225W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

PowerDI 123

Features

- 225W Peak Pulse Power Dissipation (10µs x 1000µs Waveform)
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DFLT5V0AQ-DFLT40AQ are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Case: PowerDI®123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.01 grams (Approximate)

PowerDI123

Top View

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DFLTxxxAQ-7*	Automotive	Fxx	7	8	3,000/Tape & Reel
DFLTxxAQ-7*	Automotive	Fxx	7	8	3,000/Tape & Reel

* Add "-7" to the appropriate type number in Electrical Characteristics Table on Page 2. Example: 18V reverse standoff device = DFLT18AQ-7.

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

PowerDI123

Fxx = Product Type Marking Code
See Electrical Characteristics Table on Page 2
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

Year	2016	…	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	D	…	H	I	J	K	L	M	N	O	P	R

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 (Note 6) 8/20µs	P_{PK}	225 1,125	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave	I_{FSM}	50	A
Instantaneous Forward Voltage @ I_{PP} = 12A (Note 7)	V_F	3.5	V

Thermal Characteristics

Characteristic	Symbol	Value	Unit
DC Steady-State Power Dissipation (Note 8)	P_D	1.0	W
Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	120	°C/W
Thermal Resistance, Junction to Soldering Point (Note 9)	$R_{\theta JS}$	6	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Part Number	Reverse Standoff Voltage	Breakdown Voltage V_{BR} @ I_T (Note 10)		Test Current	Max. Reverse Leakage @ V_{RWM}	Max. Clamping Voltage @ I_{PP}	Max. Peak Pulse Current I_{PP}	Marking Code
	V_{RWM} (V)	Min (V)	Max (V)	I_T (mA)	I_R (µA)	V_C (V)	(A)	
DFLT5V0AQ	5.0	6.40	7.0	10	400	9.2	24.5	FAE
DFLT15AQ	15	16.7	18.5	1.0	1.0	24.4	9.22	FBM
DFLT16AQ	16	17.8	19.7	1.0	1.0	26.0	8.65	FBP
DFLT18AQ	18	20.0	22.1	1.0	1.0	29.2	7.71	FBT
DFLT20AQ	20	22.2	24.5	1.0	1.0	32.4	6.94	FBV
DFLT22AQ	22	24.4	26.9	1.0	1.0	35.5	6.34	FBX
DFLT24AQ	24	26.7	29.5	1.0	1.0	38.9	5.78	FBZ
DFLT26AQ	26	28.9	31.9	1.0	1.0	42.1	5.35	FCE
DFLT28AQ	28	31.1	34.4	1.0	1.0	45.4	4.96	FCG
DFLT33AQ	33	36.7	40.6	1.0	1.0	53.3	4.22	FCM
DFLT36AQ	36	40.0	44.2	1.0	1.0	58.1	3.87	FCP
DFLT40AQ	40	44.4	49.1	1.0	1.0	64.5	3.49	FCR

Notes:
5. Non-Repetitive current pulse as shown in Figure 2 and derated above T_A = +25°C as per Figure 1.
6. Non-Repetitive current pulse as shown in Figure 3 and derated above T_A = +25°C as per Figure 1.
7. 1/2 sine wave (or equivalent square wave), pulse width = 8.3ms, duty cycle = 4 pulses/minute maximum.
8. Device mounted on FR-4 substrate printed circuit board with 1 inch square 2oz copper pad area.
9. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
10. V_{BR} measured at pulse test current I_T with tp ≤ 5.0ms at T_A = +25°C.

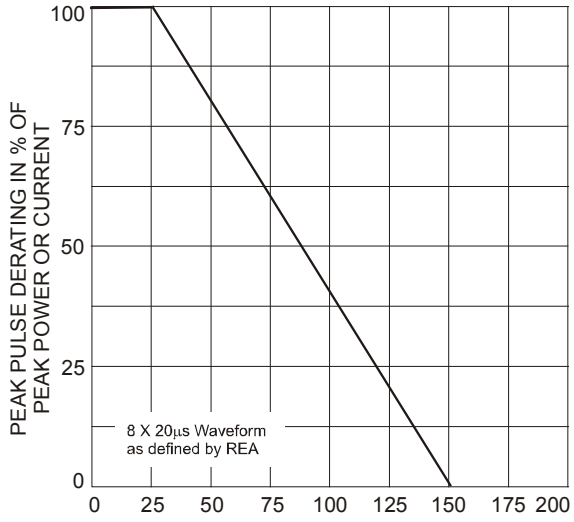


Fig. 1 Pulse Derating Curve

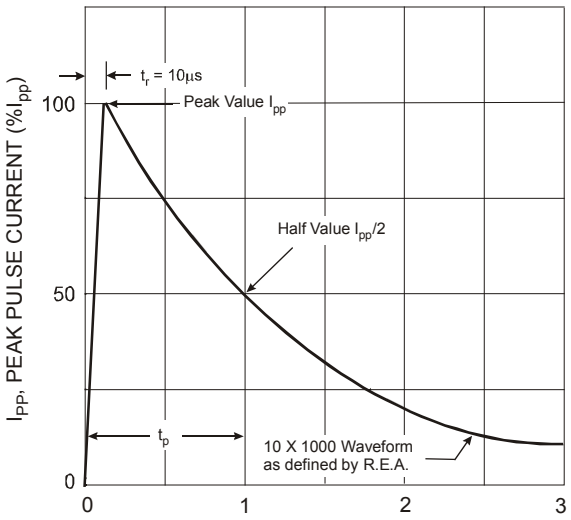


Fig. 2 Pulse Waveform

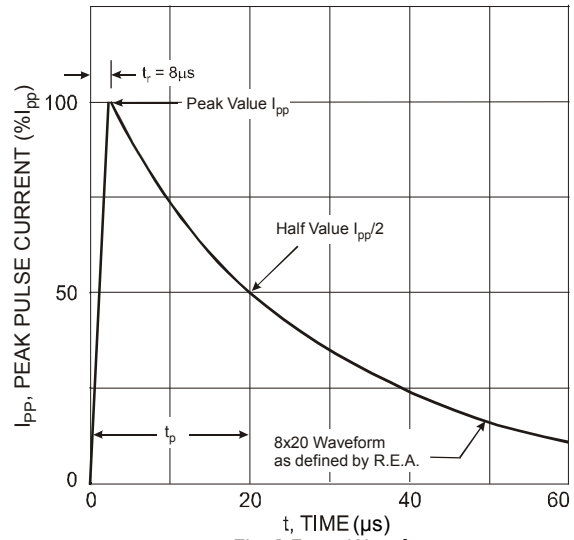


Fig. 3 Pulse Waveform

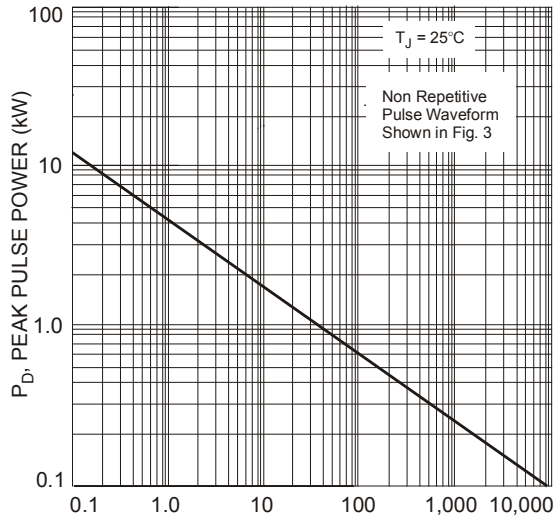


Fig. 4 Pulse Rating Curve

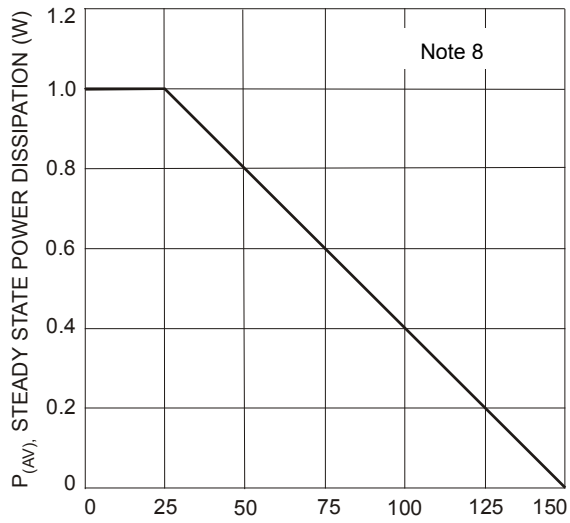


Fig. 5 Steady State Power Derating Curve

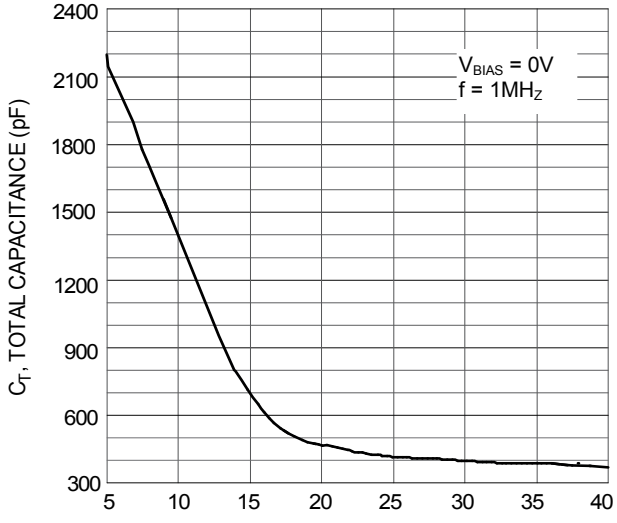
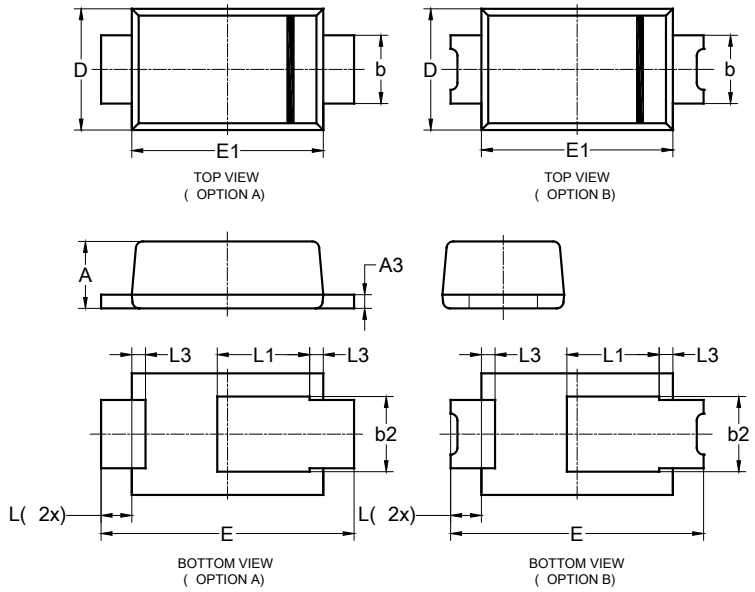


Fig. 6 Total Capacitance vs. Reverse Standoff Voltage

Package Outline Dimensions

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

PowerDI123

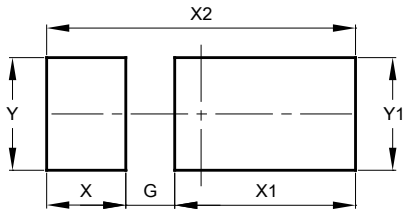


PowerDI123			
Dim	**Min**	**Max**	**Typ**
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI123



Dimensions	Value (in mm)
G	0.65
X	1.05
X1	2.40
X2	4.10
Y	1.50
Y1	1.50

IMPORTANT NOTICE

1. DIODES INCORPORATED AND ITS SUBSIDIARIES ("DIODES") MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes products. Diodes products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of the Diodes products for their intended applications, (c) ensuring their applications, which incorporate Diodes products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

www.diodes.com