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[Diodes Incorporated](#)
[SM12-7](#)

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SM12

DUAL COMMON ANODE TVS DIODE

Features

- 300 Watts Peak Pulse Power ($t_p = 8 \times 20 \mu\text{s}$)
- IEC 61000-4-2 (ESD): Air – 15kV, Contact – 8kV
- Typically Used at Computer Interface Protection, Data Line and Power Line Protection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability

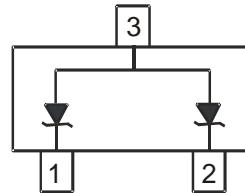
Mechanical Data

- 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: 0.0089 grams (approximate)

SOT23



Top View



Device Schematic

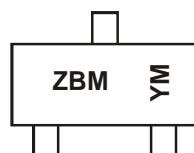
Ordering Information (Note 4)

Part Number	Case	Packaging
SM12-7	SOT23	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> 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>.

Marking Information



ZBM = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: Z = 2012)

M = Month (ex: 9 = September)

Date Code Key

Year	2012	2013	2014	2015	2016	2017	2018
Code	Z	A	B	C	D	E	F
Month	Jan	Feb	Mar	Apr	May	Jun	Jul
Code	1	2	3	4	5	6	7
Month	Aug	Sep	Oct	Nov	Dec		
Code	8	9	O	N	D		

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	P_{PP}	300	W	8/20 μs , Per Fig. 3
Peak Pulse Current	I_{PP}	12	A	8/20 μs , Per Fig. 3
ESD Protection – Contact Discharge	$V_{ESD_Contact}$	± 8	kV	Standard IEC 61000-4-2(ESD)
ESD Protection – Air Discharge	V_{ESD_Air}	± 15	kV	Standard IEC 61000-4-2(ESD)
Electrical Fast Transient Current	I_{EFT}	40	A	Standard IEC 61000-4-4(EFT)

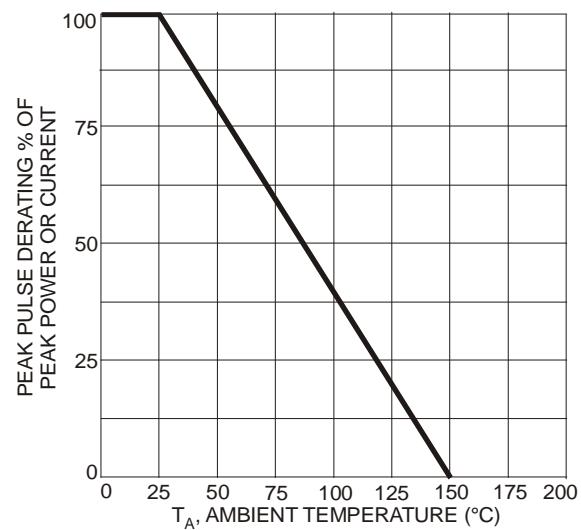
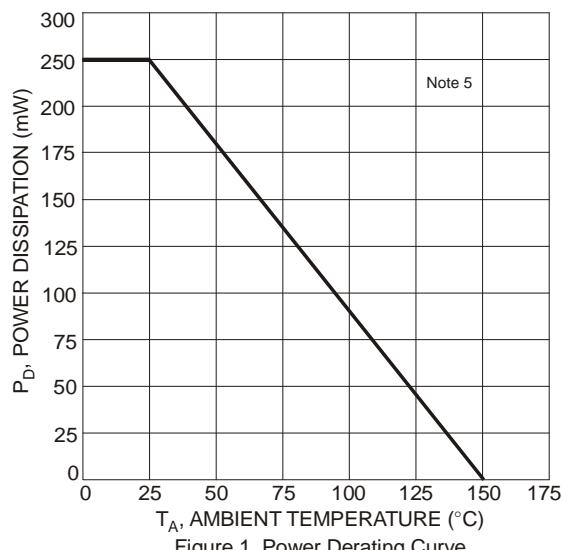
Thermal Characteristics

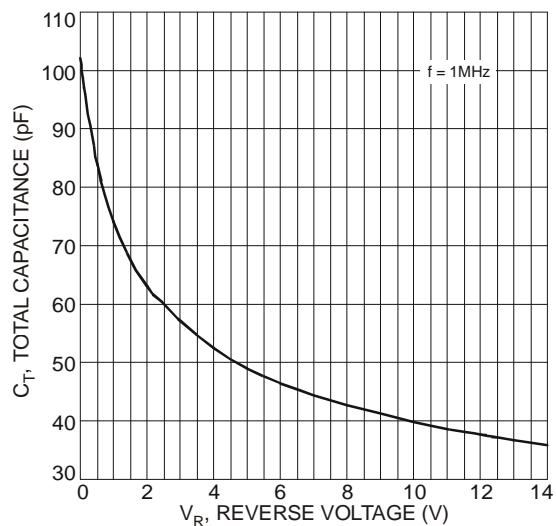
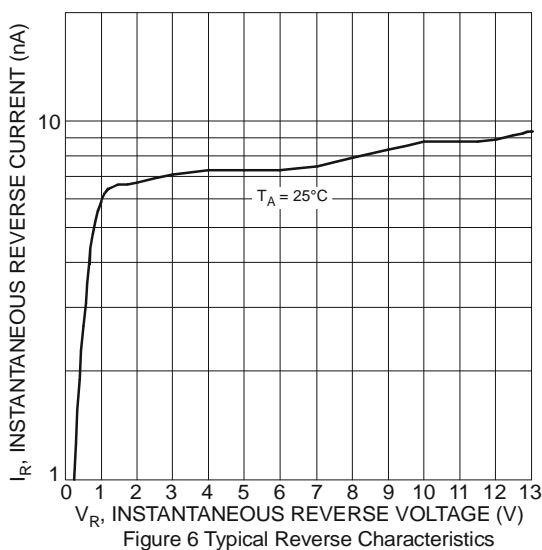
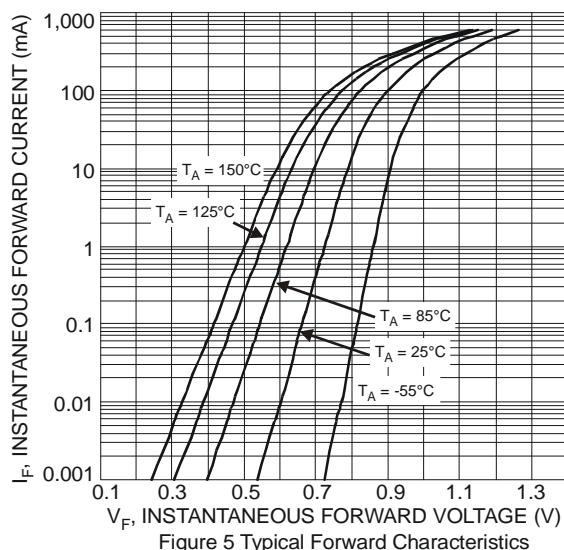
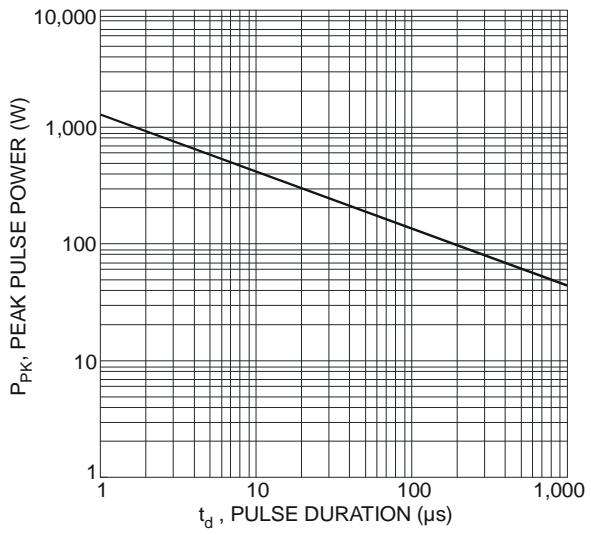
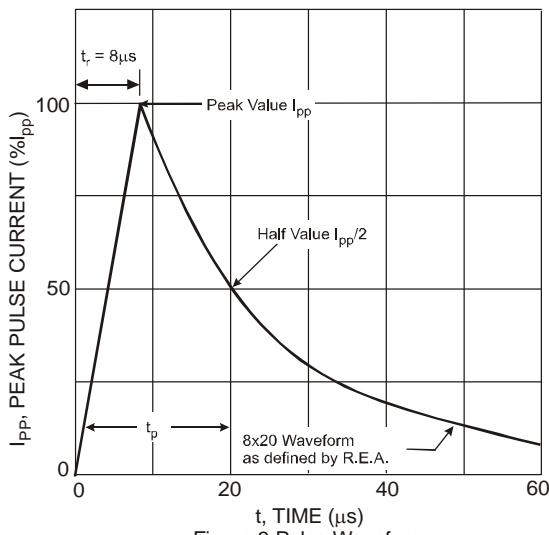
Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_D	250	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	500	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V_{RWM}	-	-	12.0	V	-
Reverse Current (Note 6)	I_R	-	-	1.0	μA	$V_R = V_{RWM} = 12.0\text{V}$
Reverse Breakdown Voltage	V_{BR}	13.3	-	15.75	V	$I_R = 1\text{mA}$
Reverse Clamping Voltage	V_{CL}	-	-	19	V	$I_{PP} = 1\text{A}$, $t_p = 8/20\mu\text{s}$
Capacitance	C_T	-	95	-	pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$, Pin 1 to 3

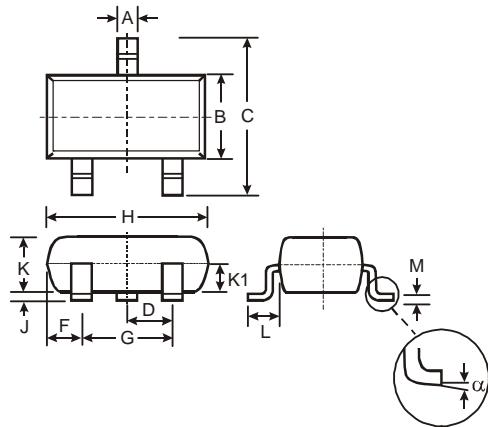
Notes:
5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at <http://www.diodes.com>.
6. Short duration pulse test used to minimize self-heating effect.





Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

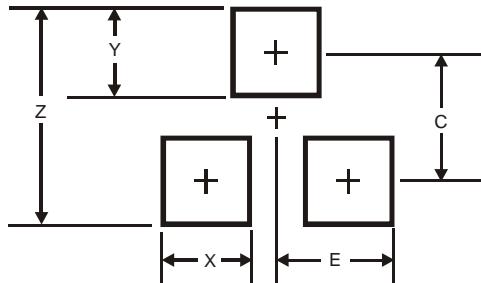


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-

All Dimensions in mm

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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

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