

## Product Summary

V <sub>BR</sub> MIN	I <sub>PP</sub> MAX	C <sub>IN</sub> 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 LVDS, USB2.0, Ethernet 100M/1G BASE-T Protection on automotive market.

## Applications

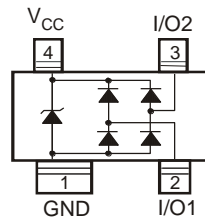
- USB2.0
- LVDS
- 100M/1000M BASE-T

## 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)**
- **The DT1042-02SRQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Package: SOT143
- Package 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)



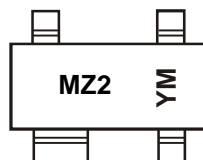
Device Schematic

## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DT1042-02SRQ-7	SOT143	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, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



MZ2 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: L = 2024)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	L	M	N	P	R	S	T	U	V	W	X	Y

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, Per IEC61000-4-5	I <sub>PP_I/O</sub>	±6.0	A	I/O to V <sub>SS</sub> , 8/20μs
Peak Pulse Power, Per IEC61000-4-5	P <sub>PP_I/O</sub>	55	W	I/O to V <sub>SS</sub> , 8/20μs
Operating Voltage (DC)	V <sub>DC</sub>	5.5	V	I/O to V <sub>SS</sub>
ESD Protection—Contact Discharge, Per IEC61000-4-2	V <sub>ESD_I/O</sub>	±16	kV	I/O to V <sub>SS</sub>
ESD Protection—Air Discharge, Per IEC61000-4-2	V <sub>ESD_I/O</sub>	±18	kV	I/O to V <sub>SS</sub>
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C	—

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	350	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R <sub>θJA</sub>	360	°C/W

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V <sub>RWM</sub>	—	—	5.0	V	V <sub>CC</sub> to V <sub>SS</sub>
Reverse Current (Note 6)	I <sub>R</sub> (V <sub>CC</sub> to V <sub>SS</sub> )	—	—	1.0	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5V, V <sub>CC</sub> to V <sub>SS</sub>
Reverse Current (Note 6)	I <sub>R</sub> (I/O to V <sub>SS</sub> )	—	—	0.5	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5V, Any I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	6.2	—	—	V	I <sub>R</sub> = 1mA, V <sub>CC</sub> to V <sub>SS</sub>
Forward Clamping Voltage	V <sub>F</sub>	-1.0	-0.8	—	V	I <sub>F</sub> = -15mA, V <sub>CC</sub> to V <sub>SS</sub>
Reverse Clamping Voltage (Note 7)	V <sub>C_VCC</sub>	—	6.3	—	V	I <sub>PP</sub> = 9A, V <sub>CC</sub> to V <sub>SS</sub> , 8/20μs
	V <sub>C_I/O</sub>	—	7.7	9	V	I <sub>PP</sub> = 6A, I/O to V <sub>SS</sub> , 8/20μs
ESD Clamping Voltage	V <sub>ESD_VCC</sub>	—	6.8	—	V	TLP, 10A, t <sub>P</sub> = 100ns, V <sub>CC</sub> to V <sub>SS</sub> , Per Figure 2
	V <sub>ESD_I/O</sub>	—	9	—	V	TLP, 10A, t <sub>P</sub> = 100ns, I/O to V <sub>SS</sub> , Per Figure 2
ESD Clamping Voltage	V <sub>ESD_VCC</sub>	—	7.2	—	V	TLP, 16A, t <sub>P</sub> = 100ns, V <sub>CC</sub> to V <sub>SS</sub> , Per Figure 2
	V <sub>ESD_I/O</sub>	—	10.5	—	V	TLP, 16A, t <sub>P</sub> = 100ns, I/O to V <sub>SS</sub> , Per Figure 2
Dynamic Resistance	R <sub>DIF_VCC</sub>	—	0.1	—	Ω	TLP, 10A, t <sub>P</sub> = 100ns, V <sub>CC</sub> to V <sub>SS</sub>
	R <sub>DIF_I/O</sub>	—	0.25	—	Ω	TLP, 10A, t <sub>P</sub> = 100ns, I/O to V <sub>SS</sub>
Channel Input Capacitance	C <sub>I/O to VSS</sub>	—	0.65	0.8	pF	V <sub>R</sub> = 2.5V, V <sub>CC</sub> = 5V, f = 1MHz

- Notes:
- Device mounted on Polyimide 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>.
  - Short duration pulse test used to minimize self-heating effect.
  - Clamping voltage value is based on an 8 × 20μs peak pulse current (I<sub>PP</sub>) waveform.

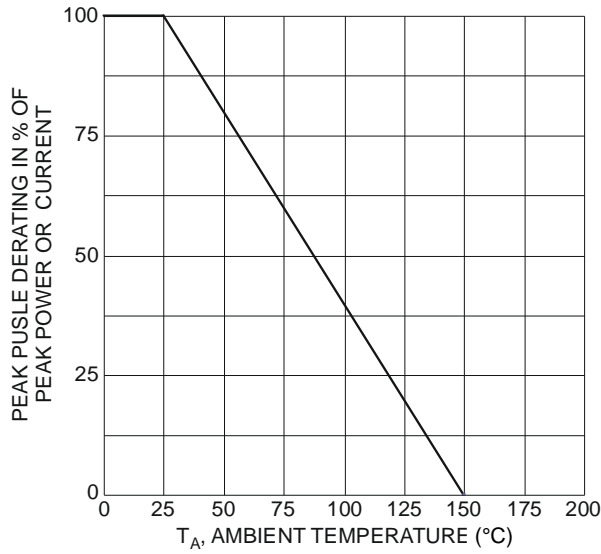


Figure 1 Pulse Derating Curve

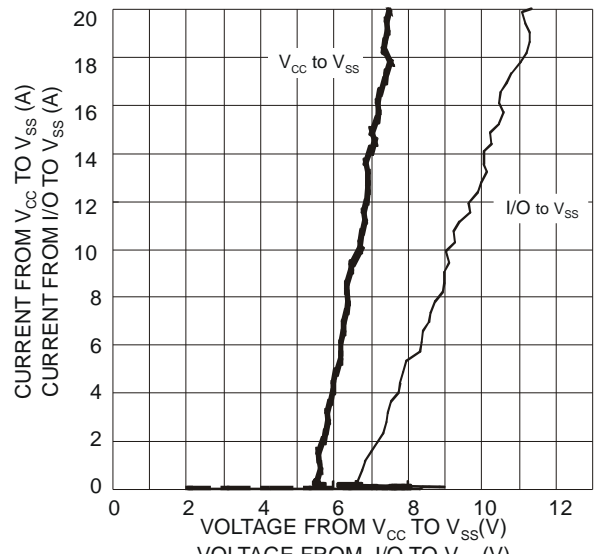


Figure 2 Current vs. Voltage

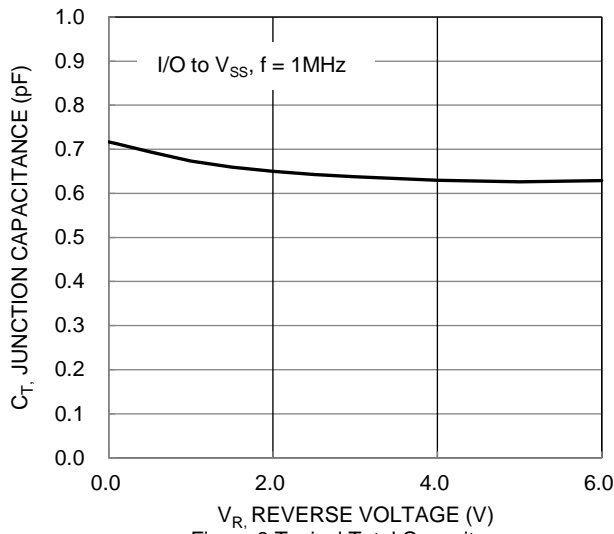


Figure 3 Typical Total Capacitance

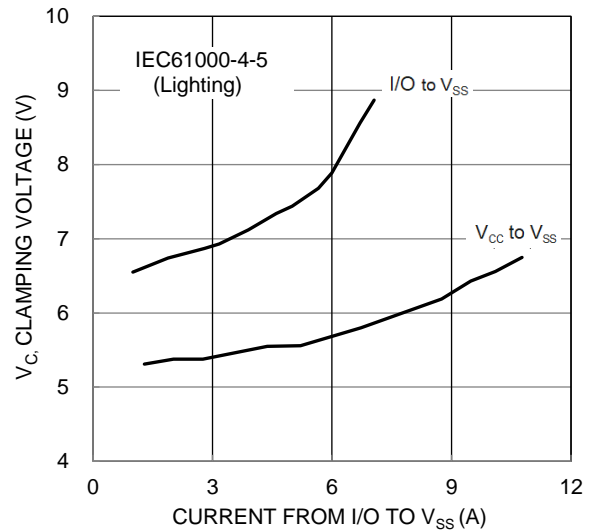
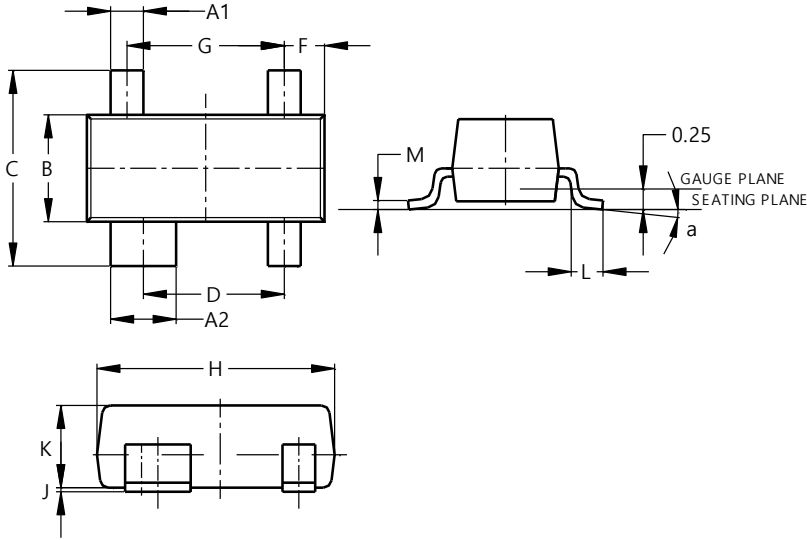


Figure 4 Clamping Voltage Characteristic

## Package Outline Dimensions

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

SOT143

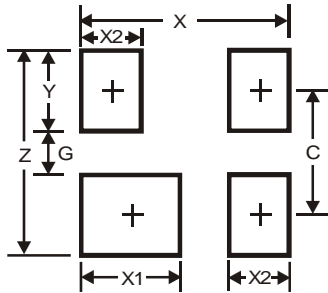


SOT143			
Dim	Min	Max	Typ
A1	0.37	0.51	0.400
A2	0.77	0.93	0.800
B	1.20	1.40	1.30
C	2.28	2.48	2.38
D	1.58	1.83	1.72
F	0.45	0.60	0.49
G	1.78	2.03	1.92
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.89	1.00	-
L	0.46	0.60	0.50
M	0.085	0.18	0.11
a	0°	8°	-
All Dimensions in mm			

## 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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