

Product Summary

V_{BR} (Min)	I_{PP} (Max)	C_T (Typ)
25.5V	2.6A	5.2pF

Description and Applications

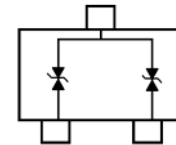
This part is a next generation ESD and surge protection device packaged in a small footprint surface-mount package. It is qualified to AEC-Q101, supported by a PPAP and is designed to protect two data lines of the controller area network (CAN) in an automotive.

- CAN / CAN-FD
- Low and high-speed CAN
- Flex rays

SOT323



Top View



Device Schematic

Features

- 110W Peak Power Dissipation per Line (8/20μs Waveform)
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±23kV, Contact ±23kV
- 2 Channels of ESD Protection
- Low Channel Input Capacitance 5.2pF for High Signal Integrity of CANFD Data Raters
- 175°C T_J – Rated for High-Temperature, Mission-Critical Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **The DIODES DESD1CANFD24VWQ 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

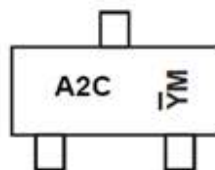
- Package: SOT323
- Package Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.009 grams (Approximate)

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DESD1CANFD24VWQ-7	SOT323	A2C	7	8	3,000	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



A2C = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: K = 2023)
 M = Month (ex: 3 = March)

Date Code Key

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	K	L	M	N	O	P	R	S	T	U	V	W

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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	P _{PP}	110	W	8/20μs, per Figure 1
Peak Pulse Current	I _{PP}	2.6	A	8/20μs, per Figure 1
ESD Protection – Contact Discharge	V _{ESD_Contact}	±23	kV	IEC 61000-4-2 Standard
ESD Protection – Air Discharge	V _{ESD_Air}	±23	kV	IEC 61000-4-2 Standard

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	417	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	V _{RWM}	—	—	24	V	—
Channel Leakage Current (Note 6)	I _{RM}	—	1	50	nA	V _{RWM} = 24V
Clamping Voltage, Positive Transients	V _{CL}	—	33	42	V	I _{PP} = 1A, t _p = 8/20μs, Figure 1
Breakdown Voltage	V _{BR}	25.5	30	35.5	V	I _R = 10mA
Diode Capacitance Matching	Δ C _T / C _T	—	0.5	—	%	V _R = ±2.5V, f = 1MHz
Channel Input Capacitance	C _T	—	5.2	6	pF	V _R = ±2.5V, f = 1MHz
		—	—	6		
ABS Parasitic Capacitance Matching (Channel 1 – Channel 2)	Δ ((C _T _Ch1-C _T _Ch2) / C _T Max)	—	—	2	%	V _R = 5V, f = 1MHz
	Δ (C _T _Ch1-C _T _Ch2)	—	—	0.12	pF	

- Notes:
- 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
 - Short duration pulse test used to minimize self-heating effect.

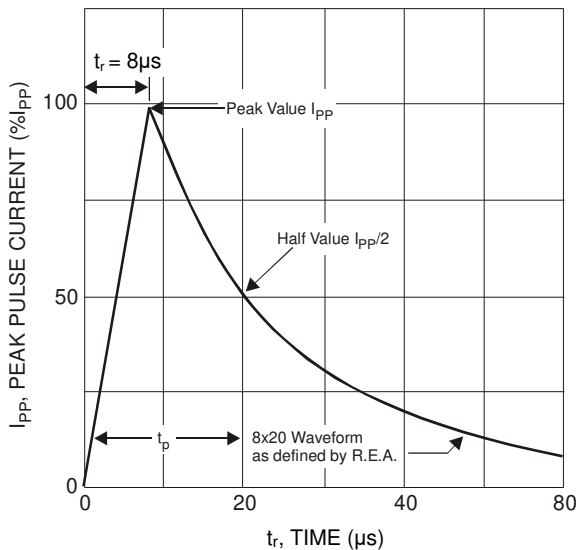


Figure 1. Pulse Waveform

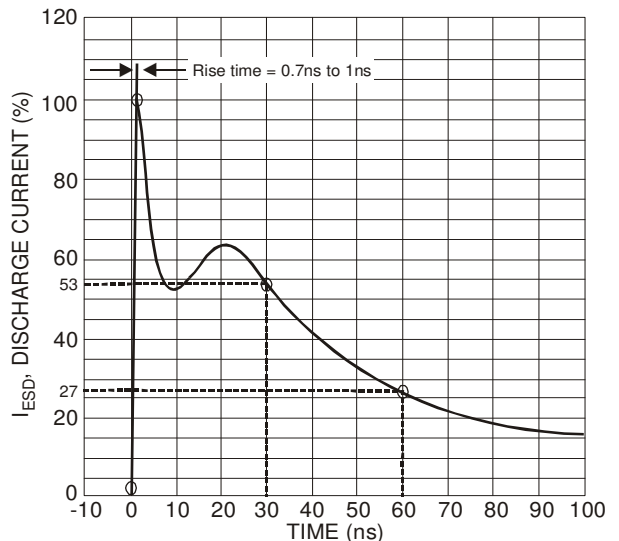


Figure 2. ESD Discharge Current Waveform IEC 61000-4-2 (330Ω/150pF)

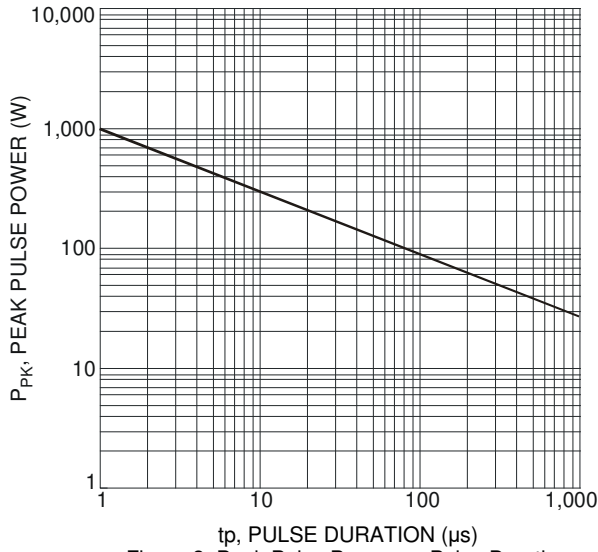


Figure 3. Peak Pulse Power vs. Pulse Duration

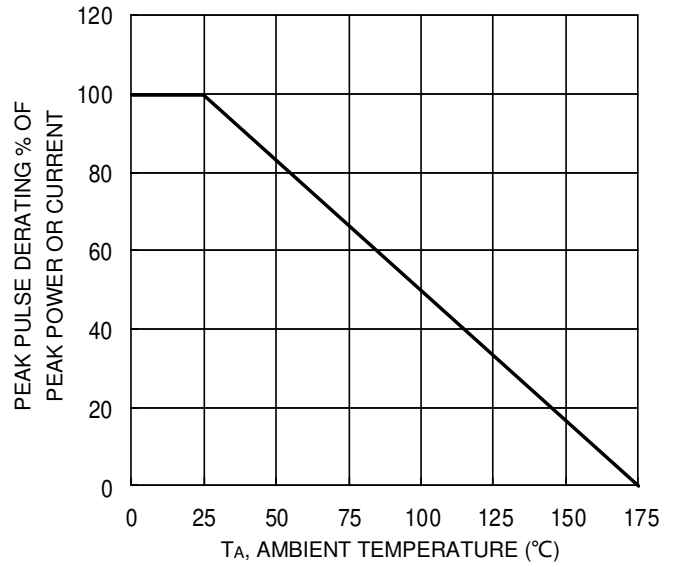


Figure 4. Pulse Derating Curve

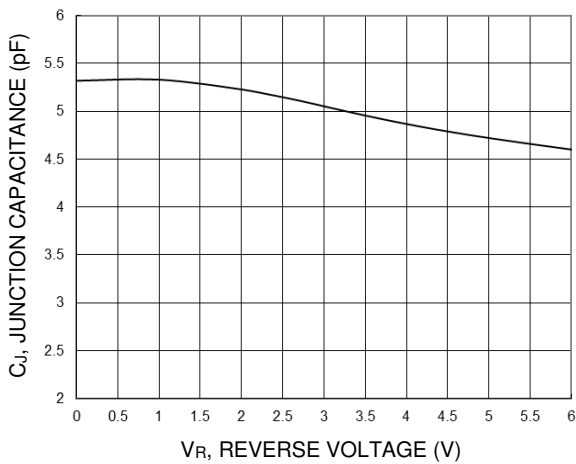


Figure 5. Typical Junction Capacitance

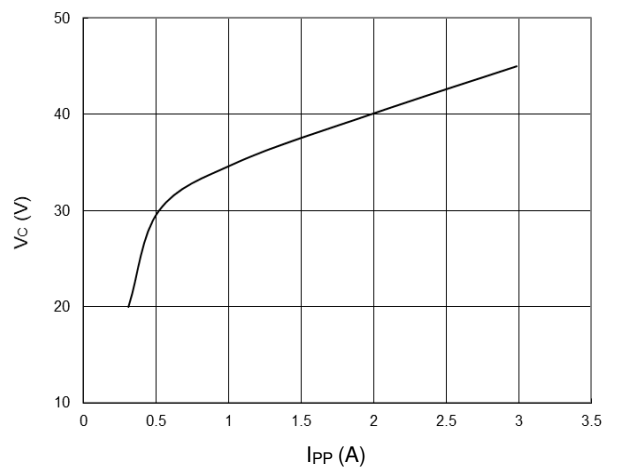


Figure 6. Typical Peak Clamping Voltage Vc vs. Peak Pulse Current IPP

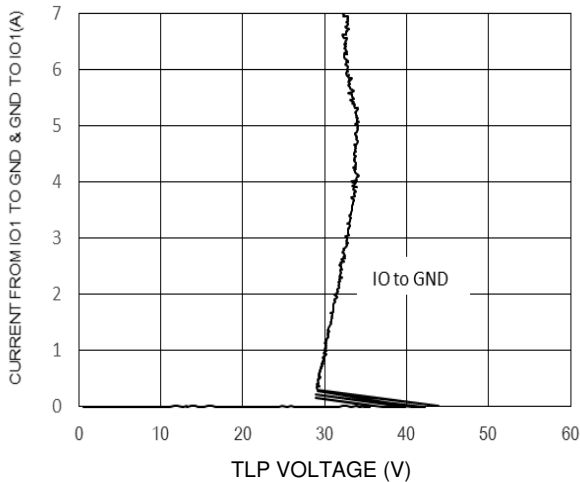
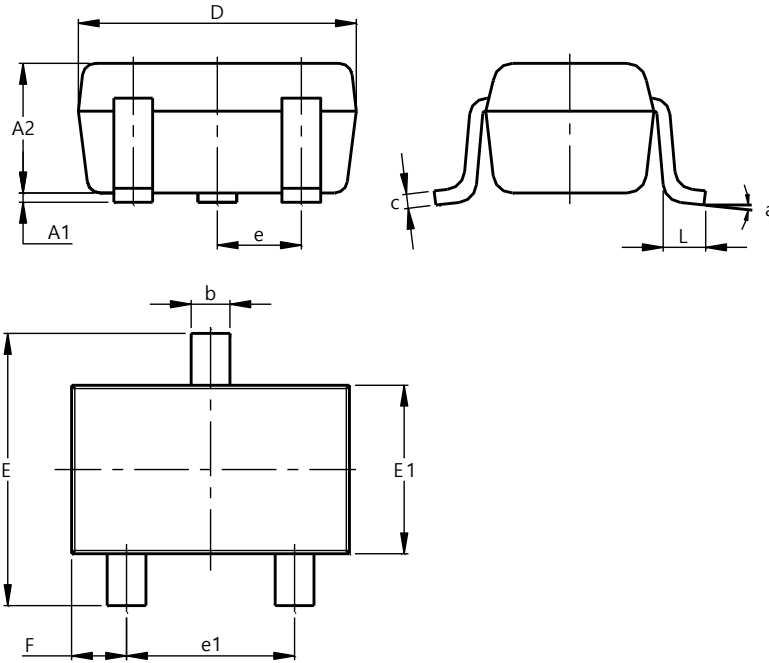


Figure 7. TLP Curve (tp = 100ns)

Package Outline Dimensions

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

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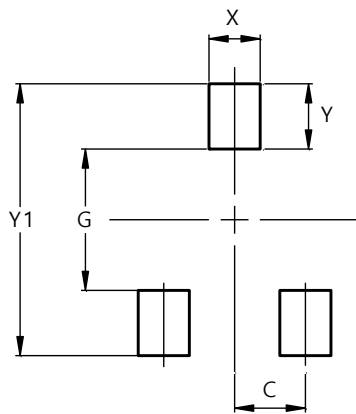


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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