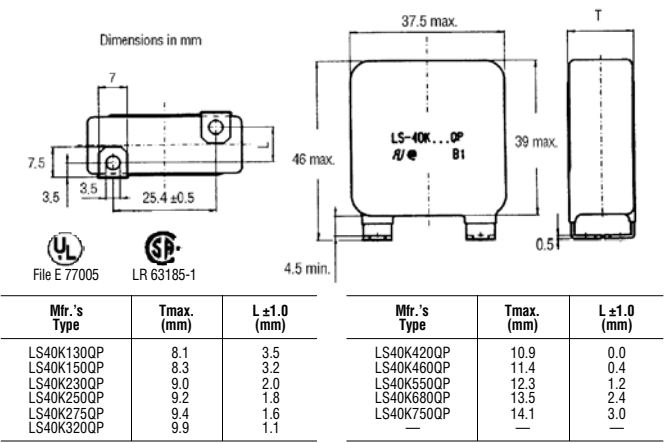


Metal Oxide Varistors
LS40K130QP-to-K750QP Series

Electrical Specifications

Mfr.'s Type	Maximum Ratings (85°C)					Characteristic (25°C)			Typical Capacitance 1 KHz
	Continuous			Transient		Varistor* Voltage 1 mA DC	Maximum Clamping Voltage		
	AC Voltage (RMS)	DC Voltage	Average Power Dissipation	Energy 2 ms	Peak Current 8/20 µs				
	Volts	Volts	Watts	Joules	Amps Ka	Volts	Volts	Amps	
LS40K130QP	130	170	1.4	310	40	205	340	300	5600
LS40K150QP	150	200	1.4	360	40	240	396	300	4800
LS40K230QP	230	300	1.4	460	40	360	595	300	3200
LS40K275QP	275	350	1.4	550	40	430	710	300	2700
LS40K320QP	320	420	1.4	640	40	510	840	300	2300
LS40K460QP	460	615	1.4	780	40	750	1240	300	1600
LS40K680QP	680	895	1.4	1100	40	1100	1815	300	1100
LS40K750QP	750	1060	1.4	1200	40	1200	2000	300	1000

*Tolerance: K=±10%.



SVP — Surge Voltage Protectors

- ▶ High Surge Current Capacity at 20 KA Maximum
- ▶ High Insulation Resistance at ≥10¹² Ohm
- ▶ Low Capacitance — Down to 1 pF
- ▶ High Breakdown Speed
- ▶ Low Cost
- ▶ Small Size
- ▶ Designed to Meet Industry Specifications
- ▶ Proven Performance: Millions in Service

The SVP is bipolar and has a symmetrical V-1 characteristic as shown below.

Surge Voltage Protectors. SVPs are gas discharge tubes, hermetically sealed, composed of 2 or 3 electrodes properly spaced by insulators and filled with a rare gas. SVPs mainly serve to provide a conductive path for unwanted, excessive transients, which prevents the transient energy and associated voltages from damaging sensitive equipment and components, and from harming personnel. Designed for rapid switching at a specific voltage level (breakdown voltage) from a non-conductive state to a conductive state (arc mode) when subjected to an excessive voltage transient. The SVP momentarily carries very high currents during conduction. After discharge of the transient, the circuit allows the SVP to restore itself. In the restored conduction, the high impedance of the SVP causes very little loss. Normal AC or DC operating circuit voltages may cause the SVP to remain in a conducting mode after the transient has passed, unless the following precautions are taken: for AC Applications — the AC follow current must not be exceeded, for DC Applications — if the normal operating voltage across the tube is greater than the glow voltage, and the current into the SVP while in arc mode, (10-20 V across the SVP) does not exceed 0.2A, a 0.68 µfd. capacitor placed in parallel with the tube will cause it to extinguish. If the DC is greater than the given values, current must be momentarily interrupted. **Electrical Characteristics Common To All Types:** Transition Time — 0.1 µs typ. Rms: ≥ 10,000 megohm. Capacitance: 1 pF typ. at 1 MHz. Operating and Storage Temperature Range: -55°C to +130°C.

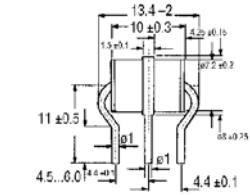
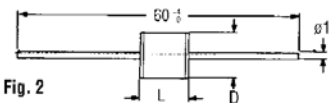
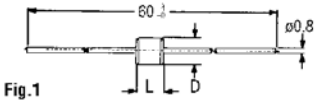


Fig. 3 T23/T83 Types

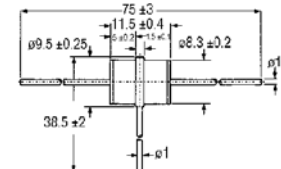


Fig. 4 T61 Types

Three-Electrode Type SVPs. Developed and refined through experience gained from actual use in telecommunications equipment. These units are designed to meet or exceed parameters specified in REA Specification PE-80.

Button Type SVPs. Compact medium-duty 2-electrode tubes provide protection for most circuit applications. Features high breakdown speed by means of a patented process. Economical; easily mounted onto PC boards.

Special Button Type SVPs. Special L71 types for AC applications undergo AC burn-in to guarantee good extinguishing characteristics at high follow currents — excellent for CATV amplifiers and other applications where AC Voltage is present.

Voltage-current characteristic and voltage variation across the protector.

Vs striking voltage
Vgt glow voltage
Va arc voltage
Ve extinguishing voltage
G glow range
A arc range

2 Electrode, Miniature Button Types

Mfr.'s Type	Fig.	DC Breakdown Voltage (V)	Nominal OD x L (mm)	Single Impulse Discharge Current (KA) 8/20 µs	AC Discharge Current (A) ¹	Impulse Breakdown Voltage Volts at			AC Follow Current (A Peak)	DC Holdover Voltage (V) ²	Impulse Life (No. of Pulses) 500 A 10/100 µs	Special Notes
						100 V/µs	1 KV/µs	10 KV/µs				
M51-C90	1	90 ±20%	5.0 x 5.0	2.5	10	<550	<600	<900	—	60	>50	General Purpose
M51-A230X	1	230 ±20%	5.0 x 5.0	2.5	10	<550	<650	<900	—	100	>50	General Purpose

2 Electrode, Standard Button Types

EC75	2	75 +30%/—20%	8.0 x 6.0	5.0	20	<550	<600	<1000	20	>60	>200	General Purpose
EC90	2	90 ±20%	8.0 x 6.0	5.0	20	<550	<600	<1000	20	>60	>200	General Purpose
N81-A90X	2	90 ±20%	8.0 x 6.0	10.0	>65	<350	<550	<700	—	60	>200	General Purpose
A81-C90X	2	90 ±20%	8.0 x 6.0	20.0	>65	<350	<550	<700	—	60	>400	General Purpose, High Current
EC145	2	145 ±20%	8.0 x 6.0	5.0	20	<550	<600	<1000	>100 ³	60	>200	60 VAC Application (CATV)
EC230	2	230 ±15%	8.0 x 6.0	5.0	20	<600	<650	<1000	25	>80	>200	General Purpose (Communication)
A81-A230X	2	230 ±20%	8.0 x 6.0	20.0	>65	<450	<600	<800	—	100	>400	General Purpose, High Current
L71-A270X*	2	270 +25%/—15%	8.0 x 8.0	10.0	>65	<400	<500	<700	>35	—	>200	120 VAC Application (S20K150 ⁴)
EC350	2	350 ±15%	8.0 x 6.0	5.0	20	<650	<700	<1000	25	>150	>200	General Purpose (Communication)
N81-A350X	2	350 ±20%	8.0 x 6.0	10.0	>65	<650	<800	<1000	—	120	>200	General Purpose
A81-A350X	2	350 ±20%	8.0 x 6.0	20.0	>65	<650	<800	<1000	—	120	>400	General Purpose, High Current
L71-A470X*	2	470 +25%/—15	8.0 x 8.0	10.0	>65	<600	<700	<800	>35	—	>200	220 VAC Application (S20K250 ⁴)
L71-A800X*	2	800 +25%/—15	8.0 x 8.0	10.0	>65	<1000	<1100	<1300	>35	—	>200	440 VAC Application (S20K460 ⁴)

3 Electrode Types

T83-A90X	3	90 ±20%	8.0 x 10.0	5.0	>20	<250	<350	<500	—	60	>100	Medium Duty, Communication Use
T23-A230X	3	230 ±20% ³	8.0 x 10.0	10.0 ³	>20	<350	<450	<600	—	150	>50 ⁴	Medium Duty, Communication Use
T23-A350	3	350 ±20% ³	8.0 x 10.0	10.0 ³	>20	<550	<650	<800	—	150	>100 ⁴	Medium Duty, Communication Use
T61-C350	4	300-500 ⁴	9.5 x 11.5	10.0 ³	>65	<550	<650	<800	—	150	>400	Heavy Duty, Communication Use

*Special button type SVP for AC applications. ¹11 cycles, 60 Hz, 1 Time. ²60 VRMS. ³Line to ground, single side. ⁴Changing polarity after each surge. ⁵Suggested limiting EPCOS Varistor. ⁶In accordance with IEEE C62.31.