

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D MAX $T_C = +25^\circ C$
100V	$9.5m\Omega @ V_{GS} = 10V$	29.5A

Description and Applications

This new generation N-Channel Enhancement Mode MOSFET is designed to minimize $R_{DS(ON)}$ and yet maintain superior switching performance. This device is ideal for use in Notebook battery power management and Load switch.

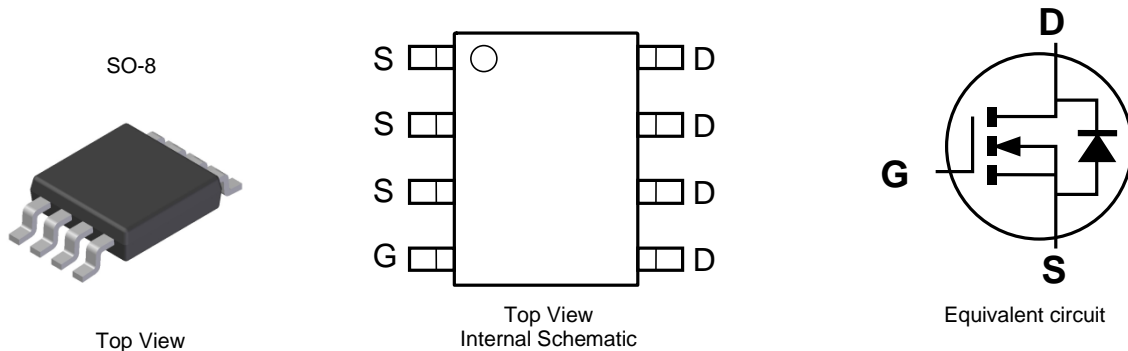
- Backlighting
- Power Management Functions
- DC-DC Converters

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**

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)

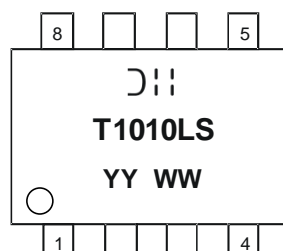


Ordering Information (Note 4)

Part Number	Case	Packaging
DMT10H010LSS-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) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



$\text{D}||$ = Manufacturer's Marking
 T1010LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Year (ex: 18 = 2018)
 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	Steady State	T _A = +25°C T _A = +70°C	I _D	11.5 9.2	A
	Steady State	T _C = +25°C T _C = +100°C	I _D	29.5 18.6	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	75	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	3	A
Avalanche Current (Note 8), L=0.3mH			I _{AS}	10	A
Avalanche Energy (Note 8), L=0.3mH			E _{AS}	15	mJ

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

Characteristic		Symbol	Value	Unit
Total Power (Note 5)		P _D	1.4	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	90	°C/W
	t<10s		48.8	
Total Power Dissipation (Note 6)		P _D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	66	°C/W
	t<10s		35.8	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	10.1	°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	1.9	2.8	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	8	9.5	mΩ	V _{GS} = 10V, I _D = 13A
		—	9	12		V _{GS} = 6V, I _D = 13A
		—	10	14.5		V _{GS} = 4.5V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	0.8	1.3	V	V _{GS} = 0V, I _S = 13A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	4166	—	pF	V _{DS} = 50V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	764	—		
Reverse Transfer Capacitance	C _{rss}	—	44	—		
Gate Resistance	R _g	—	2	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	58.4	—	nC	V _{DD} = 50V, I _D = 13A, V _{GS} = 10V
Gate-Source Charge	Q _{gs}	—	11.4	—		
Gate-Drain Charge	Q _{gd}	—	14.2	—		
Turn-On Delay Time	t _{D(ON)}	—	11.6	—	ns	V _{DD} = 50V, V _{GS} = 10V, I _D = 13A, R _g = 6Ω
Turn-On Rise Time	t _R	—	14.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	42.9	—		
Turn-Off Fall Time	t _F	—	22	—	ns	I _F = 13A, di/dt = 100A/μs
Reverse Recovery Time	t _{RR}	—	49.8	—		
Reverse Recovery Charge	Q _{RR}	—	85.1	—	nC	

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

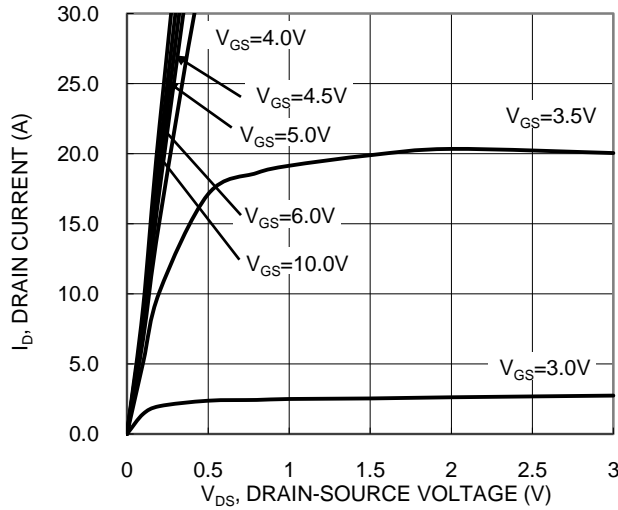


Figure 1. Typical Output Characteristic

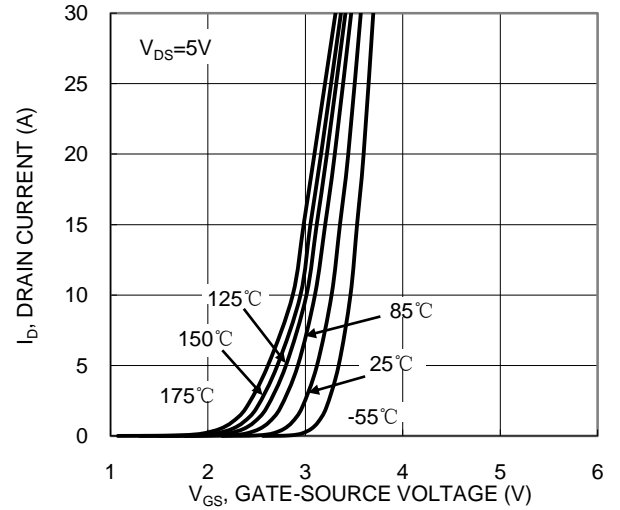


Figure 2. Typical Transfer Characteristic

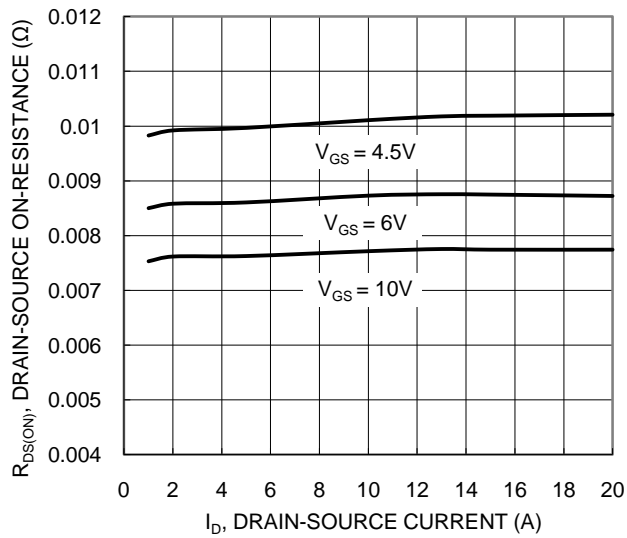


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

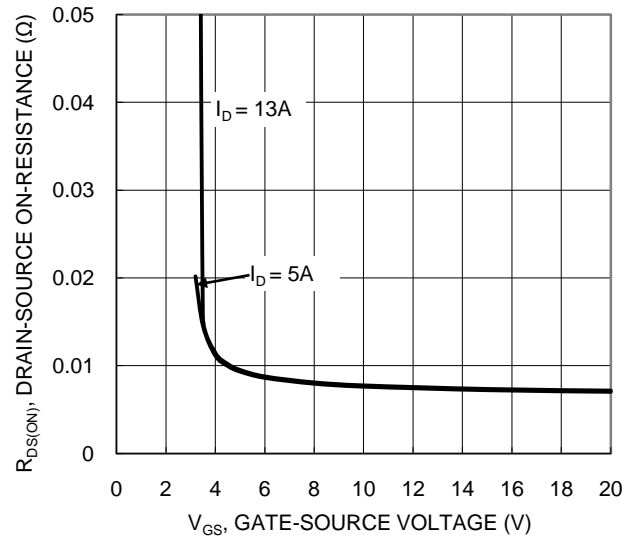


Figure 4. Typical Transfer Characteristic

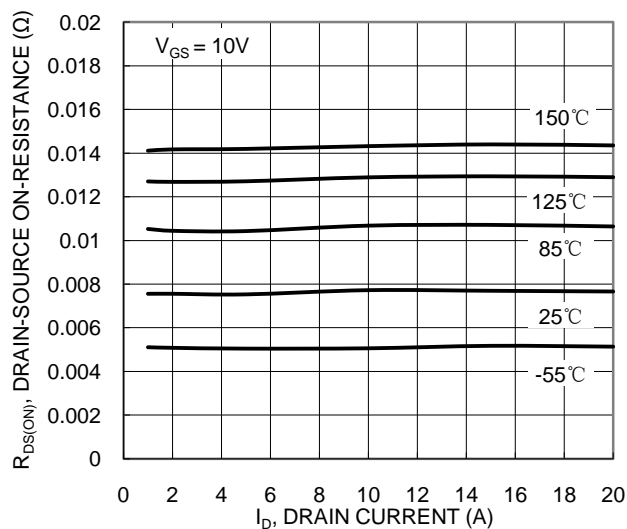


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

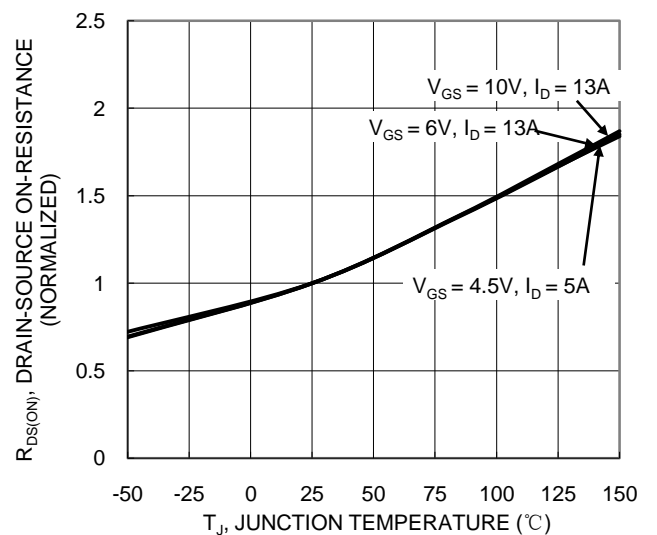
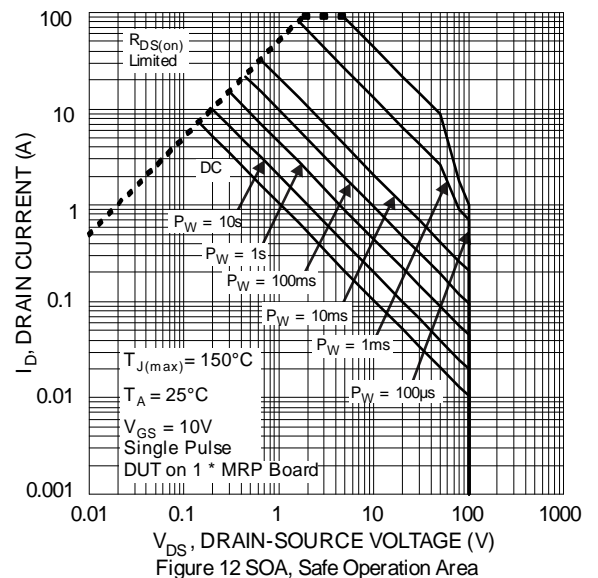
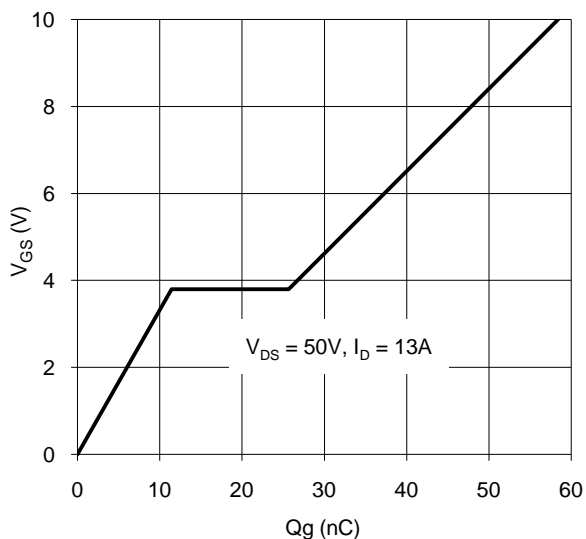
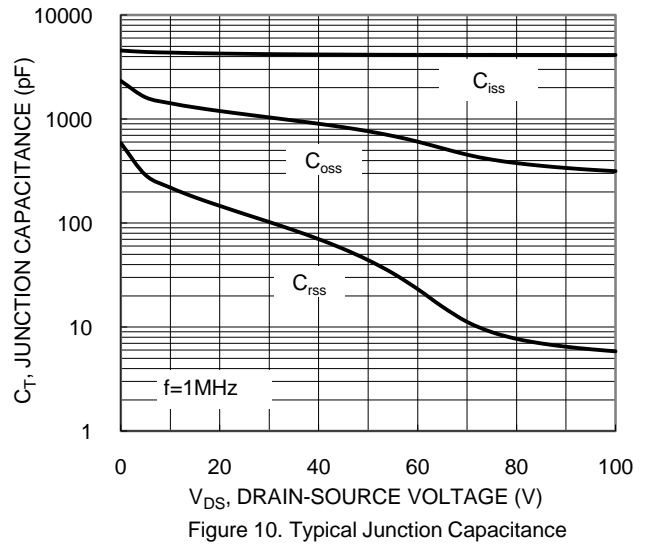
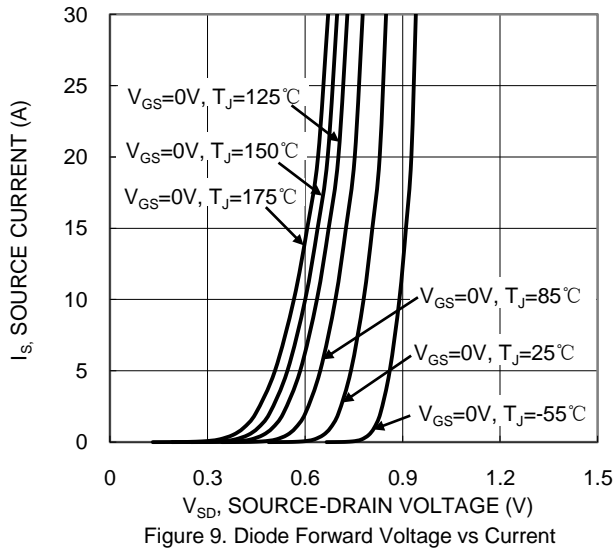
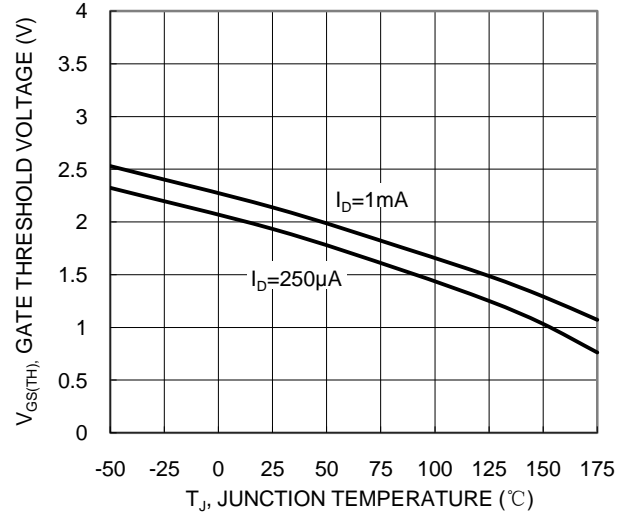
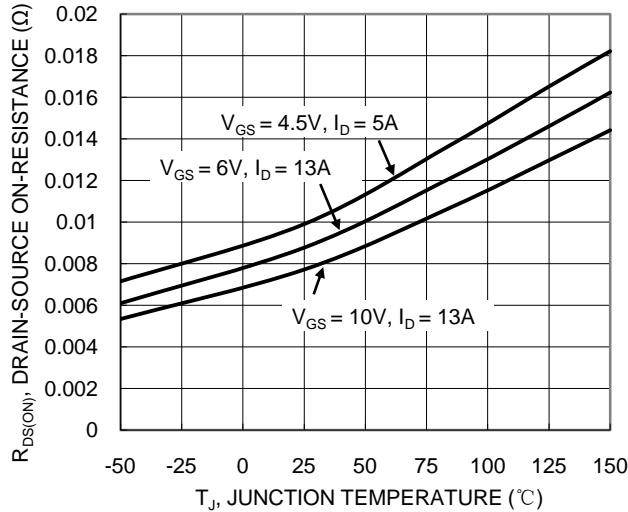
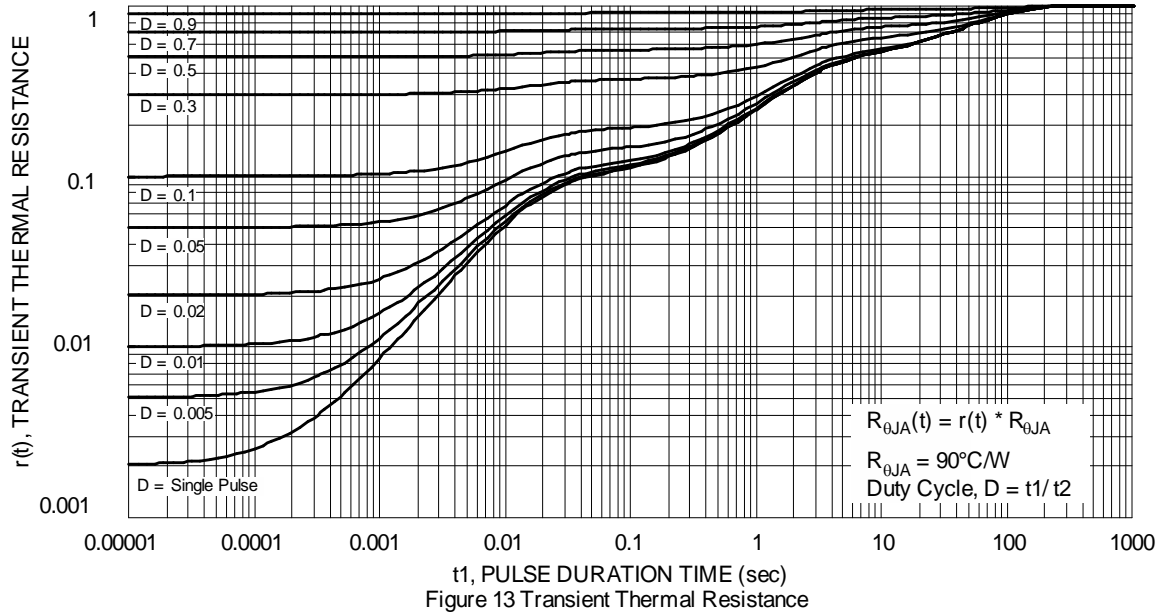


Figure 6. On-Resistance Variation with Temperature

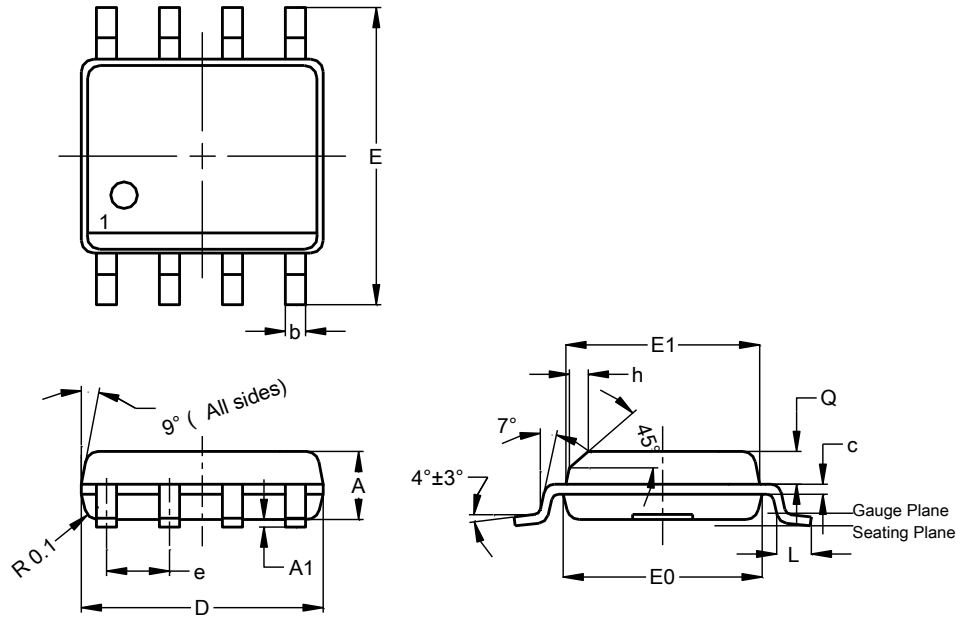




Package Outline Dimensions

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

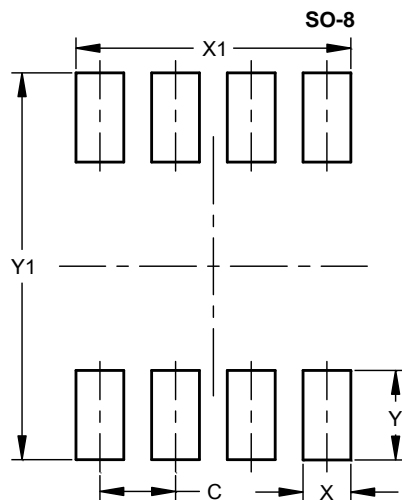
SO-8



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.



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

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