

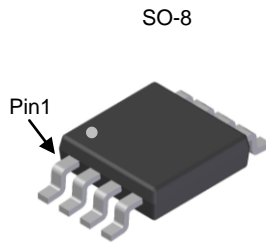
Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _A = +25°C |
|-------------------|-------------------------------|--|
| 60V | 16mΩ @ V _{GS} = 10V | 9.2A |
| | 21mΩ @ V _{GS} = 4.5V | 7.5A |

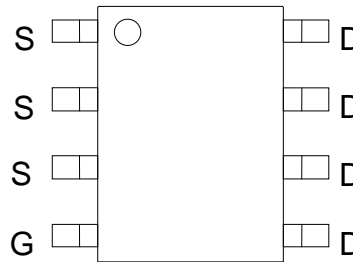
Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), maintain superior switching performance, making it ideal for high efficiency power management applications.

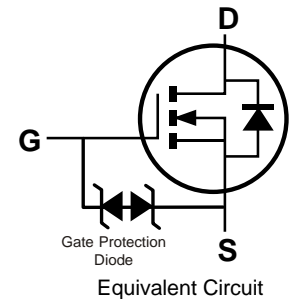
- Load Switch
- Adaptor Switch
- Notebook PC



Top View



Pin-Out
Top View



Equivalent Circuit

Features and Benefits

- 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

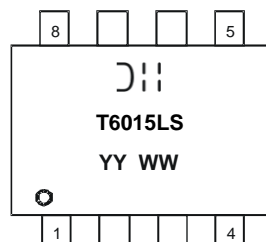
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.076 grams (Approximate)

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|------|-------------------|
| DMT6015LSS-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



DII = Manufacturer's Marking
 T6015LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Year (ex: 16 = 2016)
 WW = Week (01 - 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|--|--------------|--|------------------|-------------|-------|
| Drain-Source Voltage | | | V _{DSS} | 60 | V |
| Gate-Source Voltage | | | V _{GSS} | ±16 | V |
| Continuous Drain Current (Note 6) V _{GS} = 10V | Steady State | T _A = +25°C T _A = +70°C | I _D | 9.2 7.4 | A |
| | t < 10s | T _A = +25°C T _A = +70°C | I _D | 11.9 9.5 | A |
| Continuous Drain Current (Note 6) V _{GS} = 4.5V | Steady State | T _A = +25°C T _A = +70°C | I _D | 7.5 6.0 | A |
| | t < 10s | T _A = +25°C T _A = +70°C | I _D | 9.7 7.7 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | | | I _{DM} | 60 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | I _S | 2 | A |
| Avalanche Current, L = 0.1mH | | | I _{AS} | 15 | A |
| Avalanche Energy, L = 0.1mH | | | E _{AS} | 11 | mJ |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|--|--------------|--|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5) | | | P _D | 1.5 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | | R _{θJA} | 85 | °C/W |
| | t < 10s | | R _{θJA} | 45 | °C/W |
| Total Power Dissipation (Note 6) | | | P _D | 2.1 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | | R _{θJA} | 74 | °C/W |
| | t < 10s | | R _{θJA} | 37 | °C/W |
| Thermal Resistance, Junction to Case | | | R _{θJC} | 13 | °C/W |
| Operating and Storage Temperature Range | | | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-------|-----|------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 60 | — | — | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 48V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±16V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 0.5 | — | 2.5 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 12.4 | 16 | mΩ | V _{GS} = 10V, I _D = 10A |
| | | — | 15.8 | 21 | | V _{GS} = 4.5V, I _D = 6A |
| Diode Forward Voltage | V _{SD} | — | 0.7 | 1.2 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{ISS} | — | 1,103 | — | pF | V _{DS} = 30V, V _{GS} = 0V, f = 1MHz |
| Output Capacitance | C _{OSS} | — | 251 | — | | |
| Reverse Transfer Capacitance | C _{RSS} | — | 20 | — | | |
| Gate Resistance | R _G | — | 1.5 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _G | — | 8.9 | — | nC | V _{DS} = 30V, I _D = 10A |
| Total Gate Charge (V _{GS} = 10V) | Q _G | — | 18.9 | — | | |
| Gate-Source Charge | Q _{GS} | — | 3.0 | — | | |
| Gate-Drain Charge | Q _{GD} | — | 2.8 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 4.1 | — | ns | V _{GS} = 10V, V _{DS} = 30V, R _G = 6Ω, I _D = 10A |
| Turn-On Rise Time | t _R | — | 7.1 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 19.5 | — | | |
| Turn-Off Fall Time | t _F | — | 8.6 | — | | |
| Reverse Recovery Time | T _{RR} | — | 21.2 | — | ns | I _F = 10A, di/dt = 100A/µs |
| Reverse Recovery Charge | Q _{RR} | — | 13.2 | — | nC | |

- Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 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.

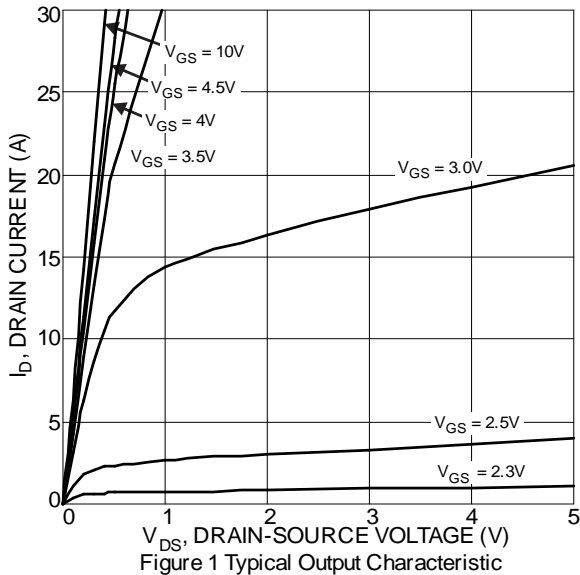


Figure 1 Typical Output Characteristic

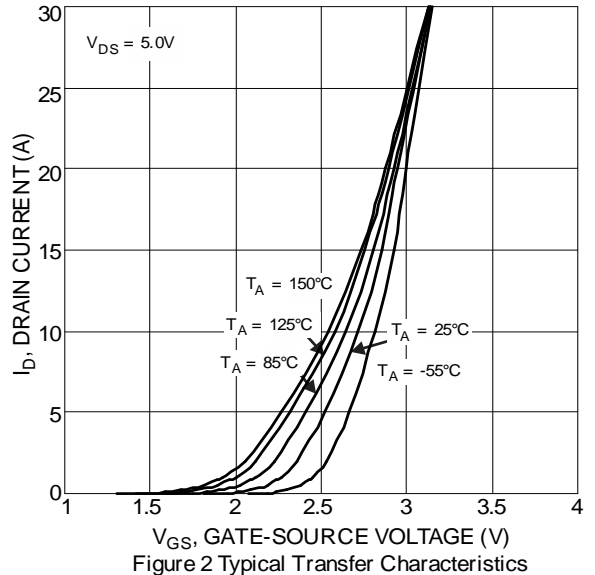


Figure 2 Typical Transfer Characteristics

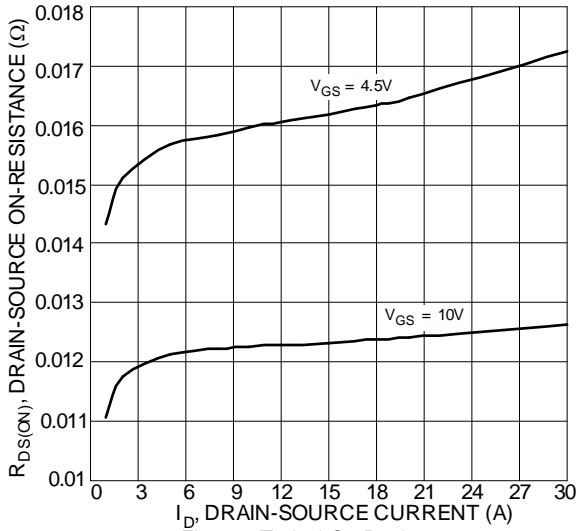


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

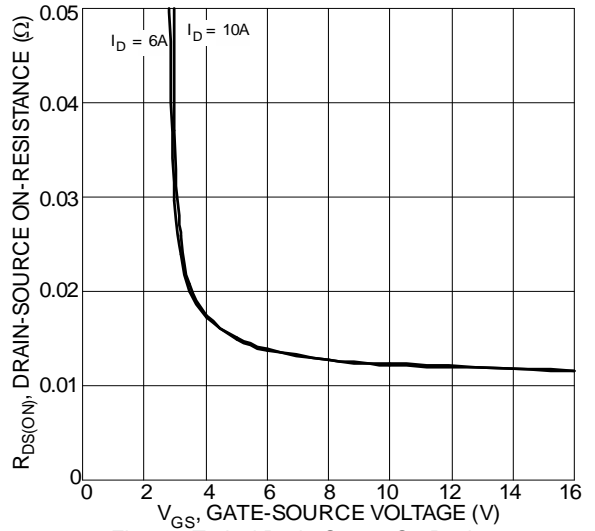


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

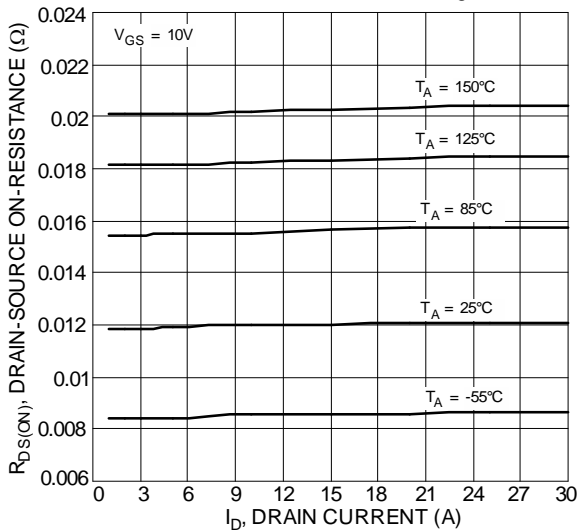


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

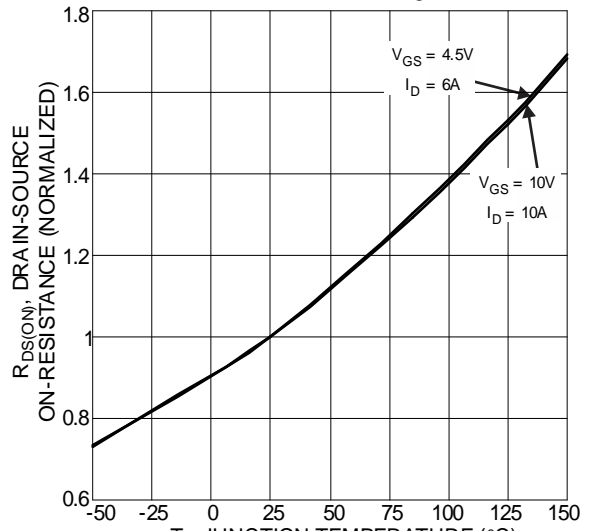


Figure 6 On-Resistance Variation with Temperature

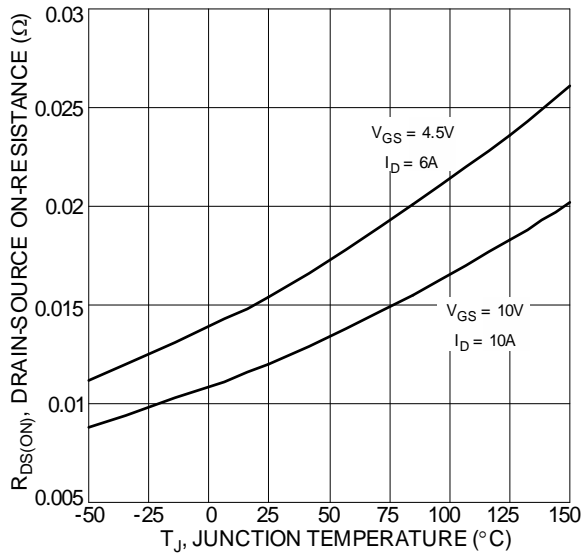


Figure 7 On-Resistance Variation with Temperature

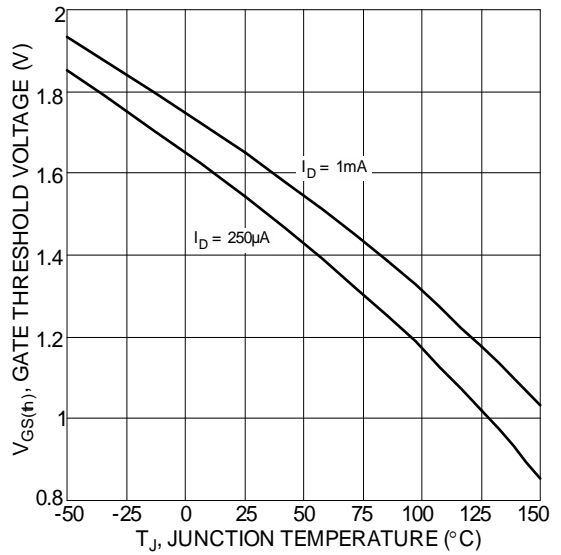


Figure 8 Gate Threshold Variation vs. Ambient Temperature

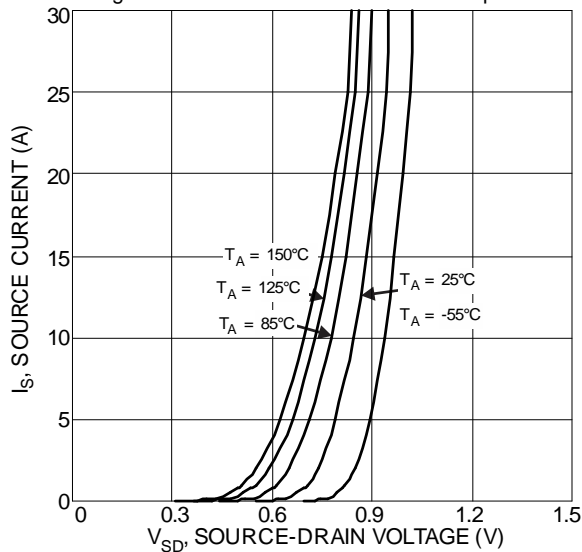


Figure 9 Diode Forward Voltage vs. Current

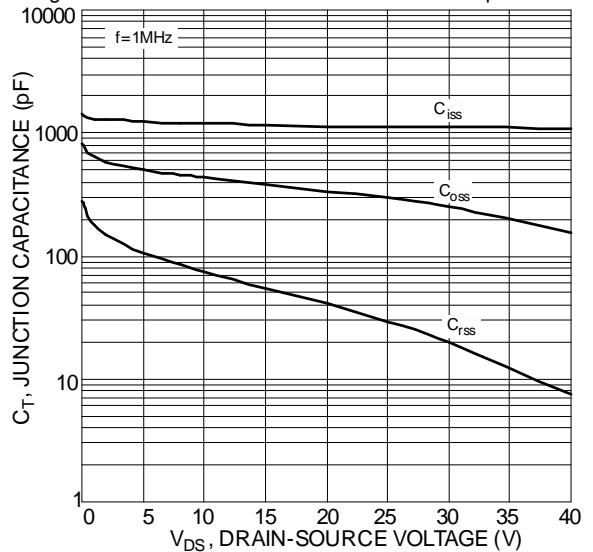


Figure 10 Typical Junction Capacitance

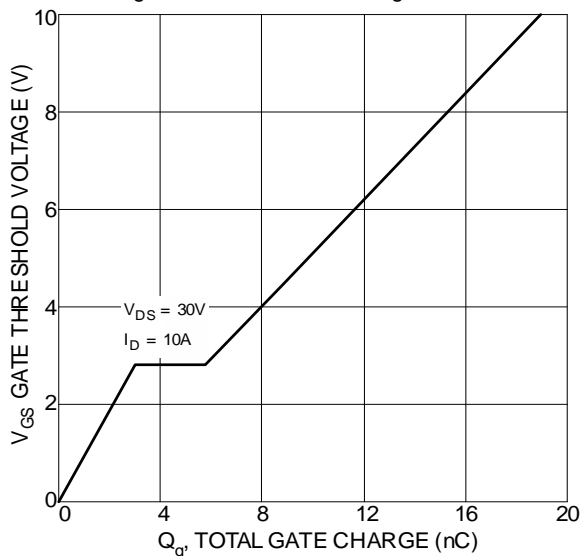


Figure 11 Gate Charge

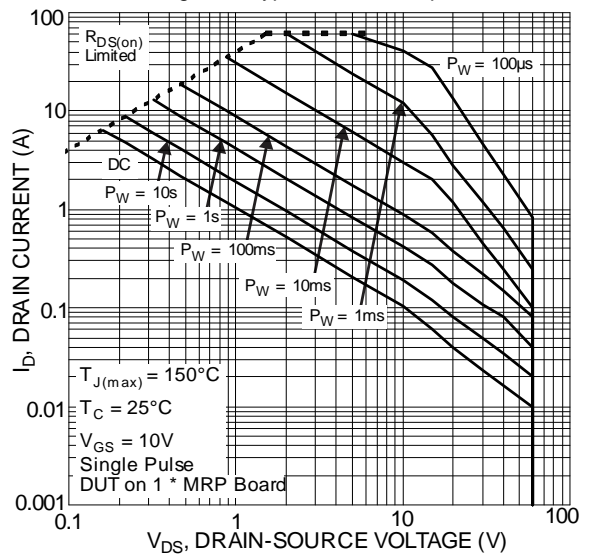


Figure 12 SOA, Safe Operation Area

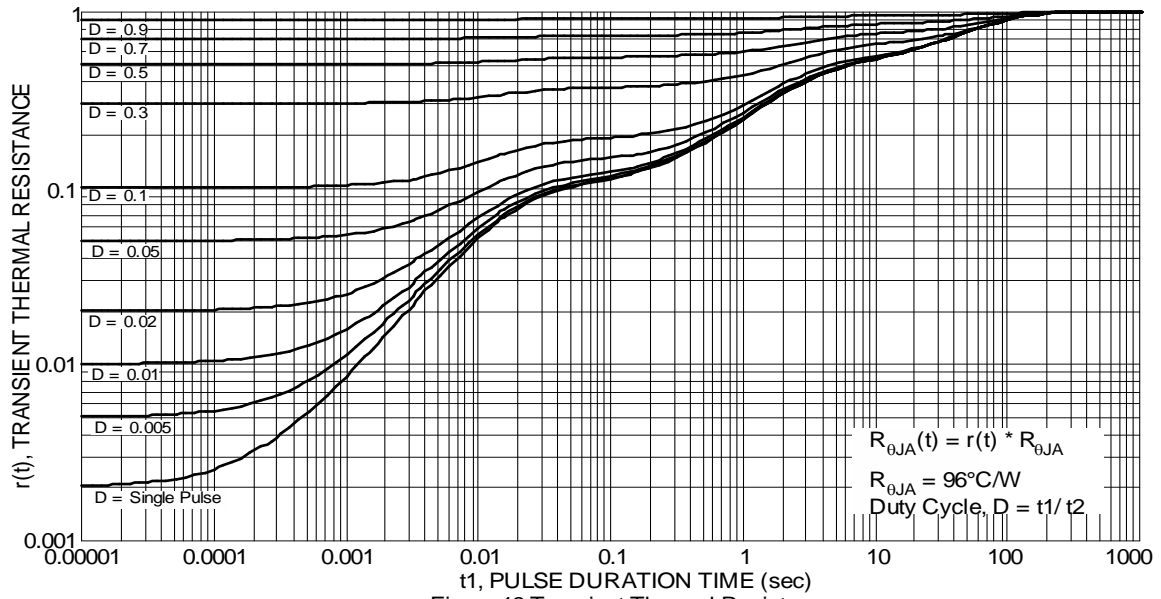
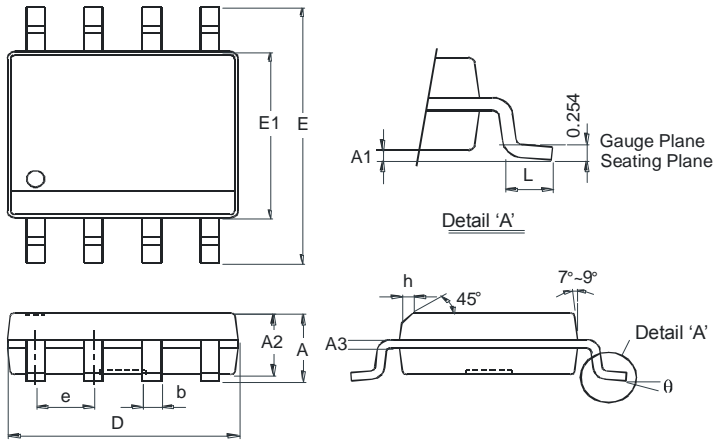


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

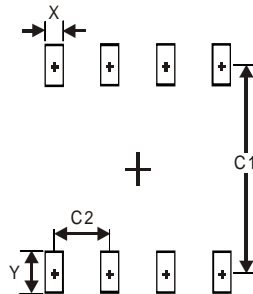


| SO-8 | | |
|-----------------------------|----------|------|
| Dim | Min | Max |
| A | - | 1.75 |
| A1 | 0.10 | 0.20 |
| A2 | 1.30 | 1.50 |
| A3 | 0.15 | 0.25 |
| b | 0.3 | 0.5 |
| D | 4.85 | 4.95 |
| E | 5.90 | 6.10 |
| E1 | 3.85 | 3.95 |
| e | 1.27 Typ | |
| h | - | 0.35 |
| L | 0.62 | 0.82 |
| θ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