

**1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER**  
 PowerDI®123

**Features**

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- High Current Capability and Low Forward Voltage Drop
- **Lead Free Finish, RoHS Compliant (Note 4)**
- **"Green" Molding Compound (No Br, Sb)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**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-020D
- Terminal Connections: Cathode Band
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Marking Information: See Page 2
- Ordering Information: See Page 2
- Weight: 0.01 grams (approximate)



Top View

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

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

| Characteristic                                                                                   | Symbol              | Value | Unit |
|--------------------------------------------------------------------------------------------------|---------------------|-------|------|
| Peak Repetitive Reverse Voltage                                                                  | V <sub>RRM</sub>    | 20    | V    |
| Working Peak Reverse Voltage                                                                     | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage                                                                              | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage                                                                              | V <sub>R(RMS)</sub> | 14    | V    |
| Average Forward Current                                                                          | I <sub>F(AV)</sub>  | 1.0   | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load | I <sub>FSM</sub>    | 50    | A    |

**Thermal Characteristics**

| Characteristic                                    | Symbol           | Value       | Unit |
|---------------------------------------------------|------------------|-------------|------|
| Power Dissipation (Note 1)                        | P <sub>D</sub>   | 1.67        | W    |
| Power Dissipation (Note 2)                        | P <sub>D</sub>   | 556         | mW   |
| Thermal Resistance Junction to Ambient (Note 1)   | R <sub>θJA</sub> | 60          | °C/W |
| Thermal Resistance Junction to Ambient (Note 2)   | R <sub>θJA</sub> | 180         | °C/W |
| Thermal Resistance Junction to Soldering (Note 3) | R <sub>θJS</sub> | 10          | °C/W |
| Operating Temperature Range                       | T <sub>J</sub>   | -55 to +125 | °C   |
| Storage Temperature Range                         | T <sub>STG</sub> | -55 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 5) | V <sub>(BR)R</sub> | 20  | —    | —    | V    | I <sub>R</sub> = 1.0mA                      |
| Forward Voltage                    | V <sub>F</sub>     | —   | 0.20 | —    | V    | I <sub>F</sub> = 0.1A                       |
|                                    |                    | —   | 0.30 | —    |      | I <sub>F</sub> = 0.7A                       |
|                                    |                    | —   | 0.32 | 0.36 |      | I <sub>F</sub> = 1.0A                       |
| Leakage Current (Note 5)           | I <sub>R</sub>     | —   | 0.26 | —    | mA   | V <sub>R</sub> = 5V, T <sub>A</sub> = 25°C  |
|                                    |                    | —   | —    | 1.0  |      | V <sub>R</sub> = 20V, T <sub>A</sub> = 25°C |
| Total Capacitance                  | C <sub>T</sub>     | —   | 75   | —    | pF   | V <sub>R</sub> = 10V, f = 1.0MHz            |

- Notes:
1. Part mounted on 50.8mm X 50.8mm GETEK board with 25.4mm X 25.4mm copper pad, 25% anode, 75% cathode. T<sub>A</sub> = 25°C.
  2. 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<sub>A</sub> = 25°C.
  3. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
  4. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*.
  5. Short duration pulse test used to minimize self-heating effect.

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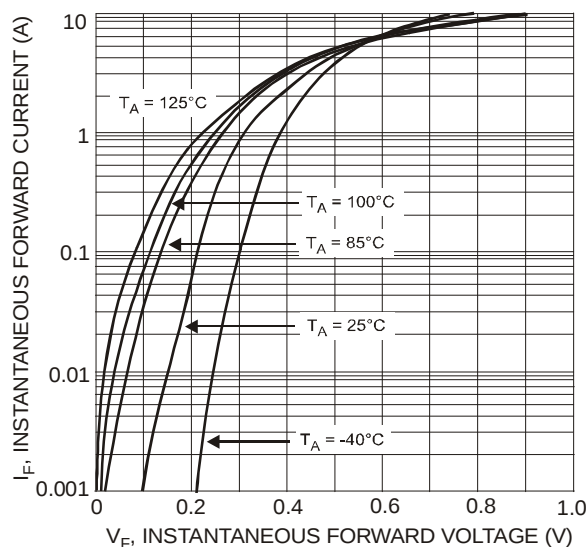


Fig. 1 Typical Forward Characteristics

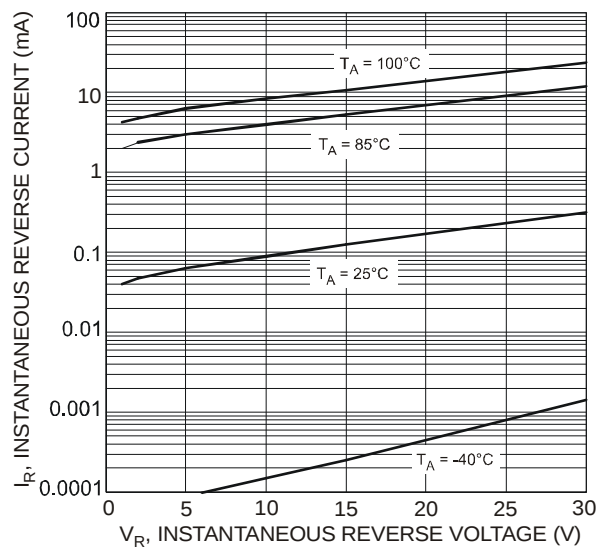


Fig. 2 Typical Reverse Characteristics

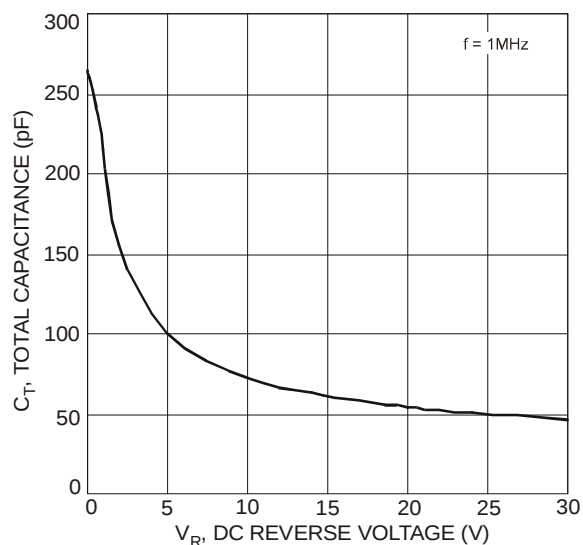


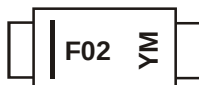
Fig. 3 Total Capacitance vs. Reverse Voltage

## Ordering Information (Note 6)

| Part Number | Case        | Packaging        |
|-------------|-------------|------------------|
| DFLS120L-7  | PowerDI®123 | 3000/Tape & Reel |

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



F02 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

### Date Code Key

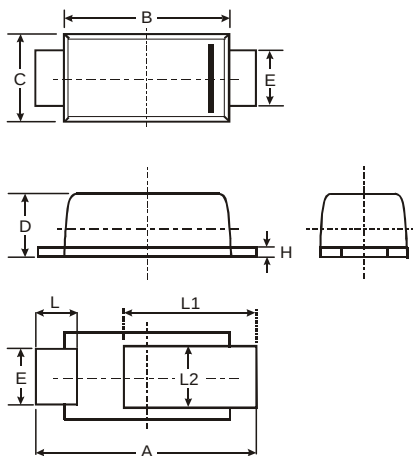
| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|
| Code | R    | S    | T    | U    | V    | W    | X    | Y    | Z    |

| 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   |

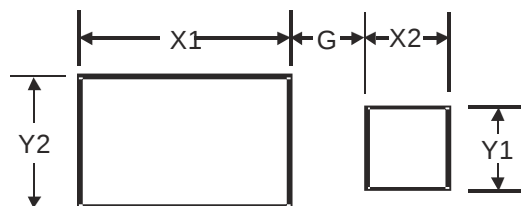
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## Package Outline Dimensions



| PowerDI <sup>®</sup> 123 |      |      |      |
|--------------------------|------|------|------|
| Dim                      | Min  | Max  | Typ  |
| A                        | 3.50 | 3.90 | 3.70 |
| B                        | 2.60 | 3.00 | 2.80 |
| C                        | 1.63 | 1.93 | 1.78 |
| D                        | 0.93 | 1.00 | 0.98 |
| E                        | 0.85 | 1.25 | 1.00 |
| H                        | 0.15 | 0.25 | 0.20 |
| L                        | 0.55 | 0.75 | 0.65 |
| L1                       | 1.80 | 2.20 | 2.00 |
| L2                       | 0.95 | 1.25 | 1.10 |
| All Dimensions in mm     |      |      |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 1.0           |
| X1         | 2.2           |
| X2         | 0.9           |
| Y1         | 1.4           |
| Y2         | 1.4           |

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