

**DUAL 30V N-CHANNEL ENHANCEMENT MODE MOSFET
PowerDI3333-8 (Type UXC)**
Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _C = +25°C |
|-------------------|-------------------------------|--|
| 30V | 10mΩ @ V _{GS} = 10V | 25A |
| | 14mΩ @ V _{GS} = 4.5V | 20A |

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, which makes it ideal for high-efficiency power management applications.

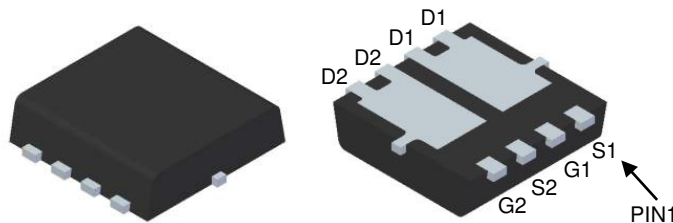
Applications

- Power Management Functions
- Analog Switch

Mechanical Data

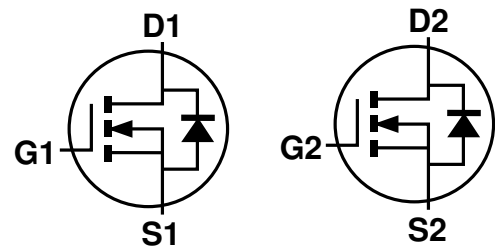
- Case: PowerDI[®] 3333-8 (Type UXC)
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.072 grams (Approximate)

PowerDI3333-8 (Type UXC)



Top View

Bottom View

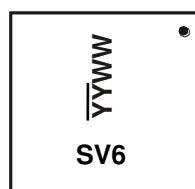


Equivalent Circuit

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------------------------|------------------|
| DMT3006LDV-7 | PowerDI3333-8 (Type UXC) | 2000/Tape & Reel |
| DMT3006LDV-13 | PowerDI3333-8 (Type UXC) | 3000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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. For packaging details, see <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


SV6 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 18 for 2018)
 WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|---|--------------|--|------------------|----------|------|
| Drain-Source Voltage | | | V _{DSS} | 30 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Continuous Drain Current, V _{GS} = 10V (Note 7) | Steady State | T _C = +25°C T _C = +70°C | I _D | 25 20 | A |
| Maximum Body Diode Forward Current (Note 7) | | | I _S | 25 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | | | I _{DM} | 90 | A |
| Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%) | | | I _{SM} | 90 | A |
| Avalanche Current (L = 0.1mH) (Note 8) | | | I _{AS} | 34 | A |
| Avalanche Energy (L = 0.1mH) (Note 8) | | | E _{AS} | 58 | mJ |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|--|--------------|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) | | | P _D | 0.9 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | | R _{θJA} | 134 | °C/W |
| | t < 10s | | | 78 | |
| Total Power Dissipation (Note 6) | | | P _D | 1.8 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | | R _{θJA} | 70 | °C/W |
| | t < 10s | | | 41 | |
| Thermal Resistance, Junction to Case (Note 7) | | | R _{θJC} | 14 | |
| Operating and Storage Temperature Range | | | T _J , T _{STG} | -55 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-------|------|------|--|
| OFF CHARACTERISTICS (Note 9) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 30 | — | — | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | — | — | 1 | µA | V _{DS} = 24V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = +20V, V _{DS} = 0V V _{GS} = -16V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 9) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1.0 | — | 3.0 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 7.6 | 10 | mΩ | V _{GS} = 10V, I _D = 9.0A |
| | | — | 10.0 | 14 | | V _{GS} = 4.5V, I _D = 8.5A |
| Diode Forward Voltage | V _{SD} | — | 0.70 | 1.2 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 10) | | | | | | |
| Input Capacitance | C _{iss} | — | 1,155 | — | pF | V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 456 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 72 | — | | |
| Gate Resistance | R _G | — | 1.6 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _G | — | 8.4 | — | nC | V _{DD} = 15V, I _D = 9A |
| Total Gate Charge (V _{GS} = 10V) | Q _G | — | 16.7 | — | | |
| Gate-Source Charge | Q _{GS} | — | 2.2 | — | | |
| Gate-Drain Charge | Q _{GD} | — | 3.5 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 3.5 | — | ns | V _{DD} = 15V, V _{GS} = 10V, R _G = 3Ω, I _D = 9A |
| Turn-On Rise Time | t _R | — | 5.5 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 13.5 | — | | |
| Turn-Off Fall Time | t _F | — | 4.6 | — | | |
| Reverse Recovery Time | t _{RR} | — | 19.3 | — | ns | I _F = 1.5A, di/dt = 100A/µs |
| Reverse Recovery Charge | Q _{RR} | — | 8.6 | — | nC | |

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PCB, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 - Thermal resistance from junction to soldering point (on the exposed drain pad).
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

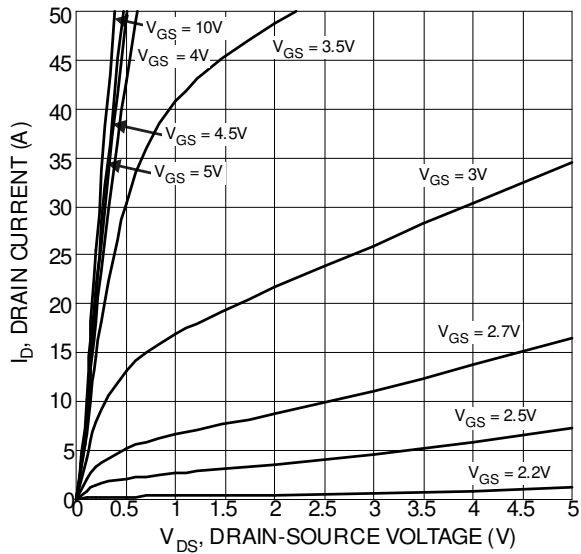


Figure 1 Typical Output Characteristic

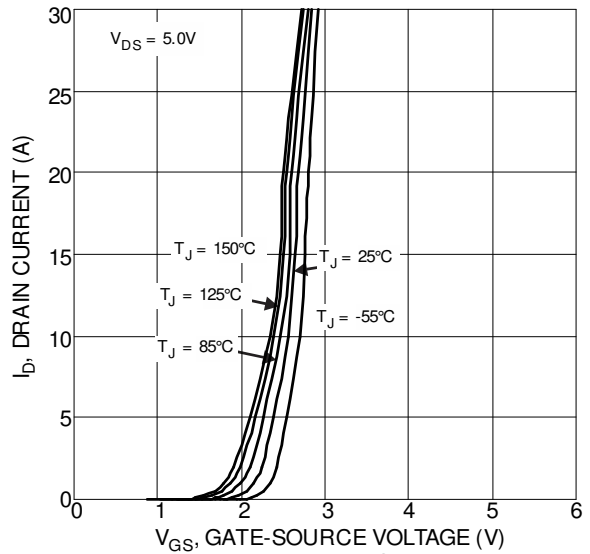


Figure 2 Typical Transfer Characteristics

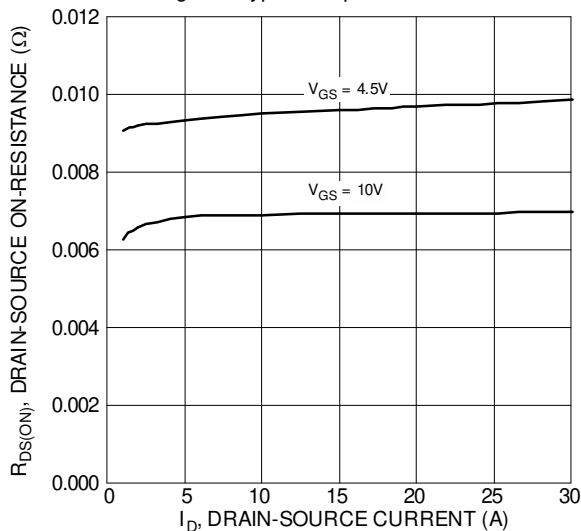


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

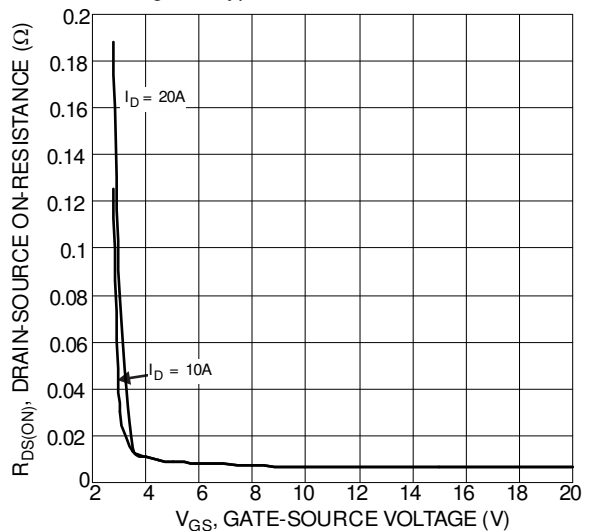


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

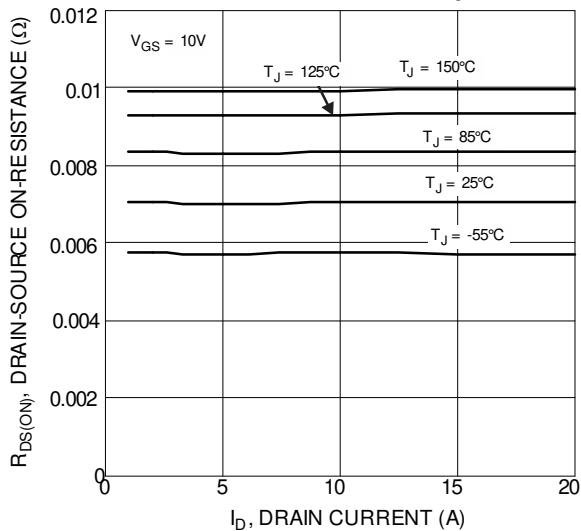


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

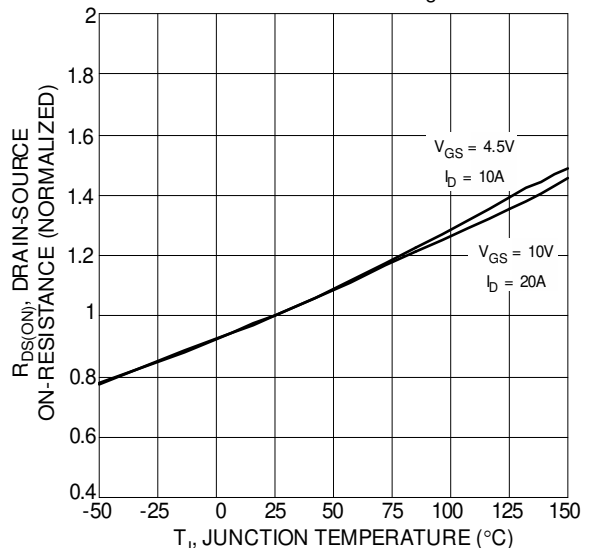


Figure 6 On-Resistance Variation with Temperature

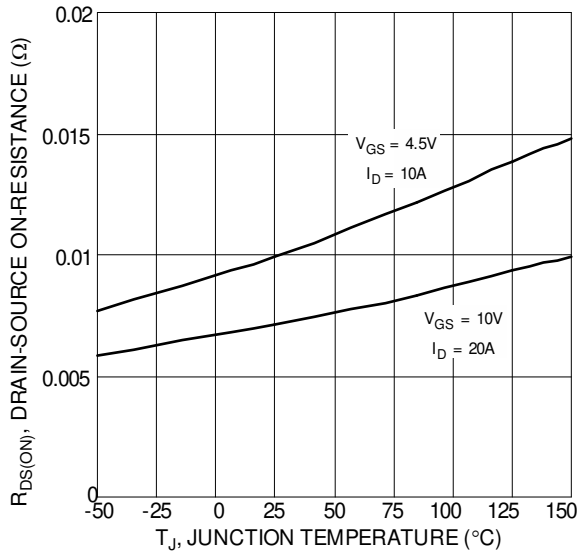


Figure 7 On-Resistance Variation with Temperature

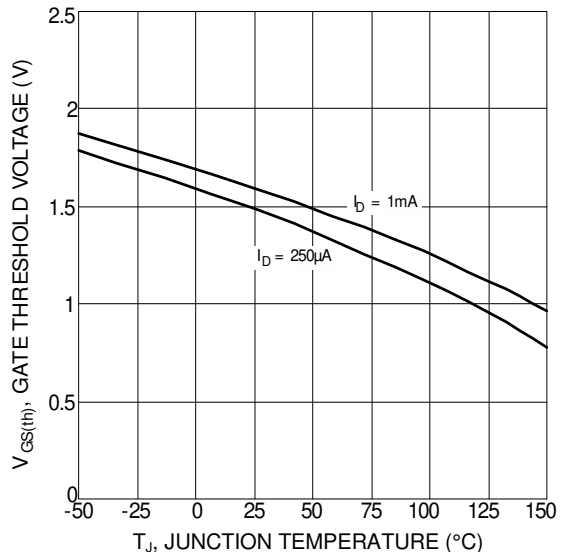


Figure 8 Gate Threshold Variation vs. Junction Temperature

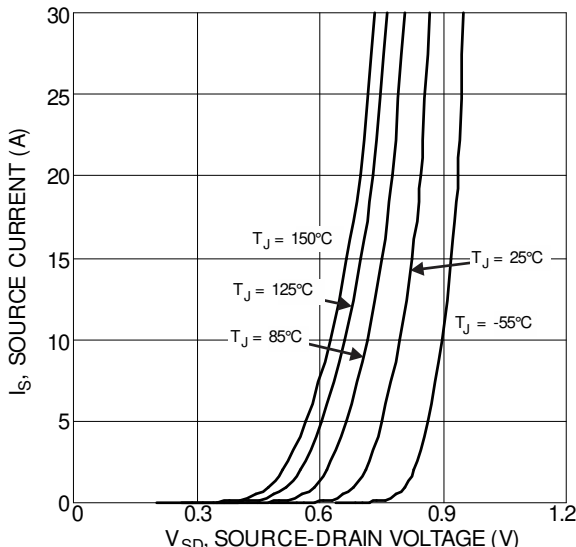


Figure 9 Diode Forward Voltage vs. Current

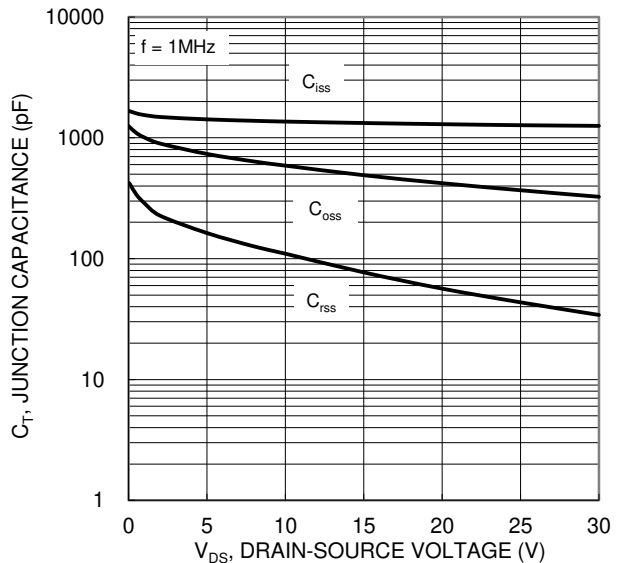


Figure 10. Typical Junction Capacitance

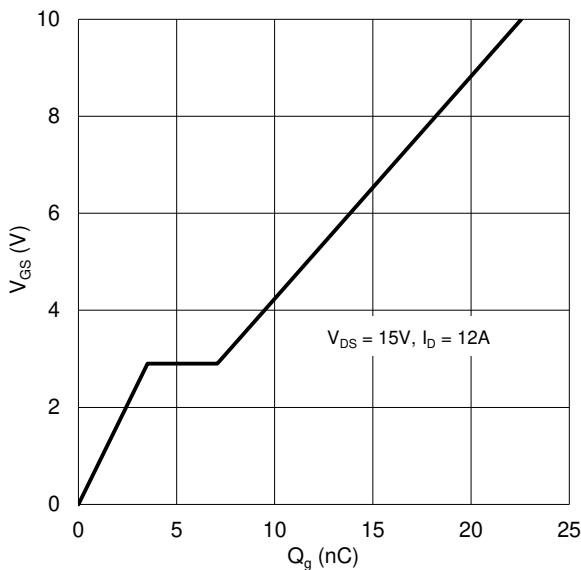


Figure 11. Gate Charge

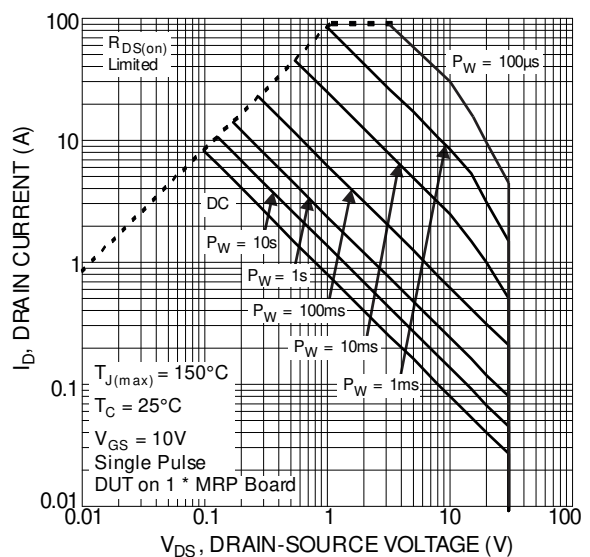
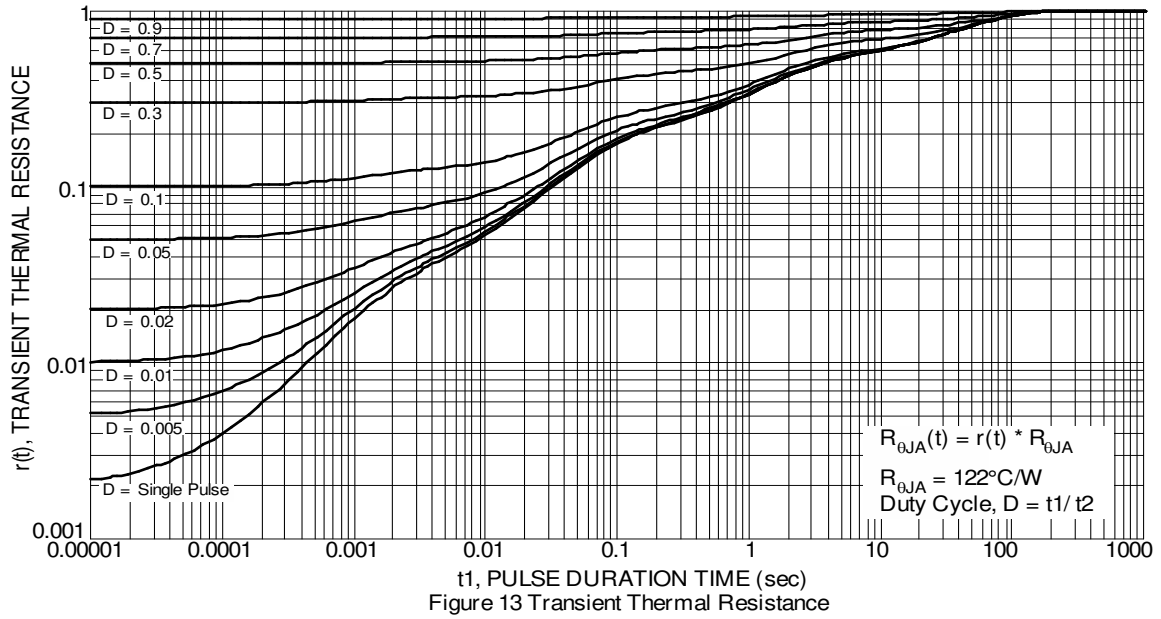


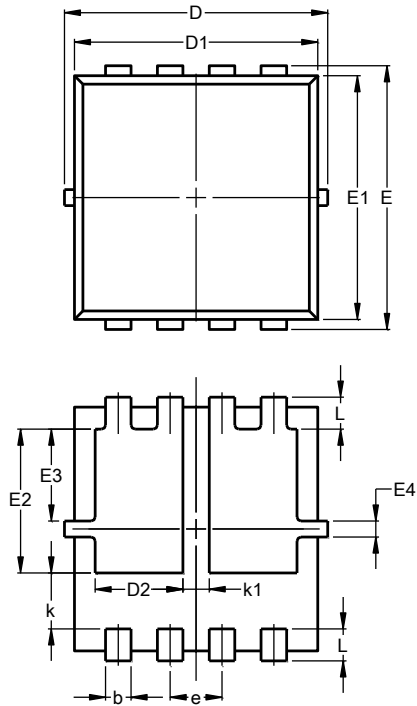
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

PowerDI3333-8 (Type UXC)

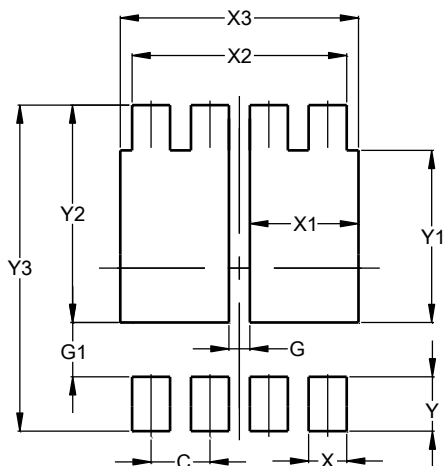


| PowerDI3333-8 (Type UXC) | | | |
|-----------------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.75 | 0.85 | 0.80 |
| A1 | 0.00 | 0.05 | — |
| b | 0.25 | 0.40 | 0.32 |
| c | 0.10 | 0.25 | 0.15 |
| D | 3.20 | 3.40 | 3.30 |
| D1 | 2.95 | 3.15 | 3.05 |
| D2 | 0.90 | 1.30 | 1.10 |
| E | 3.20 | 3.40 | 3.30 |
| E1 | 2.95 | 3.15 | 3.05 |
| E2 | 1.60 | 2.00 | 1.80 |
| E3 | 0.95 | 1.35 | 1.15 |
| E4 | 0.10 | 0.30 | 0.20 |
| e | — | — | 0.65 |
| L | 0.30 | 0.50 | 0.40 |
| k | 0.50 | 0.90 | 0.70 |
| k1 | 0.13 | 0.53 | 0.33 |
| a | 0° | 12° | 10° |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

PowerDI3333-8 (Type UXC)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| G | 0.230 |
| G1 | 0.600 |
| X | 0.420 |
| X1 | 1.200 |
| X2 | 2.370 |
| X3 | 2.630 |
| Y | 0.600 |
| Y1 | 1.900 |
| Y2 | 2.400 |
| Y3 | 3.600 |

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