

# PulseGuard® Suppressors

## Surface Mount Polymeric ESD Suppressors

### PGB Series SOT23 ESD Suppressor

#### Product Overview

PulseGuard ESD Suppressors help protect sensitive electronic equipment against electrostatic discharge (ESD). They supplement the on-chip protection of integrated circuitry and are best suited for low-voltage, high-speed applications where low capacitance is important. Data ports utilizing such high-speed protocols as USB 2.0, IEEE1394 and InfiniBand<sup>SM</sup> can benefit from this new technology. PulseGuard suppressors use polymer composite materials to suppress fast-rising ESD transients (as specified in IEC 61000-4-2 and MIL-STD-883E).

#### Features

- Ultra-low capacitance
- Low leakage current
- Fast response time
- 2-lines of protection
- Bi-directional
- Withstands multiple ESD strikes
- Standard JEDEC SOT23 outline
- Compatible with pick-and-place processes
- Available in 3,000 piece reels

#### Typical Applications

- Servers
- Laptop/Desktop Computers
- Network Hardware
- Computer Peripherals
- Digital Cameras
- External Storage

#### Ordering Information

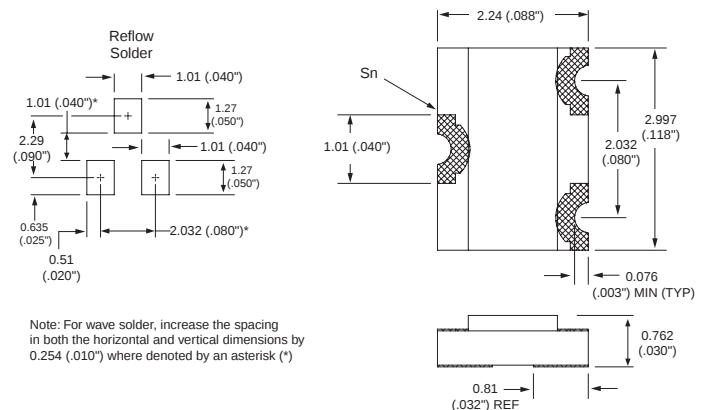
| CATALOG NUMBER | PIECES PER REEL |
|----------------|-----------------|
| PGB002ST23WR   | 3,000           |

#### Design Consideration

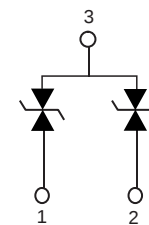
Because of the fast rise-time of the ESD transient, placement of PulseGuard suppressors is a key design consideration. To achieve optimal ESD suppression, the devices should be placed on the circuit board as close to the source of the ESD transient as possible. Install PulseGuard suppressors directly behind the connector so that they are the first board-level circuit component encountered by the ESD transient. They are connected from signal/data line to ground.



#### Reference Dimensions:



#### Equivalent Circuit



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### Electrical Characteristics

#### ESD Capability

|                                        |                      |
|----------------------------------------|----------------------|
| IEC 61000-4-2 Direct Discharge .....   | 8kV                  |
| IEC 61000-4-2 Air Discharge .....      | 15kV                 |
| Trigger Voltage <sup>1</sup> .....     | 1,000V typical       |
| Clamping Voltage <sup>1</sup> .....    | 150V typical         |
| Rated Voltage .....                    | 24VDC max            |
| Capacitance <sup>2</sup> .....         | 0.055pF              |
| Response Time <sup>1</sup> .....       | <1ns                 |
| Leakage Current <sup>3</sup> .....     | <1nA                 |
| ESD Pulse Withstand <sup>4</sup> ..... | 1,000 pulses minimum |

#### Notes:

1. Trigger and clamping voltage measured per IEC 61000-4-2, 8kV direct discharge method.
2. Capacitance measured at 1MHz.
3. Leakage current measured at 6VDC.
4. Pulse Withstand- some shifting in characteristics may occur when tested over multiple pulses at a very rapid rate.

### Environmental Specifications

**Operating Temperature:** -65°C to +125°C.

**Moisture Resistance, steady state:** MIL-STD-883, method 1004.7, 85% RH, 85°C, 1000hrs.

**Thermal Shock:** MIL-STD-202, Method 107G, -65°C to 125°C, 30 min cycle, 10 cycles.

**Vibration:** MIL-STD-202F, Method 201A, (10 to 55 to 10Hz, 1 min. cycle, 2grs each in X-Y-Z)

**Chemical Resistance:** ASTM D-543, 4hrs @ 40°C, 3 solutions (H<sub>2</sub>O, detergent solution, defluxer)

**Solder leach resistance and terminal adhesion:** Per EIA-576 test

### Physical Specifications

#### Materials:

Body: Glass Epoxy

Terminations: Copper/Nickel/Tin/Lead

**Solderability:** MIL-STD-202, Method 208 (95% coverage)

#### Soldering Parameters:

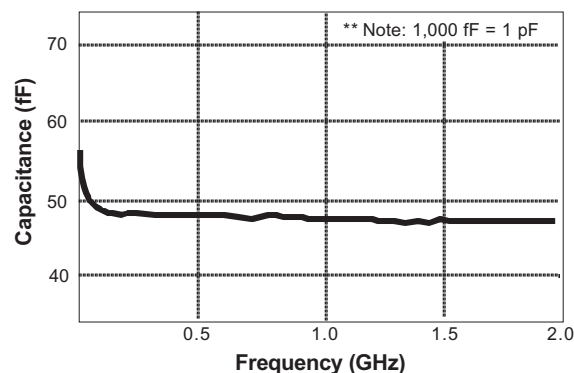
Wave Solder – 260°C, 10 seconds maximum.

Reflow Solder – 260°C, 30 seconds maximum.

### Packaging Specifications

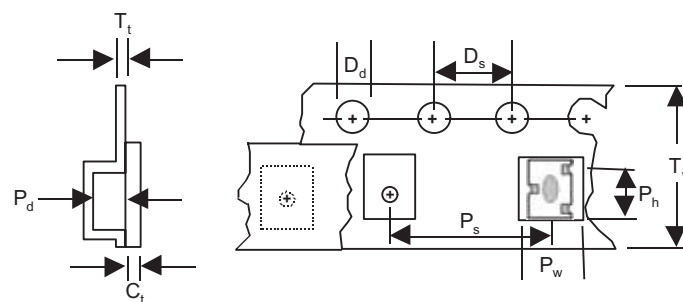
8mm Tape and Reel per EIA-RS481-1 (IEC 286, part3); 3,000 pieces per reel, add packaging suffix, WR.

### Capacitance vs. Frequency



### Carrier Tape Specifications

Parts are delivered on 7" (178mm) reel, plastic carrier tape



| DESCRIPTION                             | MEASUREMENT (MM) |
|-----------------------------------------|------------------|
| C <sub>t</sub> - Cover tape thickness   | 0.06             |
| D <sub>d</sub> - Drive hole diameter    | 1.50             |
| D <sub>s</sub> - Drive hole spacing     | 4.00             |
| P <sub>d</sub> - Pocket depth           | 1.02             |
| P <sub>h</sub> - Pocket height          | 3.23             |
| P <sub>s</sub> - Pocket spacing         | 4.00             |
| P <sub>w</sub> - Pocket width           | 2.46             |
| T <sub>t</sub> - Carrier tape thickness | 0.30             |
| T <sub>w</sub> - Carrier tape width     | 8.00             |