

## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ Max              | $I_D$<br>$T_A = +25^\circ C$ |
|------------|-------------------------------|------------------------------|
| 100V       | 16m $\Omega$ @ $V_{GS} = 10V$ | 8.3A                         |
|            | 18m $\Omega$ @ $V_{GS} = 6V$  | 7.9A                         |

## Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- High Conversion Efficiency
- Low  $R_{DS(ON)}$  – Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- **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**

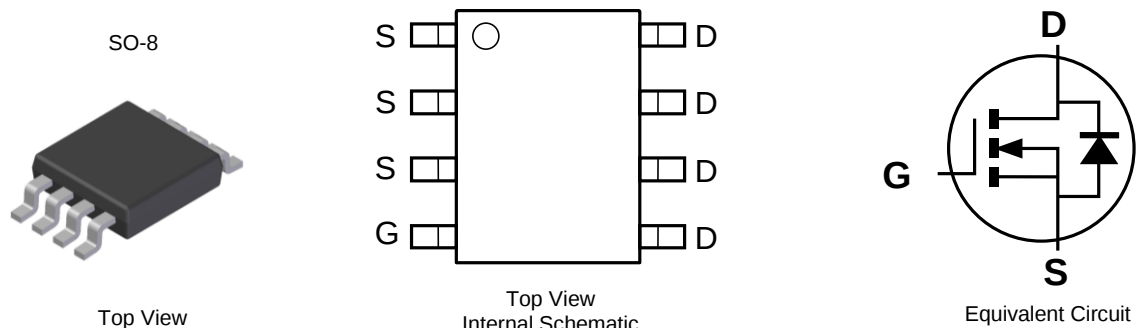
## Description and Applications

This new generation N-Channel Enhancement Mode MOSFET is designed to minimize  $R_{DS(ON)}$ , yet maintain superior switching performance. This device is ideal for use in notebook battery power management and loadswitch.

- Backlighting
- Power Management Functions
- DC-DC Converters

## 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 (e3)
- Weight: 0.074 grams (Approximate)

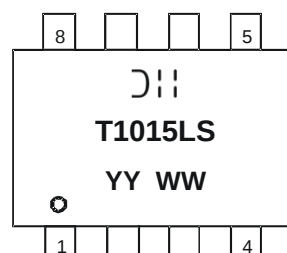


## Ordering Information (Note 4)

| Part Number     | Case | Packaging         |
|-----------------|------|-------------------|
| DMT10H015LSS-13 | 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DII = Manufacturer's Marking  
 T1015LS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or  $\overline{YY}$  = Year (ex: 16 = 2016)  
 WW = Week (01 - 53)

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

| Characteristic                                          |              |                                                  | Symbol           | Value      | Units |
|---------------------------------------------------------|--------------|--------------------------------------------------|------------------|------------|-------|
| Drain-Source Voltage                                    |              |                                                  | V <sub>DSS</sub> | 100        | 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<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 8.3<br>6.7 | A     |
| Maximum Continuous Body Diode Forward Current (Note 6)  |              |                                                  | I <sub>S</sub>   | 3          | A     |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)      |              |                                                  | I <sub>DM</sub>  | 54         | A     |
| Avalanche Current (Note 8) L = 3mH                      |              |                                                  | I <sub>AS</sub>  | 7.5        | A     |
| Avalanche Energy (Note 8) L = 3mH                       |              |                                                  | E <sub>AS</sub>  | 85         | mJ    |

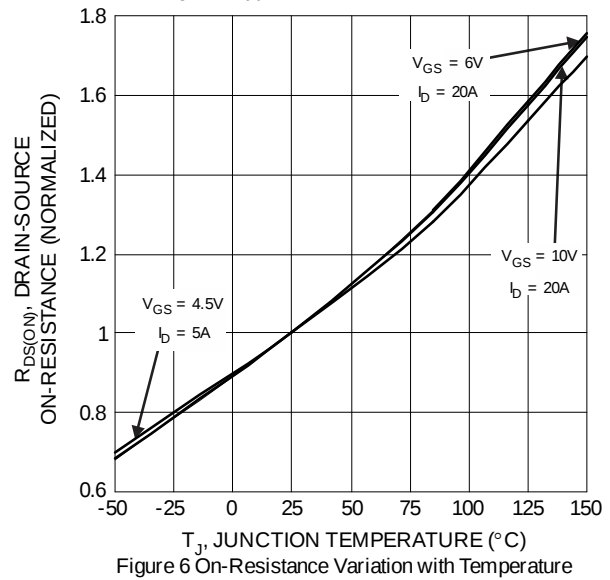
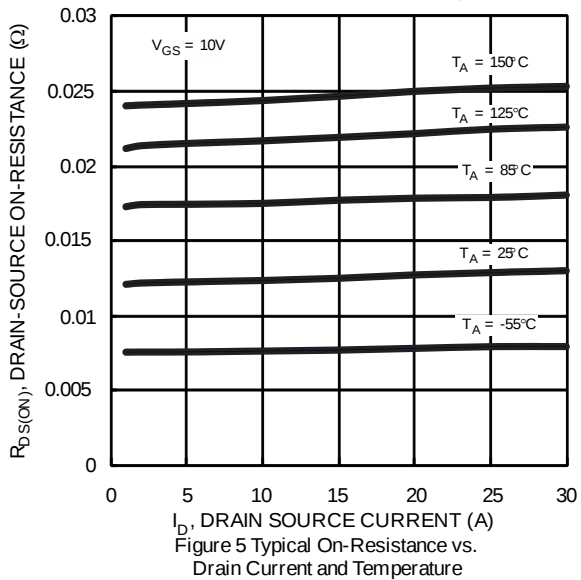
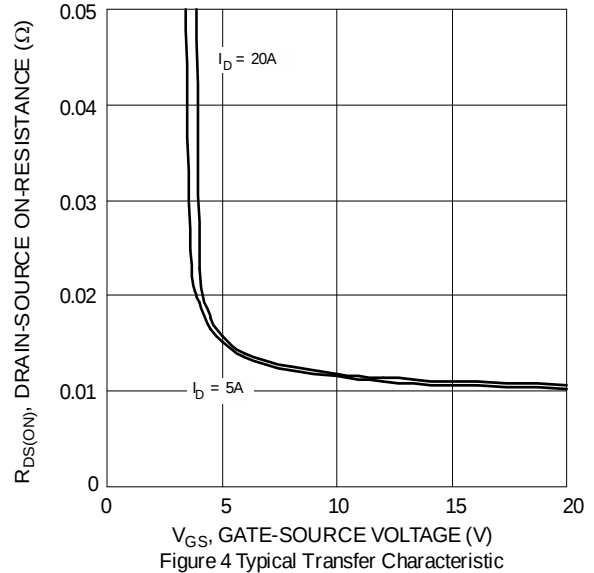
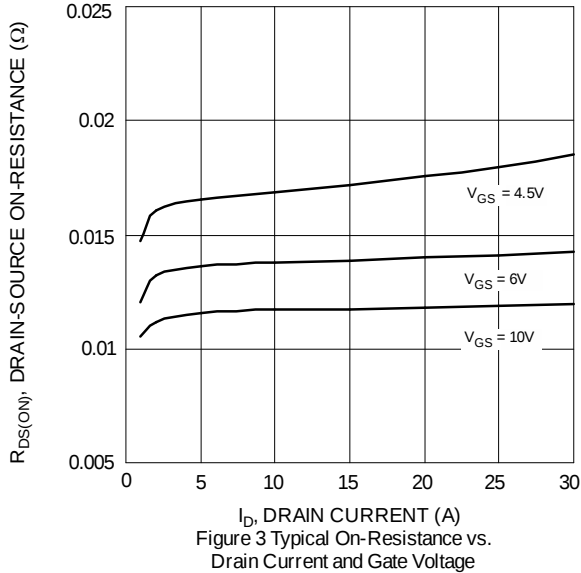
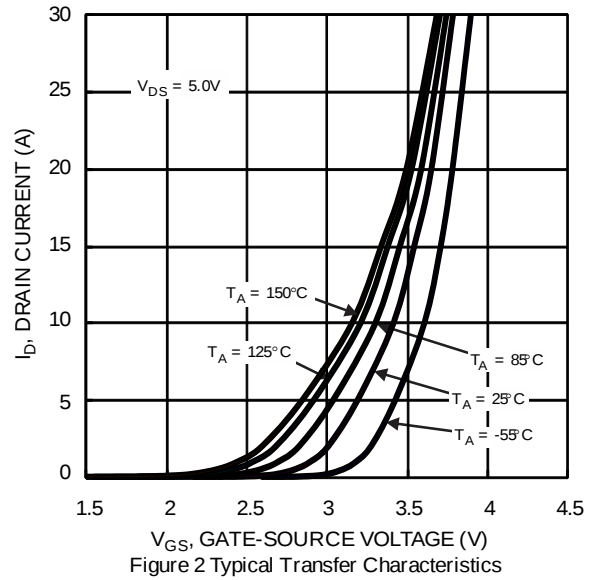
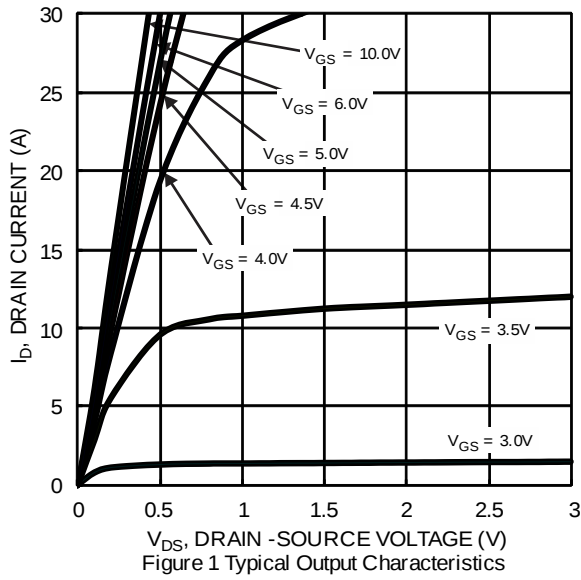
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                   | Symbol                            | Value       | Units |
|--------------------------------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | 1.2         | W     |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 100         | °C/W  |
| Total Power Dissipation (Note 6)                 | P <sub>D</sub>                    | 1.67        | W     |
| Thermal Resistance, Junction to Ambient (Note 6) | R <sub>θJA</sub>                  | 75          | °C/W  |
| Thermal Resistance, Junction to Case (Note 6)    | R <sub>θJC</sub>                  | 12          | °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</b> (Note 7)     |                     |     |       |      |      |                                                                                            |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | 100 | —     | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA                                                 |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —   | —     | 1    | µA   | V <sub>DS</sub> = 80V, 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</b> (Note 7)      |                     |     |       |      |      |                                                                                            |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | 1.4 | 2.3   | 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> | —   | 12    | 16   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A                                                |
|                                         |                     | —   | 14.5  | 18   |      | V <sub>GS</sub> = 6V, I <sub>D</sub> = 20A                                                 |
|                                         |                     | —   | 17    | 25   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A                                                |
| Diode Forward Voltage                   | V <sub>SD</sub>     | —   | 0.9   | 1.3  | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A                                                 |
| <b>DYNAMIC CHARACTERISTICS</b> (Note 8) |                     |     |       |      |      |                                                                                            |
| Input Capacitance                       | C <sub>ISS</sub>    | —   | 1,871 | —    | pF   | V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V<br>f = 1MHz                                    |
| Output Capacitance                      | C <sub>OSS</sub>    | —   | 261   | —    |      |                                                                                            |
| Reverse Transfer Capacitance            | C <sub>RSS</sub>    | —   | 7     | —    |      |                                                                                            |
| Gate Resistance                         | R <sub>G</sub>      | —   | 0.75  | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                       |
| Total Gate Charge                       | Q <sub>G</sub>      | —   | 33.3  | —    | nC   | V <sub>DD</sub> = 50V, I <sub>D</sub> = 10A,<br>V <sub>GS</sub> = 10V                      |
| Gate-Source Charge                      | Q <sub>GS</sub>     | —   | 6.9   | —    |      |                                                                                            |
| Gate-Drain Charge                       | Q <sub>GD</sub>     | —   | 5.1   | —    |      |                                                                                            |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —   | 6.5   | —    | ns   | V <sub>DD</sub> = 50V, V <sub>GS</sub> = 10V,<br>I <sub>D</sub> = 10A, R <sub>G</sub> = 6Ω |
| Turn-On Rise Time                       | t <sub>R</sub>      | —   | 7     | —    |      |                                                                                            |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —   | 19.7  | —    |      |                                                                                            |
| Turn-Off Fall Time                      | t <sub>F</sub>      | —   | 8.1   | —    | ns   | I <sub>F</sub> = 10A, di/dt = 100A/µs                                                      |
| Reverse Recovery Time                   | t <sub>RR</sub>     | —   | 37.9  | —    |      |                                                                                            |
| Reverse Recovery Charge                 | Q <sub>RR</sub>     | —   | 51.9  | —    | nC   |                                                                                            |

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.  
7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to product testing.



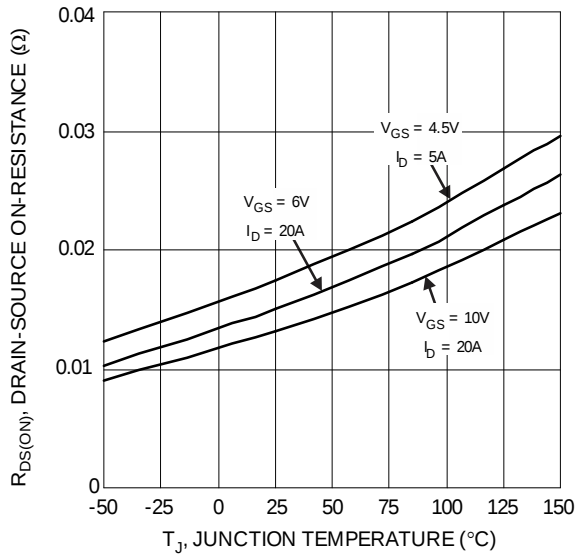


Figure 7 On-Resistance Variation with Junction Temperature

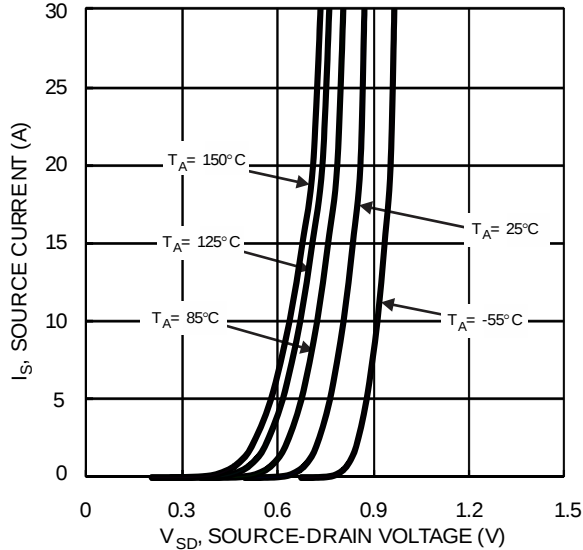


Figure 9 Diode Forward Voltage vs. Current

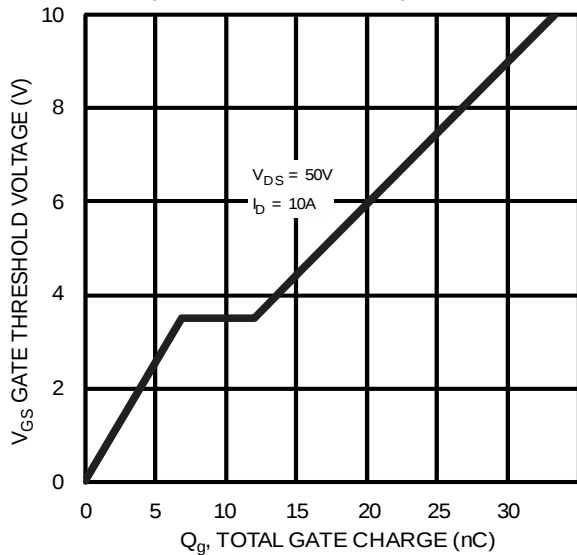


Figure 11 Gate Charge

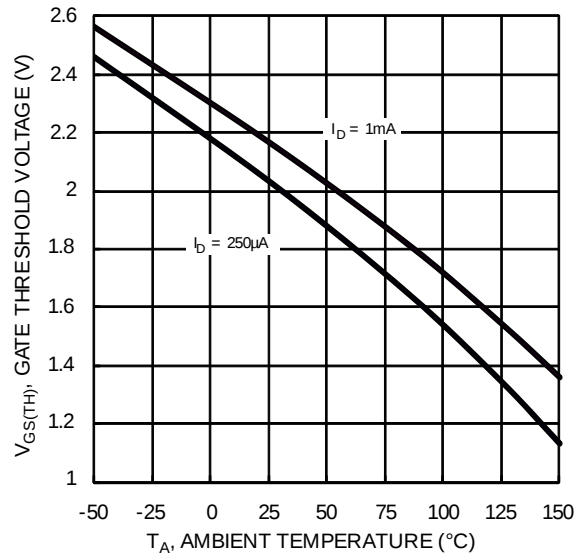


Figure 8 Gate Threshold Variation vs. Ambient Temperature

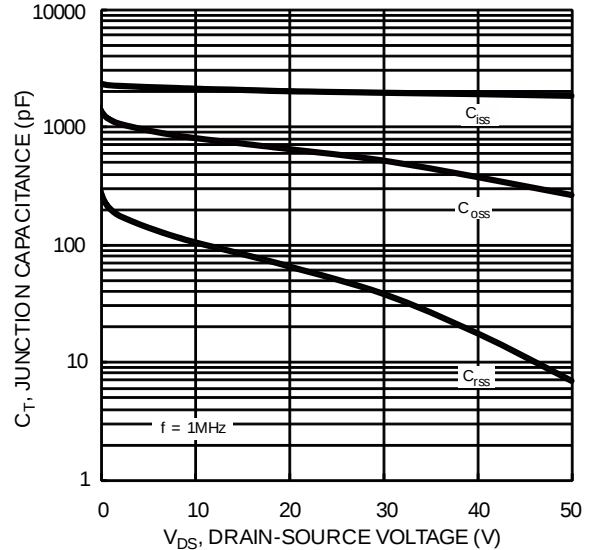


Figure 10 Typical Junction Capacitance

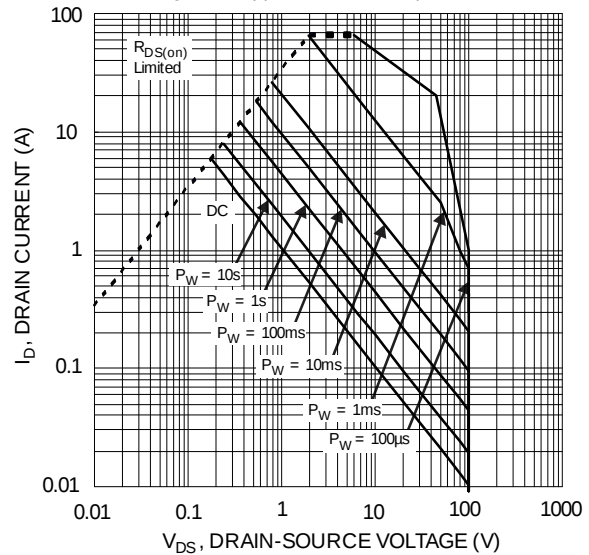
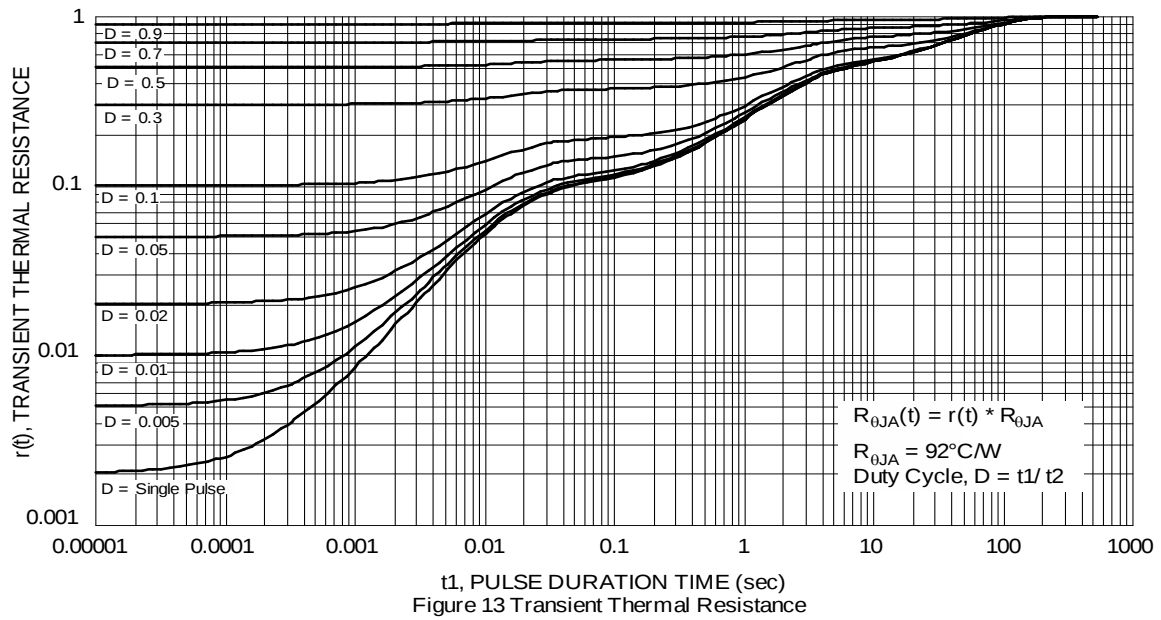


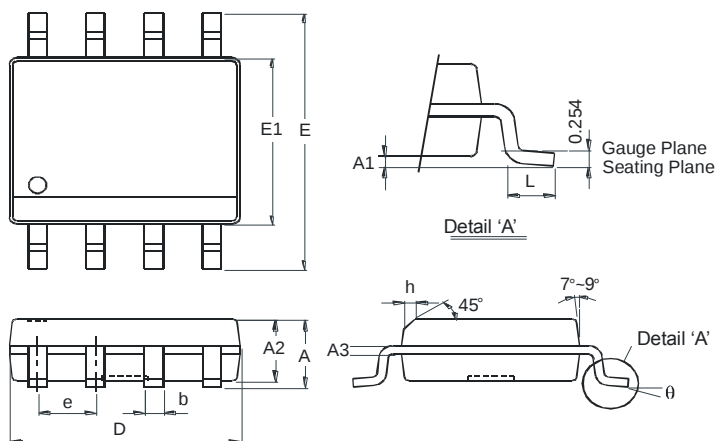
Figure 12 SOA, Safe Operation Area



## Package Outline Dimensions

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

### SO-8

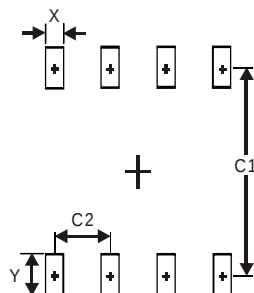


| SO-8                 |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | -        | 1.75 |
| A1                   | 0.10     | 0.20 |
| A2                   | 1.30     | 1.50 |
| A3                   | 0.15     | 0.25 |
| 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 <http://www.diodes.com/package-outlines.html> for the latest version.

### SO-8



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

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