

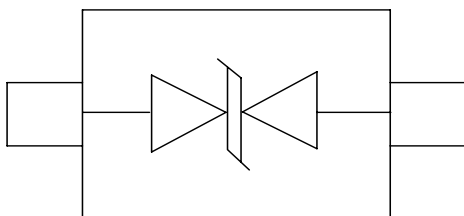
Description

The ESD5B5CL is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium. Because of its small size, it is suited for use in cellular phones, portable devices, digital cameras, power supplies and many other portable applications where board space comes at a premium. Also because of its low capacitance, it is suited for use in high frequency designs such as USB 2.0 high speed, VGA, DVI, SDI and other high speed line applications.

Features

- Protects one data line
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test Air discharge: $\pm 25\text{kV}$
 - Contact discharge: $\pm 22\text{kV}$
- IEC61000-4-5 (Lightning) 2.5A (8/20 μs)
- RoHS Compliant

Dimensions and Pin Configuration



Circuit and Pin Schematic

Mechanical Characteristics

- Package: SOD-523
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players
- Keypads, Side Keys, LCD Displays

Marking information



Details marking code reference customer approval list

Ordering Information

| Part Number | Packaging | Reel Size |
|-------------|------------------|-----------|
| ESD5B5CL | 3000/Tape & Reel | 7 inch |

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

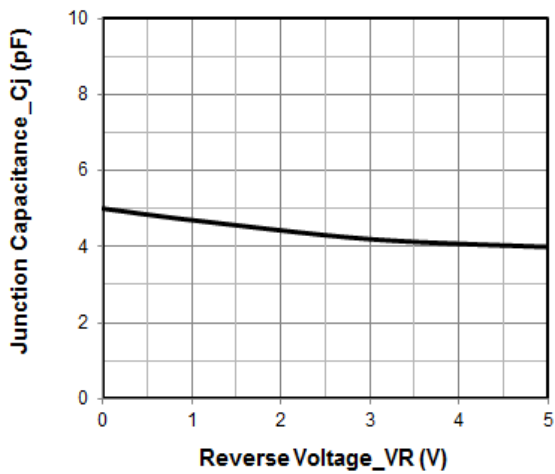
| Parameter | Symbol | Value | Unit |
|--|--------|-------------|--------------------|
| Peak Pulse Power (8/20 μs) | Ppk | 30 | W |
| Peak Pulse Current (8/20 μs) | Ipp | 2.5 | A |
| ESD per IEC 61000-4-2 (Air) | VESD | ± 25 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 22 | |
| Operating Temperature Range | TJ | -55 to +125 | $^{\circ}\text{C}$ |
| Storage Temperature Range | Tstg | -55 to +150 | $^{\circ}\text{C}$ |

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

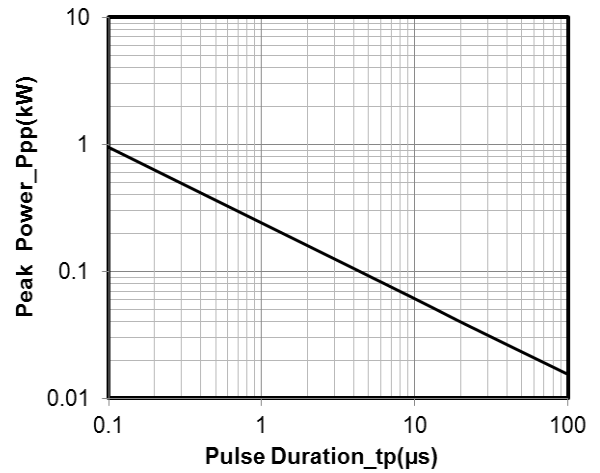
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|--------|-----|-----|-----|---------------|---|
| Reverse Working Voltage | VRWM | | | 5 | V | |
| Breakdown Voltage | VBR | 6 | | 8 | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.2 | μA | VRWM = 5V |
| Clamping Voltage | VC | | 8.5 | 9 | V | Ipp = 1A (8 x 20 μs pulse) |
| Clamping Voltage | VC | | 10 | 12 | V | Ipp = 2.5A (8 x 20 μs pulse) |
| Junction Capacitance | CJ | | 5 | | pF | VR = 0V, f = 1MHz |

WPMtek

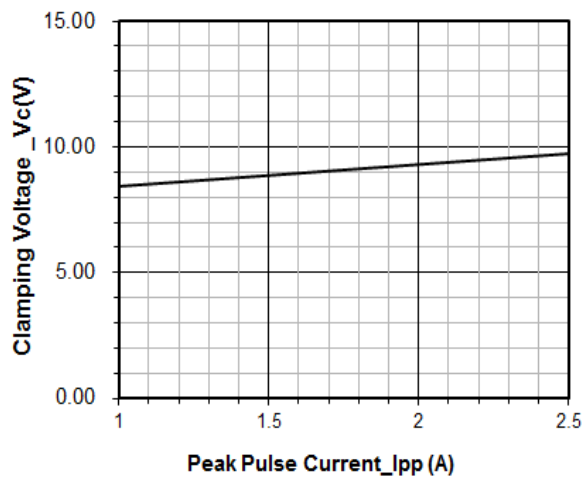
Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)



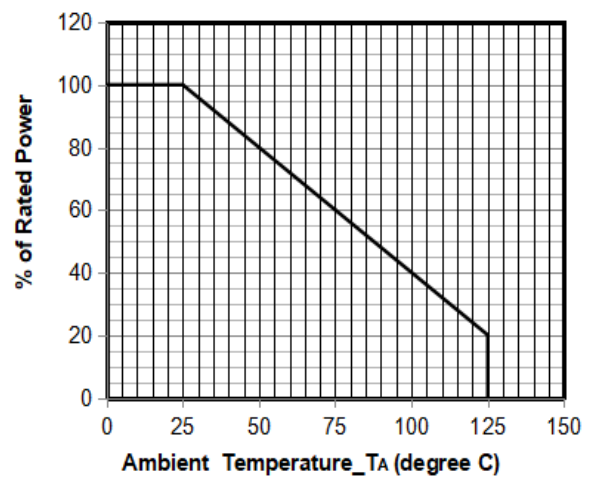
Junction Capacitance vs. Reverse Voltage



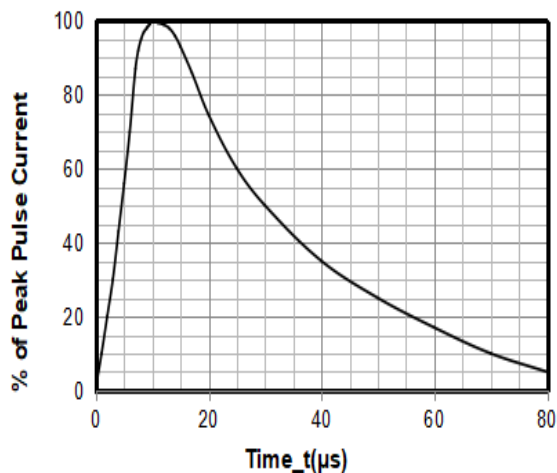
Peak Pulse Power vs. Pulse Time



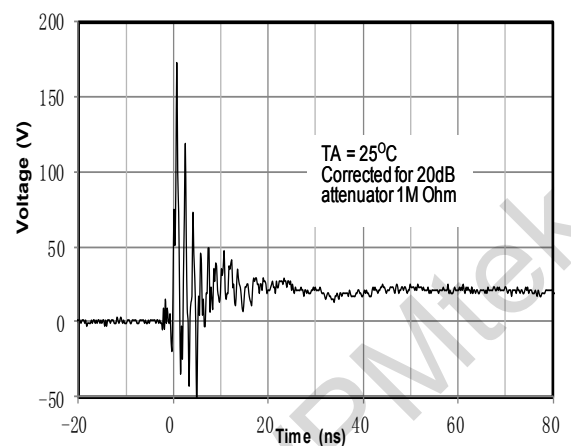
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



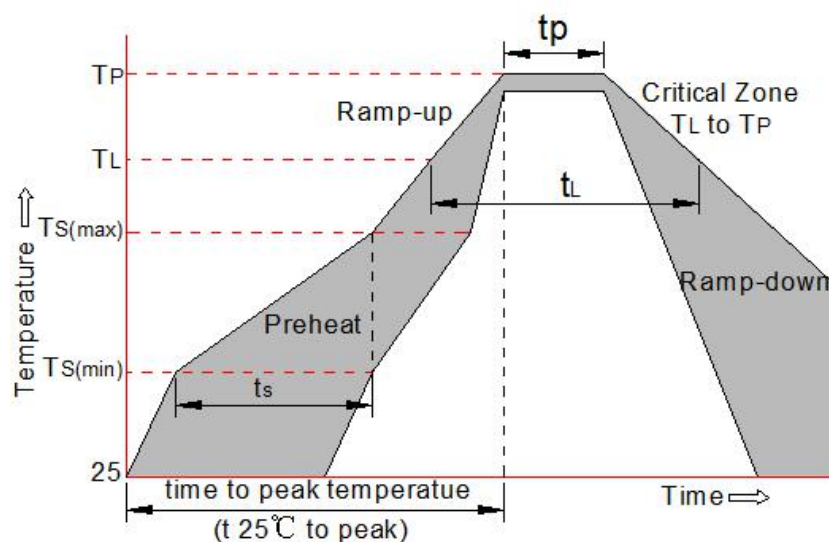
8 X 20 μs Pulse Waveform



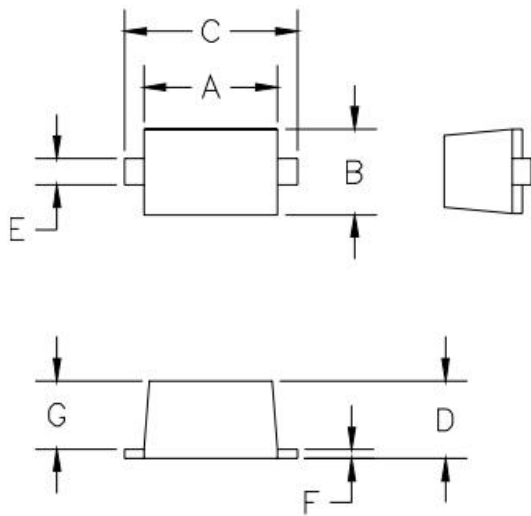
ESD Clamping Voltage
8 kV Contact per IEC61000-4-2

Soldering parameters

| Reflow Condition | | Pb-Free assembly (see FIG.2) |
|---|-----------------------------------|---------------------------------|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T_L) (Liquid us) | +217°C |
| | -Temperature(t_L) | 60-150 secs. |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T_p) | | 8 min. Max |
| Do not exceed | | +260°C |



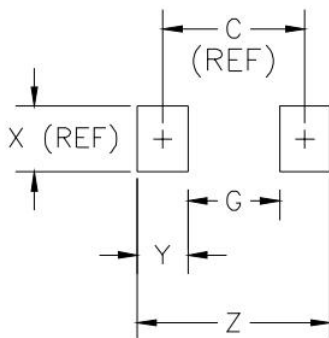
Package mechanical data



| DIMENSIONS | | | | | |
|------------------|--------|------|--------|------|------|
| DIM ^N | INCHES | | MM [1] | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | .043 | .051 | 1.10 | 1.30 | — |
| B | .028 | .035 | 0.70 | 0.90 | — |
| C | .059 | .067 | 1.50 | 1.70 | — |
| D | .020 | .028 | 0.50 | 0.70 | — |
| E | .010 | .014 | 0.25 | 0.35 | — |
| F | .004 | .008 | 0.10 | 0.20 | — |
| G | .020 | .028 | 0.50 | 0.70 | — |

[1] CONTROLLING DIMENSION: MILLIMETERS

Suggested Land Pattern



| DIMENSIONS | | | | | |
|------------------|--------|------|--------|------|------|
| DIM ^N | INCHES | | MM [1] | | NOTE |
| | MIN | MAX | MIN | MAX | |
| C | — | .067 | — | 1.70 | REF |
| G | — | .043 | — | 1.10 | — |
| X | — | .031 | — | 0.80 | REF |
| Y | — | .024 | — | 0.60 | — |
| Z | — | .091 | — | 2.30 | — |

[1] CONTROLLING DIMENSION: MILLIMETERS