Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D max T_A = +25°C
-30V	11mΩ @ V_{GS} = -20V	-9.9A
	17mΩ @ V_{GS} = -6V	-8.2A

Description

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

Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

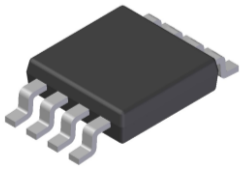
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

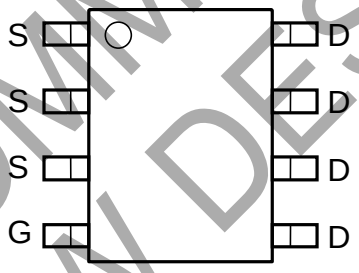
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.075 grams (Approximate)

ESD PROTECTED

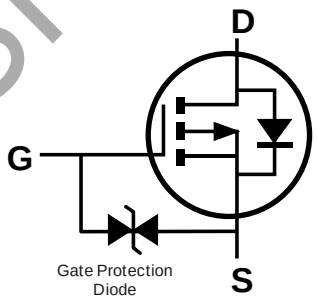
SO-8



Top View



Top View



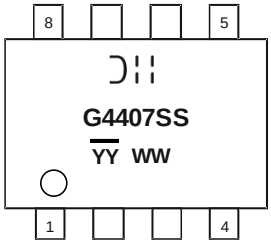
Equivalent Circuit

Ordering Information (Note 4)

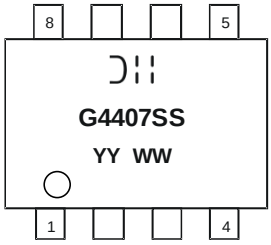
Part Number	Case	Packaging
DMG4407SSS-13	SO-8	2500/Tape & Reel

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



Chengdu A/T Site



Shanghai A/T Site

= Manufacturer's Marking
G4407SS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 18 = 2018)
WW = Week (01 to 53)
YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)
YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	±25	V
Continuous Drain Current (Note 6) V_{GS} = -20V	Steady State	T_A = +25°C T_A = +70°C	I_D	-9.9 -7.9	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	-12.5 -10.0	A
Continuous Drain Current (Note 6) V_{GS} = -6V	Steady State	T_A = +25°C T_A = +70°C	I_D	-8.2 -6.5	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	-11.0 -8.7	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-3.0	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	-80	A

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	1.45	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	88	°C/W
	t<10s		50	°C/W
Total Power Dissipation (Note 6)		P_D	1.82	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	70	°C/W
	t<10s		41	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	7.6	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-50 to +155	°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}	-30	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1.7	—	-3.0	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	9	11	mΩ	V_{GS} = -20V, I_D = -12A
		—	10	13		V_{GS} = -10V, I_D = -10A
		—	12.7	17		V_{GS} = -6V, I_D = -10A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	21	—	S	V_{DS} = -5V, I_D = -10A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	2246	—	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	352	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	294	—	pF	
Gate Resistance	R_g	—	5.1	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	20.5	—	nC	V_{GS} = -10V, V_{DS} = -15V, I_D = -12A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	41	—	nC	
Gate-Source Charge	Q_{gs}	—	7.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	8.0	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	11.3	—	ns	V_{DD} = -15V, V_{GS} = -10V, R_L = 1.25Ω, R_G = 3Ω
Turn-On Rise Time	t_R	—	15.4	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	38.0	—	ns	
Turn-Off Fall Time	t_F	—	22.0	—	ns	

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.

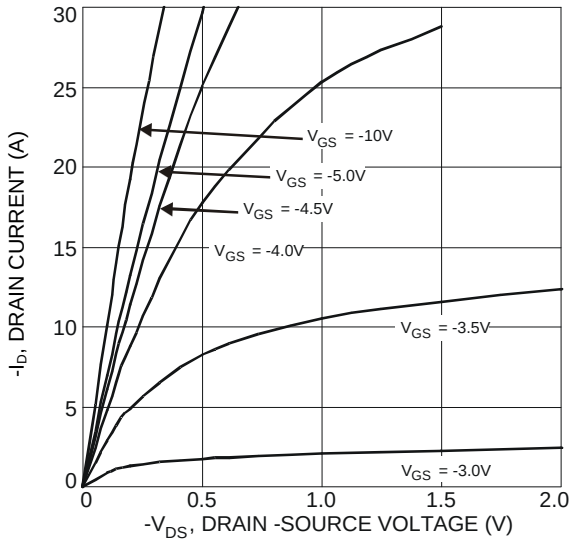


Fig. 1 Typical Output Characteristics

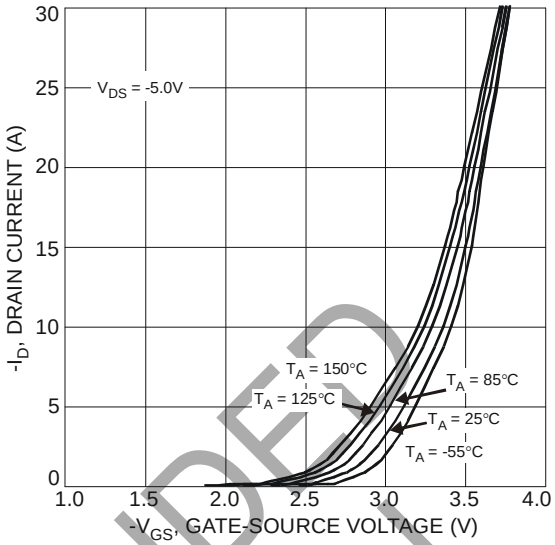


Fig. 2 Typical Transfer Characteristics

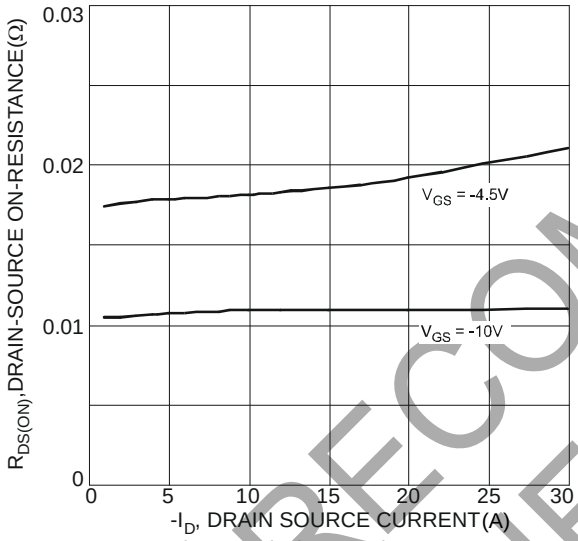


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

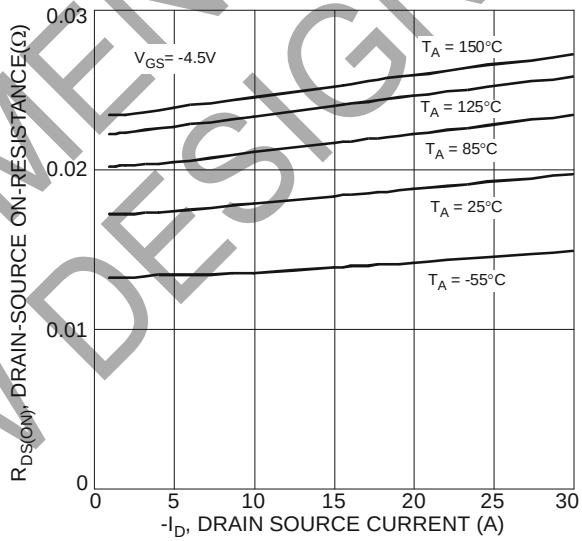


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

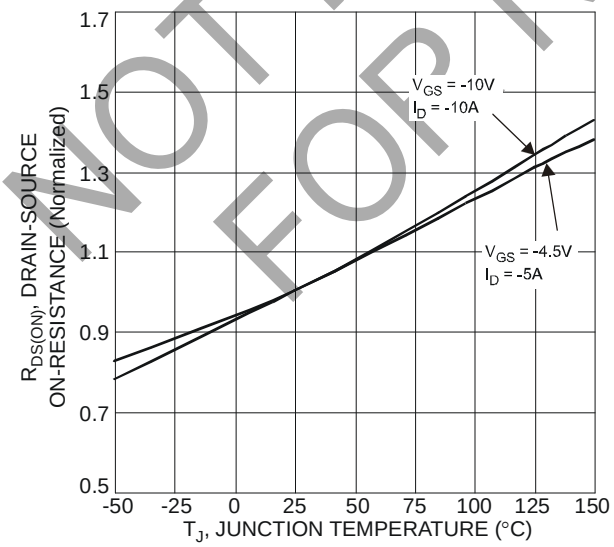


Fig. 5 On-Resistance Variation with Temperature

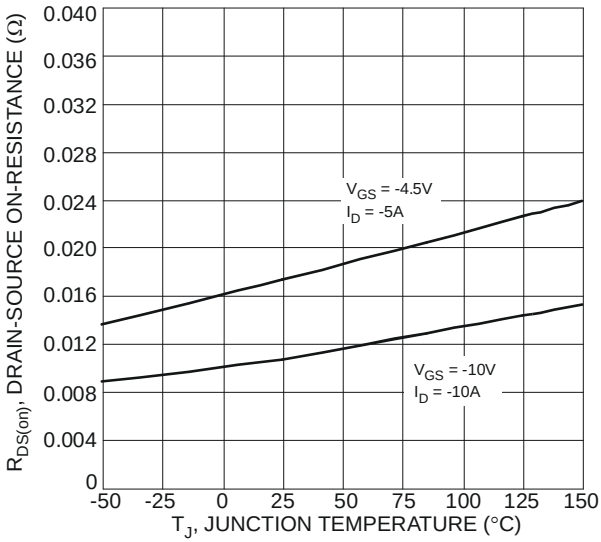


Fig. 6 On-Resistance Variation with Temperature

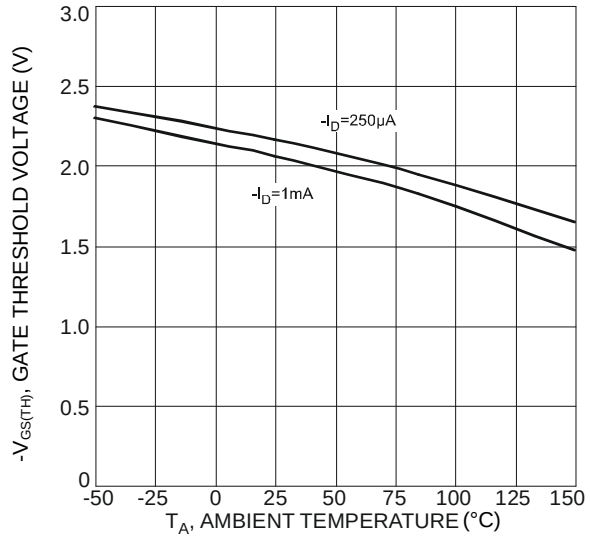


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

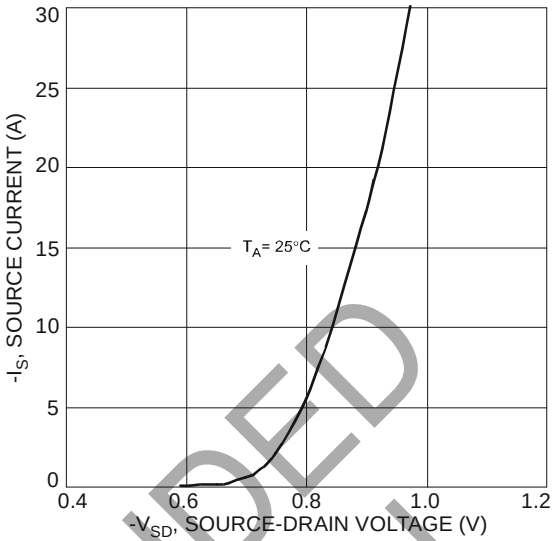


Fig. 8 Diode Forward Voltage vs. Current

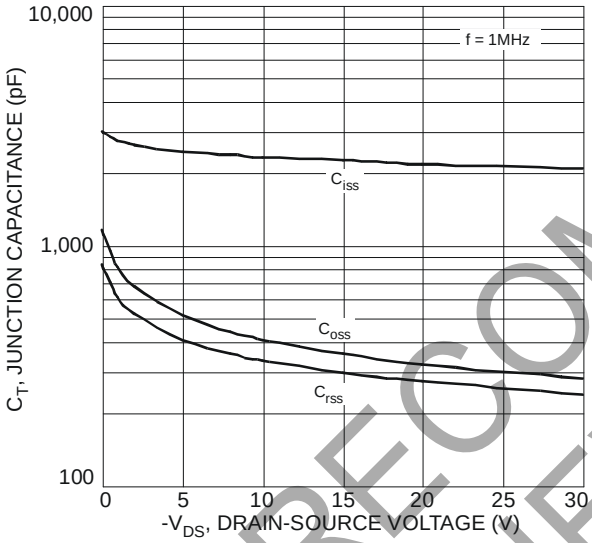


Fig. 9 Typical Junction Capacitance

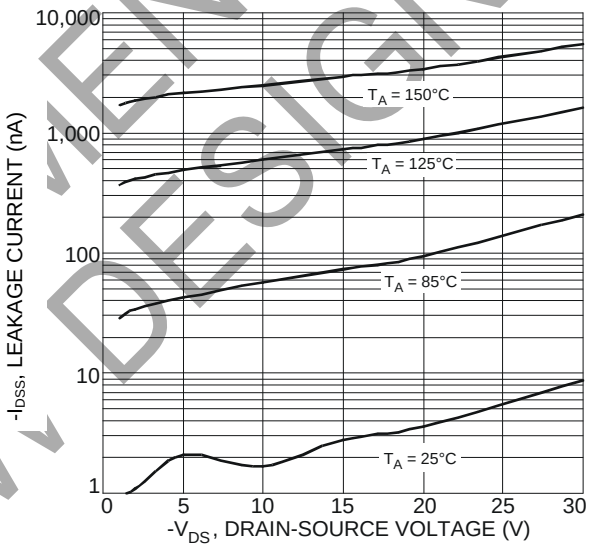


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

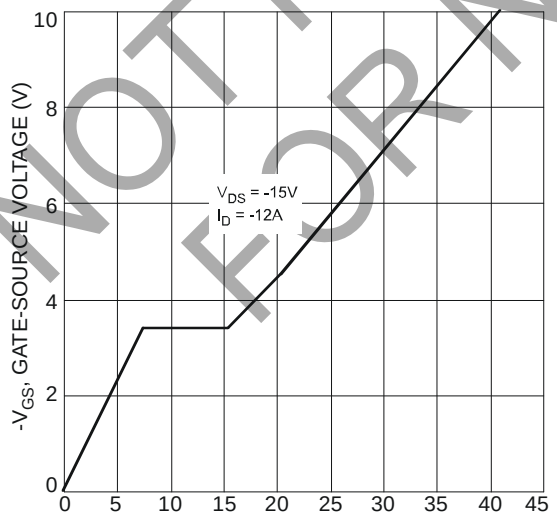


Fig. 11 Gate-Charge Characteristics

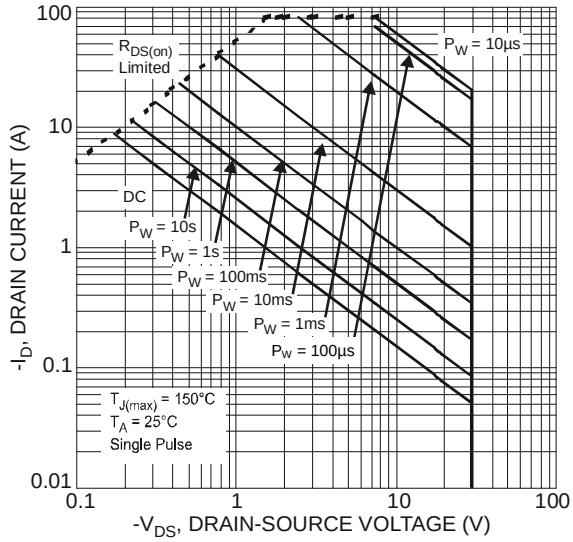


Fig. 12 SOA, Safe Operation Area

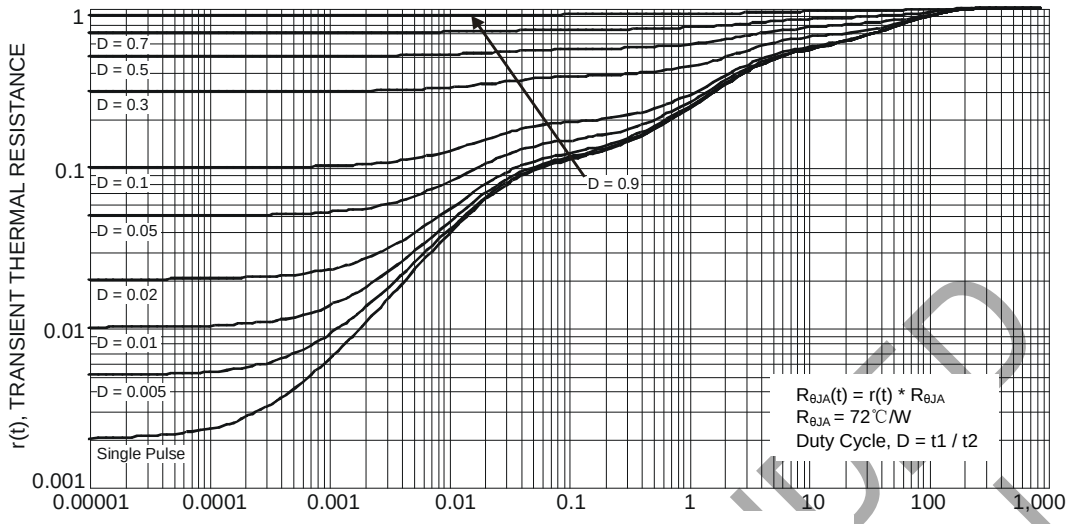
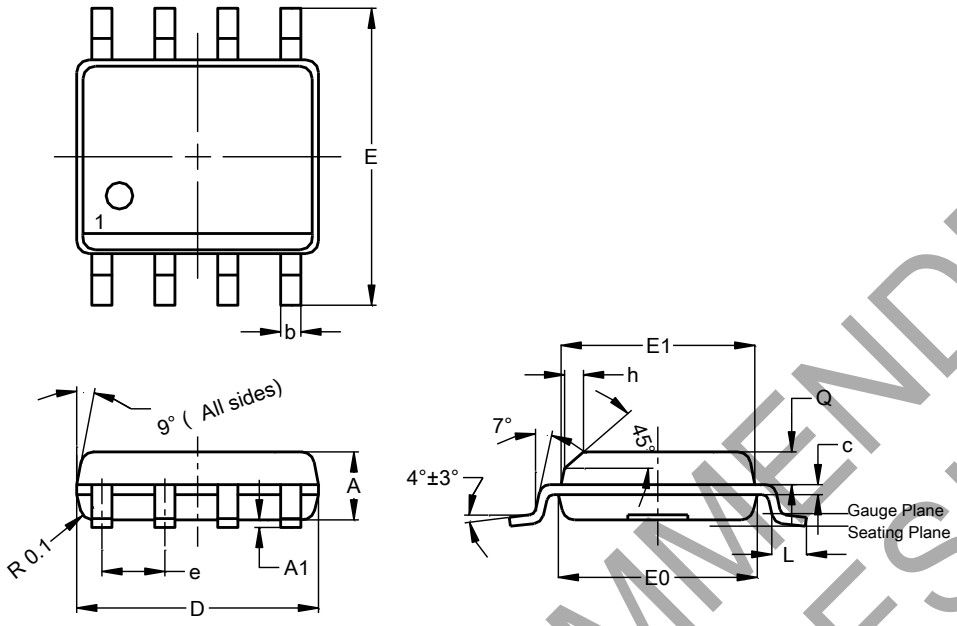


Fig. 13 Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

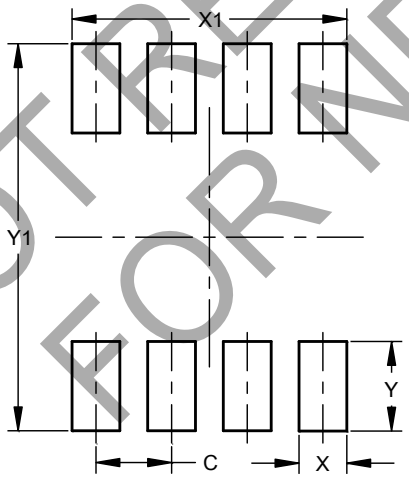


SO-8			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

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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