225W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Product Summary (@T_A = +25°C)

$V_{BR\ (MIN)}$	$I_{PP\ (MAX)}$	$V_{C\ (MAX)}$
14.4V	10.5A	21.5V

Description

This new generation TVS is designed for transient overvoltage protection. The combination of small size and high ESD surge capability makes it ideal for use in power management and battery contact.

Applications

It is ideally suited for use in applications such as the following:

- Power Management
- Automotive
- Battery Contacts

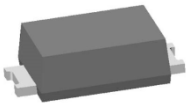
Features

- 225W Peak Pulse Power Dissipation (10µs × 1000µs Waveform)
- 13V Standoff Voltage
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SOD123F
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Bar
- Terminals: Matte Tin Finish Annealed over Copper Alloy Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.018 grams (Approximate)

SOD123F (Type B)



Top View

Bottom View

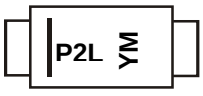
Cathode Anode

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size(inches)	Tape Width(mm)	Quantity per Reel
D13AP2WF-7	Commercial	P2L	7	8	3,000/Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
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



P2L = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: G = 2019)
M = Month (ex: 9 = September)
Bar Denotes Cathode Side

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024
Code	F	G	H	I	J	K	L

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
Peak Pulse Power Dissipation (Note 5) 10/1000µs 8/20µs	P_{PK}	225 1125	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 6)	I_{FSM}	35	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
DC Steady-State Power Dissipation (Note 7)	P_D	1.0	W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	330	°C/W
Thermal Resistance, Junction to Soldering Point (Note 8)	$R_{\theta JS}$	70	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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

Part Number	Reverse Standoff Voltage	Breakdown Voltage V_{BR} @ I_T (Note 9)		Test Current	Max. Reverse Leakage @ V_{RWM}	Max. Clamping Voltage @ I_{PP}	Max. Peak Pulse Current I_{PP} (Note 5)	Marking Code
	V_{RWM} (V)	Min (V)	Max (V)	I_T (mA)	I_R (µA)	V_C (V)	(A)	
D13AP2WF	13	14.4	15.9	1	1	21.5	10.5	P2L

Notes:
5. Non-Repetitive current pulse as shown in Figure 2.
6. 1/2 sine wave (or equivalent square wave), pulse width = 8.3ms, duty cycle = 4 pulses/minute maximum.
7. Device mounted on 1" × 1", FR-4 PCB; 2 oz. Cu pad layout.
8. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
9. V_{BR} measured at pulse test current I_T with tp ≤ 5.0ms at T_A = +25°C.

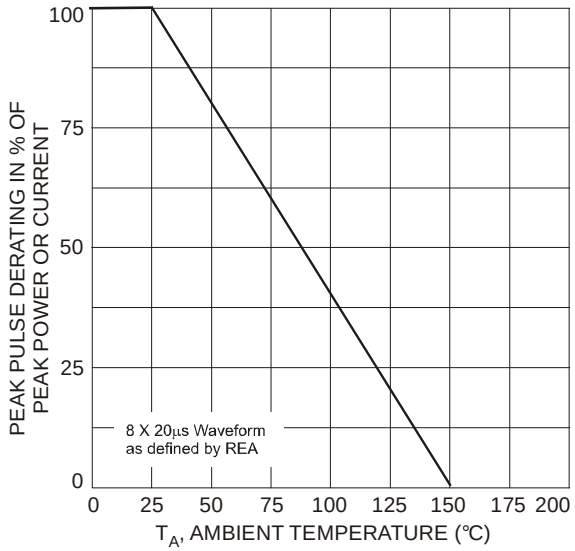


Fig. 1 Pulse Derating Curve

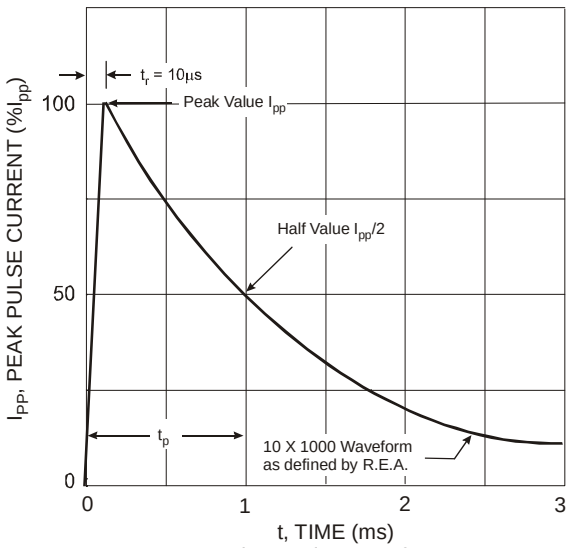


Fig. 2 Pulse Waveform

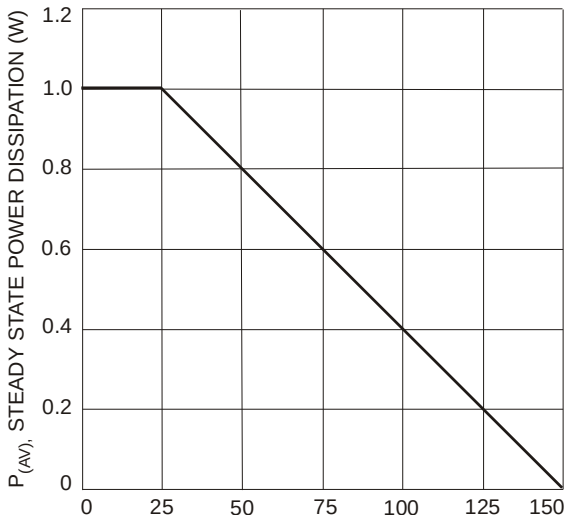


Fig. 3 Steady State Power Derating Curve

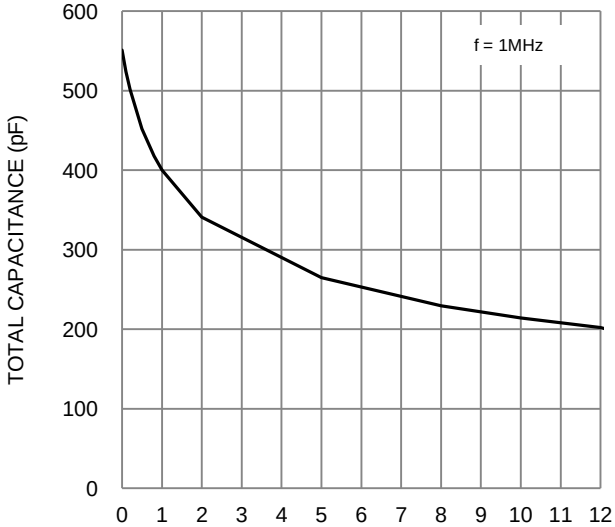
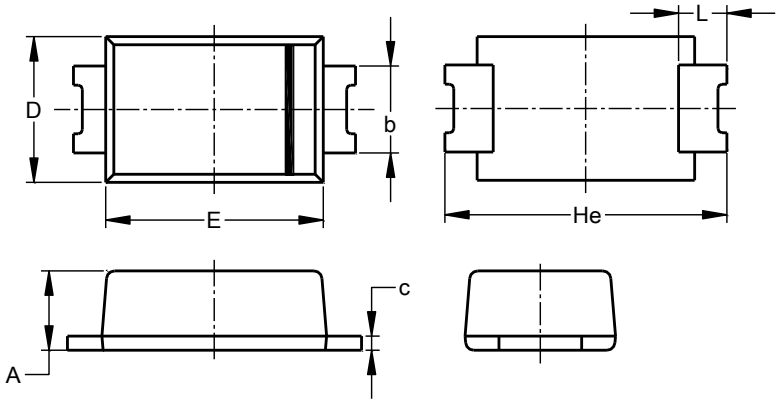


Fig. 4 Capacitance vs. V_{RWM} Voltage

Package Outline Dimensions

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

SOD123F (Type B)



SOD123F (Type B)			
Dim	**Min**	**Max**	**Typ**
A	0.81	1.15	—
b	0.80	1.35	—
c	0.05	0.30	—
D	1.70	1.90	1.80
E	2.60	2.80	2.70
He	3.30	3.70	3.50
L	0.35	0.85	—
All Dimensions in mm			

Suggested Pad Layout

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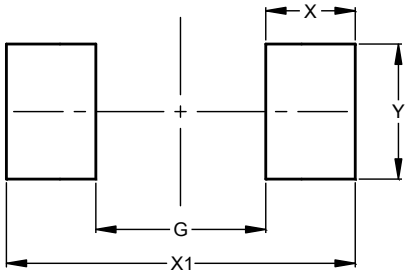
SOD123F (Type B)



Dimensions	Value (in mm)
G	1.90
X	1.00
X1	3.90
Y	1.50

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