

## Product Summary

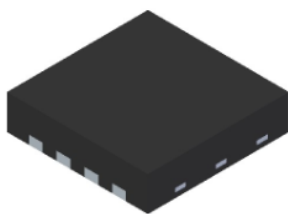
| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> Max        | I <sub>D</sub> Max<br>T <sub>C</sub> = +25°C |
|-------------------|--------------------------------|----------------------------------------------|
| -30V              | 6.8mΩ @ V <sub>GS</sub> = -10V | -50A                                         |
|                   | 13mΩ @ V <sub>GS</sub> = -4.5V | -36A                                         |

## Description

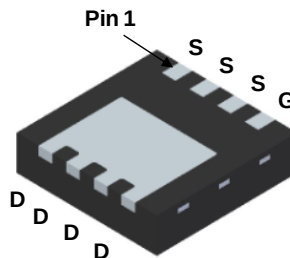
This MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

## Applications

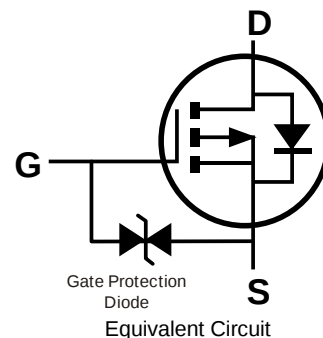
- Backlighting
- Power Management Functions
- DC-DC Converters



Top View



Bottom View



## Features and Benefits

- Low R<sub>DS(ON)</sub> – 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
- HBM ESD Protection Level of 8kV Typical
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

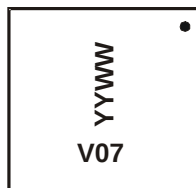
- Case: V-DFN3333-8 (Type B)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Below Diagram  
Terminals: Finish –NiPdAu over Copper Leadframe. Solderable per MIL-STD-202,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

## Ordering Information (Note 4)

| Part Number   | Case                 | Packaging         |
|---------------|----------------------|-------------------|
| DMP3007SCG-7  | V-DFN3333-8 (Type B) | 2,000/Tape & Reel |
| DMP3007SCG-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) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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



V07= Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 16 = 2016)  
 WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                           |              |                                                  | Symbol           | Value      | Unit |
|----------------------------------------------------------|--------------|--------------------------------------------------|------------------|------------|------|
| Drain-Source Voltage                                     |              |                                                  | V <sub>DSS</sub> | -30        | V    |
| Gate-Source Voltage                                      |              |                                                  | V <sub>GSS</sub> | ±25        | V    |
| Continuous Drain Current (Note 7) V <sub>GS</sub> = -10V | Steady State | T <sub>C</sub> = +25°C<br>T <sub>C</sub> = +70°C | I <sub>D</sub>   | -50<br>-40 | A    |
| Maximum Continuous Body Diode Forward Current (Note 7)   |              |                                                  | I <sub>S</sub>   | -40        | A    |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)       |              |                                                  | I <sub>DM</sub>  | -100       | A    |
| Avalanche Current (Note 8) L = 1mH                       |              |                                                  | I <sub>AS</sub>  | -16        | A    |
| Avalanche Energy (Note 8) L = 1mH                        |              |                                                  | E <sub>AS</sub>  | 130        | mJ   |

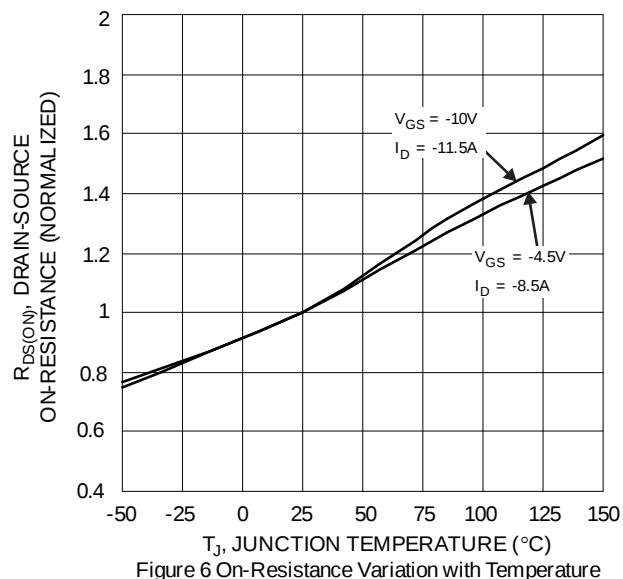
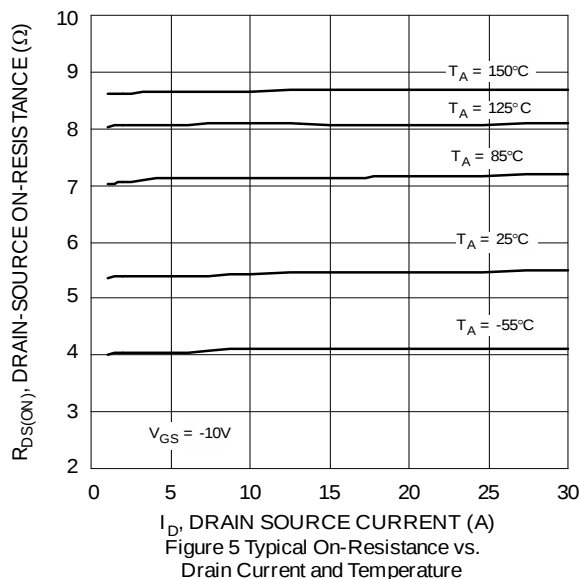
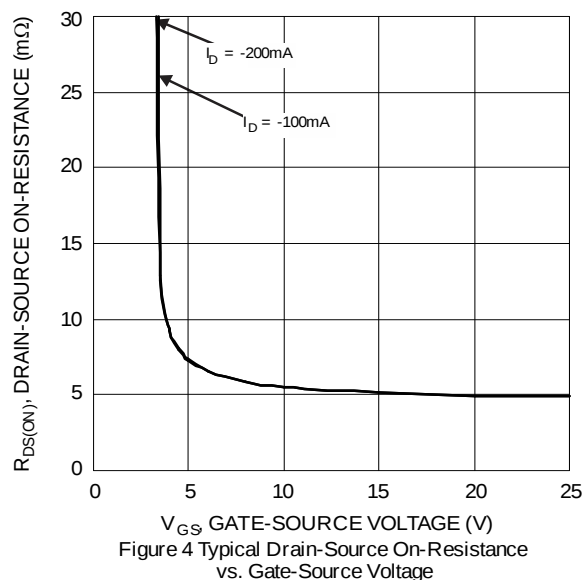
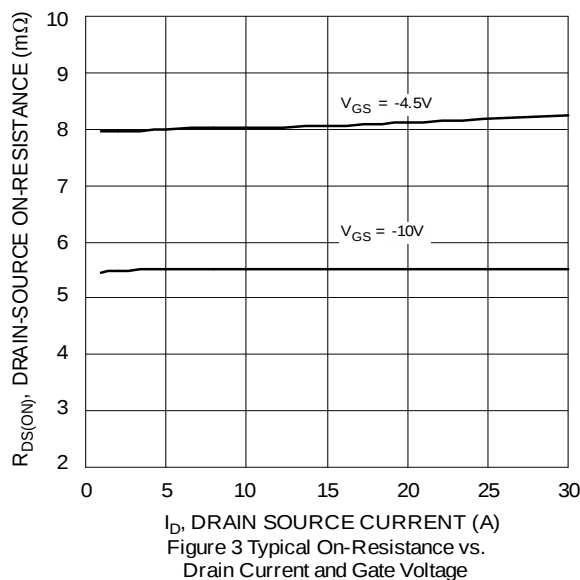
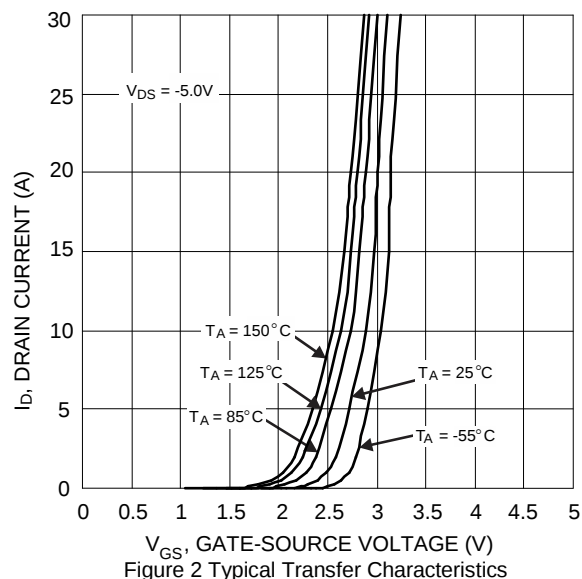
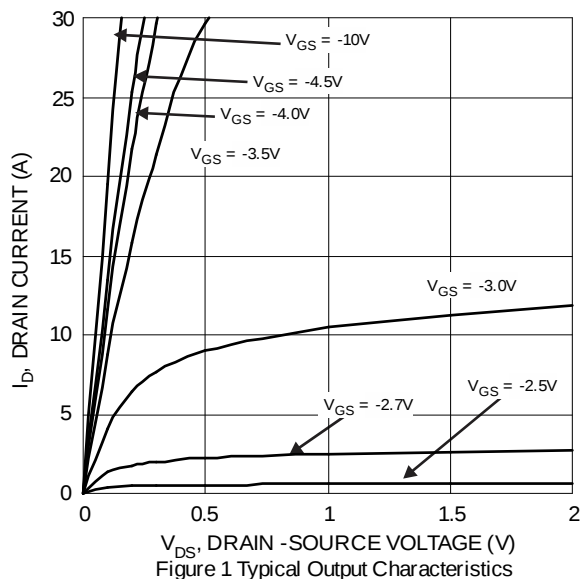
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                   |                        | Symbol                            | Value       | Unit |
|--------------------------------------------------|------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.0         | W    |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State           | R <sub>θJA</sub>                  | 124         | °C/W |
| Total Power Dissipation (Note 6)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 2.4         | W    |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State           | R <sub>θJA</sub>                  | 52          | °C/W |
| Thermal Resistance, Junction to Case (Note 7)    |                        | R <sub>θJC</sub>                  | 4.0         | °C/W |
| Operating and Storage Temperature Range          |                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                              | Symbol              | Min  | Typ   | Max  | Unit | Test Condition                                                                                  |
|---------------------------------------------|---------------------|------|-------|------|------|-------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 9)</b>         |                     |      |       |      |      |                                                                                                 |
| Drain-Source Breakdown Voltage              | BV <sub>DSS</sub>   | -30  | —     | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                   |
| Zero Gate Voltage Drain Current             | I <sub>DSS</sub>    | —    | —     | -1   | μA   | V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V                                                    |
| Gate-Source Leakage                         | I <sub>GSS</sub>    | —    | —     | ±10  | μA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                    |
| <b>ON CHARACTERISTICS (Note 9)</b>          |                     |      |       |      |      |                                                                                                 |
| Gate Threshold Voltage                      | V <sub>GS(TH)</sub> | -1.0 | —     | -3.0 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                     |
| Static Drain-Source On-Resistance           | R <sub>DS(ON)</sub> | —    | 5.7   | 6.8  | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -11.5A                                                 |
|                                             |                     | —    | 8.0   | 13   |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -8.5A                                                 |
| Diode Forward Voltage                       | V <sub>SD</sub>     | —    | -0.7  | -1.2 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A                                                      |
| <b>DYNAMIC CHARACTERISTICS (Note 10)</b>    |                     |      |       |      |      |                                                                                                 |
| Input Capacitance                           | C <sub>iss</sub>    | —    | 2,826 | —    | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                     |
| Output Capacitance                          | C <sub>oss</sub>    | —    | 606   | —    | pF   |                                                                                                 |
| Reverse Transfer Capacitance                | C <sub>rss</sub>    | —    | 305   | —    | pF   |                                                                                                 |
| Gate Resistance                             | R <sub>g</sub>      | —    | 23    | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz                                          |
| Total Gate Charge (V <sub>GS</sub> = -4.5V) | Q <sub>g</sub>      | —    | 31.2  | —    | nC   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -11.5A                                                 |
| Total Gate Charge (V <sub>GS</sub> = -10V)  | Q <sub>g</sub>      | —    | 64.2  | —    | nC   |                                                                                                 |
| Gate-Source Charge                          | Q <sub>gs</sub>     | —    | 10.6  | —    | nC   |                                                                                                 |
| Gate-Drain Charge                           | Q <sub>gd</sub>     | —    | 11.6  | —    | nC   |                                                                                                 |
| Turn-On Delay Time                          | t <sub>D(ON)</sub>  | —    | 4.8   | —    | ns   | V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V,<br>R <sub>g</sub> = 6Ω, I <sub>D</sub> = -11.5A |
| Turn-On Rise Time                           | t <sub>r</sub>      | —    | 4.3   | —    | ns   |                                                                                                 |
| Turn-Off Delay Time                         | t <sub>D(OFF)</sub> | —    | 306   | —    | ns   |                                                                                                 |
| Turn-Off Fall Time                          | t <sub>f</sub>      | —    | 125   | —    | ns   | I <sub>S</sub> = -11.5A, dI/dt = 100A/μs                                                        |
| Reverse Recovery Time                       | t <sub>RR</sub>     | —    | 19    | —    | ns   |                                                                                                 |
| Reverse Recovery Charge                     | Q <sub>RR</sub>     | —    | 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<sub>AS</sub> and E<sub>AS</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.



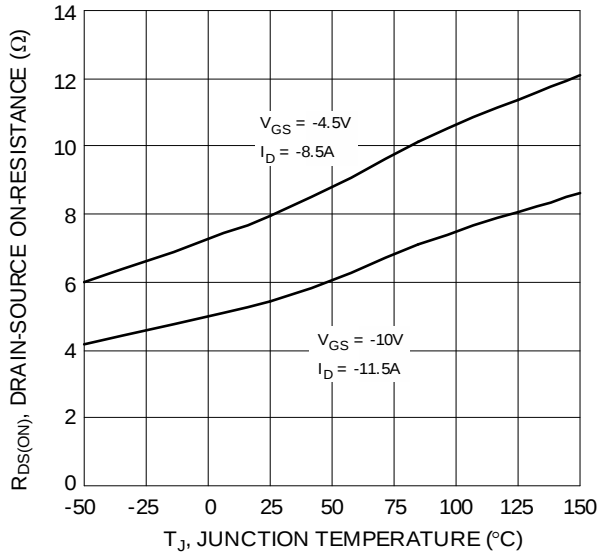


Figure 7 On-Resistance Variation with Temperature

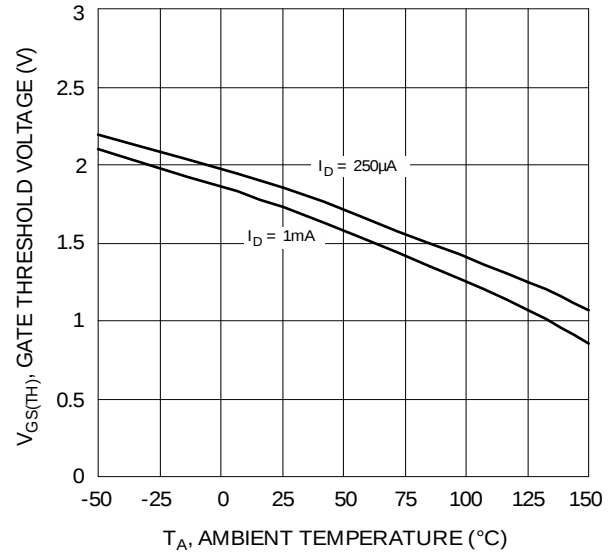


Figure 8 Gate Threshold Variation vs. Junction Temperature

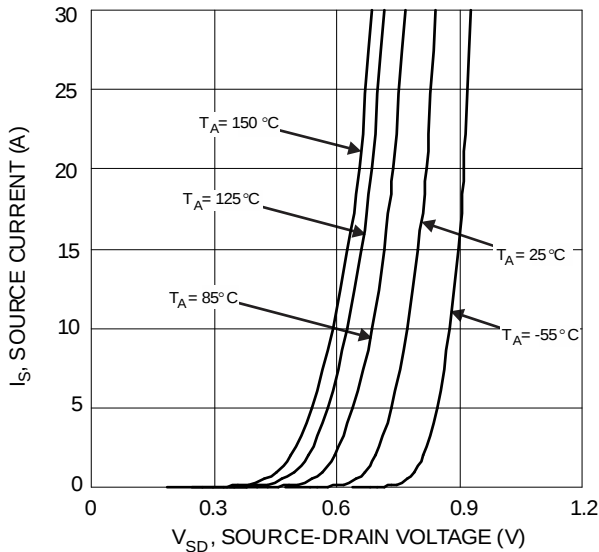


Figure 9 Diode Forward Voltage vs. Current

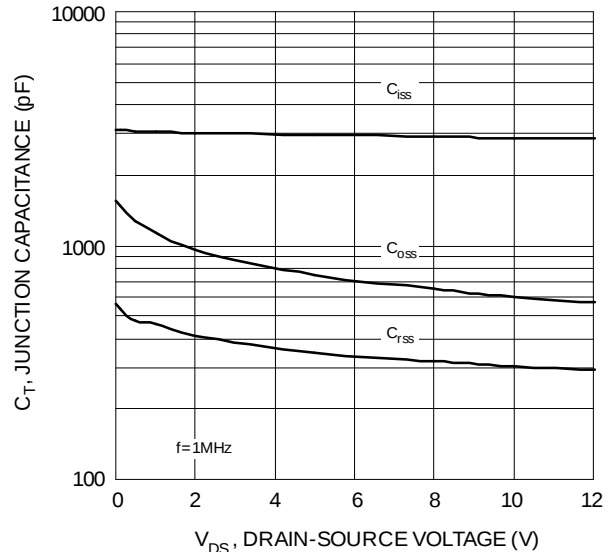


Figure 10 Typical Junction Capacitance

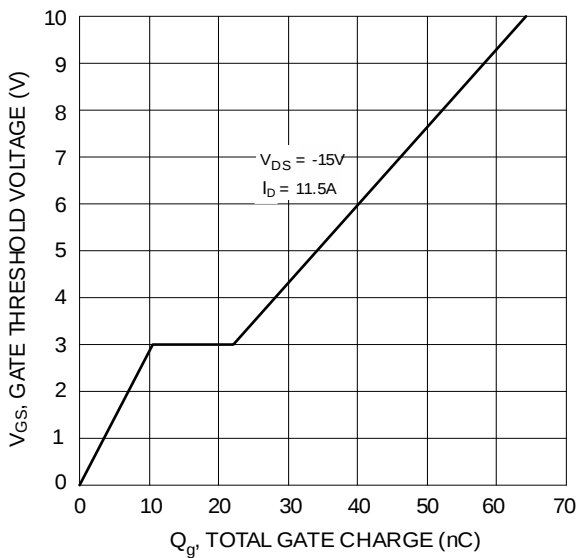


Figure 11 Gate Charge

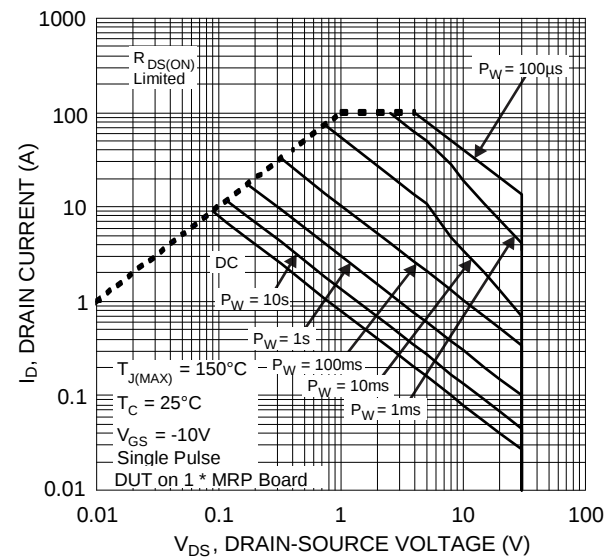
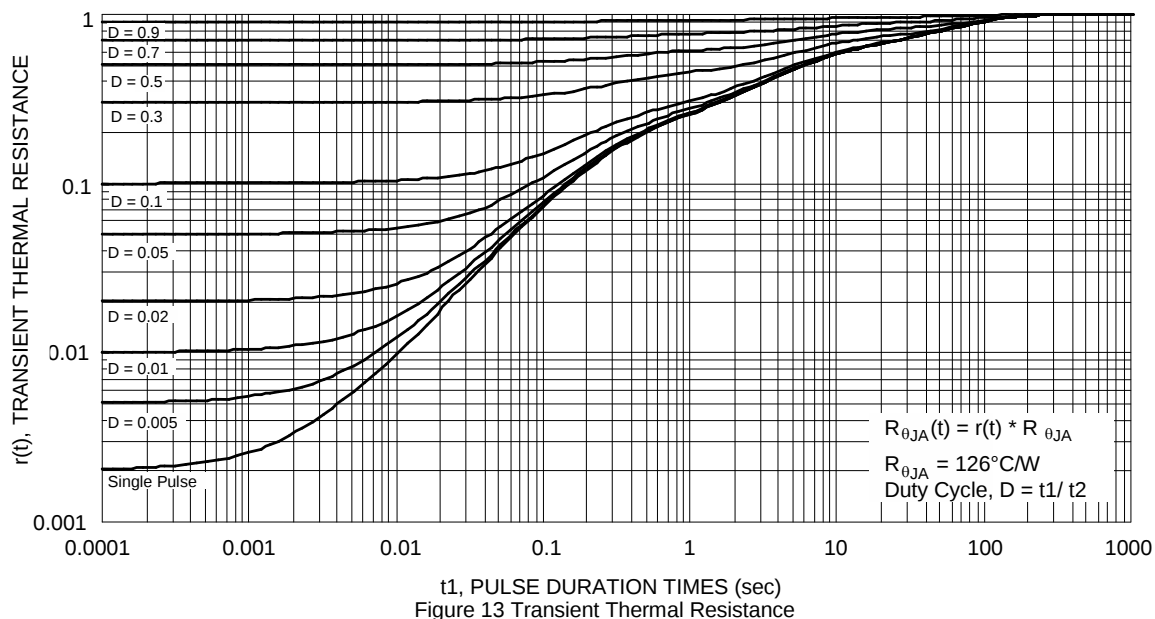


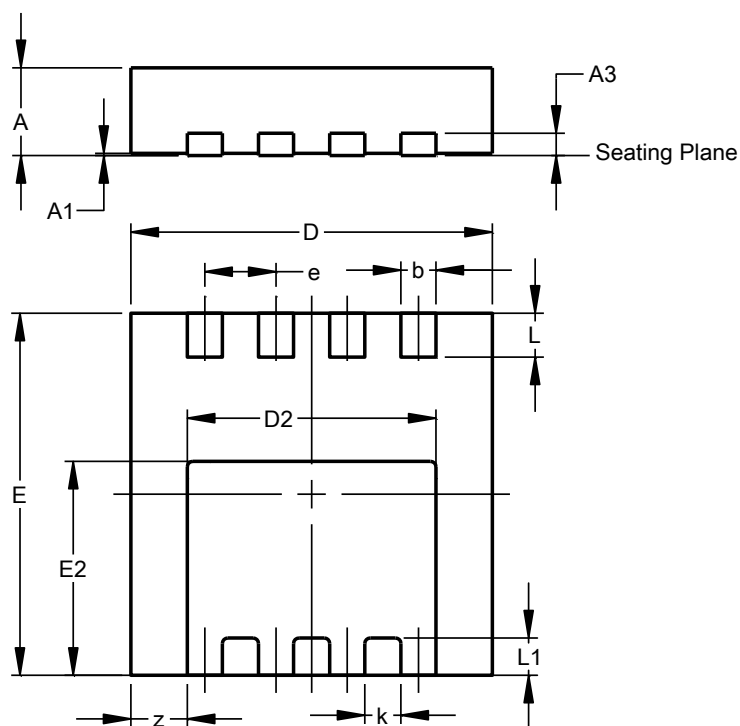
Figure 12 SOA, Safe Operation Area



## Package Outline Dimensions

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

### V-DFN3333-8 (Type B)

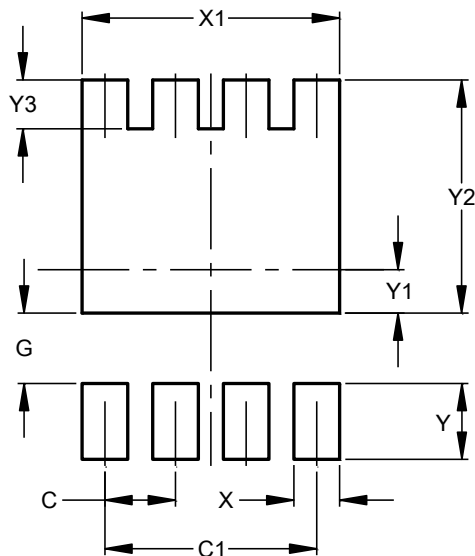


| V-DFN3333-8<br>(Type B) |      |      |       |
|-------------------------|------|------|-------|
| Dim                     | Min  | Max  | Typ   |
| A                       | 0.75 | 0.85 | 0.80  |
| A1                      | 0.00 | 0.05 | 0.02  |
| A3                      | --   | --   | 0.203 |
| 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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