

# Thyristor Surge Suppressors : TSSxxxxSB Series



**SMD Type, SMB/DO-214AA @10/700μS, 4KV**

## ■ Features

1. Precious and stable voltage
2. Low leakage current
3. Low on-state voltage
4. Low capacitance
5. Component fails short circuit when surged in excess of ratings
6. Component properties do not degrade after multiple surge events within its limits
7. RoHS Compliant and Halogen-Free



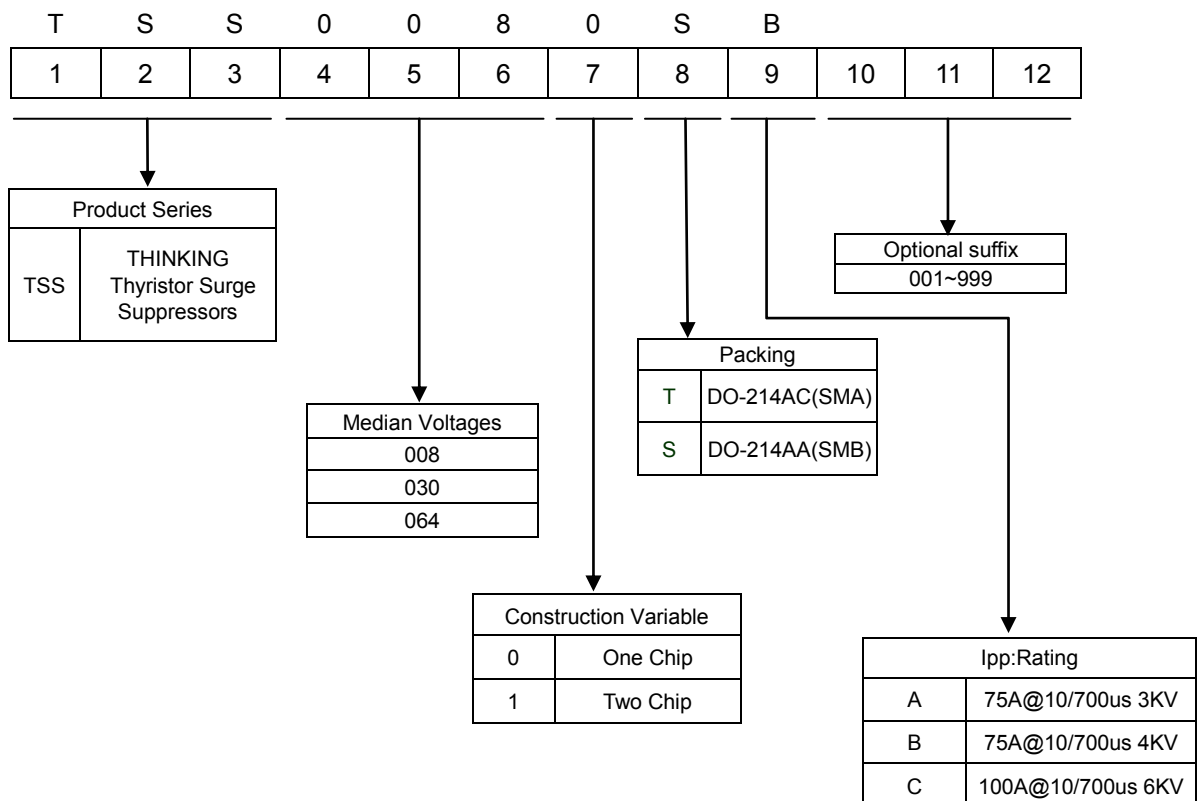
## ■ Recommended Applications

1. Communications equipment (RS232/RS485/RJ45/RJ11/COAXIAL)
2. Alarm/Camera
3. Component is used in series with an appropriate overvoltage clamp device to protect a power supply from damage due to an overvoltage condition on its AC input lines.

## ■ Mechanical Data

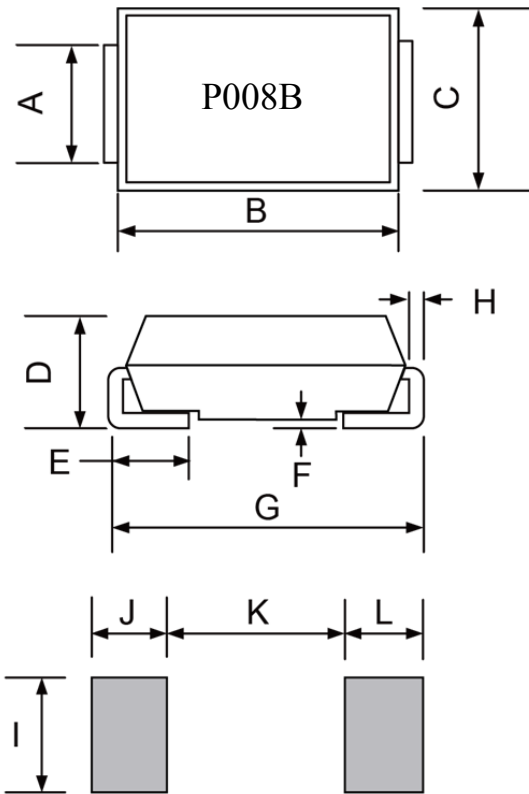
1. Case:DO-214AC molded plastic
2. Epoxy: UL 94V-0 rate flame retardant

## ■ Part Number Code

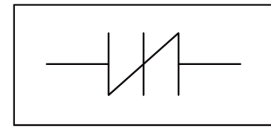


### Structures and Dimensions

#### SMB/DO-214AA



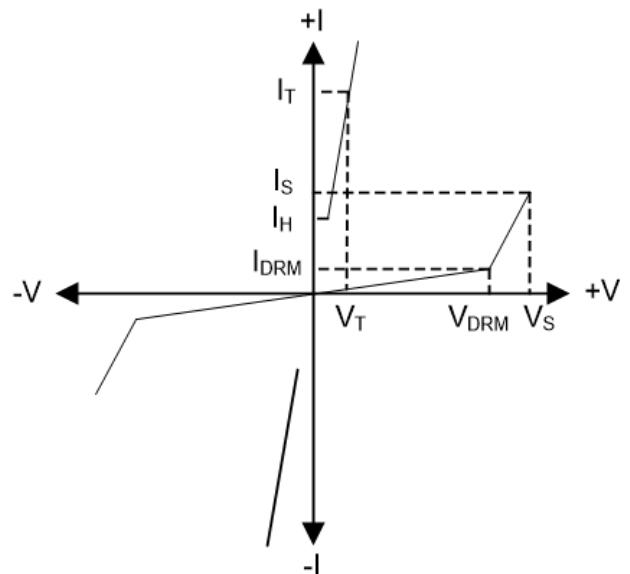
#### Schematic Symbol



| Item | Millimeters |       | Inches |       |
|------|-------------|-------|--------|-------|
|      | Min.        | Max.  | Min.   | Max.  |
| A    | 1.80        | 2.20  | 0.071  | 0.086 |
| B    | 4.05        | 4.65  | 0.160  | 0.183 |
| C    | 3.30        | 3.94  | 0.130  | 0.155 |
| D    | 2.05        | 2.45  | 0.810  | 0.096 |
| E    | 0.76        | 1.52  | 0.030  | 0.060 |
| F    | -           | 0.203 | -      | 0.008 |
| G    | 5.08        | 5.59  | 0.200  | 0.220 |
| H    | 0.152       | 0.305 | 0.006  | 0.012 |
| I    | 2.26        | -     | 0.089  | -     |
| J/L  | 2.160       | -     | 0.085  | -     |
| K    | -           | 2.740 | -      | 0.107 |

### Electrical Parameters

| Parameter | Definition  |
|-----------|---|
| VDRM      | Peak Off-state Voltage: maximum voltage that can be applied while maintaining off state |
| VS        | Switching Voltage: maximum voltage prior to switching to on state                       |
| VT        | On-state Voltage: maximum voltage measured at rated on-state current                    |
| IDRM      | Leakage Current: maximum peak off-state current measured at VDRM                        |
| IS        | Switching Current: maximum current required to switch to on state                       |
| IT        | On-state Current: maximum rated continuous on-state current                             |
| IH        | Holding Current: minimum current required to maintain on state                          |
| CO        | Off-state Capacitance: typical capacitance measured in off state                        |



V-I Characteristic

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## ■ Electrical Characteristics

| Part Number | Marking | Peak Off-state Voltage  | Switching Voltage | On-state Voltage | Leakage Current | Switching Current | On-state Current | Holding Current | Off-state Capacitance | Peak Pulse Voltage | Peak Pulse Current |
|-------------|---------|-------------------------|-------------------|------------------|-----------------|-------------------|------------------|-----------------|-----------------------|--------------------|--------------------|
|             |         | VDRM@<br>IDRM=5 $\mu$ A | VS@<br>100V/us    | VT@<br>IT=2.2A   | IDRM            | IS                | IT               | IH              | CO@<br>1MHz           | VPP@<br>10/700us   | IPP@<br>10/700us   |
|             |         | (V)min                  | (V)max            | (V)max           | ( $\mu$ A)max   | (mA)max           | (A)max           | (mA)min         | (pF) max              | (V)                | (A)                |
| TSS0300SB   | P030B   | 25                      | 40                | 4                | 5               | 800               | 2.2              | 50              | 100                   | 4000               | 75                 |
| TSS0720SB   | P072B   | 65                      | 88                | 4                | 5               | 800               | 2.2              | 150             | 100                   | 4000               | 75                 |
| TSS2300SB   | P230B   | 190                     | 260               | 4                | 5               | 800               | 2.2              | 150             | 80                    | 4000               | 75                 |
| TSS3100SB   | P310B   | 275                     | 350               | 4                | 5               | 800               | 2.2              | 150             | 65                    | 4000               | 75                 |
| TSS3500SB   | P350B   | 320                     | 400               | 4                | 5               | 800               | 2.2              | 150             | 65                    | 4000               | 75                 |

Note:

- (1) Absolute maximum ratings measured at TA= 25°C (unless otherwise noted).
- (2) Devices are bi-directional.
- (3) IPP ratings is applicable to temperature ranged from -40°C to +85°C.
- (4) Off-state capacitance (CO) is measured at 1 MHz with a 2 V bias, and which is a typical value.

## ■ Thermal Considerations

| Package      | Symbol | Parameter                              | Value       | Unit |
|--------------|--------|--|-------------|------|
| SMB/DO-214AA | TJ     | Operating Junction Temperature         | -40 to +150 | °C   |
|              | Ts     | Storage Temperature Range              | -40 to +150 | °C   |
|              | RJA    | Junction to Ambient on printed circuit | 90          | °C/W |

### ■ Characteristics Curves

Figure 1.V-I Characteristic

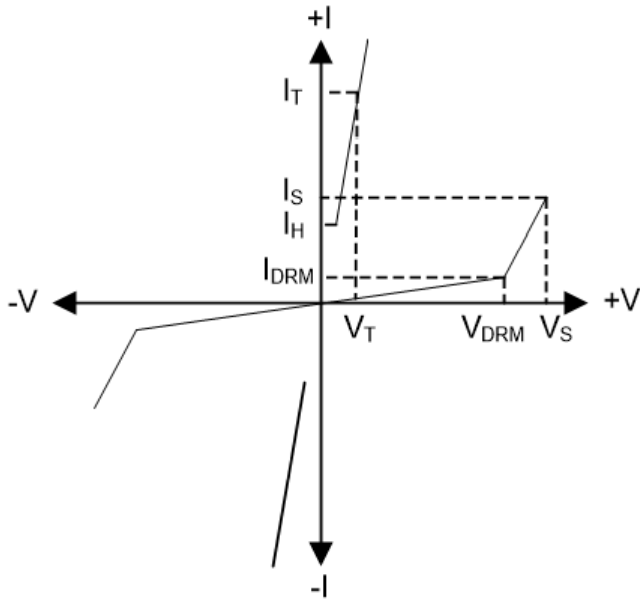


Figure 2. tr x td Pulse Wave-form

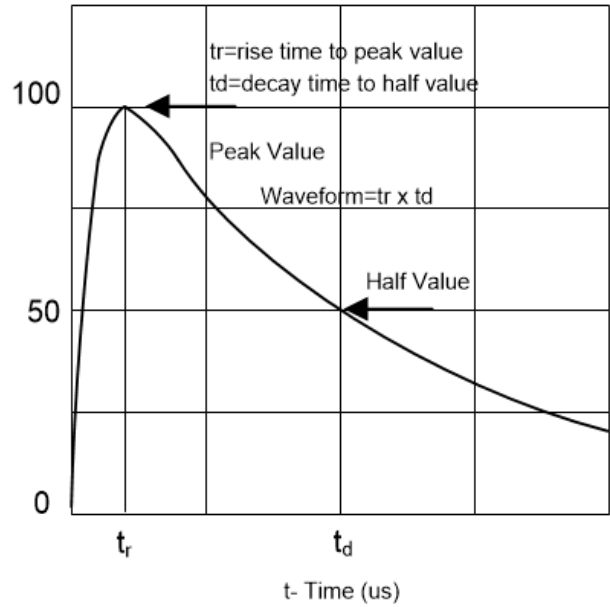


Figure 3. Normalized  $V_S$  Change versus Junction Temperature

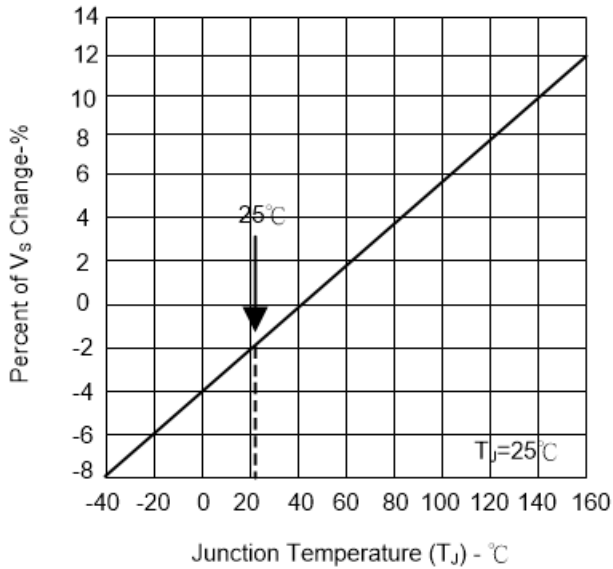
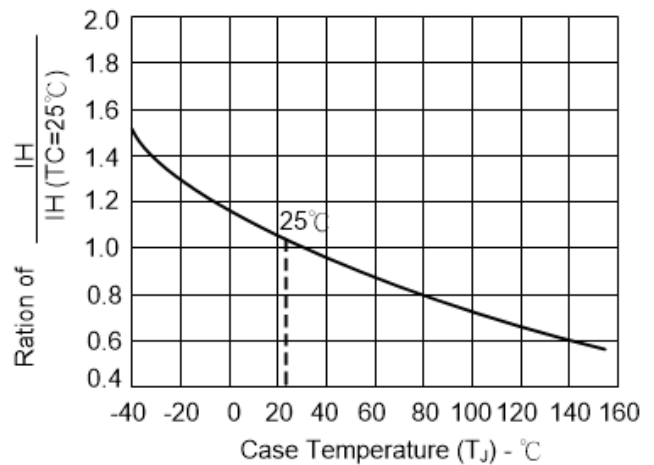
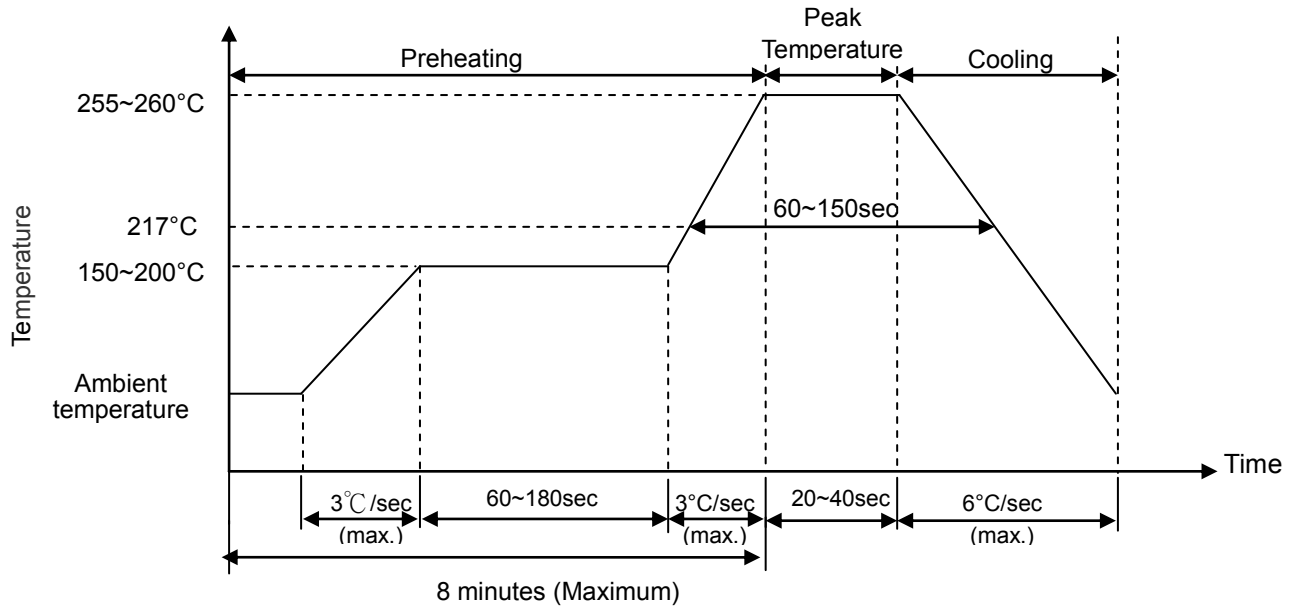


Figure 4. Normalized DC Holding Current versus Case Temperature



### ■ Soldering Recommendation

#### ● IR-reflow soldering profile



#### ● Recommended Reworking Conditions with Soldering Iron

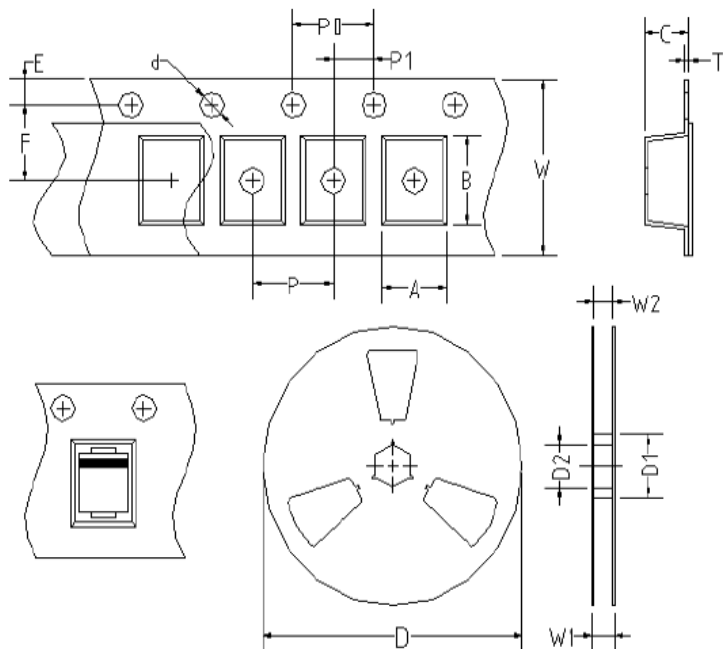
| Item                              | Conditions   |
|-----------------------------------|--------------|
| Temperature of Soldering Iron-tip | 360°C (max.) |
| Soldering Time                    | 3 sec (max.) |
| Diameter of Soldering Iron-tip    | Φ 3mm (max.) |

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## ■ Packaging



| Item                   | Symbol | SMA/DO-214AC |
|------------------------|--------|--------------|
|                        |        | Unit: mm     |
| Carrier width          | A      | 3.77±0.15    |
| Carrier length         | B      | 5.70±0.15    |
| Carrier depth          | C      | 2.45±0.15    |
| Sprocket hole          | d      | 1.55±0.10    |
| Reel outside diameter  | D      | 330±1.0      |
| Reel inner diameter    | D1     | 75±1.0       |
| Feed hole diameter     | D2     | 13.5±1.0     |
| Sprocket hole position | E      | 1.75±0.1     |
| Punch hole position    | F      | 5.50±0.05    |
| Sprocket hole pitch    | P      | 8.00±0.10    |
| Carrier pitch          | P0     | 4.00±0.10    |
| Embossment center      | P1     | 2.00±0.10    |
| Tape thickness         | T      | 0.25±0.10    |
| Tape width             | W      | 12.00±0.15   |
| Reel width             | W1     | 18.1±1.5     |
| Reel inner width       | W2     | 13.5±1.0     |

## ■ Quantity

MPQ: 3,000pcs

| Package Type | Reel Diameters | Reel  |
|--------------|----------------|-------|
|              | (mm)           | PCS   |
| SMA/DO-214AC | 330            | 3,000 |

## ■ Warehouse Storage Conditions of product

- Storage Condition:
  - Storage Temperature: -10°C~+40°C
  - Working Temperature:- 40°C~+85°C
  - Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year