



**THE DATASHEET OF
DFLS160Q-7**



Product Summary

| V_R (V) | I_F (A) | $V_{F\ MAX}$ (V) @ +25°C | $I_{R\ MAX}$ (mA) @ +25°C |
|-----------|-----------|-----------------------------|------------------------------|
| 60 | 1.0 | 0.50 | 0.1 |

Description and Applications

This Schottky Barrier Rectifier has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as:

- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

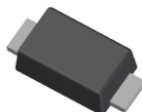
Features and Benefits

- 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[®]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 [Ⓔ]
- Weight: 0.01 grams (Approximate)

PowerDI123



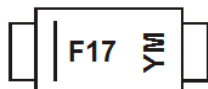
Top View

Ordering Information (Note 5)

| Part Number | Compliance | Case | Packaging |
|-------------|------------|------------|------------------|
| DFLS160Q-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



F17 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | B | C | D | E | F | G | H | I | J | K | L | M | N | O |

| 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 (@ $T_A = +25^\circ\text{C}$, 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_{RRM} | 60 | V |
| Working Peak Reverse Voltage | V_{RWM} | | |
| DC Blocking Voltage | V_R | | |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 42 | V |
| Average Forward Current | $I_{F(AV)}$ | 1.0 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I_{FSM} | 50 | A |
| Electrostatic Discharge | HBM | 4000 | V |
| Electrostatic Discharge | MM | 400 | V |
| Electrostatic Discharge | CDM | 1 | kV |

Thermal Characteristics

| Characteristic | Symbol | Typ | Max | Unit |
|---|-----------------|-------------|-----|--------------------|
| Thermal Resistance Junction to Soldering Point (Cathode) (Note 6) | $R_{\theta JS}$ | — | 6 | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient (Note 7) | $R_{\theta JA}$ | 125 | — | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient (Note 8) | $R_{\theta JA}$ | 60 | — | $^\circ\text{C/W}$ |
| Typical Thermal Resistance to Case (Note 9) | $R_{\theta JC}$ | — | 18 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +150 | | $^\circ\text{C}$ |

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------------------|-------------|-----|-----|------|------|--|
| Reverse Breakdown Voltage (Note 10) | $V_{(BR)R}$ | 60 | — | — | V | $I_R = 0.2\text{mA}$ |
| Forward Voltage | V_F | — | — | 0.50 | V | $I_F = 1.0\text{A}$ |
| Leakage Current (Note 10) | I_R | — | — | 0.1 | mA | $V_R = 60\text{V}, T_A = +25^\circ\text{C}$ |
| Total Capacitance | C_T | — | 67 | — | pF | $V_R = 10\text{V}, f = 1.0\text{MHz}$ |
| Switching Speed t_{RR} | t_{RR} | — | 12 | — | ns | $I_F=0.5\text{A}, I_R=1\text{A}, I_{RR}=0.25\text{A}$ (RG1) |

- Notes:
- Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
 - 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>.
 - Part mounted on 50.8mm*50.8mm GETEK board with 25.4mm*25.4mm copper pad, 25% anode, 75% cathode. $T_A = +25^\circ\text{C}$
 - Part mounted on FR-4 board with 1.8mm X 2.5mm cathode and 1.8mm X 1.2mm anode, 1 oz. copper pads. $T_A = +25^\circ\text{C}$
 - Short duration pulse test to minimize self-heating effect

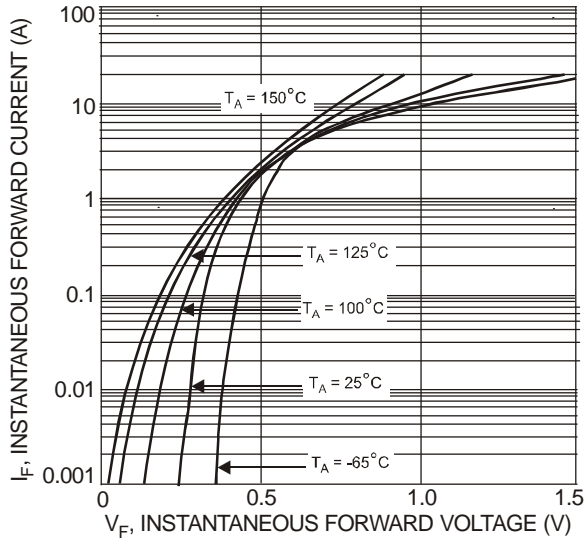


Fig. 1 Typical Forward Characteristics

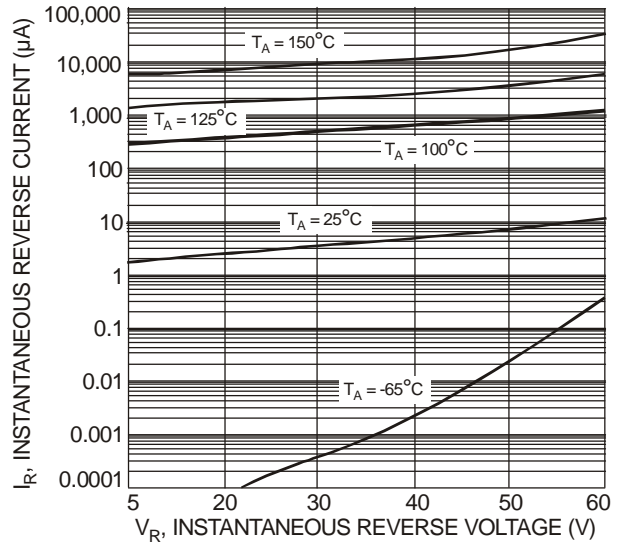


Fig. 2 Typical Reverse Characteristics

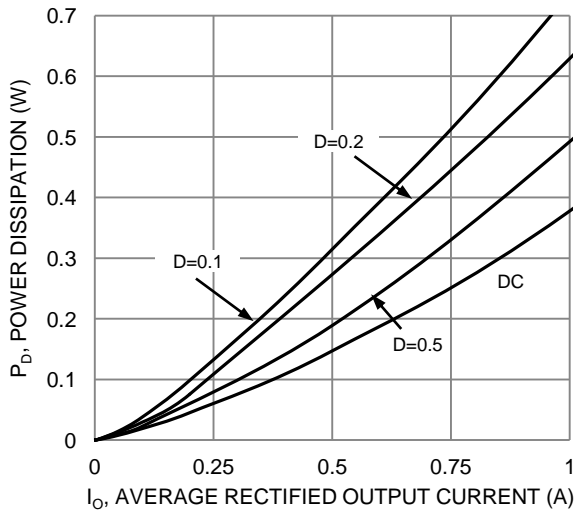


Fig. 3 Forward Power Dissipation $T_J=125^\circ\text{C}$

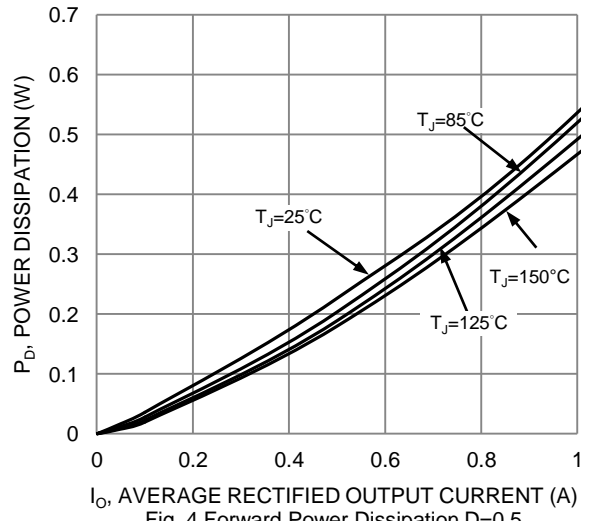


Fig. 4 Forward Power Dissipation $D=0.5$

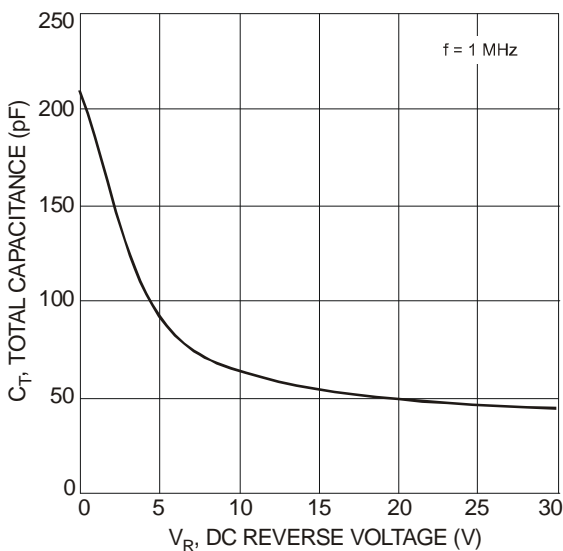


Fig. 5 Total Capacitance vs. Reverse Voltage

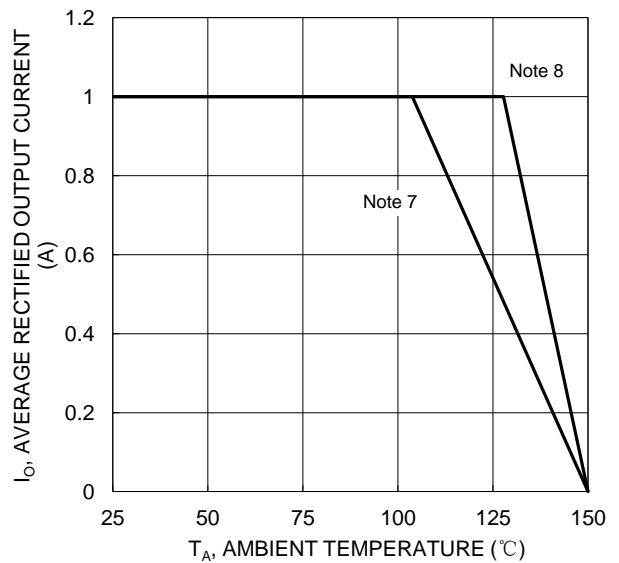


Fig. 6 DC Forward Current Derating

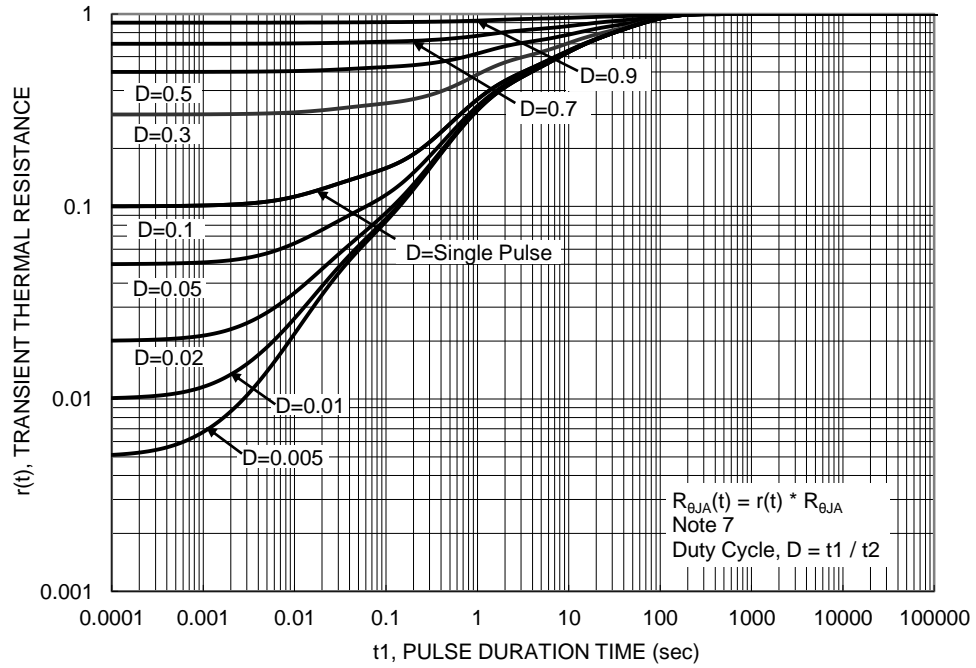
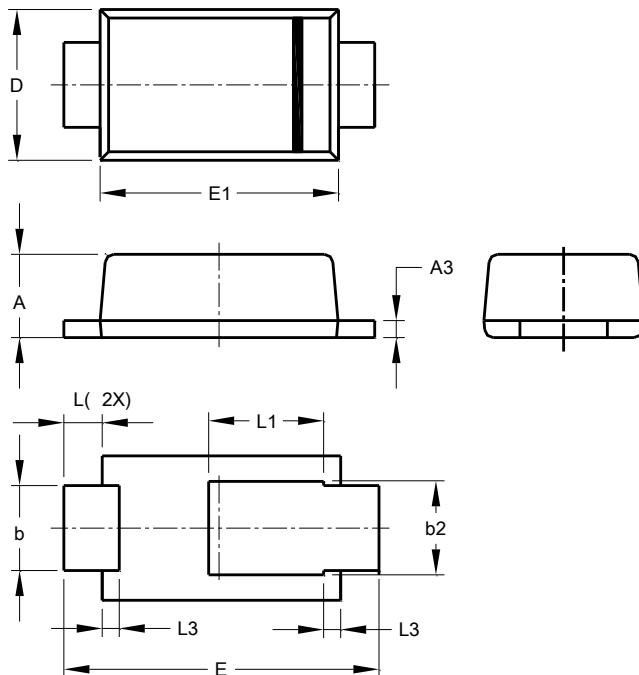


Fig. 7 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI123

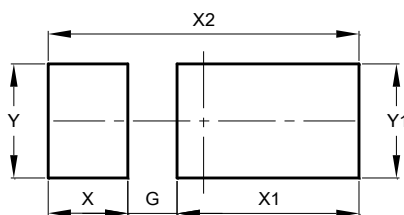


| PowerDI123 | | | |
|----------------------|-------|-------|------|
| Dim | Min | Max | Typ |
| A | 0.93 | 1.00 | 0.98 |
| A3 | 0.15 | 0.25 | 0.20 |
| b | 0.85 | 1.25 | 1.00 |
| b2 | 1.025 | 1.125 | 1.10 |
| D | 1.63 | 1.93 | 1.78 |
| E | 3.50 | 3.90 | 3.70 |
| E1 | 2.60 | 3.00 | 2.80 |
| L | 0.40 | 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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