优尚

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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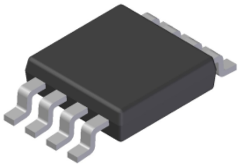
Features

- Low On-Resistance
  - 13mΩ @ V_{GS} = -10V
  - 16mΩ @ V_{GS} = -4.5V
  - 22mΩ @ V_{GS} = -2.5V
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

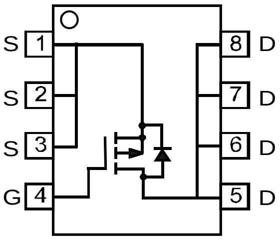
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ⓔ3
- Weight: 0.072g (Approximate)

SO-8



Top View



Top View
Internal Schematic

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±12	V
Drain Current (Note 5)	Steady State	T_A = +25°C T_A = +70°C	I_D	-10 -8	A
Pulsed Drain Current (Note 6)			I_{DM}	-90	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. Device mounted on 2 oz. Copper pads on FR-4 PCB.

6. Pulse width ≤10µS, Duty Cycle ≤1%.

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}	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.6	-0.77	-1.1	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	8	13	mΩ	V_{GS} = -10V, I_D = -10A
		—	11	16		V_{GS} = -4.5V, I_D = -9A
		—	17	22		V_{GS} = -2.5V, I_D = -8A
Forward Transconductance	g_{fs}	—	28	—	S	V_{DS} = -10V, I_D = -10A
Diode Forward Voltage (Note 7)	V_{SD}	-0.5	-0.68	-1.2	V	V_{GS} = 0V, I_S = -3A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	2444	—	pF	V_{DS} = -10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	594	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	556	—	pF	
Gate Resistance	R_G	—	2.0	—	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	Q_g	—	28.1 56.9	—	nC	V_{DS} = -10V, V_{GS} = -4.5V, I_D = -10A V_{DS} = -10V, V_{GS} = -10V, I_D = -10A
Gate-Source Charge	Q_{gs}	—	3.4	—		V_{DS} = -10V, V_{GS} = -10V, I_D = -10A
Gate-Drain Charge	Q_{gd}	—	11.9	—		V_{DS} = -10V, V_{GS} = -10V, I_D = -10A
Turn-On Delay Time	$t_{D(ON)}$	—	7.5	15	ns	V_{DD} = -15V, I_D = -1A, V_{GS} = -10V, R_{GEN} = 6Ω
Turn-On Rise Time	t_R	—	9.9	20		
Turn-Off Delay Time	$t_{D(OFF)}$	—	108.0	216		
Turn-Off Fall Time	t_F	—	76.5	153		

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

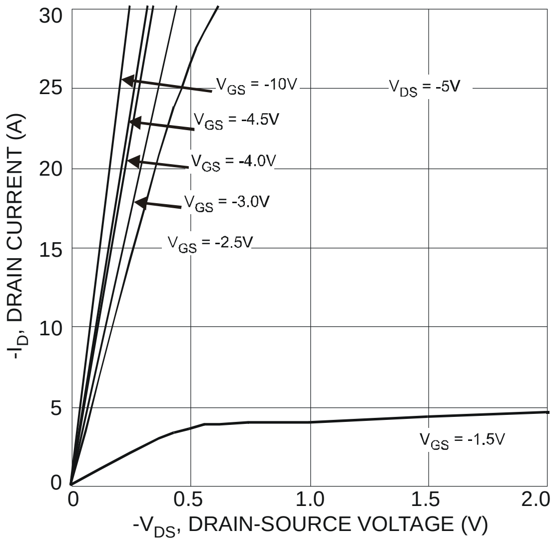


Fig. 1 Typical Output Characteristic

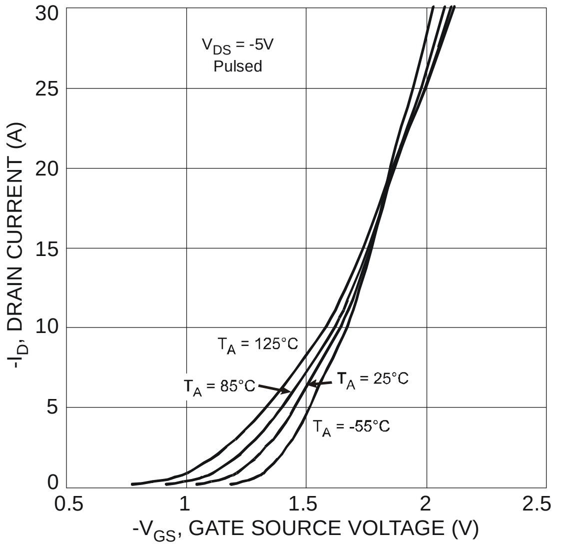


Fig. 2 Typical Transfer Characteristics

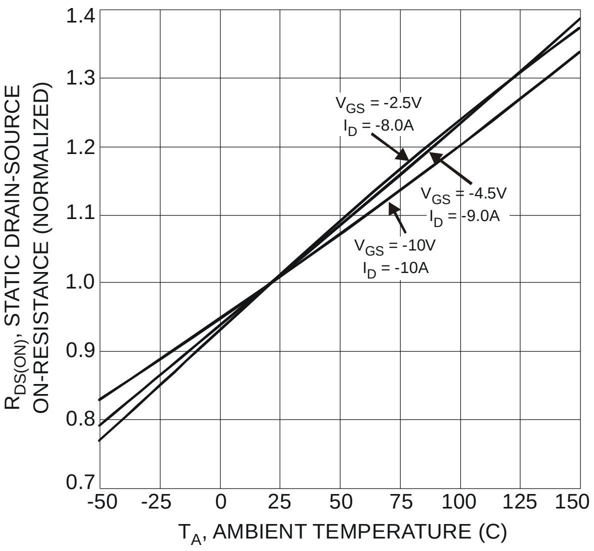


Fig. 3 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

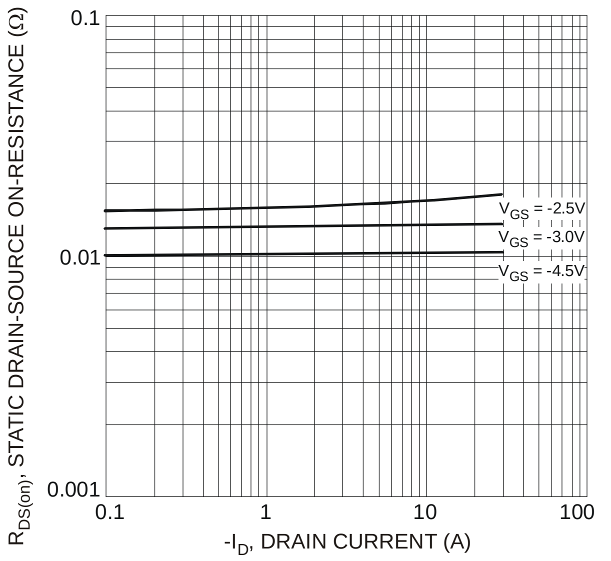


Fig. 4 On-Resistance vs. Drain Current and Gate Voltage

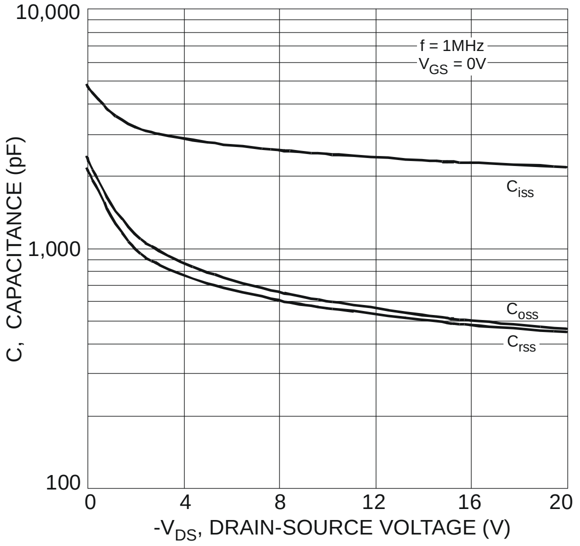


Fig. 5 Typical Total Capacitance

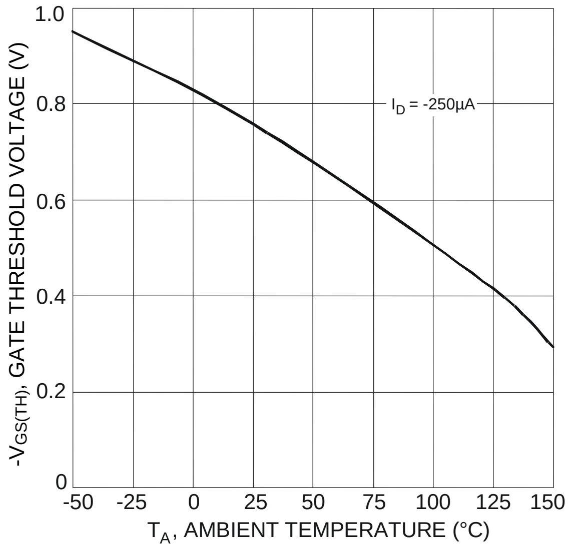


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

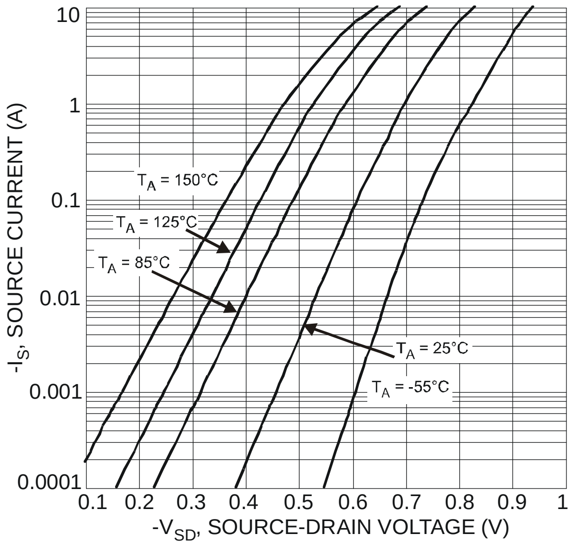


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

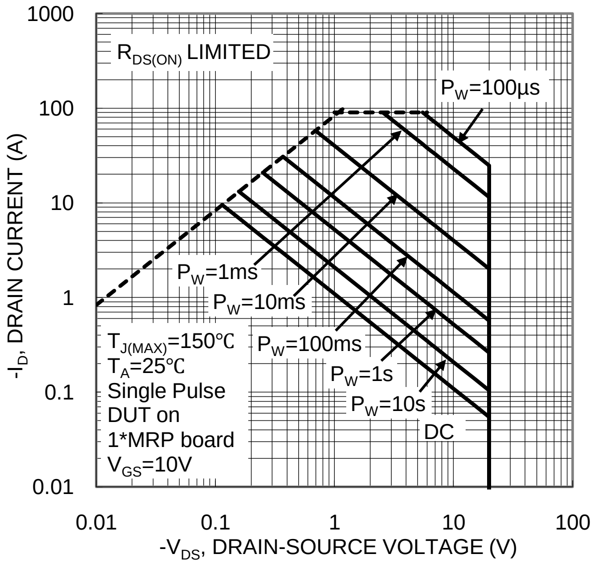
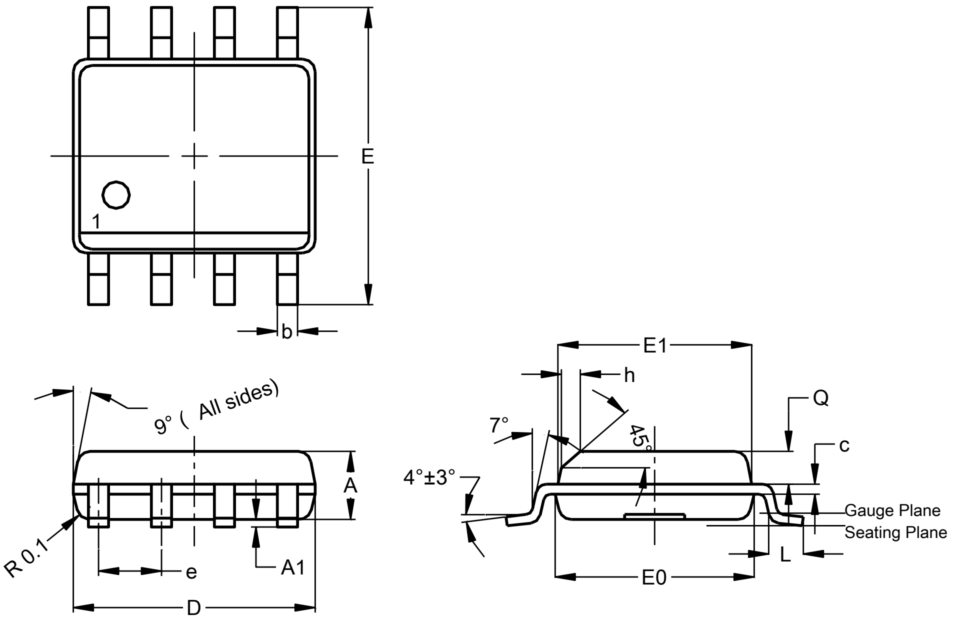


Figure 8. SOA, Safe Operation Area

Package Outline Dimensions

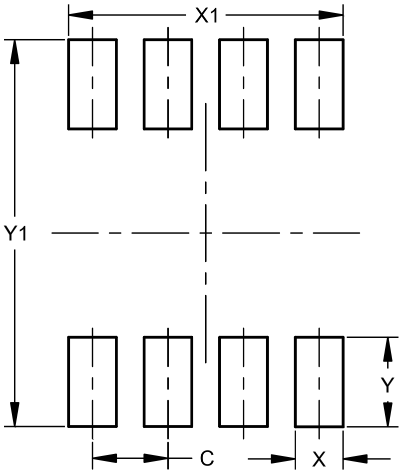
SO-8



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