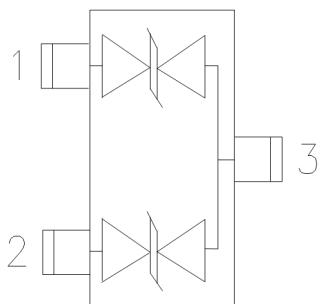


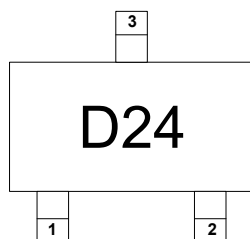
## Description

The SM24CANB-02HTG is a bi-directional TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting sensitive semiconductor components from damage. The SM24CANB-02HTG complies with the IEC 61000-4-2 (ESD) standard with  $\pm 15\text{kV}$  air and  $\pm 8\text{kV}$  contact discharge. It is assembled into a lead-free SOT-23 package. It is designed to protect components which are connected to data and transmission lines from voltage surges.

## Circuit Diagram



## Marking Diagram



### Transparent top view

D24: Device Marking Code

## Features

- \* 420W peak pulse power (8/20 $\mu\text{s}$ )
- \* Protects two bi-directional lines
- \* Ultra low leakage: nA level
- \* Operating voltage: 24V
- \* AEC-Q101 qualified
- \* Low clamping voltage
- \* Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
  - Air discharge:  $\pm 30\text{kV}$
  - Contact discharge:  $\pm 30\text{kV}$
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 9A (8/20 $\mu\text{s}$ )
- \* RoHS Compliant

## Applications

- \* Cellular Handsets and Accessories
- \* Notebooks and Handhelds
- \* Portable Instrumentation
- \* Set Top Box
- \* Industrial Controls
- \* Server and Desktop PC

## Ordering Information

| Part Number    | Packaging        | Reel Size |
|----------------|------------------|-----------|
| SM24CANB-02HTG | 3000/Tape & Reel | 7 inch    |

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

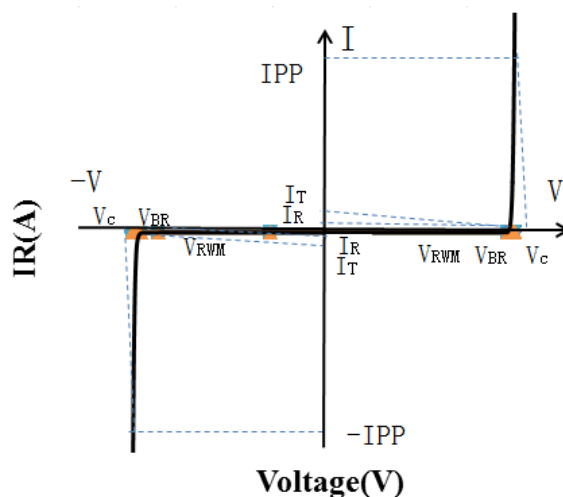
| Parameter                                | Symbol | Value       | Unit               |
|------------------------------------------|--------|-------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | Ppk    | 420         | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | IPP    | 9           | A                  |
| ESD per IEC 61000-4-2 (Air)              | VESD   | $\pm 30$    | kV                 |
| ESD per IEC 61000-4-2 (Contact)          |        | $\pm 30$    |                    |
| 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)

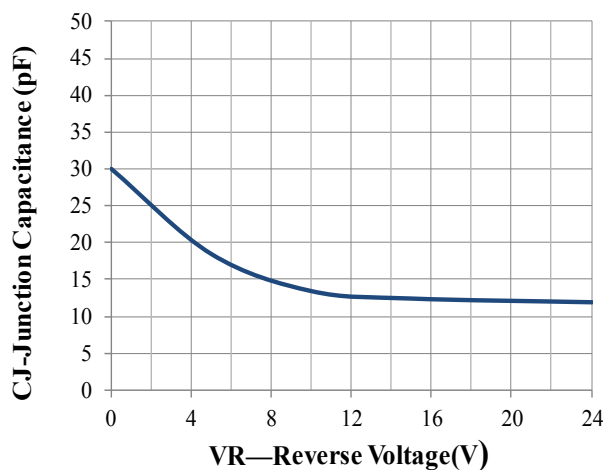
| Parameter               | Symbol           | Test Condition                                           | Min | Typ  | Max  | Unit          |
|-------------------------|------------------|----------------------------------------------------------|-----|------|------|---------------|
| Reverse Working Voltage | $V_{\text{RWM}}$ |                                                          |     |      | 24   | V             |
| Breakdown Voltage       | $V_{\text{BR}}$  | $I_{\text{T}} = 1\text{mA}$                              | 26  | 28.5 | 30.5 | V             |
| Reverse Leakage Current | $I_{\text{R}}$   | $V_{\text{RWM}} = 24\text{V}$                            |     |      | 0.5  | $\mu\text{A}$ |
| Clamping Voltage        | $V_{\text{C}}$   | $I_{\text{PP}} = 1\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     | 35   | 40   | V             |
| Clamping Voltage        | $V_{\text{C}}$   | $I_{\text{PP}} = 9\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     | 45   | 58   | V             |
| Junction Capacitance    | $C_{\text{J}}$   | $V_{\text{R}} = 0\text{V}$ , $f = 1\text{MHz}$           |     | 30   | 50   | pF            |

## Portion Electronics Parameter

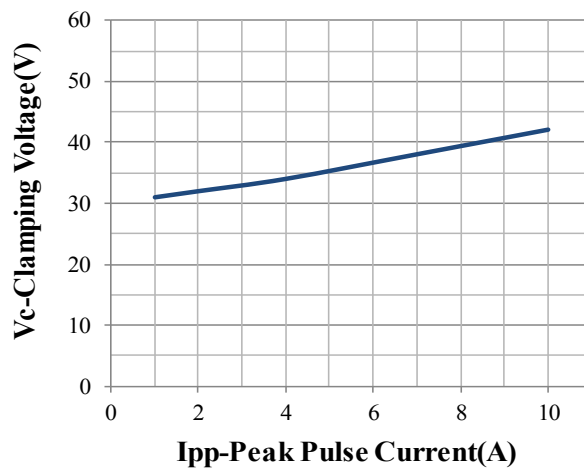
| Symbol          | Parameter                          |
|-----------------|------------------------------------|
| $I_{\text{T}}$  | Test Current                       |
| $I_{\text{PP}}$ | Maximum Reverse Peak Pulse Current |
| $V_{\text{C}}$  | Clamping Voltage @ $I_{\text{C}}$  |



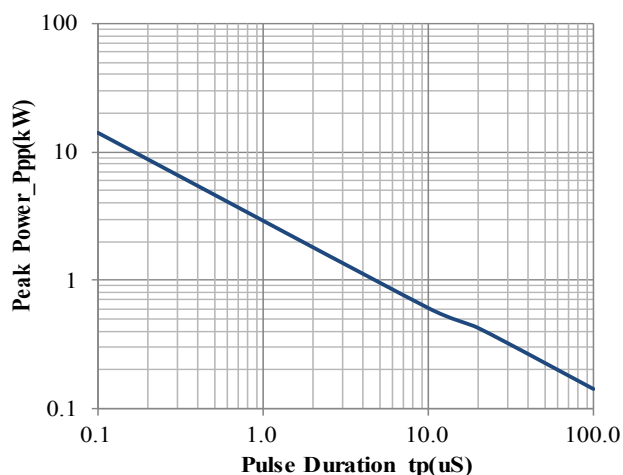
## Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise Specified)



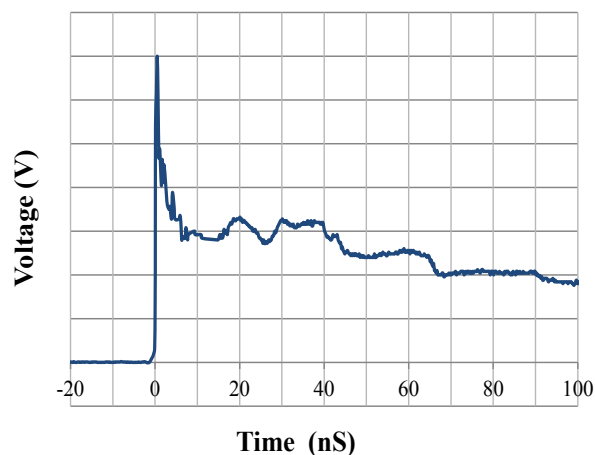
Junction Capacitance vs. Reverse Voltage



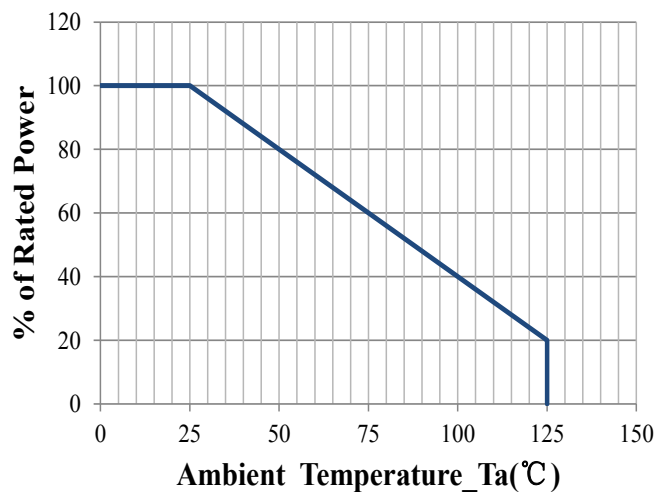
Clamping Voltage vs. Peak Pulse Current



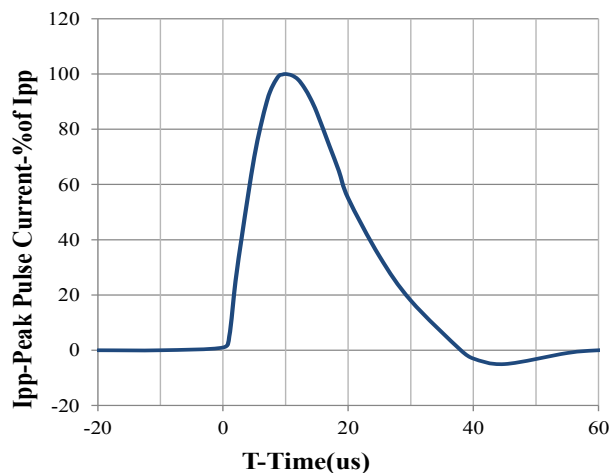
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform

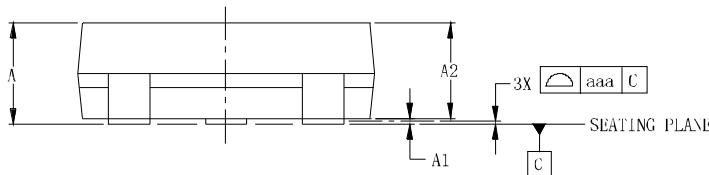
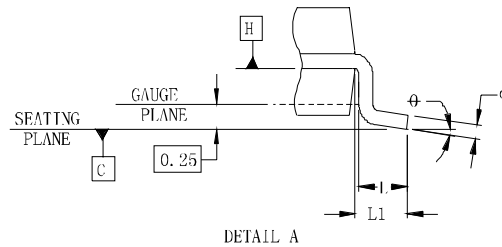
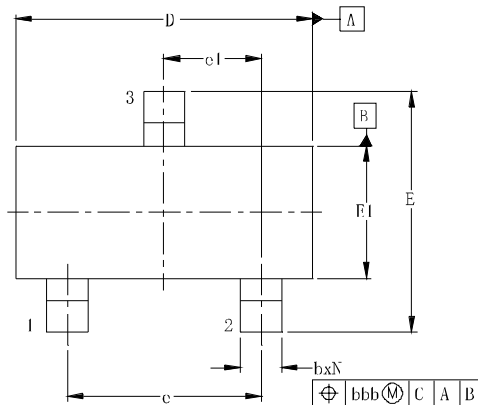


Power Derating Curve



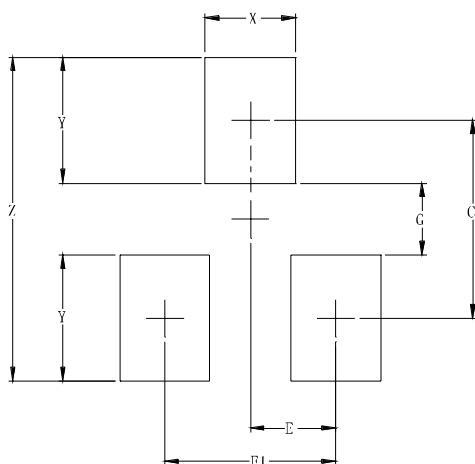
8 X 20us Pulse Waveform

## SOT-23 Package Outline Drawing



| DIM | DIMENSIONS |      |      |             |      |      |
|-----|------------|------|------|-------------|------|------|
|     | INCHES     |      |      | MILLIMETERS |      |      |
|     | MIN        | NOM  | MAX  | MIN         | NOM  | MAX  |
| A   | .035       | —    | .044 | 0.89        | —    | 1.12 |
| A1  | .000       | —    | .004 | 0.01        | —    | 0.10 |
| A2  | .035       | .037 | .040 | 0.88        | 0.95 | 1.02 |
| b   | .012       | —    | .020 | 0.30        | —    | 0.51 |
| c   | .003       | —    | .007 | 0.08        | —    | 0.18 |
| D   | .110       | .114 | .120 | 2.80        | 2.90 | 3.04 |
| E   | .082       | .093 | .104 | 2.10        | 2.37 | 2.64 |
| E1  | .047       | .051 | .055 | 1.20        | 1.30 | 1.40 |
| e   | .075       |      |      | 1.90 BSC    |      |      |
| e1  | .037       |      |      | 0.95 BSC    |      |      |
| L   | .015       | .020 | .024 | 0.40        | 0.50 | 0.60 |
| L1  | .022       |      |      | (0.55)      |      |      |
| N   | 3          |      |      | 3           |      |      |
| θ   | 0°         | —    | 8°   | 0°          | —    | 8°   |
| aaa | .004       |      |      | 0.10        |      |      |
| bbb | .008       |      |      | 0.20        |      |      |

## Suggested Land Pattern



| DIM | DIMENSIONS |             |
|-----|------------|-------------|
|     | INCHES     | MILLIMETERS |
| C   | .087       | 2.20        |
| E   | .037       | 0.95        |
| E1  | .075       | 1.90        |
| G   | .031       | 0.80        |
| X   | .039       | 1.00        |
| Y   | .055       | 1.40        |
| Z   | .141       | 3.60        |