

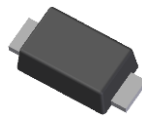
## Features

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- **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 ([DFLS160Q](#))**

## Mechanical Data

- Package: PowerDI<sup>®</sup>123
- Package 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 <sup>(3)</sup>
- Weight: 0.01 grams (Approximate)

PowerDI123



Top View

## Ordering Information (Note 4)

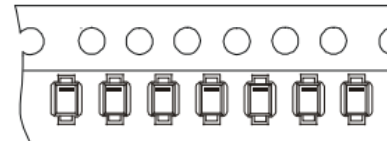
| Part Number | Package    | Packing |             |
|-------------|------------|---------|-------------|
|             |            | Qty.    | Carrier     |
| DFLS160-7   | PowerDI123 | 3,000   | Tape & Reel |

- 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



F17 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: J = 2022)  
M = Month (ex: 9 = September)



### Date Code Key

| Year | 2005 | .... | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | S    | .... | J    | K    | L    | M    | N    | O    | P    | R    | S    | T    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

| Characteristic                                                                                      | Symbol                                                 | Value | Unit |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage              | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | 60    | V    |
| RMS Reverse Voltage                                                                                 | V <sub>R(RMS)</sub>                                    | 42    | V    |
| Average Forward Current                                                                             | I <sub>F(AV)</sub>                                     | 1.0   | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | I <sub>FSM</sub>                                       | 50    | A    |

## Thermal Characteristics

| Characteristic                                          | Symbol                            | Typ         | Max | Unit |
|---------------------------------------------------------|-----------------------------------|-------------|-----|------|
| Thermal Resistance Junction to Soldering Point (Note 5) | R <sub>θJS</sub>                  | —           | 6   | °C/W |
| Thermal Resistance Junction to Ambient (Note 6)         | R <sub>θJA</sub>                  | 125         | —   | °C/W |
| Typical Thermal Resistance (Note 7)                     | R <sub>θJC</sub>                  | —           | 18  | °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.)

| Characteristic                     | Symbol             | Min | Typ | Max  | Unit | Test Condition                               |
|------------------------------------|--------------------|-----|-----|------|------|----------------------------------------------|
| Reverse Breakdown Voltage (Note 8) | V <sub>(BR)R</sub> | 60  | —   | —    | V    | I <sub>R</sub> = 0.2mA                       |
| Forward Voltage                    | V <sub>F</sub>     | —   | —   | 0.50 | V    | I <sub>F</sub> = 1.0A                        |
| Leakage Current (Note 8)           | I <sub>R</sub>     | —   | —   | 0.1  | mA   | V <sub>R</sub> = 60V, T <sub>A</sub> = +25°C |
| Total Capacitance                  | C <sub>T</sub>     | —   | 67  | —    | pF   | V <sub>R</sub> = 10V, f = 1.0MHz             |

- Notes:
5. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
  6. Device mounted on Polyimide substrate, 1" x 1" 2oz copper double-sided PC board with minimum recommended pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
  7. Part mounted on FR-4 board with 1.8mm x 2.5mm cathode and 1.8mm x 1.2mm anode, 1oz. copper pads. T<sub>A</sub> = +25°C.
  8. Short duration pulse test to minimize self-heating effect

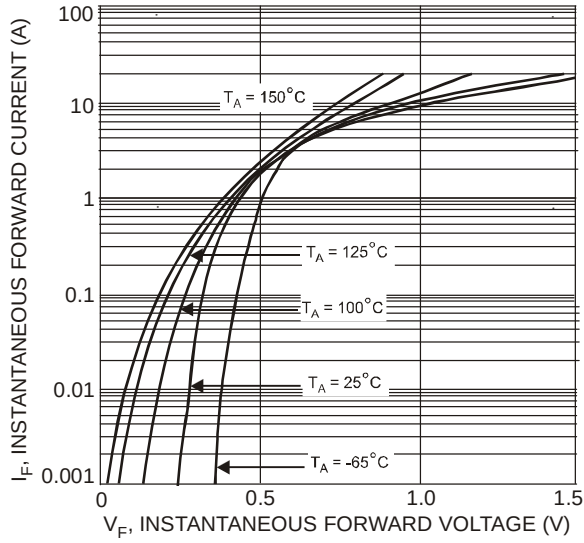


Fig. 1 Typical Forward Characteristics

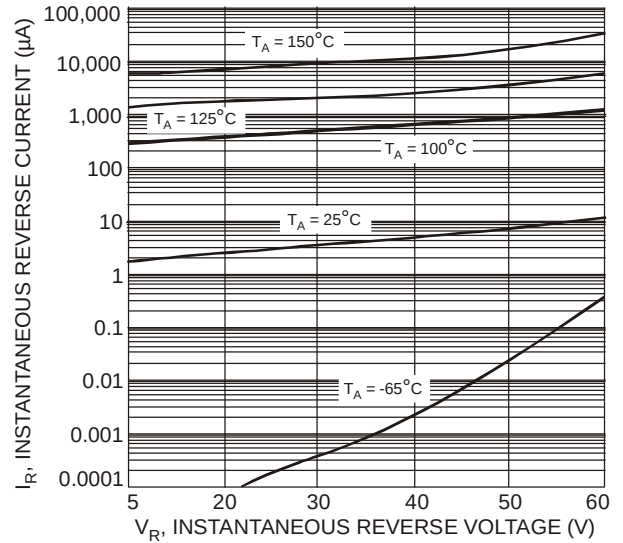


Fig. 2 Typical Reverse Characteristics

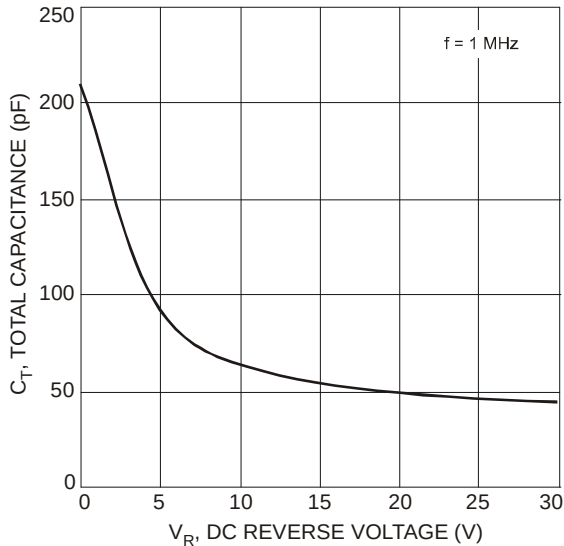


Fig. 3 Total Capacitance vs. Reverse Voltage

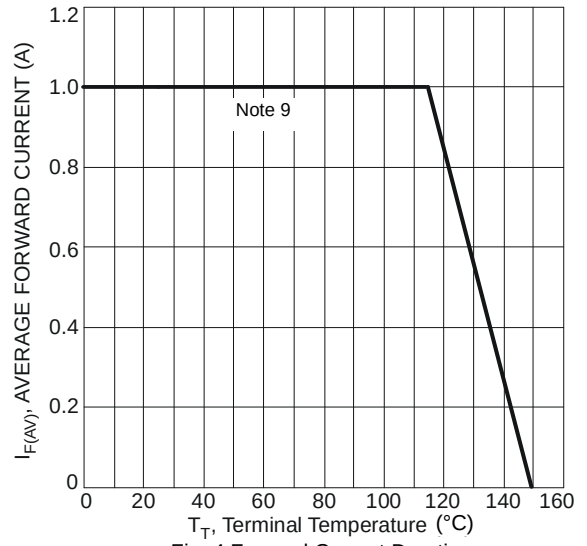


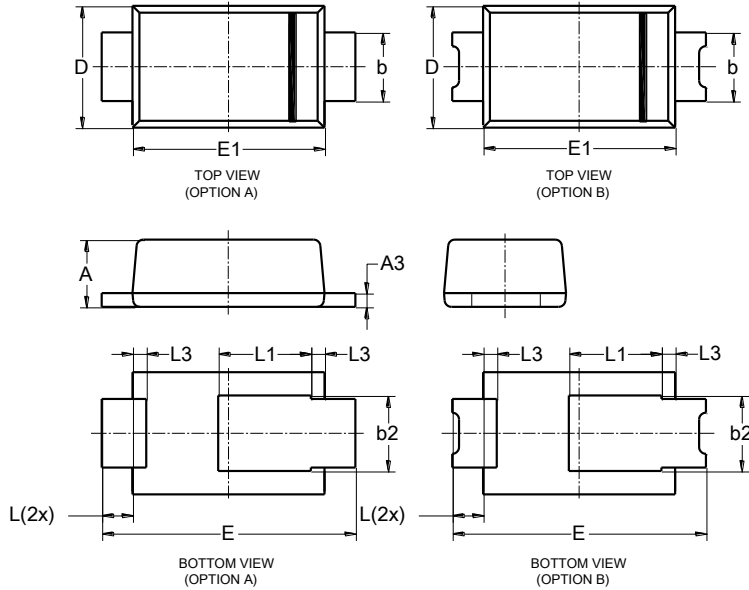
Fig. 4 Forward Current Derating

Note: 9. Part mounted on 50.8mm x 50.8mm GETEK board with 25.4mm x 25.4mm copper pad, 25% anode, 75% cathode.  $T_A = +25^\circ\text{C}$ .

## Package Outline Dimensions

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

### PowerDI123

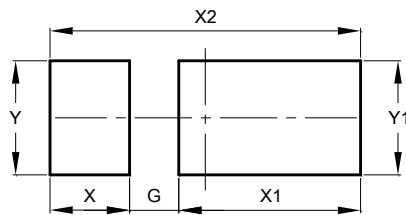


| PowerDI123           |       |       |      |
|----------------------|-------|-------|------|
| Dim                  | Min   | Max   | Typ  |
| A                    | 0.93  | 1.00  | 0.98 |
| A3                   | 0.15  | 0.25  | 0.20 |
| b                    | 0.85  | 1.25  | 1.00 |
| b2                   | 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          |

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