

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**

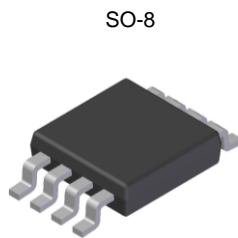
Description and Applications

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.

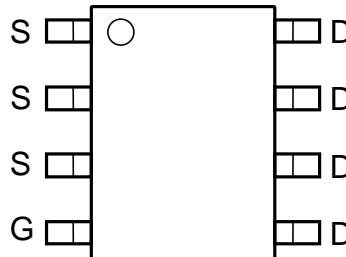
- Backlighting
- Power Management Functions
- DC-DC Converters

Mechanical Data

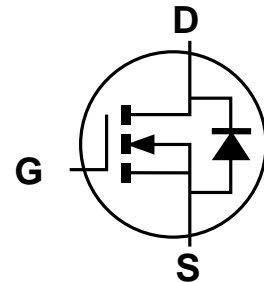
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method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



Top View



Top View



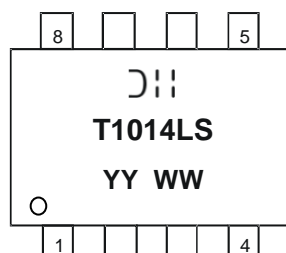
Equivalent Circuit

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

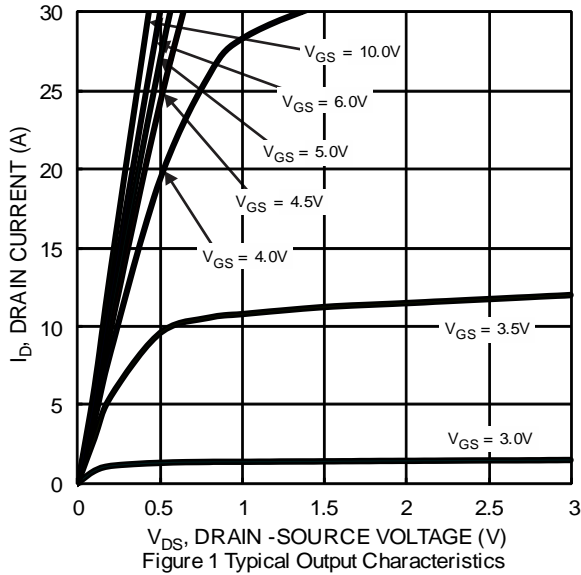
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

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

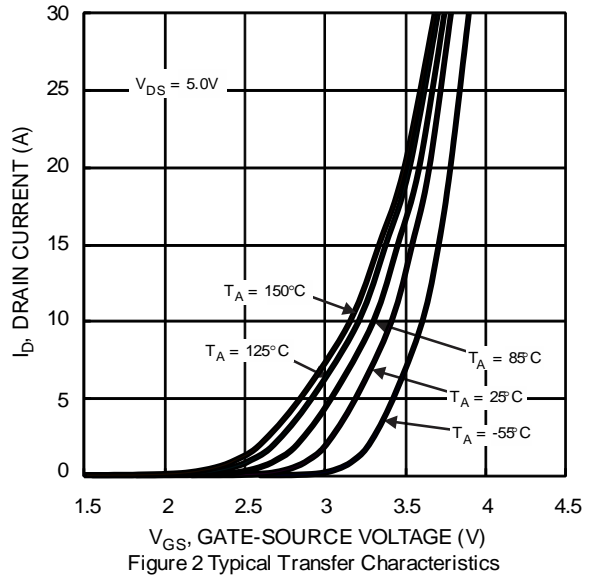
Electrical Characteristics (T_A = +25°C, unless otherwise specified.)

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	

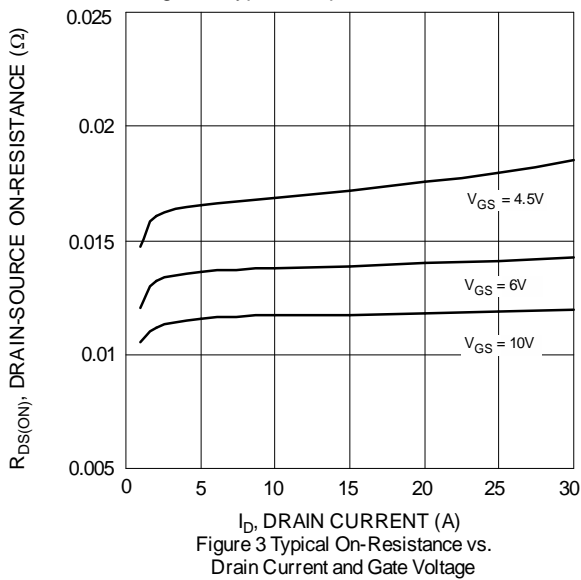
- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product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



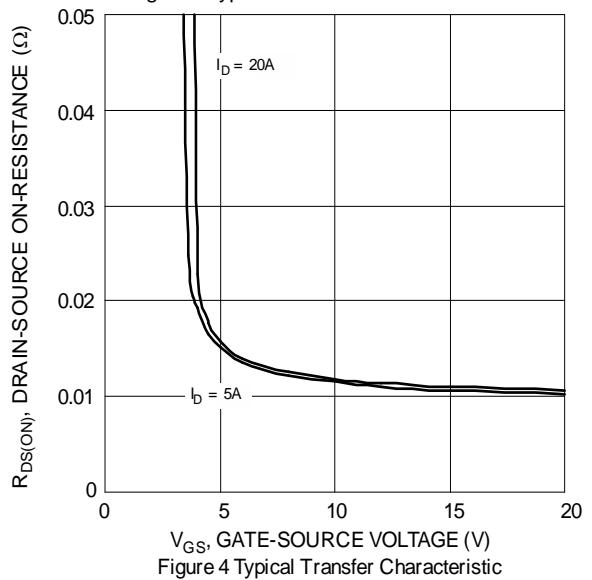
V_{DS} , DRAIN-SOURCE VOLTAGE (V)
Figure 1 Typical Output Characteristics



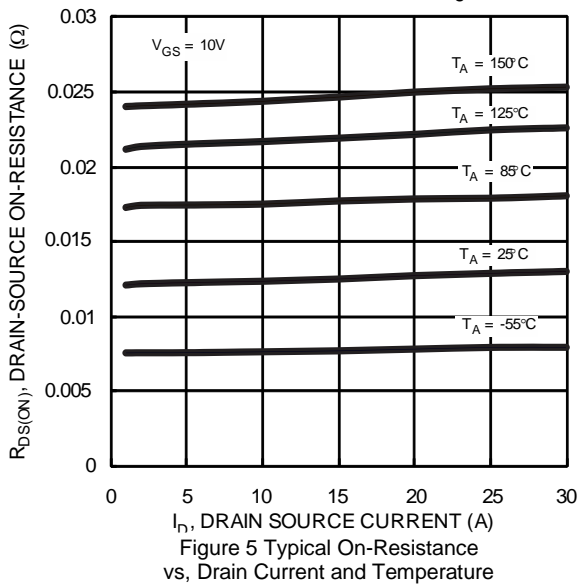
V_{GS} , GATE-SOURCE VOLTAGE (V)
Figure 2 Typical Transfer Characteristics



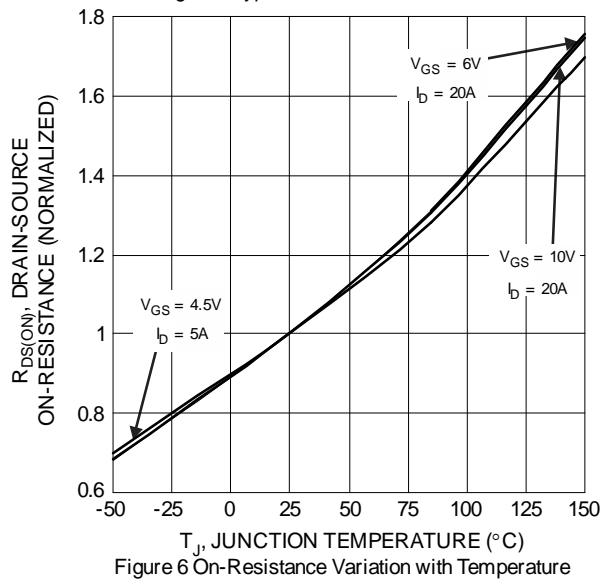
I_D , DRAIN CURRENT (A)
Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage



V_{GS} , GATE-SOURCE VOLTAGE (V)
Figure 4 Typical Transfer Characteristic



I_D , DRAIN SOURCE CURRENT (A)
Figure 5 Typical On-Resistance vs. Drain Current and Temperature



T_J , JUNCTION TEMPERATURE ($^{\circ}C$)
Figure 6 On-Resistance Variation with Temperature

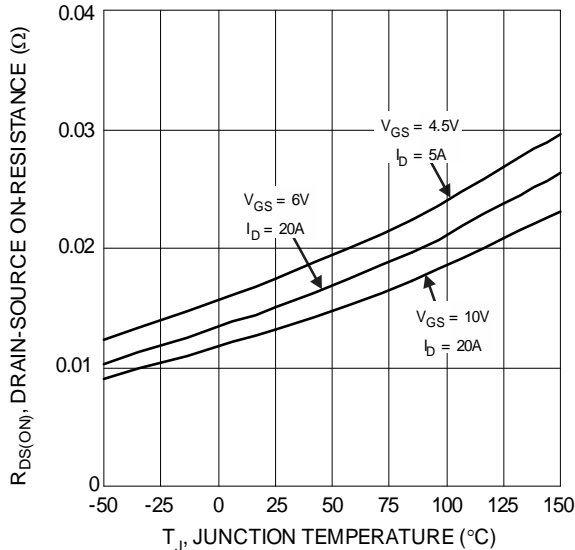


Figure 7 On-Resistance Variation with Junction Temperature

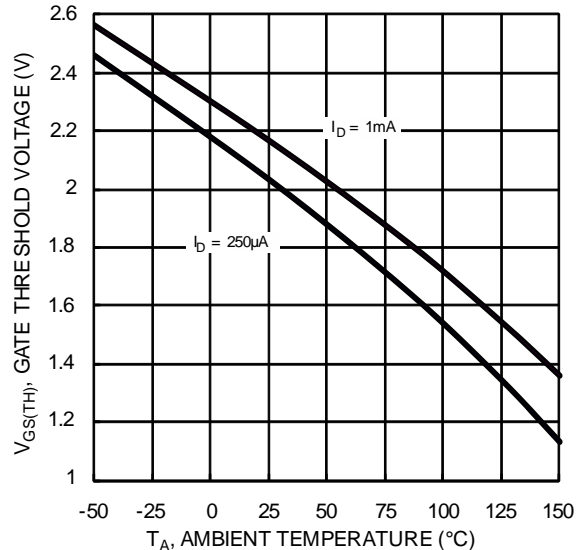


Figure 8 Gate Threshold Variation vs. Ambient Temperature

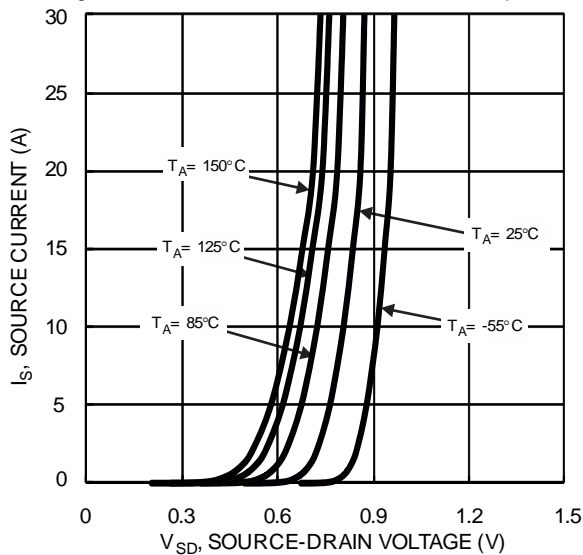


Figure 9 Diode Forward Voltage vs. Current

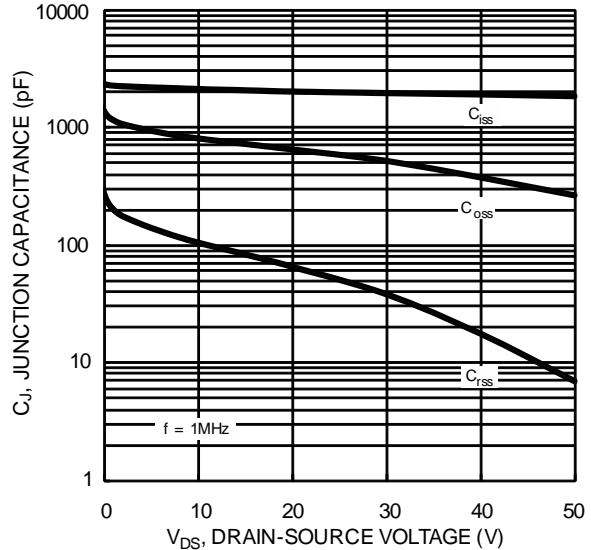


Figure 10 Typical Junction Capacitance

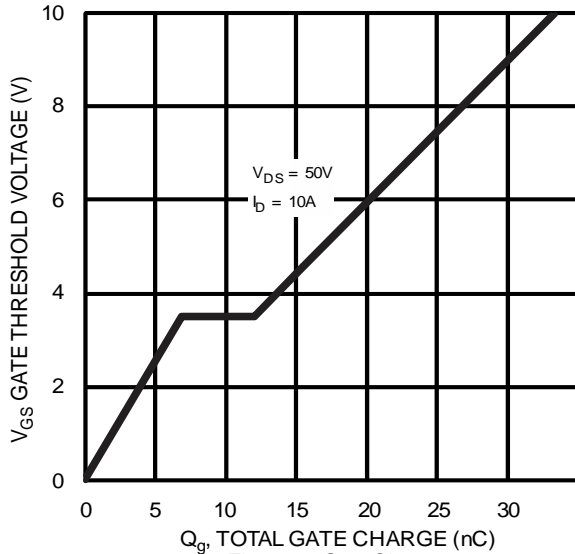


Figure 11 Gate Charge

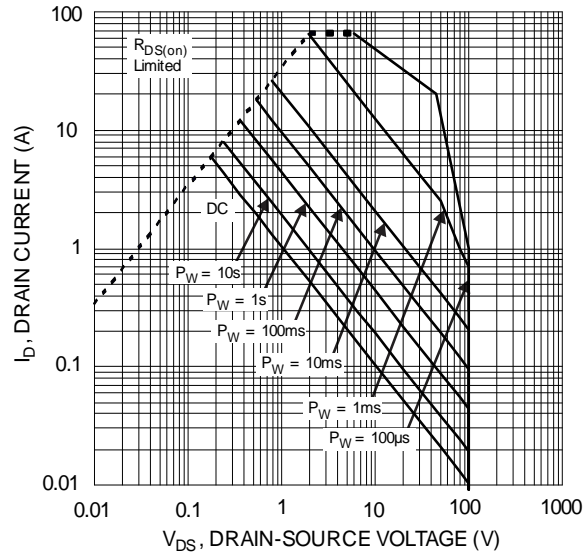
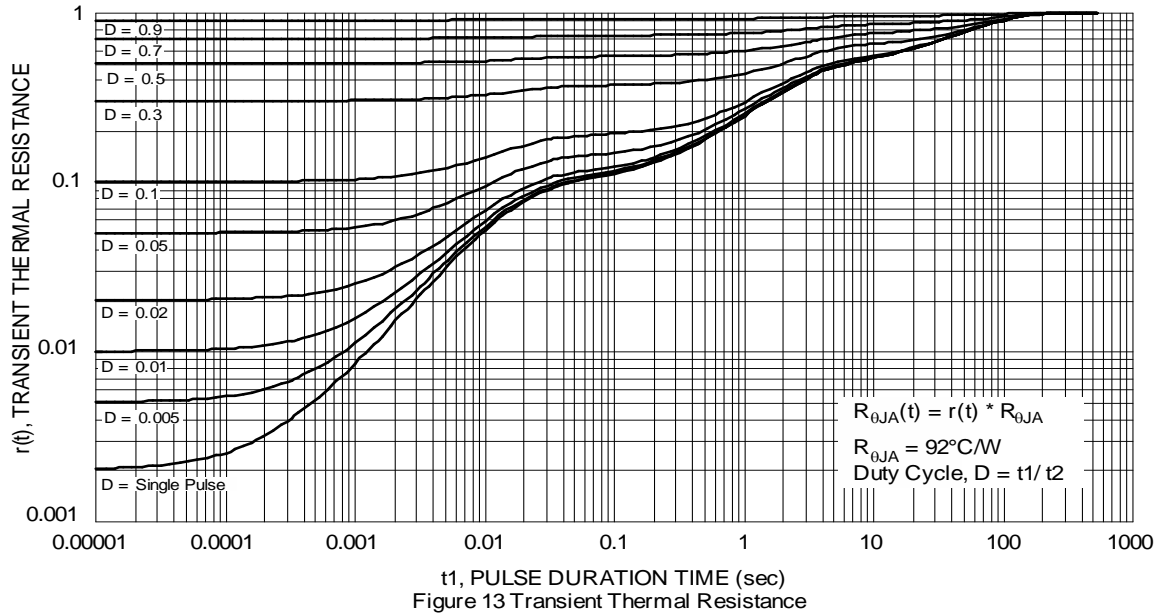


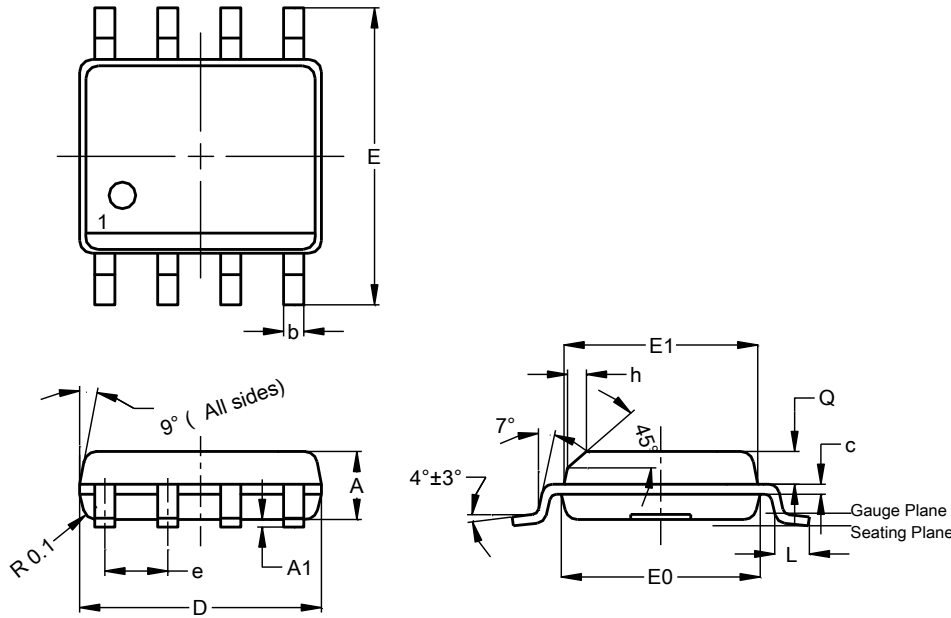
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

SO-8

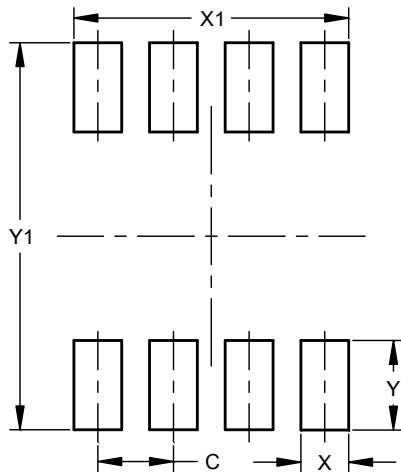


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

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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