



**THE DATASHEET OF
DMN3030LFG-7**



Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | Package | I_D $T_A = +25^\circ C$ |
|---------------|------------------------|---------|------------------------------|
| 30V | 18mΩ @ $V_{GS} = 10V$ | POWERDI | 8.6A |
| | 27mΩ @ $V_{GS} = 4.5V$ | 3333-8 | 5.5A |

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Backlighting
- DC-DC Converters
- Power Management Functions

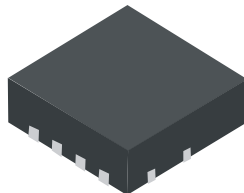
Features

- Low $R_{DS(ON)}$ – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

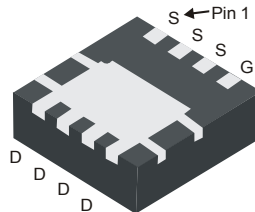
Mechanical Data

- Case: POWERDI3333-8
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.072 grams (approximate)

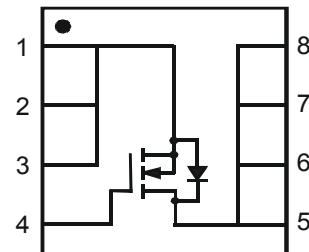
POWERDI3333-8



Top View



Bottom View



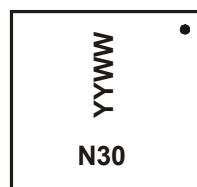
Top View
Internal Schematic

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|---------------|--------------------|
| DMN3030LFG-7 | POWERDI3333-8 | 2000 / Tape & Reel |
| DMN3030LFG-13 | POWERDI3333-8 | 3000 / Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



N30 = Product marking code
 YYWW = Date code marking
 YY = Last digit of year (ex: 10 for 2010)
 WW = Week code (01 – 53)

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

| Characteristic | | | Symbol | Value | Units |
|--|------------------|--|-----------|------------|-------|
| Drain-Source Voltage | | | V_{DSS} | 30 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 25 | V |
| Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$ | Steady State | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | 5.3 4.2 | A |
| | $t < 10\text{s}$ | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | 6.8 5.2 | A |
| Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$ | Steady State | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | 8.6 6.8 | A |
| | $t < 10\text{s}$ | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | 11 8.8 | A |
| Pulsed Drain Current (10 μs pulse, duty cycle = 1%) | | | I_{DM} | 70 | A |
| Maximum Body Diode continuous Current | | | I_S | 3 | A |

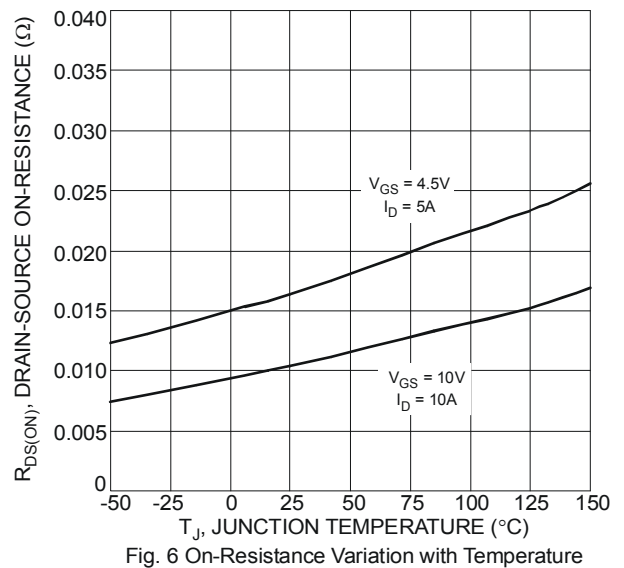
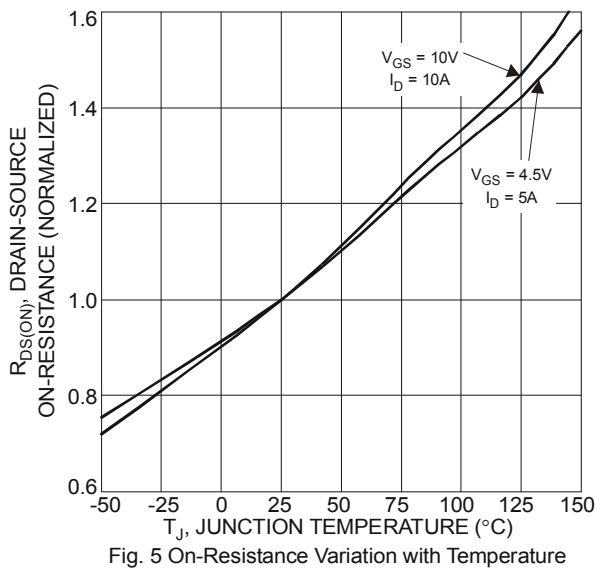
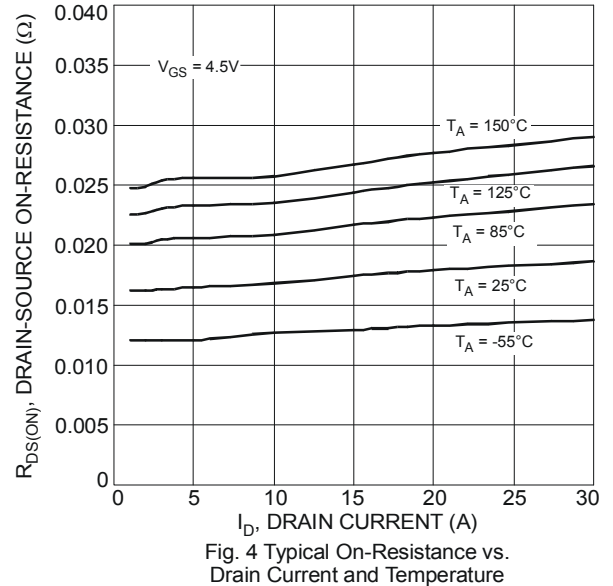
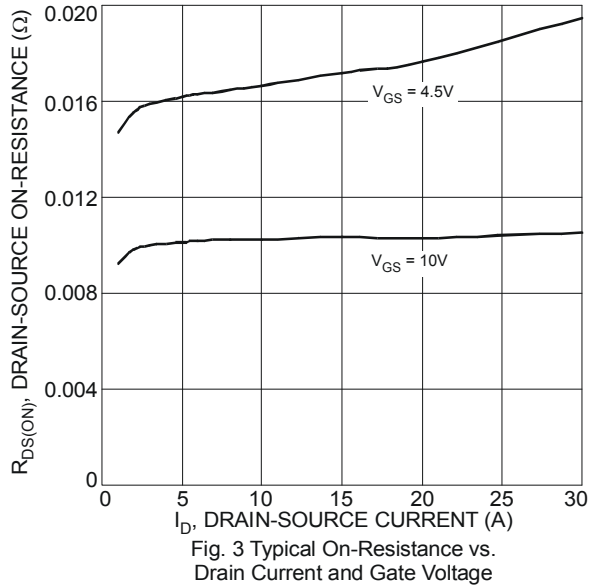
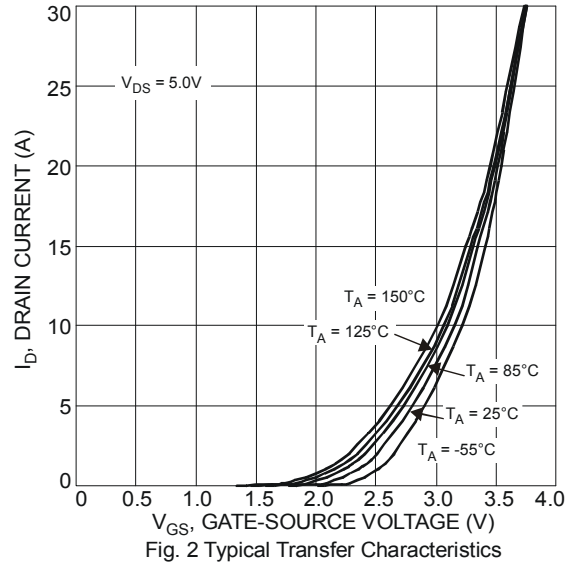
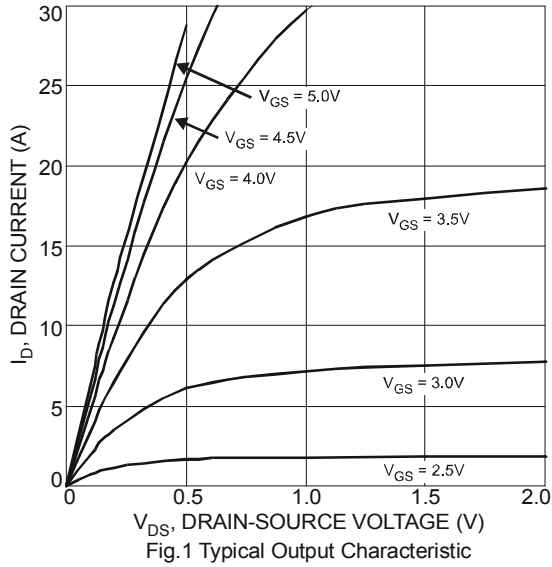
Thermal Characteristics

| Characteristic | | Symbol | Value | Units |
|--|---------------------------|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 5) | $T_A = +25^\circ\text{C}$ | P_D | 0.9 | W |
| | $T_A = +70^\circ\text{C}$ | | 0.5 | |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | $R_{\theta JA}$ | 148 | $^\circ\text{C/W}$ |
| | $t < 10\text{s}$ | | 89 | |
| Total Power Dissipation (Note 6) | $T_A = +25^\circ\text{C}$ | P_D | 2.3 | W |
| | $T_A = +70^\circ\text{C}$ | | 1.4 | |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady state | $R_{\theta JA}$ | 56 | $^\circ\text{C/W}$ |
| | $t < 10\text{s}$ | | 34 | |
| Thermal Resistance, Junction to Case (Note 6) | | $R_{\theta JC}$ | 6.9 | $^\circ\text{C}$ |
| Operating and Storage Temperature Range | | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|--------------|-----|------|---------|---------------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 30 | — | — | V | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$ | I_{DSS} | — | — | 100 | nA | $V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 1 | μA | $V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$ |
| | | — | — | 100 | nA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 0.8 | 1.2 | 2.1 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | — | 10 | 18 | m Ω | $V_{GS} = 10\text{V}, I_D = 10\text{A}$ |
| | | — | 16 | 27 | | $V_{GS} = 4.5\text{V}, I_D = 7.5\text{A}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | — | 6 | — | S | $V_{DS} = 5\text{V}, I_D = 10\text{A}$ |
| Diode Forward Voltage | V_{SD} | — | 0.7 | 1.0 | V | $V_{GS} = 0\text{V}, I_S = 1\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | — | 751 | — | pF | $V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 121 | — | | |
| Reverse Transfer Capacitance | C_{rss} | — | 110 | — | | |
| Gate Resistance | R_g | — | 1.5 | — | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ |
| Total Gate Charge $V_{GS} = 4.5\text{V}$ | Q_g | — | 9 | — | nC | $V_{GS} = 4.5\text{V}, V_{DS} = 15\text{V}, I_D = 6\text{A}$ |
| Total Gate Charge $V_{GS} = 10\text{V}$ | Q_g | — | 17.4 | — | | |
| Gate-Source Charge | Q_{gs} | — | 2.2 | — | | |
| Gate-Drain Charge | Q_{gd} | — | 3 | — | | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 2.5 | — | ns | $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_G = 6\Omega, R_L = 1.8\Omega, I_D = 6.7\text{A}$ |
| Turn-On Rise Time | t_r | — | 6.6 | — | | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 19.0 | — | | |
| Turn-Off Fall Time | t_f | — | 6.3 | — | | |

- Notes:
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.



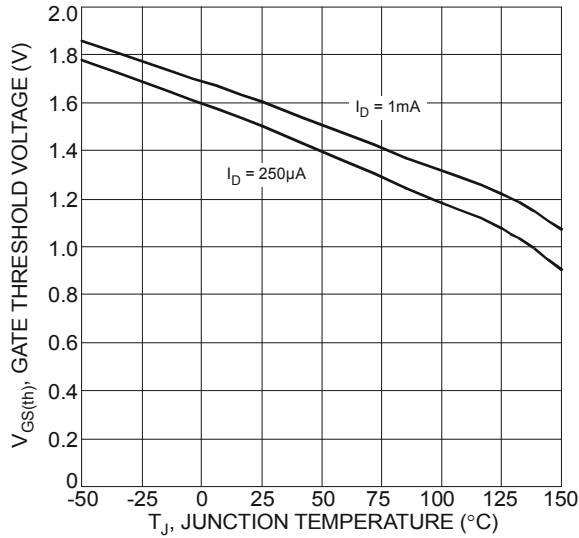


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

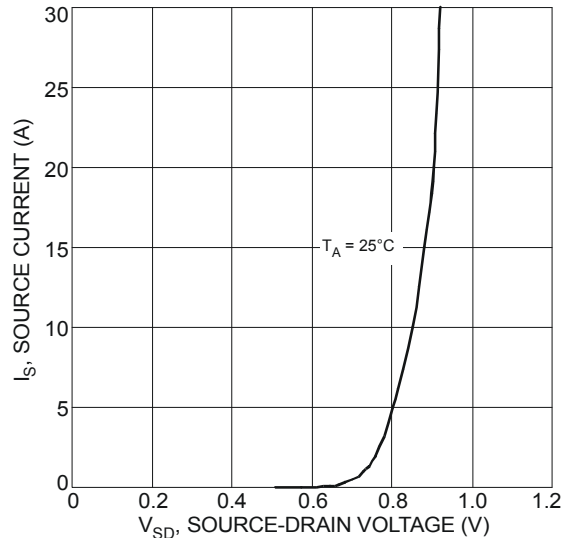


Fig. 8 Diode Forward Voltage vs. Current

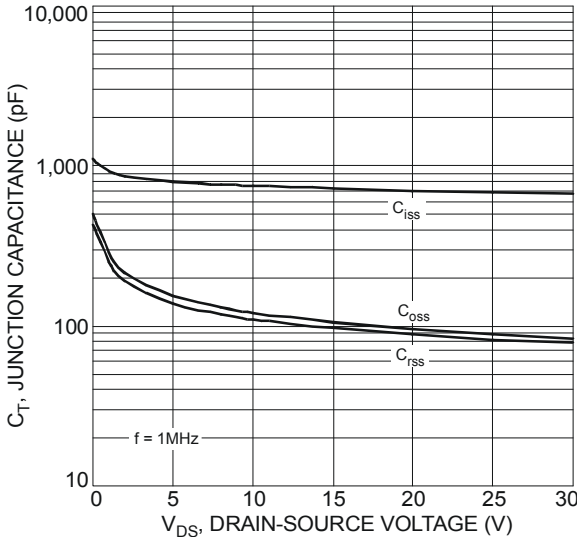


Fig. 9 Typical Junction Capacitance

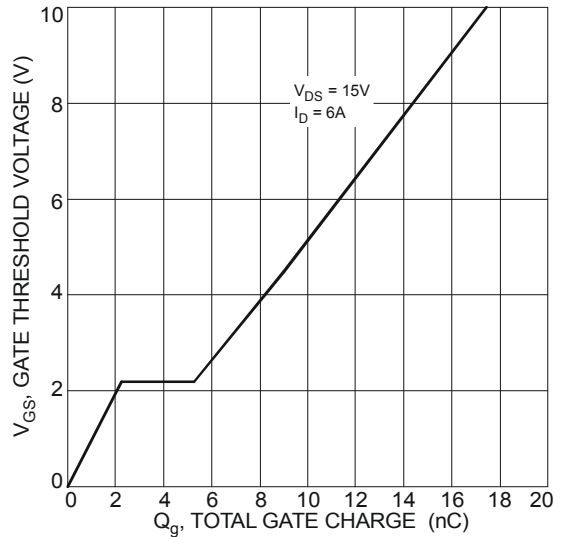


Fig. 10 Gate Charge

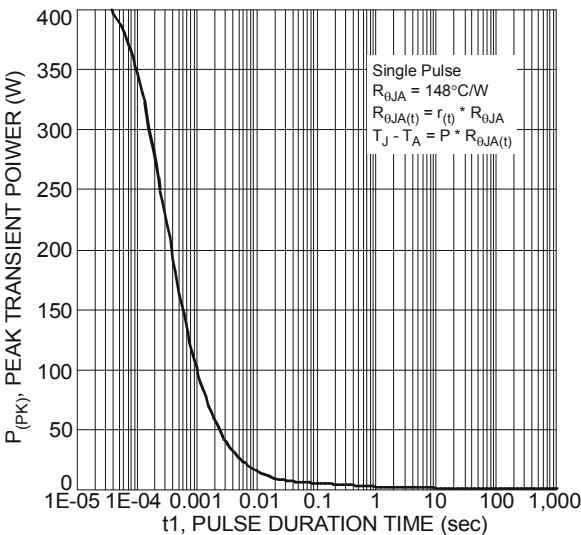


Fig. 11 Single Pulse Maximum Power Dissipation

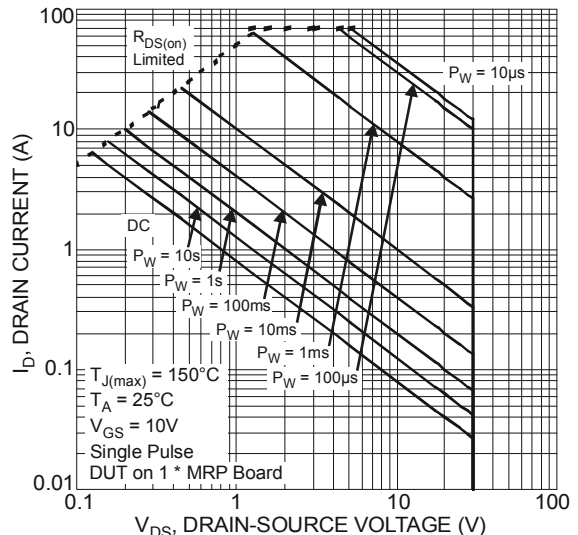
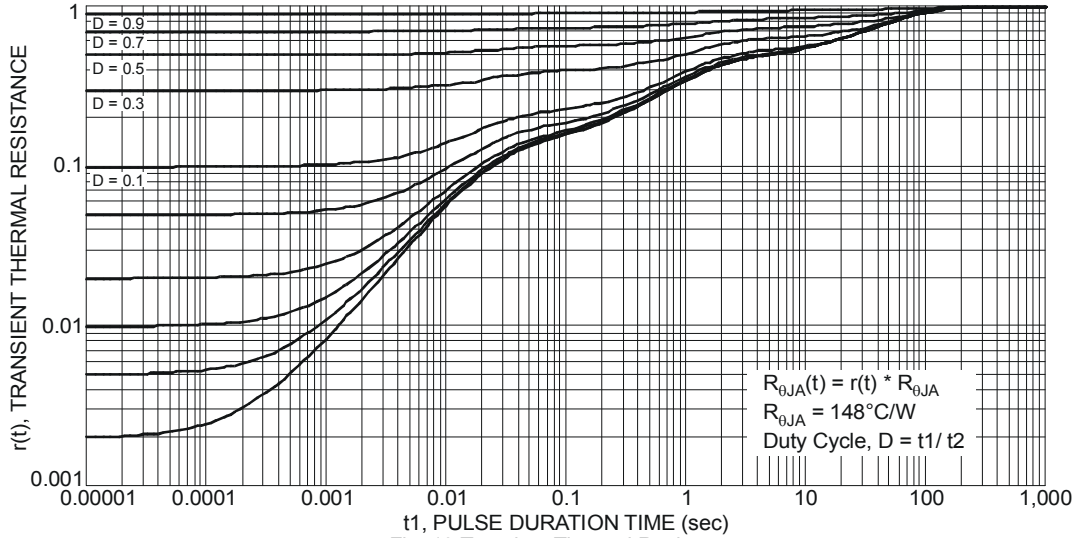
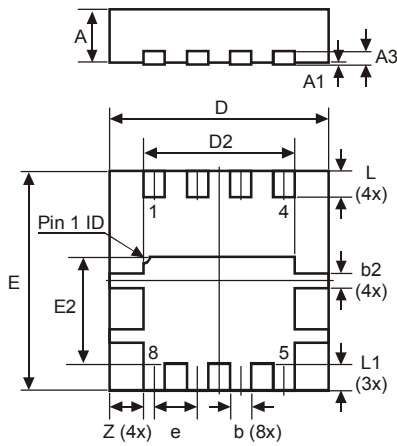


Fig. 12 SOA, Safe Operation Area

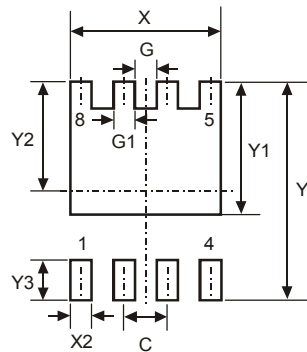


Package Outline Dimensions



| POWERDI [®] 3333-8 | | | |
|-----------------------------|------|------|-------|
| Dim | Min | Max | Typ |
| D | 3.25 | 3.35 | 3.30 |
| E | 3.25 | 3.35 | 3.30 |
| D2 | 2.22 | 2.32 | 2.27 |
| E2 | 1.56 | 1.66 | 1.61 |
| A | 0.75 | 0.85 | 0.80 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | | | 0.203 |
| b | 0.27 | 0.37 | 0.32 |
| b2 | | | 0.20 |
| L | 0.35 | 0.45 | 0.40 |
| L1 | | | 0.39 |
| e | | | 0.65 |
| Z | | | 0.515 |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| G | 0.230 |
| G1 | 0.420 |
| Y | 3.700 |
| Y1 | 2.250 |
| Y2 | 1.850 |
| Y3 | 0.700 |
| X | 2.370 |
| X2 | 0.420 |

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