DESD3512SO

CAN BUS ESD PROTECTION DIODE

Product Summary

$V_{BR(MIN)}$	$I_{PP(MAX)}$	$C_{T(TYP)}$
36V & 13.3V	4A & 11A	32pF

Features

- 240W & 330W Peak Power Dissipation per Line (8/20µs Waveform)
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- 2 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)**

Description and Applications

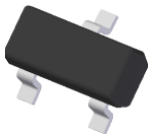
This DESD3512SO is a next generation ESD and surge protection device packaged in a small footprint surface mount package. It is qualified to AEC-Q101, supported by a PPAP and is designed to protect two data lines of the Controller Area Network (CAN) in an automotive.

- CAN Bus Protection
- Industrial Control Network

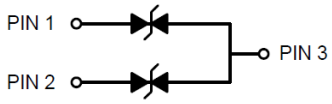
Mechanical Data

- Case: SOT23
- Case 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



Bottom View



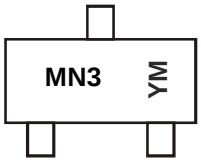
Device Schematic

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DESD3512SO-7	Commercial	MN3	7	8	3,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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 http://www.diodes.com/products/packages.html.

Marking Information



MN3 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020
Code	B	C	D	E	F	G	H

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	Condition
Peak Pulse Power Dissipation	P_{PP}	240 & 330	W	8/20µs, per Figure 3
Peak Pulse Current	I_{PP}	4 & 11	A	8/20µs, per Figure 3
ESD Protection – Contact Discharge	$V_{ESD\_CONTACT}$	±30	kV	IEC61000-4-2 Standard
ESD Protection – Air Discharge	V_{ESD_AIR}	±30	kV	IEC61000-4-2 Standard

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Standoff Voltage, from Pin 1 or Pin 2 to Pin 3	V_{RWM1}	-	-	35	V	-
Reverse Standoff Voltage, from Pin 3 to Pin 1 or Pin 2	V_{RWM2}	-	-	12	V	-
Channel Leakage Current, from Pin 1 or Pin 2 to Pin 3 (Note 6)	I_{RM1}	-	-	500	nA	V_{RWM} = 35V
Channel Leakage Current, from Pin 3 to Pin 1 or Pin 2 (Note 6)	I_{RM2}	-	-	500	nA	V_{RWM} = 12V
Breakdown Voltage, from Pin 1 or Pin 2 to Pin 3	V_{BR1}	36	-	-	V	I_R = 1mA
Breakdown Voltage, from Pin 3 to Pin 1 or Pin 2	V_{BR2}	13.3	-	-	V	I_R = 1mA
Clamping Voltage, from Pin 1 or Pin 2 to Pin 3	V_{CL1}	-	-	53	V	I_{PP} = 1A, t_P = 8/20µS
		-	-	60	V	I_{PP} = 4A, t_P = 8/20µS
Clamping Voltage, from Pin 3 to Pin 1 or Pin 2	V_{CL2}	-	-	20	V	I_{PP} = 1A, t_P = 8/20µS
		-	-	30	V	I_{PP} = 11A, t_P = 8/20µS
Channel Input Capacitance	C_T	-	32	-	pF	V_R = 0V, f = 1MHz

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated 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.

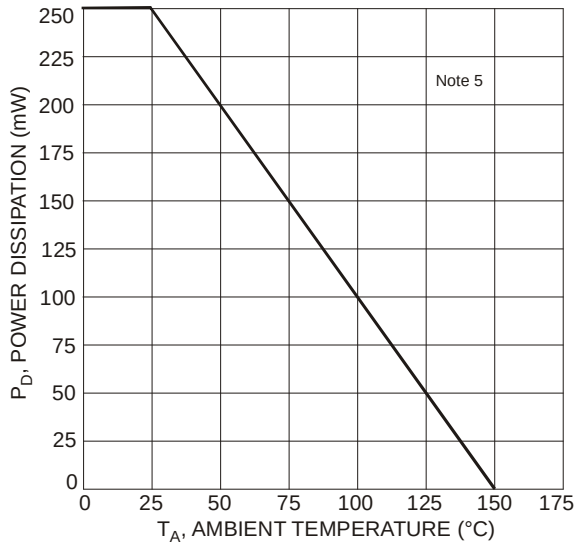


Figure 1 Power Derating Curve

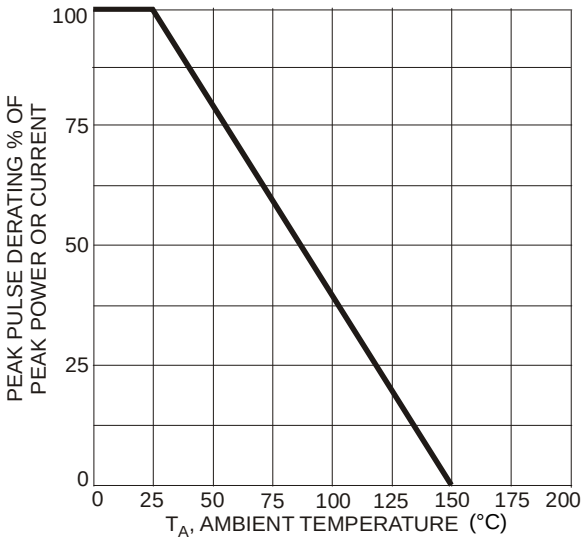


Figure 2 Pulse Derating Curve

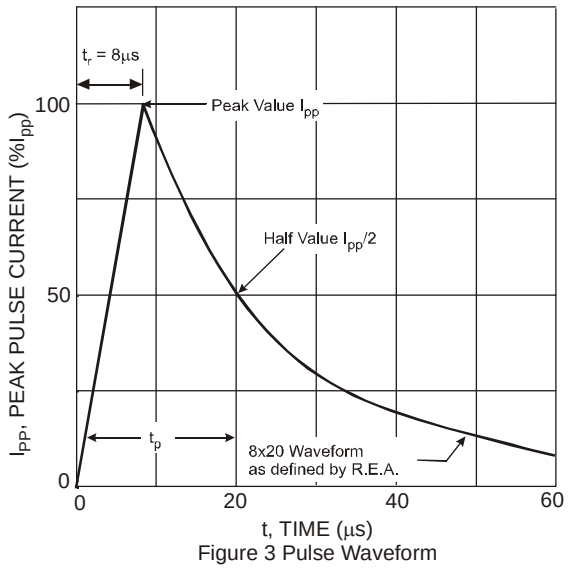


Figure 3 Pulse Waveform

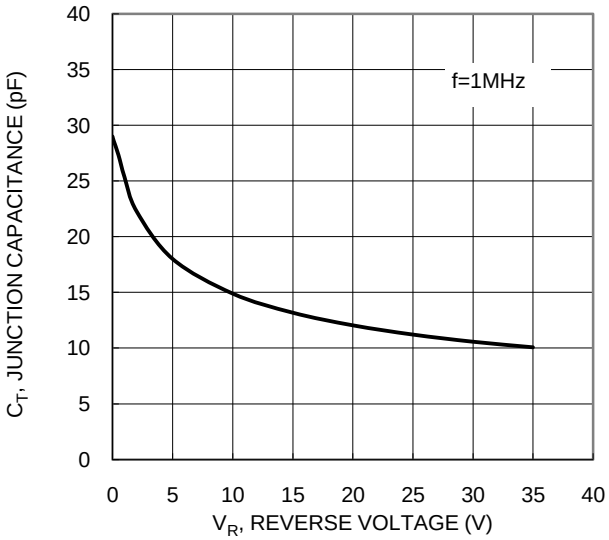


Figure 4: Typical Junction Capacitance

Package Outline Dimensions

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

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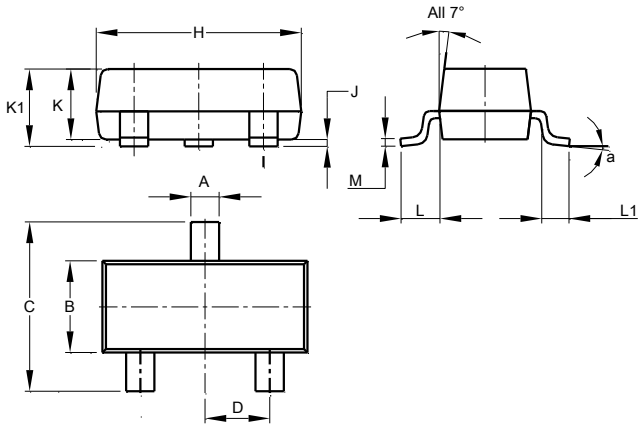

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Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085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

Suggested Pad Layout

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

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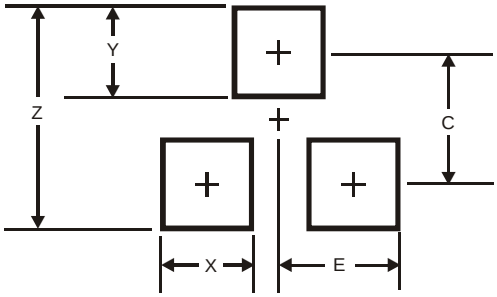

Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35