

### 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

- 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

#### 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	AgSnO <sub>2</sub> type	
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)	Min. switching capacity <sup>#1</sup>	100 mA, 5 V DC
	Mechanical (at 180 cpm)	10 <sup>6</sup>
	Electrical (at 20 cpm) (at rated load)	10 <sup>5</sup>

### Coil

Nominal operating power	250 mW
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<sup>#1</sup> 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.

### Remarks

- \* Specifications will vary with foreign standards certification ratings.
- \*<sup>1</sup> Measurement at same location as "Initial breakdown voltage" section.
- \*<sup>2</sup> Detection current: 10mA
- \*<sup>3</sup> Wave is standard shock voltage of  $\pm 1.2 \times 50\mu\text{s}$  according to JEC-212-1981
- \*<sup>4</sup> Excluding contact bounce time.
- \*<sup>5</sup> Half-wave pulse of sine wave: 11 ms; detection time: 10  $\mu\text{s}$
- \*<sup>6</sup> Half-wave pulse of sine wave: 6 ms
- \*<sup>7</sup> Detection time: 10  $\mu\text{s}$
- \*<sup>8</sup> Refer to "6. Usage, Storage and Transport Conditions" in **AMBIENT ENVIRONMENT** section in Relay Technical Information.

### Characteristics

Max. operating speed	20 cpm (at rated load)	
Initial insulation resistance* <sup>1</sup>	Min. 1,000 MΩ (at 500 V DC)	
Initial * <sup>2</sup> 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* <sup>3</sup>	Min. 10,000 V	
Operate time* <sup>4</sup> (at nominal voltage)	Max. 15 ms (at 20°C 68°F)	
Release time (without diode)* <sup>4</sup> (at nominal voltage)	Max. 5 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* <sup>5</sup>	Min. 200 m/s <sup>2</sup> {approx. 20 G}
	Destructive* <sup>6</sup>	Min. 1,000 m/s <sup>2</sup> {approx. 100 G}
Vibration resistance	Functional* <sup>7</sup>	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* <sup>8</sup> (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, 6, 9, 12, 18, 24V

UL/CSA, TÜV, SEMKO, TV-5 approved type is standard.

- Notes
- Standard packing Carton: 100 pcs. Case: 500 pcs.
  - 6 V, 18 V DC types are also available. Please consult us for details.

# LK-S

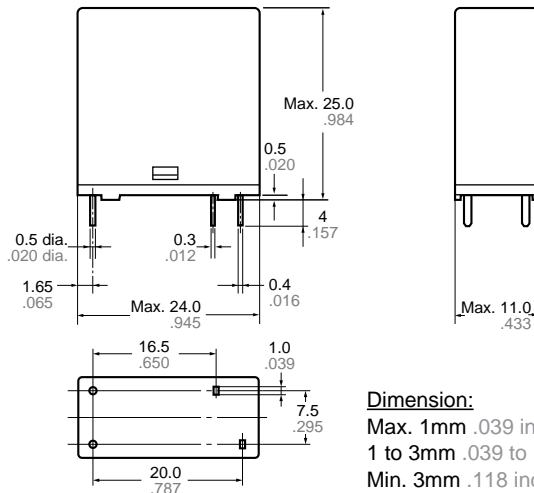
## TYPES AND COIL DATA (at 20°C 68°F)

Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.) (Initial)	Drop-out voltage, V DC (min.) (Initial)	Coil resistance, $\Omega$ ( $\pm 10\%$ )	Nominal operating current, mA ( $\pm 10\%$ )	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-6V	6	4.2	0.6	144	41.7	250	7.8
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-18V	18	12.6	1.8	1,296	13.9	250	23.4
LKS1aF-24V	24	16.8	2.4	2,304	10.4	250	31.2

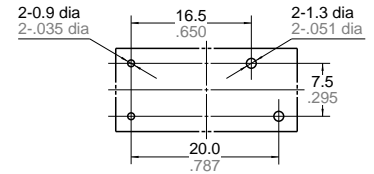
## DIMENSIONS (mm inch)

Download [CAD Data](#) from our Web site.

### CAD Data



### PC board pattern (Bottom view)



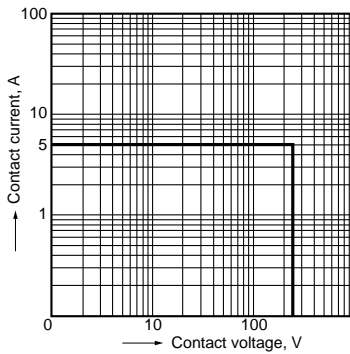
Tolerance:  $\pm 0.1 \pm 0.004$

### Schematic (Bottom view)



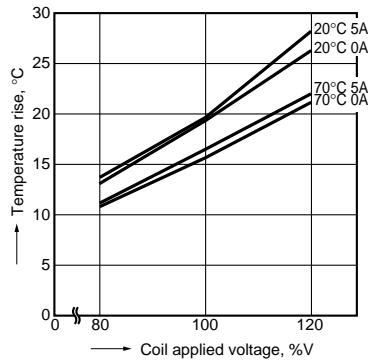
## REFERENCE DATA

### 1. Max. switching power (AC resistive load)



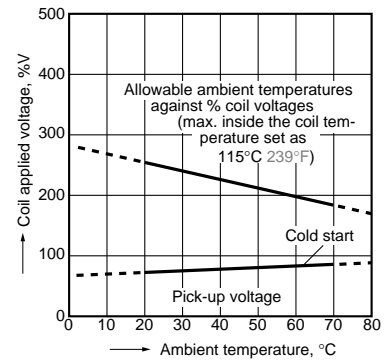
### 2. Coil temperature rise

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



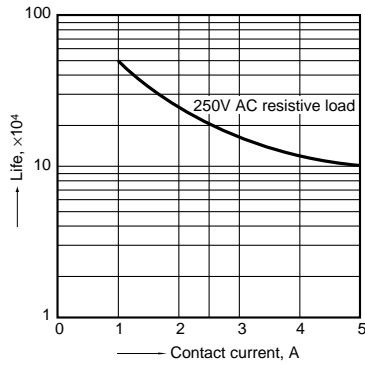
### 3. Ambient temperature characteristics and coil applied voltage

Contact current: 5 A



4. Life curve

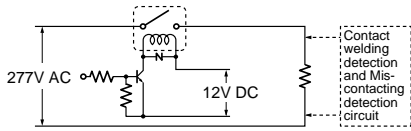
Operation frequency: 20 times/min.  
 (ON/OFF = 1.5s: 1.5s)  
 Ambient temperature: Room temperature



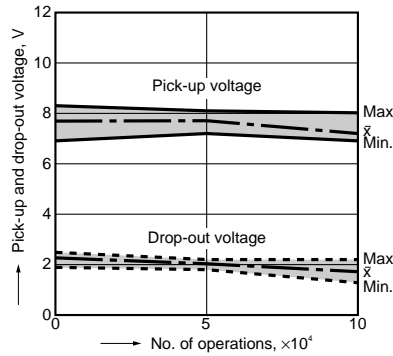
5-(1). Electrical life test

(5 A 277 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

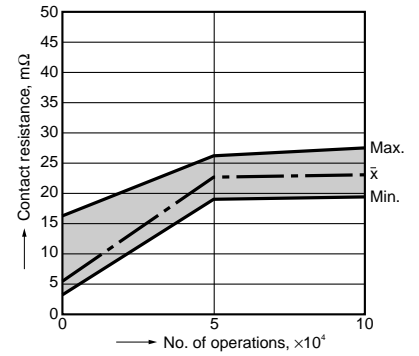
Circuit:



Change of pick-up and drop-out voltage



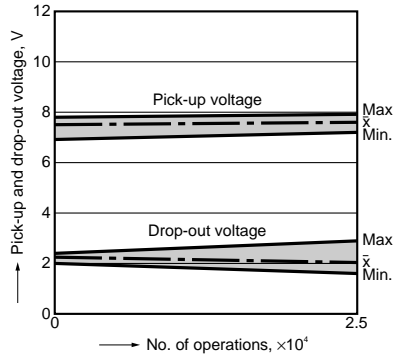
Change of contact resistance



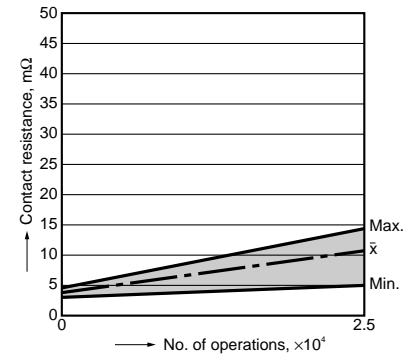
5-(2). Electrical life test

(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



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 10A 277V AC	LR26550 etc.	5A 277V AC 5A 30V DC 10A 277V AC	4001439 0	5A 250V AC (cosφ=1.0) 10A 250V AC (cosφ=1.0)	UL E43149 CSA LR26550	TV-5	B 10 01 13461 270	5A 250V AC (cosφ=1.0)	807779	3/100A 250V AC 5/40A 250V AC

For Cautions for Use, see [Relay Technical Information](#).