2-CHANNEL BI-DIRECTIONAL ESD PROTECTION FOR ETHERNET INTERFACES

Product Summary

V_{RWM} Max	V_{hold} Min	I_R Max
24V	28V	100nA

Features and Benefits

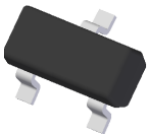
- Provides ESD Protection per IEC 61000-4-2 Standard:
  Air – ±30kV, Contact – ±30kV
- 200W Peak Power Dissipation
- High Trigger Voltage 100V
- Low Capacitance 2.3pF
- ESD Protection for Two High-Speed Lines
- Fully OPEN Alliance 100BASE-T1 Compliant
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DESD2ETH100SOQ 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/

Description and Applications

This DESD2ETH100SOQ offers Fully OPEN Alliance 100BASE-T1 compliant electrostatic discharge (ESD) and surge protection and is packaged in a small footprint surface-mount package. This device is designed for Ethernet protection for two automotive in-vehicle network bus lines from the damage caused by ESD and other transients.

- OPEN Alliance 100BASE-T1 Ethernet
- Low-voltage differential signal (LVDS) automotives
- Automotive in-vehicle network lines

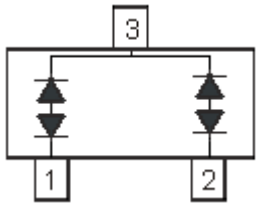
SOT23



Top View

Mechanical Data

- Package: SOT23
- 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)



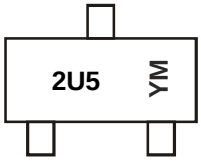
Device Schematic

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DESD2ETH100SOQ-7	SOT23	2U5	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



2U5 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: L = 2024)
M = Month (ex: 8 = August)

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_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current (Note 7)	I_{PP}	3.2	A	8/20µs, Per Figure 3
ESD Protection – Contact Discharge	$V_{ESD\_Contact}$	±30	kV	IEC 61000-4-2; contact discharge
	$V_{ESD\_Contact}$	±30	kV	ISO 10605; contact discharge; C = 150pF; R = 330Ω
	$V_{ESD\_Contact}$	±30	kV	ISO 10605; contact discharge; C = 330pF; R = 330Ω
	$V_{ESD\_Contact}$	±30	kV	1000 contact discharges (IEC 61000-4-2); OPEN Alliance specification
ESD Protection – Air Discharge	V_{ESD_Air}	±30	kV	IEC 61000-4-2; Air discharge

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	410	°C/W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V_{RWM}	—	—	24	V	—
Reverse Leakage Current (Note 6)	I_R	—	—	100	nA	V_{RWM} = 24V
Trigger Voltage (Note 8)	V_{TR}	100	160	—	V	t_R = 10ns; t_P = 100ns
Holding Voltage (Note 8)	V_{hold}	28	—	—	V	t_R = 10ns; t_P = 100ns
Dynamic Resistance (Note 8)	R_{dyn}	—	0.44	—	Ω	I_R = 40A; t_R = 10ns; t_P = 100ns
Channel Input Capacitance	C_T	—	2.3	2.8	pF	V_{IN} = 0V, f = 1MHz
ABS Parasitic Capacitance Matching (Channel 1 – Channel 2)	Δ (C_T_Ch1-C_T _Ch2)	—	0.5	—	%	V_R = 0V, f = 1MHz
	Δ (C_T_Ch1-C_T _Ch2)	—	0.5	—	pF	V_R = 2.5V, f = 1MHz

Notes:
5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown in Diodes Incorporated's package outline PDFs, 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. Measured from pin 1 or pin 2 to pin 3; Non-repetitive current pulse per Figure 3.
8. Non-repetitive current pulse, Transmission Line Pulse (TLP); square pulse.

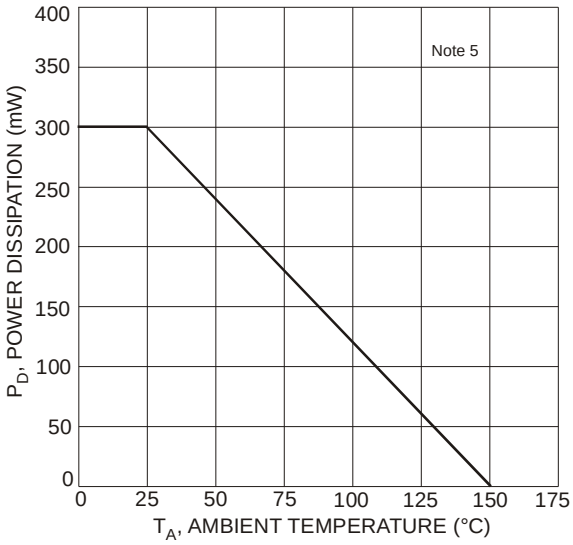


Figure 1 Power Derating Curve

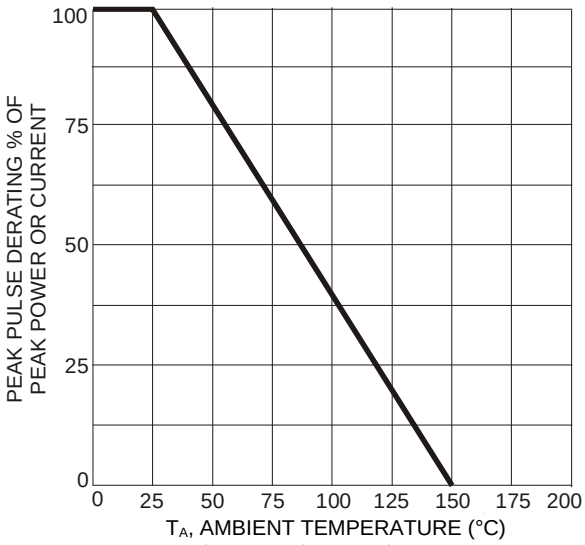


Figure 2 Pulse Derating Curve

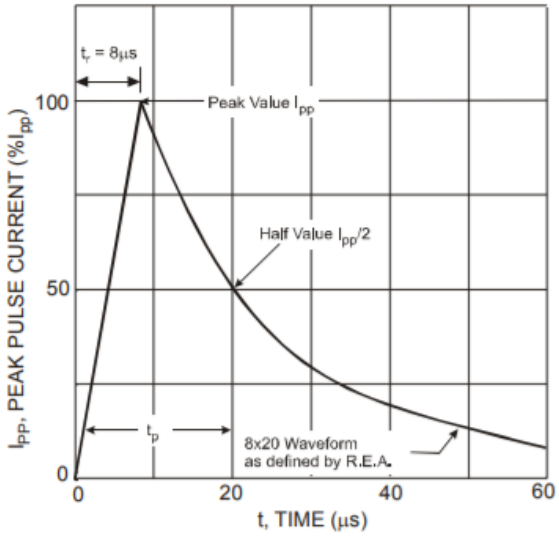


Figure 3 Typical 8 × 20µs Pulse Waveform

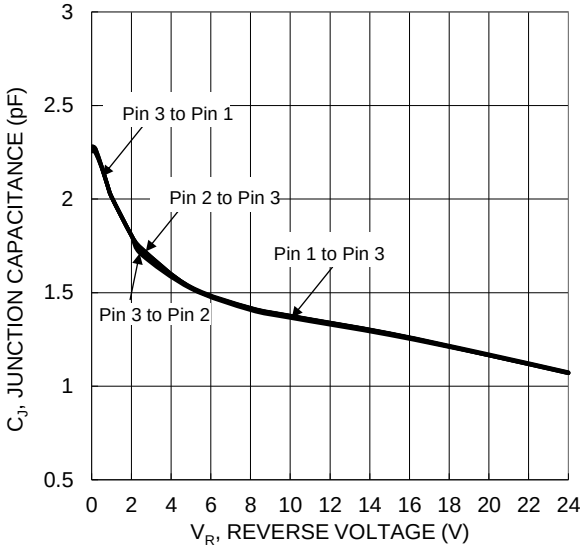


Figure 4 Typical Junction Capacitance

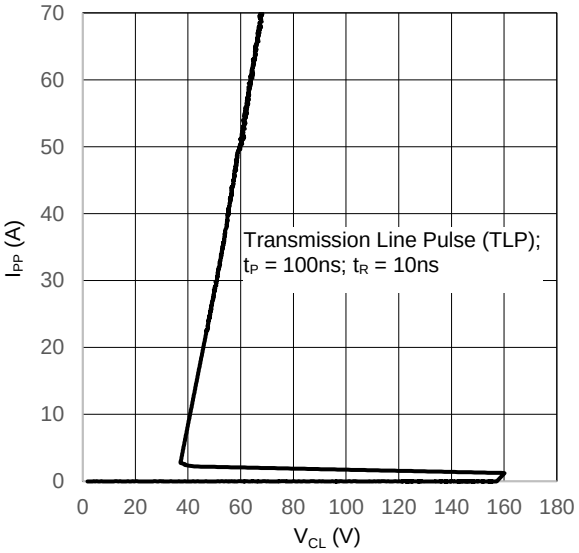


Figure 5 Typical TLP Characteristic with Dynamic Resistance

Package Outline Dimensions

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

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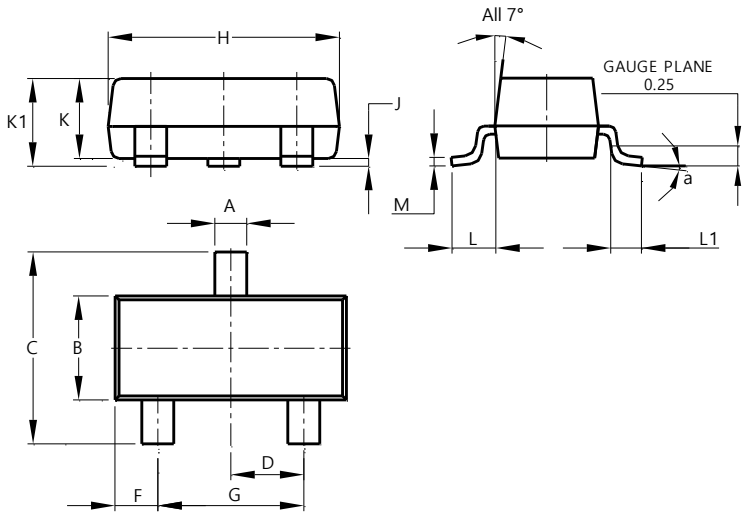

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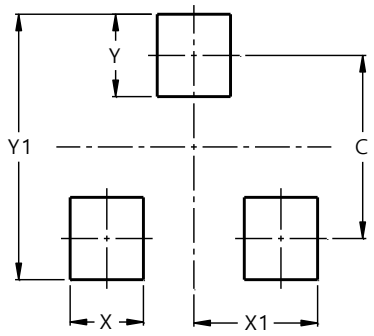
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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