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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Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25°C$
30V	20mΩ @ V_{GS} = 10V	6.9A
	27mΩ @ V_{GS} = 4.5V	5.8A

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

Description and Applications

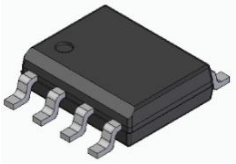
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- Power Management Functions
- DC-DC Converters

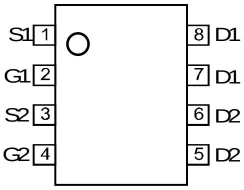
Mechanical Data

- 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 e3
- Weight: 0.072grams (Approximate)

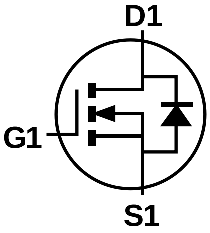
SO-8



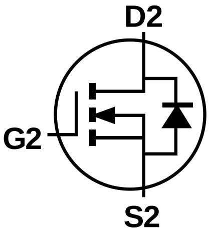
Top View



Top View



N-Channel MOSFET



N-Channel MOSFET

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}	±20	V
Drain Current (Note 5)	Steady State	T_A = +25°C T_A = +70°C	I_D	6.9 5.8	A
Pulsed Drain Current (Note 6)			I_{DM}	30	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	2	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°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}	30	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	100	nA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
		—	—	1	μA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	2.1	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	13 22	20 27	mΩ	V_{GS} = 10V, I_D = 6.9A V_{GS} = 4.5V, I_D = 5A
Forward Transconductance	g_{fs}	—	7	—	S	V_{DS} =5V, I_D = 6.9A
Diode Forward Voltage (Note 7)	V_{SD}	0.5	—	1.2	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	725	—	pF	V_{DS} = 15V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	114	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	92	—	pF	
Gate Resistance	R_G	—	0.89	—	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	Q_g	—	6.4 13	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D =5A V_{GS} = 10V, V_{DS} = 15V, I_D = 6.9A
Gate-Source Charge	Q_{gs}	—	1.9	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 6.9A
Gate-Drain Charge	Q_{gd}	—	3.2	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 6.9A
Turn-On Delay Time	$t_{D(ON)}$	—	11	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_D = 1.8Ω, R_G = 6Ω
Turn-On Rise Time	t_R	—	7	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	63	—	ns	
Turn-Off Fall Time	t_F	—	30	—	ns	

Notes:
5. Device mounted on 2 oz. Copper pads on FR-4 PCB with $R_{\theta JA}$ = 62.5°C/W.
6. Pulse width ≤10μS, Duty Cycle ≤1%.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

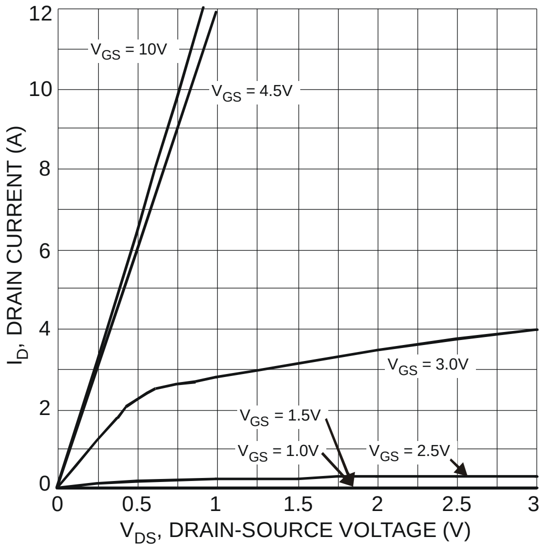


Fig. 1 Typical Output Characteristics

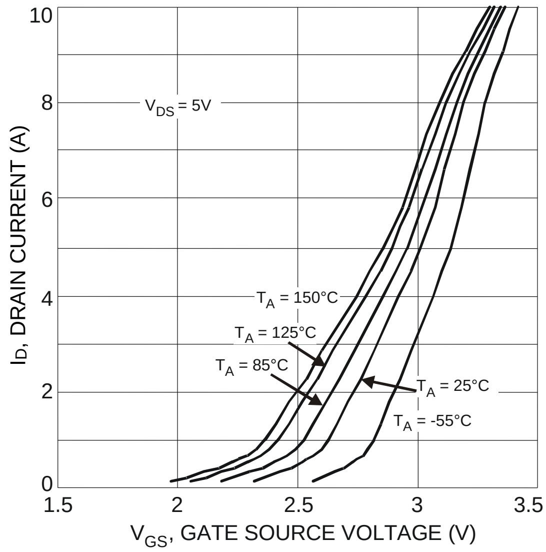


Fig. 2 Typical Transfer Characteristics

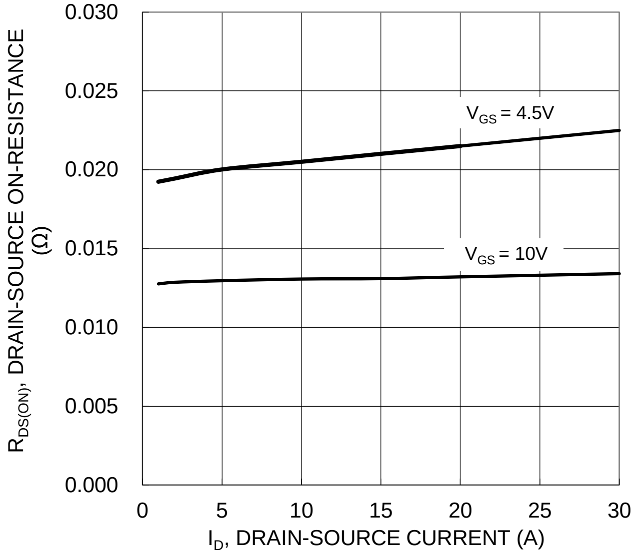


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

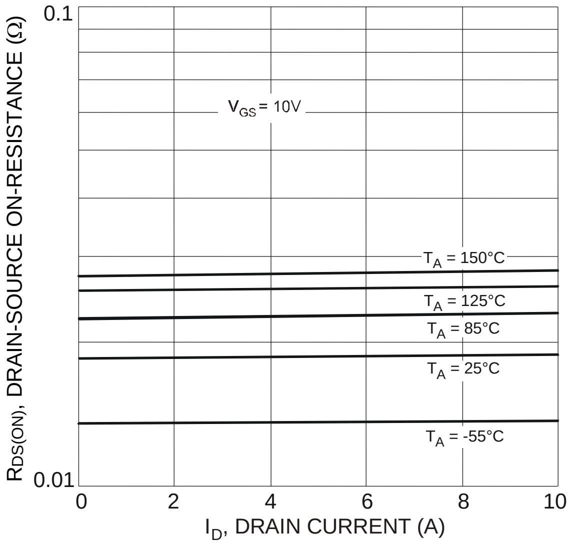


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

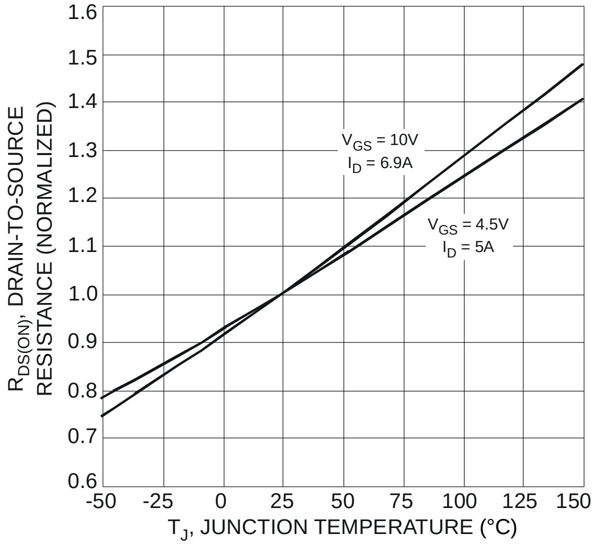


Fig. 5 On-Resistance Variation with Temperature

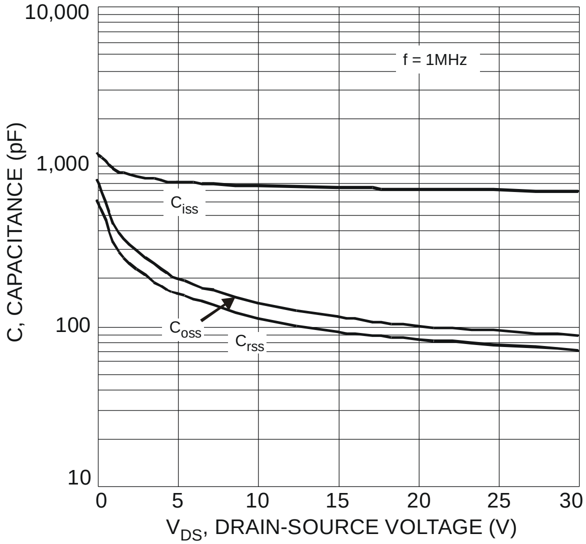


Fig. 6 Typical Capacitance

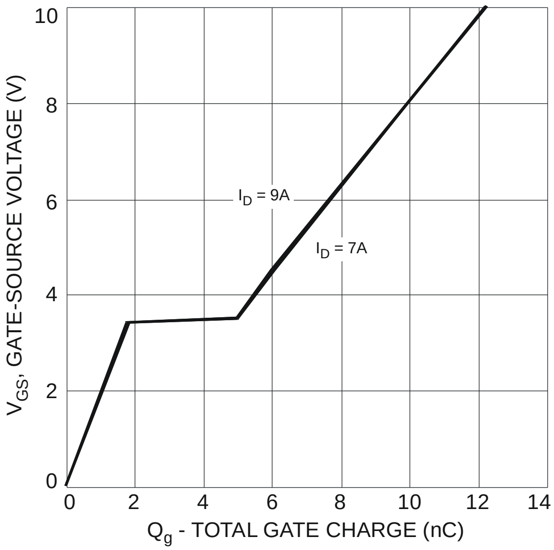


Fig. 7 Gate Charge

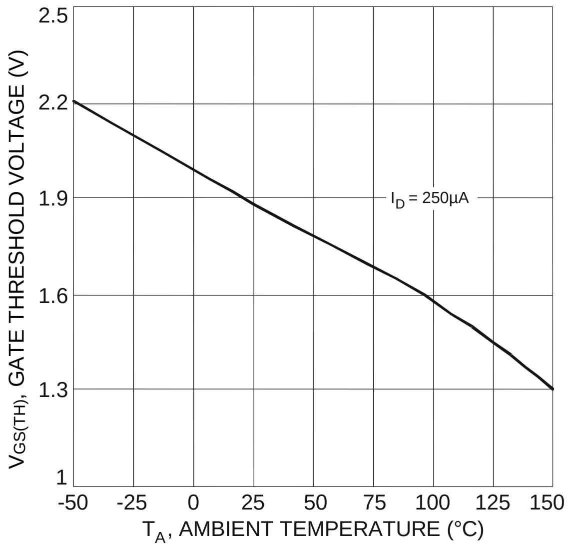


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

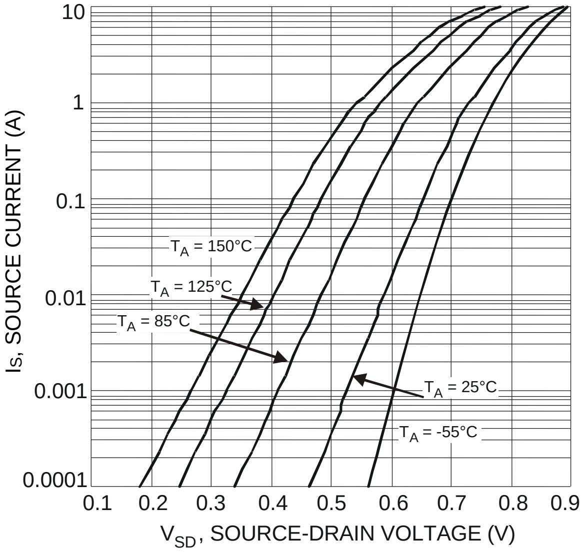


Fig. 9 Diode Forward Voltage vs. Current

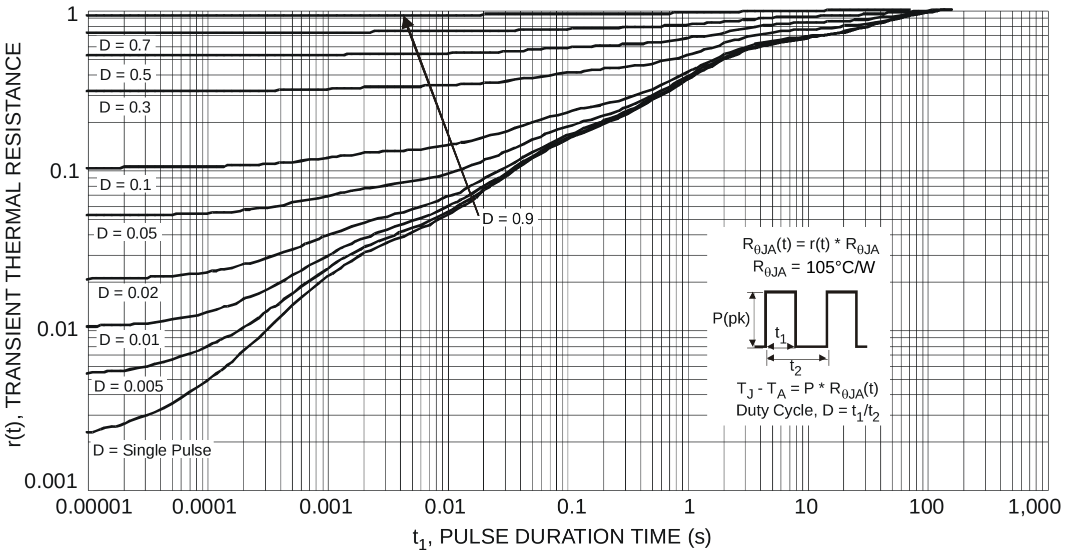
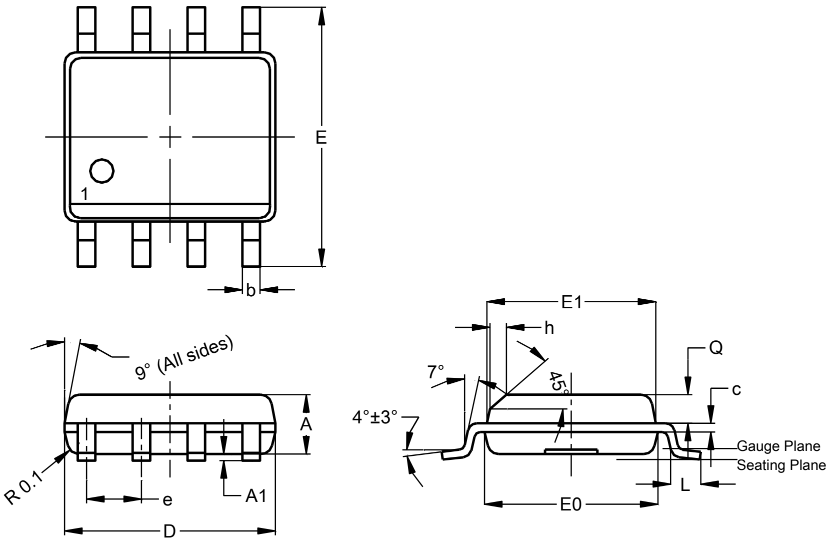


Fig. 10 Transient Thermal Response

Package Outline Dimensions

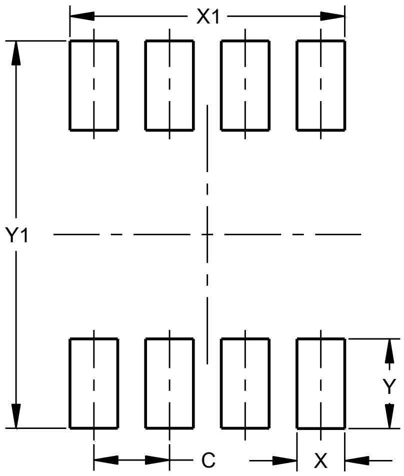
SO-8



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