



**THE DATASHEET OF
DMT10H014LSS-13**



Product Summary

| BV_{DSS} | $R_{DS(ON)}$ Max | I_D $T_A = +25^\circ C$ |
|------------|--------------------------------|------------------------------|
| 100V | 15m Ω @ $V_{GS} = 10V$ | 8.9A |
| | 18m Ω @ $V_{GS} = 6.0V$ | 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**

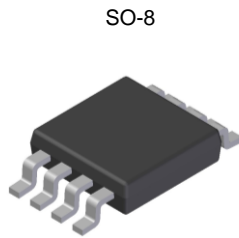
Description and Applications

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 load switch.

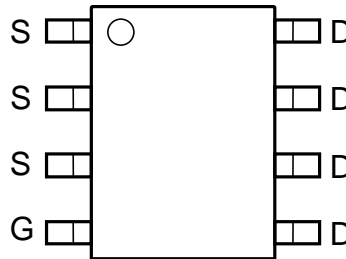
- Backlighting
- Power Management Functions
- DC-DC Converters

Mechanical Data

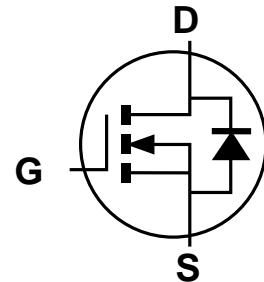
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.074 grams (Approximate)



Top View



Top View



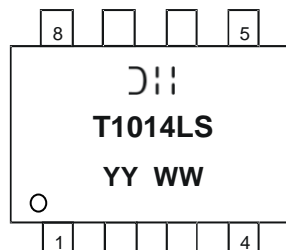
Equivalent Circuit

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-----------------|------|-------------------|
| DMT10H014LSS-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
 T1014LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Year (ex: 16 = 2016)
 WW = Week (01 to 53)

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

| Characteristic | Symbol | Value | Unit |
|---------------------------------------------------------------|------------------|-------|------|
| Drain-Source Voltage | V _{DSS} | 100 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 6) V _{GS} = 10V | I _D | 8.9 | A |
| Steady State T _A = +25°C T _A = +70°C | | 7.1 | |
| Maximum Continuous Body Diode Forward Current (Note 6) | I _S | 3 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | 54 | A |
| Avalanche Current, L = 3mH | I _{AS} | 7.5 | A |
| Avalanche Energy, L = 3mH | E _{AS} | 85 | mJ |

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

| Characteristic | Symbol | Value | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) | P _D | 1.2 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 100 | °C/W |
| Total Power Dissipation (Note 6) | P _D | 1.67 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 75 | °C/W |
| Thermal Resistance, Junction to Case (Note 6) | R _{θJC} | 12 | °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} | 100 | — | — | V | V _{GS} = 0V, I _D = 1mA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 80V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1.4 | 2 | 3 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 11.5 | 15 | mΩ | V _{GS} = 10V, I _D = 20A |
| | | — | 15 | 18 | | V _{GS} = 6V, I _D = 20A |
| | | — | 17.5 | 25 | | V _{GS} = 4.5V, I _D = 5A |
| | | — | — | — | | V _{GS} = 0V, I _S = 20A |
| Diode Forward Voltage | V _{SD} | — | 0.9 | 1.3 | V | V _{GS} = 0V, I _S = 20A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{ISS} | — | 1871 | — | pF | V _{DS} = 50V, V _{GS} = 0V f = 1MHz |
| Output Capacitance | C _{OSS} | — | 261 | — | | |
| Reverse Transfer Capacitance | C _{RSS} | — | 7 | — | | |
| Gate Resistance | R _G | — | 0.75 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | — | 33.3 | — | nC | V _{DD} = 50V, I _D = 10A, V _{GS} = 10V |
| 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} = 50V, V _{GS} = 10V, I _D = 10A, R _G = 6Ω |
| 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 = 10A, di/dt = 100A/µs |
| Reverse Recovery Charge | Q _{RR} | — | 51.9 | — | nC | |

- 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.

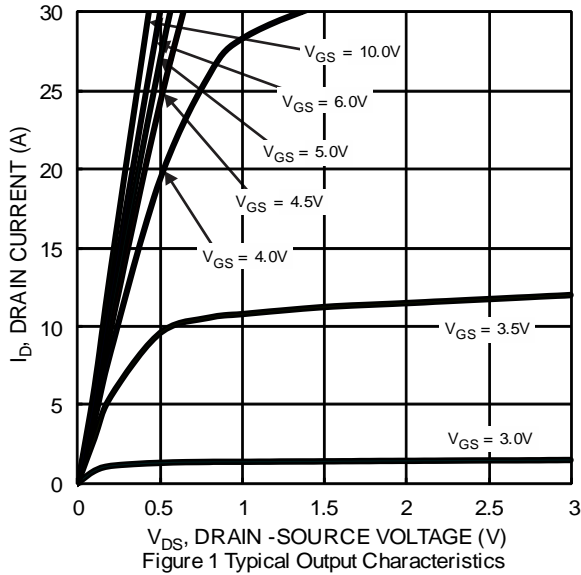


Figure 1 Typical Output Characteristics

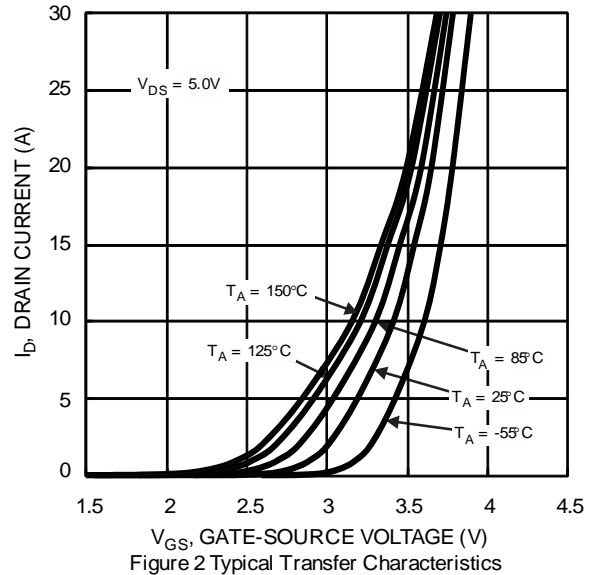


Figure 2 Typical Transfer Characteristics

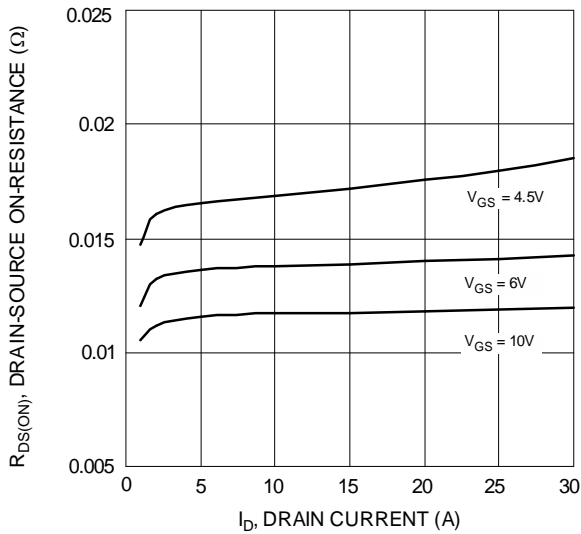


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

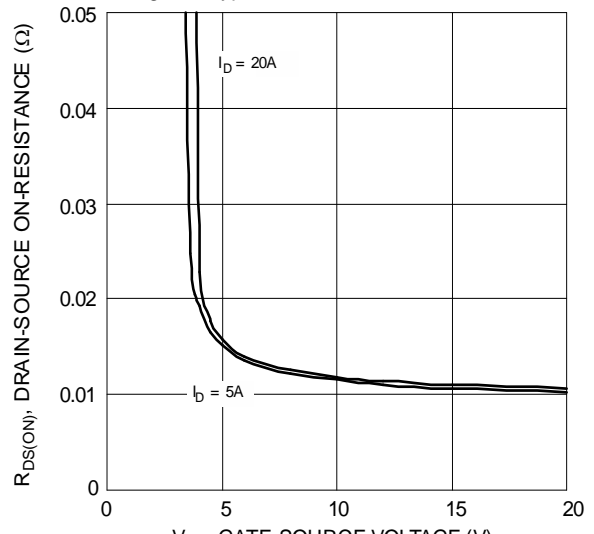


Figure 4 Typical Transfer Characteristic

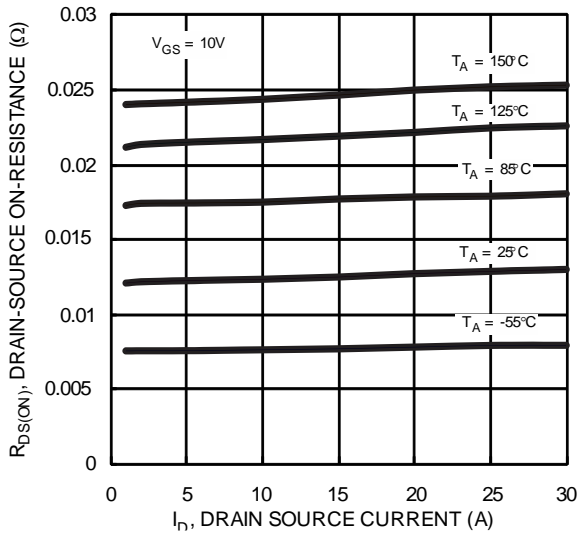


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

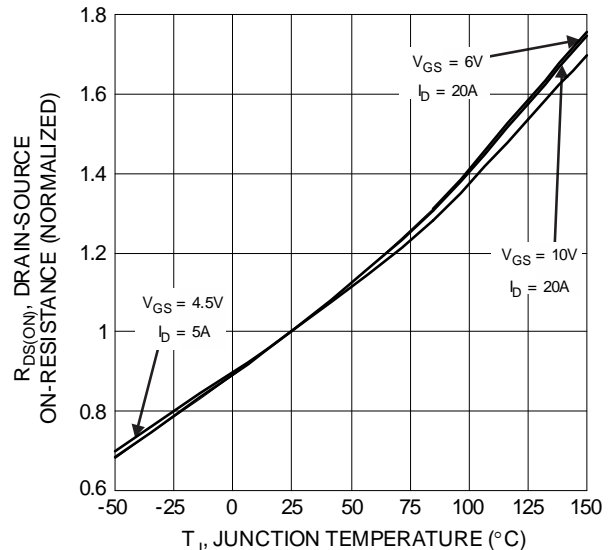


Figure 6 On-Resistance Variation with Temperature

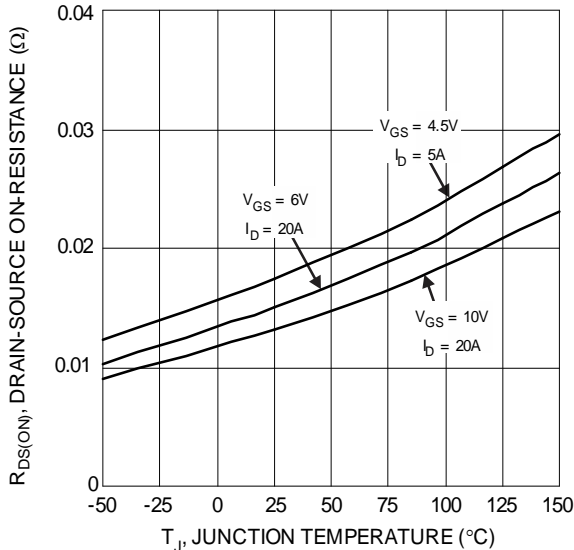


Figure 7 On-Resistance Variation with Junction Temperature

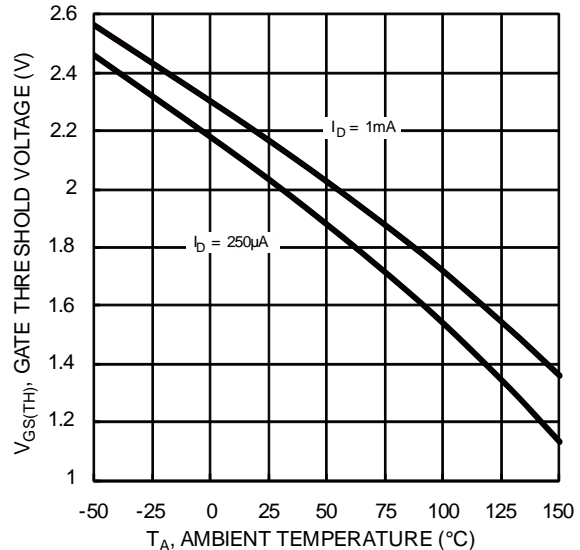


Figure 8 Gate Threshold Variation vs. Ambient Temperature

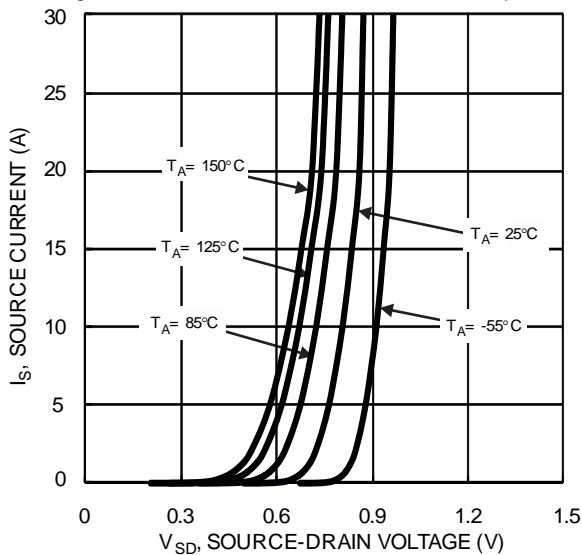


Figure 9 Diode Forward Voltage vs. Current

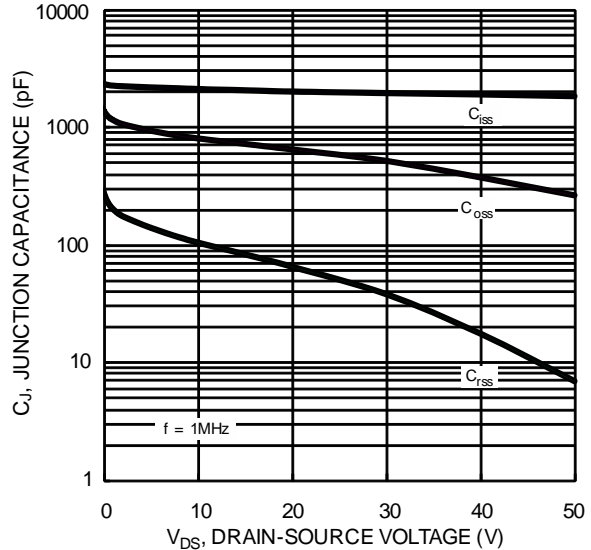


Figure 10 Typical Junction Capacitance

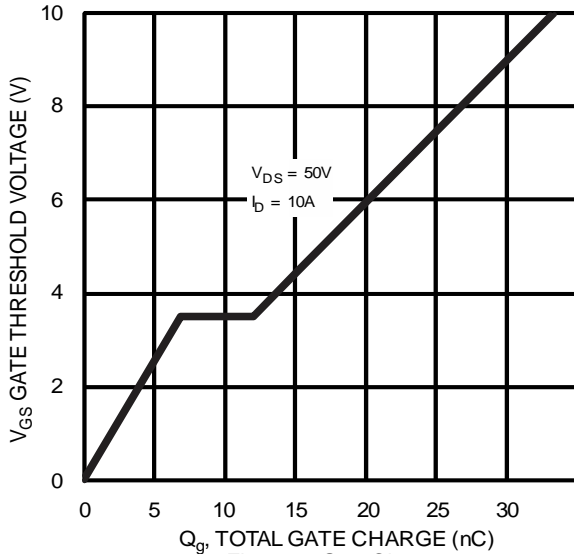


Figure 11 Gate Charge

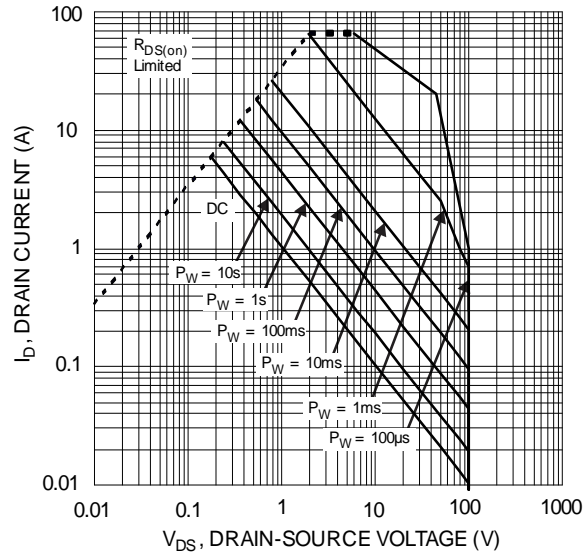
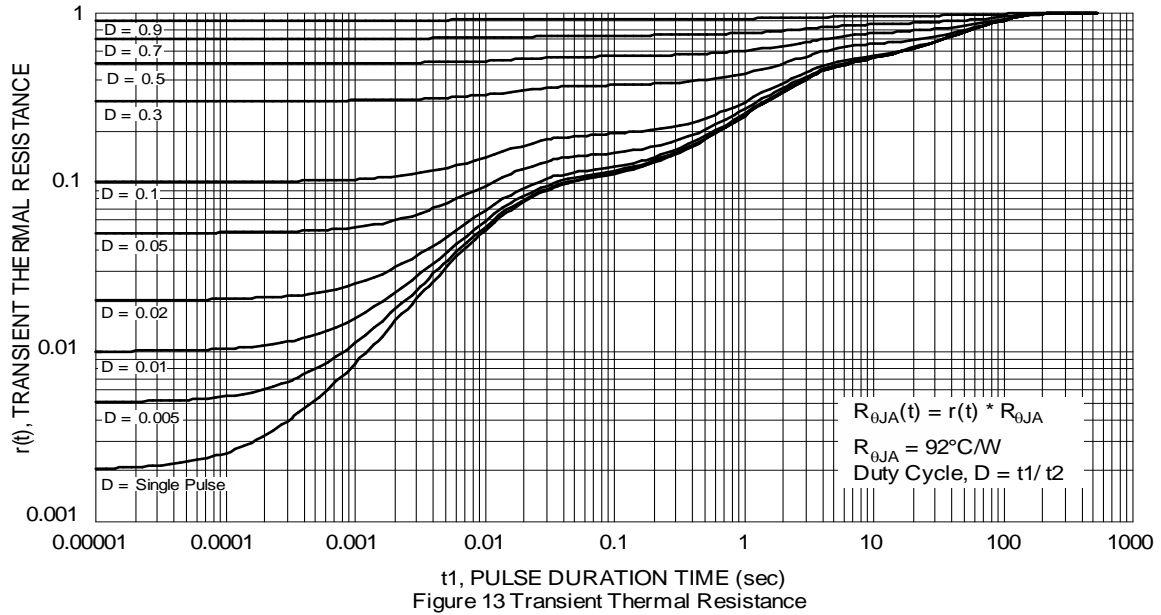


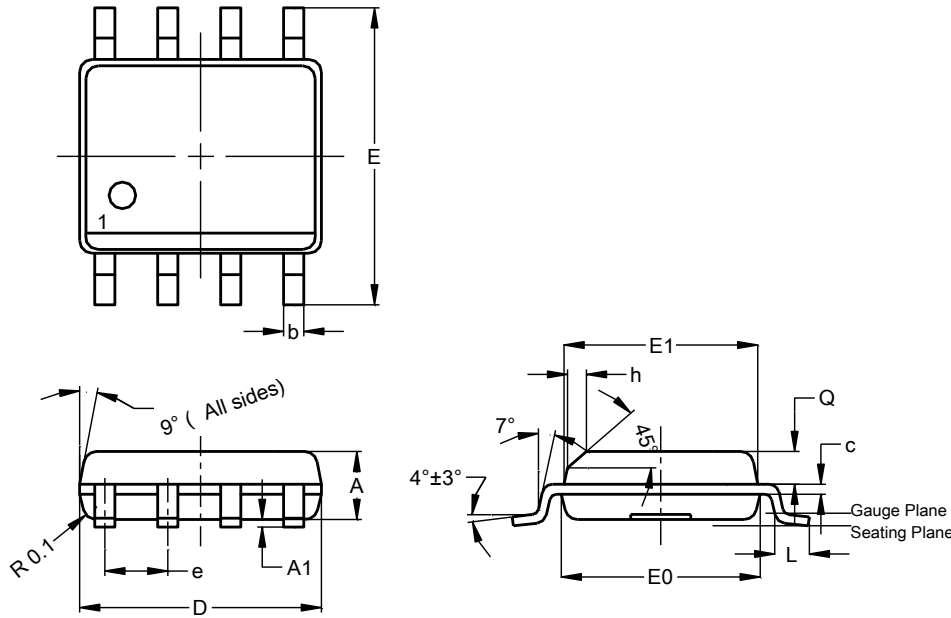
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

SO-8

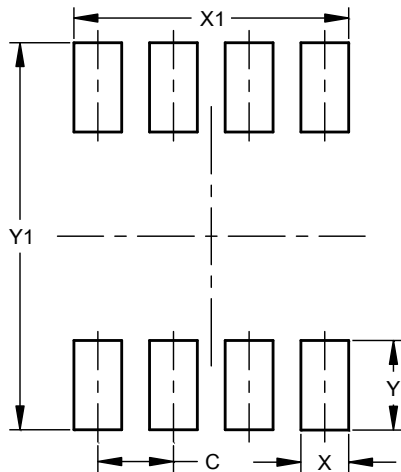


| SO-8 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 1.40 | 1.50 | 1.45 |
| A1 | 0.10 | 0.20 | 0.15 |
| b | 0.30 | 0.50 | 0.40 |
| c | 0.15 | 0.25 | 0.20 |
| D | 4.85 | 4.95 | 4.90 |
| E | 5.90 | 6.10 | 6.00 |
| E1 | 3.80 | 3.90 | 3.85 |
| E0 | 3.85 | 3.95 | 3.90 |
| 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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