



**TV-5/TV-8 rated
1 Form A 5A/8A silent type
power relays**

LK-Q RELAYS



RoHS compliant

Protective construction: Flux-resistant type

FEATURES

1. High sensitivity

A nominal operating power of 250mW and high sensitivity make it ideal for energy saving (LK relay is 530mW).

2. Silent

Approx. 10 dB less sound pressure than previous LK series relay

3. High inrush current capability

Switching capability;

- TV-5 type: inrush 100A, steady: 5A
- TV-8 type: inrush 118A, steady: 8A

4. Long insulation distance

- 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

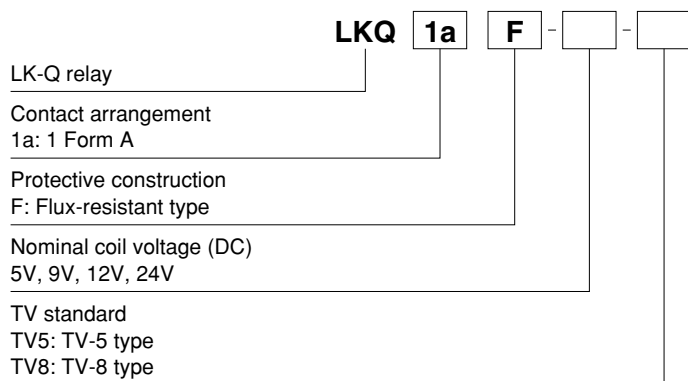
5. Conforms to the various safety standards

UL/C-UL, TÜV, and SEMKO approved

TYPICAL APPLICATIONS

- Flat-panel TVs
- Audio visual equipment

ORDERING INFORMATION



Note: Certified by UL/C-UL, TÜV and SEMKO

TYPES

| Contact arrangement | Nominal coil voltage | Part No. | |
|---------------------|----------------------|----------------|----------------|
| | | TV-5 type | TV-8 type |
| 1 Form A | 5V DC | LKQ1aF-5V-TV5 | LKQ1aF-5V-TV8 |
| | 9V DC | LKQ1aF-9V-TV5 | LKQ1aF-9V-TV8 |
| | 12V DC | LKQ1aF-12V-TV5 | LKQ1aF-12V-TV8 |
| | 24V DC | LKQ1aF-24V-TV5 | LKQ1aF-24V-TV8 |

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 | 80%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 50mA | 100Ω | 250mW | 6.5V DC |
| 9V DC | | | 27.8mA | 324Ω | | 11.7V DC |
| 12V DC | | | 20.8mA | 576Ω | | 15.6V DC |
| 24V DC | | | 10.4mA | 2,304Ω | | 31.2V DC |

2. Specifications

| Characteristics | Item | Specifications | |
|--|--|---|---|
| | | TV-5 type | TV-8 type |
| Contact | Arrangement | 1 Form A | |
| | Contact resistance (Initial) | Max. 100 mΩ (By voltage drop 6 V DC 1A) | |
| | Contact material | AgSnO ₂ type | |
| Rating | Nominal switching capacity (resistive load) | 5A 277V AC | 8A 277V AC |
| | Max. switching power (resistive load) | 1,385VA | 2,216VA |
| | Max. switching voltage | 277V AC | |
| | Max. switching current | 5A (AC) | 8A (AC) |
| | Min. switching capacity (reference value)*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 | |
| | 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. 10 ⁶ | |
| | Electrical | Min. 10 ⁵ (ON: 1.5s, OFF: 1.5s, at nominal switching capacity) | Min. 5×10 ⁴ (ON: 1.5s, OFF: 1.5s, 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 | |

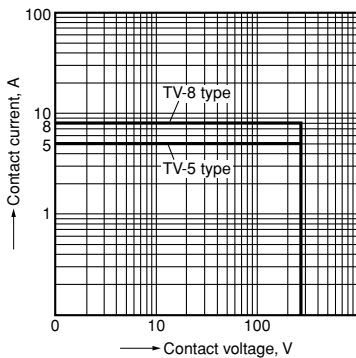
Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

*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.

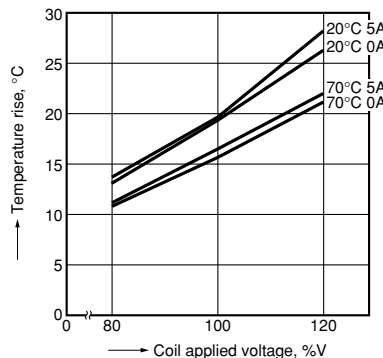
REFERENCE DATA

1. Max. switching power (AC resistive load)



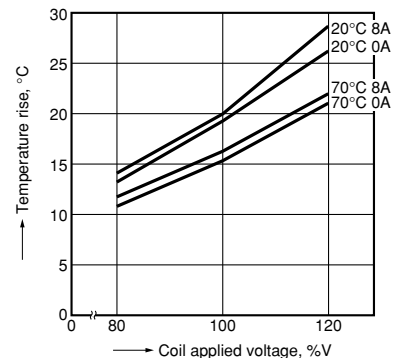
2-(1). Coil temperature rise (TV-5 type)

Sample: LKQ1aF-12V-TV5, 6 pcs.
Point measured: coil inside
Contact current: 0A, 5A

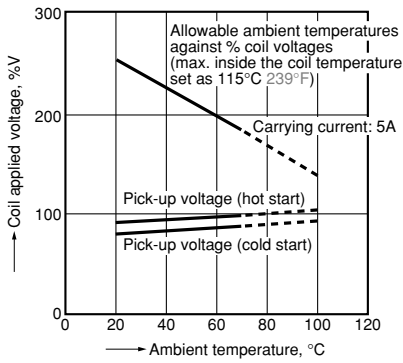


2-(2). Coil temperature rise (TV-8 type)

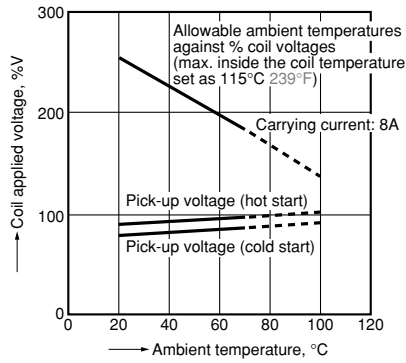
Sample: LKQ1aF-12V-TV8, 6 pcs.
Point measured: coil inside
Contact current: 0A, 8A



3-(1). Ambient temperature characteristics and coil applied voltage (TV-5 type)



3-(2). Ambient temperature characteristics and coil applied voltage (TV-8 type)

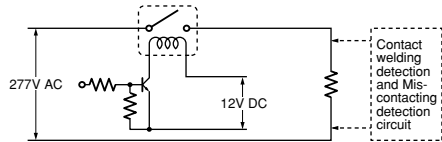


4-(1). Electrical life test (TV-5 type)

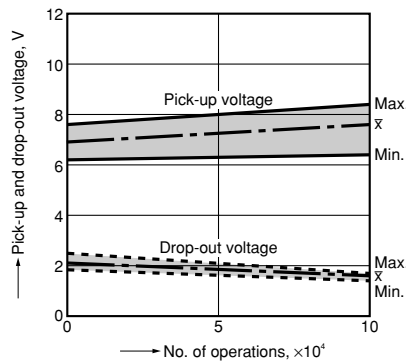
(5A 277V AC, resistive load)

Sample: LKQ1aF-12V-TV5, 6 pcs.
Operation frequency: 20 times/min.
(ON/OFF = 1.5s: 1.5s)
Ambient temperature: 20°C 68°F

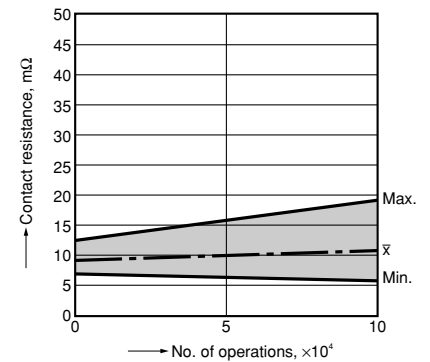
Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance

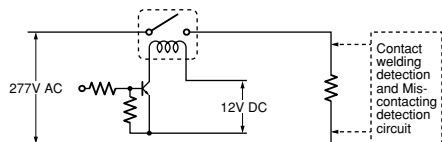


4-(2). Electrical life test (TV-8 type)

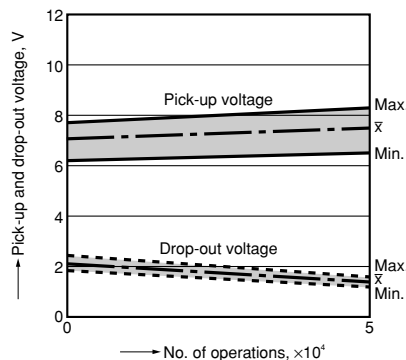
(8A 277V AC, resistive load)

Sample: LKQ1aF-12V-TV8, 6 pcs.
Operation frequency: 20 times/min.
(ON/OFF = 1.5s: 1.5s)
Ambient temperature: 20°C 68°F

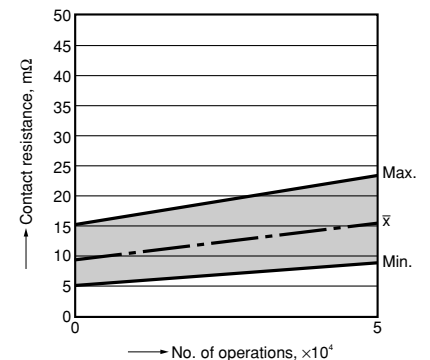
Circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



5-(1). Operation noise distribution

Measuring conditions

Sample: LKQ1aF-12V-TV5, 50pcs

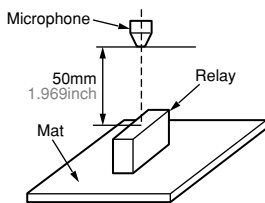
Background noise: approx. 20dB

Coil voltage: 12V DC

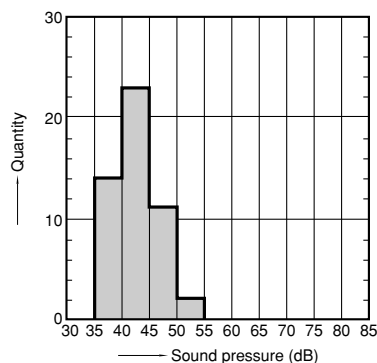
Equipment setting: "A" weighted

Single part (refer to figure below)

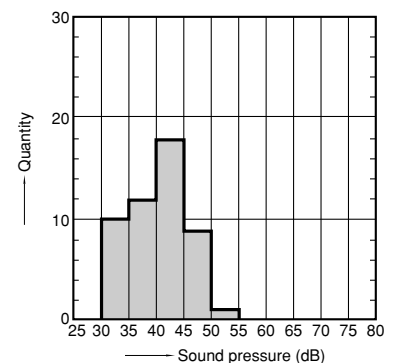
With diode



When operate (At contact making)

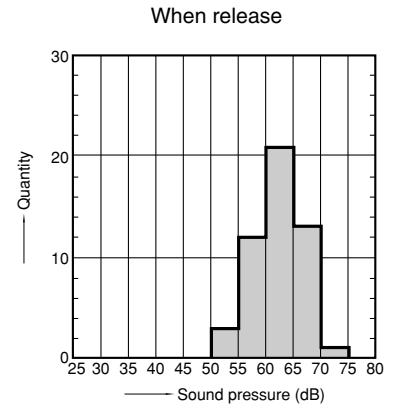
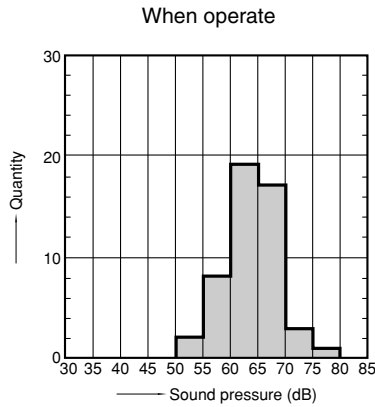
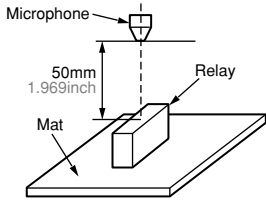


When release (At contact breaking)



5-(2). Operation noise distribution
(refer to comparison)

Measuring conditions
Sample: LKT1aF-12V, 50pcs
Background noise: approx. 20dB
Coil voltage: 12V DC
Equipment setting: "A" weighted
Single part (refer to figure below)
With diode

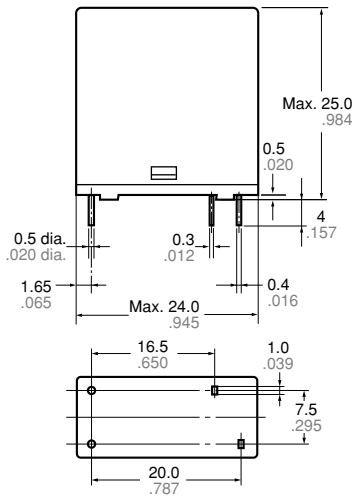


DIMENSIONS (mm inch)

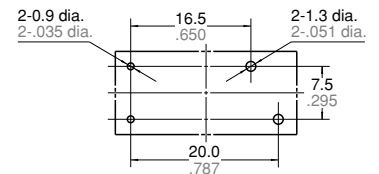
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

CAD Data

External dimensions



PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic (Bottom view)



Dimension:

Less than 1mm .039inch:
Min. 1mm .039inch less than 3mm .118 inch: $\pm 0.2 \pm 0.008$
Min. 3mm .118 inch:

General tolerance

$\pm 0.1 \pm 0.004$
 $\pm 0.2 \pm 0.008$
 $\pm 0.3 \pm 0.012$

SAFETY STANDARDS

| Item | UL/C-UL (Recognized) | | | TÜV (Certified) | | | SEMKO (Certified) | | TV rating (UL/C-UL) | |
|-----------|----------------------|-------------------------|-------------------|-------------------|-----------------------|-------------------|-------------------|-----------------|---------------------|----------------|
| | File No. | Contact rating | Cycles | File No. | Contact rating | Cycles | File No. | Contact rating | File No. | Contact rating |
| TV-5 type | E43149 | 10A 277V AC General use | 5x10 ⁴ | B 12 09 13461 333 | 5A 250V AC (cosφ=1.0) | 10 ⁵ | 1408509 | 3A/100A 250V AC | E43149 | TV-5 |
| | | 5A 277V AC General use | 10 ⁵ | | | | | | | |
| | | 5A 30V DC Resistive | 10 ⁵ | | | | | | | |
| TV-8 type | E43149 | 10A 277V AC General use | 5x10 ⁴ | B 12 09 13461 333 | 8A 250V AC (cosφ=1.0) | 2x10 ⁴ | 1408509 | 3/100A 250V AC | E43149 | TV-8 |
| | | 8A 277V AC General use | 5x10 ⁴ | | | | | | | |
| | | 5A 277V AC General use | 10 ⁵ | | | | | | | |
| | | 5A 30V DC Resistive | 10 ⁵ | | | | | | | |

* CSA standard: Certified by C-UL

NOTES

1. For cautions for use, please read
"GENERAL APPLICATION
GUIDELINES".

Please contact

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