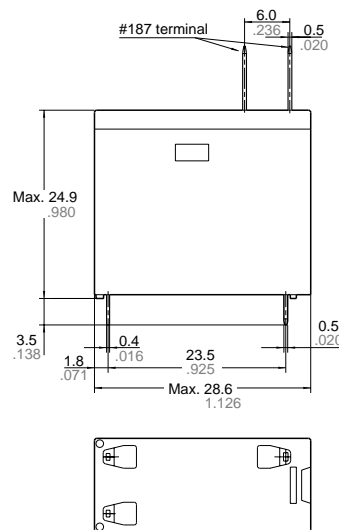


Tolerance : ±0.1 ±.004

Schematic (Bottom view)



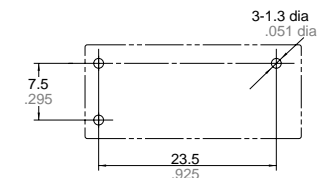
PCB side three terminals



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

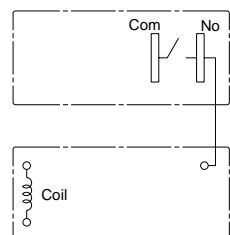
Tolerance
±0.1 ±.004
±0.2 ±.008
±0.3 ±.012

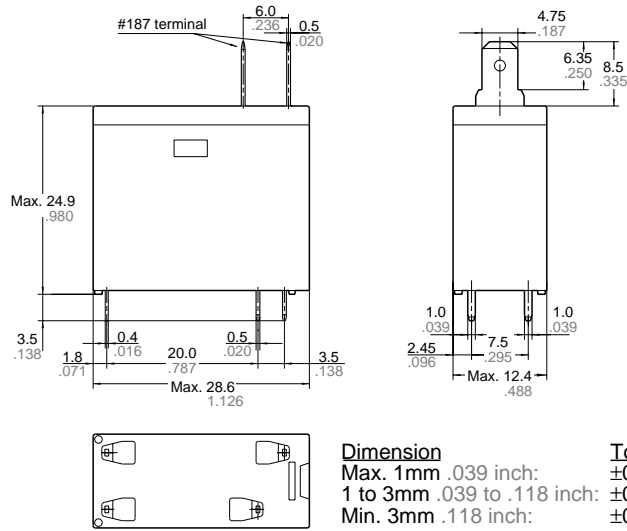
PC board pattern (Bottom view)



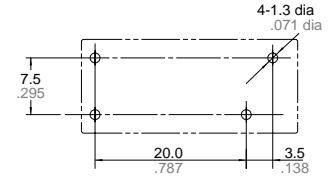
Tolerance : ±0.1 ±.004

Schematic (Bottom view)



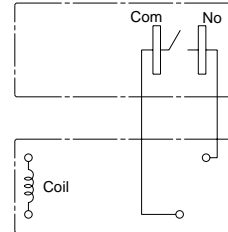


PC board pattern (Bottom view)



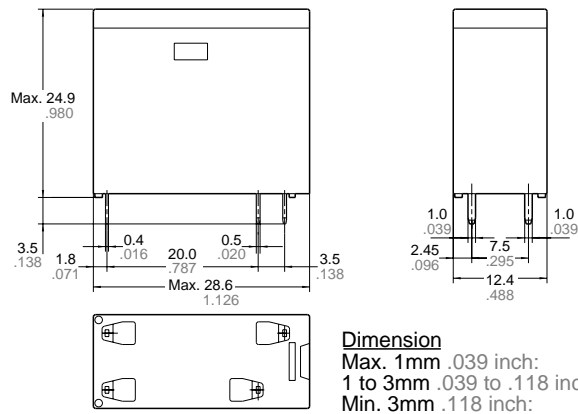
Tolerance : $\pm 0.1 \pm 0.004$

Schematic (Bottom view)

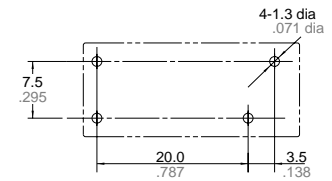


2. PCB type

PCB side four terminals
(No tab terminals)



PC board pattern (Bottom view)



Tolerance : $\pm 0.1 \pm 0.004$

Schematic (Bottom view)

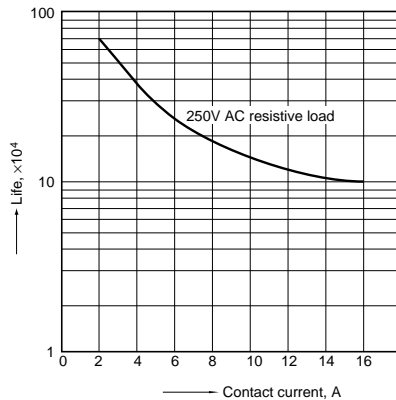
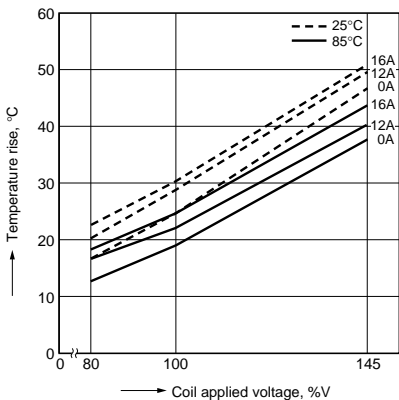


REFERENCE DATA

1. Coil temperature rise

Sample: ALE15B12, 6 pcs.
Point measured: coil inside
Ambient temperature: 25°C 77°F, 85°C 185°F

2. Life curve



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

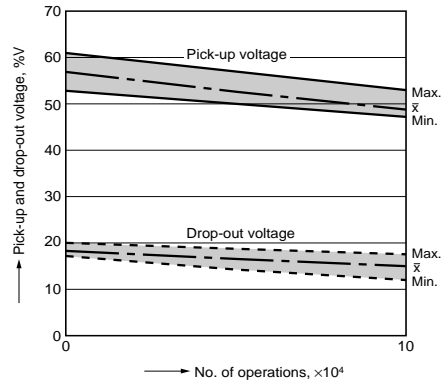
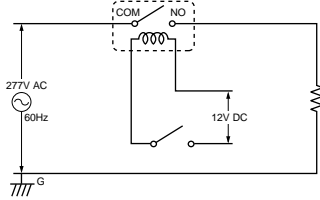
Sample: ALE15B12, 6 pcs.

Operation frequency: 20 times/min.

(ON/OFF = 1.5s: 1.5s)

Ambient temperature: Room temperature

Circuit:



For Cautions for Use, see Relay Technical Information (Page 48 to 76).