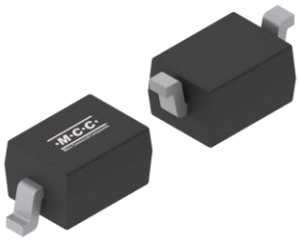
# 1-Line Bi-directional Standard Capacitance ESD

## Features

- Transient protection:
  - IEC 61000-4-2 (ESD) ±30kV (Air), ±30kV (Contact)
  - IEC 61000-4-5 (Lightning) 6A (8/20μs)
- Fully automotive qualified to AEC-Q101
- Bi-directional ESD protection of single line
- Reverse working voltage, $V_{RWM}$: 27V
- Capacitance: 16pF (typical)
- Clamping voltage: 50V (max)
- Reverse leakage current: 50nA max at $V_R$ = 27V
- Solid-state silicon-avalanche



**SOD-323**

RoHS Compliant | Lead Free | Halogen Free | AEC Qualified

## Applications

- Automotive Application
- CAN Bus Protection

## Mechanical Data

- Package: SOD-323
- Moisture Sensitivity Level 1, per J-STD-020
- Halogen Free. “Green” Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Body Marking and Pin Layout

| Marking Code | Simplified Outline | Internal Structure |
|---|---|---|
|   %=placeholder for date code |   Transparent top view |   |

## Ordering Information

| Product Name | Reel Size | Packing Type | Qty/Reel |
|---|---|---|---|
| ESD27VD3BQ-TP | 7’’ | Tape & Reel | 3,000 |

For packaging details, visit our website at https://www.mccsemi.com/Package/List

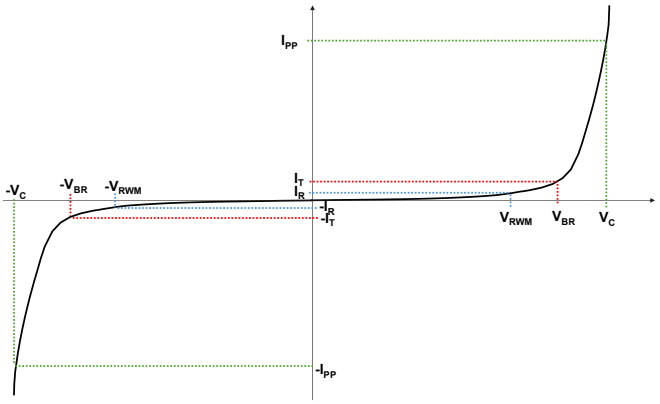
## Maximum Ratings ($T_A$=25°C unless otherwise specified)

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| IEC61000-4-2(ESD) | Air | $V_{ESD}$ | ±30 | kV |
| | Contact | $V_{ESD}$ | ±30 | kV |
| Peak Pulse Current (8/20μs) (Note 2) | | $I_{PP}$ | 6 | A |
| Peak Pulse Power (8/20μs) (Note 2) | | $P_{PK}$ | 300 | W |
| Operating Temperature Range | | $T_J$ | -55 to +150 | °C |
| Storage Temperature Range | | $T_{STG}$ | -55 to +150 | °C |

Note:
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and 1000ppm antimony compounds.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.

## Parameter Definition

| Symbol | Parameter |
|---|---|
| $V_{RWM}$ | Peak Reverse Working Voltage |
| $I_R$ | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$ | Breakdown Voltage @ $I_T$ |
| $I_T$ | Test Current |
| $I_{PP}$ | Maximum Reverse Peak Pulse Current |
| $V_C$ | Clamping Voltage @ $I_{PP}$ |
| $P_{PK}$ | Peak Pulse Power |
| $C_J$ | Junction Capacitance |




## Electrical Characteristics ($T_A$=25°C unless otherwise specified)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Reverse Working Voltage | $V_{RWM}$ | | | | 27 | V |
| Reverse Breakdown Voltage | $V_{BR}$ | $I_T$ =1mA | 28 | | 38 | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$=27V | | | 0.05 | μA |
| Clamping Voltage (Note3) | $V_C$ | $I_{PP}$=1A, $t_P$=8/20μs | | 35 | 43 | V |
| | | $I_{PP}$=6A, $t_P$=8/20μs | | 43 | 50 | |
| Junction Capacitance | $C_J$ | $V_R$=0V, f=1MHz | | 16 | 30 | pF |
| Dynamic Resistance (Note4) | $R_{DYN}$ | TLP, $t_p$=100ns | | 0.32 | | Ω |

Note:
3. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5..
4. TLP parameter: $Z_0$=50Ω, tp=100ns, tr=2ns, averaging window from 60ns to 80ns. $R_{DYN}$ is calculated from 4A to 16A.

## Curve Characteristics

Fig. 1 - 8 X 20μs Pulse Waveform

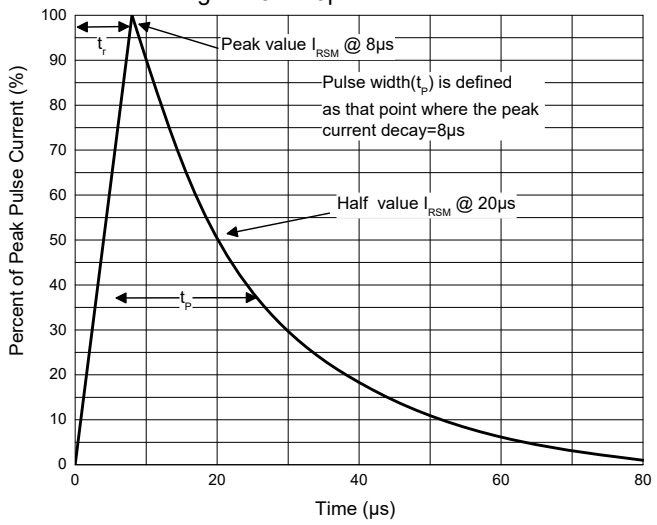



Fig. 2 - Pulse Derating Curve

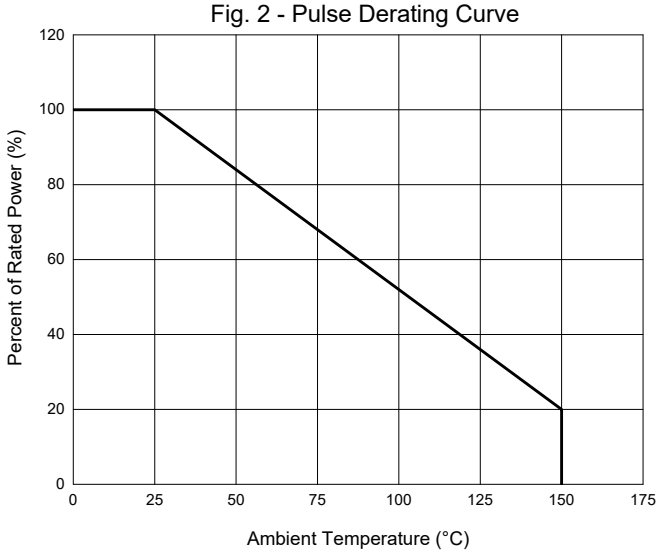



Fig. 3 - Capacitance Characteristics

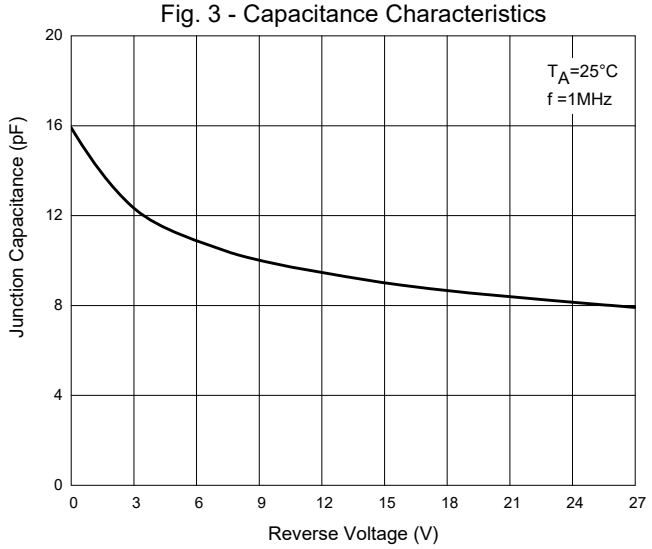



Fig. 4 - Clamping Voltage Characteristics

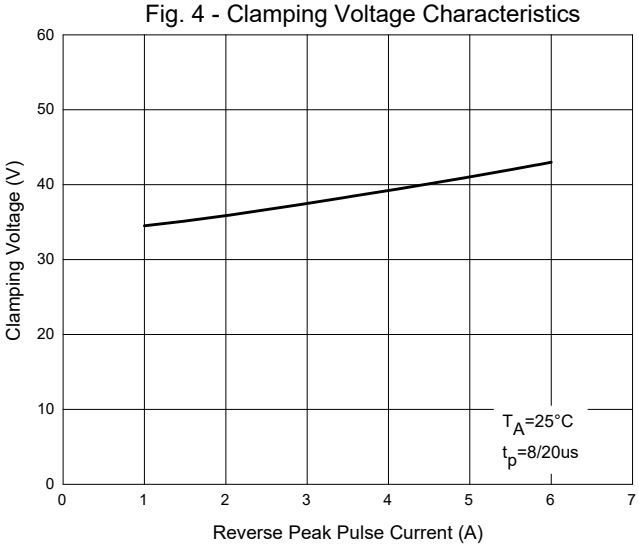
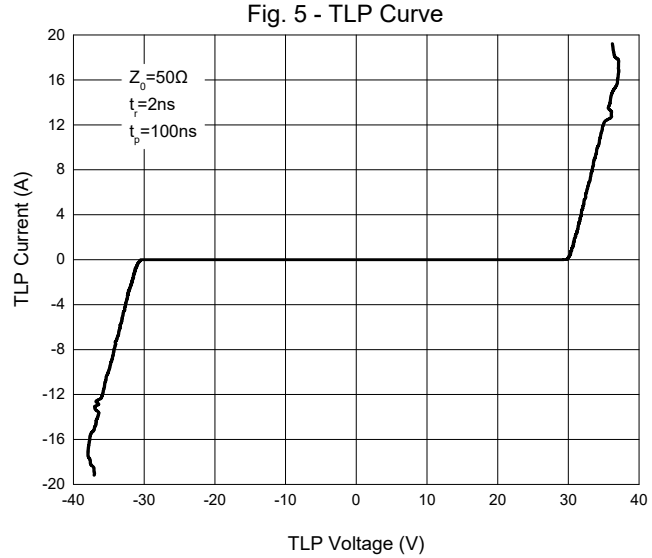
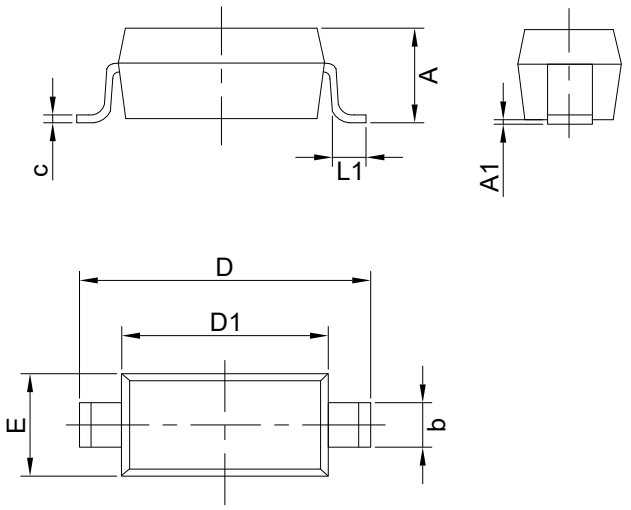



Fig. 5 - TLP Curve



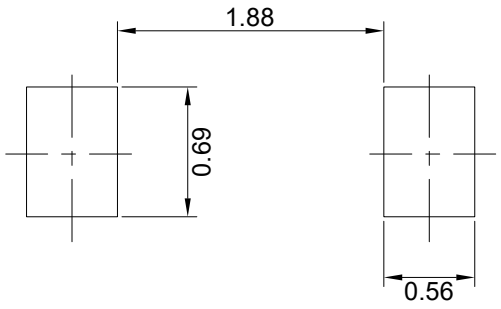
## Package Outline




| DIM | INCH | | MM | | NOTE |
|---|---|---|---|---|---|
| | MIN | MAX | MIN | MAX | |
| A | 0.031 | 0.045 | 0.80 | 1.15* | Note 1 |
| A1 | 0.000 | 0.006 | 0.00 | 0.15 | |
| b | 0.010 | 0.016 | 0.25 | 0.40 | |
| c | 0.003 | 0.010 | 0.08 | 0.25 | |
| D | 0.090 | 0.107 | 2.30 | 2.70 | |
| D1 | 0.063 | 0.071 | 1.60 | 1.80 | |
| E | 0.045 | 0.055 | 1.15 | 1.40 | |
| L1 | 0.004 | 0.018 | 0.10 | 0.45 | |

Notes:
1. Dimension A for products from manufacturing site VN is controlled at max 1.10 mm.

## Suggested Pad Layout (Unit:mm)




Notes:
1. The suggested land pattern dimensions have been provided for reference only.
2. For further information, please refer to document IPC-7351A.

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