

Description

The PDCSM24 is an uni-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 PDCSM24 complies with the IEC 61000-4-2 (ESD) standard with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ 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.

Features

- Protects two uni-directional lines
- Ultra low leakage: nA level
- Operating voltage: 24V
- Low clamping voltage
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$ Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lighting) 6A (8/20 μs)
- RoHS Compliant

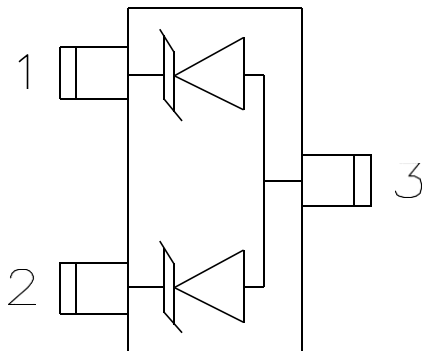
Mechanical Characteristics

- Package: SOT-23
- 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

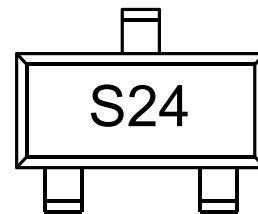
- Cellular Handsets and Accessories
- Notebook and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC

Dimensions and Pin Configuration



Circuit and Pin Schematic

Marking Information



S24 = Device Marking Code

Ordering Information

| Part Number | Marking | Packaging | Reel Size |
|-------------|---------|------------------|-----------|
| PDCSM24 | S24 | 3000/Tape & Reel | 7 inch |

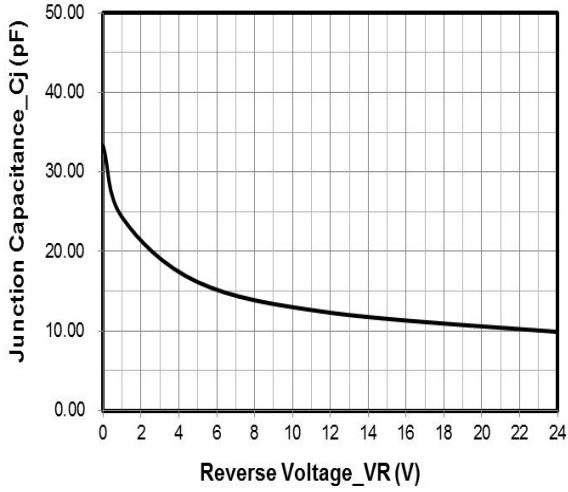
Absolute Maximum Ratings (TA=25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---------------------------------|------------------|-------------|------|
| Peak Pulse Power (8/20μs) | Ppk | 270 | W |
| Peak Pulse Current (8/20μs) | I _{PP} | 6 | A |
| ESD per IEC 61000-4-2 (Air) | V _{ESD} | ±30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ±30 | |
| Operating Temperature Range | T _J | -55 to +125 | °C |
| Storage Temperature Range | T _{stg} | -55 to +150 | °C |

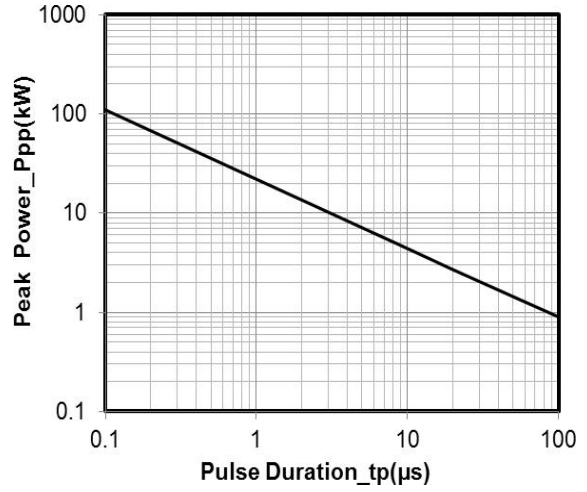
Electrical Characteristics (TA=25°C unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|------------------|-----|-----|-----|------|---|
| Reverse Working Voltage | V _{RWM} | | | 24 | V | |
| Breakdown Voltage | V _{BR} | 27 | | | V | I _T = 1mA |
| Reverse Leakage Current | I _R | | | 0.2 | μA | V _{RWM} = 24V |
| Forward Voltage | V _F | | 0.8 | 1.2 | V | I _F = 10mA |
| Clamping Voltage | V _C | | | 32 | V | I _{PP} = 1A (8 x 20μs pulse) |
| Clamping Voltage | V _C | | | 45 | V | I _{PP} = 6A (8 x 20μs pulse) |
| Junction Capacitance | C _J | | | 40 | pF | V _R = 0V, f = 1MHz, Pin 1 to Pin 3 or Pin 2 to Pin 3 |
| Junction Capacitance | C _J | | | 20 | pF | V _R = 0V, f = 1MHz, Pin 1 to Pin 2 |

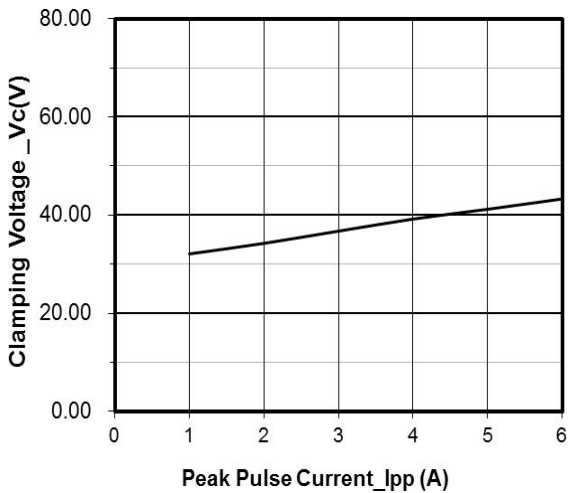
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



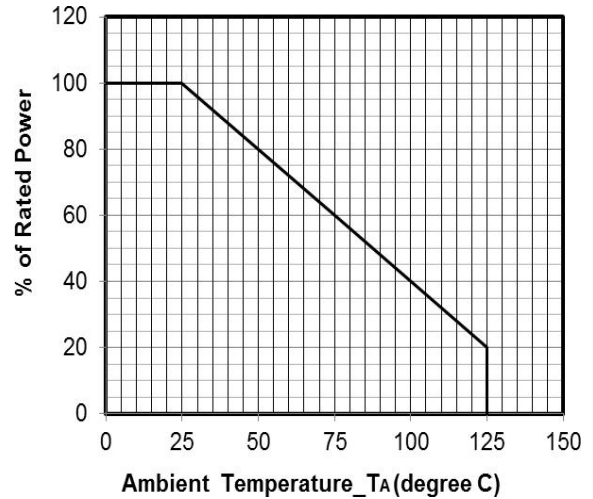
Junction Capacitance vs. Reverse Voltage



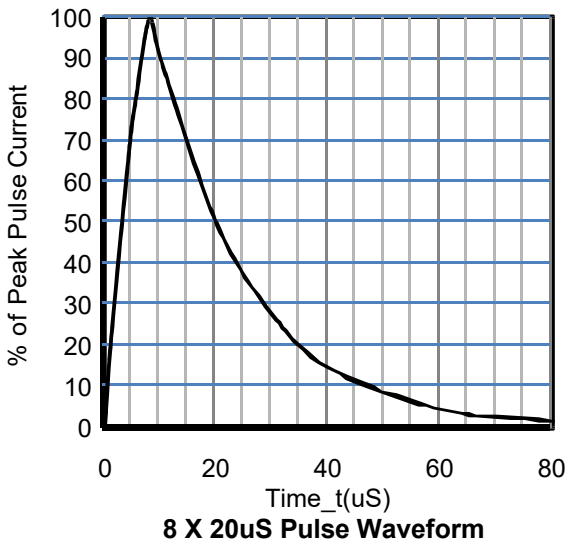
Peak Pulse Power vs. Pulse Time



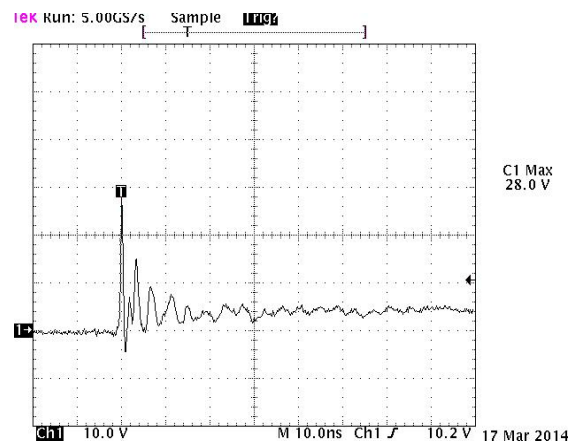
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



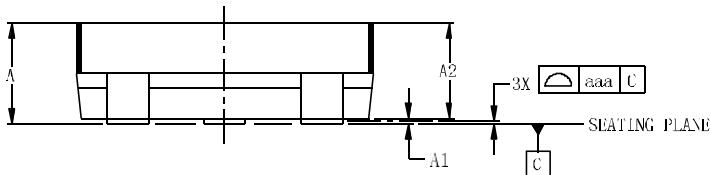
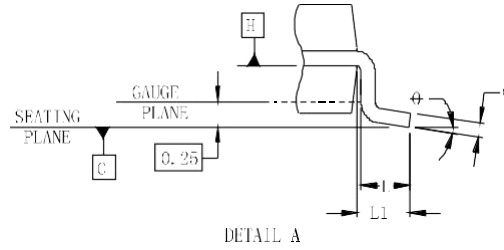
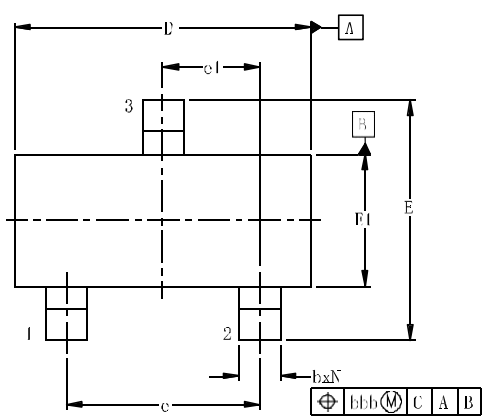
8 X 20uS Pulse Waveform



Note: Data is taken with a 10x attenuator

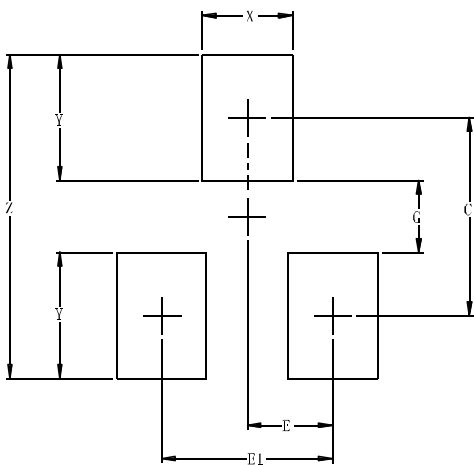
**ESD Clamping Voltage
8 kV Contact per IEC61000-4-2**

SOT-23 Package Outline Drawing



| SYM | INCHES | | | MILLIMETERS | | |
|-----|--------|-------|-------|-------------|------|------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.035 | - | 0.044 | 0.89 | - | 1.12 |
| A1 | 0.000 | - | 0.004 | 0.01 | - | 0.10 |
| A2 | 0.035 | 0.037 | 0.040 | 0.88 | 0.95 | 1.02 |
| b | 0.012 | - | 0.020 | 0.30 | - | 0.51 |
| c | 0.003 | - | 0.007 | 0.08 | - | 0.18 |
| D | 0.110 | 0.114 | 0.120 | 2.80 | 2.90 | 3.04 |
| E | 0.082 | 0.093 | 0.104 | 2.10 | 2.37 | 2.64 |
| E1 | 0.047 | 0.051 | 0.055 | 1.20 | 1.30 | 1.40 |
| e | 0.075 | | | 1.90BSC | | |
| e1 | 0.037 | | | 0.95BSC | | |
| L | 0.015 | 0.020 | 0.024 | 0.40 | 0.50 | 0.60 |
| L1 | 0.022 | | | 0.55 | | |
| N | 3 | | | 3 | | |
| e | 0° | - | 8° | 0° | - | 8° |
| aaa | 0.004 | | | 0.10 | | |
| bbb | 0.008 | | | 0.20 | | |

Suggested Land Pattern



| DIMENSIONS | | |
|------------|--------|-------------|
| SYM | INCHES | MILLIMETERS |
| C | 0.087 | 2.20 |
| E | 0.037 | 0.95 |
| E1 | 0.075 | 1.90 |
| G | 0.031 | 0.80 |
| X | 0.039 | 1.00 |
| Y | 0.055 | 1.40 |
| Z | 0.141 | 3.60 |