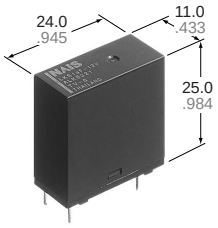
NAiS

250 mW Slim Power Relay

LK-S RELAYS



mm inch

FEATURES

1. High sensitivity: 250mW
The power-saving relay is highly sensitive at the nominal operating power of 250 mW 530 mW power consumption on LK relays).

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 IEC65)
2) Surge withstand voltage between contact and coil: 10,000 V

3. High noise immunity realized by the card separation structure between contact and coil

4. Popular terminal pitch in AV equipment field

5. Space-saving slim type
Base area: Width 11 × Length 24 mm
Width .433 × Length .945 inch

6. Conforms to the various safety standards
UL/CSA, VDE, TÜV and SEMKO SEV approved

SPECIFICATIONS

Contact

Arrangement		1 Form A
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		Max. 100 mΩ
Contact material		Silver alloy
Rating (resistive load)	Nominal switching capacity	5 A 277 V AC
	Max. switching power	1,385 V A
	Max. switching voltage	277 V AC
	Max. switching current	5 A (AC)
Expected life (min. operations)	Mechanical (at 180 cpm)	10^6
	Electrical (at 20 cpm) (at rated load)	10^5

Coil

Nominal operating power	250 mW

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 ±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
*8 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61).

Characteristics

Max. operating speed		20 cpm (at rated load)
Initial insulation resistance*1		Min. 1,000 MΩ (at 500 V DC)
Initial *2 breakdown voltage	Between open contacts	1,000 Vrms for 1 min.
	Between contact and coil	4,000 Vrms for 1 min.
Initial surge voltage between contact and coil*3		Min. 10,000 V
Operate time*4 (at nominal voltage)		Approx. 7 ms (at 20°C 68°F)
Release time (with diode)*4 (at nominal voltage)		Approx. 2 ms (at 20°C 68°F)
Temperature rise (at 70°C)		Max. 35°C with nominal coil voltage and at 5 A contact carrying current (resistance method)
Shock resistance	Functional*5	Min. 200 m/s²{approx. 20 G}
	Destructive*6	Min. 1,000 m/s²{approx. 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 +70°C –40°F to +158°F
	Humidity	5 to 85% R.H.
	Air pressure	86 to 106 kPa
Unit weight		Approx. 12 g .42 oz

TYPICAL APPLICATIONS

- Audio visual equipment
- Office equipment
- Home appliances

ORDERING INFORMATION

Ex. LKS [1a] [F] – [12V]

Contact arrangement	Protective construction	Coil voltage(DC)
1a: 1 Form A	F: Flux-resistant type	5, 9, 12, 24V

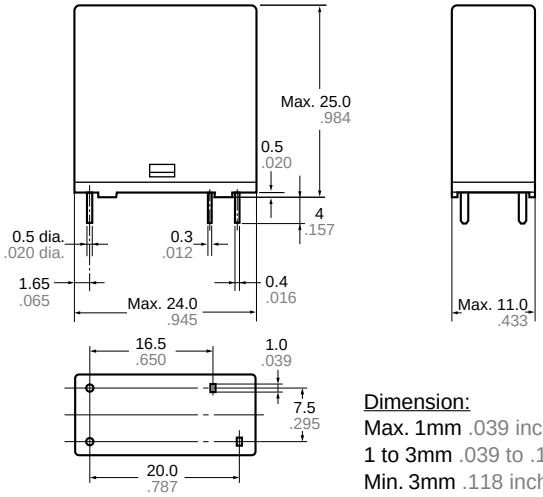
UL/CSA, TÜV, SEMKO, TV-5 approved type is standard.
Notes 1. Standard packing Carton: 100 pcs. Case: 500 pcs.
2. 6 V, 18 V DC types are also available. Please consult us for details.

TYPES AND COIL DATA (at 20°C 68°F)

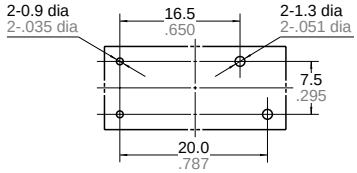
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.) (Initial)	Drop-out voltage, V DC (min.) (Initial)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Maximum allowable voltage, V DC (at 20°C 68°F)
LKS1aF-5V	5	3.5	0.5	100	50	250	6.5
LKS1aF-9V	9	6.3	0.9	324	27.8	250	11.7
LKS1aF-12V	12	8.4	1.2	576	20.8	250	15.6
LKS1aF-24V	24	16.8	2.4	2,304	10.4	250	31.2

DIMENSIONS

mm inch



PC board pattern (Bottom view)



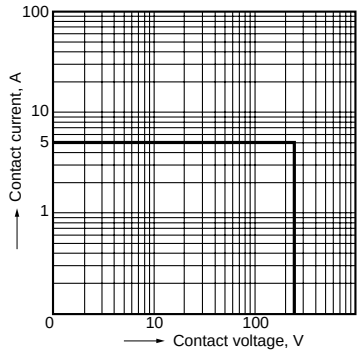
Tolerance: ±0.1 ±.004

Schematic (Bottom view)

Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

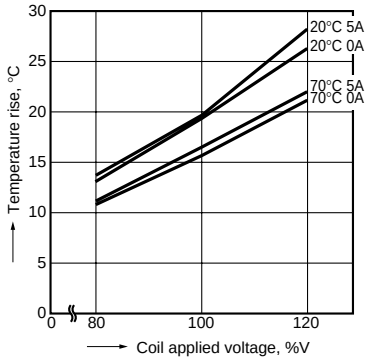
REFERENCE DATA

1. Max. switching power (AC resistive load)



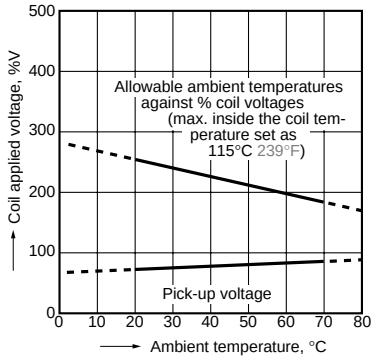
2. Coil temperature rise

Sample: LKS1aF-12V, 6 pcs.
Point measured: coil inside
Contact current: 0 A, 5A



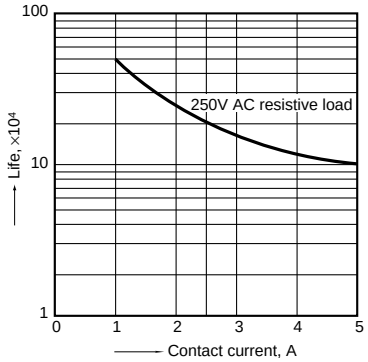
3. Ambient temperature characteristics and coil applied voltage

Contact current: 5 A



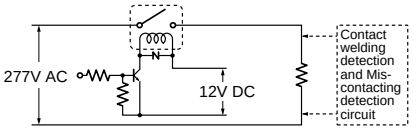
4. Life curve

Operation frequency: 20 times/min.
(ON/OFF = 1.5s: 1.5s)
Ambient temperature: Room temperature

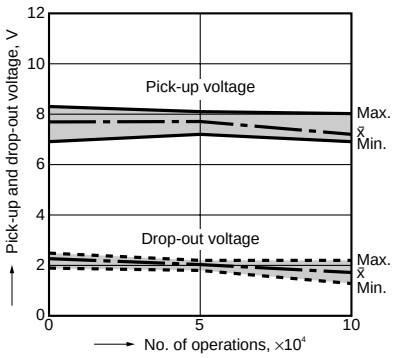


5-(1). Electrical life test
(5 A 250 V AC, resistive load)
Sample: LKS1aF-12V, 6 pcs.
Operation frequency: 20 times/min.
(ON/OFF = 1.5s: 1.5s)
Ambient temperature: 20°C 68°F

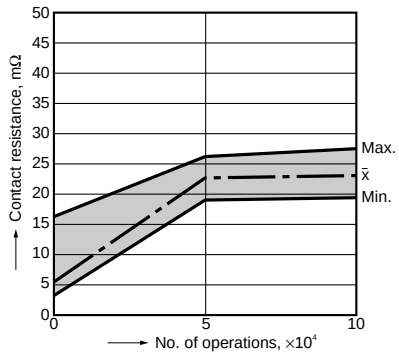
Circuit:



Change of pick-up and drop-out voltage

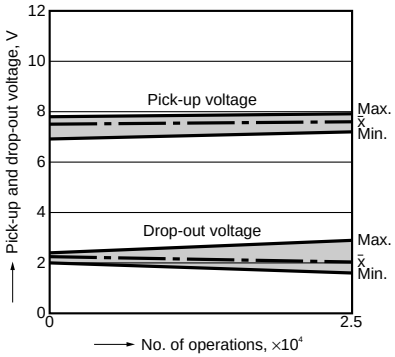


Change of contact resistance

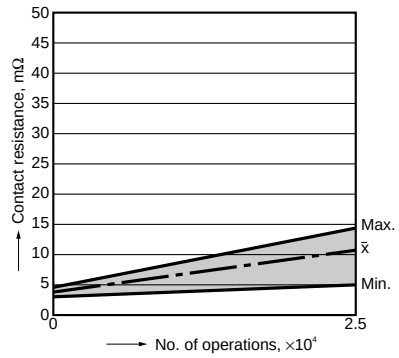


5-(2). Electrical life test (UL lamp load test TV-5)
Tested sample: LKS1aF-12V, 6 pcs.
- Overload test
  Load: 7.5 A 120 V AC (60 Hz),
  Inrush: 111 A
  Operation frequency: 10 times/min
  (ON: OFF = 1 s: 5 s)
  No. of operations: 50 ope.
- Endurance test
  Load: 5A 120 V AC (60 Hz),
  Inrush: 78 A
  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



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

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