



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Product Summary

BV_{DSS}	$R_{DS(ON) Max}$	I_D $T_A = +25^\circ C$
-40V	11m Ω @ $V_{GS} = -10V$	-10.8A
	15m Ω @ $V_{GS} = -4.5V$	-9.6A

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production Low On-Resistance
- Low Input Capacitance

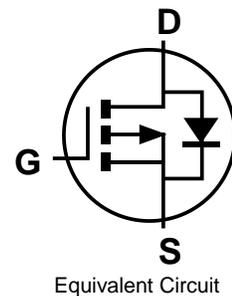
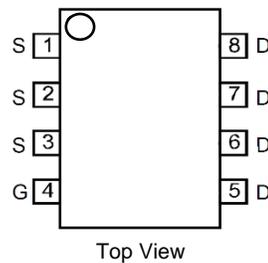
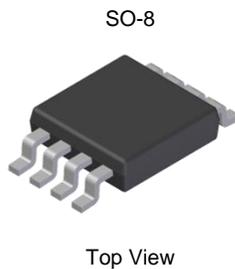
Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and is ideal for use in:

- DC-DC converters
- Power-management functions
- Analog switches

Mechanical Data

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



Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-40	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 6) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	I_D	-10.8	A
		$T_A = +70^\circ\text{C}$		-8.6	
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)			I_{DM}	-112	A
Maximum Body Diode Continuous Current (Note 6)			I_S	-10.8	A
Avalanche Current, $L = 1\text{mH}$			I_{AS}	-26	A
Avalanche Energy, $L = 1\text{mH}$			E_{AS}	338	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	1.6	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	80.2	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	P_D	2.1	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	60.4	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	7.8	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-40	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$V_{DS} = -40\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1.5	—	-2.5	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	6	11	m Ω	$V_{GS} = -10\text{V}, I_D = -9.8\text{A}$
		—	8.5	15		$V_{GS} = -4.5\text{V}, I_D = -9.8\text{A}$
Diode Forward Voltage	V_{SD}	—	-0.7	-1	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	5697	—	pF	$V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	534	—		
Reverse Transfer Capacitance	C_{rss}	—	408	—		
Gate Resistance	R_G	—	7	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	—	53	—	nC	$V_{DS} = -20\text{V}, I_D = -9.8\text{A}$
Total Gate Charge ($V_{GS} = -10\text{V}$)	Q_g	—	112	—		
Gate-Source Charge	Q_{gs}	—	20	—		
Gate-Drain Charge	Q_{gd}	—	18	—		
Turn-On Delay Time	$t_{D(ON)}$	—	11.5	—	ns	$V_{GS} = -10\text{V}, V_{DD} = -20\text{V},$ $R_G = 2\Omega, I_D = -9.8\text{A}$
Turn-On Rise Time	t_R	—	41	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	146	—		
Turn-Off Fall Time	t_F	—	165	—		
Reverse Recovery Time	t_{RR}	—	27	—	ns	$I_F = -9.8\text{A}, di/dt = -100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{RR}	—	22	—	nC	$I_F = -9.8\text{A}, di/dt = -100\text{A}/\mu\text{s}$

- 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.

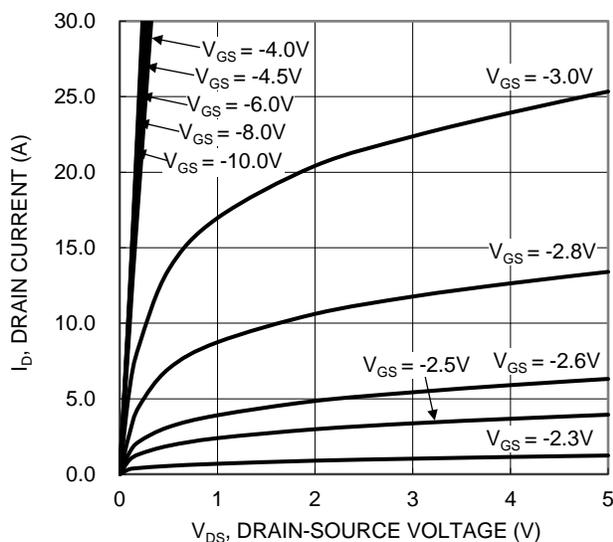


Figure 1. Typical Output Characteristic

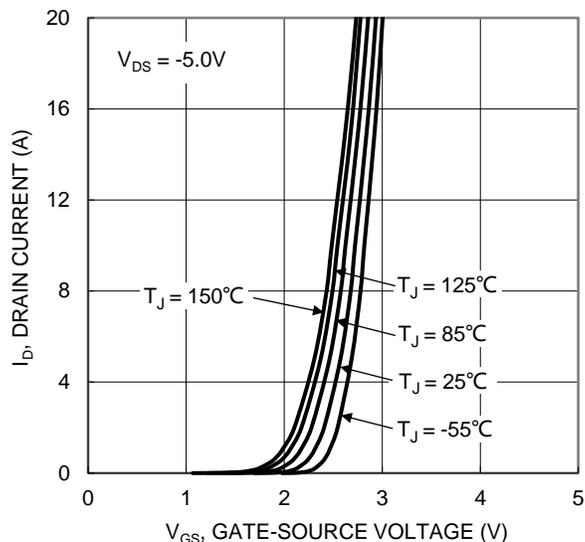


Figure 2. Typical Transfer Characteristic

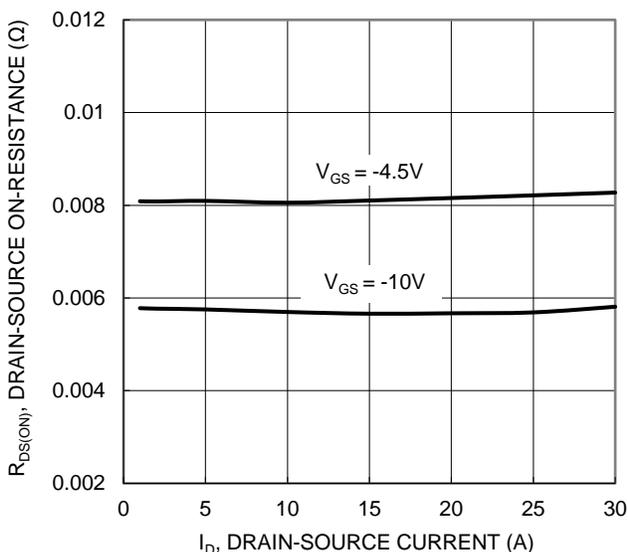


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

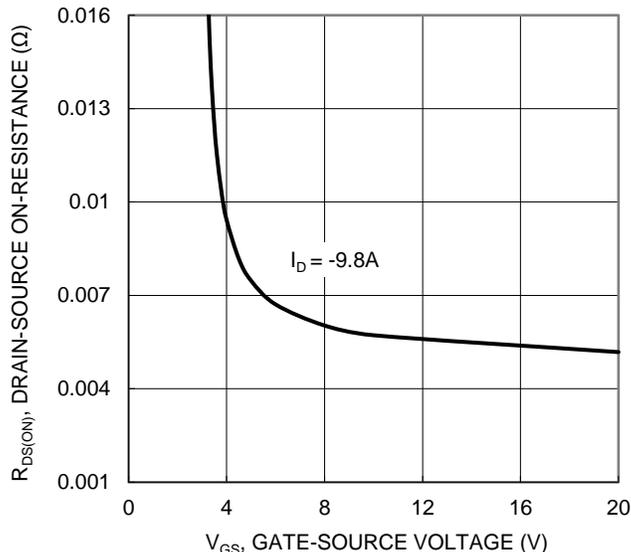


Figure 4. Typical Transfer Characteristic

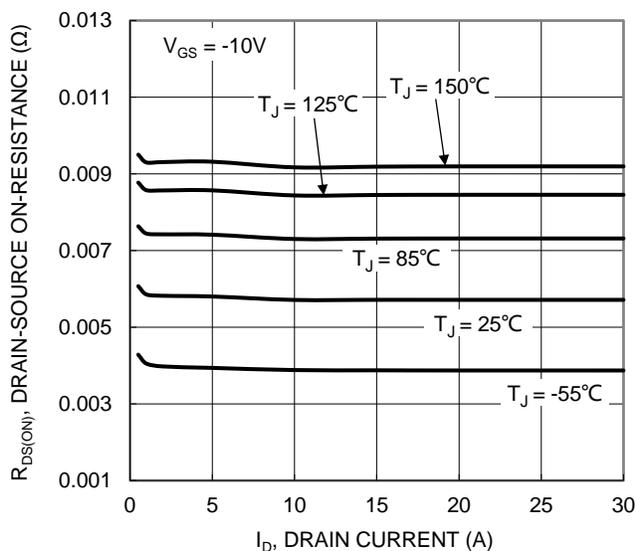


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

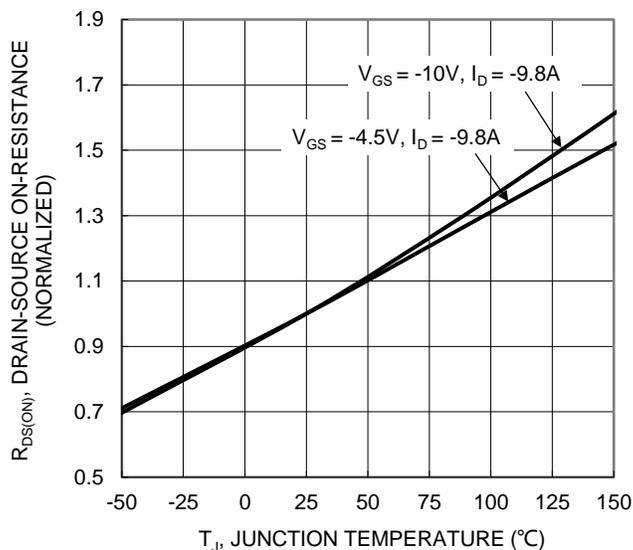


Figure 6. On-Resistance Variation with Junction Temperature

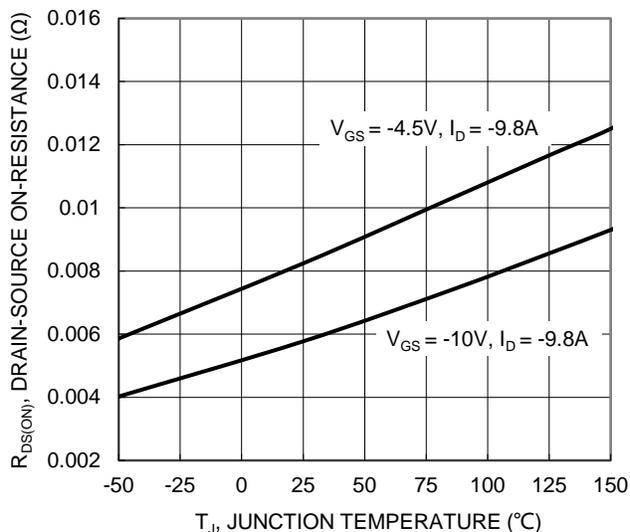


Figure 7. On-Resistance Variation with Junction Temperature

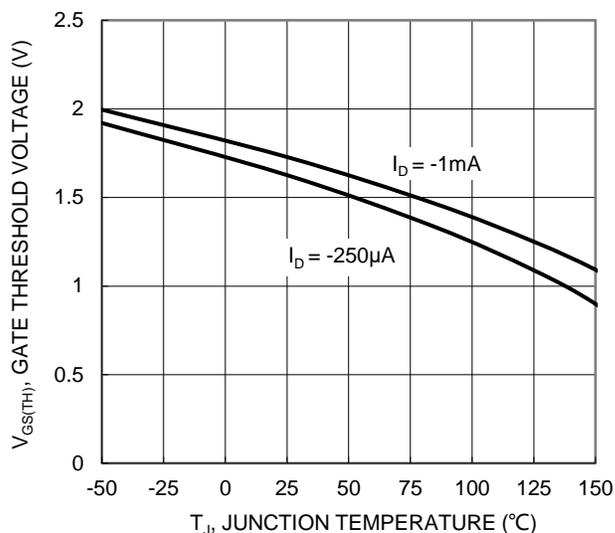


Figure 8. Gate Threshold Variation vs. Junction Temperature

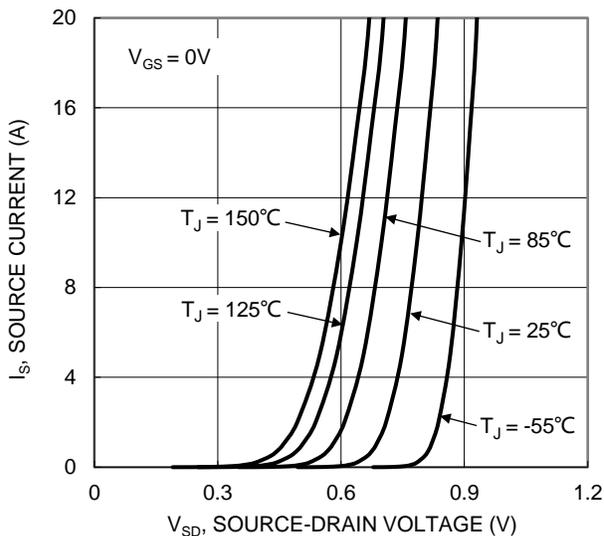


Figure 9. Diode Forward Voltage vs. Current

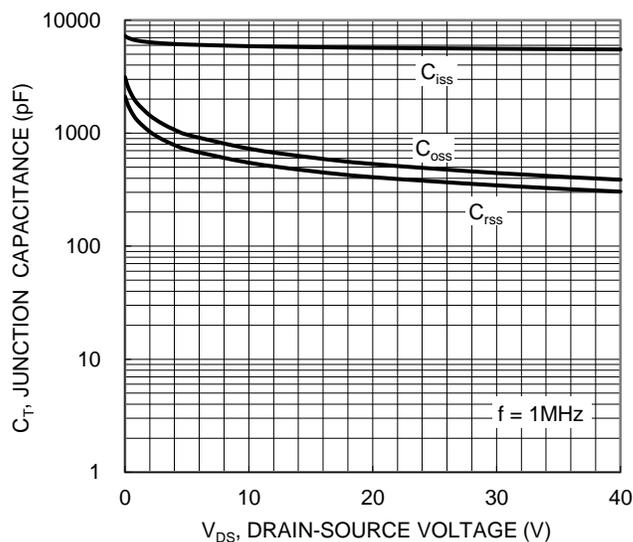


Figure 10. Typical Junction Capacitance

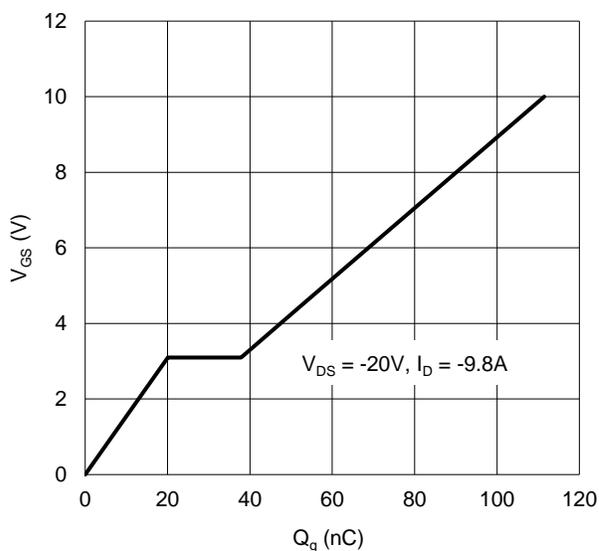


Figure 11. Gate Charge

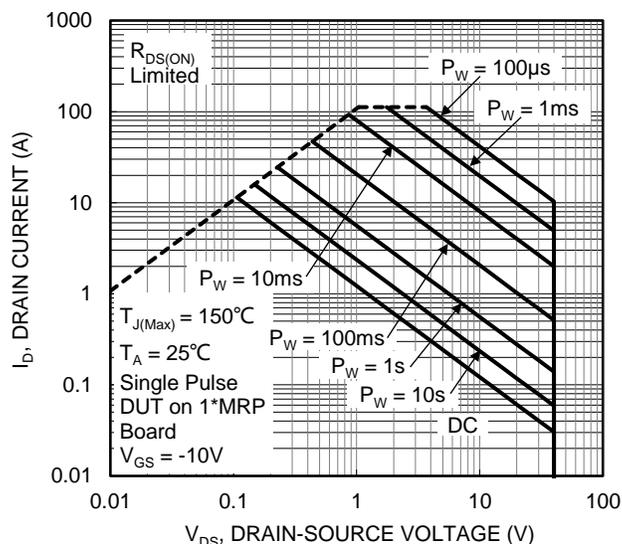


Figure 12. SOA, Safe Operation Area

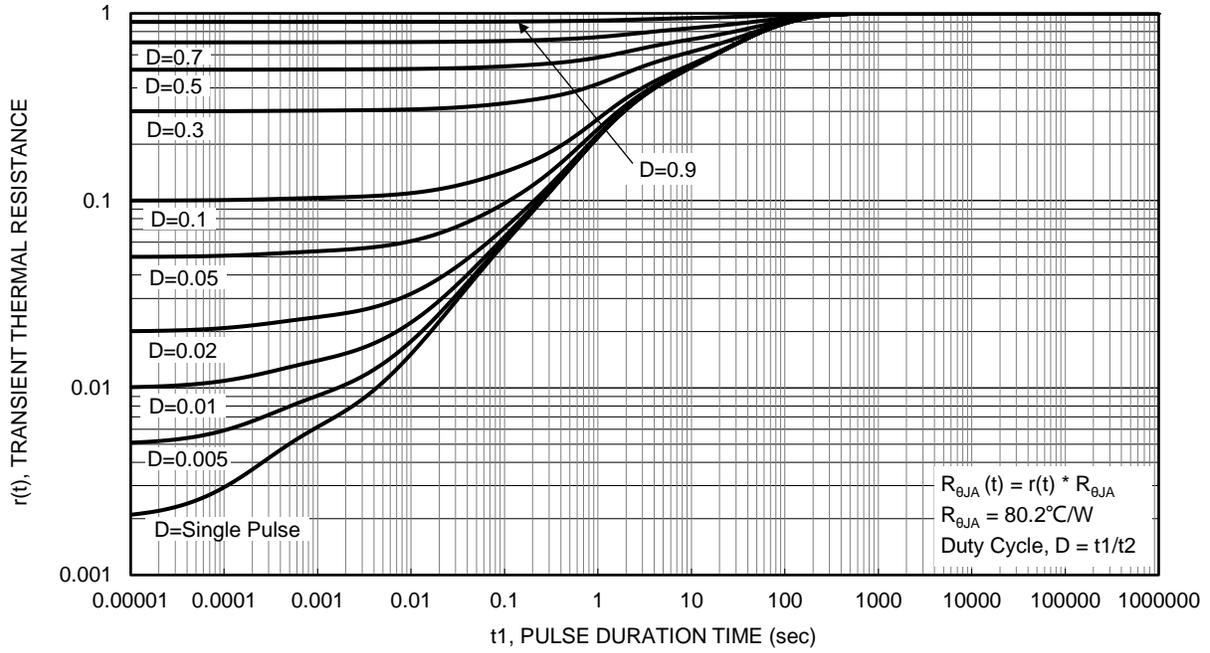
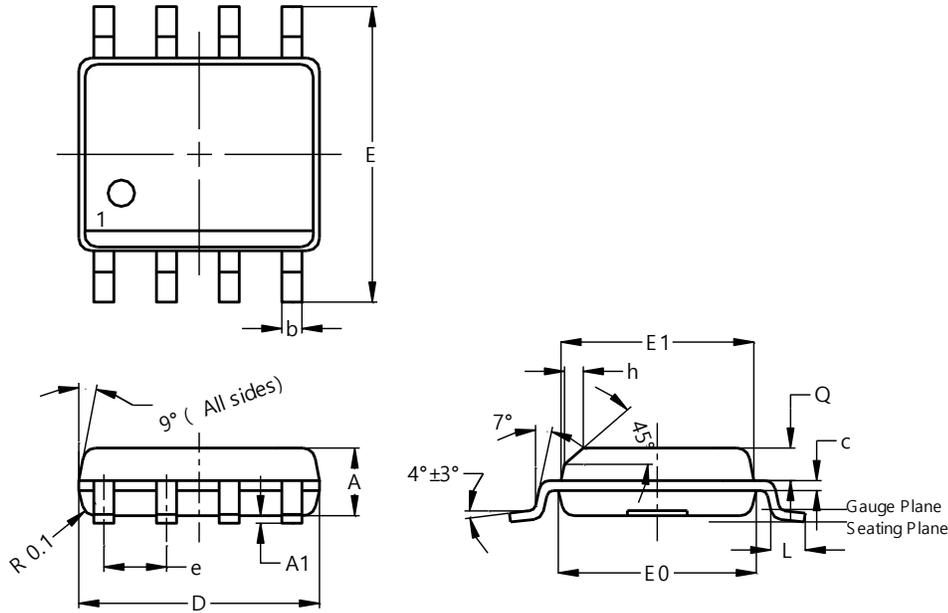


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

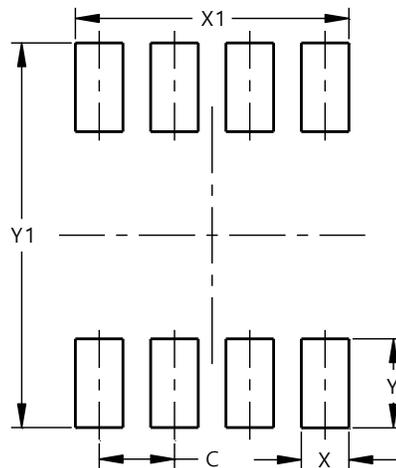
SO-8



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

SO-8



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