

## Product Summary (@+25°C)

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ max (V) | $I_R$ max ( $\mu$ A) |
|---------------|-----------|---------------|----------------------|
| 150           | 1.0       | 0.82          | 2                    |

## Applications

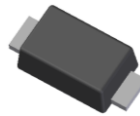
- SMPS
- DC-DC Convert
- Freewheeling Diodes
- Reverse Polarity Protection
- Blocking Diodes

## Features and Benefits

- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: PowerDI<sup>®</sup> 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 <sup>Ⓔ</sup>
- Weight: 0.01 grams (Approximate)



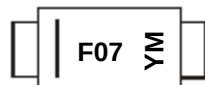
Top View

## Ordering Information (Note 5)

| Part Number | Compliance | Case       | Packaging        |
|-------------|------------|------------|------------------|
| DFLS1150Q-7 | Automotive | PowerDI123 | 3000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



F07 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: F = 2018)  
M = Month (ex: 9 = September)

### Date Code Key

| Year  | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | X    | Y    | Z    | A    | B    | C    | D    | E    | F    | G    | H    | I    |
| 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    |

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DFLS1150Q

Document number: DS38627 Rev. 3 - 2

## 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                                                                     | V <sub>RRM</sub>    | 150   | V    |
| Working Peak Reverse Voltage                                                                        | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage                                                                                 | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage                                                                                 | V <sub>R(RMS)</sub> | 106   | 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 6)                | R <sub>θJS</sub>                  | —           | 7   | °C/W |
| Thermal Resistance Junction to Ambient (Note 7) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 125         | —   | °C/W |
| Thermal Resistance Junction to Ambient (Note 8) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 70          | —   | °C/W |
| Operating and Storage Temperature Range                                | T <sub>J</sub> , T <sub>STG</sub> | -55 to +175 |     | °C   |

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

| Characteristic                     | Symbol             | Min | Typ | Max  | Unit | Test Condition                                                            |
|------------------------------------|--------------------|-----|-----|------|------|---------------------------------------------------------------------------|
| Reverse Breakdown Voltage (Note 9) | V <sub>(BR)R</sub> | 150 | —   | —    | V    | I <sub>R</sub> = 2μA                                                      |
| Forward Voltage                    | V <sub>F</sub>     | —   | —   | 0.82 | V    | I <sub>F</sub> = 1.0A                                                     |
| Leakage Current (Note 9)           | I <sub>R</sub>     | —   | —   | 2    | μA   | V <sub>R</sub> = 150V, T <sub>A</sub> = +25°C                             |
| Total Capacitance                  | C <sub>T</sub>     | —   | 28  | —    | pF   | V <sub>R</sub> = 5V <sub>DC</sub> , f = 1MHz                              |
| Switching Speed                    | t <sub>RR</sub>    | —   | 13  | —    | ns   | I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1A, I <sub>RR</sub> = 0.25A (RG1) |

- Notes:
6. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
  7. Part mounted on FR-4 board with 2 oz., minimum recommended copper pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
  8. Part mounted on 1inch sq. copper pad, 2oz.
  9. Short duration pulse test used to minimize self-heating effect.

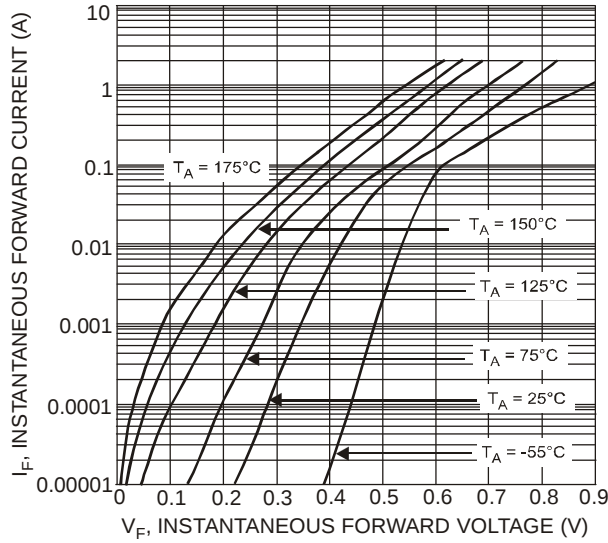


Fig. 1 Typical Forward Characteristics

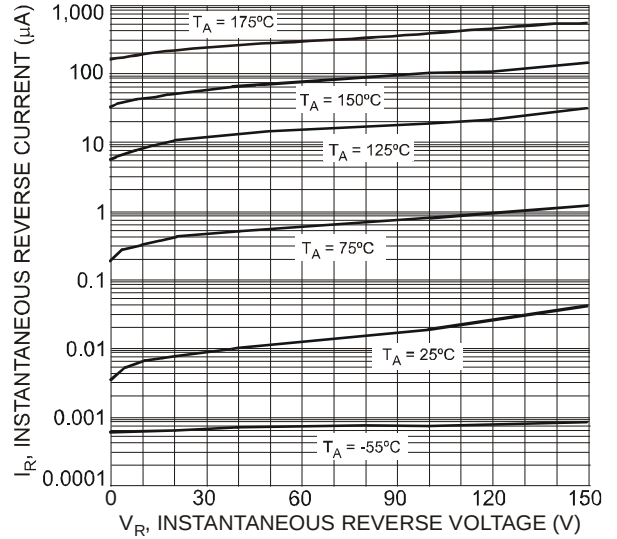


Fig. 2 Typical Reverse Characteristics

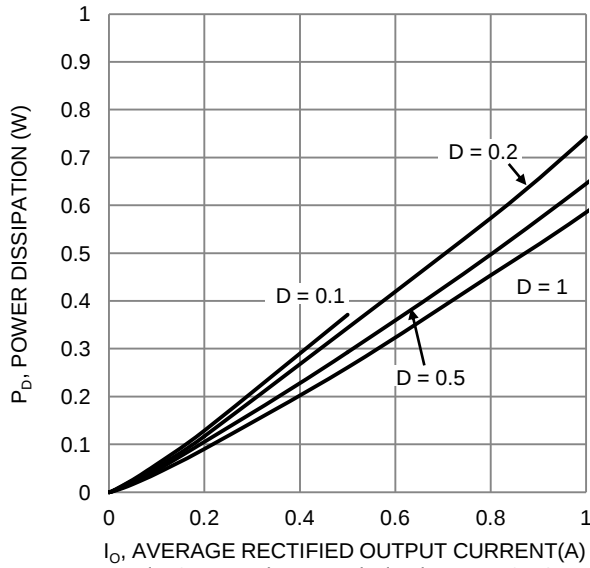


Fig. 3 Forward Power Dissipation  $T_J = 125^\circ\text{C}$

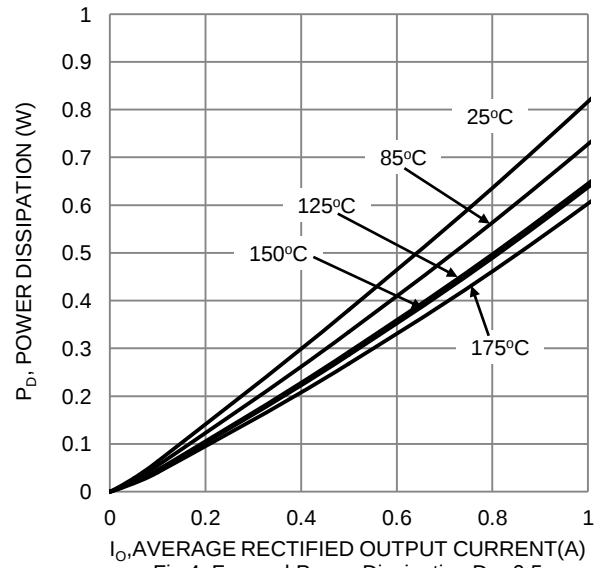


Fig. 4 Forward Power Dissipation  $D = 0.5$

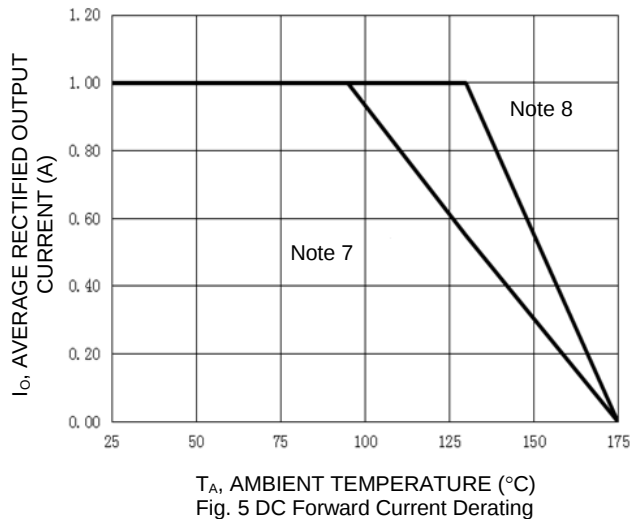


Fig. 5 DC Forward Current Derating

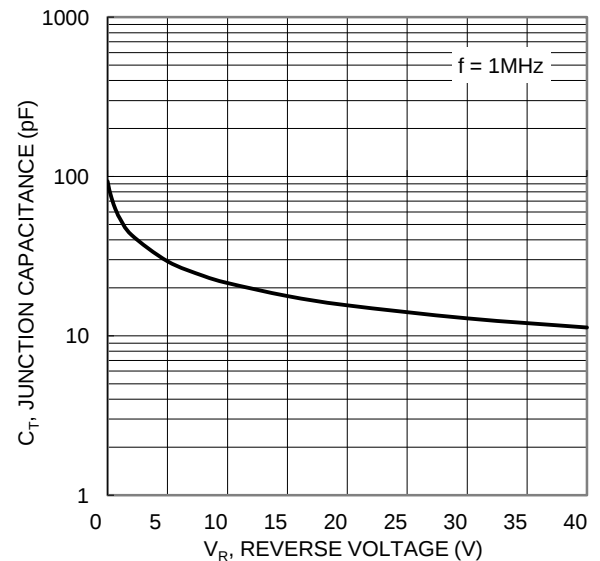


Fig. 6 Typical Junction Capacitance

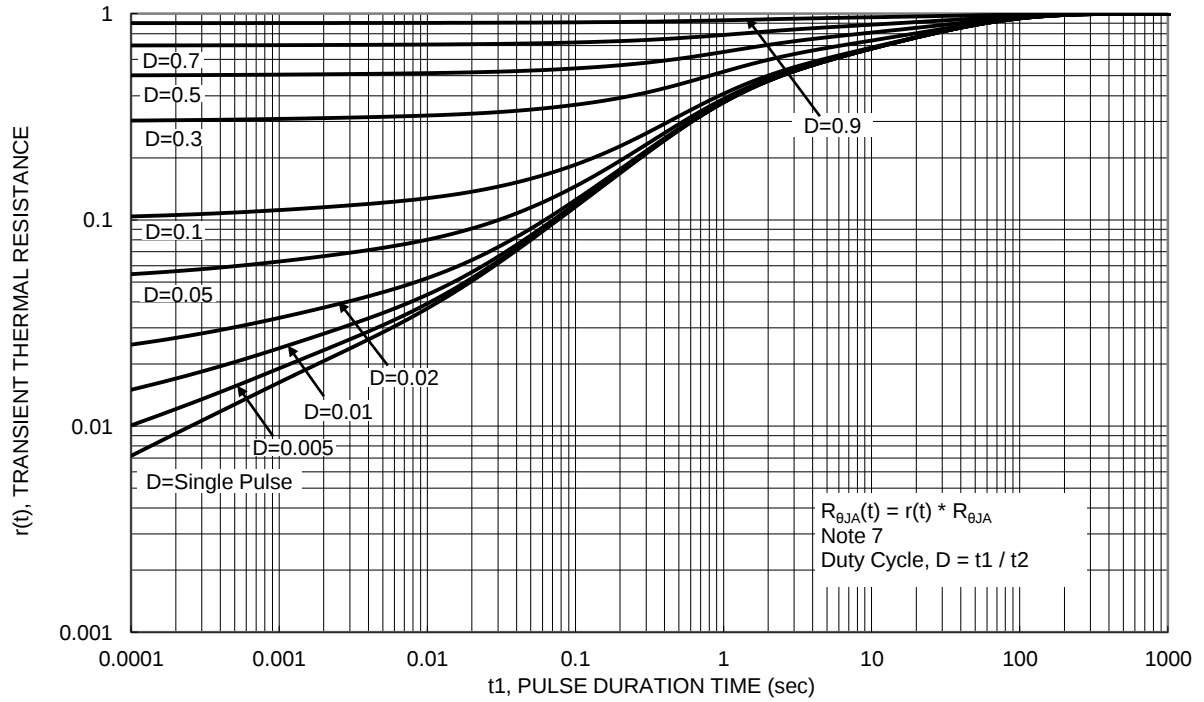
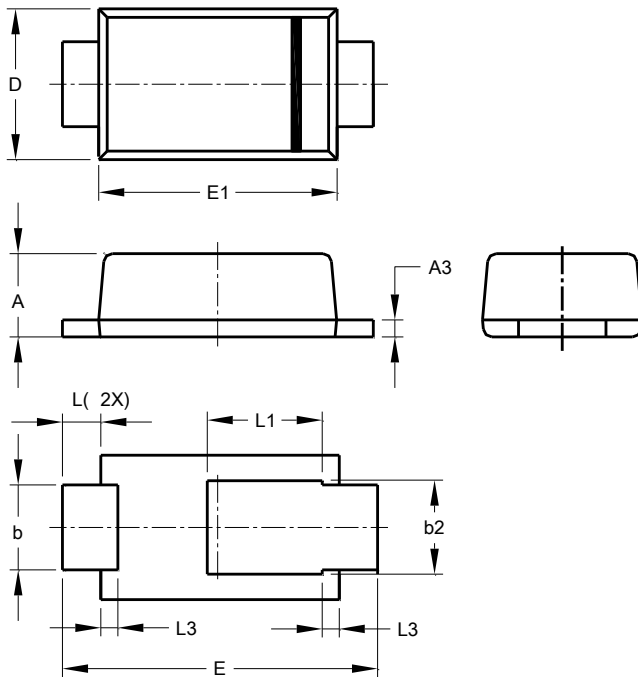


Fig. 7 Transient Thermal Resistance

## Package Outline Dimensions

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

### PowerDI123

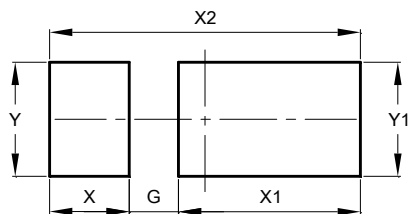


| PowerDI123           |       |       |      |
|----------------------|-------|-------|------|
| Dim                  | Min   | Max   | Typ  |
| A                    | 0.93  | 1.00  | 0.98 |
| A3                   | 0.15  | 0.25  | 0.20 |
| b                    | 0.85  | 1.25  | 1.00 |
| b2        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