

Product Summary

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

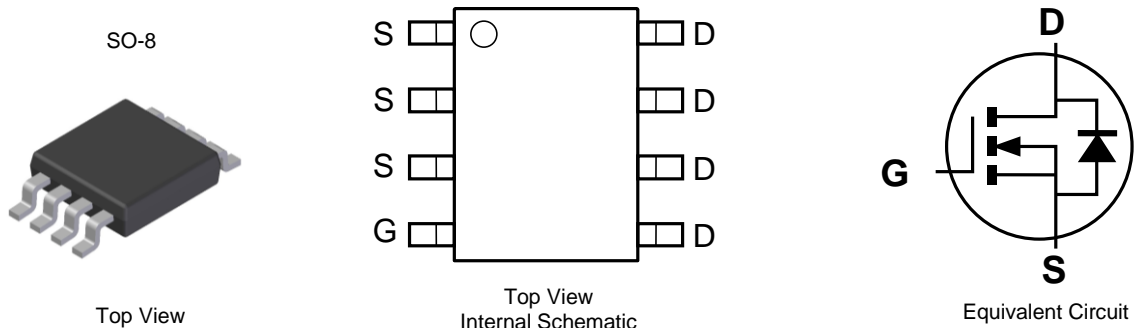
Description and Applications

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)

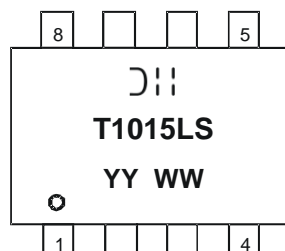


Ordering Information (Note 4)

| 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 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



- ⌋|| = 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Units | |
|--|-----------|--|------------|---|
| Drain-Source Voltage | V_{DSS} | 100 | V | |
| Gate-Source Voltage | V_{GSS} | ± 20 | V | |
| Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$ | I_D | Steady State $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | 8.3 6.7 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | I_S | 3 | A |
| Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%) | I_{DM} | 54 | A | |
| Avalanche Current (Note 8) $L = 3\text{mH}$ | I_{AS} | 7.5 | A | |
| Avalanche Energy (Note 8) $L = 3\text{mH}$ | E_{AS} | 85 | mJ | |

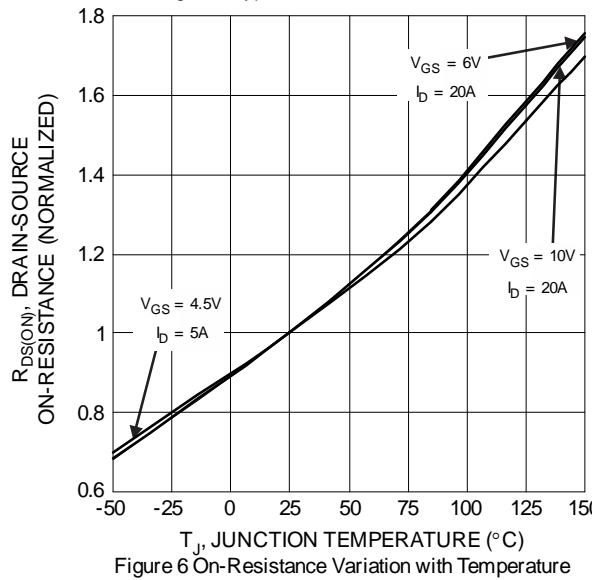
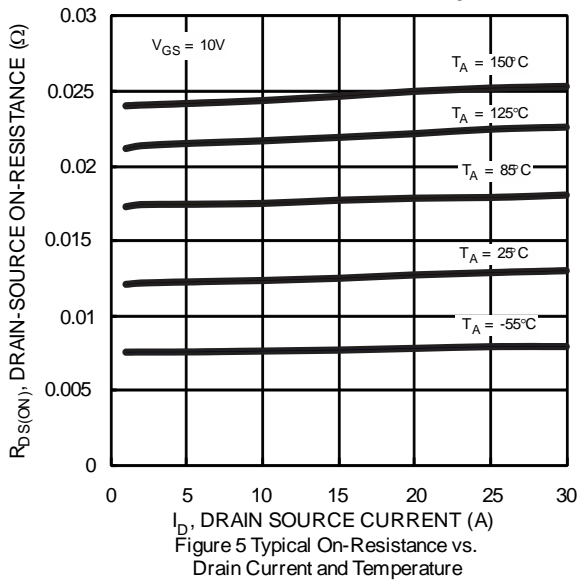
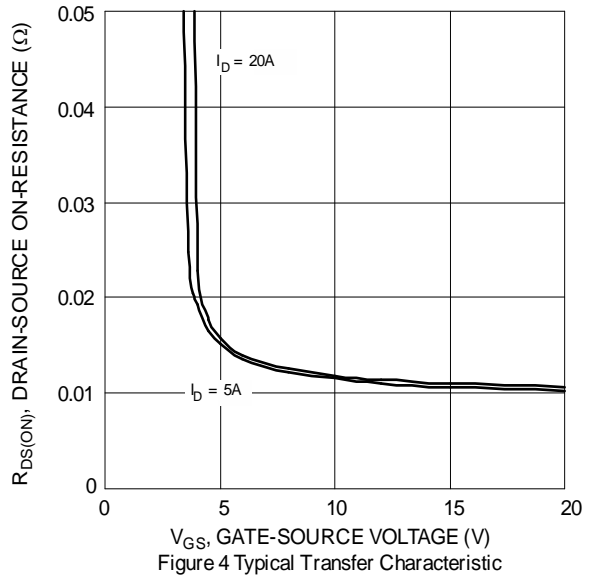
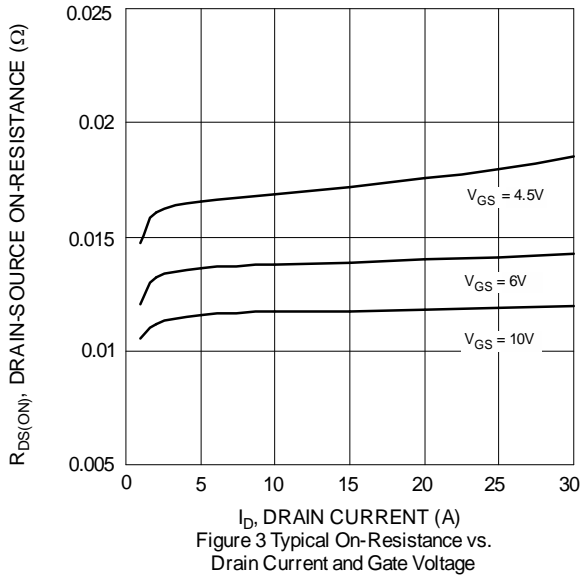
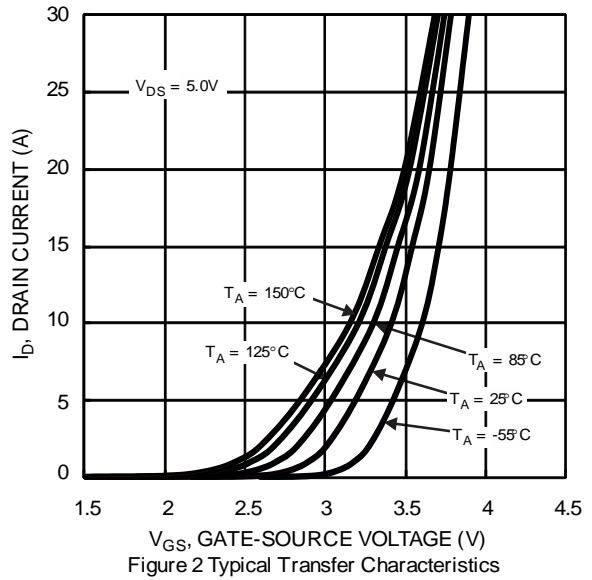
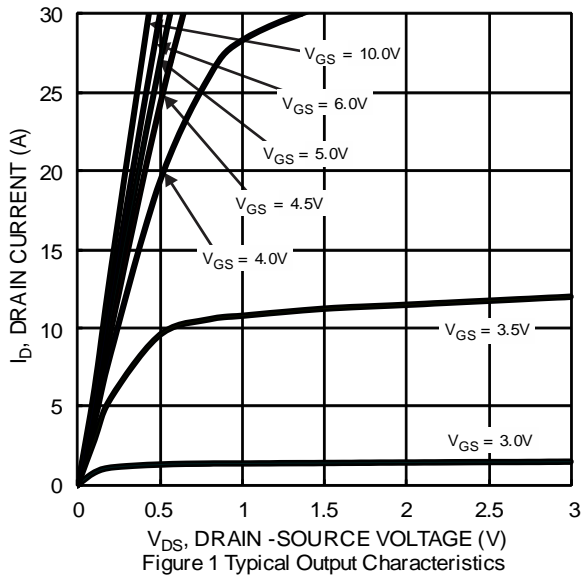
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Units |
|--|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 5) | P_D | 1.2 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 100 | $^\circ\text{C/W}$ |
| Total Power Dissipation (Note 6) | P_D | 1.67 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | $R_{\theta JA}$ | 75 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case (Note 6) | $R_{\theta JC}$ | 12 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics ($T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|--------------|-----|-------|-----------|---------------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 100 | — | — | V | $V_{GS} = 0\text{V}, I_D = 1\text{mA}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 100 | nA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 1.4 | 2.3 | 3 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 12 | 16 | m Ω | $V_{GS} = 10\text{V}, I_D = 20\text{A}$ |
| | | — | 14.5 | 18 | | $V_{GS} = 6\text{V}, I_D = 20\text{A}$ |
| | | — | 17 | 25 | | $V_{GS} = 4.5\text{V}, I_D = 5\text{A}$ |
| Diode Forward Voltage | V_{SD} | — | 0.9 | 1.3 | V | $V_{GS} = 0\text{V}, I_S = 20\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{ISS} | — | 1,871 | — | pF | $V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$ |
| Output Capacitance | C_{OSS} | — | 261 | — | | |
| Reverse Transfer Capacitance | C_{RSS} | — | 7 | — | | |
| Gate Resistance | R_G | — | 0.75 | — | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ |
| Total Gate Charge | Q_G | — | 33.3 | — | nC | $V_{DD} = 50\text{V}, I_D = 10\text{A},$ $V_{GS} = 10\text{V}$ |
| Gate-Source Charge | Q_{GS} | — | 6.9 | — | | |
| Gate-Drain Charge | Q_{GD} | — | 5.1 | — | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 6.5 | — | ns | $V_{DD} = 50\text{V}, V_{GS} = 10\text{V},$ $I_D = 10\text{A}, R_G = 6\Omega$ |
| Turn-On Rise Time | t_R | — | 7 | — | | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 19.7 | — | | |
| Turn-Off Fall Time | t_F | — | 8.1 | — | | |
| Reverse Recovery Time | t_{RR} | — | 37.9 | — | ns | $I_F = 10\text{A}, di/dt = 100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge | Q_{RR} | — | 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.



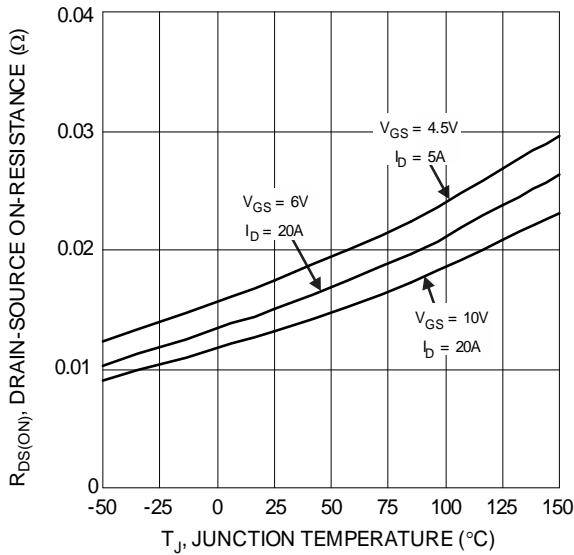


Figure 7 On-Resistance Variation with Junction Temperature

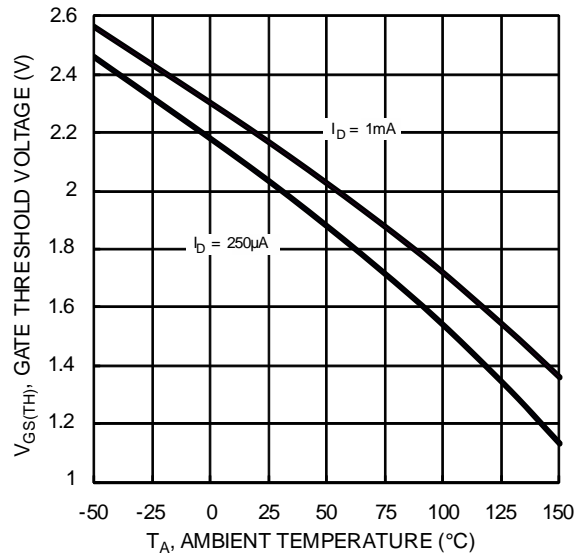


Figure 8 Gate Threshold Variation vs. Ambient Temperature

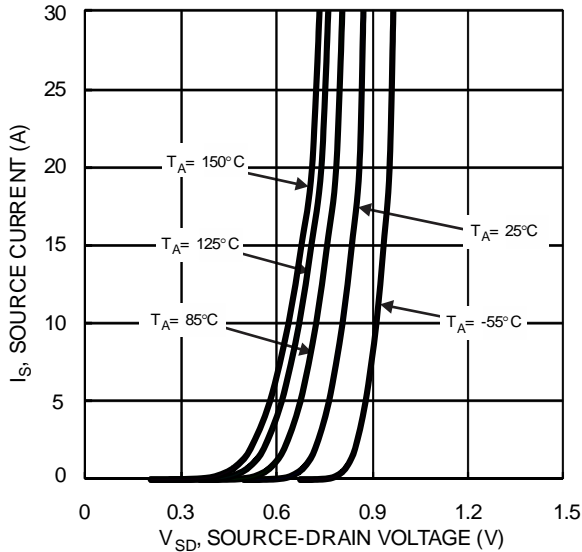


Figure 9 Diode Forward Voltage vs. Current

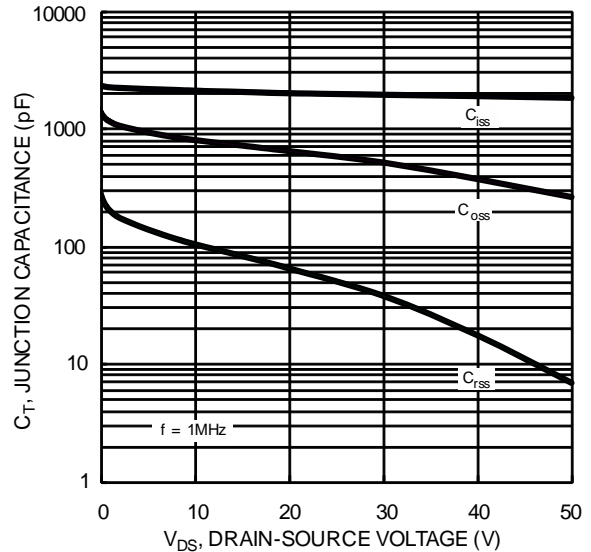


Figure 10 Typical Junction Capacitance

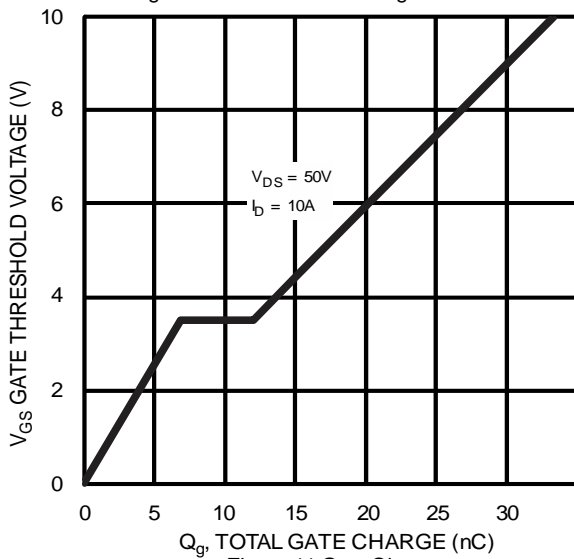


Figure 11 Gate Charge

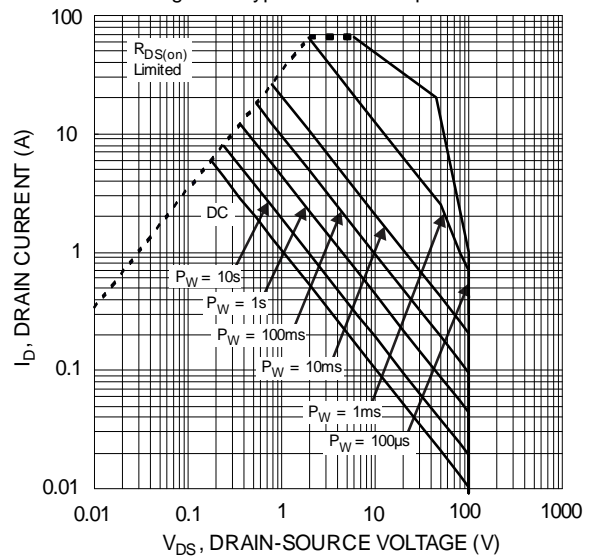
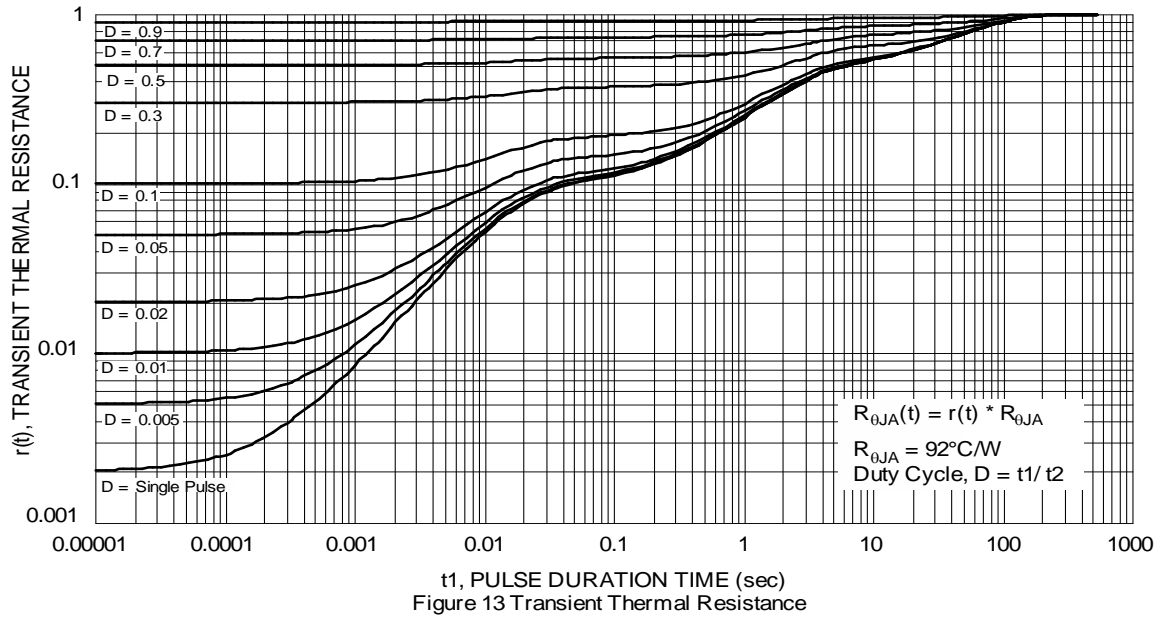


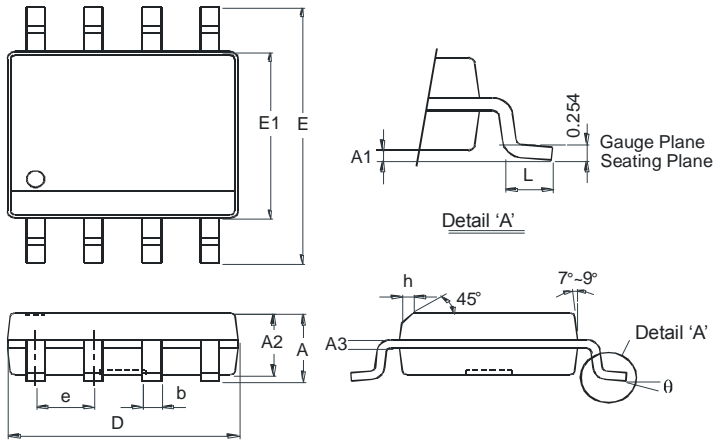
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

SO-8

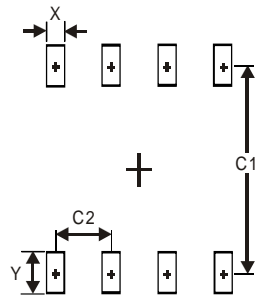


| SO-8 | | |
|-----------------------------|----------|------|
| Dim | Min | Max |
| A | - | 1.75 |
| A1 | 0.10 | 0.20 |
| A2 | 1.30 | 1.50 |
| A3 | 0.15 | 0.25 |
| b | 0.3 | 0.5 |
| D | 4.85 | 4.95 |
| E | 5.90 | 6.10 |
| E1 | 3.85 | 3.95 |
| e | 1.27 Typ | |
| h | - | 0.35 |
| L | 0.62 | 0.82 |
| θ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