

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ C$
60V	12m Ω @ $V_{GS} = 10V$	9.8A
	14m Ω @ $V_{GS} = 4.5V$	8.4A

Description and Applications

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

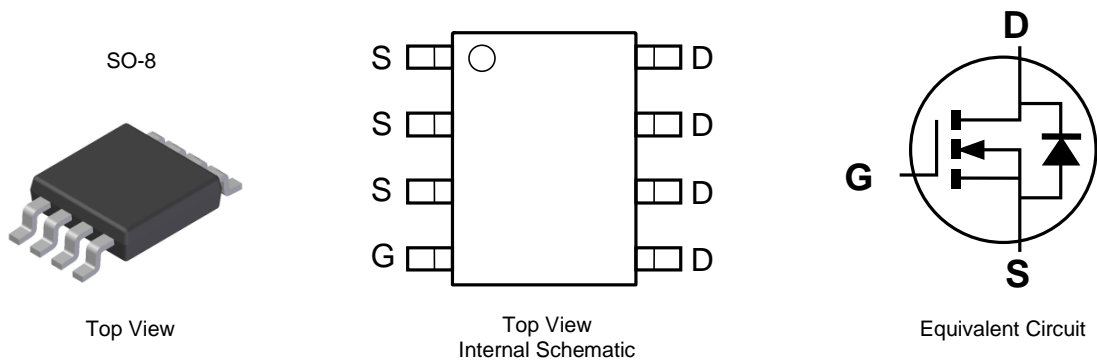
- Power Management Functions
- DC-DC Converters
- Backlighting

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- High Conversion Efficiency
- Low $R_{DS(ON)}$ – Ensures On-State Losses Are Minimized
- Excellent $Q_{GD} \times R_{DS(ON)}$ Product (FOM)
- Advanced Technology for DC-DC Converters
- 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
- Terminal Finish – Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.074 grams (Approximate)

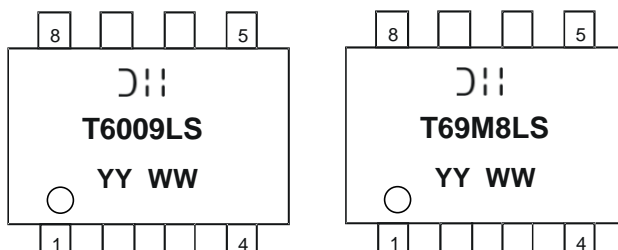


Ordering Information (Note 4)

Part Number	Case	Packaging
DMT69M8LSS-13	SO-8	2,500/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



$\text{D} \text{H}$ = Manufacturer's Marking
 T6009LS & T69M8LS = Date Code Marking
 YY or YY = Year (ex: 17 = 2017)
 WW = Week (01 to 53)

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

Characteristic			Symbol	Value	Unit
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	I _D	9.8	A
		T _A = +70°C	I _D	7.9	A
	t < 10s	T _A = +25°C	I _D	12.2	A
			I _D	9.5	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	3	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	60	A
Avalanche Current, L = 0.1mH			I _{AS}	25	A
Avalanche Energy, L = 0.1mH			E _{AS}	31.5	mJ

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P _D	1.25	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R _{θJA}	100	°C/W
	t < 10s			55.5	°C/W
Total Power Dissipation (Note 6)			P _D	1.6	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R _{θJA}	75	°C/W
	t < 10s			42	°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}	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}	—	—	±100	nA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.7	—	2	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	9.8	12	mΩ	V _{GS} = 10V, I _D = 13.5A
		—	12	14		V _{GS} = 4.5V, I _D = 11.5A
Diode Forward Voltage	V _{SD}	—	0.9	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iSS}	—	1,925	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	438	—		
Reverse Transfer Capacitance	C _{rss}	—	41	—		
Gate Resistance	R _G	—	1.7	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _G	—	33.5	—	nC	V _{DS} = 30V, I _D = 13.5A
Total Gate Charge (V _{GS} = 4.5V)	Q _G	—	15.6	—		
Gate-Source Charge	Q _{GS}	—	4.7	—		
Gate-Drain Charge	Q _{GD}	—	5.3	—		
Turn-On Delay Time	t _{D(ON)}	—	4.5	—	ns	V _{DD} = 30V, V _{GS} = 10V, R _G = 6Ω, I _D = 13.5A
Turn-On Rise Time	t _R	—	8.6	—		
Turn-Off Delay Time	t _{D(OFF)}	—	35.9	—		
Turn-Off Fall Time	t _F	—	15.7	—		
Body Diode Reverse Recovery Time	t _{RR}	—	18.2	—	ns	I _F = 13.5A, di/dt = 400A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	33.1	—	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.

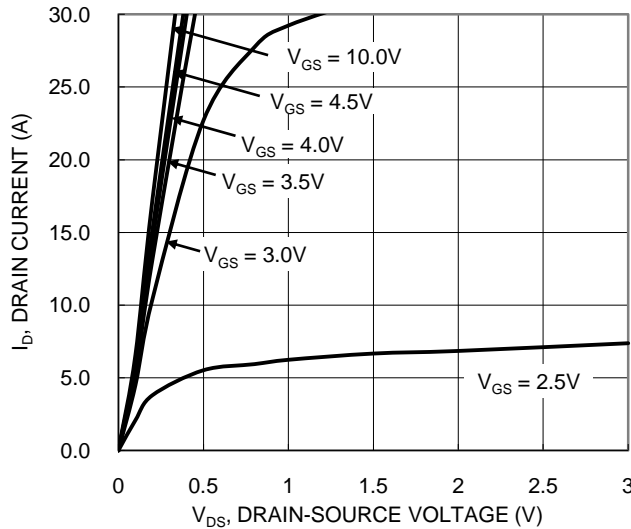


Figure 1. Typical Output Characteristic

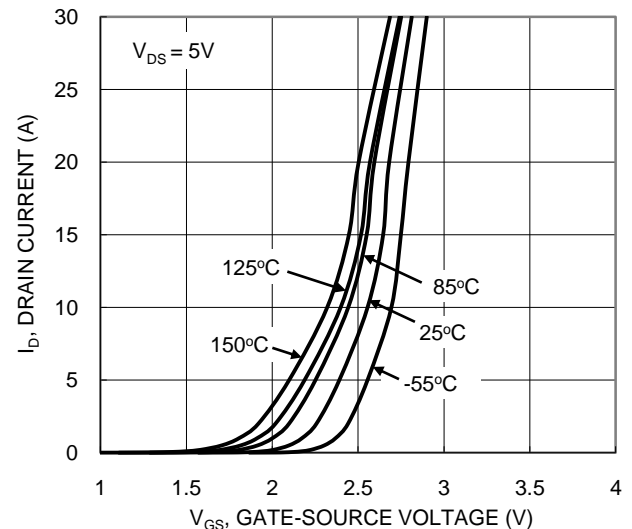


Figure 2. Typical Transfer Characteristic

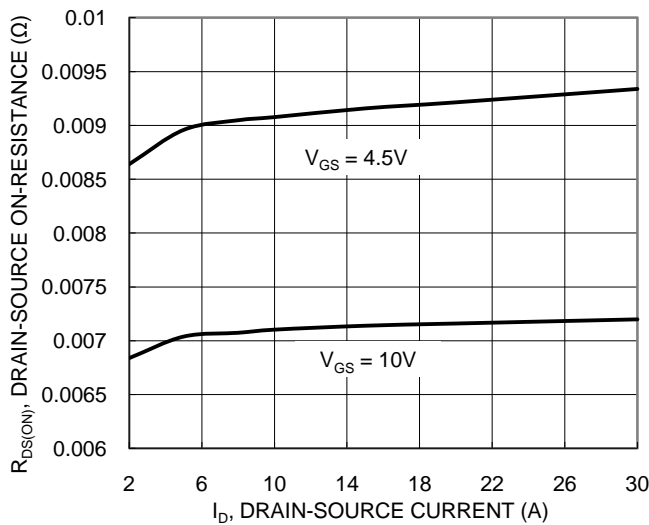


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

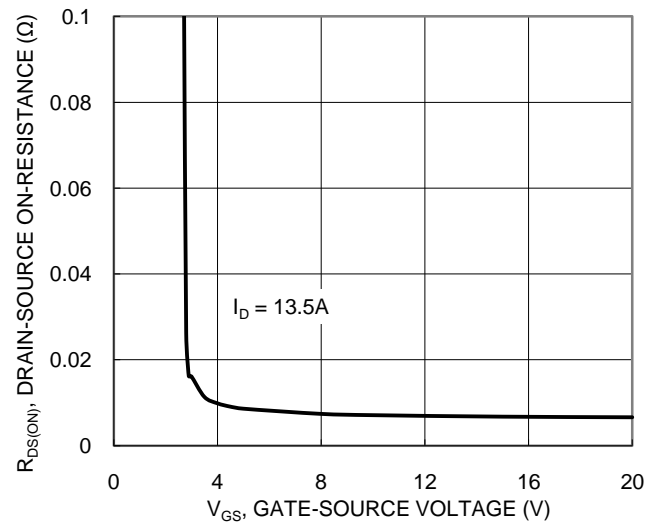


Figure 4. Typical Transfer Characteristic

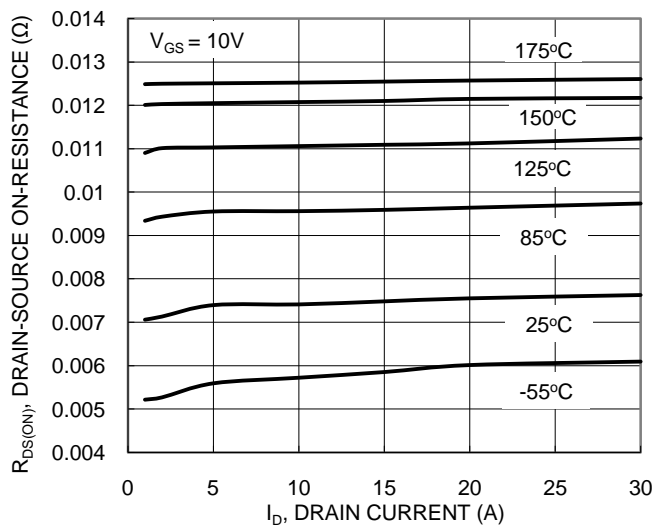


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

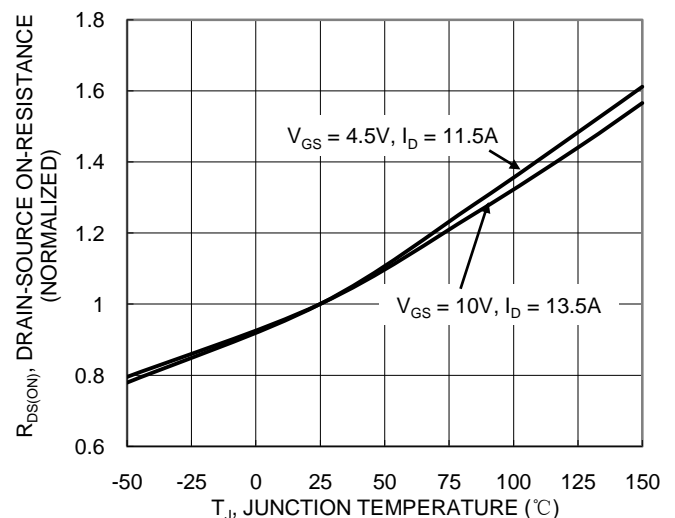
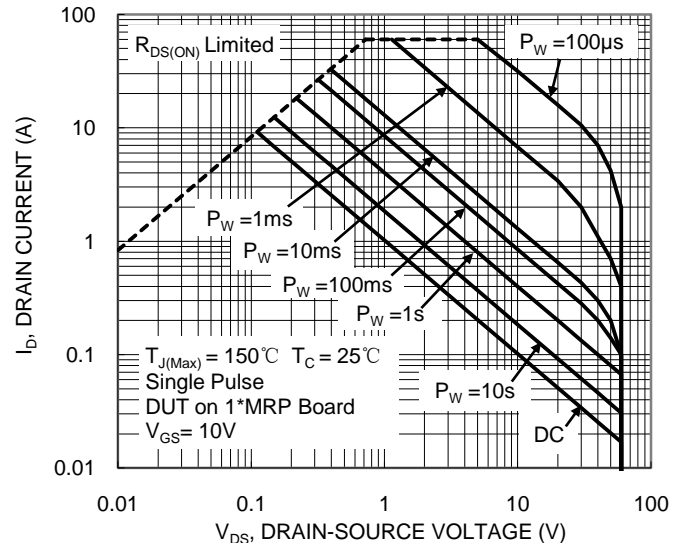
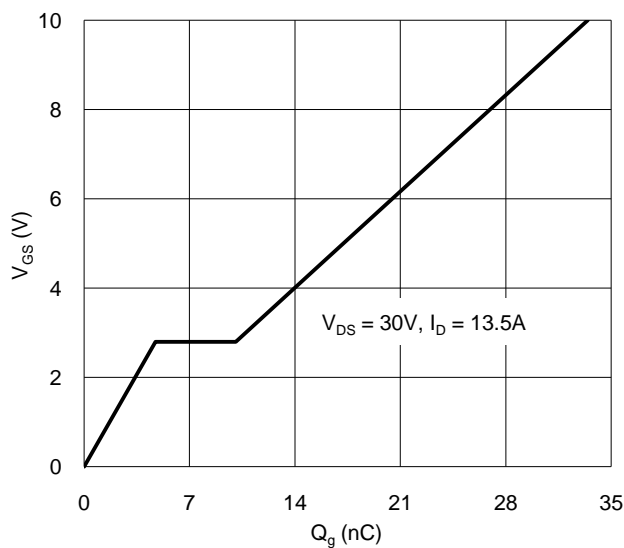
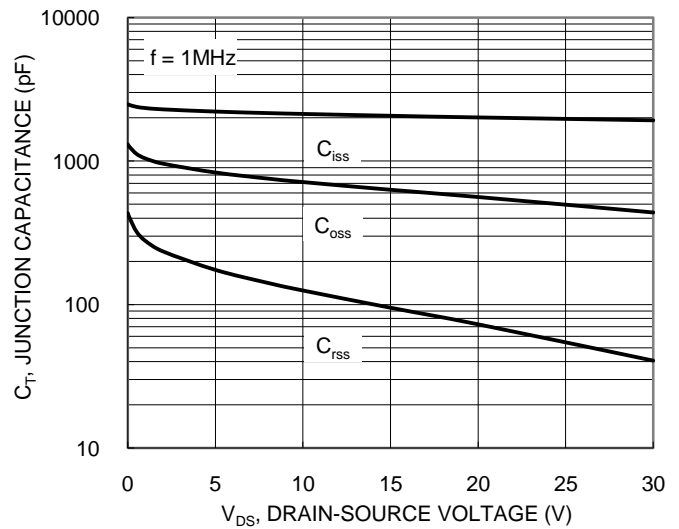
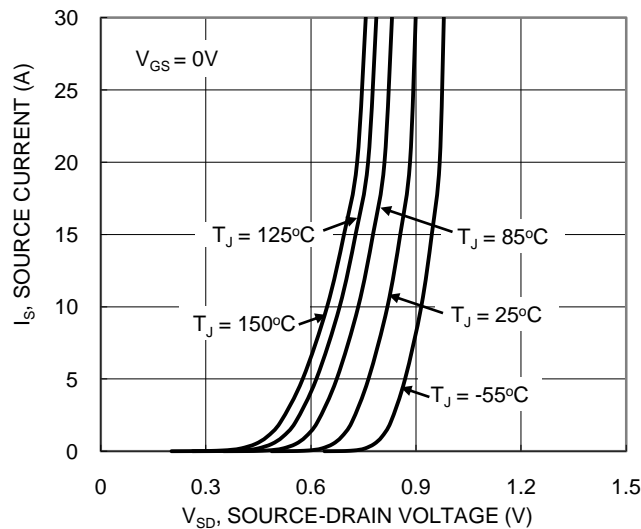
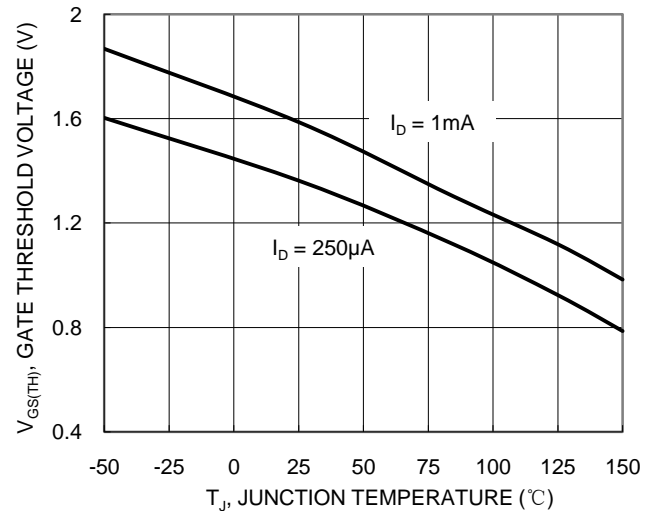
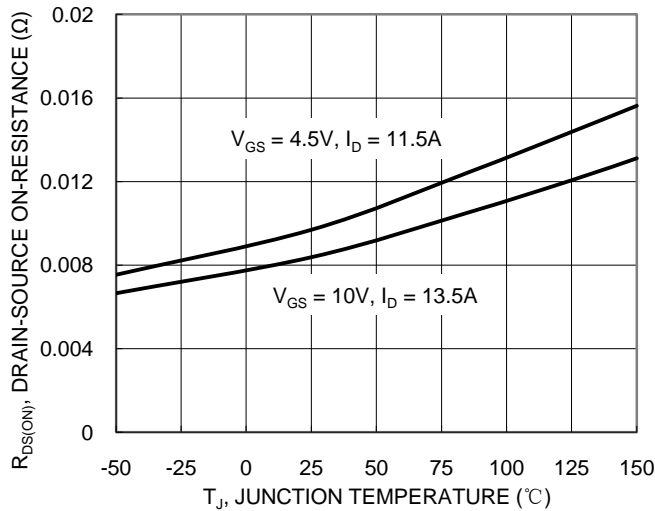


Figure 6. On-Resistance Variation with Junction Temperature



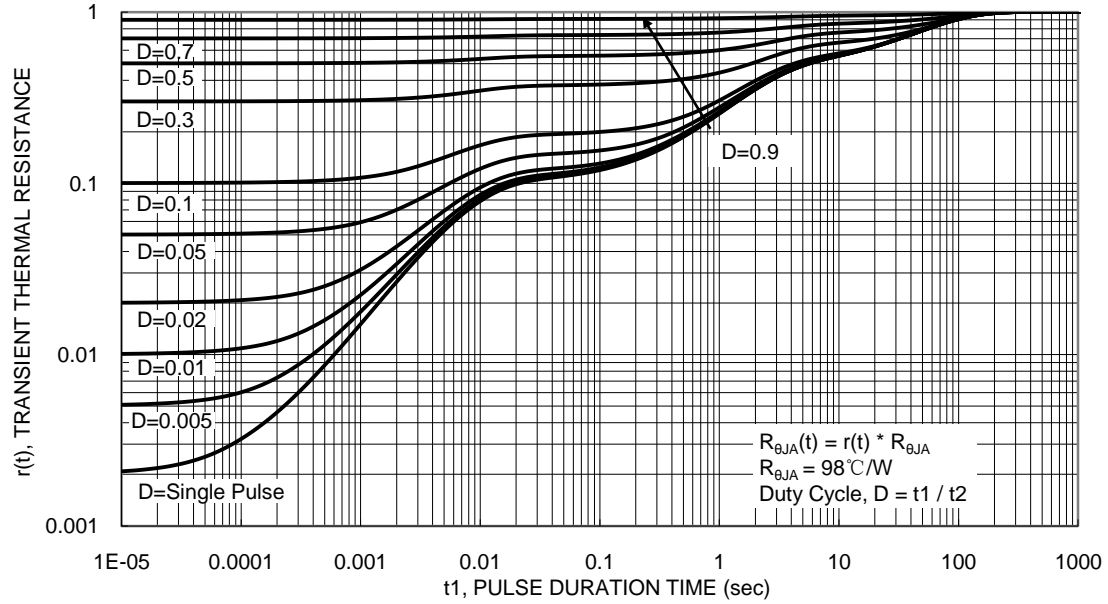
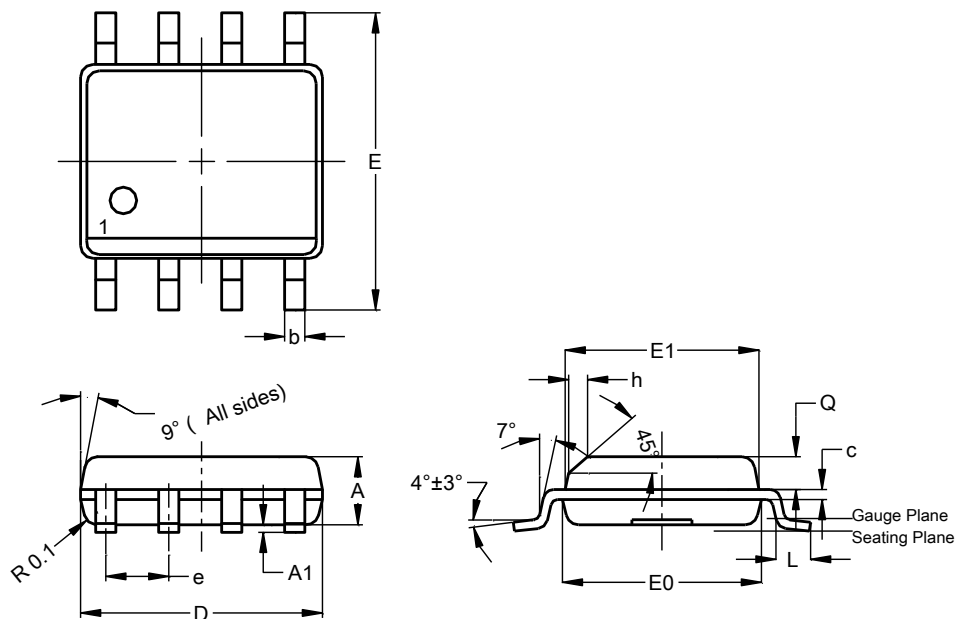


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

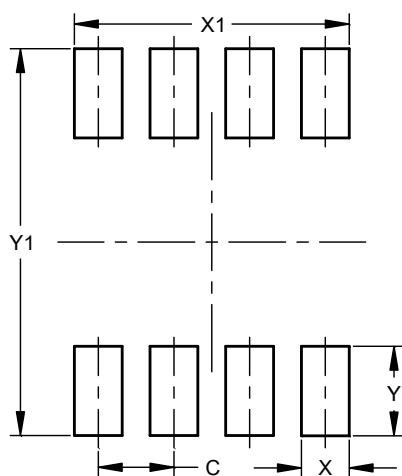


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

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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