



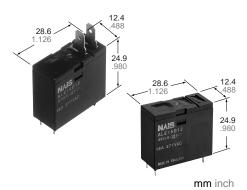






16A Power Relay For Micro wave oven

LE RELAYS



FEATURES

- 1. Ideal for magnetron and heater loads
- 2. Excellent heat resistance
- This satisfies UL coil insulation class B/ class F available
- 3. High insulation resistance
- Creepage distance and clearances between contact and coil: Min. 8 mm .315
- Surge withstand voltage: Min. 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

SPECIFICATIONS

Contact

Arrangement		1 Form A	
Initial contact resis (By voltage drop 6		100 mΩ	
Contact material		Silver alloy	
Rating (resistive load)	Nominal switch- ing 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)	105	

Coil

Туре	Standard	High sensitive
Nominal operating power	400 mW	200 mW

- Specifications will vary with foreign standards certification ratings.
- * 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 24).

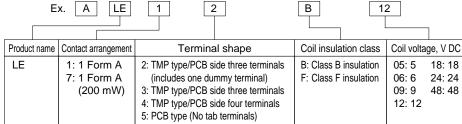
Characteristics

Max. operating spe (at rated load)	ed	20 cpm		
Initial insulation res	istance*1	Min. 1,000 MΩ (at 500 V DC)		
Initial breakdown	Between open contacts	1,000 Vrms for 1 min.		
voltage*2	Between con- tacts and coil	4,000 Vrms for 1 min.		
Initial surge voltage and coil*3	e between contact	Min. 10,000 V		
Operate time*4 (at nominal voltage) (at 20°C 68°F)	Max. 20ms		
Release time (with (at nominal voltage		Max. 20ms Max. 25ms (200 mW type)		
Temperature rise (a (resistance method 16 A, 20°C 68°F)		Max. 55°C Max. 45°C (200 mW type)		
Shock resistance	Functional*5	Min. 200 m/s ² {20 G}		
SHOCK resistance	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 condens- ing 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 2



UL/CSA, TÜV, VDE approved type is standard.

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

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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	ALE15\(\)05
	6	ALE12006	ALE13O06	ALE14O06	ALE15\(\text{O06}\)
	9	ALE12O09	ALE13O09	ALE14O09	ALE15\(\to\)09
	12	ALE12O12	ALE13O12	ALE14O12	ALE15O12
	18	ALE12O18	ALE13O18	ALE14O18	ALE15O18
	24	ALE12O24	ALE13O24	ALE14O24	ALE15\(\)24
	48	ALE12O48	ALE13O48	ALE14O48	ALE15\(\text{O48}\)

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	ALE75O05	
	6	ALE72006	ALE73O06	ALE74O06	ALE75\(\)06	
	9	ALE72O09	ALE73O09	ALE74O09	ALE75\(\triangle 009\)	
	12	ALE72O12	ALE73O12	ALE74O12	ALE75O12	
	18	ALE72O18	ALE73O18	ALE74O18	ALE75O18	
	24	ALE72O24	ALE73O24	ALE74O24	ALE75O24	
	48	ALE72O48	ALE73O48	ALE74O48	ALE75\(\text{O48}\)	

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		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	400	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

2. High sensitive type

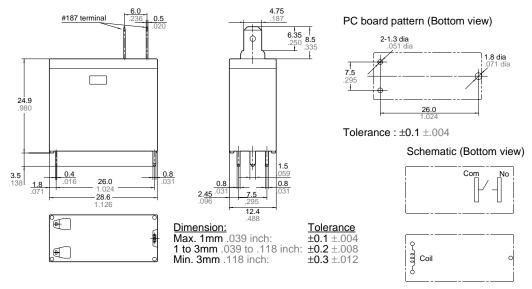
Nominal voltage, V DC	Pick-up voltage, V DC (max.) (at 20°C 68°F)	Drop-out voltage, V DC (min.) (at 20°C 68°F)	Coil resistance, Ω (±10%) (at 20°C 68°F)	Nominal operating current, mA (±10%) (at 20°C 68°F)	Nominal operating power, mW (at 20°C 68°F)	Maximum allowable voltage, V DC (at 20°C 68°F)
5	3.75	0.25	125	40		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	200	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

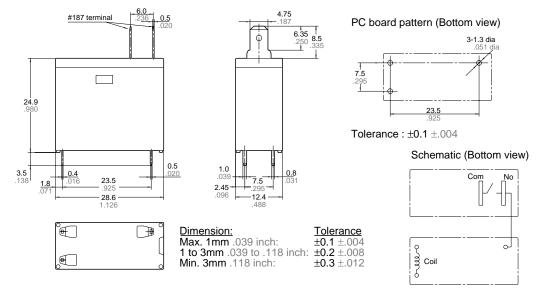
1. TMP type

PCB side three terminals (includes one dummy terminal)

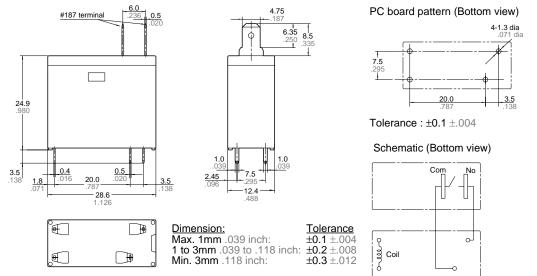




PCB side three terminals mm inch



PCB side four terminals mm inch

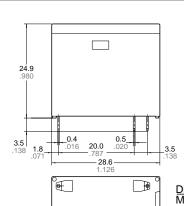


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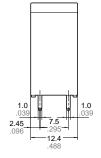
2. PCB type

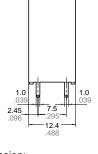
PCB side four terminals (No tab terminals)





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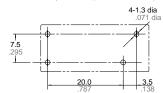
Min. 3mm .118 inch:

Tolerance ±0.1 ±.004 ±0.2 ±.008 Dimension: Max. 1mm .039 inch: 1 to 3mm .039 to .118 inch:

 $\pm 0.3 \pm .012$

mm inch

PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

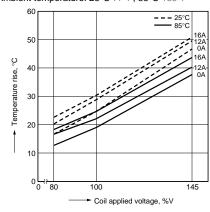
Schematic (Bottom view)



REFERENCE DATA

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

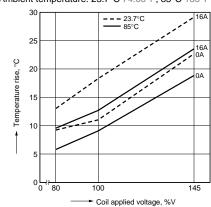
Sample: ALE15B12, 6 pcs. Point measured: coil inside Ambient temperature: 25°C 77°F, 85°C 185°F



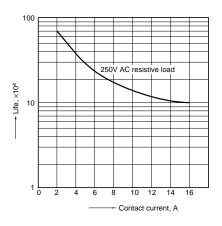
1-2. Coil temperature rise (200mW type)

Sample: ALE75B12, 6 pcs. Point measured: coil inside Ambient temperature: 23.7°C 74.66°F, 85°C 185°F

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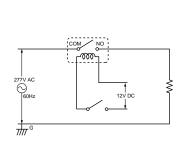


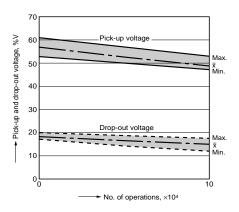
2. Life curve



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 11 to 39).