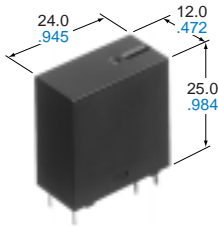


**UL File No.: E43149**  
**CSA File No.: LR26550**  
**VDE File No.: 116920 ÜG**



mm inch

### FEATURES

- 2 Form A slim type**  
24(L) × 12(W) × 25(H) mm  
.945(L) × .472(W) × .984(H) inch
- 3A type and 5A TV-4 type**  
3A type: Contact reliability and break performance best suited for protecting and switching speakers.  
5A TV-4 type: Tough against inrush current and optimal for turning on and off the power supply. Rated TV-4 (UL/CSA).
- High insulation resistance**
  - Creepage distance and clearances

- between contact and coil: Min. 6 mm .236 inch (In compliance with IEC65)
- Surge withstand voltage between contact and coil: 10,000 V or more.
- High noise immunity realized by the card separation structure between contact and coil**
- Conforms to the various safety standards**
  - UL/CSA, SEMKO, TÜV, VDE approved

### SPECIFICATIONS

#### Contact

Type	3A rated	5A TV-4 rated
Arrangement	2 Form A	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	Max. 50 mΩ	Max. 100 mΩ
Contact material	Gold-clad silver alloy	Silver alloy
Rating (resistive load)	Nominal switching capacity	3 A 125 V AC
	Max. switching power	625 VA
	Max. switching voltage	125 V AC
	Max. switching current	5 A (AC)
Expected life (min. operations)	Mechanical (at 180 cpm)	10 <sup>6</sup>
	Electrical (at 20 cpm) (at rated load)	5 × 10 <sup>4</sup> (ON:OFF=1.5s:1.5s)

#### Coil

Nominal operating power	530 mW
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#### Remarks

- \*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

#### Characteristics

Type	3A rated	5A TV-4 rated
Max. operating speed	20 cpm	
Initial insulation resistance*1	Min. 1,000 MΩ (at 500 V DC)	
Initial *2 breakdown voltage	Between contact sets	1,000 Vrms for 1 min.
	Between open contacts	1,000 Vrms for 1 min.
	Between contact 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)	Max. 15ms (at 20°C 68°F)	
Release time (with diode)*4 (at nominal voltage)	Max. 15ms (at 20°C 68°F)	
Temperature rise (at 70°C)	Max. 45°C with nominal coil voltage and at 3 A contact carrying current	Max. 45°C with nominal coil voltage and at 5 A contact carrying current
	Shock resistance	Functional*5
Vibration resistance	Destructive*6	Min. 1,000 m/s <sup>2</sup> {approx. 100 G}
	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 (Not freezing and condensing at low temperature)	Ambient temp.
Humidity		5 to 85% R.H.
Air pressure		86 to 106 kPa
Unit weight	Approx. 13 g .46 oz	

### TYPICAL APPLICATIONS

- Audio visual equipment
- Monitor
- Home appliances

### ORDERING INFORMATIONS

Product name	Contact arrangement	Contact capacity	Protective construction	Coil voltage(V DC)
LA	2: 2 Form A	Nil: 3A P: 5A TV-4	F: Flux-resistant type	12, 24

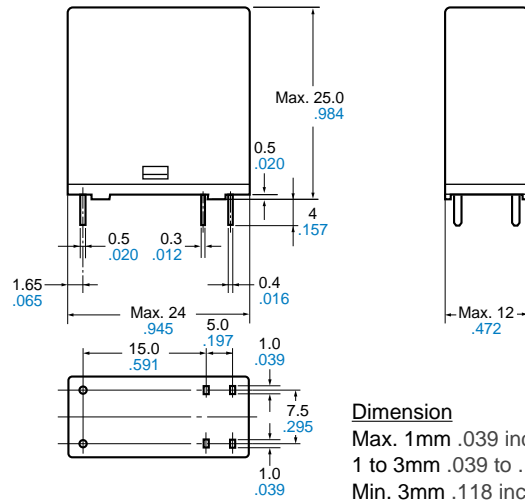
Notes: 1. Standard packing Carton: 100 pcs. Case: 500 pcs.  
 2. 4.5V, 5V, 9V and 18V DC types are also available. Please consult us for details.

# TYPES AND COIL DATA (at 20°C 68°F)

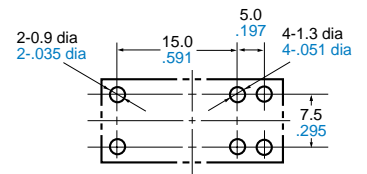
Part No.		Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Maximum allowable voltage, V DC
3 A type	5A TV-3 type							
ALA2F12	ALA2PF12	12	(Initial) 9	(Initial) 0.6	272	44.2	530	15.6
ALA2F24	ALA2PF24	24	(Initial) 18	(Initial) 1.2	1,087	22.1	530	31.2

## DIMENSIONS

mm inch



PC board pattern (Bottom view)



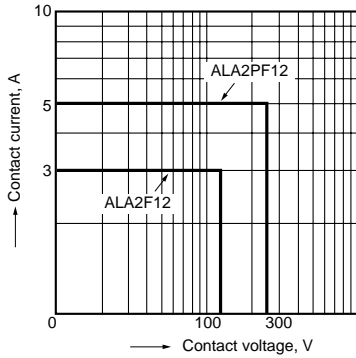
Tolerance : ±0.1 ±.004

Schematic (Bottom view)



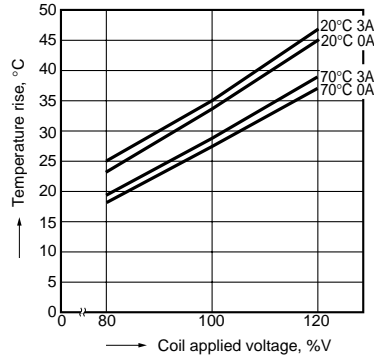
## REFERENCE DATA

1. Max. switching power (AC resistive load)



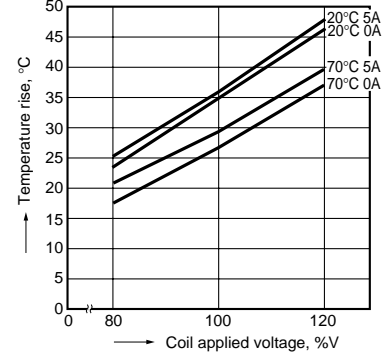
2-(1). Coil temperature rise

Sample: ALA2F12, 6 pcs.  
Measured portion: coil inside  
Contact current: 0 A, 3A



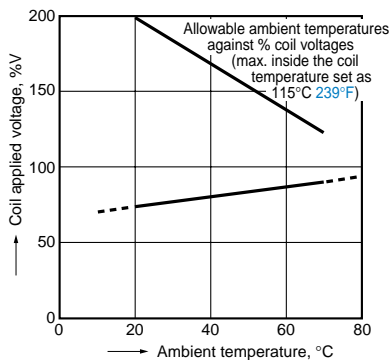
2-(2). Coil temperature rise

Sample: ALA2PF12, 6 pcs.  
Measured portion: coil inside  
Contact current: 0 A, 5A



3. Ambient temperature characteristics and coil applied voltage

Contact current: ALA2F=3A  
ALA2PF=5A



4-(1). Electrical life test

(3 A 125 V AC, resistive load)

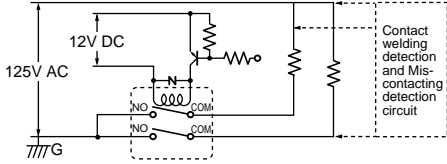
Sample: ALA2F12, 6 pcs.

Operation frequency: 20 times/min.

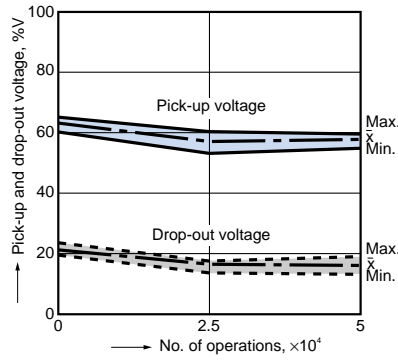
(ON/OFF = 1.5s: 1.5s)

Ambient temperature: 20°C 68°F

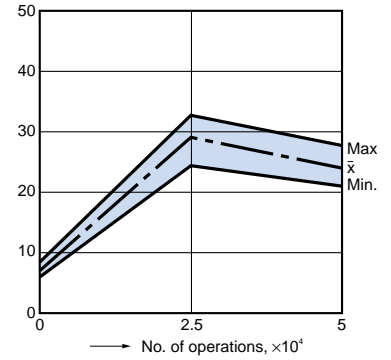
Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



4-(2). Electrical life test

(5 A 250 V AC, resistive load)

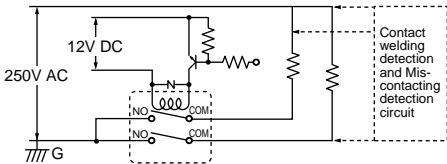
Sample: ALA2PF12, 6 pcs.

Operation frequency: 20 times/min.

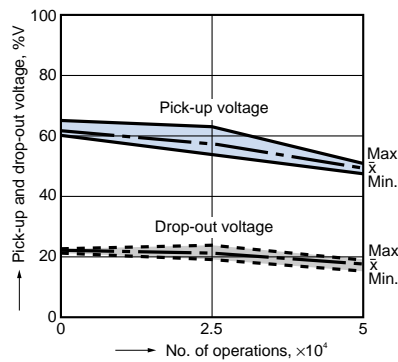
(ON/OFF = 1.5s: 1.5s)

Ambient temperature: 20°C 68°F

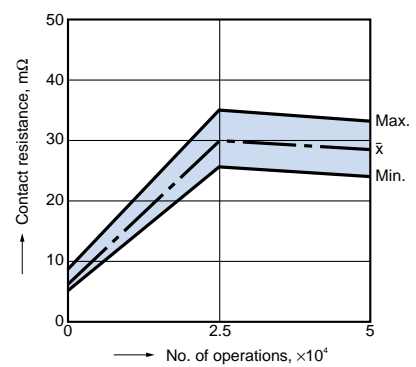
Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



4-(3). Electrical life test

(UL lamp load test TV-3)

Tested sample: ALA2PF12, 6 pcs.

• Overload test

Load: 4.5 A 120 V AC (60 Hz),

Inrush: 71 A

Operation frequency: 10 times/min

(ON: OFF = 1 s: 5 s)

No. of operations: 50 ope.

• Endurance test

Load: 3A 120 V AC (60 Hz),

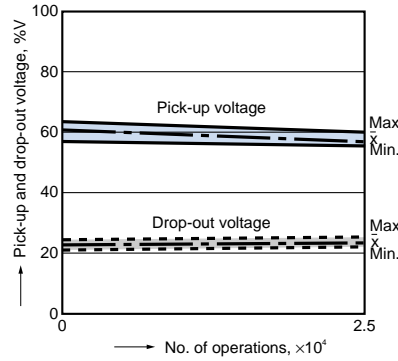
Inrush: 51 A

Operation frequency: 10 times/min

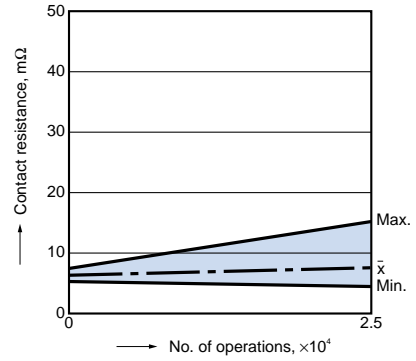
(ON: OFF = 1 s: 5 s)

No. of operations: 25,000 ope.

Change of pick-up and drop-out voltage



Change of contact resistance



## NOTES

### 1. Coil operating power

Pure DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%. However, check it with the actual circuit since the characteristics may be slightly different.

### 2. Voltage applied to coil

To ensure reliable operation, please apply nominal voltage to the coil. Beware of the fact that pick-up voltage and dropout voltage vary depending on the ambient temperature and conditions.

### 3. Operating life

Operating life varies depending on the type and load of the coil drive circuit, as well as factors like the operating frequency, operating phase and ambient atmosphere, so please check with actual equipment.

### 4. Soldering

We recommend the following soldering conditions.

#### 1) Automatic soldering

- \* Preheating: 100°C 212°F, within 2 mins (PC board solder surface)
- \* Soldering: 260°C 500°F, within 5 s

#### 2) Hand soldering

- \* Iron tip temperature: 280 to 300°C  
536 to 571°F
- \* Soldering iron: 30 to 60W
- \* Soldering time: Within 5 s

### 5. Usage, transport and storage conditions

1) Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:

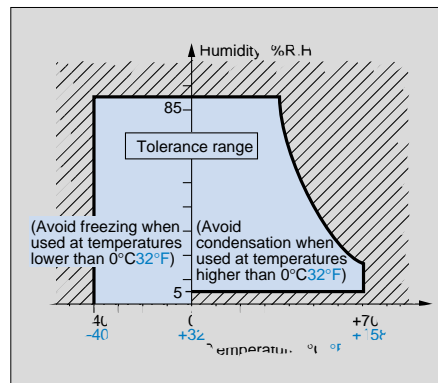
(1) Temperature:

–40 to +70°C –40 to +158°F

(2) Humidity: 5 to 85% RH

(Avoid freezing and condensation.)

The humidity range varies with the temperature. Use within the range indicated in the graph below.



(3) Atmospheric pressure: 86 to 106 kPa  
Temperature and humidity range for usage, transport, and storage:

#### 2) Condensation

Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.

#### 3) Freezing

Condensation or other moisture may freeze on the relay when the temperatures is lower than 0°C 32°F. This causes problems such as sticking of movable parts or operational time lags.

#### 4) Low temperature, low humidity environments

The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

### 6. Others

If in error the relay has been dropped, the appearance and characteristics should be checked before use without fail.