

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> MAX       | Package | I <sub>D</sub><br>T <sub>A</sub> = +25°C |
|-------------------|-------------------------------|---------|--|
| -30V              | 70mΩ @V <sub>GS</sub> = -10V  | SO-8    | -3.9A                                    |
|                   | 95mΩ @V <sub>GS</sub> = -4.5V |         | -3.3A                                    |

## Description

This MOSFET has been 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

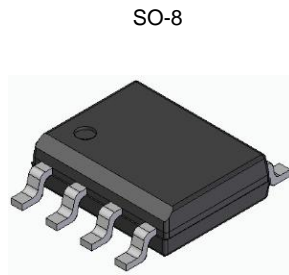
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features

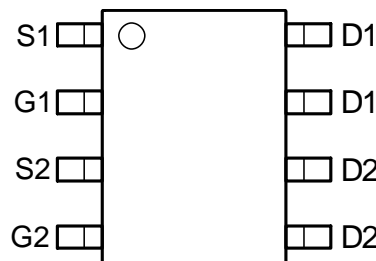
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

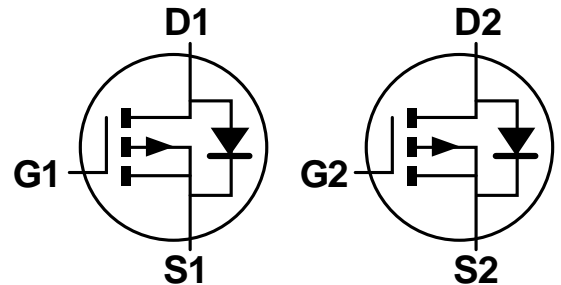
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 Ⓜ3
- Weight: 0.074 grams (Approximate)



Top View



Top View  
Pin-Out



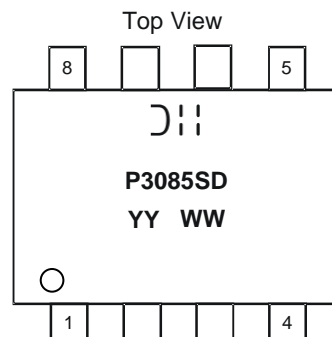
Equivalent Circuit

## Ordering Information (Note 4)

| Part Number   | Case | Packaging        |
|---------------|------|------------------|
| DMP3085LSD-13 | SO-8 | 2500/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, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



⌋⌋ = Manufacturer's Code Marking  
 P3085SD = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 19 = 2019)  
 WW = Week (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> | ±20                    | V    |   |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V | Steady State     | T <sub>A</sub> = +25°C | -3.9 | A |
|  |                  | T <sub>A</sub> = +70°C | -3.1 |   |
|  | t < 10s          | T <sub>A</sub> = +25°C | -4.9 | A |
|  |                  | T <sub>A</sub> = +70°C | -3.9 |   |
| Maximum Continuous Body Diode Forward Current (Note 6)   | I <sub>S</sub>   | -2.5                   | A    |   |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)       | I <sub>DM</sub>  | -20                    | A    |   |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value                  | Unit |      |
|--|-----------------------------------|------------------------|------|------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | T <sub>A</sub> = +25°C | 1.1  | W    |
|  |                                   | T <sub>A</sub> = +70°C | 0.7  |      |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | Steady State           | 107  | °C/W |
|  |                                   | t < 10s                | 70   |      |
| Total Power Dissipation (Note 6)                 | P <sub>D</sub>                    | T <sub>A</sub> = +25°C | 1.7  | W    |
|  |                                   | T <sub>A</sub> = +70°C | 1.1  |      |
| Thermal Resistance, Junction to Ambient (Note 6) | R <sub>θJA</sub>                  | Steady State           | 75   | °C/W |
|  |                                   | t < 10s                | 50   |      |
| Thermal Resistance, Junction to Case             | R <sub>θJC</sub>                  | 14.5                   |      |      |
| 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 7)</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> = -30V, V <sub>GS</sub> = 0V  |
| Gate-Source Leakage                         | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 7)</b>          |                     |     |      |      |      |   |
| Gate Threshold Voltage                      | V <sub>GS(TH)</sub> | -1  | —    | -3   | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA                                 |
| Static Drain-Source On-Resistance           | R <sub>DS(ON)</sub> | —   | 50   | 70   | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -5.3A  |
|   |                     | —   | 75   | 95   |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.2A   |
| Forward Transfer Admittance                 | Y <sub>fs</sub>     | —   | 5.8  | —    | S    | V <sub>DS</sub> = -5V, I <sub>D</sub> = -5.3A   |
| 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 8)</b>     |                     |     |      |      |      |   |
| Input Capacitance                           | C <sub>iss</sub>    | —   | 563  | —    | pF   | V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V, f = 1.0MHz                                    |
| Output Capacitance                          | C <sub>oss</sub>    | —   | 48   | —    |      |   |
| Reverse Transfer Capacitance                | C <sub>rss</sub>    | —   | 41   | —    |      |   |
| Gate Resistance                             | R <sub>G</sub>      | —   | 10.3 | —    | 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>      | —   | 5.2  | —    | nC   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -3.8A  |
| Total Gate Charge (V <sub>GS</sub> = -10V)  | Q <sub>g</sub>      | —   | 11   | —    |      |   |
| Gate-Source Charge                          | Q <sub>gs</sub>     | —   | 1.7  | —    |      |   |
| Gate-Drain Charge                           | Q <sub>gd</sub>     | —   | 1.9  | —    |      |   |
| Turn-On Delay Time                          | t <sub>D(ON)</sub>  | —   | 4.8  | —    | ns   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω |
| Turn-On Rise Time                           | t <sub>R</sub>      | —   | 5    | —    |      |   |
| Turn-Off Delay Time                         | t <sub>D(OFF)</sub> | —   | 31   | —    |      |   |
| Turn-Off Fall Time                          | t <sub>F</sub>      | —   | 14.6 | —    |      |   |

- 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.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

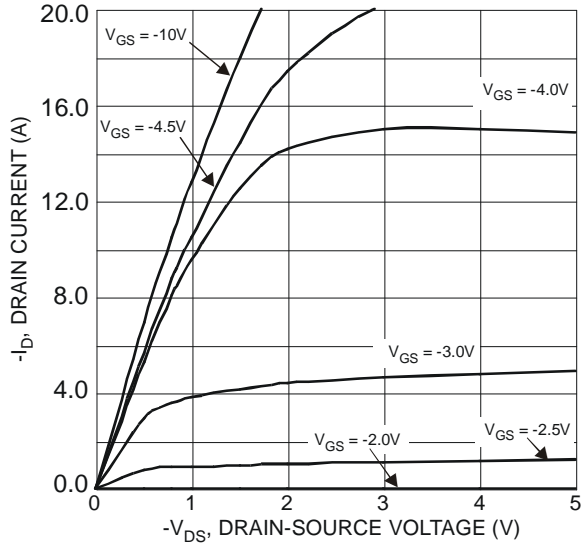


Figure 1 Typical Output Characteristics

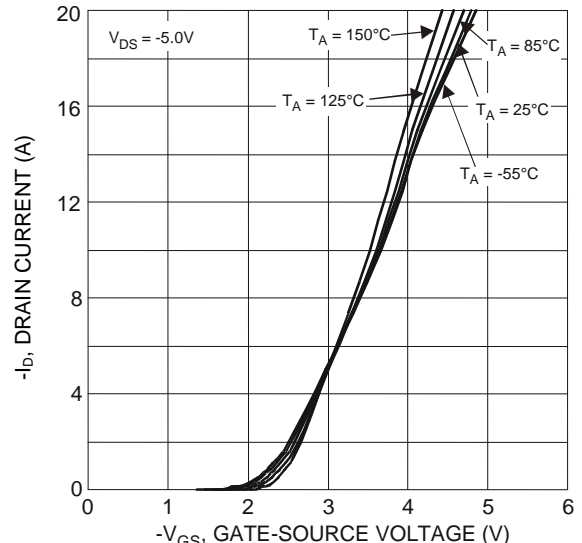


Figure 2 Typical Transfer Characteristics

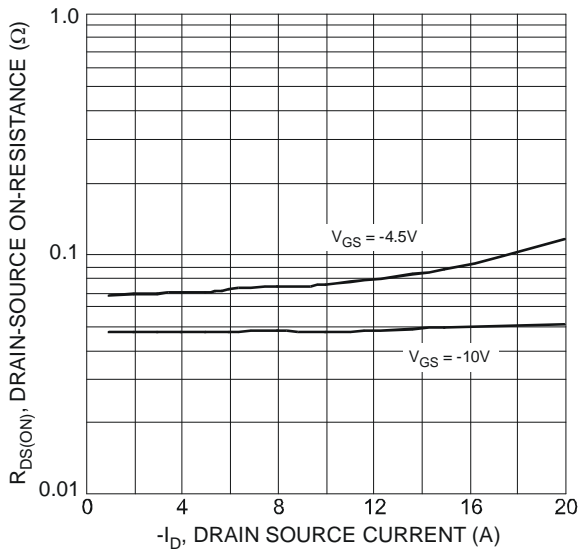


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

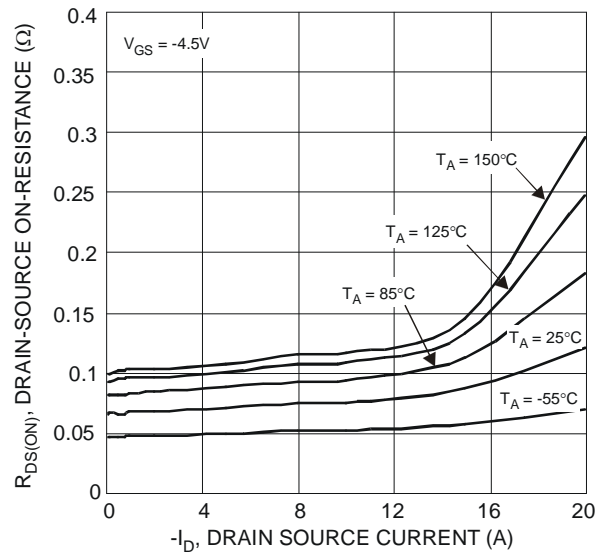


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

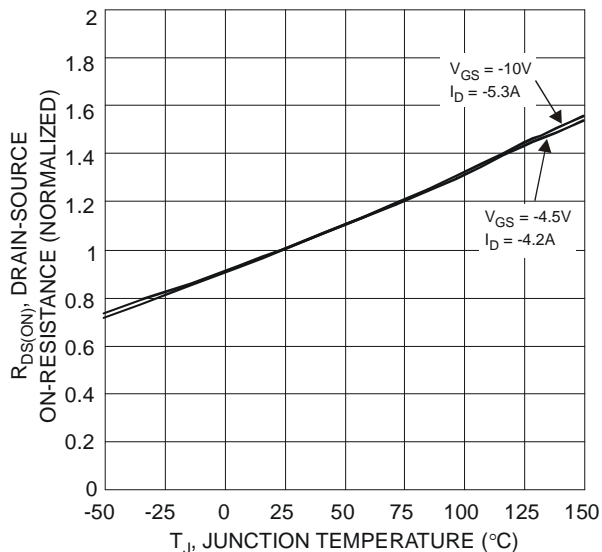


Figure 5 On-Resistance Variation with Temperature

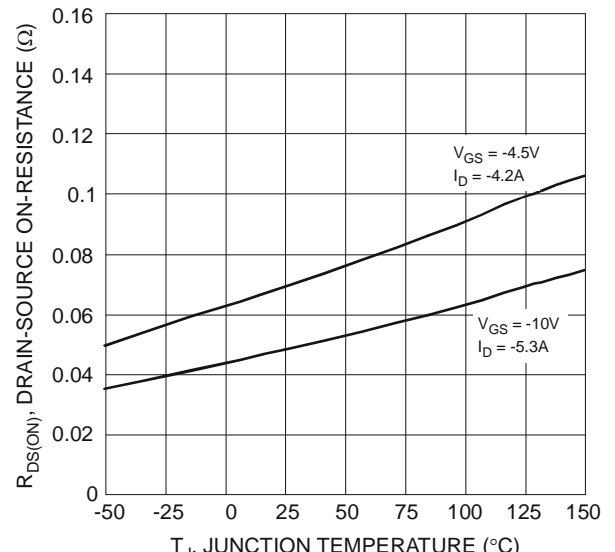


Figure 6 On-Resistance Variation with Temperature

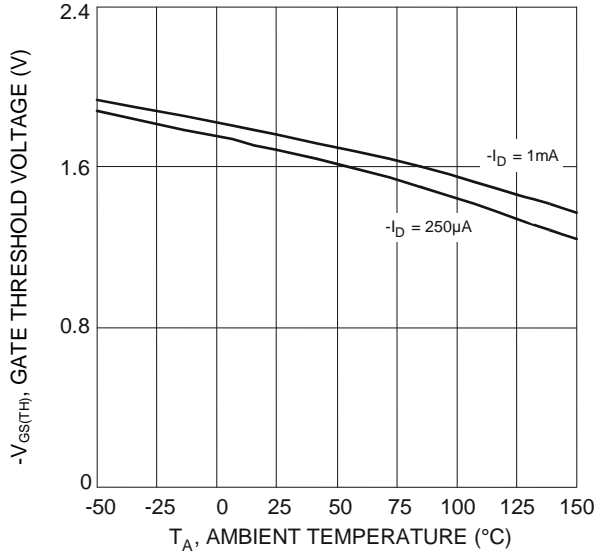


Figure 7 Gate Threshold Variation vs. Ambient Temperature

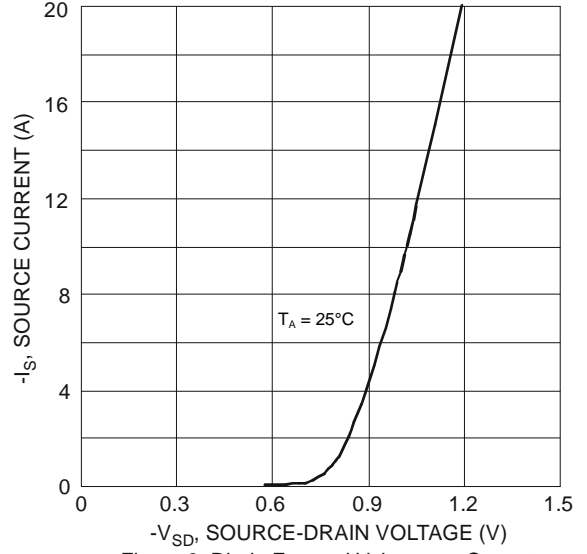


Figure 8 Diode Forward Voltage vs. Current

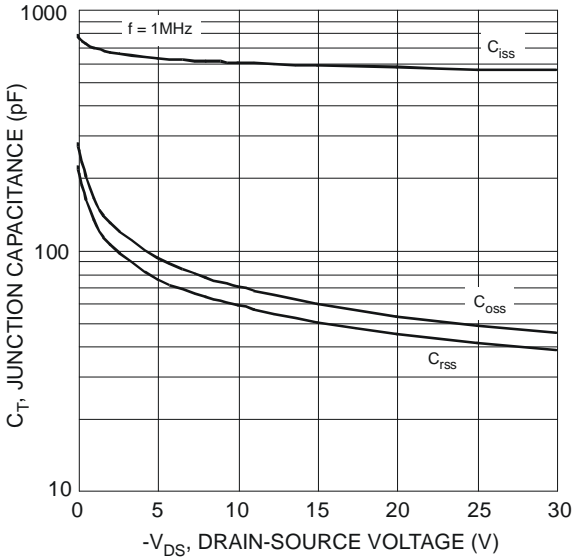


Figure 9 Typical Junction Capacitance

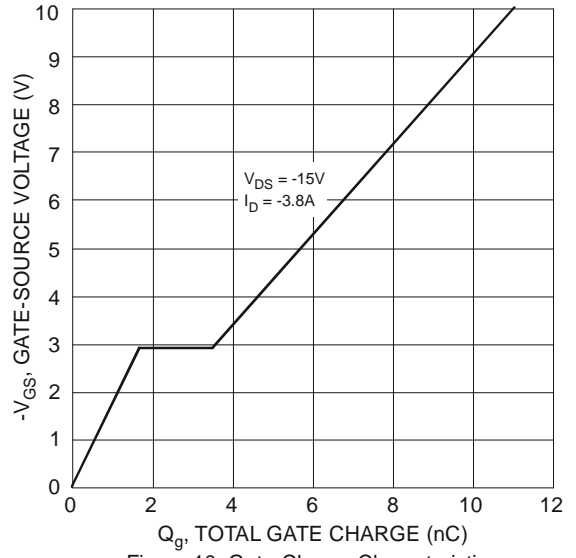


Figure 10 Gate-Charge Characteristics

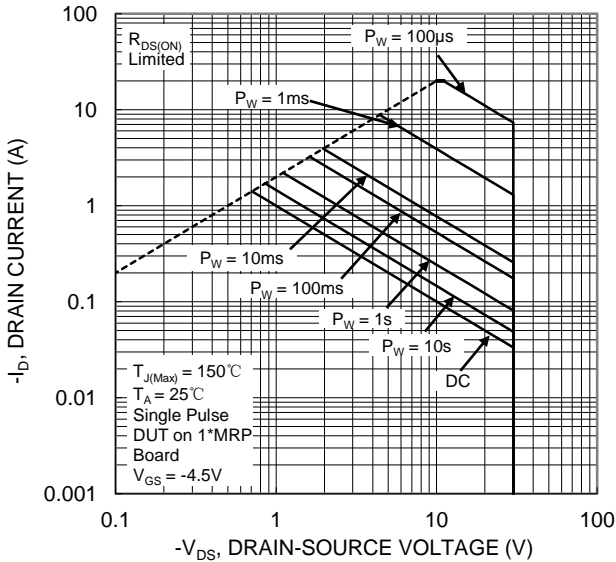


Figure 11 SOA, Safe Operation Area

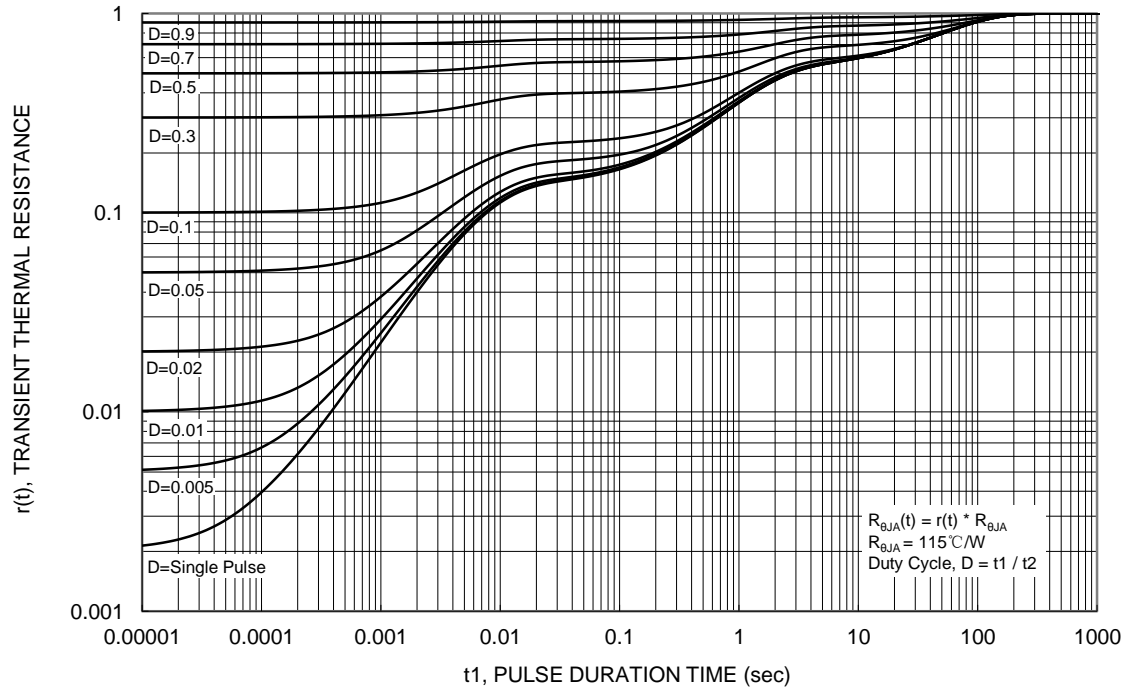
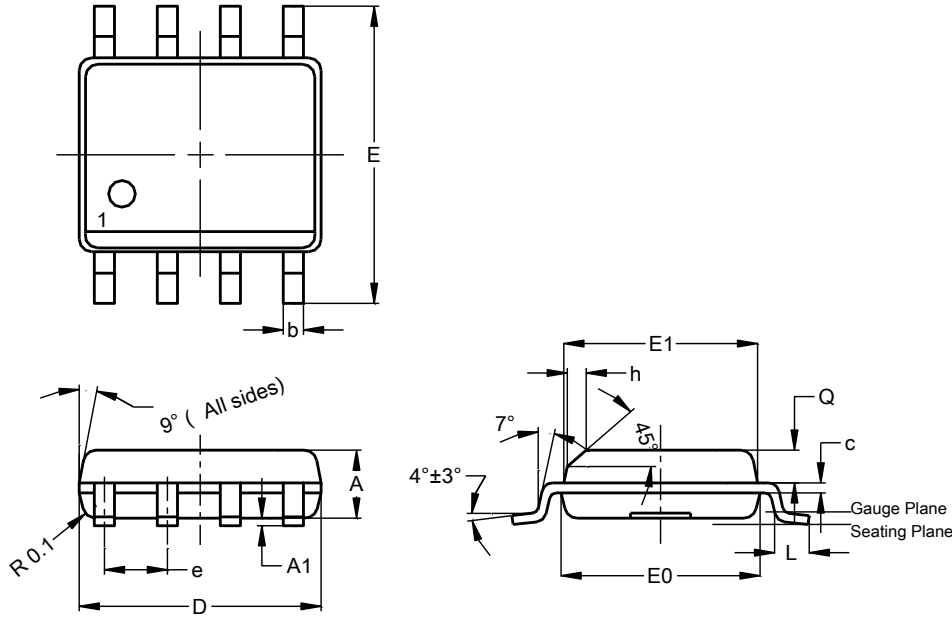


Figure 12 Transient Thermal Resistance

**Package Outline Dimensions**

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

SO-8



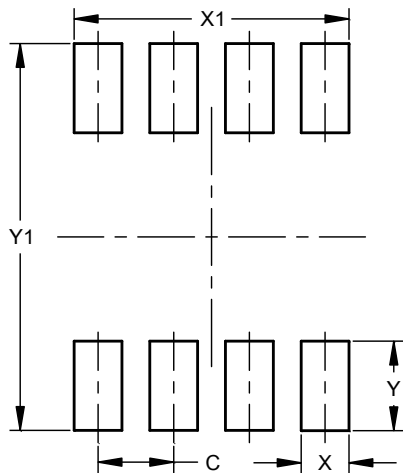
| SO-8 |      |      |      |
|------|------|------|------|
| Dim  | Min  | Max  | Typ  |
| A    | 1.40 | 1.50 | 1.45 |
| A1   | 0.10 | 0.20 | 0.15 |
| b    | 0.30 | 0.50 | 0.40 |
| c    | 0.15 | 0.25 | 0.20 |
| D    | 4.85 | 4.95 | 4.90 |
| E    | 5.90 | 6.10 | 6.00 |
| E1   | 3.80 | 3.90 | 3.85 |
| E0   | 3.85 | 3.95 | 3.90 |
| e    | --   | --   | 1.27 |
| h    | --   | --   | 0.35 |
| L    | 0.62 | 0.82 | 0.72 |
| Q    | 0.60 | 0.70 | 0.65 |

All Dimensions in mm

**Suggested Pad Layout**

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

SO-8



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.27          |
| X          | 0.802         |
| X1         | 4.612         |
| Y          | 1.505         |
| Y1         | 6.50          |

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