



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

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Product Summary

BV _{DSS}	R _{DS(on)} Max	I _D Max T _A = +25°C
100V	32mΩ @ V _{GS} = 10V	5A
	49mΩ @ V _{GS} = 4.5V	4A

Features and Benefits

- High Conversion Efficiency
- Low R_{DS(on)}—Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application

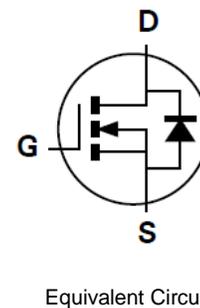
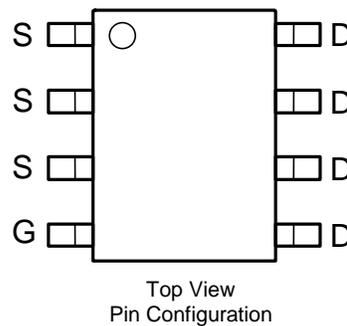
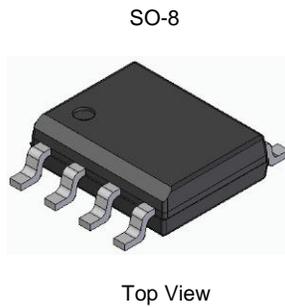
Description and Applications

This 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.

- High Frequency Switching
- Synchronous Rectification
- DC-DC Converters

Mechanical Data

- Package: SO-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Finish—Matte Tin Annealed over Copper Leadframe. 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}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	I_D	$T_A = +25^\circ\text{C}$	5
		$T_A = +70^\circ\text{C}$	4
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	42	A
Maximum Continuous Body Diode Forward Current (Note 6)	I_S	25	A
Pulsed Body Diode Forward Current (10 μs Pulse, Duty Cycle = 1%)	I_{SM}	42	A
Avalanche Current, $L = 0.3\text{mH}$	I_{AS}	13	A
Avalanche Energy, $L = 0.3\text{mH}$	E_{AS}	25.3	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	1.3	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	P_D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	11	$^\circ\text{C/W}$
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}	100	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$
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	$V_{GS(th)}$	1.3	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	23	32	m Ω	$V_{GS} = 10\text{V}, I_D = 10\text{A}$
		—	34	49		$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$
Diode Forward Voltage	V_{SD}	—	0.8	1.0	V	$V_{GS} = 0\text{V}, I_S = 6\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	683	—	pF	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	165	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	6.9	—	pF	
Gate Resistance	R_g	—	1.2	—	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	—	6.3	—	nC	$V_{DS} = 50\text{V}, I_D = 6\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	11.9	—	nC	
Gate-Source Charge	Q_{gs}	—	2.0	—	nC	
Gate-Drain Charge	Q_{gd}	—	3.1	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	4.1	—	ns	$V_{DS} = 50\text{V}, R_L = 5.85\Omega$ $V_{GS} = 10\text{V}, R_{GEN} = 3\Omega$
Turn-On Rise Time	t_R	—	4.5	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	12.5	—	ns	
Turn-Off Fall Time	t_F	—	9.3	—	ns	$I_F = 6\text{A}, di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Time	t_{RR}	—	31.5	—	ns	
Reverse Recovery Charge	Q_{RR}	—	94.6	—	nC	

- Notes:
- Device mounted on FR-4 substrate PCB, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PCB, 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.

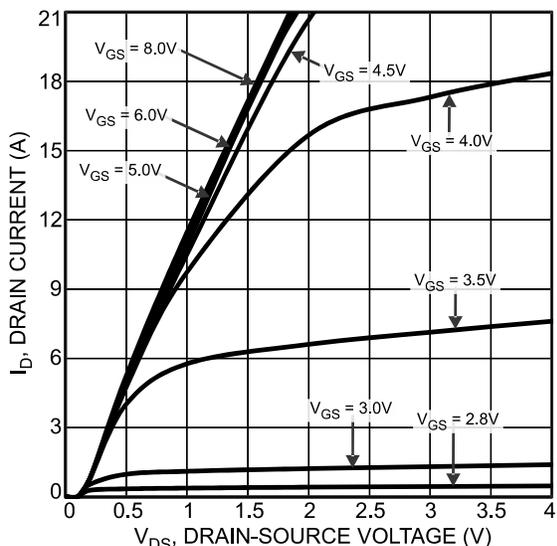


Fig. 1 Typical Output Characteristic

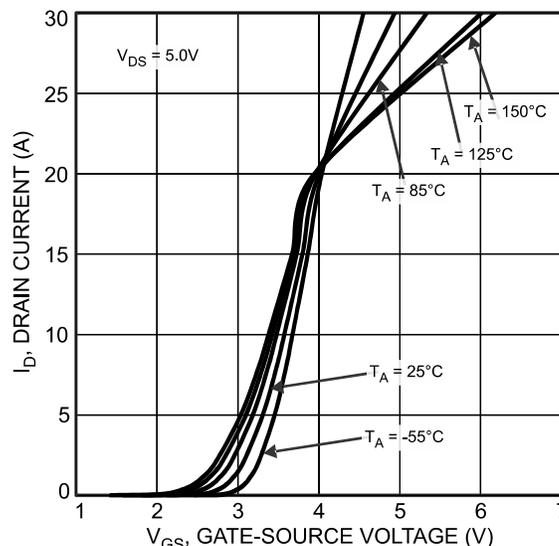


Fig. 2 Typical Transfer Characteristics

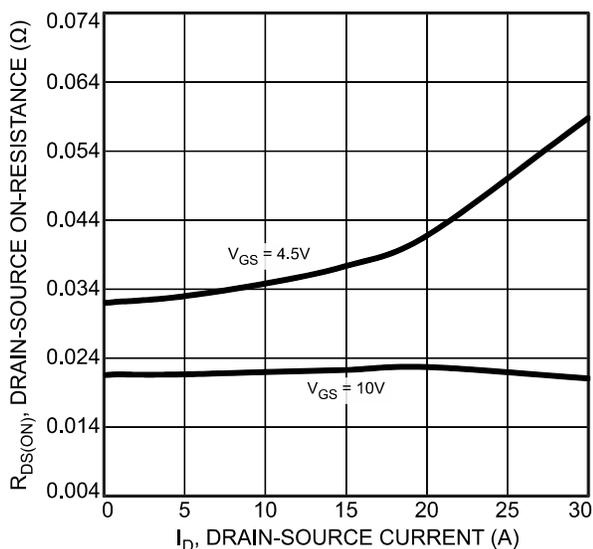


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

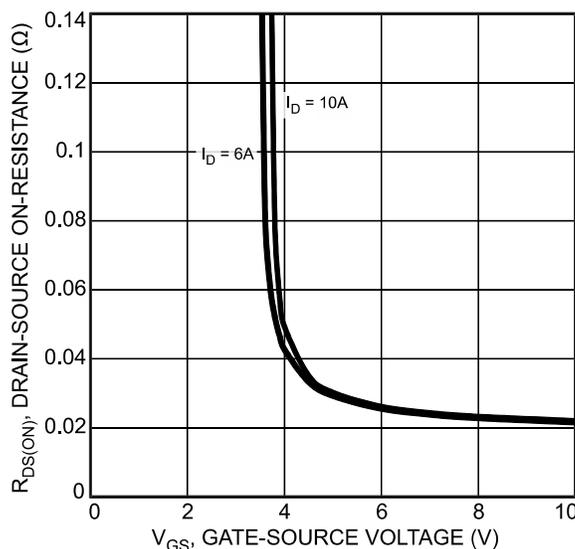


Fig. 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

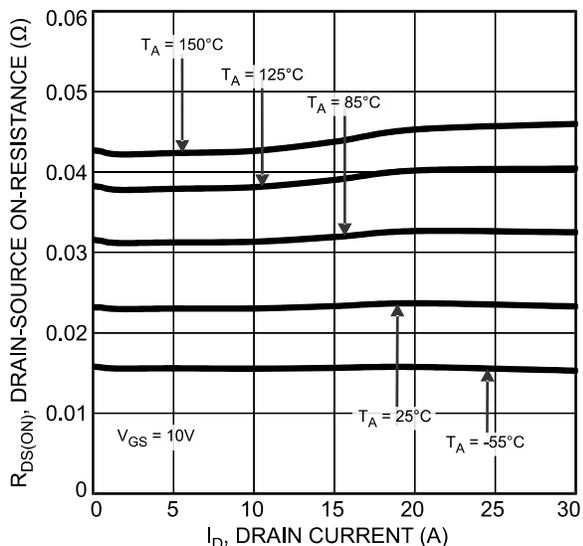


Fig. 5 Typical On-Resistance vs. Drain Current and Junction Temperature

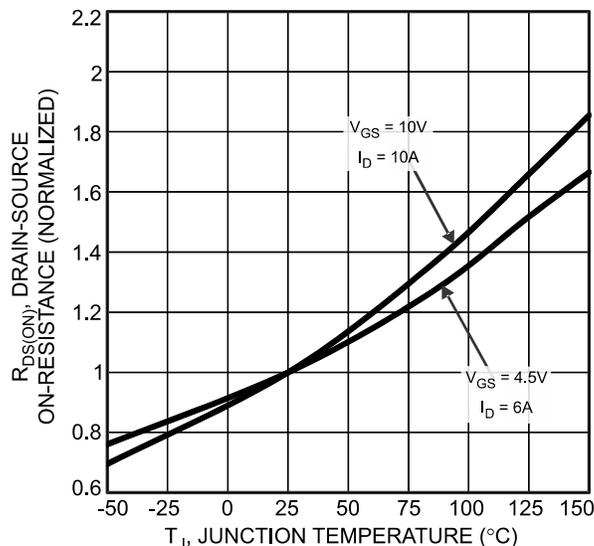


Fig. 6 On-Resistance Variation with Junction Temperature

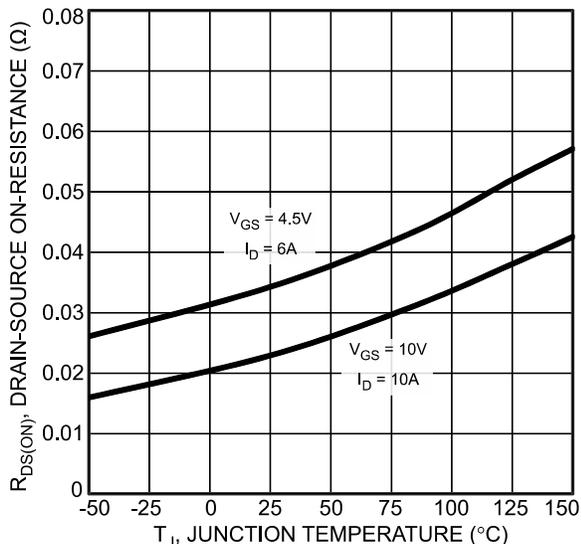


Fig. 7 On-Resistance Variation with Junction Temperature

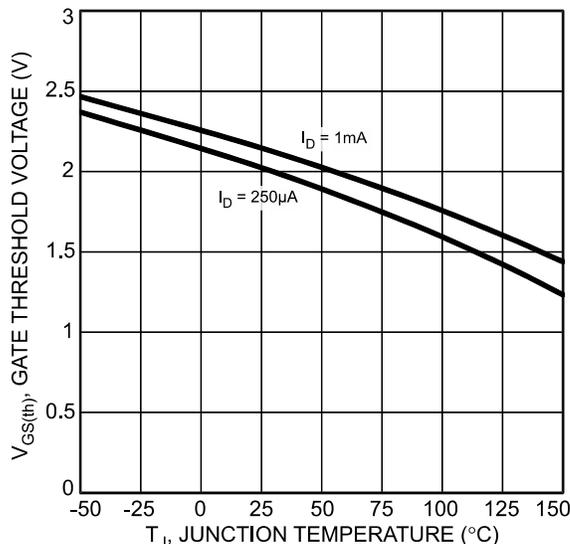


Fig. 8 Gate Threshold Variation vs. Junction Temperature

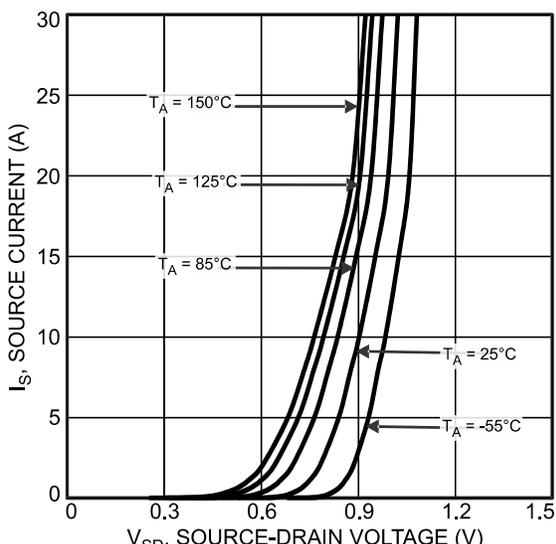


Fig. 9 Diode Forward Voltage vs. Current

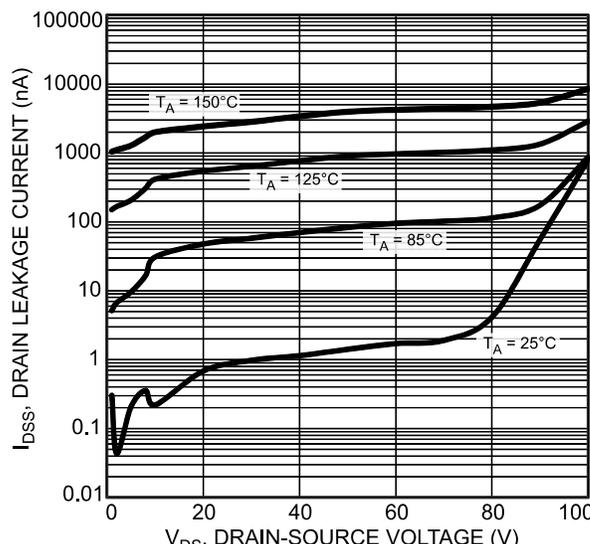


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

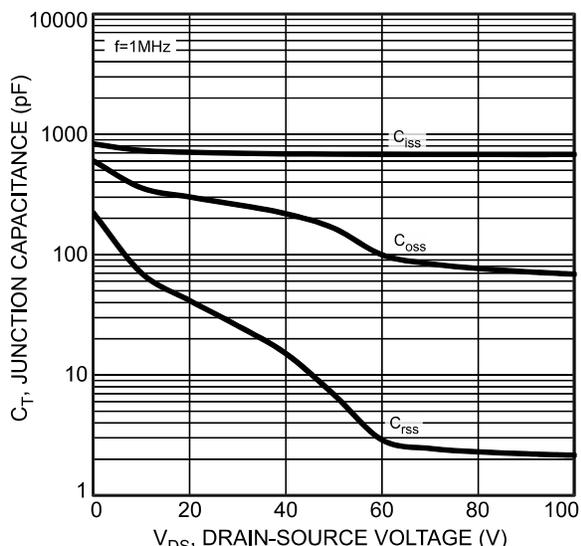


Fig. 10 Typical Junction Capacitance

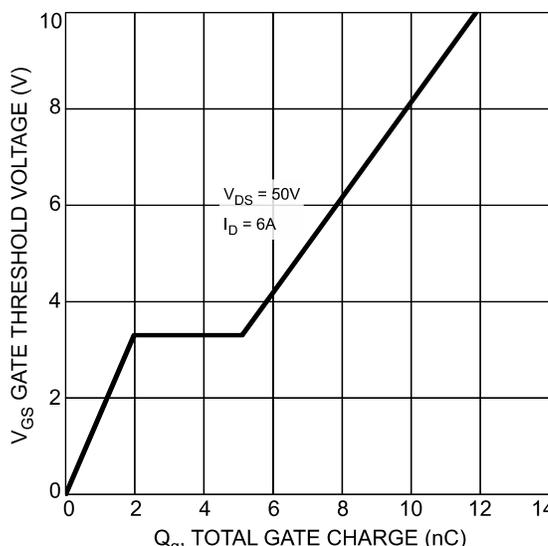


Fig. 12 Gate Charge

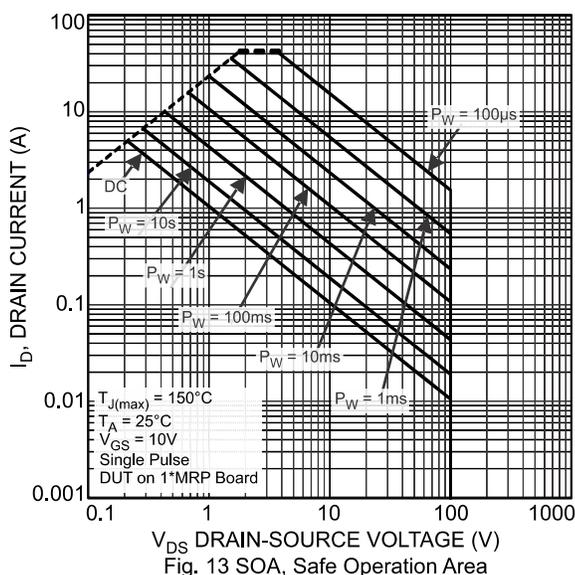


Fig. 13 SOA, Safe Operation Area

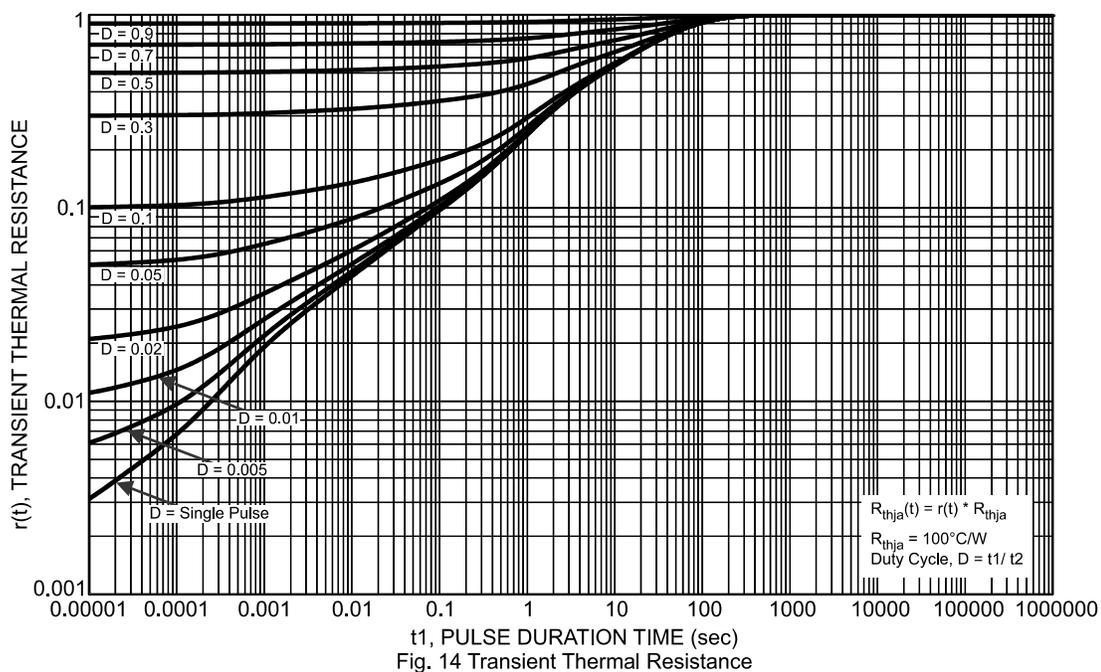
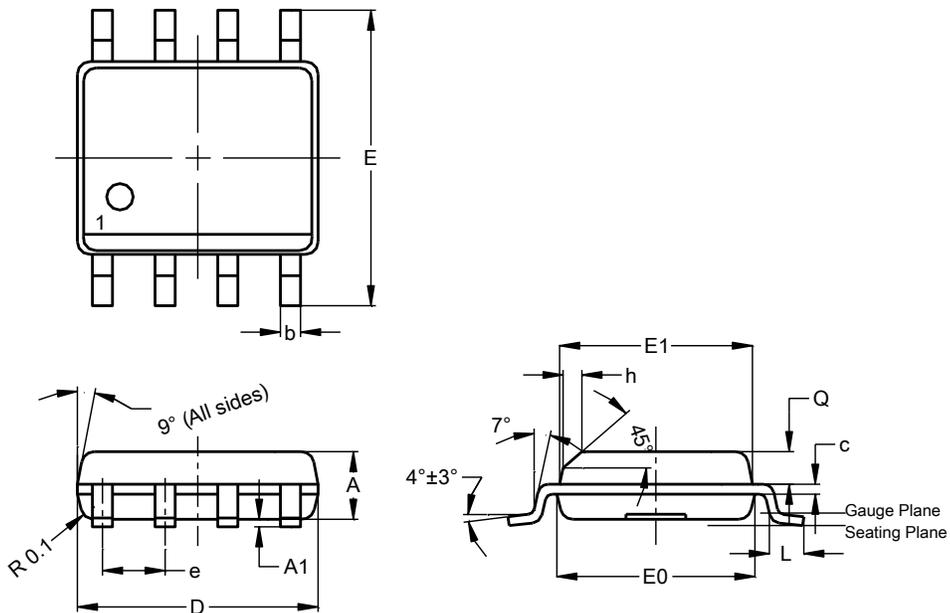


Fig. 14 Transient Thermal Resistance

Package Outline Dimensions

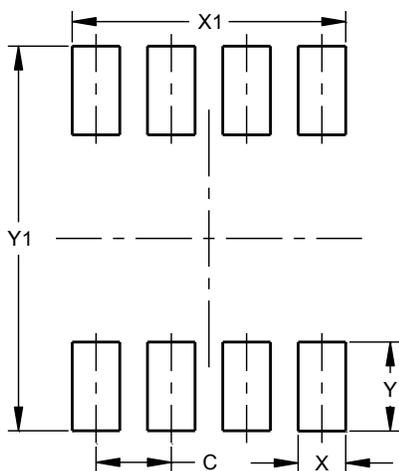
SO-8



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