

# Surge Arresters

## 陶瓷气体放电管

SE93 Series

## Gas Discharge Tubes - SE93 Series

Features	Applications
<ul style="list-style-type: none"> <li>● Extremely small size</li> <li>● Extremely fast response time</li> <li>● Excellent SMD handing</li> <li>● Stable performance over life</li> <li>● Very low capacitance</li> <li>● High insulation resistance</li> <li>● RoHS-compatible</li> <li>● UL-identification,</li> </ul>	<ul style="list-style-type: none"> <li>● Splitter</li> <li>● PCI Cards</li> <li>● Modem</li> <li>● Line cards</li> </ul>

### Electrical specifications

Part Number	DC spark-over Voltage	Max. Impulse Breakdown Voltage	Discharge Current (8/20us)	AC discharge Current	Impulse Life (10/1000us)	Minimum Insulation Resistance		Max. Capacitance 1MHz
	100V/S	1KV/us	10 times	50Hz, 1S	100A	Test Voltage DC(V)	(GΩ)	(Pf)
	%	V	KA	A	Times			

DIP

SE93-75X	±30	600	5	5	100	50	1	1
SE93-90X	±30	600	5	5	100	50	1	1
SE93-150X	±20	650	5	5	100	100	1	1
SE93-230X	±20	700	5	5	100	100	1	1
SE93-350X	±20	900	5	5	100	100	1	1
SE93-420X	±20	950	5	5	100	100	1	1
SE93-470X	±20	1100	5	5	100	100	1	1
SE93-600X	±20	1300	5	5	100	100	1	1

Glow Voltage at 10mA..... ~60V

Arc Voltage at 1A..... ~10V

Glow to Arc transition Current..... ~0.3A

Weight..... ~1g

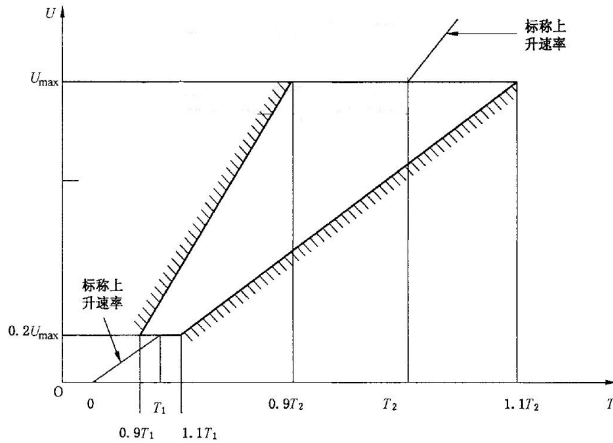
Operation and storage temperature..... -40~90°C

Climatic category (IEC 60068-1)..... 40/90/21

Surface treatment..... Matte-tin plated

## Gas Discharge Tubes - SE93 Series

### DC breakdown voltage



### 8/20us, Test wave

$$T1=1.25T=8\mu s \pm 20\%$$

$$T2=20\mu s \pm 20\%$$

### 10/700us, Test Wave

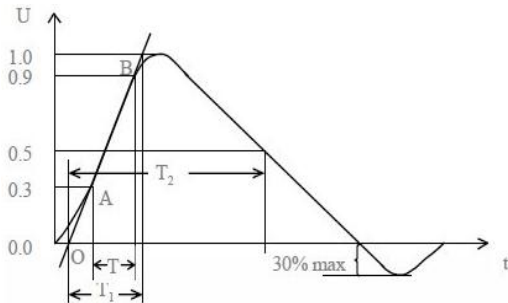
$$T1=1.67T=10\mu s \pm 20\%$$

$$T2=700\mu s \pm 20\%$$

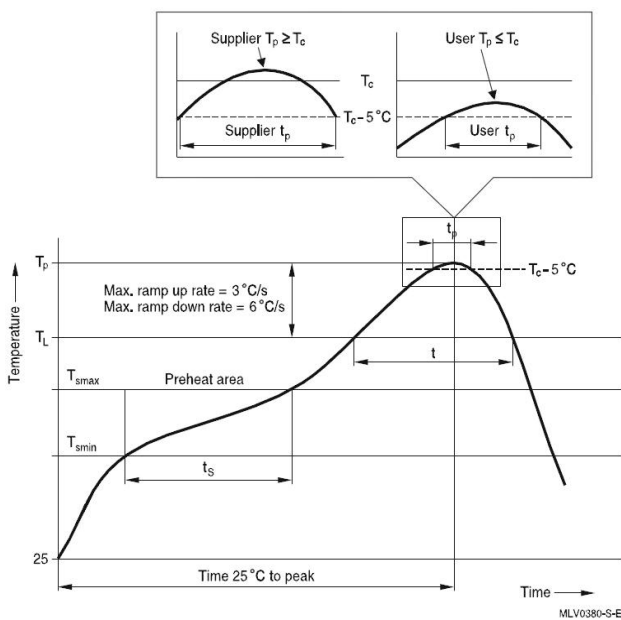
### 10/1000us, Test Wave

$$T1=1.67T=10\mu s \pm 20\%$$

$$T2=1000\mu s \pm 20\%$$



### Recommended wave soldering profile



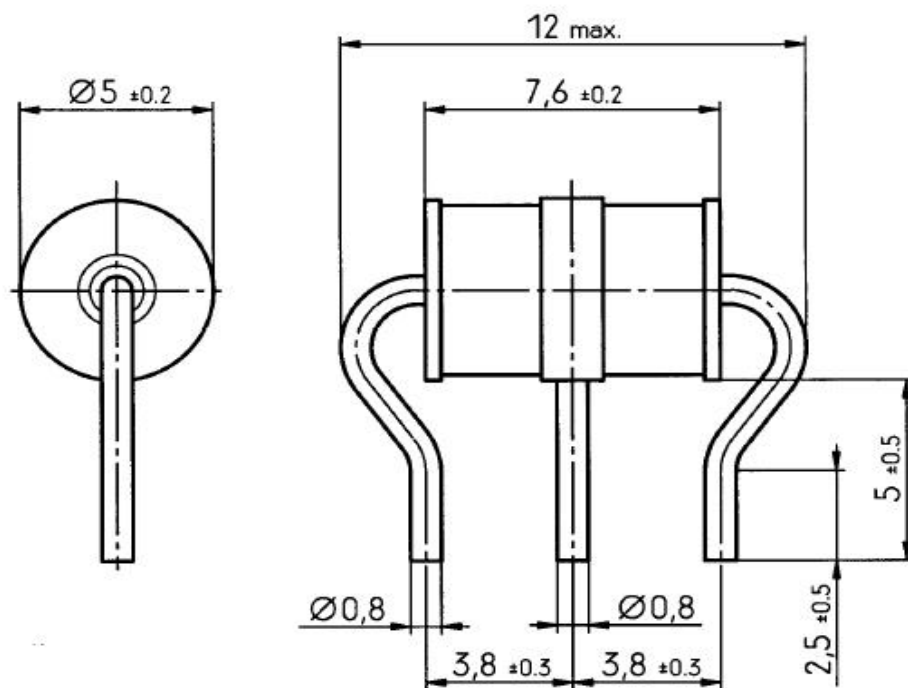
Reflow profile features		Sn-Pb eutectic assembly	Pb-free assembly
Preheat and soak - Temperature min - Temperature max - Time	$T_{smin}$ $T_{smax}$ $t_{smin}$ to $t_{smax}$	100 °C 150 °C 60 ... 120 s	150 °C 200 °C 60 ... 180 s
Average ramp-up rate	$T_{smax}$ to $T_p$	max. 3 °C/ s	max. 3 °C/ s
Liquidous temperature Time at liquidous	$T_L$ $t_L$	183 °C 60 ... 150 s	217 °C 60 ... 150 s
Peak package body temperature *, Classification temperature **	$T_p$ , $T_c$	220 ... 235 °C **	245 ... 260 °C **
Time ( $t_p$ ) ** within 5 °C of the specified classification temperature ( $T_c$ )		20 s ***	30 s ***
Average ramp-down rate	$T_p$ to $T_{smax}$	max. 6 °C/ s	max. 6 °C/ s
Time 25 °C to peak temperature		max. 6 min	max. 8 min

\* = Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.  
 \*\* = For details please refer to JEDEC J-STD-020D.  
 \*\*\* = Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

## Gas Discharge Tubes - SE93 Series

- 1) Sampling size in accordance to AQL(C=0)
- 2) DC spark-over voltage  $\pm 30\%$  after load
- 3) Tests according to ITU-T Rec. K. 12 and IEC61643-1

### Dimensions



Wire tin-plated

### Product Name

**SE9**    **3** - **230X**    **F**

**Series:**

SE8系列：直径8\*10  
SE9系列：直径5\*7.6

**LeadType:**

0=SMD  
3=Thrust

**DCLineVoltage:**

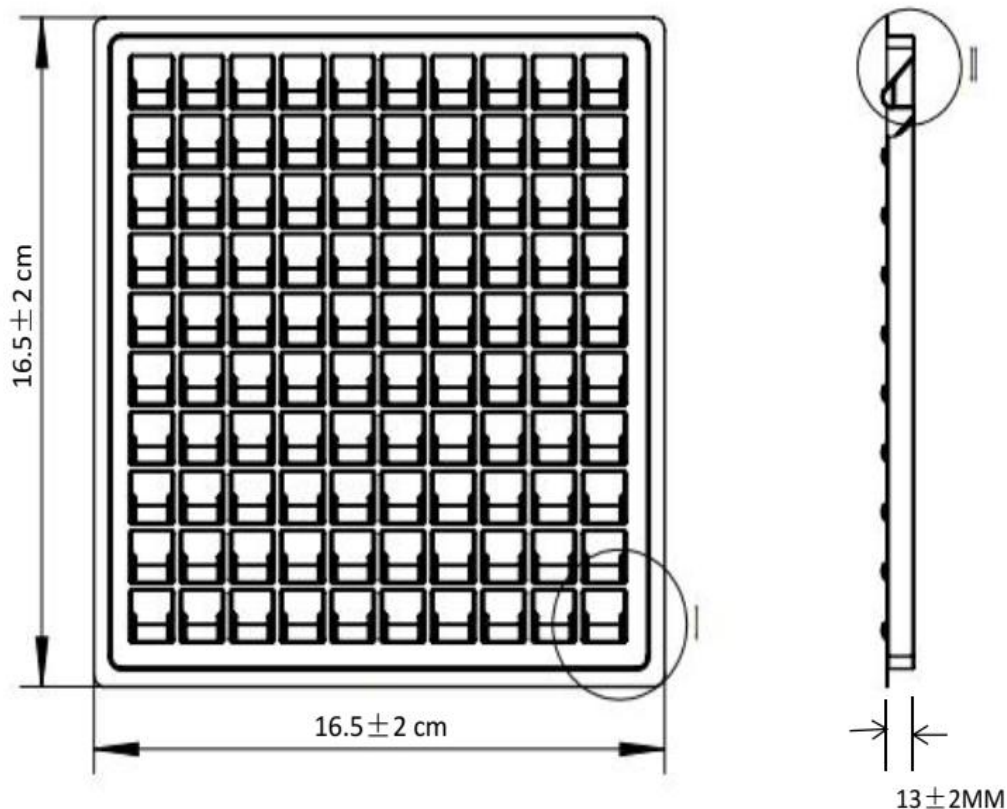
90X=90V  
230X=230V

**Package:**

F=With Fail-Short mechanism

## Gas Discharge Tubes - SE93 Series

### Packaging



10x10=100

100pcs/box

### Cautions and warnings

- Surge arresters must not be operated directly in power supply networks
- Surge arresters may become hot in case of longer periods of current stress (danger of burning).
- If the contacts of the surge arrester are defective, current stress can lead to the formation of sparks and loud noises.
- Surge arresters may be used only within their specified values. In case of overload, the head contacts may fail or the component may be destroyed.
- Damaged surge arresters must not be re-used.