



**THE DATASHEET OF
DMP3007SCGQ-7**



Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _C = +25°C |
|-------------------|--------------------------------|--|
| -30V | 6.8mΩ @ V _{GS} = -10V | -50A |
| | 13mΩ @ V _{GS} = -4.5V | -36A |

Description and Applications

This MOSFET has been designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

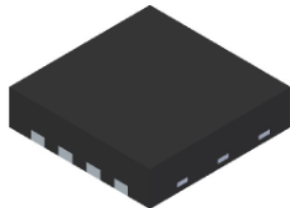
- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

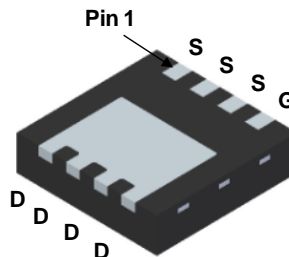
- Low R_{DS(ON)} – Ensures On State Losses are Minimized
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- Occupies Just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- 100% Unclamped Inductive Switching (Test in Production)– Ensures More Reliability
- HBM ESD Protection Level of 8kV Typical
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

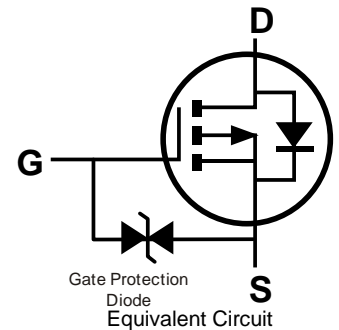
- Case: V-DFN3333-8 (Type B)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Below Diagram
Terminals: Finish –NiPdAu over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.030 grams (Approximate)



Top View



Bottom View

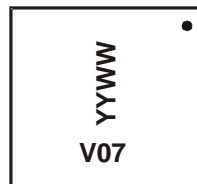


Ordering Information (Note 5)

| Part Number | Case | Packaging |
|----------------|----------------------|-------------------|
| DMP3007SCGQ-7 | V-DFN3333-8 (Type B) | 2,000/Tape & Reel |
| DMP3007SCGQ-13 | V-DFN3333-8 (Type B) | 3,000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



V07= Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 18 = 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} | ±25 | V |
| Continuous Drain Current (Note 8) V _{GS} = -10V | I _D | T _C = +25°C | -50 |
| Steady State | | T _C = +70°C | -40 |
| Maximum Continuous Body Diode Forward Current (Note 8) | I _S | -40 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | -100 | A |
| Avalanche Current (Note 9) L = 1mH | I _{AS} | -16 | A |
| Avalanche Energy (Note 9) L = 1mH | E _{AS} | 130 | mJ |

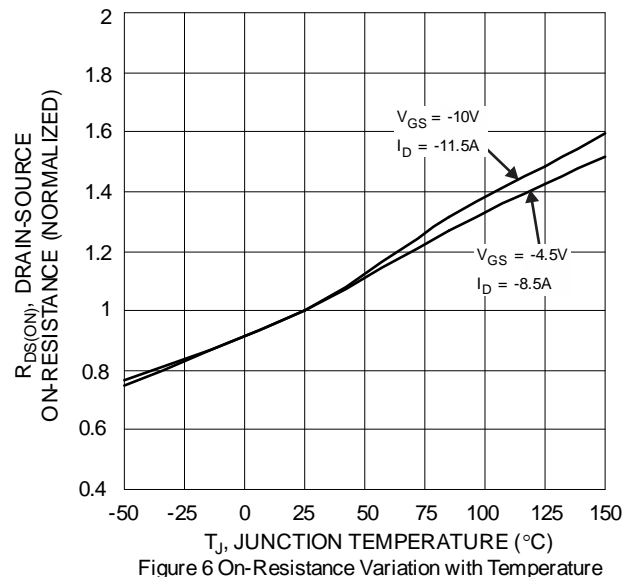
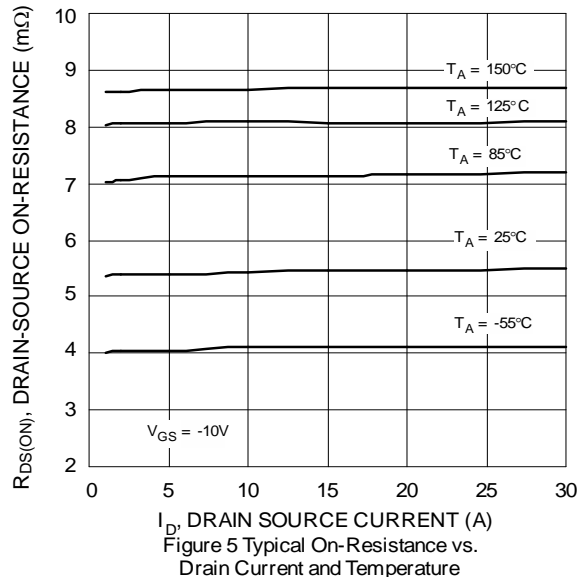
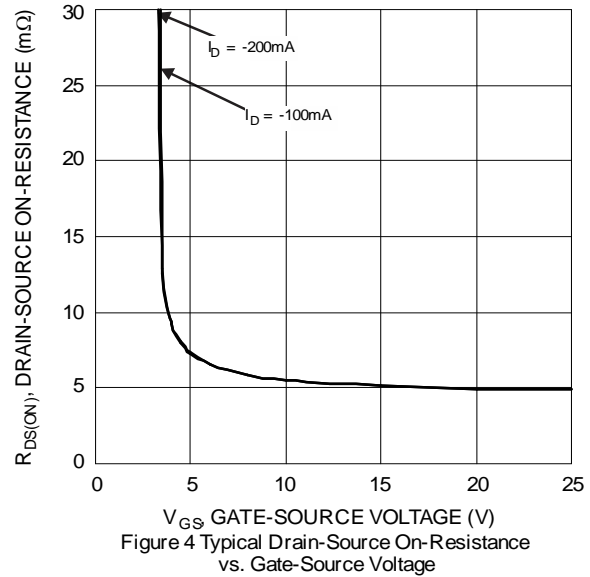
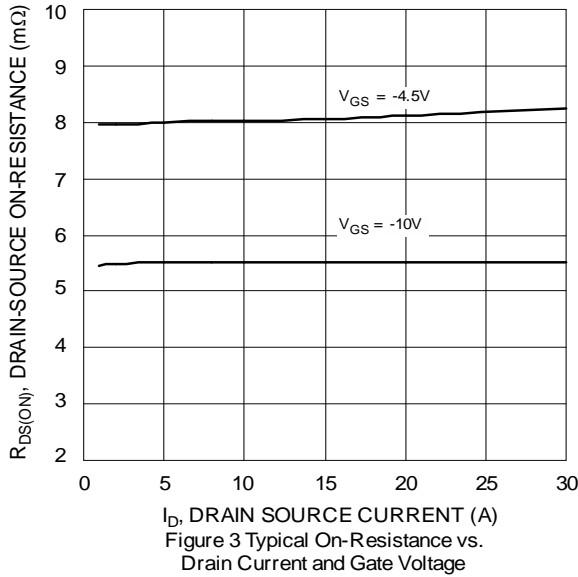
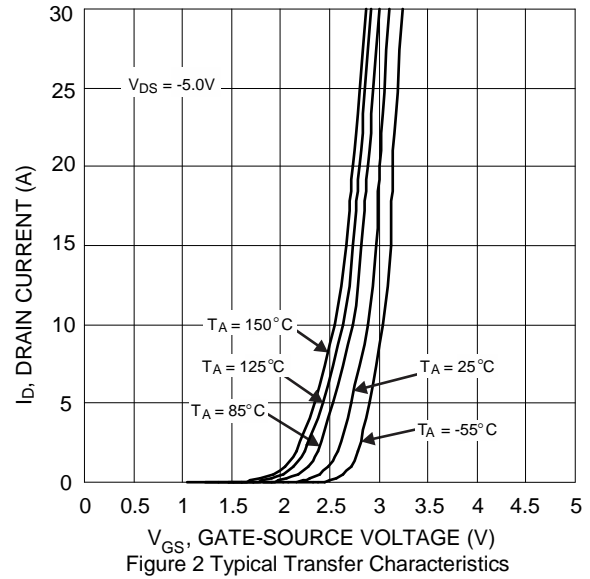
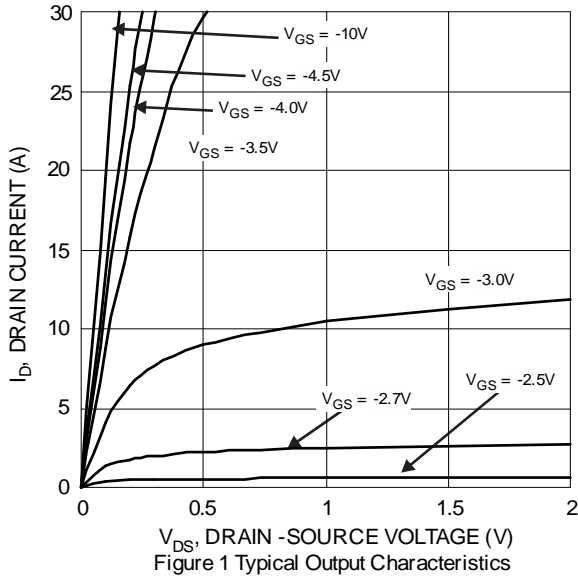
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 6) | P _D | 1.0 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 124 | °C/W |
| Total Power Dissipation (Note 7) | P _D | 2.4 | W |
| Thermal Resistance, Junction to Ambient (Note 7) | R _{θJA} | 52 | °C/W |
| Thermal Resistance, Junction to Case (Note 8) | R _{θJC} | 4.0 | °C/W |
| 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 10) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -30 | — | — | V | V _{GS} = 0V, I _D = -250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | µA | V _{DS} = -24V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 10) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -1.0 | — | -3.0 | V | V _{DS} = V _{GS} , I _D = -250µA |
| Static Drain-Source On-Resistance | R _{D(S)ON} | — | 5.7 | 6.8 | mΩ | V _{GS} = -10V, I _D = -11.5A |
| | | — | 8.0 | 13 | | V _{GS} = -4.5V, I _D = -8.5A |
| Diode Forward Voltage | V _{SD} | — | -0.7 | -1.2 | V | V _{GS} = 0V, I _S = -1A |
| DYNAMIC CHARACTERISTICS (Note 11) | | | | | | |
| Input Capacitance | C _{iSS} | — | 2,826 | — | pF | V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oSS} | — | 606 | — | pF | |
| Reverse Transfer Capacitance | C _{rSS} | — | 305 | — | pF | |
| Gate Resistance | R _g | — | 23 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge (V _{GS} = -4.5V) | Q _g | — | 31.2 | — | nC | V _{DS} = -15V, I _D = -11.5A |
| Total Gate Charge (V _{GS} = -10V) | Q _g | — | 64.2 | — | nC | |
| Gate-Source Charge | Q _{gs} | — | 10.6 | — | nC | |
| Gate-Drain Charge | Q _{gd} | — | 11.6 | — | nC | |
| Turn-On Delay Time | t _{D(ON)} | — | 4.8 | — | ns | V _{DD} = -15V, V _{GS} = -10V, R _g = 6Ω, I _D = -11.5A |
| Turn-On Rise Time | t _r | — | 4.3 | — | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 306 | — | ns | |
| Turn-Off Fall Time | t _f | — | 125 | — | ns | |
| Reverse Recovery Time | t _{RR} | — | 19 | — | ns | I _S = -11.5A, dI/dt = 100A/µs |
| Reverse Recovery Charge | Q _{RR} | — | 9.8 | — | nC | |

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 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.



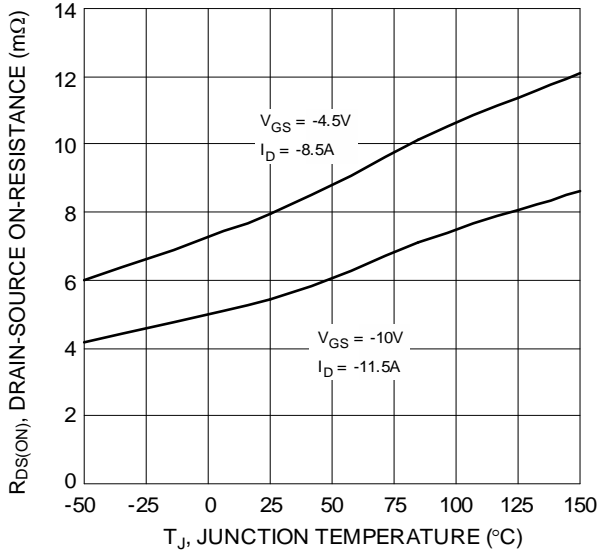


Figure 7 On-Resistance Variation with Temperature

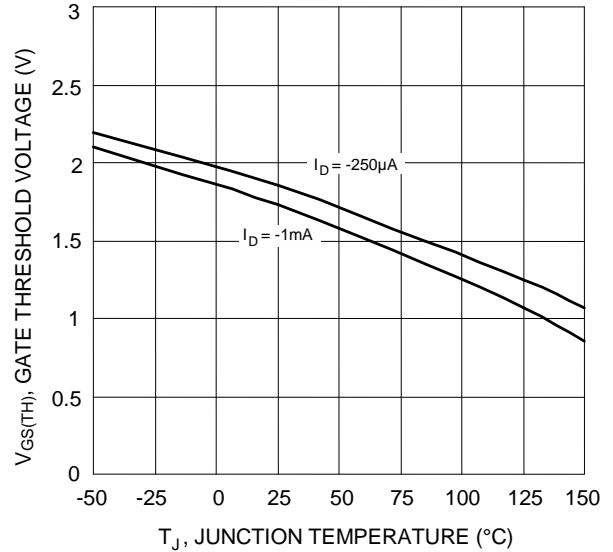


Figure 8 Gate Threshold Variation vs. Junction Temperature

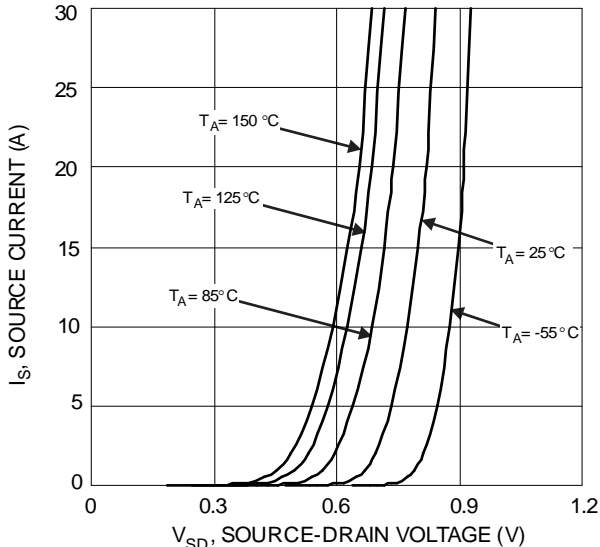


Figure 9 Diode Forward Voltage vs. Current

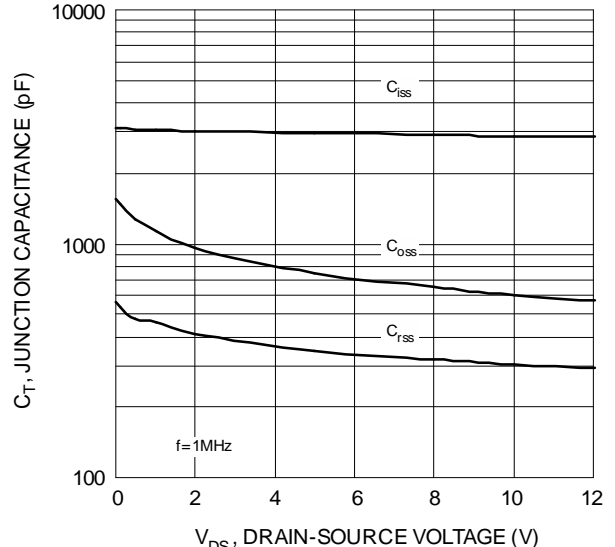


Figure 10 Typical Junction Capacitance

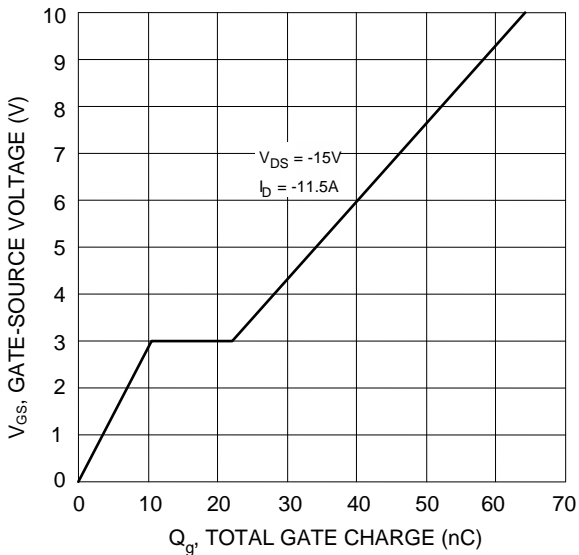


Figure 11 Gate Charge

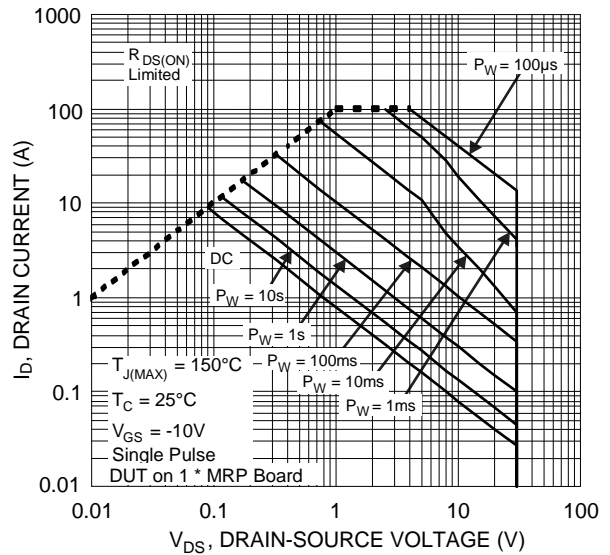
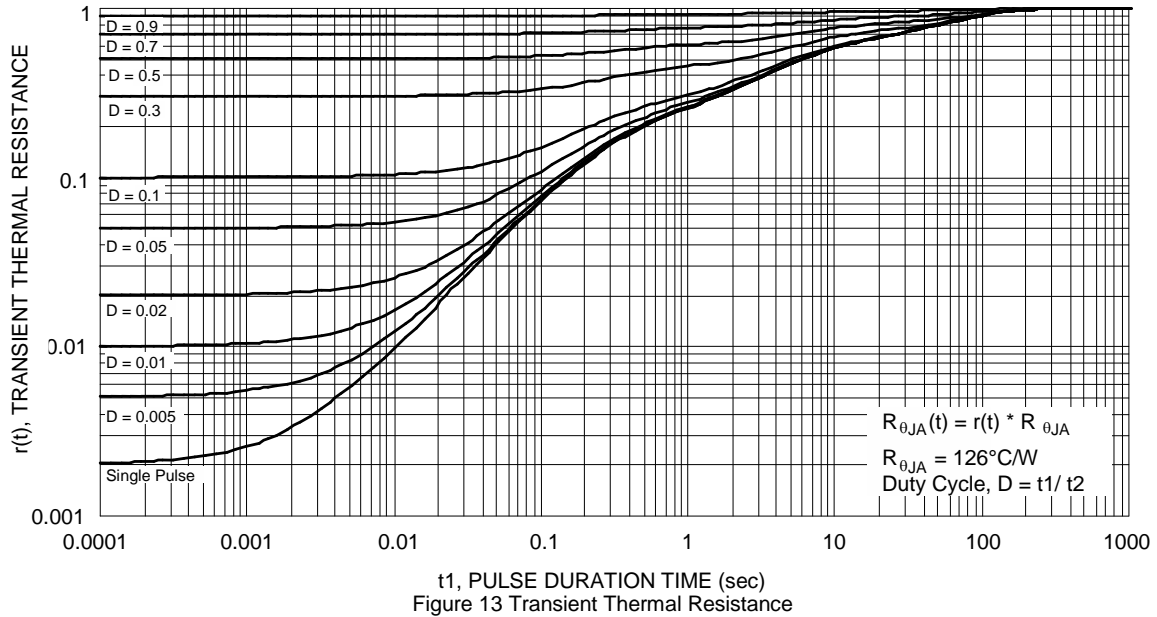


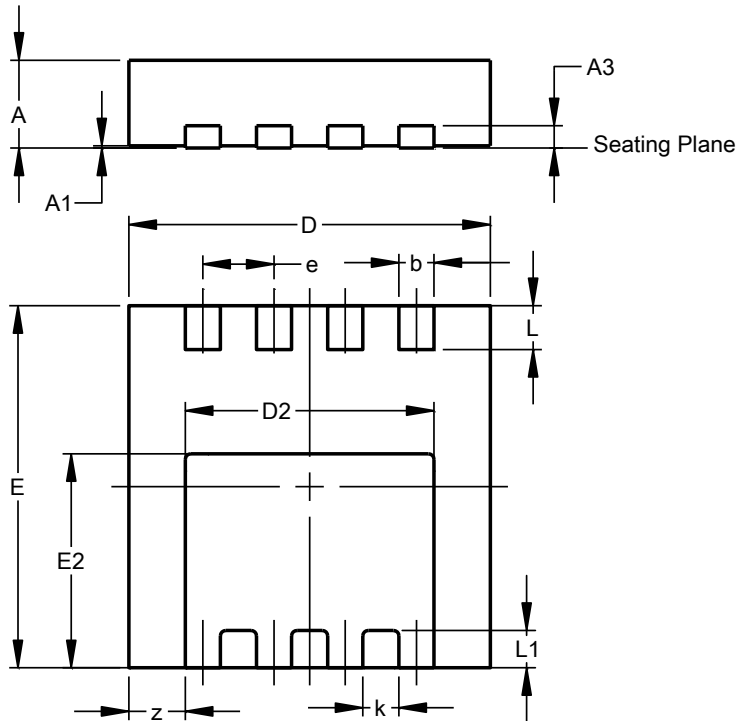
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

V-DFN3333-8 (Type B)

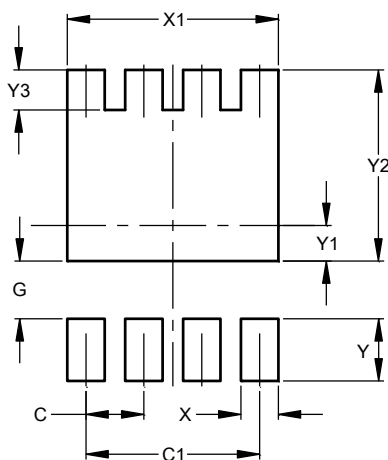


| V-DFN3333-8 (Type B) | | | |
|-------------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.75 | 0.85 | 0.80 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | -- | -- | 0.203 |
| b | 0.27 | 0.37 | 0.32 |
| D | 3.25 | 3.35 | 3.30 |
| D2 | 2.17 | 2.37 | 2.27 |
| E | 3.25 | 3.35 | 3.30 |
| E2 | 1.85 | 2.05 | 1.95 |
| e | -- | -- | 0.65 |
| k | -- | -- | 0.33 |
| L | 0.35 | 0.45 | 0.40 |
| L1 | -- | -- | 0.34 |
| z | -- | -- | 0.515 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

V-DFN3333-8 (Type B)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| C1 | 1.950 |
| G | 0.650 |
| X | 0.420 |
| X1 | 2.370 |
| Y | 0.700 |
| Y1 | 0.400 |
| Y2 | 2.150 |
| Y3 | 0.450 |

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