

## Product Summary

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

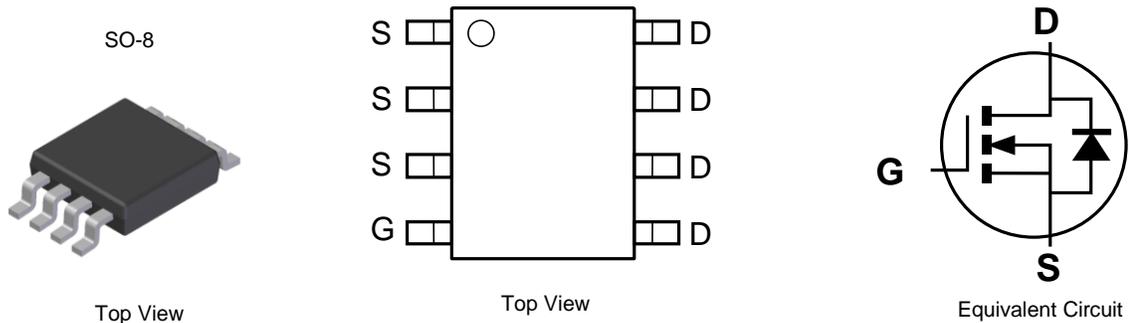
## Description and Applications

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)

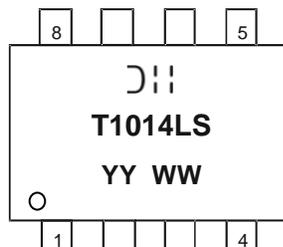


## Ordering Information (Note 4)

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](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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
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	I <sub>D</sub>	8.9	A
Steady State T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C		7.1	
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, L = 3mH	I <sub>AS</sub>	7.5	A
Avalanche Energy, L = 3mH	E <sub>AS</sub>	85	mJ

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

Characteristic	Symbol	Value	Unit
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 (Note 7)</b>						
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 (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.4	2	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>	—	11.5	15	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A
		—	15	18		V <sub>GS</sub> = 6V, I <sub>D</sub> = 20A
		—	17.5	25		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A
		—	—	—		V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A
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 (Note 8)</b>						
Input Capacitance	C <sub>ISS</sub>	—	1871	—	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V 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, 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, 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	—		
Reverse Recovery Time	t <sub>RR</sub>	—	37.9	—	ns	I <sub>F</sub> = 10A, di/dt = 100A/µs
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 1inch square copper plate.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to product testing.

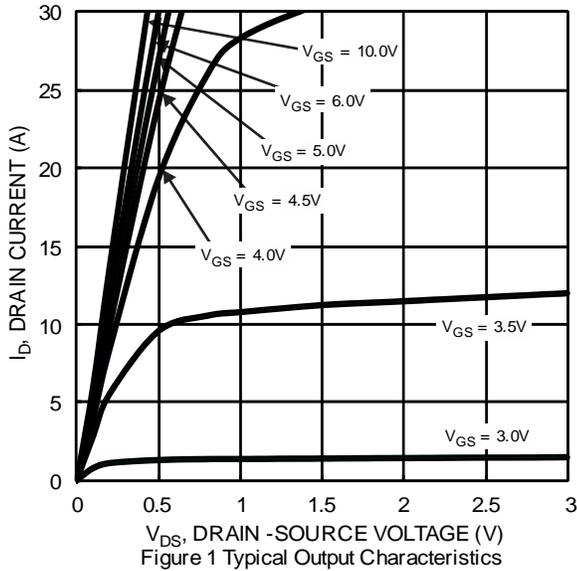


Figure 1 Typical Output Characteristics

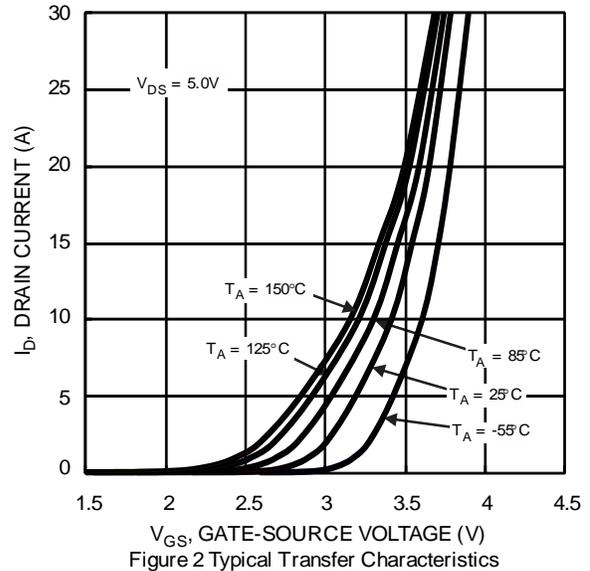


Figure 2 Typical Transfer Characteristics

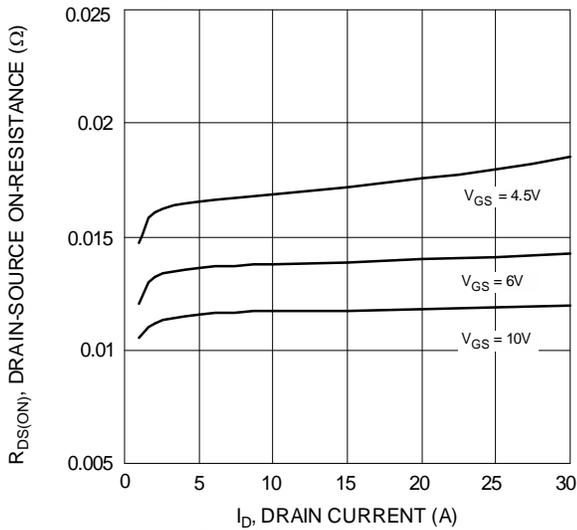


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

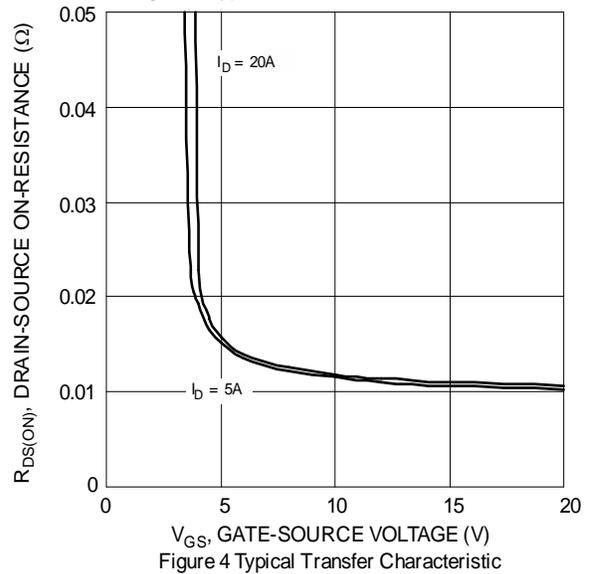


Figure 4 Typical Transfer Characteristic

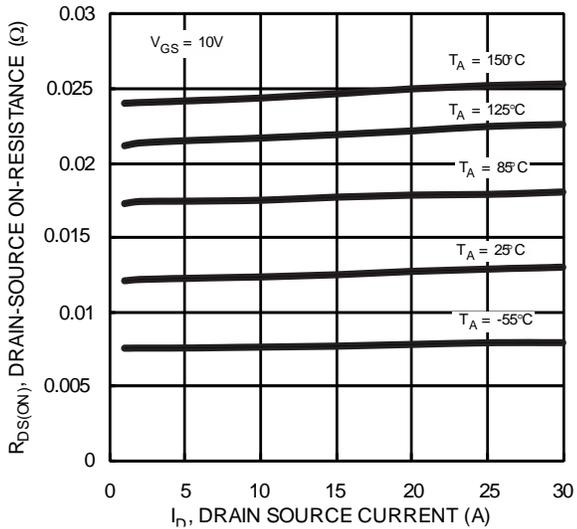


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

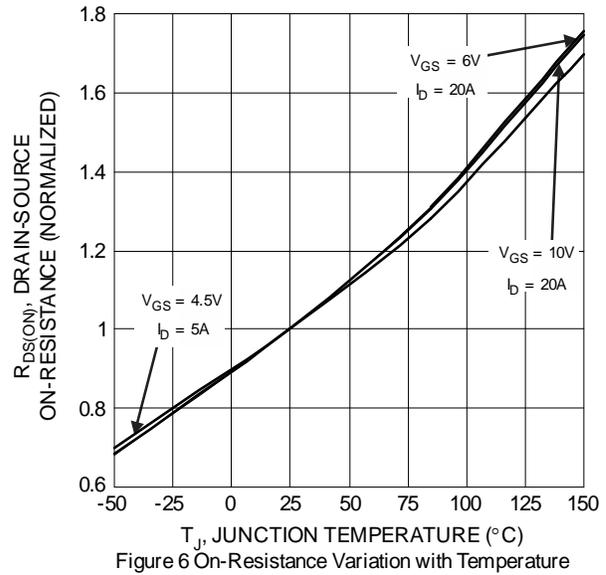


Figure 6 On-Resistance Variation with Temperature

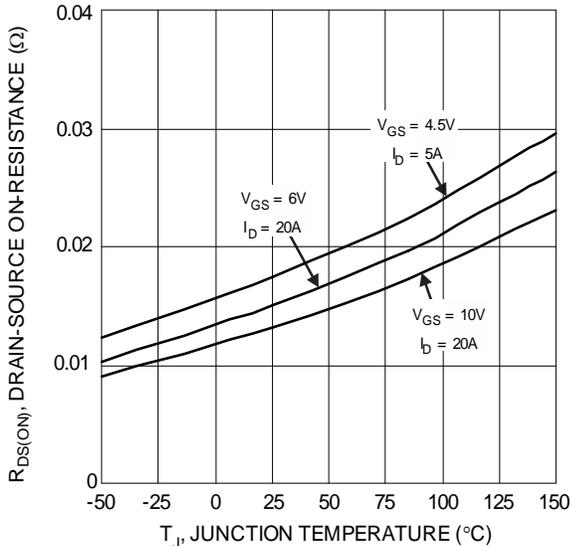


Figure 7 On-Resistance Variation with Junction Temperature

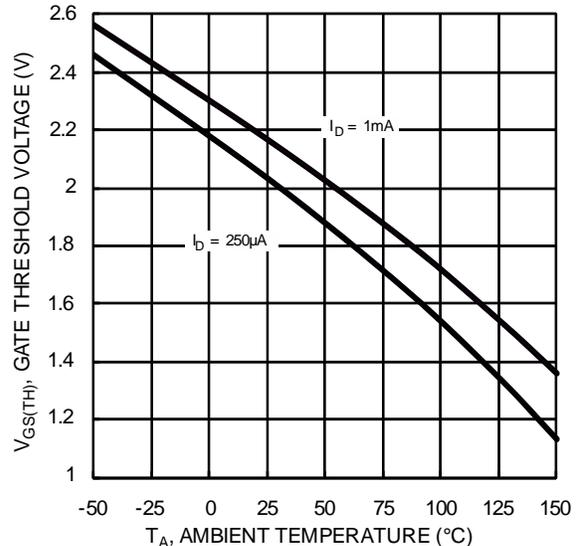


Figure 8 Gate Threshold Variation vs. Ambient Temperature

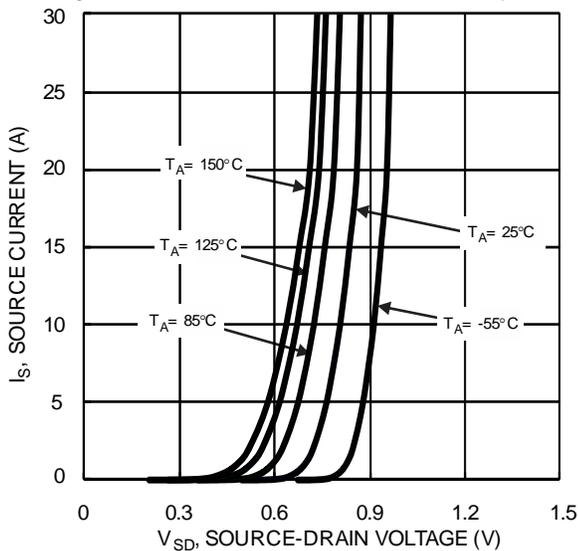


Figure 9 Diode Forward Voltage vs. Current

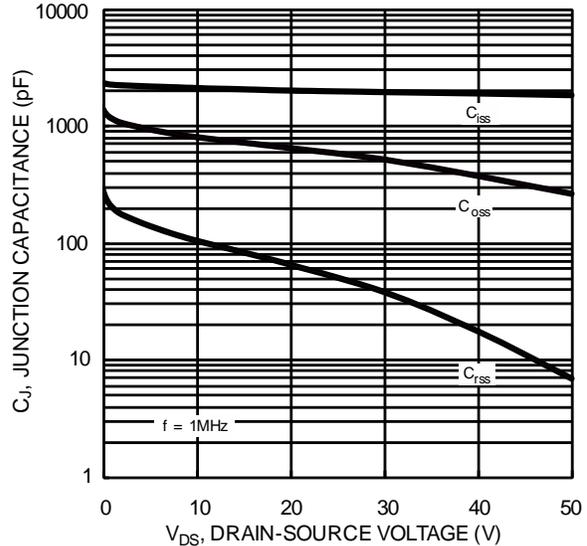


Figure 10 Typical Junction Capacitance

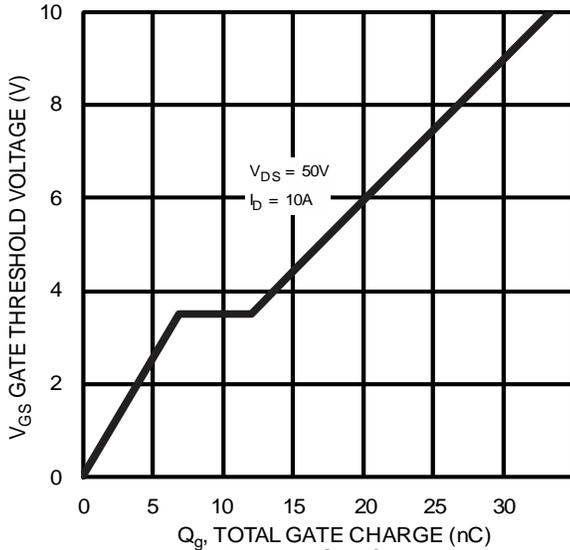


Figure 11 Gate Charge

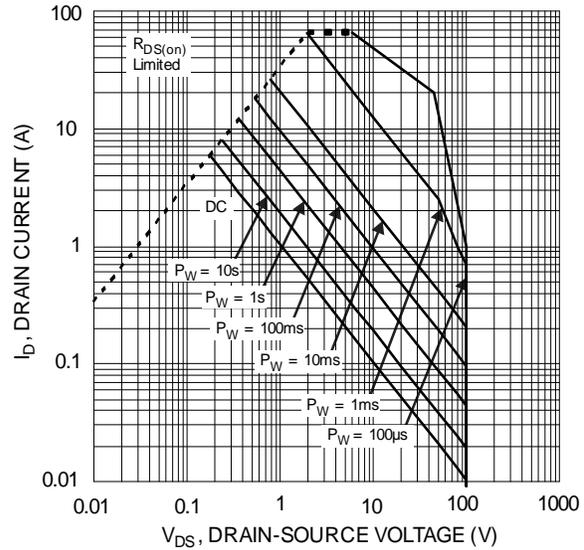
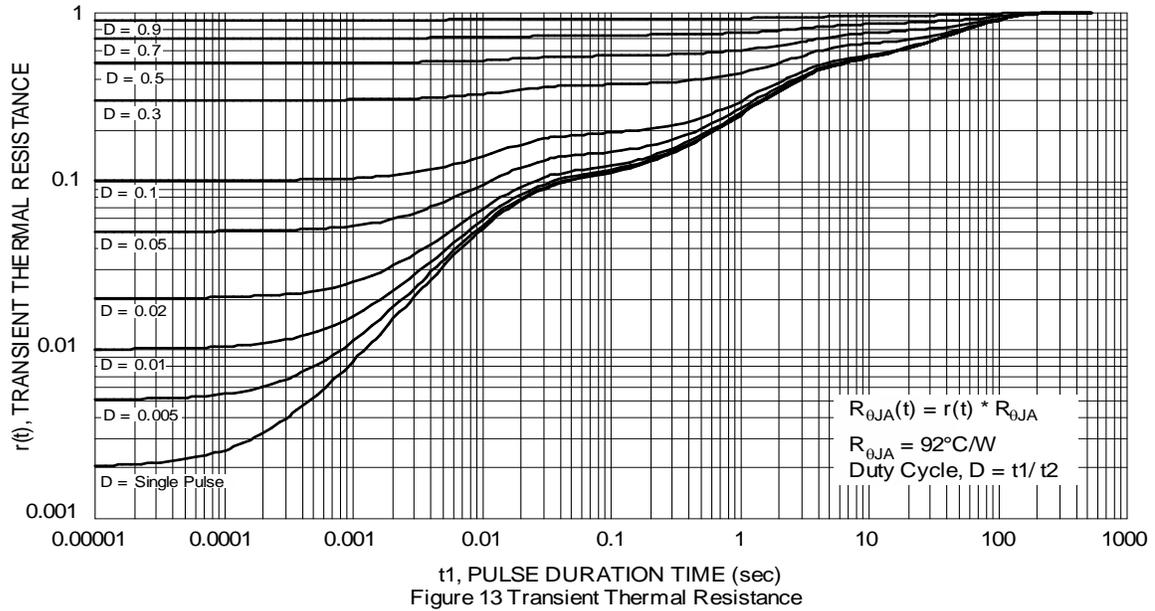


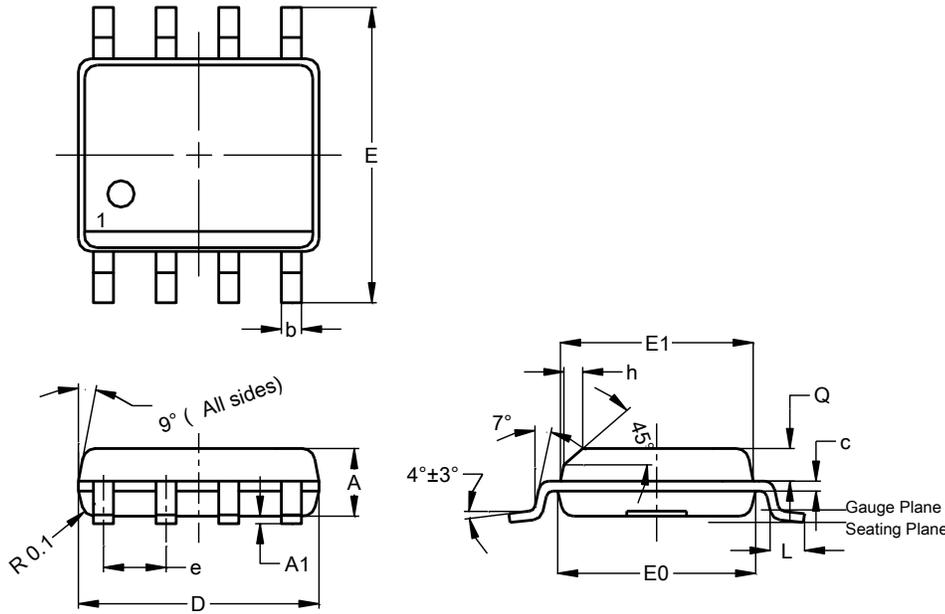
Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

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

SO-8

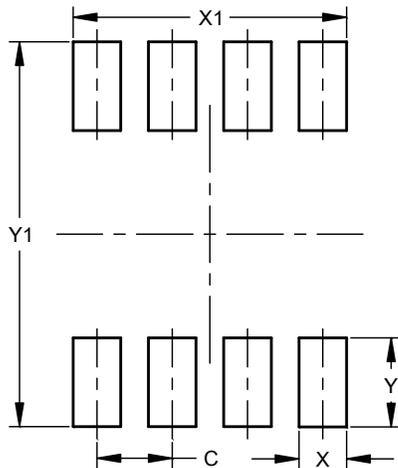


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

**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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