1- Line Bidirectional ESD Protection Diode

## General description

PWESD-5VSDE a 5.0V bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making his device an ideal solution for protecting voltage sensitive high-speed data lines. The PWESD-5VSDE has a low capacitance with a typical value at 0.7pF,and complies with the IEC61000-4-2(ESD) standard with ±30kV air and ±30kV contact discharge. It is assembled into a leadfree SOD-323 package. The small size, low capacitance and high ESD surge protection make PWESD-5VSDE an idea choice to protect cell phone, wireless systems, and communication equipment.

## Features and benefits

- Working Voltage 5.0V
- Ultra Low Capacitance 0.7 pF
- Low leakage current: nA Level
- IEC 61000-4-2 (ESD Air): ±30kV
- IEC 61000-4-2 (ESDContact): ±30kV
- IEC61000-4-5(Lightning 8/20μS): 18A

## Application information

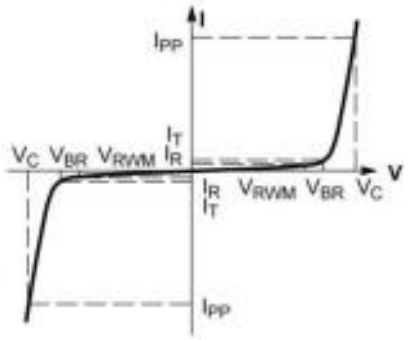
- High- speed data lines
- Smart phones
- USB Ports
- Wireless Systems
- Ethernet 10/100/1000 Base T

## Schematic & Pin configuration

| Simplified outline | Graphic symbol |
|---|---|
|  |  |

## Portion Electronics Parameter

| Symbol | Parameter |
|---|---|
| $I_{PP}$ | Reverse Peak Pulse Current |
| $V_C$ | Clamping Voltage @ $I_{PP}$ |
| $V_{RWM}$ | Working Peak Reverse Voltage |
| $I_R$ | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$ | Breakdown Voltage @ $I_T$ |
| $I_T$ | $V_{BR}$ Test Current |




## Maximum Ratings

($T_A$ = 25 ℃, unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power (Tp = 8/20μs) | $P_{PPM}$ | 200 | W |
| Rated Peak Pulse Current (Tp = 8/20μs) | $I_{PPM}$ | 18 | A |
| ESD voltage IEC 61000-4-2 (air discharge) | $V_{ESD}$ | 30 | kV |
| ESD voltage IEC 61000-4-2 (contact discharge) | $V_{ESD}$ | 30 | kV |
| Maximum lead temperature for soldering during 10s | $T_L$ | 260 | °C |
| Storage Temperature Range | $T_{stg}$ | -55 to +150 | °C |
| Operating Temperature Range | $T_J$ | -40 to +125 | °C |

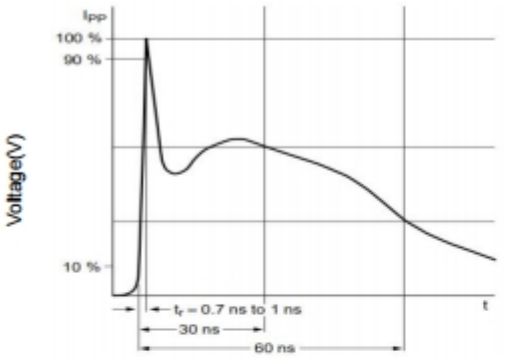
## Electrical Characteristics

($T_A$ = 25 ℃, unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit | Condition |
|---|---|---|---|---|---|---|
| Reverse Working Voltage | $V_{RWM}$ | -- | -- | 5.0 | V | |
| Breakdown Voltage | $V_{BR}$ | 6.7 | 8.0 | 9.0 | V | $I_T$=1mA |
| Leakage Current ILeak | $I_R$ | -- | -- | 100 | nA | $V_{RWM}$=5.0V |
| Clamping Voltage | $V_C$ | -- | 5.5 | -- | V | $I_{PP}$=1A,$T_p$=8/20μs |
| Clamping Voltage | $V_C$ | -- | 9.5 | 11.0 | V | $I_{PP}$=18A,$T_p$=8/20μs |
| Junction Capacitance | $C_j$ | -- | 0.70 | 0.90 | pF | $V_R$=0V, f=1MHz |
| Junction Capacitance | $C_j$ | -- | 0.70 | 0.90 | pF | $V_R$=5.0V, f=1MHz |

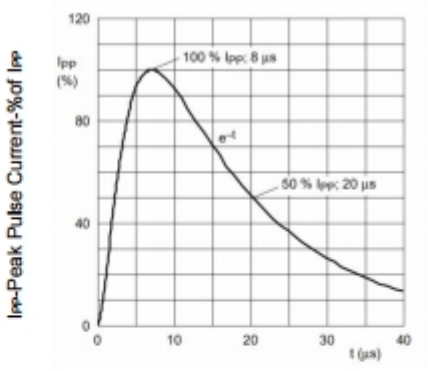
## Typical Performance Characteristics

($T_A$=25℃ unless otherwise Specified)



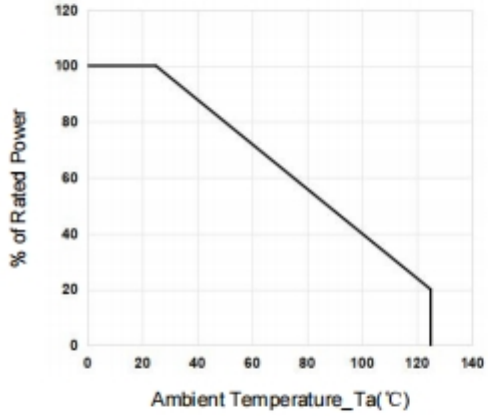

Time(nS)

**IEC61000-4-2 Pulse Waveform**

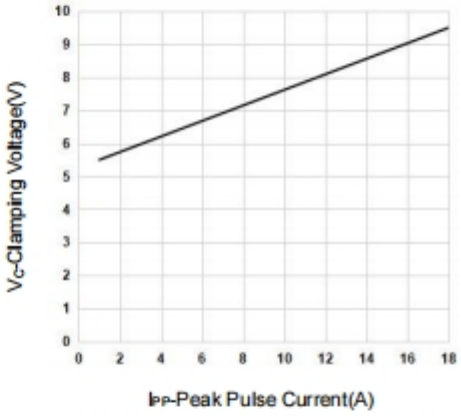



T-Time(μS)

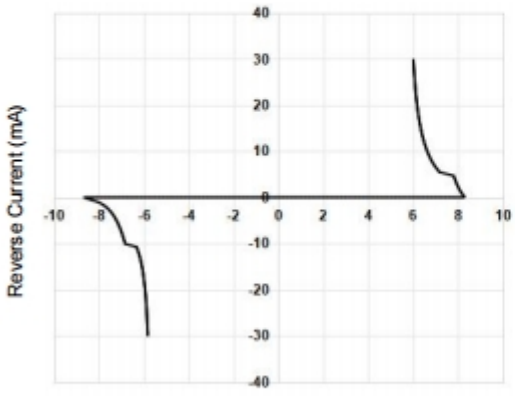
**IEC61000-4-5 8X20μs Pulse Waveform**



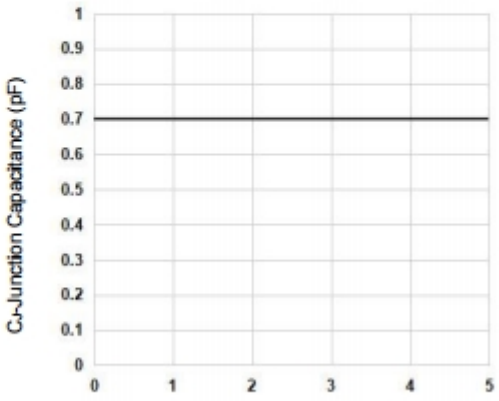

**Power Derating Curve**




**Clamping Voltage vs. Peak Pulse Current**



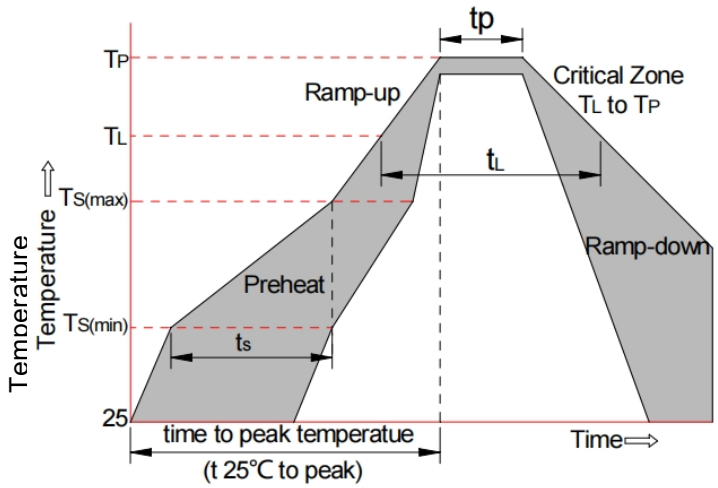

**Reverse Current vs. Reverse Voltage**




**Junction Capacitance vs. Reverse Voltage**

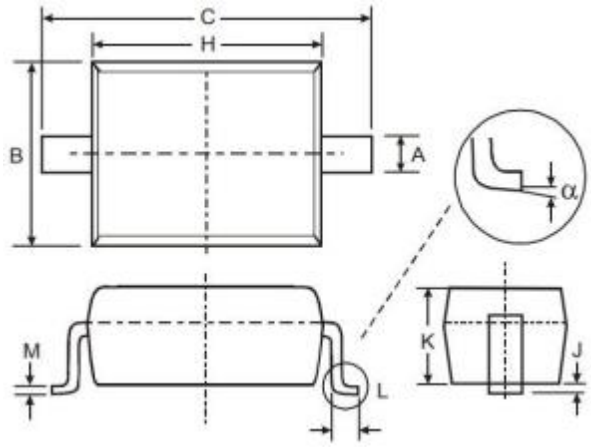
## Soldering Parameters

| Reflow Condition | | Pb-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 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 |
| xTime 25°C to Peak Temp ($T_P$) | | 8 min. Max |
| Do not exceed | | +260°C |



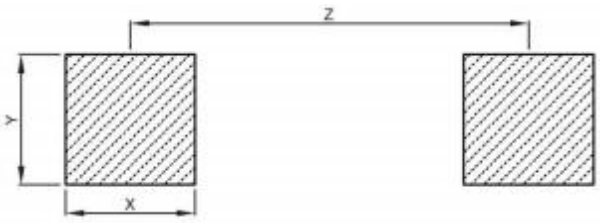
## Package Outline Dimensions

**SOD323**




| SYMBOL | MILLIMETERS | |
|---|---|---|
| | MIN | MAX |
| A | 0.25 | 0.35 |
| B | 1.20 | 1.40 |
| C | 2.40 | 2.70 |
| H | 1.60 | 1.80 |
| J | 0.01 | 0.15 |
| K | 0.70 | 0.90 |
| L | 0.20 | 0.40 |
| M | 0.08 | 0.15 |
| α | 0° | 8° |

## Soldering Footprint (mm)




| SYMBOL | MILLIMETERS | |
|---|---|---|
| | MIN | MAX |
| X | 0.65 | 0.75 |
| Y | 0.65 | 0.75 |
| Z | 2.10 | 2.20 |

## IMPORTANT NOTICE

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