

Product Summary

| V _B R MIN | I _{PP} MAX | C _{IN} TYP |
|----------------------|---------------------|---------------------|
| 6.2V | 6.0A | 0.65pF |

Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of small size and high ESD surge capability makes it ideal for use in portable applications, such as cellular phones, digital cameras, and MP3 players.

Applications

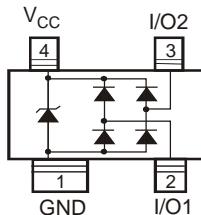
- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

Features

- Provides ESD Protection per IEC 61000-4-2 Standard:
Air: +18kV, Contact: ±16kV
- IEC 61000-4-5 (Lightning): ±6A
- TLP Dynamic Resistance: 0.25Ω
- Two Channels of ESD Protection
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SOT143
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe
(Lead-free Plating). Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.009 grams (Approximate)



Device Schematic

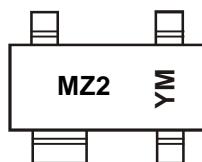
Ordering Information (Note 4)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---------------|------------|---------|--------------------|-----------------|-------------------|
| DT1042-02SR-7 | Standard | MZ2 | 7 | 8 | 3000/Tape & Reel |

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, see <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



MZ2 = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: F = 2018)

M = Month (ex: 9 = September)

Date Code Key

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | | | | | | |
|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|
| Code | D | E | F | G | H | I | | | | | | |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | Conditions |
|--|----------------|-------------|------|--------------------------|
| Peak Pulse Current, Per IEC61000-4-5 | $I_{PP_I/O}$ | ± 6.0 | A | I/O to V_{SS} , 8/20μs |
| Peak Pulse Power, Per IEC61000-4-5 | $P_{PP_I/O}$ | 55 | W | I/O to V_{SS} , 8/20μs |
| Operating Voltage (DC) | V_{DC} | 5.5 | V | I/O to V_{SS} |
| ESD Protection—Contact Discharge, Per IEC61000-4-2 | $V_{ESD_I/O}$ | ± 16 | kV | I/O to V_{SS} |
| ESD Protection—Air Discharge, Per IEC61000-4-2 | $V_{ESD_I/O}$ | ± 18 | kV | I/O to V_{SS} |
| Operating Temperature | T_{OP} | -55 to +85 | °C | — |
| Storage Temperature | T_{STG} | -55 to +150 | °C | — |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------|-------|------|
| Power Dissipation Typical (Note 5) | P_D | 350 | mW |
| Thermal Resistance, Junction to Ambient Typical (Note 5) | R_{eJA} | 360 | °C/W |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|-----------------------------------|----------------------------------|------|------|-----|------|---|
| Reverse Working Voltage | V_{RWM} | — | — | 5.0 | V | V_{CC} to V_{SS} |
| Reverse Current (Note 6) | $I_R(V_{CC} \text{ to } V_{SS})$ | — | — | 1.0 | μA | $V_R = V_{RWM} = 5V$, V_{CC} to V_{SS} |
| Reverse Current (Note 6) | $I_R(I/O \text{ to } V_{SS})$ | — | — | 0.5 | μA | $V_R = V_{RWM} = 5V$, Any I/O to V_{SS} |
| Reverse Breakdown Voltage | V_{BR} | 6.2 | — | — | V | $I_R = 1mA$, V_{CC} to V_{SS} |
| Forward Clamping Voltage | V_F | -1.0 | -0.8 | — | V | $I_F = -15mA$, V_{CC} to V_{SS} |
| Reverse Clamping Voltage (Note 7) | $V_{C_V_{CC}}$ | — | 6.3 | — | V | $I_{PP} = 9A$, V_{CC} to V_{SS} , 8/20μs |
| | $V_{C_I/O}$ | — | 7.7 | 9 | V | $I_{PP} = 6A$, I/O to V_{SS} , 8/20μs |
| ESD Clamping Voltage | $V_{ESD_V_{CC}}$ | — | 6.8 | — | V | TLP, 10A, $t_p = 100ns$, V_{CC} to V_{SS} , Per Figure 2 |
| | $V_{ESD_I/O}$ | — | 9 | — | V | TLP, 10A, $t_p = 100ns$, I/O to V_{SS} , Per Figure 2 |
| ESD Clamping Voltage | $V_{ESD_V_{CC}}$ | — | 7.2 | — | V | TLP, 16A, $t_p = 100ns$, V_{CC} to V_{SS} , Per Figure 2 |
| | $V_{ESD_I/O}$ | — | 10.5 | — | V | TLP, 16A, $t_p = 100ns$, I/O to V_{SS} , Per Figure 2 |
| Dynamic Resistance | $R_{DIF_V_{CC}}$ | — | 0.1 | — | Ω | TLP, 10A, $t_p = 100ns$, V_{CC} to V_{SS} |
| | $R_{DIF_I/O}$ | — | 0.25 | — | Ω | TLP, 10A, $t_p = 100ns$, I/O to V_{SS} |
| Channel Input Capacitance | $C_{I/O \text{ to } V_{SS}}$ | — | 0.65 | 0.8 | pF | $V_R = 2.5V$, $V_{CC} = 5V$, $f = 1MHz$ |

Notes:

- 5. Device mounted on Polymide PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
- 6. Short duration pulse test used to minimize self-heating effect.
- 7. Clamping voltage value is based on an 8 × 20μs peak pulse current (I_{PP}) waveform.

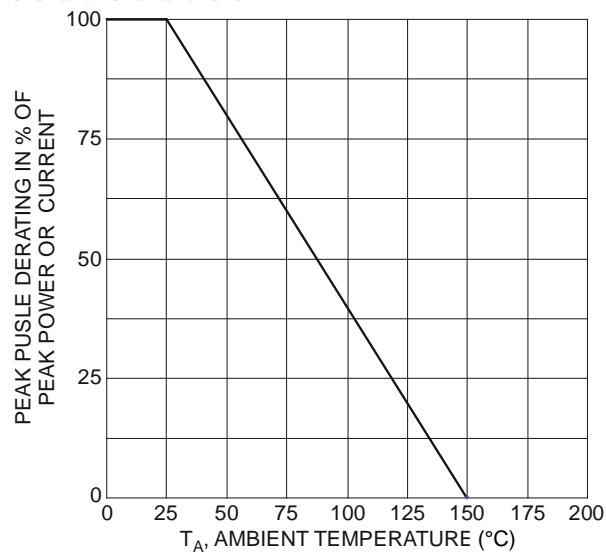


Figure 1 Pulse Derating Curve

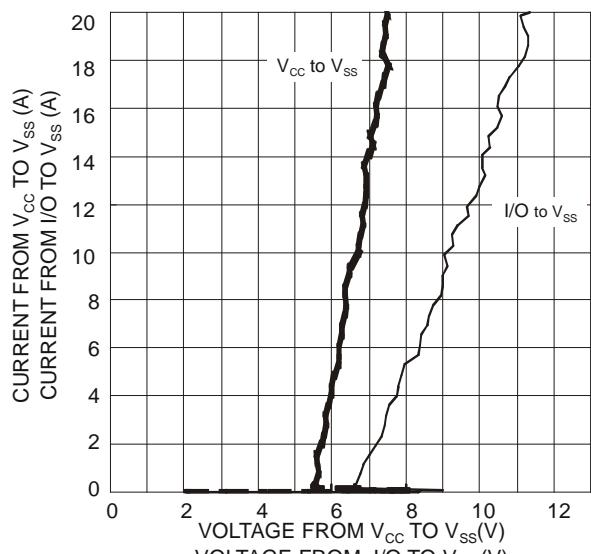


Figure 2 Current vs. Voltage

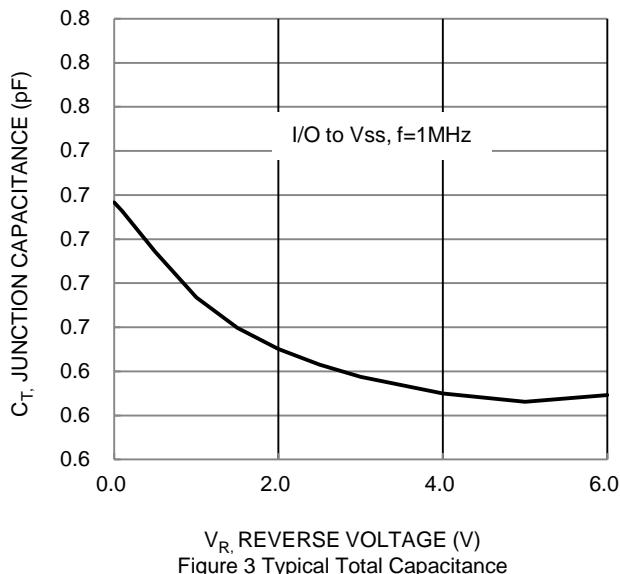


Figure 3 Typical Total Capacitance

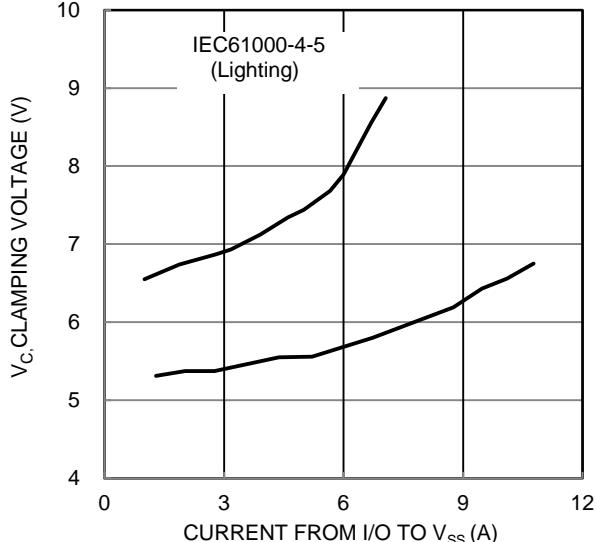
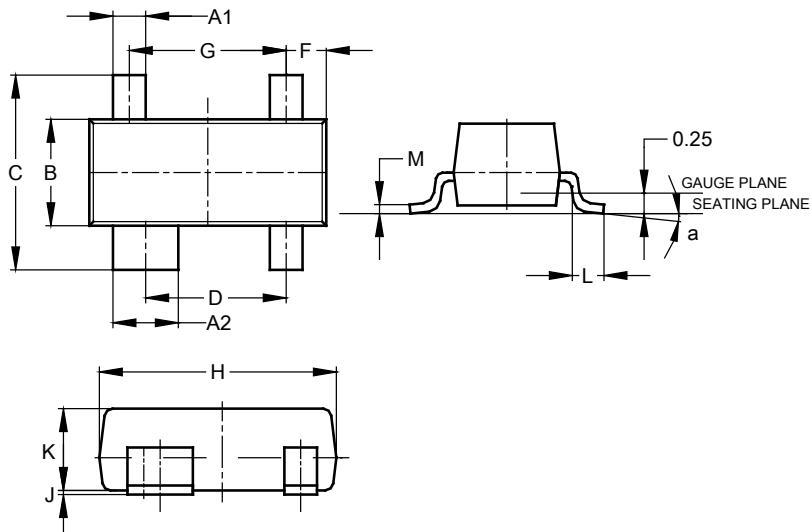


Figure 4 Clamping Voltage Characteristic

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT143



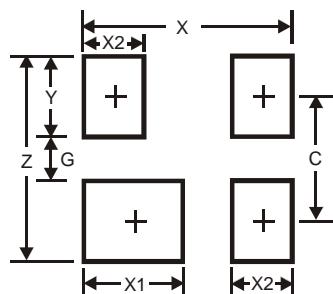
| SOT143 | | | |
|--------|-------|------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.37 | 0.51 | 0.400 |
| A2 | 0.77 | 0.93 | 0.800 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.28 | 2.48 | 2.38 |
| D | 1.58 | 1.83 | 1.72 |
| F | 0.45 | 0.60 | 0.49 |
| G | 1.78 | 2.03 | 1.92 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.89 | 1.00 | - |
| L | 0.46 | 0.60 | 0.50 |
| M | 0.085 | 0.18 | 0.11 |
| a | 0° | 8° | - |

All Dimensions in mm

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT143



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.70 |
| G | 1.30 |
| X | 2.50 |
| X1 | 1.00 |
| X2 | 0.60 |
| Y | 0.70 |
| C | 2.00 |

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