# Low Capacitance Thyristor Surge Suppressors TSS Semiconductor Component P0640SB

Our Product Introduction

## Basic Information

- Place of Origin: Shenzhen, Guangdong, China
- Brand Name: SOCAY
- Certification: REACH,RoHS,ISO
- Model Number: P0640SB
- Minimum Order Quantity: 2500PCS
- Price: Negotiable
- Packaging Details: tape reel,bulk
- Delivery Time: 1-3 weeks

## Product Specification

- Key Words: Diodes
- Package: DO-214AA/SMB
- Application: Protection Circuit Board;
- Mounting Type: Surface Amount
- VDRM (Min.): 58V
- IDRM: 5μA
- Vs @100V/μS (Max.): 77V
- Is (Max.): 800mA
- Vt @It=2.2A (Max.): 4V
- It (Max.): 2.2A
- C0 @1MHz,2V Bias (Typ.): 60pF
- Highlight: **Thyristor Surge Suppressors TSS**, **Low Capacitance Thyristor Surge Suppressors**, **P0640SB**

## More Images

## Product Description

**Low Capacitance Thyristor Surge Suppressors TSS Semiconductor Component P0640SB**

**DATASHEET: PXXX0SB_v2103.1.pdf**

| Part Number | Marking | $V_{DRM}$ @$I_{DRM}$=5 μA | VS @100V/μS | $V_T$ @$I_T$=2.2A | $I_S$ | $I_T$ | $I_H$ | C0 @1MHz, 2V bias |
|---|---|---|---|---|---|---|---|---|
| | | V min | V max | V max | mA max | A max | mA min | pF typ |
| P0080SB | P008B | 6 | 25 | 4 | 800 | 2.2 | 50 | 80 |
| P0300SB | P03B | 25 | 40 | 4 | 800 | 2.2 | 50 | 80 |
| P0640SB | P06B | 58 | 77 | 4 | 800 | 2.2 | 150 | 80 |
| P0720SB | P07B | 65 | 88 | 4 | 800 | 2.2 | 150 | 75 |
| P0900SB | P09B | 75 | 98 | 4 | 800 | 2.2 | 150 | 70 |
| P1100SB | P11B | 90 | 130 | 4 | 800 | 2.2 | 150 | 70 |
| P1300SB | P13B | 120 | 160 | 4 | 800 | 2.2 | 150 | 65 |
| P1500SB | P15B | 140 | 180 | 4 | 800 | 2.2 | 150 | 65 |
| P1800SB | P18B | 170 | 220 | 4 | 800 | 2.2 | 150 | 65 |
| P2300SB | P23B | 190 | 260 | 4 | 800 | 2.2 | 150 | 60 |
| P2600SB | P26B | 220 | 300 | 4 | 800 | 2.2 | 150 | 60 |
| P3100SB | P31B | 275 | 350 | 4 | 800 | 2.2 | 150 | 50 |
| P3500SB | P35B | 320 | 400 | 4 | 800 | 2.2 | 150 | 50 |
| P4200SB | P42B | 400 | 520 | 4 | 800 | 2.2 | 150 | 40 |

**Notes:**
Vs is measured at 100KV/s.
Off-state capacitance is measured in $V_{DC}$=2V, $V_{RMS}$=1V, f=1MHz.

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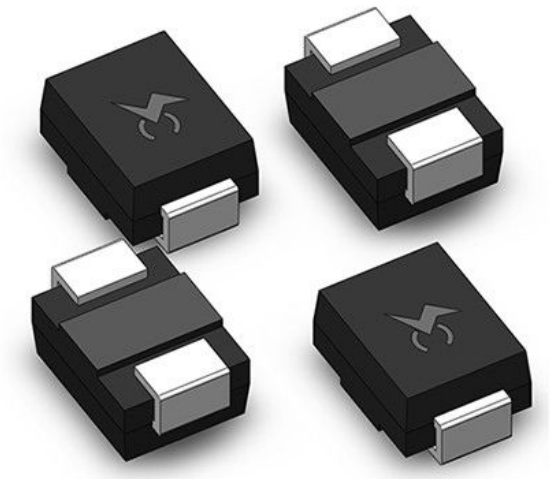


**Introduction:**
The TSS are characterised by precise conduction, fast response, high surge absorption capacity, biaxial symmetry and high reliability.

**Working Principle**

When connected in parallel to a circuit and the device is not moving, the resistance value is high and can be considered as an open circuit with little or no effect on the circuit. When there is an abnormal pulse, the resistance value drops instantly, releasing the current momentarily. When the abnormal high voltage disappears, it returns to its high resistance state and the circuit works normally.

| Parameter | Definition |
|---|---|
| $I_S$ | **Switching Current** - maximum current required to switch to on state |
| $I_{DRM}$ | **Leakage Current** - maximum peak off-state current measured at $V_{DRM}$ |
| $I_H$ | **Holding Current** - minimum current required to maintain on state |
| $I_T$ | **On-state Current** - maximum rated continuous on-state current |
| $V_S$ | **Switching Voltage** - maximum voltage prior to switching to on stat |
| $V_{DRM}$ | **Peak Off-state Voltage** - maximum voltage that can be applied while maintaining off state |
| $V_T$ | **On-state Voltage** - maximum voltage measured at rated on-state current |
| $C_0$ | **Off-state Capacitance** - typical capacitance measured in off state |

| Series | 2/10µS[1] | 8/20µS[1] | 10/160µS[1] | 10/560µS[1] | 10/1000µS[1] | 5/310µS[1] | $I_{TSM}$ 50/60 Hz | di/dt |
|---|---|---|---|---|---|---|---|---|
| | 2/10µS[2] | 1.2/50µS[2] | 10/160µS[2] | 10/560µS[2] | 10/1000µS[2] | 10/700µS[2] | | |
| | A min | A min | A min | A min | A min | A min | A min | Amps/µs max |
| B | 250 | 250 | 150 | 100 | 80 | 100 | 30 | 500 |

| | |
|---|---|
| Notes:<br>Current waveform in µs<br>Voltage waveform in µs | - Peak pulse current rating ($I_{PP}$) is repetitive and guaranteed for the life of the product.<br>- $I_{PP}$ ratings applicable over temperature range of -40ºC to +85ºC<br>- The device must initially be in thermal equilibrium with -40°C < $T_j$ < +150°C |

| | | |
|---|---|---|
| **High Temp Voltage Blocking** | 80% Rated VDRM (VAC Peak ) +125°C or +150°C, Lead Material Copper Alloy High Temp Voltage Blocking 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101 | |
| | | |
| **Temp Cycling** | -65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104 | |
| | | |
| **Biased Temp & Humidity** | 52 VDC (+85°C) 85%RH, 504 up to 1008 hrs. EIA/ JEDEC, JESD22-A-101 | |

| | | |
|---|---|---|
| **High Temp Storage** | +150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101 | |
| **Low Temp Storage** | -65°C, 1008 hrs. | |
| **Thermal Shock** | 0°C to +100°C, 5 min. dwell, 10 sec. transfer, Thermal Shock 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106 | |
| **Autoclave (Pressure Cooker Test)** | +121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/Cooker Test) JEDEC, JESD22-A-102 | |
| **Resistance to Solder Heat** | +260°C, 30 secs. MIL-STD-750 (Method 2031 | |
| **Moisture Sensitivity Level** | 85%RH, +85°C, 168 hrs., 3 reflow cycles Level (+260°C Peak). JEDEC-J-STD-020, Level 1 | |

| | | |
|---|---|---|
| **Lead Material** | Copper Alloy | |
| **Terminal Finish** | 100% Matte-Tin Plated | |
| **Body Material** | UL recognized epoxy meeting flammability classification 94V-0 | |

| Part Number | Component Package | Quantity | Packaging Option | Packaging Specification |
|---|---|---|---|---|
| **Pxxx0SB** | DO-214AA | 2500 | Tape & Reel - 12mm/13″tape | EIA -481 - D |

**Thermal Considerations**

| Package | Symbol | Parameter | Value | Unit |
|---|---|---|---|---|
| DO-214AA  | $T_J$ | Operating Junction Temperature Range | - 40 to + 150 | °C |
| | $T_S$ | Storage Temperature Range | - 40 to +150 | °C |
| | $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 90 | °C/W |

**Figure 1 - V-I Characteristics**

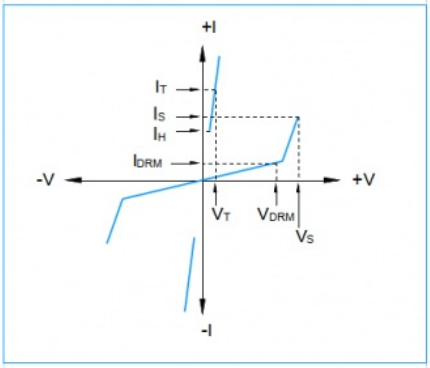



**Figure 2 - $t_r \times t_d$ Pulse Waveform**

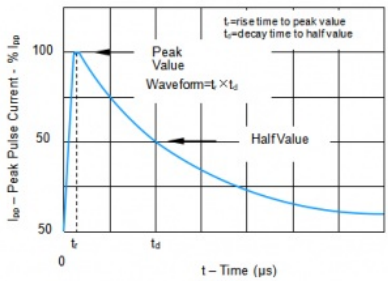



**Figure 3 - Normalized $V_S$ Change Versus Junction Temperature**

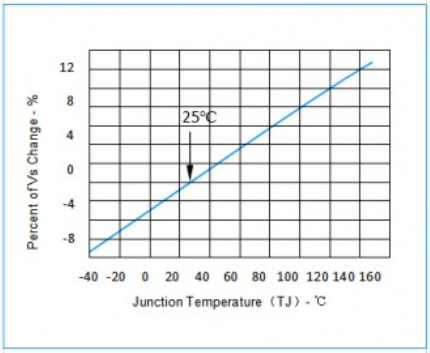
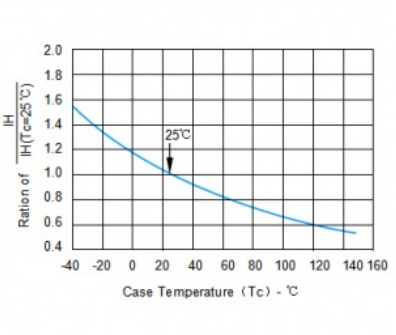
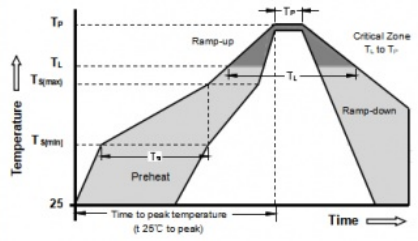



**Figure 4 - Normalized DC Holding Current Versus Case Temperature**

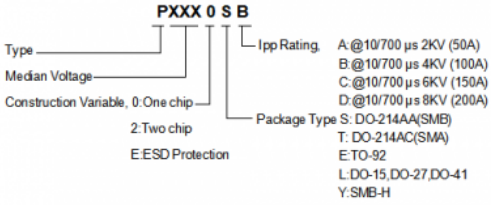


## Soldering Parameters



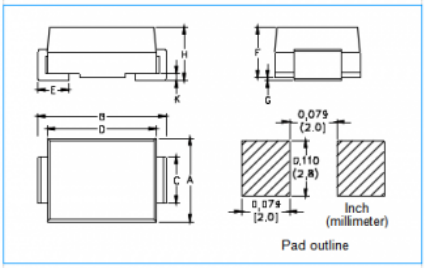

| Reflow Condition | | Lead–free assembly |
|---|---|---|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max ($T_{s(max)}$) | +200°C |
| | -Time (min to max) ($T_s$) | 60 -180 Seconds |
| Average ramp up rate ( Liquidus Temp $T_L$) to peak | | 3°C/Second Max |
| $T_{s(max)}$ 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 ($t_p$) | | 30 Seconds Max |
| Ramp-down Rate | | 6°C/Second Max |
| Time 25°C to peak Temperature ($T_P$) | | 8 minutes Max |
| Do not exceed | | +260°C |

## Part Numbering




## Part Marking


## Dimensions DO-214AA




| Dimensions | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.130 | 0.156 | 3.30 | 3.95 |
| B | 0.201 | 0.220 | 5.10 | 5.60 |
| C | 0.077 | 0.087 | 1.95 | 2.20 |
| D | 0.159 | 0.181 | 4.05 | 4.60 |
| E | 0.030 | 0.063 | 0.76 | 1.60 |
| F | 0.076 | 0.096 | 1.90 | 2.45 |
| G | 0.002 | 0.008 | 0.05 | 0.20 |
| H | 0.077 | 0.104 | 1.95 | 2.65 |
| K | 0.006 | 0.016 | 0.15 | 0.41 |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