Product Summary

$V_{BR\ Min}$	$I_{PP\ Max}$	$C_{IN\ Typ}$
13V	4A	20pF

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.

Applications

- Cellular handsets
- Portable electronics
- Computers and peripherals
- Automotive

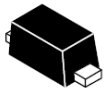
Features

- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- 1 Channel 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 D12V0M1U2S9Q 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: SOD923
- 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: 0.001 grams (Approximate)

SOD923 (0.3mm Lead Width)



Top View



Device Schematic

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
D12V0M1U2S9Q-7	SOD923 (0.3mm Lead Width)	TM	7	8	10,000	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



TM = Product Type Marking Code
Line Denotes Pin 1 or Cathode Side

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	P_{PP}	100	W	8/20µs, Figure 3
Peak Pulse Current	I_{PP}	4	A	8/20µs, Figure 3
ESD Protection – Contact Discharge	$V_{ESD_Contact}$	±30	kV	IEC 61000-4-2 Standard
ESD Protection – Air Discharge	V_{ESD_Air}	±30	kV	IEC 61000-4-2 Standard
ESD Protection – 1000 Contact Discharges (Open Alliance Spec)	VESD_CONTACT1k	±25	kV	IEC 61000-4-2 Standard
ESD Protection – Contact Discharge (ISO Spec)	VESD_CONTACT2	±30	kV	ISO 10605, 150pF, 330Ohm
ESD Protection – Air Discharge (ISO Spec)	VESD_AIR2	±30	kV	ISO 10605, 150pF, 330Ohm
ESD Protection – Contact Discharge (ISO Spec)	VESD_CONTACT3	±30	kV	ISO 10605, 330pF, 330Ohm
ESD Protection – Air Discharge (ISO Spec)	VESD_AIR3	±30	kV	ISO 10605, 330pF, 330Ohm

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_D	250	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	V_{RWM}	—	—	12	V	—
Channel Leakage Current (Note 6)	I_{RM}	—	1	100	nA	V_{RWM} = 12V
Clamping Voltage, IEC 61000-4-5	V_{CL}	—	—	20	V	I_{PP} = 1A, tp = 8/20µs
		—	—	25		I_{PP} = 4A, tp = 8/20µs
Breakdown Voltage	V_{BR}	13	—	—	V	I_R = 1mA
Channel Input Capacitance	C_{IN}	—	20	26	pF	V_R = 0, f = 1MHz

Notes: 5. Device mounted on FR-4 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.

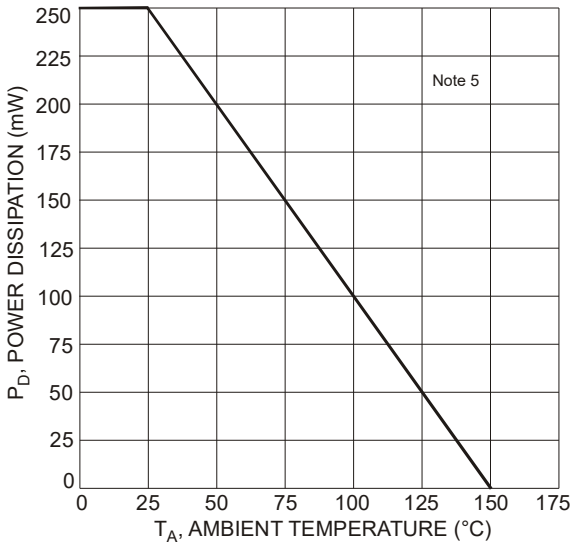


Figure 1 Power Derating Curve

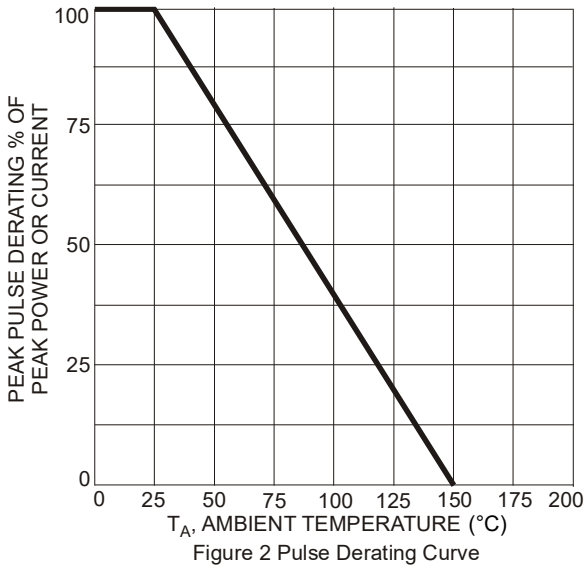


Figure 2 Pulse Derating Curve

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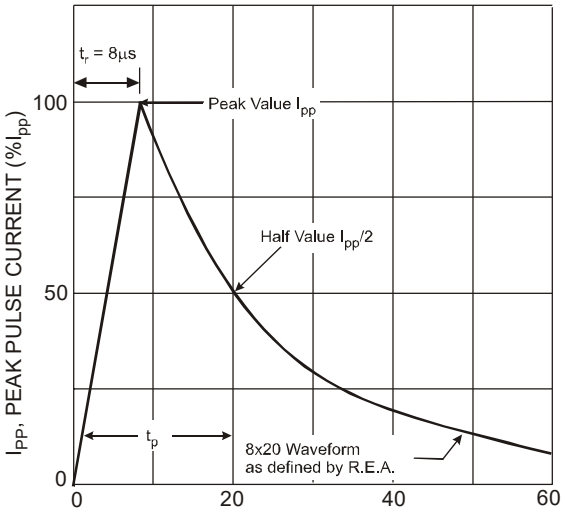


Figure 3 Pulse Waveform

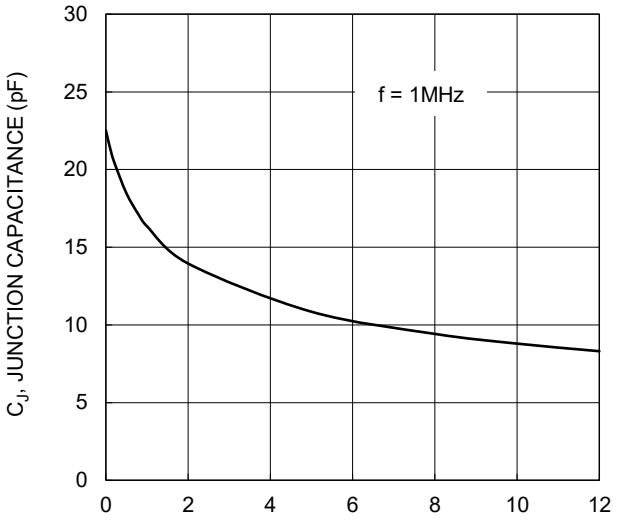


Figure 4 Typical Junction Capacitance

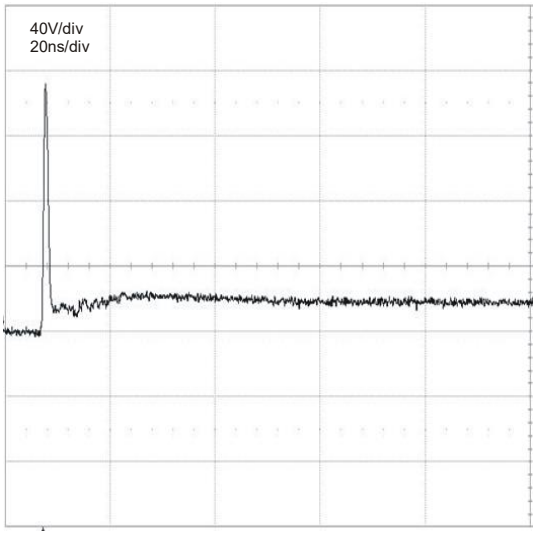


Figure 5 ESD Response to IEC 61000-4-2
(+8kV Contact Discharge)

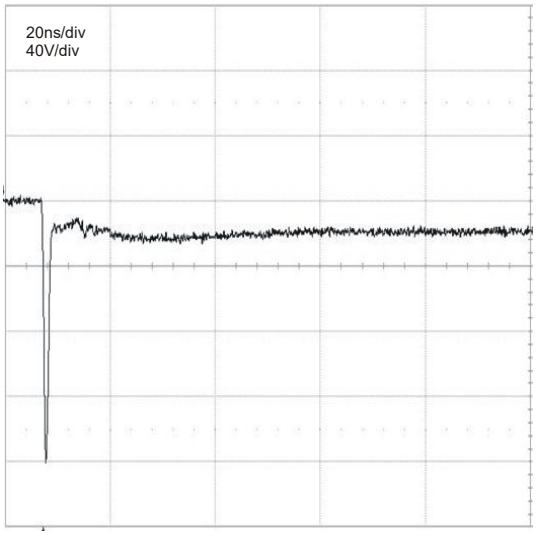


Figure 6 ESD Response to IEC 61000-4-2
(-8kV Contact Discharge)

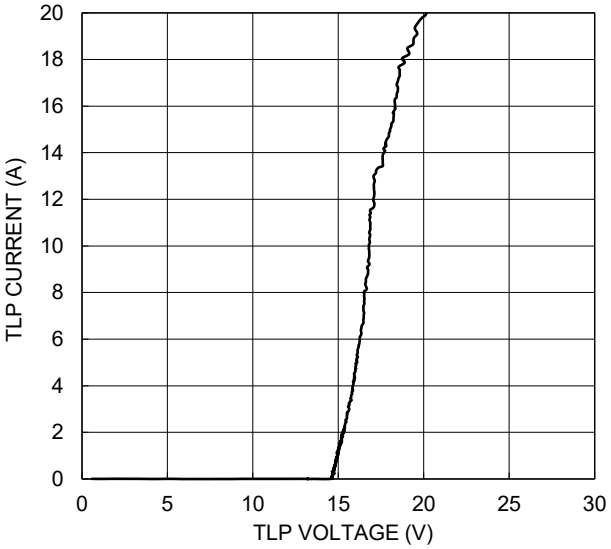


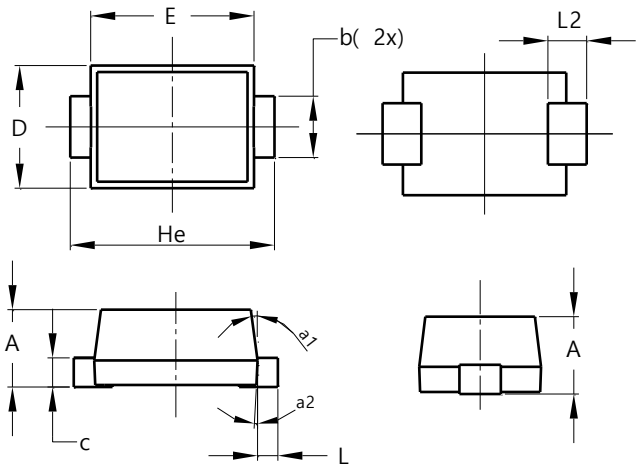
Figure 7 TLP Current vs. Voltage (t_P = 100ns)

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Package Outline Dimensions

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

SOD923 (0.3mm Lead Width)

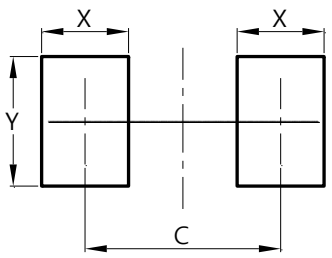


SOD923 (0.3mm Lead Width)			
Dim	**Min**	**Max**	**Typ**
A	0.34	0.40	0.37
b	0.25	0.35	0.30
c	0.05	0.15	0.10
D	0.55	0.65	0.60
E	0.75	0.85	0.80
He	0.95	1.05	1.00
L	0.05	0.15	0.10
L2	0.190 REF		
a1	0°	8°	7°
a2	2°	4°	3°
All Dimensions in mm			

Suggested Pad Layout

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

SOD923 (0.3mm Lead Width)



Dimensions	Value (in mm)
C	0.900
X	0.400
Y	0.600

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