

Product Summary (@T_A = +25°C)

V _{BR} (MIN)	I _{PP} (MAX)	V _C (MAX)
20V	7.71A	29.2V

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
- Battery Contacts

Features

- 225W Peak Pulse Power Dissipation (10µs x 1000µs Waveform)
- 18V Standoff Voltages
- 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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

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
- Weight: 0.018 grams (Approximate)

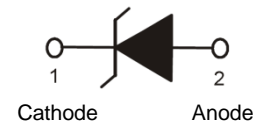
SOD123F (Type B)



Top View



Bottom View



Cathode

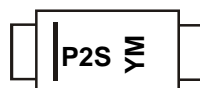
Anode

Ordering Information (Note 4)

Part Number	Compliance	Marking Code	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D18AP2WF-7	Commercial	P2S	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



P2S = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: 1 = 2021)
 M = Month (ex: 9 = September)
 Bar Denotes Cathode Side

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	R	S	T	U

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 _{θJA}	330	°C/W
Thermal Resistance, Junction to Soldering Point (Note 8)	R _{θJS}	70	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Reverse Standoff Voltage	Breakdown Voltage V _{BR} @ I _T (Note 9)		Test Current I _T (mA)	Max. Reverse Leakage @ V _{RWM} I _R (μA)	Max. Clamping Voltage @ I _{PP} V _C (V)	Max. Peak Pulse Current I _{PP} (Note 5) (A)	Marking Code
	Min (V)	Max (V)					
V _{RWM} (V)	Min (V)	Max (V)	I _T (mA)	I _R (μA)	V _C (V)	(A)	P2S
18	20.0	22.1	1	1	29.2	7.71	

- 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"x1", FR-4 PCB; 2 oz. Cu pad layout.
 8. Theoretical R_{θJS} 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 t_p ≤ 5.0ms at T_A = +25°C.

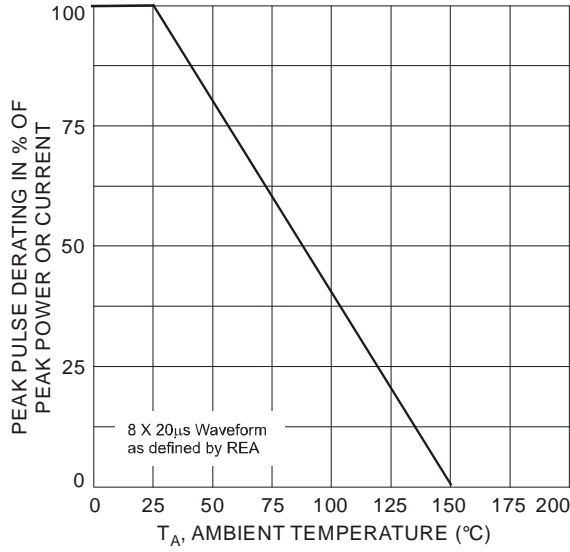


Fig. 1 Pulse Derating Curve

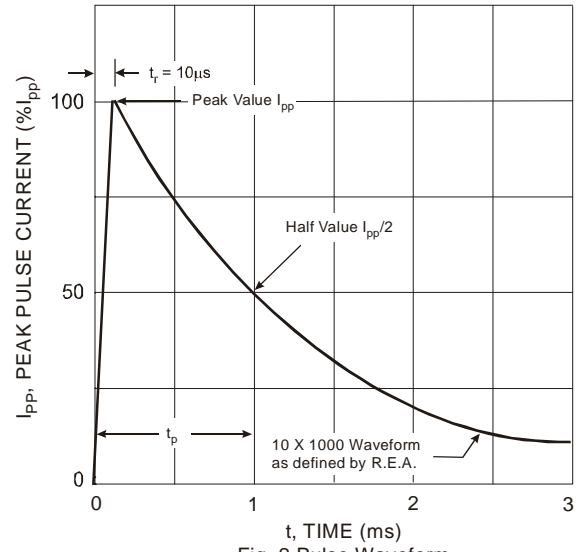


Fig. 2 Pulse Waveform

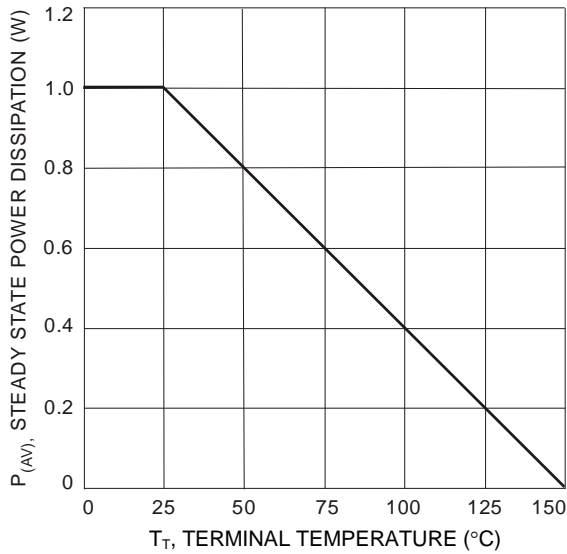


Fig. 3 Steady State Power Derating Curve

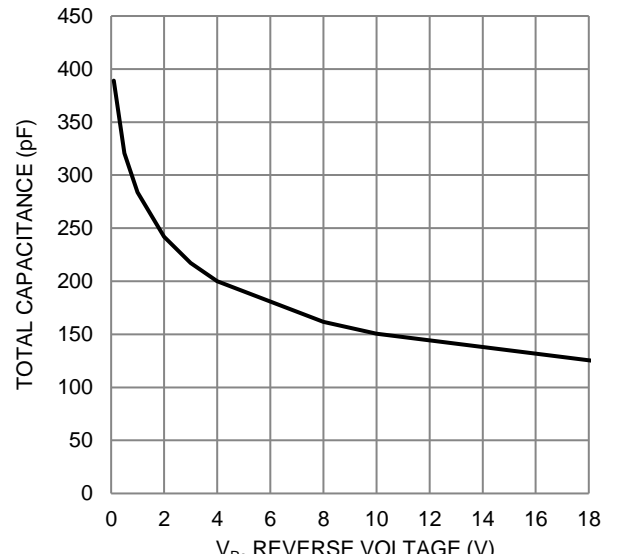
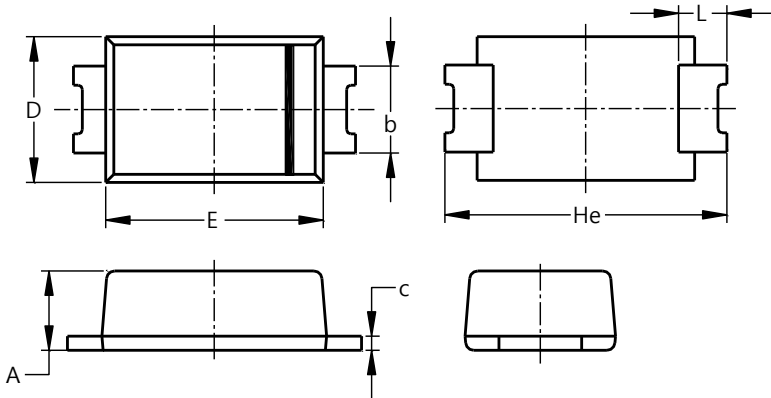


Fig. 4 Capacitance vs V_R

Package Outline Dimensions

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

SOD123F (Type B)

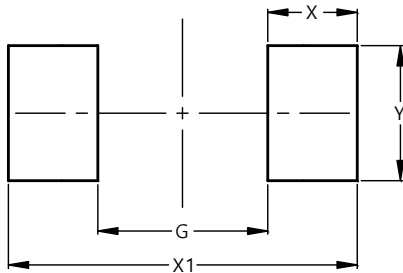


SOD123F (Type B)			
Dim	Min	Max	Typ
A	0.81	1.15	—
b	0.80	1.35	—
c	0.05	0.30	—
D	1.70	1.90	1.80
E	2.60	2.80	2.70
He	3.30	3.70	3.50
L	0.35	0.85	—
All Dimensions in mm			

Suggested Pad Layout

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

SOD123F (Type B)



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

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