

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
- 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 electrostatic discharge (ESD) protection and surge protection device packaged in a small footprint surface-mount package. The combination of small size and high ESD surge capability makes it ideal for use in automotive applications.

- Low-voltage differential signaling (LVDS) automobiles

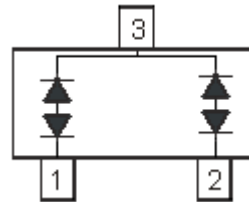
Mechanical Data

- 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)

SOT23



Top View

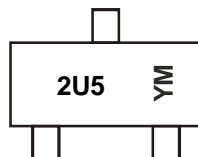


Device Schematic

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DESD2ETH100SOQ-7	SOT23	2U5	7	8	3,000	Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - 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 _{θJA}	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}) / C _{T_Max}	—	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.

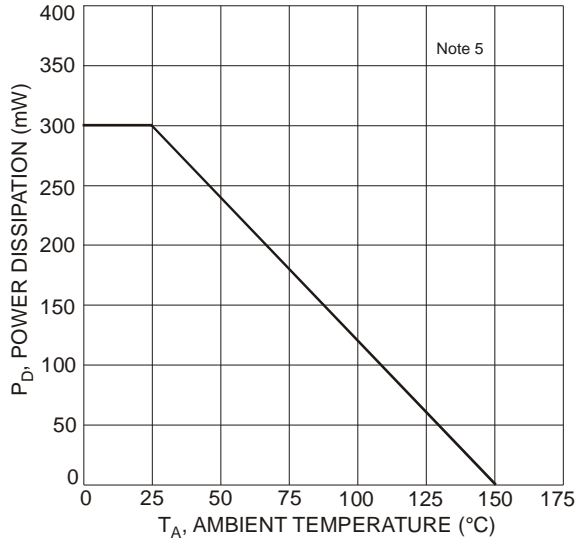


Figure 1 Power Derating Curve

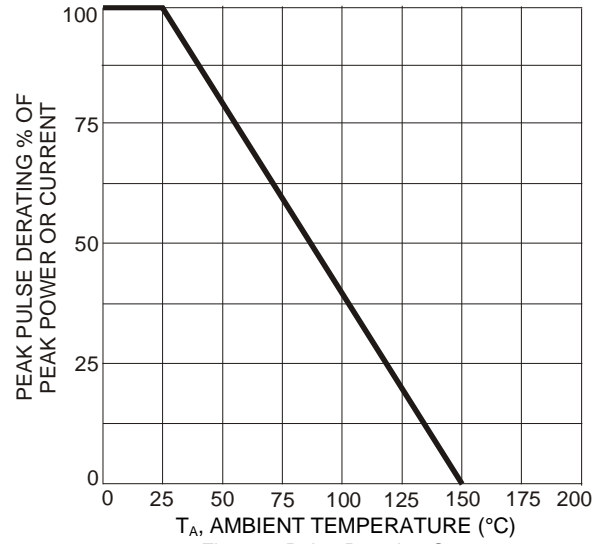


Figure 2 Pulse Derating Curve

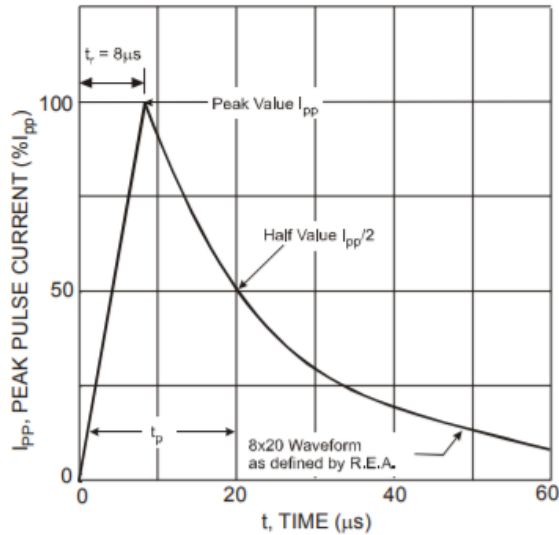


Figure 3 Typical $8 \times 20\mu\text{s}$ Pulse Waveform

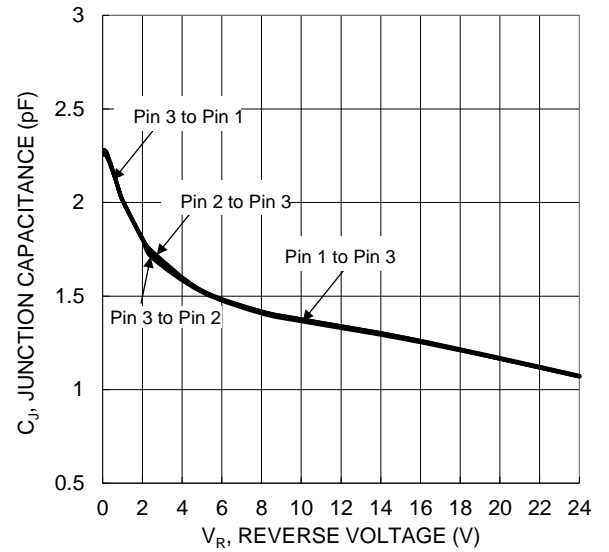


Figure 4 Typical Junction Capacitance

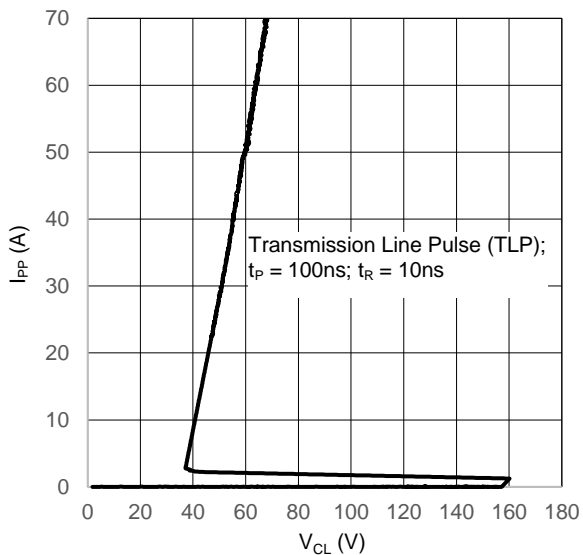
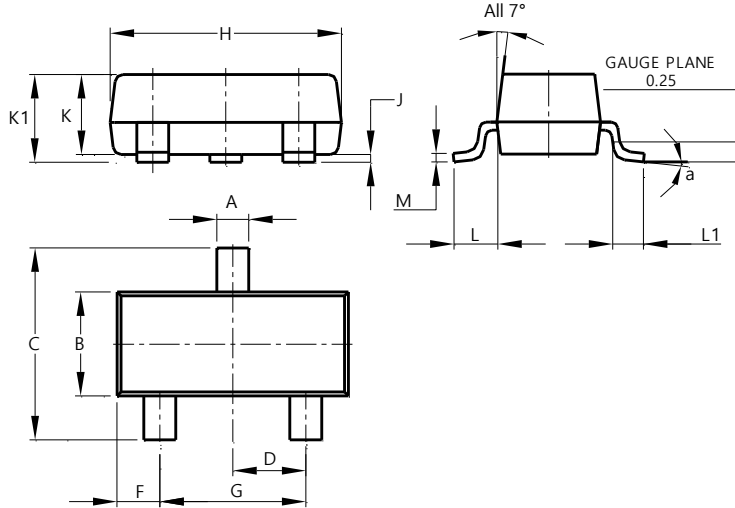


Figure 5 Typical TLP Characteristic with Dynamic Resistance

Package Outline Dimensions

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

SOT23

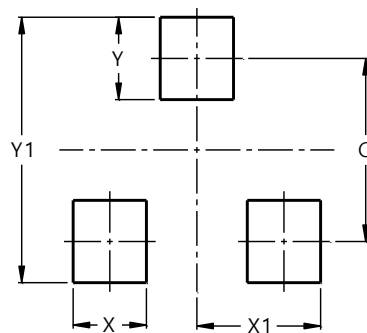


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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