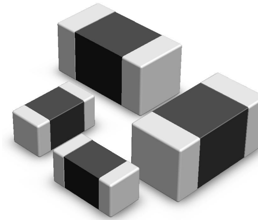
## Description

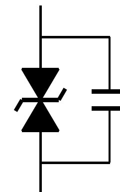
The SV0603E180G0B is based on Multilayer fabrication technology. These components are designed to suppress a variety of transient events, including those specified in IEC 61000-4-2 or other standards used for Electromagnetic Compliance (EMC). The SV0603E180G0B is typically applied to protect integrated circuits and other components at the circuit board level. It can operate over a wider temperature range than zener diodes.



## Features

- Lead Free type
- SMD type zinc oxide based ceramic chip
- Insulator over coat keeps excellent low and stable leakage current
- Plating termination provided good solderability characteristic
- Quick response time (<1ns)
- Low clamping voltage
- Meet IEC61000-4-2 standard
- Low capacitance can meet high speed single transient voltage protection

## Equivalent Circuits



## Applications

- Low capacitance product applications for high-speed signal lines such as HDMI, DVI, USB, IEEE 1394 Port etc.
- Normal capacitance product applications for I/O Port (RS232, USB, PS2, VGA, Audio) on Mother Board and Notebook, Set–Top Box, MP3 Players, DVD Players, and Docking System etc.

**Electrical Characteristics (25±5℃)**

| Symbol | Minimum | Typical | Maximum | Units |
|---|---|---|---|---|
| $V_{DC}$ | — | — | 18 | V |
| $V_V$ | 46 | — | 60 | V |
| $V_C$ | — | — | 110 | V |
| $C_P$ | — | 1 | — | pF |

**$V_{DC}$** – Maximum DC operating voltage the varistor can maintain and not exceed 10μA leakage current.

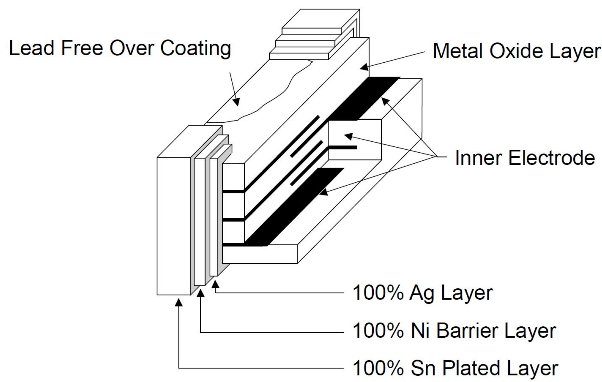
**$V_V$** – Voltage across the device measure at 1mA DC current.

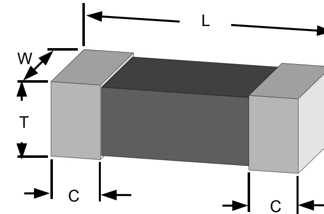
Equivalent to $V_B$ "breakdown voltage"

**$V_C$** – Maximum peak current across the varistor with 8/20μs waveform and 1A pulse current.

**$C_P$** – Device capacitance measured with zero volt bias 1Vrms at 1MHz. The pF is ±30%.

## Construction & Dimensions



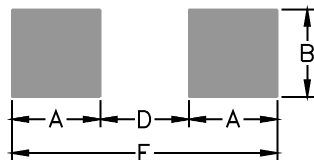

| Size EIA (EIAJ) | 0603 (1608) | |
|---|---|---|
| **Symbol** | **Inches** | **Millimeters** |
| **L** | 0.063±0.006 | 1.60±0.15 |
| **W** | 0.031±0.004 | 0.80±0.10 |
| **T** | 0.031±0.008 | 0.80±0.20 |
| **C** | 0.012±0.008 | 0.30±0.20 |

## Pad Layouts & Precaution for handling of substrate

### Solder cream in reflow soldering

Refer to the recommendable land pattern as printing mask pattern for solder cream.

(1) Print solder in a thickness of 150 to 200μm



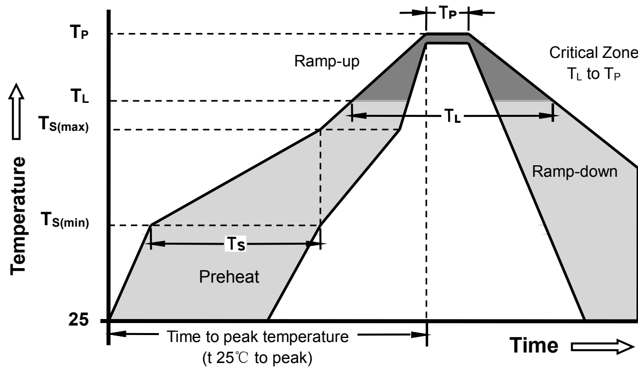

| Size EIA (EIAJ) | 0603 (1608) | |
|---|---|---|
| **Symbol** | **Inches** | **Millimeters** |
| **A** | 0.040 | 1.02 |
| **B** | 0.030 | 0.76 |
| **D** | 0.020 | 0.50 |
| **E** | 0.100 | 2.54 |

### Precaution for handling of substrate

Do not exceed to bend the board after soldering thes product extremely. (reference examples)

- Mounting place must be as far as possible from the position, which is close to the break line of board or on the line of large holes of board.
- Do not bend extremely the board, in mounting another component. If necessary, use back-up pin (support pin) to prevent from bending extremely.
- Do not break the board by hand. We recommend to use the machine or the jig to break it.

## Soldering Parameters




| Reflow Condition | | Pb-Free assembly |
|---|---|---|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max ($T_{s(max)}$) | +200°C |
| | -Time (min to max) ($T_S$) | 60 -180 Seconds |
| Average ramp up rate ( Liquidus Temp $T_L$) to peak | | 3°C/Second Max |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate | | 3°C/Second Max |
| Reflow | - Temperature ($T_L$) (Liquidus) | +217°C |
| | - Time (min to max) ($T_L$) | 60 -150 Seconds |
| Peak Temperature ($T_P$) | | 260 +0/-5°C |
| Time within 5°C of actual peak Temperature ($T_P$) | | 20-40 Seconds |
| Ramp-down Rate | | 6°C/Second Max |
| Time 25°C to peak Temperature ($T_P$) | | 8 minutes Max |

## Precaution for Soldering

Note that this product will be easily damaged by rapid heating, rapid cooling or local heating.
Do not give heat shock over 100°C in the process of soldering.
We recommend to take preheating and gradual cooling

**Soldering gun procedure**

Note the follows, in case of using solder gun for replacement.
1) The tip temperature must be less than 280 for the period within 3 seconds by using soldering gun under 30W
2) The soldering gun tip shall not touch this product directly.

**Soldering volume**

Note that excess of soldering volume will easily get crack the body of this product.

## General Technical Data

| Operating Temperature | | -40 ~ +85ºC |
|---|---|---|
| Storage Temperature | | -40 ~ +85ºC |
| Response Time | | <1 ns |
| Solderability | | 245±5ºC, 3±1sec |
| Solder leach resistance | | 260±5ºC, 10±1sec |
| Taping Package Storage Condition | Storage Temperature | 5 ~ 40ºC |
| | Relative Humidity | To 65% |
| | Storage Time | 12 Months max |

## Environmental Performance

| Item | Specifications | Test Condition |
|---|---|---|
| Bias Humidity | $\triangle V_V / V_V \leq \pm 10$ % | 90%RH, 40ºC, Working Voltage, 1000 hrs |
| Thermal Shock | $\triangle V_V / V_V \leq \pm 10$ % | -40ºC to 85ºC, 30 min. cycle, 5 cycles |
| Full Load Voltage | $\triangle V_V / V_V \leq \pm 10$ % | Working Voltage, 85ºC,1000 hrs |