

Features

- Protects one data or power line
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- 2-pin SOD-523 package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: ±30kV
Contact discharge: ±30kV
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 22A (8/20µs)
- RoHS Compliant

Mechanical Characteristics

- Package: SOD-523
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram

Applications

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

Part Number Code

| | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| E | S | D | 0 | 5 | 1 | 1 | L | 1 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| | |
|--------------|---------------------------------------|
| Product Type | |
| ESD | TSK Electrostatic suppressor ESD Type |

| | |
|-----------------------------|------|
| Reverse Working Voltage (V) | |
| 3V3 | 3.3V |
| 05 | 5V |
| 16 | 16V |

| | |
|------|--------|
| Line | |
| 1 | 1-Line |
| 2 | 2-Line |
| 3 | 3-Line |

| | |
|------------------|--------|
| Capacitance Type | |
| L | Low |
| X | Normal |

| | |
|-------------|-----|
| directional | |
| 0 | Bi |
| 1 | Uni |

| | |
|------|---------|
| Size | |
| 1 | 0201 |
| 2 | 0402 |
| 3 | DFN0603 |
| 4 | DFN1006 |

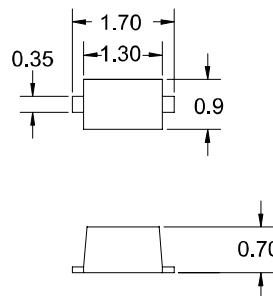
★ Code 4 to 9 is optional

Description

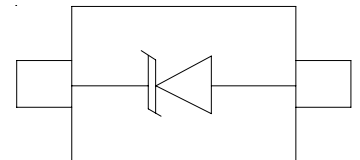
The ESD0511xH1 is a uni-directional TVS diode,utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line.The ESD0511xH1 complies with the IEC 61000-4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. It is assembled into a small lead-free SOD-523 package. The small size and high ESD surge protection make ESD0511xH1 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.



Dimensions and Pin Configuration



Maximum Dimensions (mm)



SOD-523 (Top View)

Package Dimensions

Circuit and Pin Schematic

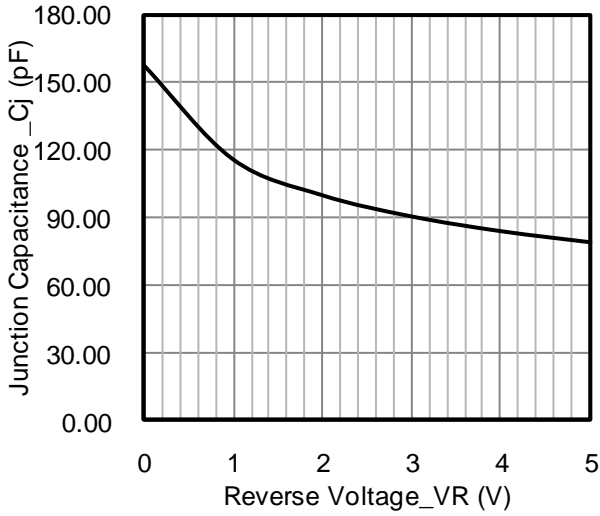
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|--------|-------------|--------------------|
| Peak Pulse Power (8/20 μs) | Ppk | 300 | W |
| Peak Pulse Current (8/20 μs) | Ipp | 22 | A |
| ESD per IEC 61000-4-2 (Air) | VESD | ± 30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 30 | |
| Operating Temperature Range | TJ | -55 to +125 | $^{\circ}\text{C}$ |
| Storage Temperature Range | Tstg | -55 to +150 | $^{\circ}\text{C}$ |

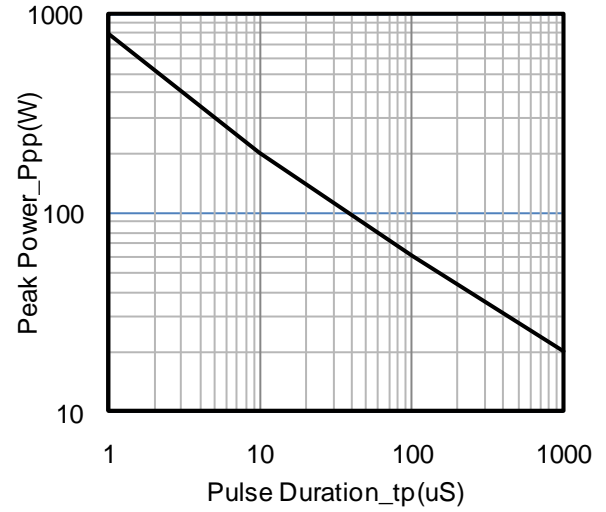
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|--------|-----|-----|-----|---------------|--|
| Reverse Working Voltage | VRWM | | | 5 | V | |
| Breakdown Voltage | VBR | 6 | | | V | $I_T = 1\text{mA}$ |
| Reverse Leakage Current | I_R | | | 0.5 | μA | $VRWM = 5\text{V}$ |
| Forward Voltage | V_F | | 1.0 | 1.2 | V | $I_F = 10\text{mA}$ |
| Clamping Voltage | V_C | | | 8 | V | $I_{PP} = 1\text{A}$ (8 x 20 μs pulse) |
| Clamping Voltage | V_C | | | 14 | V | $I_{PP} = 22\text{A}$ (8 x 20 μs pulse) |
| Junction Capacitance | CJ | | 160 | | pF | $V_R = 0\text{V}$, $f = 1\text{MHz}$ |

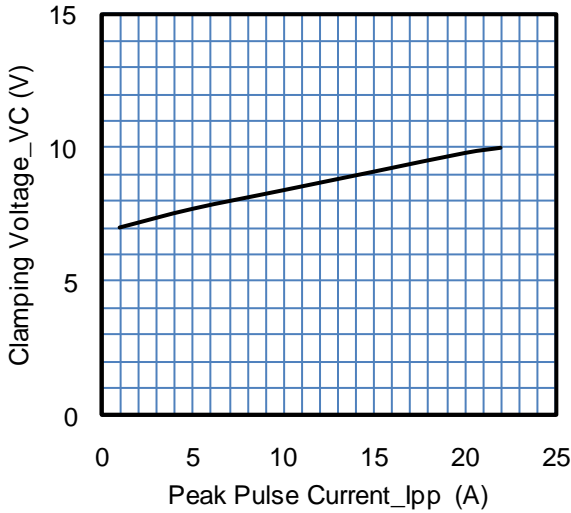
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



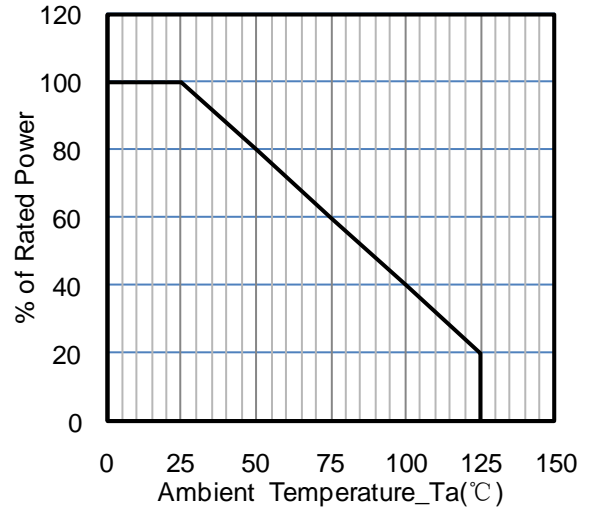
Junction Capacitance vs. Reverse Voltage



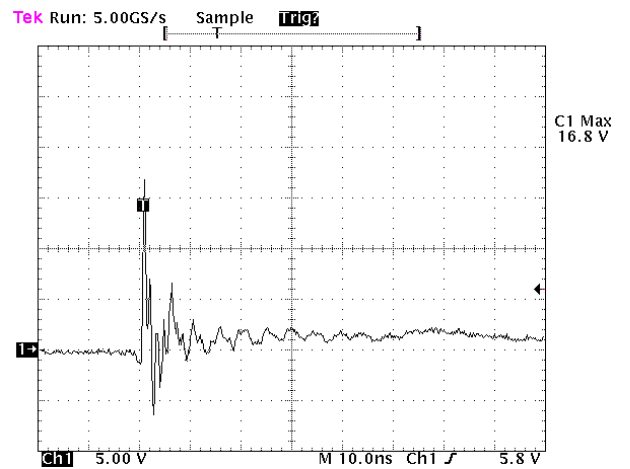
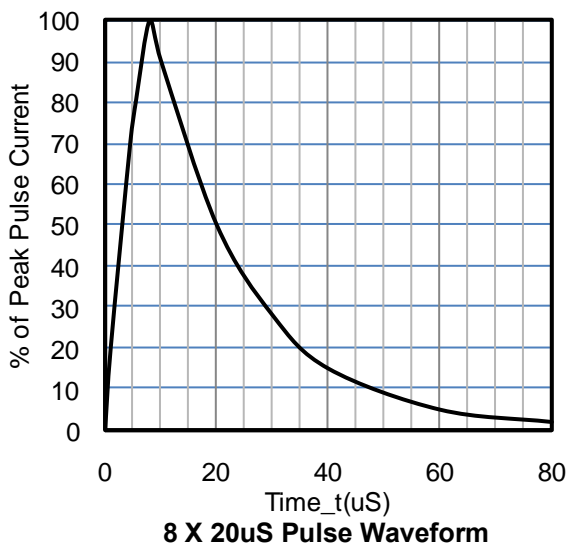
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current



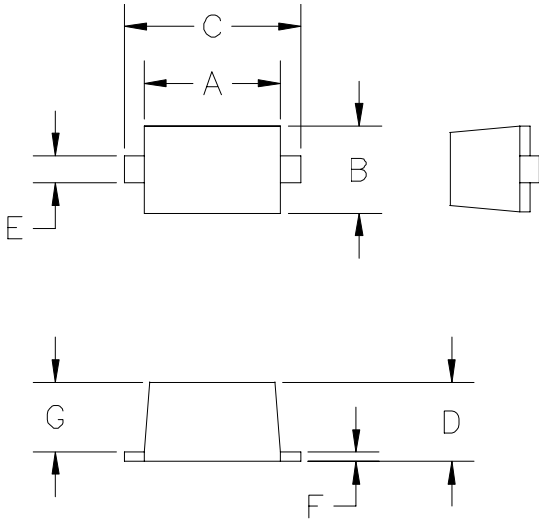
Power Derating Curve



ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

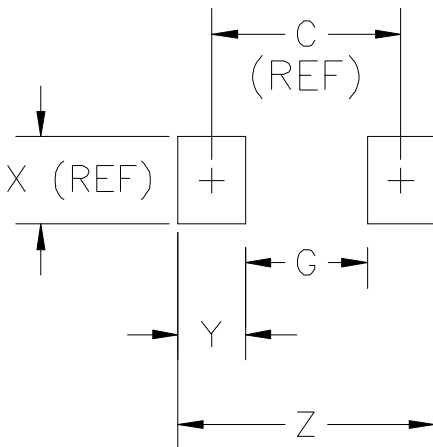
SOD-523 Package Outline Drawing



| 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

Ordering Information

| Part Number | Packaging | Reel Size |
|-------------|------------------|-----------|
| ESD0511XH1 | 3000/Tape & Reel | 7 inch |