## Maximum Ratings (@$T_A$ = +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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_{RM}$ | 30 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 21 | V |
| Average Rectified Output Current (See Figure 1) | $I_O$ | 2.0 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 75 | A |
| Non-Repetitive Avalanche Energy<br>($T_J$ = +25°C, $I_{AS}$ = 5A, L = 8.5mH) | $E_{AS}$ | 105 | mJ |
| Repetitive Peak Avalanche Energy<br>($T_P$ = 1µs, $T_J$ = +25°C) | $P_{ARM}$ | 1,100 | W |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Maximum Thermal Resistance<br>Thermal Resistance Junction to Soldering (Note 5)<br>Thermal Resistance Junction to Ambient (Note 6)<br>Thermal Resistance Junction to Ambient (Note 7) | <br>$R_{\theta JS}$<br>$R_{\theta JA}$<br>$R_{\theta JA}$ | <br>5<br>178<br>123 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 8) | $V_{(BR)R}$ | 30 | - | - | V | $I_R$ = 400µA |
| Forward Voltage Drop | $V_F$ | - | 0.22 | 0.26 | V | $I_F$ = 0.1A, $T_J$ = +25°C |
| | | - | 0.31 | 0.35 | | $I_F$ = 1.0A, $T_J$ = +25°C |
| | | - | 0.36 | 0.40 | | $I_F$ = 2.0A, $T_J$ = +25°C |
| | | - | 0.12 | 0.15 | | $I_F$ = 0.1A, $T_J$ = +125°C |
| | | - | 0.27 | 0.30 | | $I_F$ = 1.0A, $T_J$ = +125°C |
| | | - | 0.30 | 0.33 | | $I_F$ = 2.0A, $T_J$ = +125°C |
| Leakage Current (Note 8) | $I_R$ | - | 75 | 150 | µA | $V_R$ = 5V, $T_J$ = +25°C |
| | | - | 150 | 400 | µA | $V_R$ = 30V, $T_J$ = +25°C |
| | | - | 6 | 15 | mA | $V_R$ = 5V, $T_J$ = +125°C |
| | | - | 12 | 20 | mA | $V_R$ = 30V, $T_J$ = +125°C |

Notes:
5. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
6. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
7. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
8. Short duration pulse test used to minimize self-heating effect.

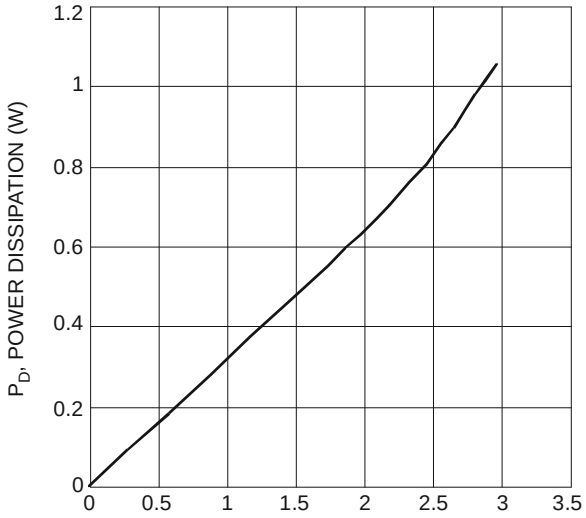



Fig. 1 Forward Power Dissipation

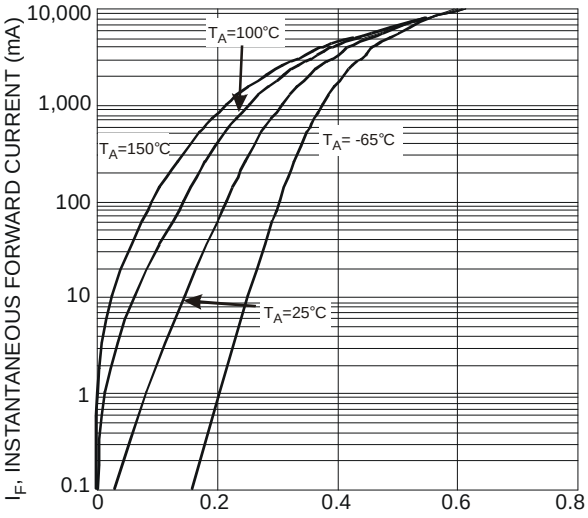



Fig. 2 Typical Forward Characteristics

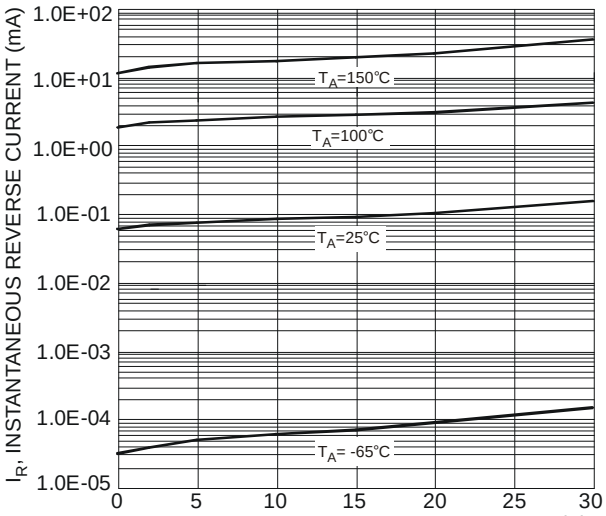



Fig. 3 Typical Reverse Characteristics

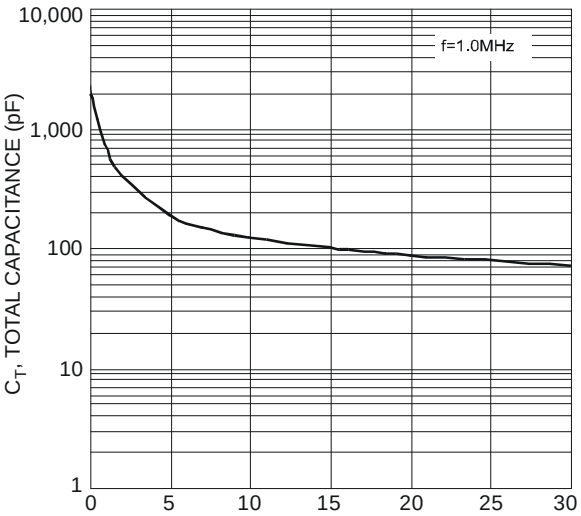



Fig. 4 Total Capacitance vs. Reverse Voltage

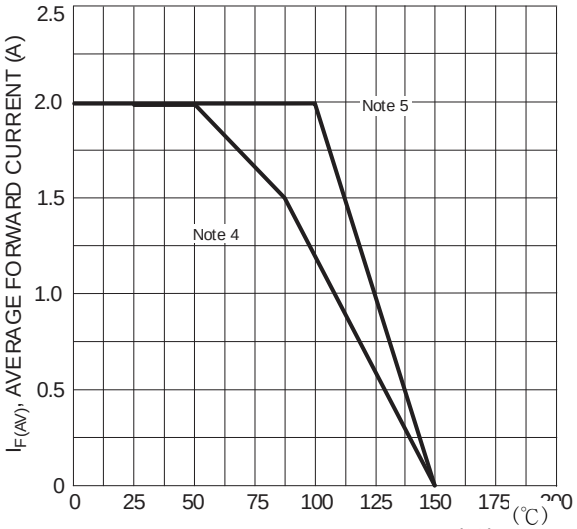



Fig. 5 Forward Current Derating Curve

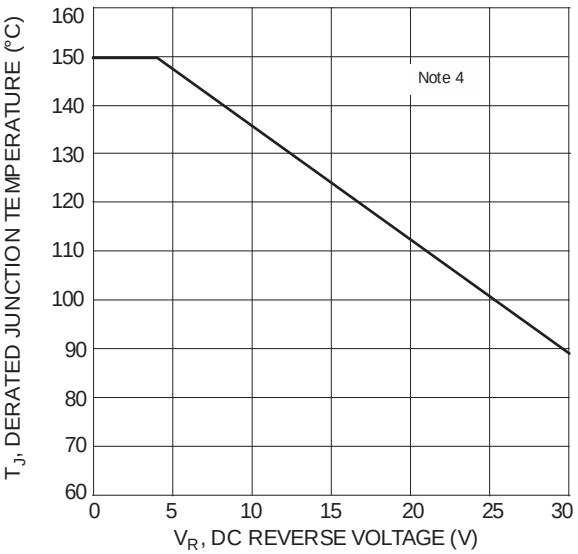



Fig. 6 Operating Temperature Derating

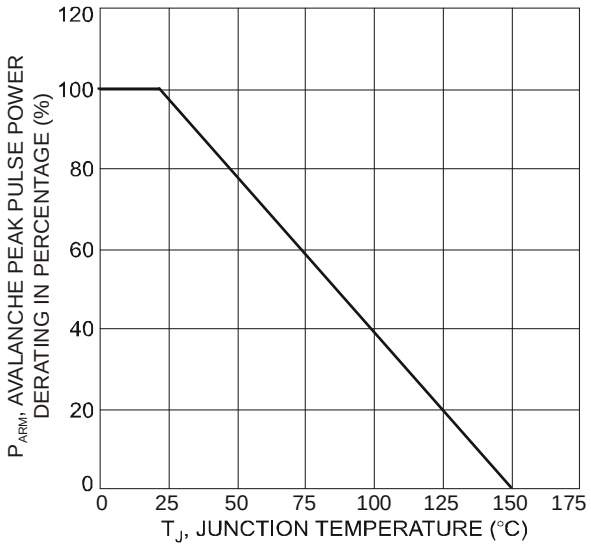



Fig. 7 Pulse Derating Curve

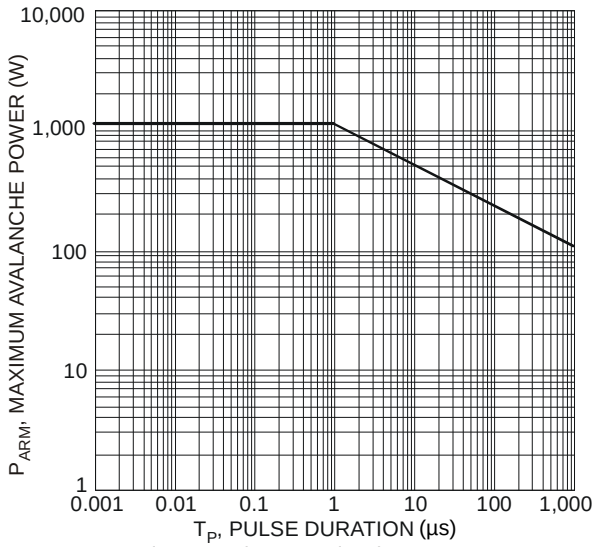



Fig. 8 Maximum Avalanche Power Curve

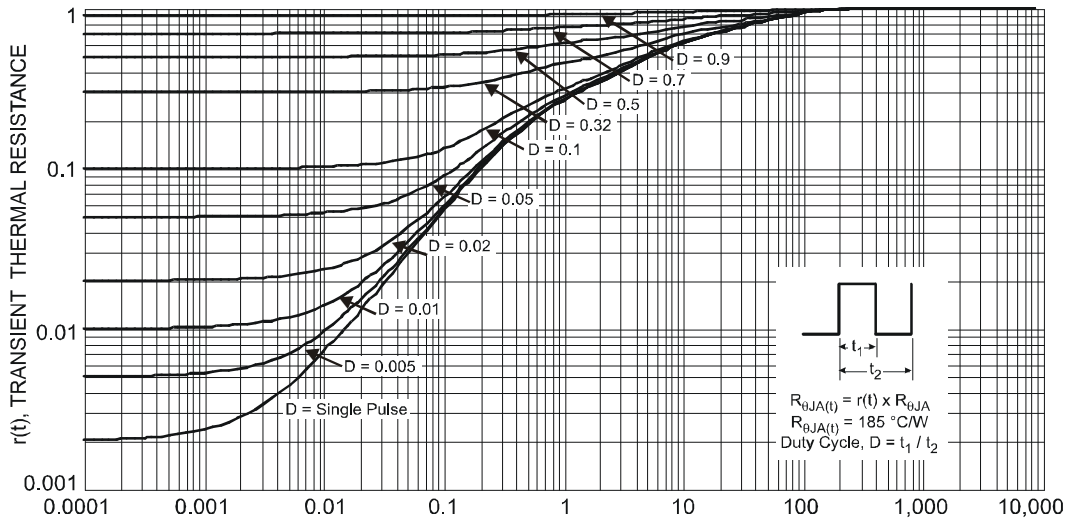
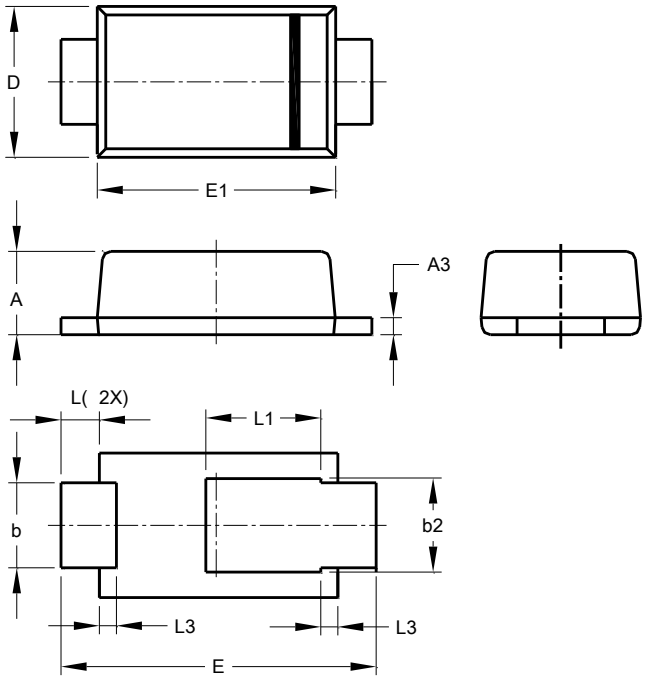



Fig. 9 Transient Thermal Resistance

## Package Outline Dimensions

Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

**POWERDI®123**

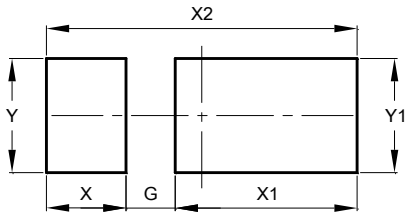



| POWERDI®123 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.93 | 1.00 | 0.98 |
| **A3** | 0.15 | 0.25 | 0.20 |
| **b** | 0.85 | 1.25 | 1.00 |
| **b2** | 1.025 | 1.125 | 1.10 |
| **D** | 1.63 | 1.93 | 1.78 |
| **E** | 3.50 | 3.90 | 3.70 |
| **E1** | 2.60 | 3.00 | 2.80 |
| **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 AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

**POWERDI®123**




| 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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