

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                     | Symbol           | Value       | Unit |
|--------------------------------------------------------------------|------------------|-------------|------|
| Peak Pulse Power Dissipation (Note 5) 10/1000µs<br>(Note 6) 8/20µs | P <sub>PK</sub>  | 225<br>1125 | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 7)   | I <sub>FSM</sub> | 50          | A    |
| Instantaneous Forward Voltage @ I <sub>PP</sub> = 12A (Note 8)     | V <sub>F</sub>   | 3.5         | V    |

**Thermal Characteristics**

| Characteristic                                            | Symbol                            | Value       | Unit |
|-----------------------------------------------------------|-----------------------------------|-------------|------|
| DC Steady-State Power Dissipation (Note 9)                | P <sub>D</sub>                    | 1.0         | W    |
| Thermal Resistance, Junction to Ambient (Note 9)          | R <sub>θJA</sub>                  | 125         | °C/W |
| Thermal Resistance, Junction to Soldering Point (Note 10) | R <sub>θJS</sub>                  | 6           | °C/W |
| Operating and Storage Temperature Range                   | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Part Number | Reverse Standoff Voltage | Breakdown Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> (Note 11) |         | Test Current        | Max. Reverse Leakage @ V <sub>RWM</sub> | Max. Clamping Voltage @ I <sub>pp</sub> | Max. Peak Pulse Current<br>I <sub>pp</sub> | Marking Code |
|-------------|--------------------------|-----------------------------------------------------------------|---------|---------------------|-----------------------------------------|-----------------------------------------|--------------------------------------------|--------------|
|             | V <sub>RWM</sub> (V)     | Min (V)                                                         | Max (V) | I <sub>T</sub> (mA) | I <sub>R</sub> (µA)                     | V <sub>C</sub> (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:
- Non-Repetitive current pulse as shown in figure 2 and derated above T<sub>A</sub> = +25°C as per figure 1.
  - Non-Repetitive current pulse as shown in figure 3 and derated above T<sub>A</sub> = +25°C as per figure 1.
  - I<sub>FSM</sub> = 40A for DFLT170A and DFLT220A; I<sub>FSM</sub> = 50A for all other voltages.
  - 1/2 sine wave (or equivalent square wave), pulse width = 8.3ms, duty cycle = 4 pulses/minute maximum.
  - Device mounted on FR-4 substrate printed circuit board with 1 inch square 2oz copper pad area.
  - Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
  - V<sub>BR</sub> measured at pulse test current I<sub>T</sub> with tp ≤ 5.0ms at T<sub>A</sub> = +25°C.

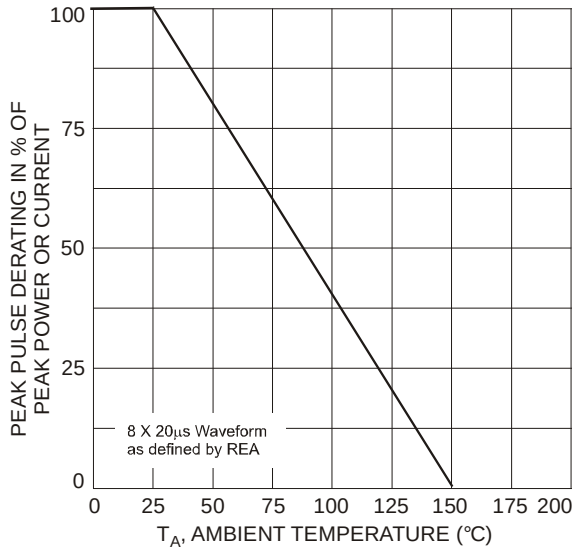


Fig. 1 Pulse Derating Curve

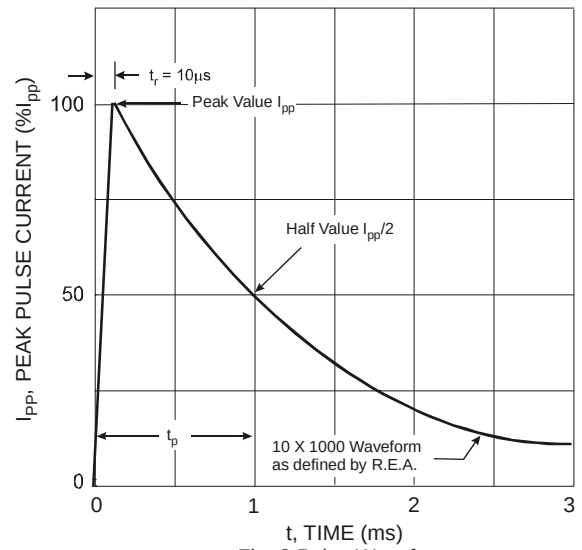


Fig. 2 Pulse Waveform

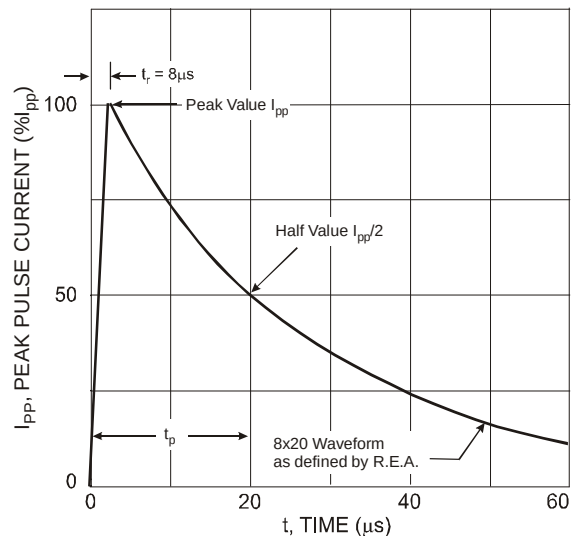


Fig. 3 Pulse Waveform

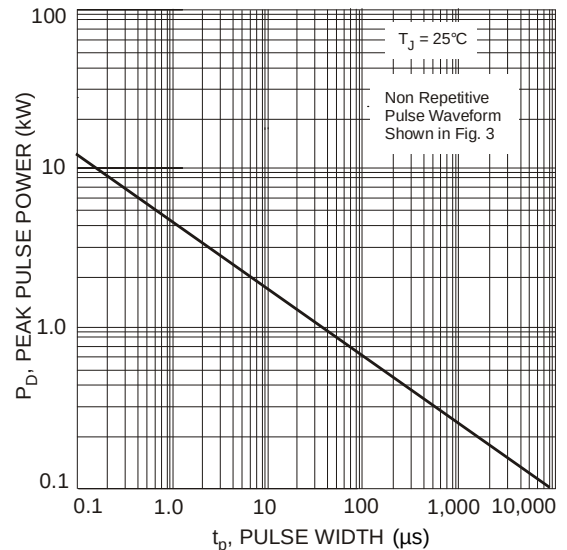


Fig. 4 Pulse Rating Curve

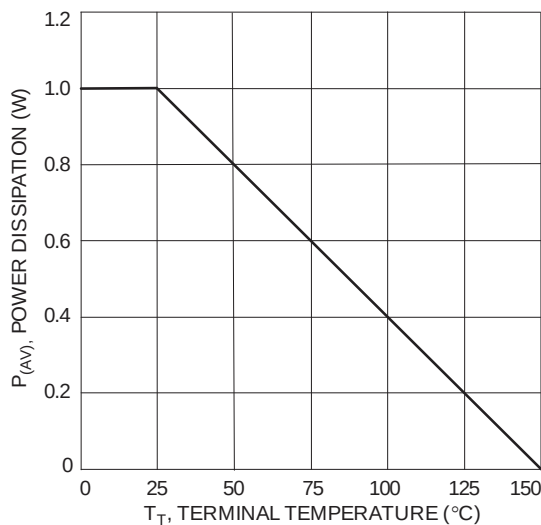


Fig. 5 Power Derating Curve

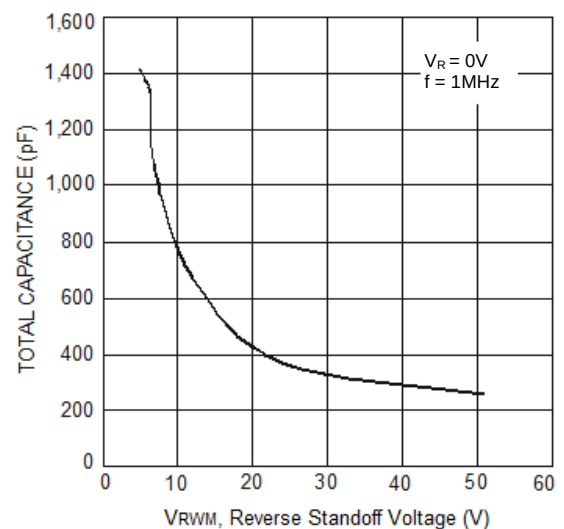


Fig. 6 Total Capacitance vs Reverse Standoff Voltage

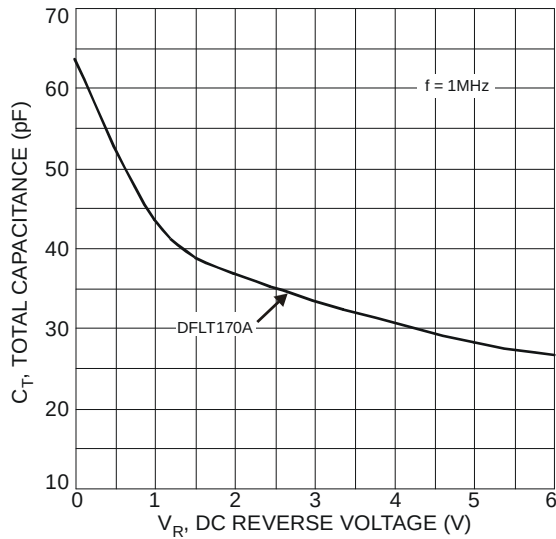


Fig. 7 Total Capacitance vs. Reverse Voltage

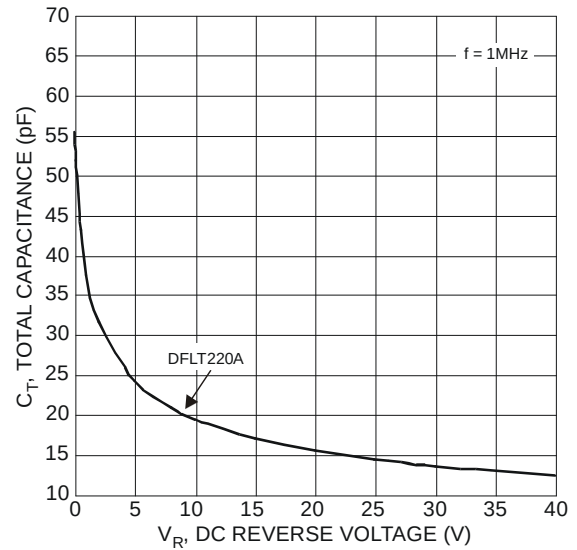
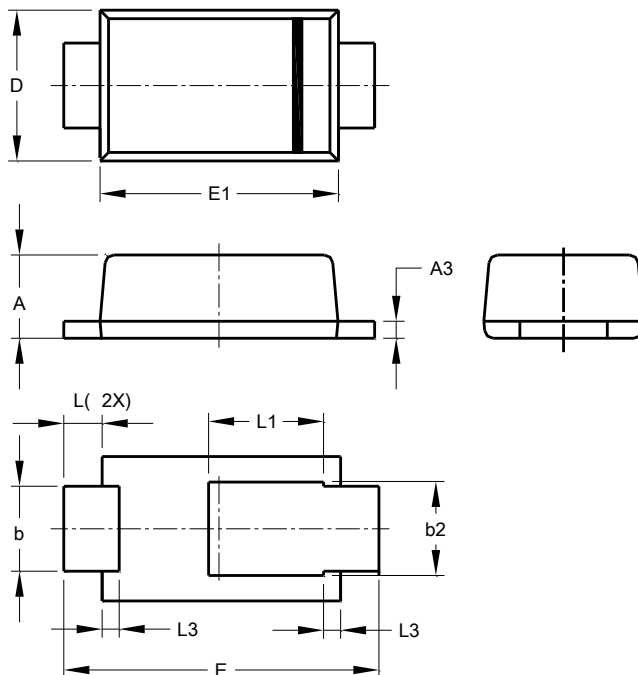


Fig. 8 Total Capacitance vs. Reverse Voltage

## Package Outline Dimensions

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

### PowerDI<sup>®</sup>123

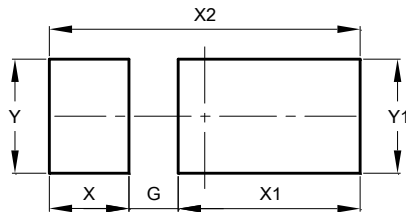


| PowerDI <sup>®</sup> 123 |       |       |      |
|--------------------------|-------|-------|------|
| Dim                      | Min   | Max   | Typ  |
| A                        | 0.93  | 1.00  | 0.98 |
| A3                       | 0.15  | 0.25  | 0.20 |
| b                        | 0.85  | 1.25  | 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<br>(in mm) |
|------------|------------------|
| G          | 0.65             |
| X          | 1.05             |
| X1         | 2.40             |
| X2         | 4.10             |
| Y          | 1.50             |
| Y1         | 1.50             |

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