

**225W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR
POWERDI**

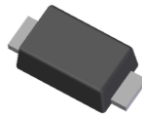
Features

- 225W Peak Pulse Power Dissipation (10µs x 1000µs Waveform)
- 5.0V to 220V Standoff Voltages
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet (DFLTXXXAQ)**

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)

PowerDI[®]123



Top View

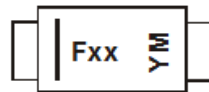
Ordering Information (Note 4)

| Product | Compliance | Marking | Reel Size(inches) | Tape Width(mm) | Quantity Per Reel |
|-------------|------------|---------|-------------------|----------------|-------------------|
| DFLTxxxA-7* | Commercial | Fxx | 7 | 8 | 3,000/Tape & Reel |

* Add "-7" to the appropriate type number in Electrical Characteristics Table on page 2. Example: 10V reverse standoff device = DFLT10A-7.

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) 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 <http://www.diodes.com/products/packages.html>.

Marking Information



Fxx = Product Type Marking Code
See Electrical Characteristics Table on Page 2
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2004 | ---- | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | R | ---- | Z | A | B | C | D | E | 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 (Note 6) 8/20µs | P _{PK} | 225 1125 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 7) | I _{FSM} | 50 | A |
| Instantaneous Forward Voltage @ I _{PP} = 12A (Note 8) | V _F | 3.5 | V |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| DC Steady-State Power Dissipation (Note 9) | P _D | 1.0 | W |
| Thermal Resistance, Junction to Ambient (Note 9) | R _{θJA} | 125 | °C/W |
| Thermal Resistance, Junction to Soldering Point (Note 10) | R _{θJS} | 6 | °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 11) | | 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) | |
| DFLT5V0A | 5.0 | 6.40 | 7.0 | 10 | 400 | 9.2 | 24.5 | FAE |
| DFLT6V0A | 6.0 | 6.67 | 7.37 | 10 | 400 | 10.3 | 21.8 | FAG |
| DFLT6V5A | 6.5 | 7.22 | 7.98 | 10 | 250 | 11.2 | 20.1 | FAK |
| DFLT7V0A | 7.0 | 7.78 | 8.60 | 10 | 100 | 12.0 | 18.8 | FAM |
| DFLT7V5A | 7.5 | 8.33 | 9.21 | 1.0 | 50 | 12.9 | 17.4 | FAP |
| DFLT8V0A | 8.0 | 8.89 | 9.83 | 1.0 | 25 | 13.6 | 16.5 | FAR |
| DFLT8V5A | 8.5 | 9.44 | 10.4 | 1.0 | 10 | 14.4 | 15.6 | FAT |
| DFLT9V0A | 9.0 | 10.0 | 11.1 | 1.0 | 5.0 | 15.4 | 14.6 | FAV |
| DFLT10A | 10 | 11.1 | 12.3 | 1.0 | 2.5 | 17.0 | 13.2 | FAX |
| DFLT11A | 11 | 12.2 | 13.5 | 1.0 | 2.5 | 18.2 | 12.4 | FAZ |
| DFLT12A | 12 | 13.3 | 14.7 | 1.0 | 2.5 | 19.9 | 11.3 | FBE |
| DFLT13A | 13 | 14.4 | 15.9 | 1.0 | 1.0 | 21.5 | 10.5 | FBG |
| DFLT14A | 14 | 15.6 | 17.2 | 1.0 | 1.0 | 23.2 | 9.7 | FBK |
| DFLT15A | 15 | 16.7 | 18.5 | 1.0 | 1.0 | 24.4 | 9.22 | FBM |
| DFLT16A | 16 | 17.8 | 19.7 | 1.0 | 1.0 | 26.0 | 8.65 | FBP |
| DFLT17A | 17 | 18.9 | 20.9 | 1.0 | 1.0 | 27.6 | 8.15 | FBR |
| DFLT18A | 18 | 20.0 | 22.1 | 1.0 | 1.0 | 29.2 | 7.71 | FBT |
| DFLT20A | 20 | 22.2 | 24.5 | 1.0 | 1.0 | 32.4 | 6.94 | FBV |
| DFLT22A | 22 | 24.4 | 26.9 | 1.0 | 1.0 | 35.5 | 6.34 | FBX |
| DFLT24A | 24 | 26.7 | 29.5 | 1.0 | 1.0 | 38.9 | 5.78 | FBZ |
| DFLT26A | 26 | 28.9 | 31.9 | 1.0 | 1.0 | 42.1 | 5.35 | FCE |
| DFLT27A | 27 | 30 | 33.15 | 1.0 | 1.0 | 43.7 | 5.15 | FCF |
| DFLT28A | 28 | 31.1 | 34.4 | 1.0 | 1.0 | 45.4 | 4.96 | FCG |
| DFLT30A | 30 | 33.3 | 36.8 | 1.0 | 1.0 | 48.4 | 4.65 | FCK |
| DFLT33A | 33 | 36.7 | 40.6 | 1.0 | 1.0 | 53.3 | 4.22 | FCM |
| DFLT36A | 36 | 40.0 | 44.2 | 1.0 | 1.0 | 58.1 | 3.87 | FCP |
| DFLT40A | 40 | 44.4 | 49.1 | 1.0 | 1.0 | 64.5 | 3.49 | FCR |
| DFLT43A | 43 | 47.8 | 52.8 | 1.0 | 1.0 | 69.4 | 3.24 | FCT |
| DFLT45A | 45 | 50.0 | 55.3 | 1.0 | 1.0 | 72.7 | 3.10 | FCV |
| DFLT48A | 48 | 53.3 | 58.9 | 1.0 | 1.0 | 77.4 | 2.91 | FCX |
| DFLT51A | 51 | 56.7 | 62.7 | 1.0 | 1.0 | 82.4 | 2.73 | FCZ |
| DFLT170A | 170 | 189 | 209 | 1.0 | 5.0 | 281 | 0.81 | FDZ |
| DFLT220A | 220 | 242 | 276 | 1.0 | 5.0 | 375 | 0.60 | FEZ |

- 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. I_{FSM} = 40A for DFLT170A and DFLT220A; I_{FSM} = 50A for all other voltages.
 8. 1/2 sine wave (or equivalent square wave), pulse width = 8.3ms, duty cycle = 4 pulses/minute maximum.
 9. Device mounted on FR-4 substrate printed circuit board with 1 inch square 2oz copper pad area.
 10. Theoretical R_{θJS} calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
 11. V_{BR} measured at pulse test current I_T with tp ≤ 5.0ms at T_A = +25°C.

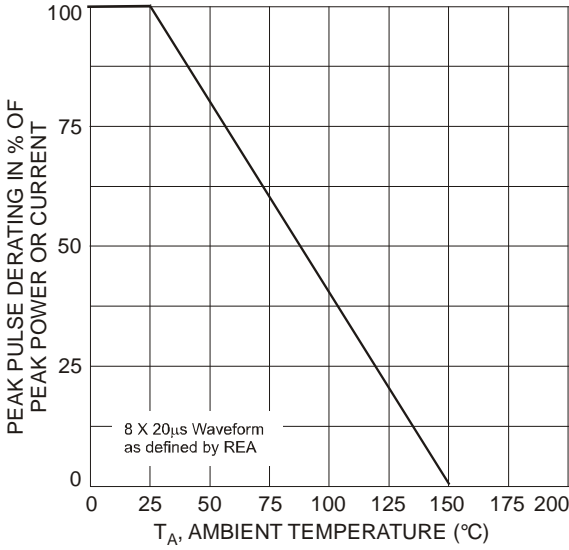


Fig. 1 Pulse Derating Curve

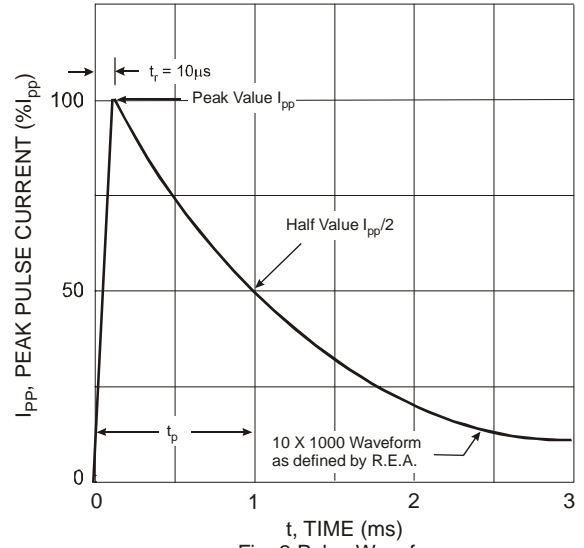


Fig. 2 Pulse Waveform

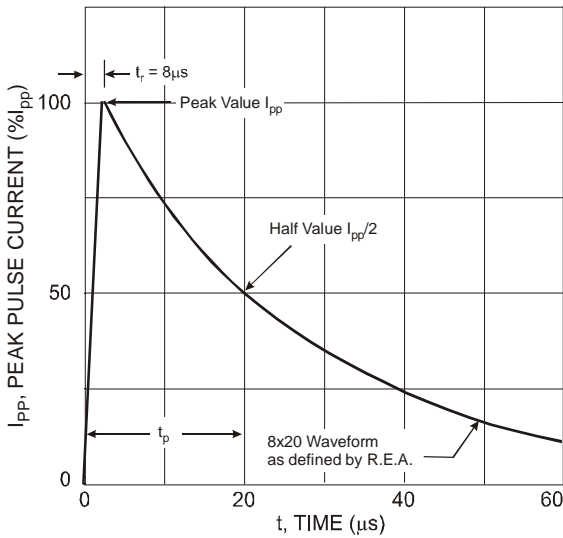


Fig. 3 Pulse Waveform

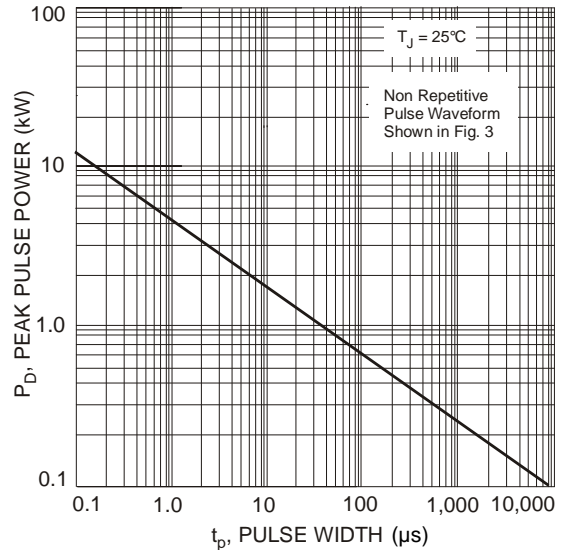


Fig. 4 Pulse Rating Curve

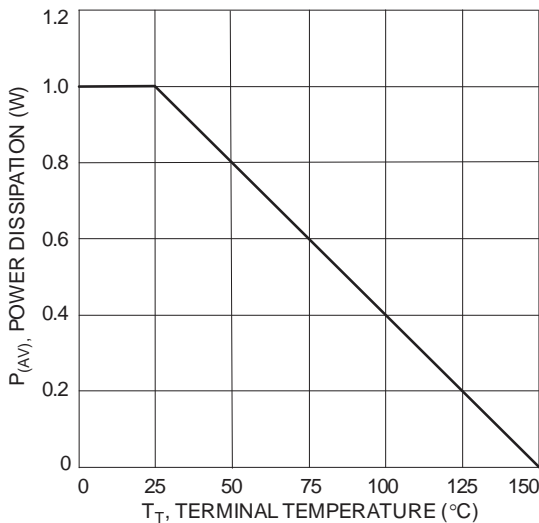


Fig. 5 Power Derating Curve

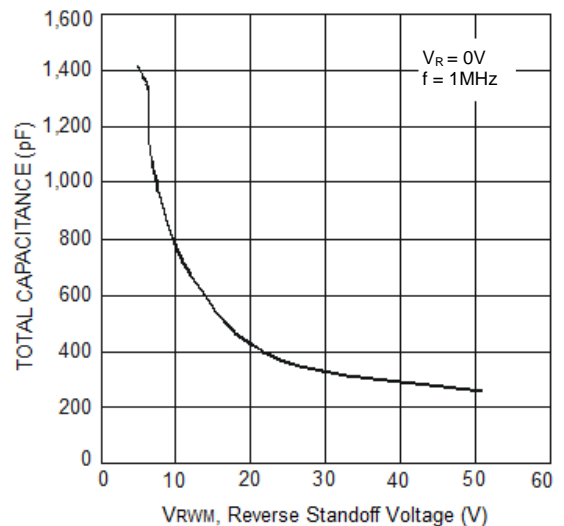


Fig. 6 Total Capacitance vs Reverse Standoff Voltage

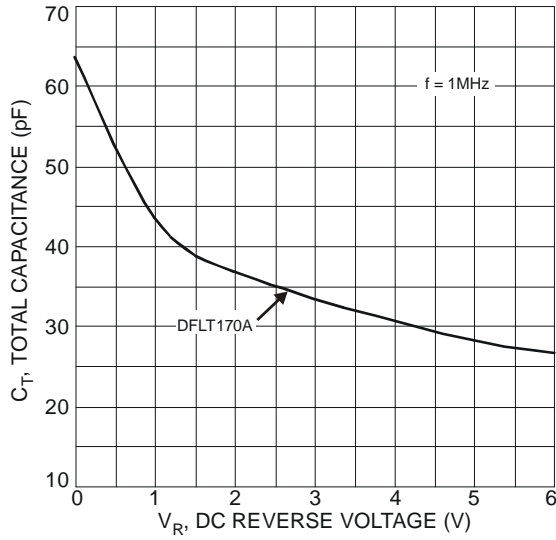


Fig. 7 Total Capacitance vs. Reverse Voltage

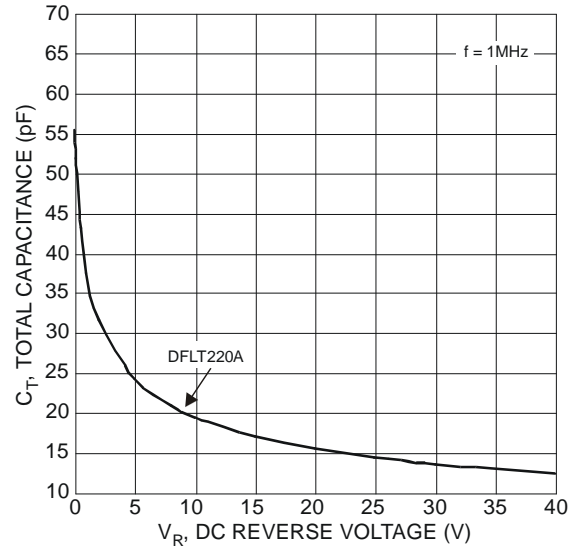
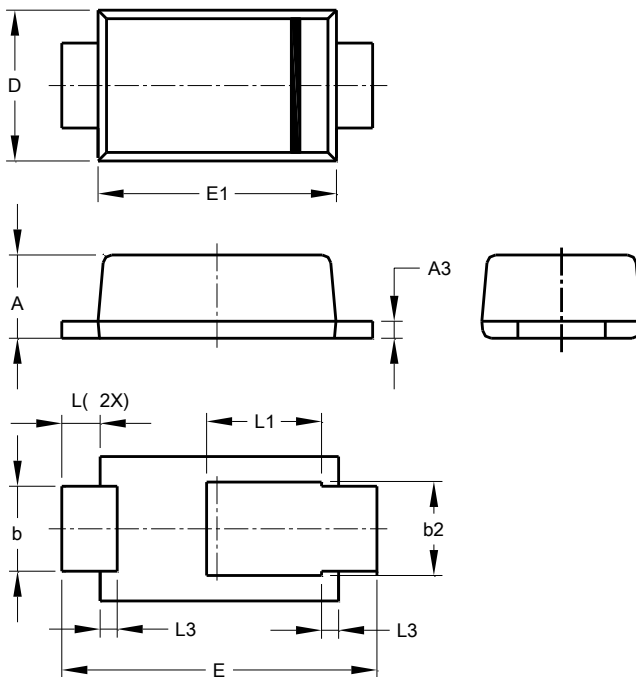


Fig. 8 Total Capacitance vs. Reverse Voltage

Package Outline Dimensions

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

PowerDI[®]123

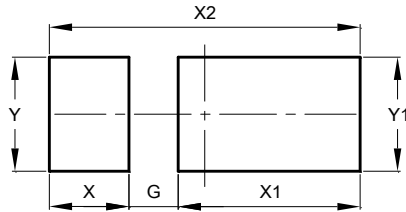


| PowerDI [®] 123 | | | |
|--------------------------|-------|-------|------|
| Dim | Min | Max | Typ |
| A | 0.93 | 1.00 | 0.98 |
| A3 | 0.15 | 0.25 | 0.20 |
| b | 0.85 | 1.25 | 1.00 |
| b2 | 1.025 | 1.125 | 1.10 |
| D | 1.63 | 1.93 | 1.78 |
| E | 3.50 | 3.90 | 3.70 |
| E1 | 2.60 | 3.00 | 2.80 |
| L | 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.

PowerDI[®]123



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

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