

Panasonic
 ideas for life

TV-5 rated.
 1a 5A power relays

LK RELAYS



FEATURES

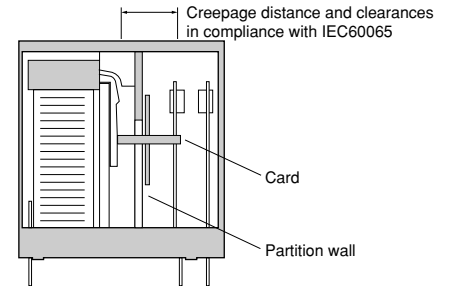
1. High inrush current capability

- 1) Operating load capability:
inrush 100 A, steady 5 A
- 2) UL, CSA, TV-5

2. High insulation resistance between contact and coil

- 1) Creepage distance and clearances between contact and coil: Min. 6 mm .236 inch (In compliance with IEC60065)
- 2) Surge withstand voltage between contact and coil: 10,000 V

3. Popular terminal pitch in AV equipment field

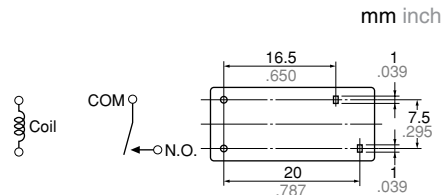


4. Space-saving slim type

Base area: Width 11 × Length 24 mm
 Width .433 × Length .945 inch

5. Conforms to the various safety standards

UL, CSA, VDE, TÜV, SEMKO approved

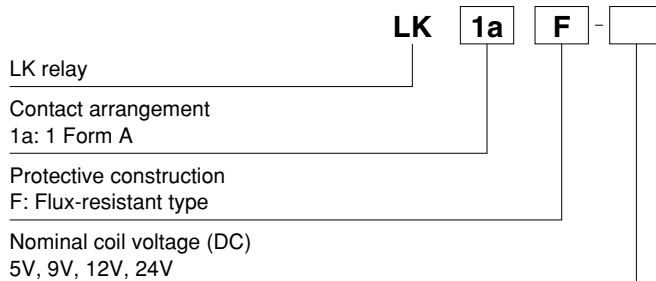


Compliance with RoHS Directive

TYPICAL APPLICATIONS

- AV equipment: TV's, VTR's, etc.
- OA equipment
- HA equipment

ORDERING INFORMATION



Notes: Certified by UL, CSA, TÜV and SEMKO
 VDE approved type is available. Please consult us for details.

TYPES

| Contact arrangement | Nominal coil voltage | Part No. |
|---------------------|----------------------|-----------|
| 1 Form A | 5V DC | LK1aF-5V |
| | 9V DC | LK1aF-9V |
| | 12V DC | LK1aF-12V |
| | 24V DC | LK1aF-24V |

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

RATING

1. Coil data

| Nominal coil voltage | Pick-up voltage (at 20°C 68°F) | Drop-out voltage (at 20°C 68°F) | Nominal operating current [±10%] (at 20°C 68°F) | Coil resistance [±10%] (at 20°C 68°F) | Nominal operating power | Max. applied voltage (at 20°C 68°F) |
|----------------------|---|---|---|---------------------------------------|-------------------------|-------------------------------------|
| 5V DC | 70%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 106.4mA | 47Ω | 530mW | 6.5V DC |
| 9V DC | | | 58.8mA | 153Ω | | 11.7V DC |
| 12V DC | | | 44.2mA | 272Ω | | 15.6V DC |
| 24V DC | | | 22.1mA | 1,087Ω | | 31.2V DC |

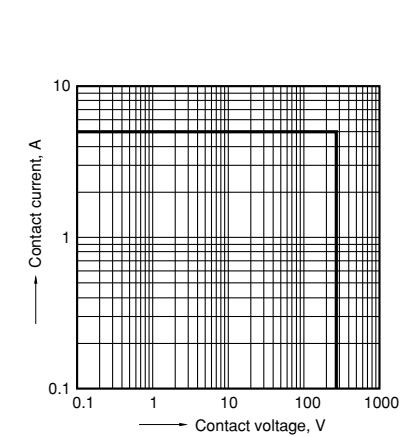
2. Specifications

| Characteristics | Item | | Specifications |
|----------------------------|--|--------------------------|---|
| Contact | Arrangement | | 1 Form A |
| | Contact resistance (Initial) | | Max. 100 mΩ (By voltage drop 6V DC 1A) |
| | Contact material | | AgSnO ₂ type |
| Rating | Nominal switching capacity | | 5A 277V AC (resistive load), 5A 30V DC (resistive load) |
| | Max. switching power | | 1,385 VA, 150 W (resistive load) |
| | Max. switching voltage | | 277V AC, 30V DC |
| | Max. switching current | | 5A (AC), 5A (DC) |
| | Min. switching capacity*1 | | 100mA, 5V DC |
| Electrical characteristics | Insulation resistance (Initial) | | Min. 1,000MΩ (at 500V DC) Measurement at same location as “Breakdown voltage” section. |
| | Breakdown voltage (Initial) | Between open contacts | 1,000 Vrms for 1 min. (Detection current: 10 mA) |
| | | Between contact and coil | 4,000 Vrms for 1 min. (Detection current: 10 mA) |
| | Surge breakdown voltage*2 (Between contact and coil) (Initial) | | 10,000 V |
| | Temperature rise (coil) | | Max. 35°C 95°F (By resistive method, nominal coil voltage applied to the coil; contact carrying current: 5A, at 70°C 158°F) |
| | Operate time (at nominal voltage) (at 20°C 68°F) (Initial) | | Max. 15 ms (excluding contact bounce time.) |
| | Release time (at nominal voltage) (at 20°C 68°F) (Initial) | | Max. 5 ms (excluding contact bounce time) (Without diode) |
| Mechanical characteristics | Shock resistance | Functional | 200 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.) |
| | | Destructive | 1,000 m/s ² (Half-wave pulse of sine wave: 6 ms.) |
| | Vibration resistance | Functional | 10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10μs.) |
| | | Destructive | 10 to 55 Hz at double amplitude of 1.5 mm |
| Expected life | Mechanical (at 180 times/min.) | | Min. 2×10 ⁶ |
| | Electrical (at 20 times/min.) | | Min. 10 ⁵ (at nominal switching capacity) |
| Conditions | Conditions for operation, transport and storage*3 | | Ambient temperature: -40°C to +70°C -40°F to +158°F, Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature), Air pressure: 86 to 106kPa |
| | Max. operating speed | | 20 times/min. (at nominal switching capacity) |
| Unit weight | | | Approx. 12 g .42 oz |

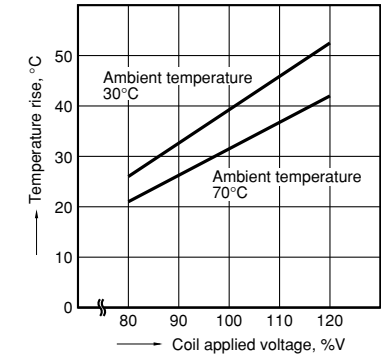
Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981
*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

REFERENCE DATA

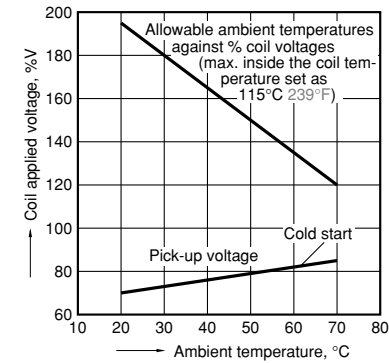
1. Max. switching power (AC resistive load)



2. Coil temperature rise
Sample: LK1aF-12V, 6 pcs.
Point measured: coil inside
Contact current: 5 A



3. Ambient temperature characteristics
Contact current: 5 A

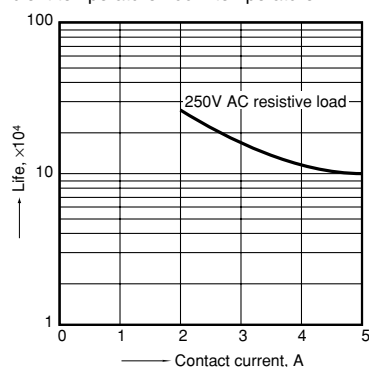


4. Life curve

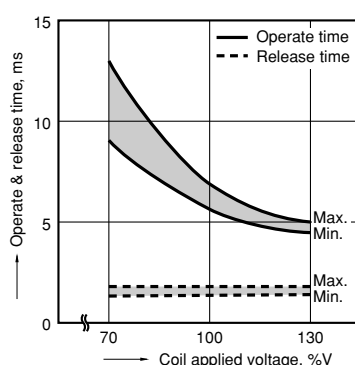
Operation frequency: 20 times/min.

(ON/OFF = 1.5s: 1.5s)

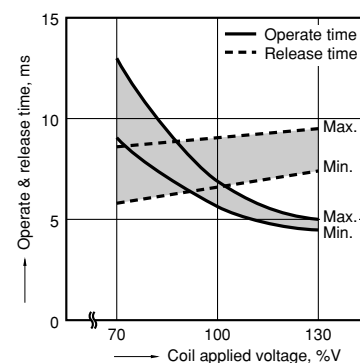
Ambient temperature: room temperature



5-1. Operate & release time (without diode)



5-2. Operate & release time (with diode)



6-1. Electrical life test

(5 A 277 V AC, resistive load)

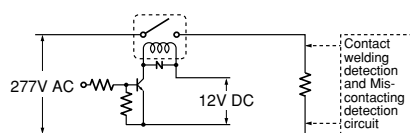
Sample: LK1aF-12V, 6 pcs.

Operation frequency: 20 times/min.

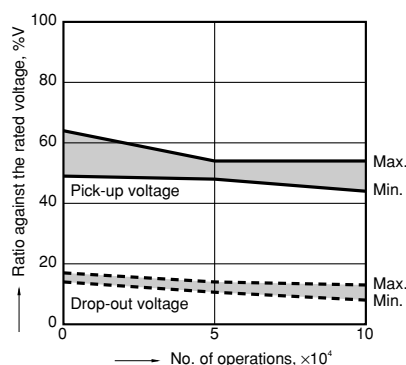
(ON/OFF = 1.5s: 1.5s)

Ambient temperature: 26°C 79°F

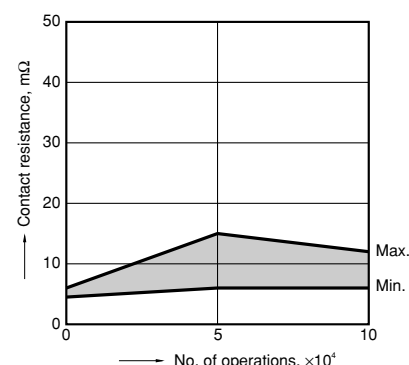
Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



6-2. Electrical life test

(UL lamp load test TV-5)

Tested sample: LK1aF-12V, 6 pcs.

• Overload test

Load: 7.5 A 120 V AC (60 Hz),

Inrush: 111 A

Operation frequency: 10 times/min

(ON: OFF = 1 s: 5 s)

No. of operations: 50 ope.

• Endurance test

Load: 5 A 120 V AC (60 Hz),

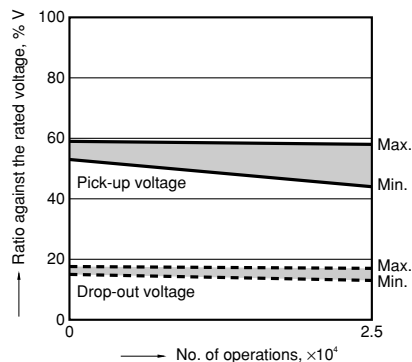
Inrush: 78 A

Operation frequency: 10 times/min

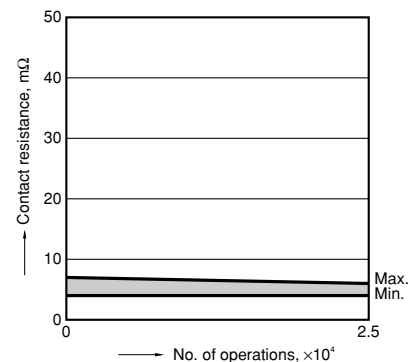
(ON: OFF = 1 s: 5 s)

No. of operations: 25,000 ope.

Change of pick-up and drop-out voltage



Change of contact resistance



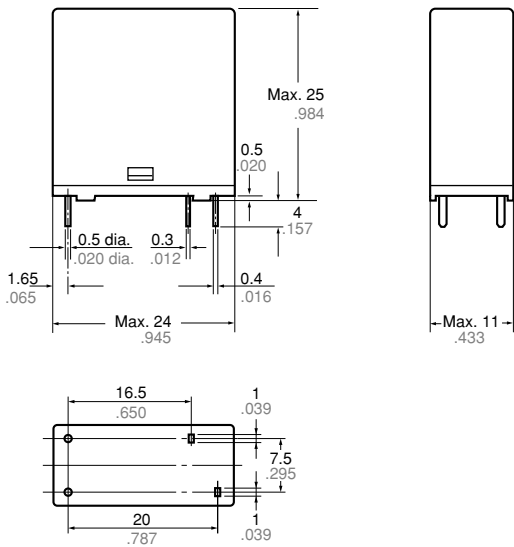
DIMENSIONS (mm inch)

The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://panasonic-electric-works.net/ac>

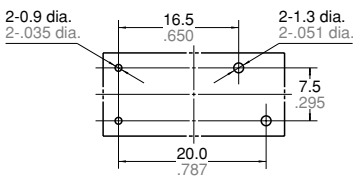
CAD Data



External dimensions



PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm .004$

Schematic (Bottom view)



| Dimension: | General tolerance |
|--|--------------------|
| Less than 1mm .039inch: | $\pm 0.1 \pm .004$ |
| Min. 1mm .039inch less than 3mm .118 inch: | $\pm 0.2 \pm .008$ |
| Min. 3mm .118 inch: | $\pm 0.3 \pm .012$ |

SAFETY STANDARDS

| UL/C-UL (Recognized) | | CSA (Certified) | | VDE (Certified) | | TV rating (UL/CSA) | | TÜV (Certified) | | SEMKO (Certified) | |
|----------------------|-------------------------|-----------------|-------------------------|-----------------|-----------------------|--------------------------------|--------|----------------------|--|-------------------|---------------------------------|
| File No. | Contact rating | File No. | Contact rating | File No. | Contact rating | File No. | Rating | File No. | Rating | File No. | Contact rating |
| E43149 | 5A 277V AC 5A 30V DC | LR26550 etc. | 5A 277V AC 5A 30V DC | 40014390 | 5A 250V AC (cosφ=1.0) | UL E43149 CSA LR26550 | TV-5 | B 08 06 13461 245 | 5A 250V AC (cosφ=1.0) 5A 30V DC (0ms) | 807779 | 3/100A 250V AC 5/40A 250V AC |

For Cautions for Use.