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## Product Summary

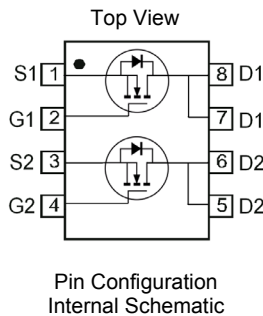
| $V_{(BR)DSS}$ | $R_{DS(on)}$ max                      | $I_D$ max<br>$T_A = +25^\circ\text{C}$ |
|---------------|---------------------------------------|--|
| 30V           | 16m $\Omega$ @ $V_{GS} = 10\text{V}$  | 9.8A                                   |
|               | 22m $\Omega$ @ $V_{GS} = 4.5\text{V}$ | 8.4A                                   |

## Description

This 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
- Power Management Functions
- DC-DC Converters

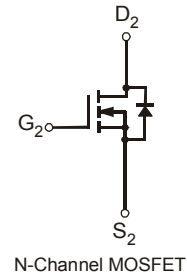
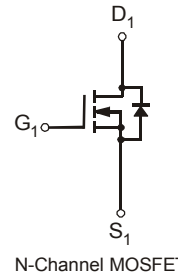


## Features and Benefits

- 100% avalanche rated part
- Low  $R_{DS(on)}$  - minimizes conduction losses
- Low  $Q_g$  - minimizes switching losses
- **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: 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 Leadframe. Solderable per MIL-STD-202, Method 208 <sup>(3)</sup>
- Weight: 0.076 grams (approximate)

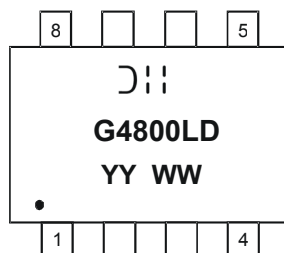
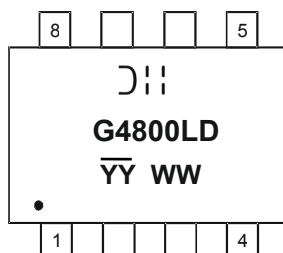


## Ordering Information (Notes 4 & 5)

| Part Number    | Compliance | Case | Packaging           |
|----------------|------------|------|---------------------|
| DMG4800LSD-13  | Standard   | SO-8 | 2,500 / Tape & Reel |
| DMG4800LSDQ-13 | Automotive | SO-8 | 2,500 / 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q10x and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



- $\text{D}||$  = Manufacturer's Marking  
 G4800LD = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or  $\overline{\text{YY}}$  = Year (ex: 14 = 2014)  
 WW = Week (01 - 53)  
 YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 $\overline{\text{YY}}$  = Date Code Marking for CAT (Chengdu Assembly/ Test site)



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

| Characteristic   |              |  | Symbol           | Value      | Units |
|--|--------------|--|------------------|------------|-------|
| 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>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 7.5<br>6.0 | A     |
|  | t < 10s      | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 9.8<br>7.7 | A     |
| Continuous Drain Current (Note 7) V <sub>GS</sub> = 4.5V | Steady State | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 6.4<br>5.0 | A     |
|  | t < 10s      | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 8.4<br>6.6 | A     |
| Maximum Continuous Body Diode Forward Current (Note 7)   |              |  | I <sub>S</sub>   | 2          | A     |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%)       |              |  | I <sub>DM</sub>  | 42         | A     |
| Avalanche Current (Notes 8 & 9) L = 0.1mH                |              |  | I <sub>AR</sub>  | 17         | A     |
| Repetitive Avalanche Energy (Notes 8 & 9) L = 0.1mH      |              |  | E <sub>AR</sub>  | 14         | mJ    |

**Thermal Characteristics**

| Characteristic                                   |              |  | Symbol                            | Value      | Units |
|--|--------------|--|-----------------------------------|------------|-------|
| Total Power Dissipation (Note 6)                 |              |  | P <sub>D</sub>                    | 1.17       | W     |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State |  | R <sub>θJA</sub>                  | 107        | °C/W  |
|  | t < 10s      |  | R <sub>θJA</sub>                  | 61         |       |
| Total Power Dissipation (Note 7)                 |              |  | P <sub>D</sub>                    | 1.5        | W     |
| Thermal Resistance, Junction to Ambient (Note 7) | Steady State |  | R <sub>θJA</sub>                  | 83         | °C/W  |
|  | t < 10s      |  | R <sub>θJA</sub>                  | 49         |       |
| 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 10)</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 T <sub>J</sub> = +25°C | I <sub>DSS</sub>    | —   | —     | 1.0  | 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 10)</b>                    |                     |     |       |      |      |  |
| Gate Threshold Voltage                                 | V <sub>GS(th)</sub> | 0.8 | —     | 1.6  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA   |
| Static Drain-Source On-Resistance                      | R <sub>DS(on)</sub> | —   | 12    | 16   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A   |
|  |                     | —   | 16    | 22   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7A  |
| Forward Transfer Admittance                            | Y <sub>fs</sub>     | —   | 8     | —    | S    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 9A   |
| Diode Forward Voltage                                  | V <sub>SD</sub>     | —   | 0.72  | 0.94 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A  |
| <b>DYNAMIC CHARACTERISTICS (Note 11)</b>               |                     |     |       |      |      |  |
| Input Capacitance                                      | C <sub>iss</sub>    | —   | 798   | —    | pF   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz   |
| Output Capacitance                                     | C <sub>oss</sub>    | —   | 128   | —    | pF   |  |
| Reverse Transfer Capacitance                           | C <sub>rss</sub>    | —   | 122   | —    | pF   |  |
| Gate Resistance  | R <sub>g</sub>      | —   | 1.37  | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz   |
| Total Gate Charge                                      | Q <sub>g</sub>      | —   | 8.56  | —    | nC   | V <sub>GS</sub> = 5V, V <sub>DS</sub> = 15V,<br>I <sub>D</sub> = 9A  |
| Gate-Source Charge                                     | Q <sub>gs</sub>     | —   | 1.8   | —    | nC   |  |
| Gate-Drain Charge                                      | Q <sub>gd</sub>     | —   | 2.5   | —    | nC   |  |
| Turn-On Delay Time                                     | t <sub>D(on)</sub>  | —   | 5.03  | —    | ns   | V <sub>DD</sub> = 15V, V <sub>GEN</sub> = 10V,<br>R <sub>L</sub> = 15Ω, R <sub>G</sub> = 6Ω, I <sub>D</sub> = 1A |
| Turn-On Rise Time                                      | t <sub>r</sub>      | —   | 4.50  | —    | ns   |  |
| Turn-Off Delay Time                                    | t <sub>D(off)</sub> | —   | 26.33 | —    | ns   |  |
| Turn-Off Fall Time                                     | t <sub>f</sub>      | —   | 8.55  | —    | ns   |  |

- 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.
  - I<sub>AR</sub> and E<sub>AR</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Applicable to products manufactured with Data Code "1146" (Nov, 2011) and newer.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

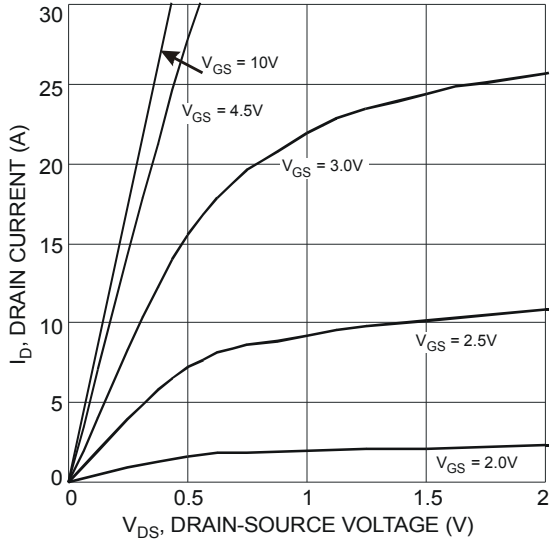


Fig. 1 Typical Output Characteristic

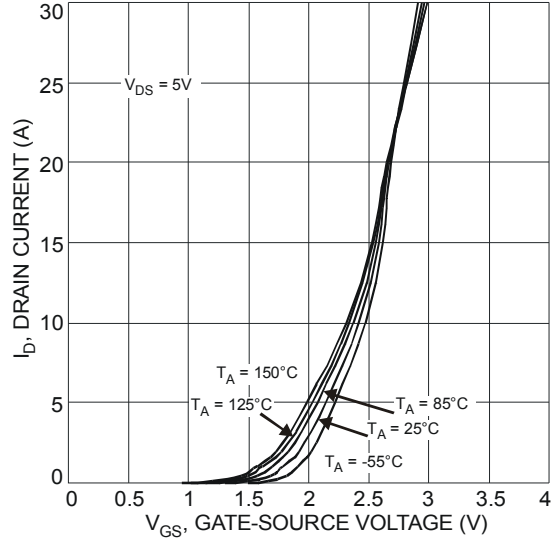


Fig. 2 Typical Transfer Characteristic

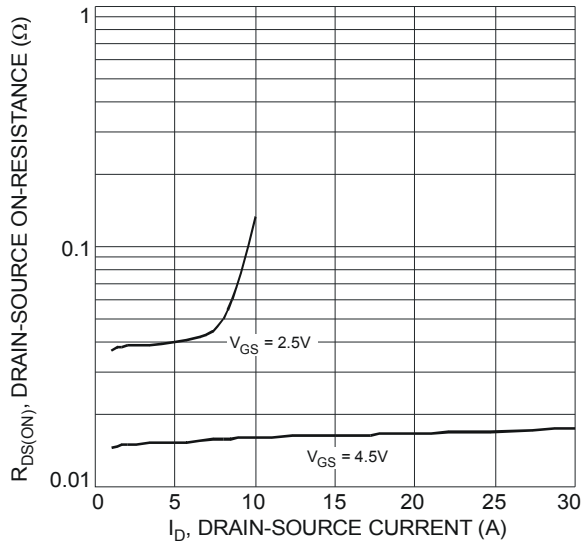


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

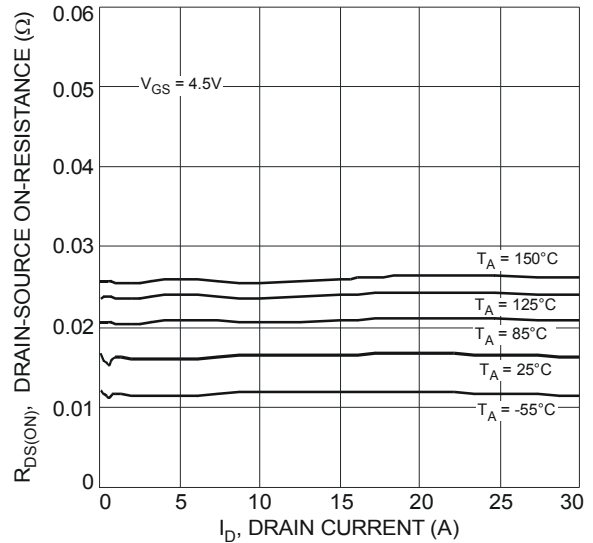


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

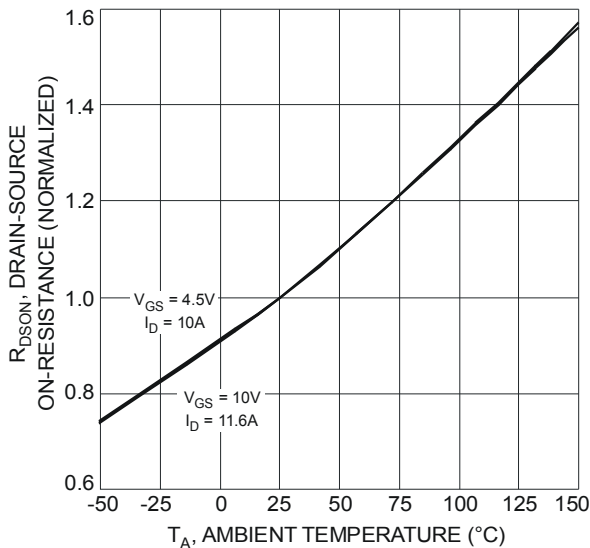


Fig. 5 On-Resistance Variation with Temperature

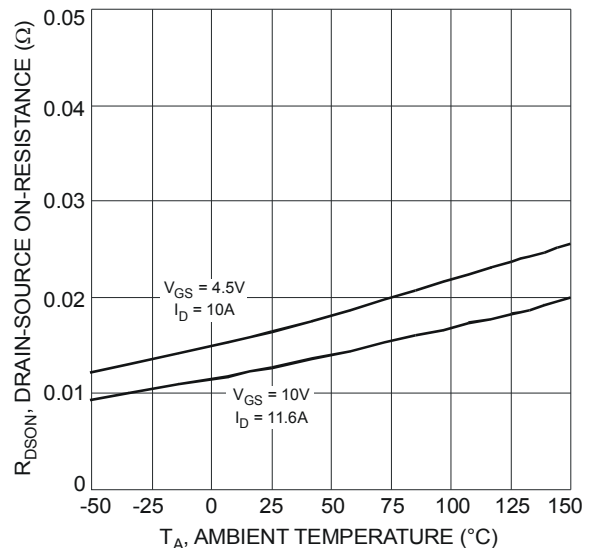


Fig. 6 On-Resistance Variation with Temperature

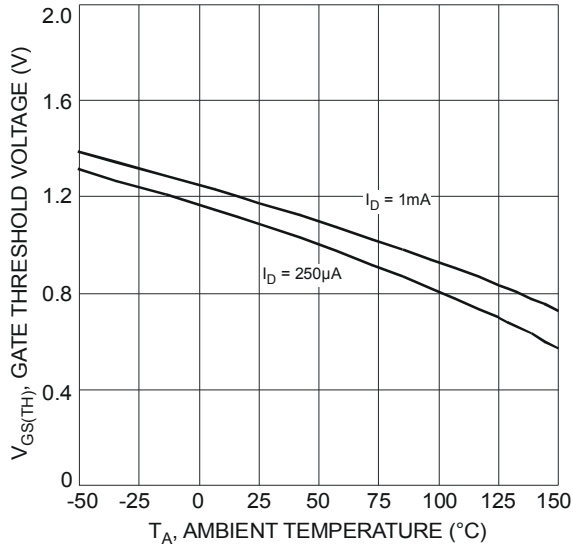


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

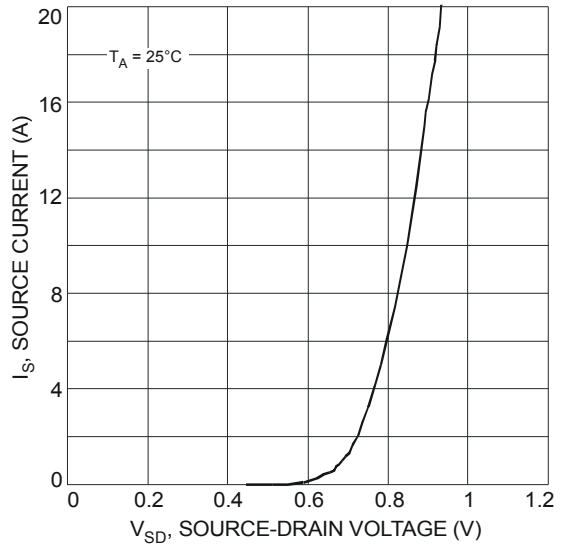


Fig. 8 Diode Forward Voltage vs. Current

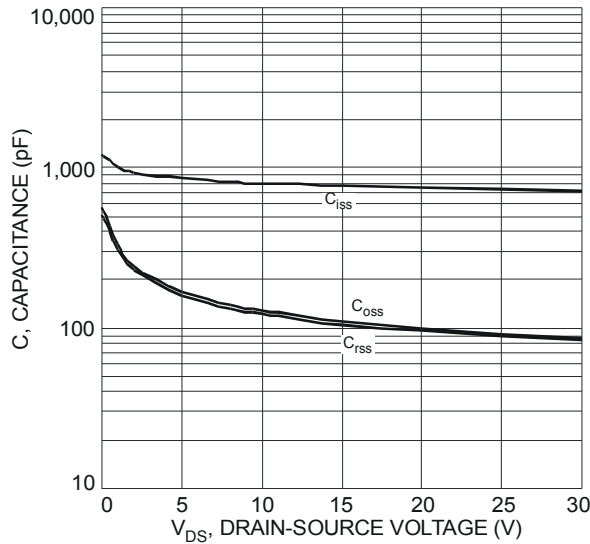


Fig. 9 Typical Total Capacitance

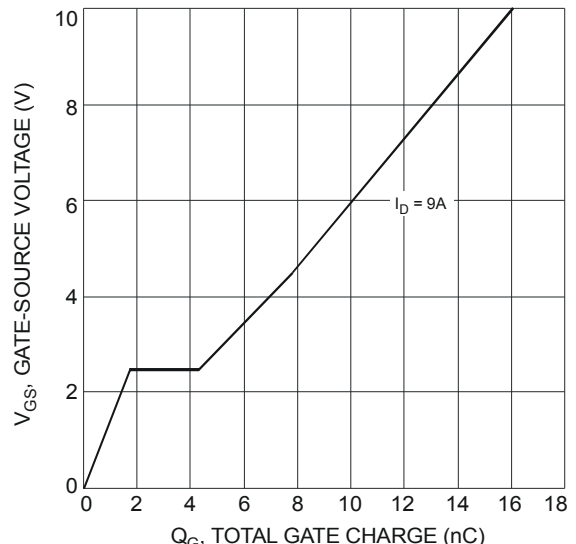


Fig. 10 Total Gate Charge

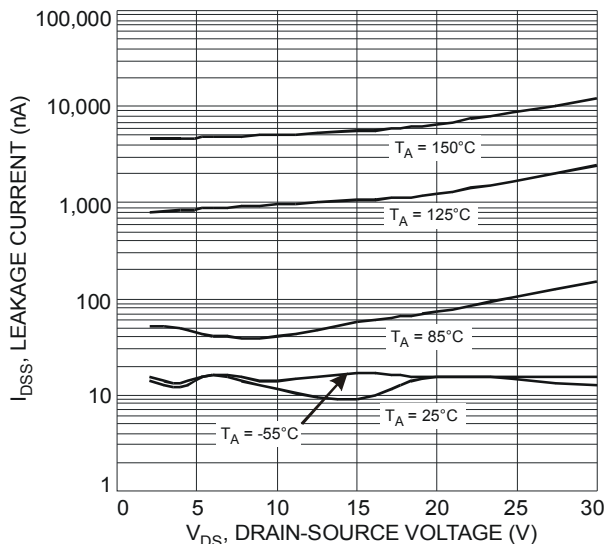


Fig. 11 Typical Leakage Current vs. Drain-Source Voltage

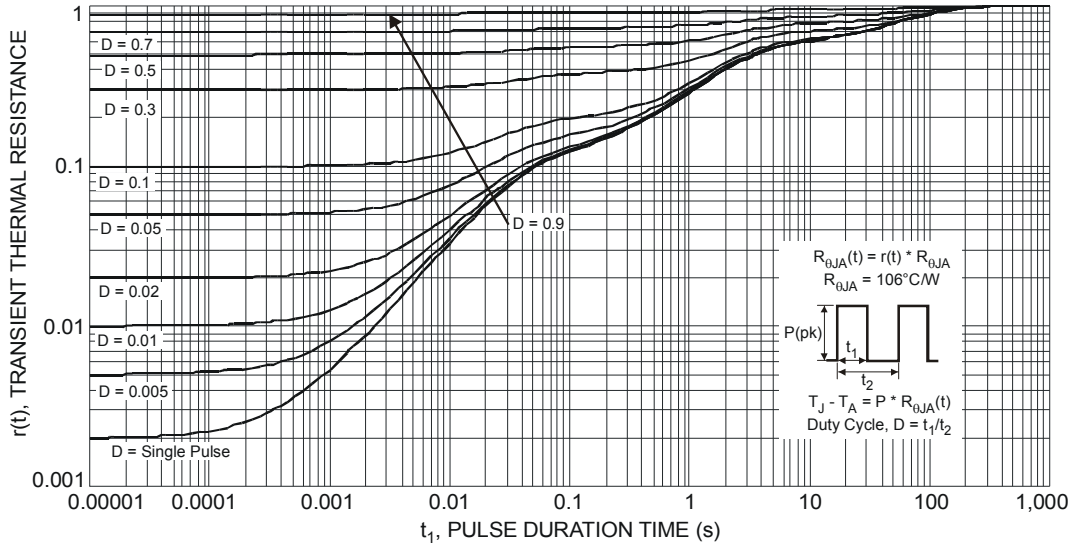
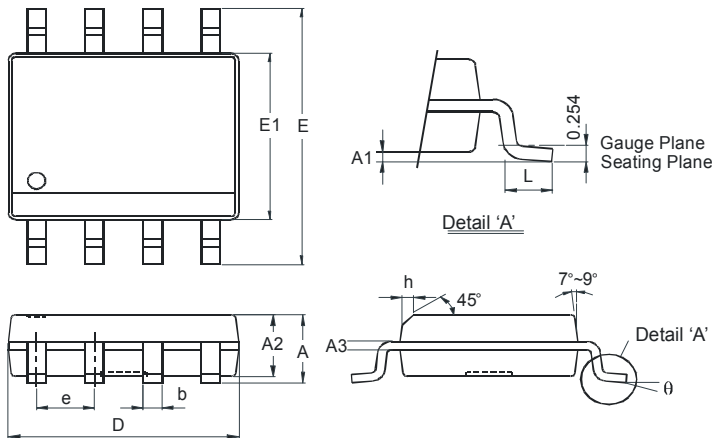


Fig. 12 Transient Thermal Response

**Package Outline Dimensions**

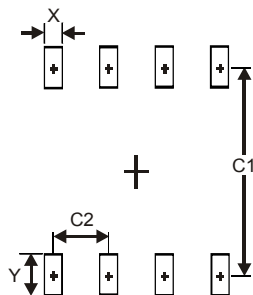
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| SO-8                 |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | -        | 1.75 |
| A1                   | 0.10     | 0.20 |
| A2                   | 1.30     | 1.50 |
| A3                   | 0.15     | 0.25 |
| b                    | 0.3      | 0.5  |
| D                    | 4.85     | 4.95 |
| E                    | 5.90     | 6.10 |
| E1                   | 3.85     | 3.95 |
| e                    | 1.27 Typ |      |
| h                    | -        | 0.35 |
| L                    | 0.62     | 0.82 |
| θ                    | 0°       | 8°   |
| All Dimensions in mm |          |      |

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.60          |
| Y          | 1.55          |
| C1         | 5.4           |
| C2         | 1.27          |

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