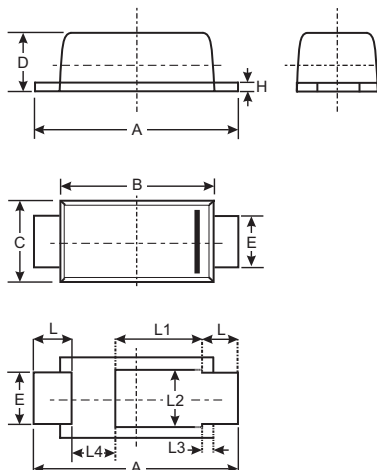


**1.0A SURFACE MOUNT SUPER-FAST RECTIFIER**  
**PowerDI™ 123**
**Features**

- Glass Passivated Die Construction
- Super-Fast Recovery Time for High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- **Lead Free Finish, RoHS Compliant (Note 2)**
- **"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-020C
- Terminal Connections: Cathode Band
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Marking & Type Code Information: See Last Page
- Ordering Information: See Last Page
- Weight: 0.01 grams (approximate)



| PowerDI™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                    | 0.45 | 0.85 | 0.65 |
| L1                   | —    | —    | 1.35 |
| L2                   | —    | —    | 1.10 |
| L3                   | —    | —    | 0.20 |
| L4                   | 0.90 | 1.30 | 1.05 |
| All Dimensions in mm |      |      |      |

**Maximum Ratings and Electrical Characteristics**  $T_A = 25^\circ\text{C}$  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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage (Note 5)                            | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200          | V             |
| RMS Reverse Voltage                                                                                                        | $V_{R(RMS)}$                    | 140          | V             |
| Average Rectified Output Current (see figure 4)                                                                            | $I_O$                           | 1.0          | A             |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single half sine-wave Superimposed on Rated Load                        | $I_{FSM}$                       | 30           | A             |
| Forward Voltage Drop<br>@ $I_F = 0.6\text{A}$<br>@ $I_F = 1.0\text{A}$                                                     | $V_{FM}$                        | 0.90<br>0.98 | V             |
| Peak Reverse Current<br>at Rated DC Blocking Voltage (Note 5)<br>@ $T_A = 25^\circ\text{C}$<br>@ $T_A = 100^\circ\text{C}$ | $I_{RM}$                        | 5.0<br>200   | $\mu\text{A}$ |
| Reverse Recovery Time (Note 4)                                                                                             | $t_{rr}$                        | 25           | ns            |
| Typical Total Capacitance ( $f = 1\text{MHz}$ , $V_R = 4\text{VDC}$ )                                                      | $C_T$                           | 27           | pF            |

**Thermal Characteristics**

| Characteristic                                                             | Symbol          | Typ         | Max | Unit               |
|----------------------------------------------------------------------------|-----------------|-------------|-----|--------------------|
| Power Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$                      | $P_D$           | —           | 1.0 | W                  |
| Thermal Resistance Junction to Soldering Point (Note 3)                    | $R_{\theta JS}$ | —           | 6   | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient (Note 1) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 116         | —   | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient (Note 6) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 182         | —   | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                                    | $T_J, T_{STG}$  | -65 to +150 |     | $^\circ\text{C}$   |

- Notes:
1. Device mounted on 1" x 1", Polyimide PCB; 2 oz. Cu pad layout as shown on Diodes Inc. suggested pad layout document AP02001.pdf.
  2. RoHS revision 13.2.2003. Glass and high temperature solder exemptions applied, see *EU Directive Annex Notes 5 and 7*.
  3. Theoretical  $R_{\theta JS}$  calculated from the top center of the die straight down to the PCB cathode tab solder junction.
  4. Measured with  $I_F = 0.5\text{A}$ ,  $I_R = 1.0\text{A}$ ,  $I_{rr} = 0.25\text{A}$ . See figure 7.
  5. Short duration pulse test to minimize self-heating effect.
  6. Device mounted on FR-4 PCB, 2 oz. Copper, minimum recommended pad layout pattern per <http://www.diodes.com/datasheets/ap02001.pdf>

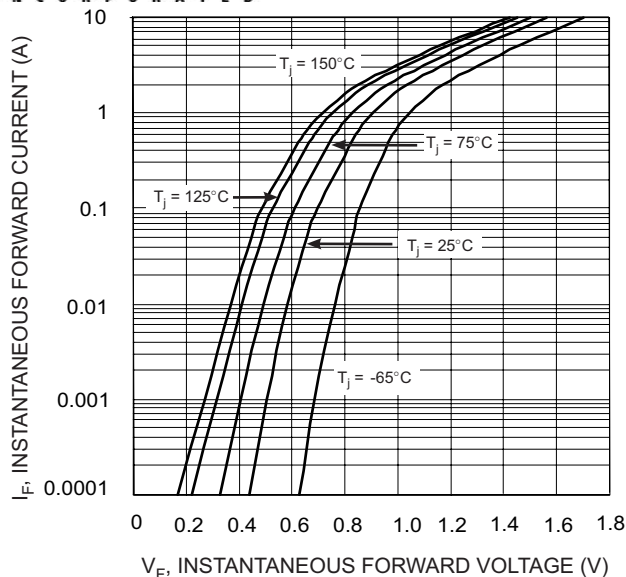


Fig. 1 Typical Forward Characteristics

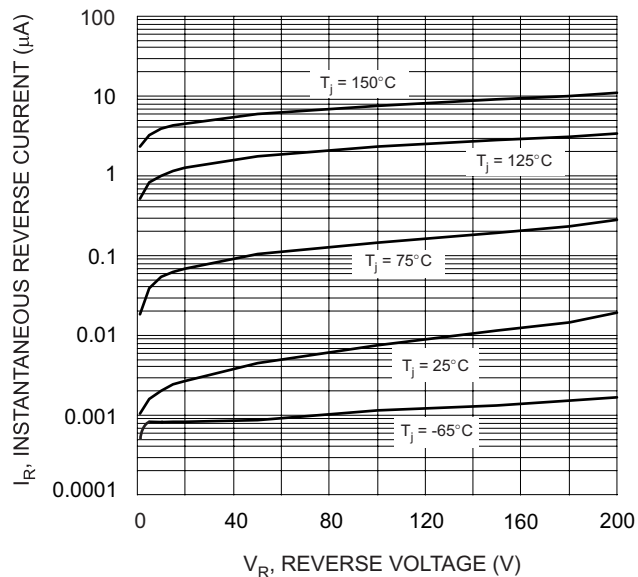


Fig. 2 Typical Reverse Characteristics

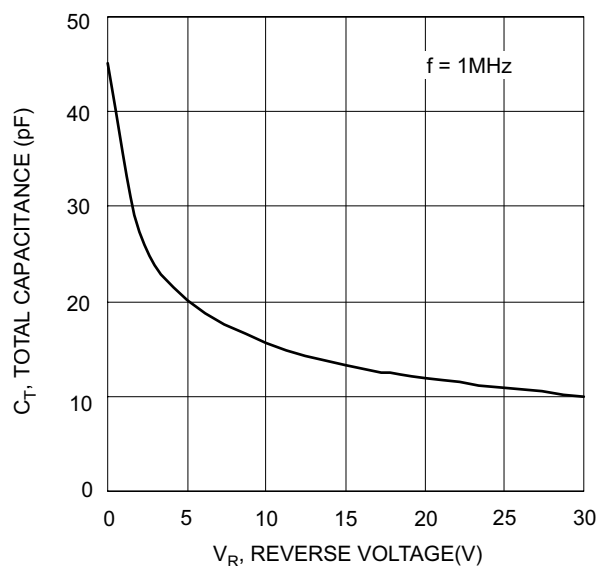


Fig. 3 Typical Total Capacitance

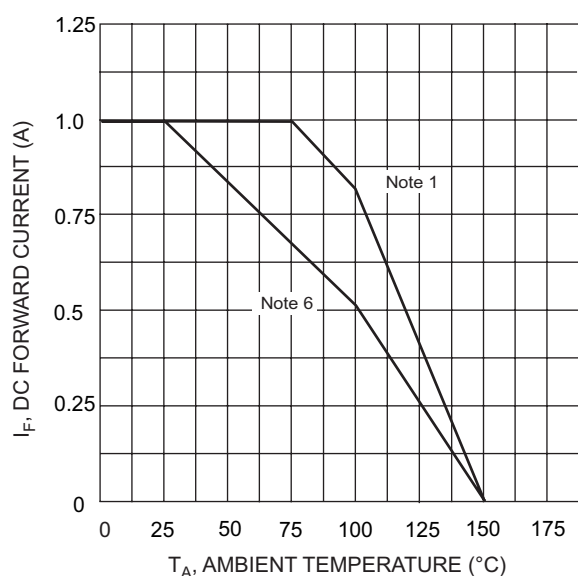


Fig. 4 DC Forward Current Derating

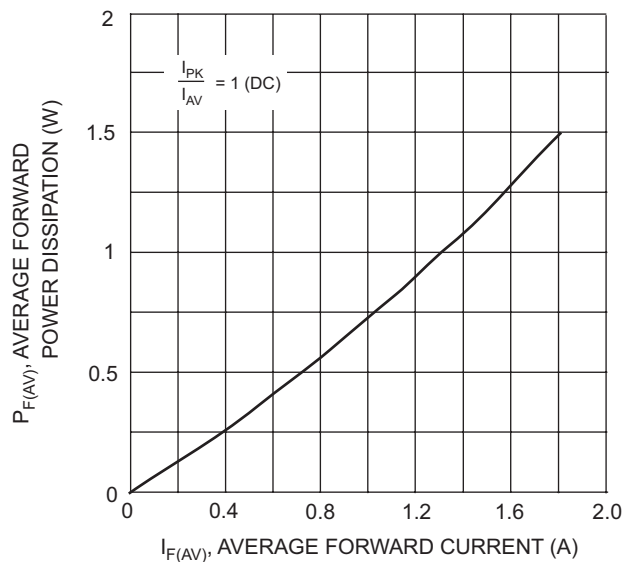


Fig. 5 Forward Power Dissipation

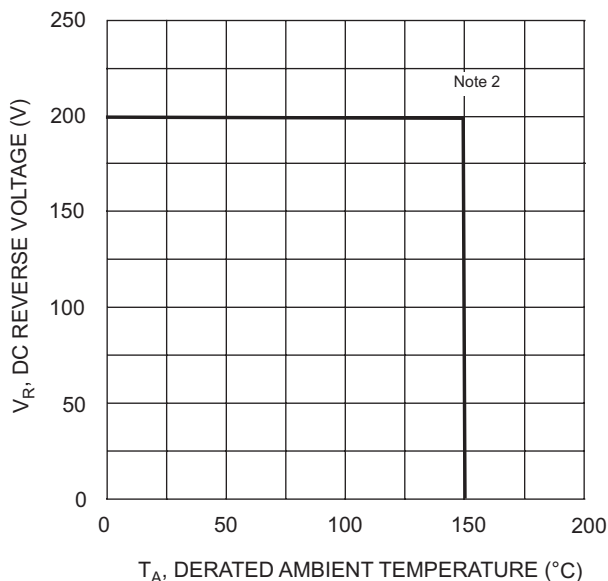
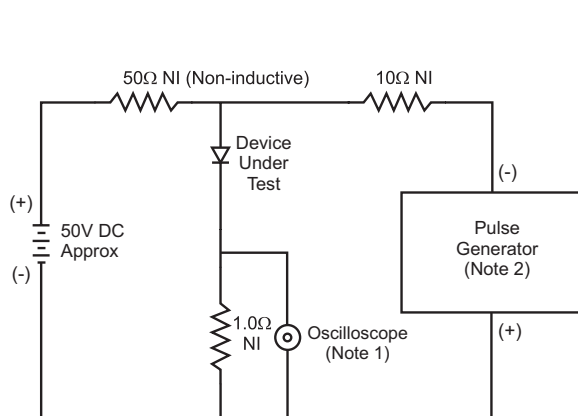
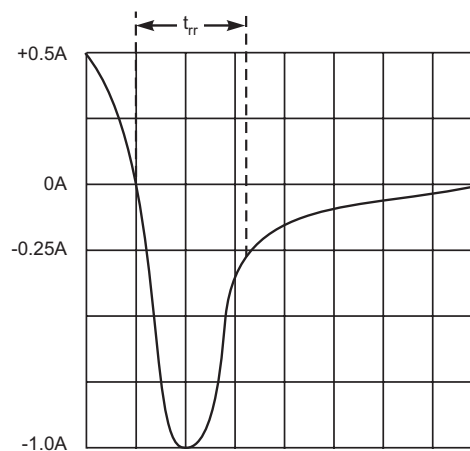


Fig. 6 Operating Temperature Derating



Notes:

1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
2. Rise Time = 10ns max. Input Impedance = 50Ω.



Set time base for 50/100 ns/cm

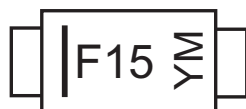
Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

## Ordering Information (Note 7)

| Device     | Marking Code | Packaging    | Shipping         |
|------------|--------------|--------------|------------------|
| DFLU1200-7 | F15          | PowerDI™ 123 | 3000/Tape & Reel |

Notes: 7. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



F15 = Product Type Marking Code (See Table Above)  
 YM = Date Code Marking  
 Y = Year (ex: S = 2005)  
 M = Month (ex: 9 = September)

Date Code Key

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

| Month | Jan | Feb | March | 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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