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

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = +25°C
30V	7mΩ @ V_{GS} = 10V	16A
	10mΩ @ V_{GS} = 4.5V	13.5A

Features and Benefits

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

Description

This MOSFET has been 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.

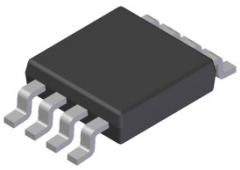
Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

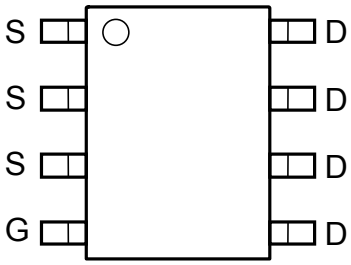
Mechanical Data

- 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
- Weight: 0.074 grams (approximate)

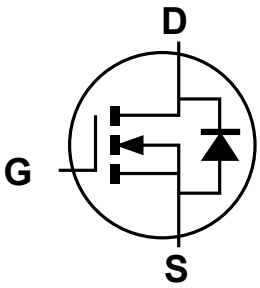
SO-8



Top View



Top View
Internal Schematic



Equivalent circuit

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

Characteristic			Symbol	Value	Units
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	16 13	A
Pulsed Drain Current (Note 6)			I_{DM}	64	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

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}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1.3	—	2.1	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	5 7.9	7 10	mΩ	V_{GS} = 10V, I_D = 15A V_{GS} = 4.5V, I_D = 13A
Forward Transconductance	g_{fs}	—	16.4	—	S	V_{DS} = 10V, I_D = 15A
Diode Forward Voltage	V_{SD}	—	0.67	1.2	V	V_{GS} = 0V, I_S = 2.3A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	2714	—	pF	V_{DS} = 15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	436	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	380	—	pF	
Gate Resistance	R_G	—	0.7	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	Q_g	—	31.2 64.2	—	nC	V_{DS} = 15V, V_{GS} = 4.5V, I_D = 16A V_{DS} = 15V, V_{GS} = 10V, I_D = 16A
Gate-Source Charge	Q_{gs}	—	7.1	—		V_{DS} = 15V, V_{GS} = 10V, I_D = 16A
Gate-Drain Charge	Q_{gd}	—	17.1	—		V_{DS} = 15V, V_{GS} = 10V, I_D = 16A
Turn-On Delay Time	$t_{d(on)}$	—	10.3	—	ns	V_{DS} = 15V, V_{GS} = 10V, I_D = 1A, R_G = 6.0Ω
Rise Time	t_r	—	14.8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	85.1	—		
Fall Time	t_f	—	43.6	—		

Notes: 5.Device mounted on 2 oz. Copper pads on FR-4 PCB, with $R_{\theta JA}$ = +50°C
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.

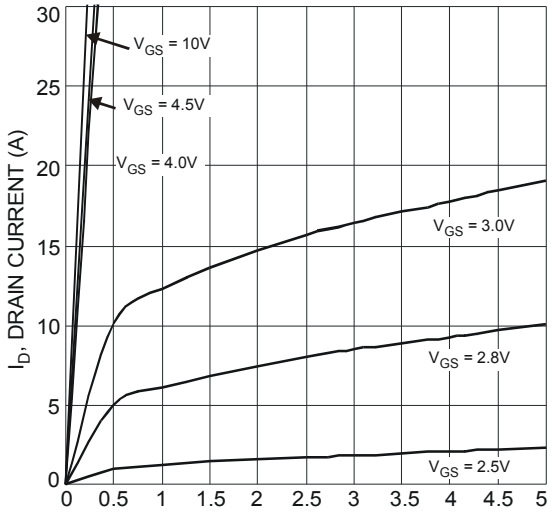


Fig. 1 Typical Output Characteristic

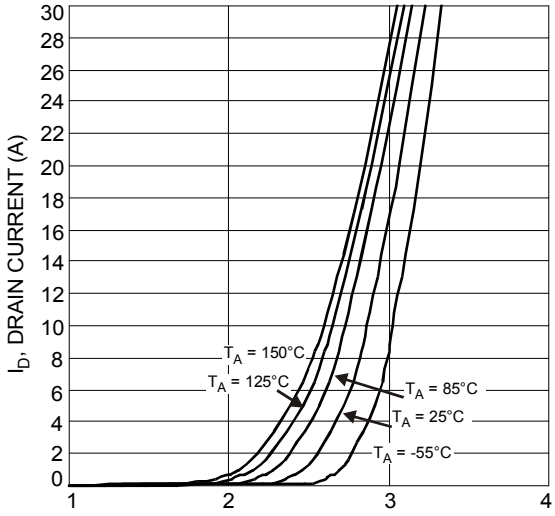


Fig. 2 Typical Transfer Characteristic

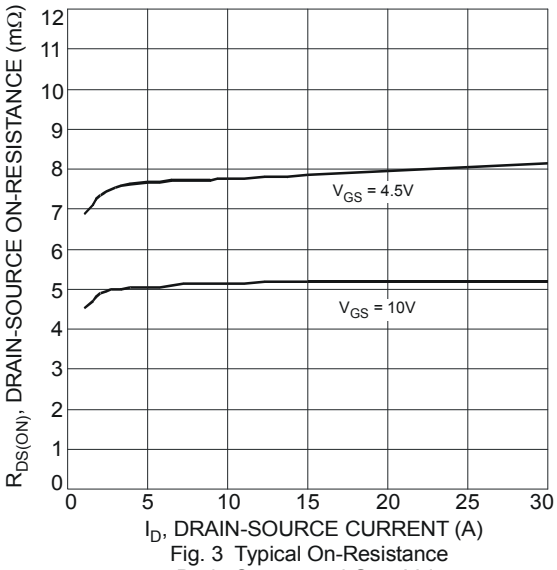


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

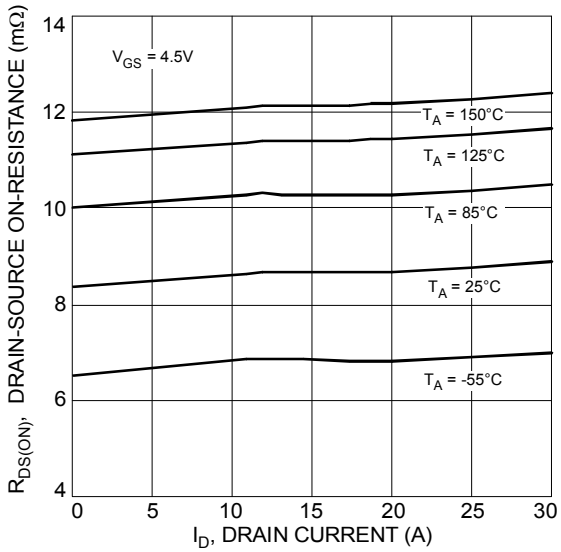


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

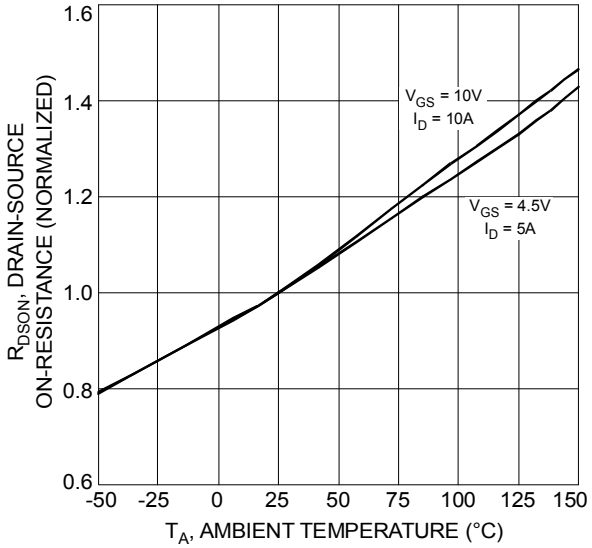


Fig. 5 On-Resistance Variation with Temperature

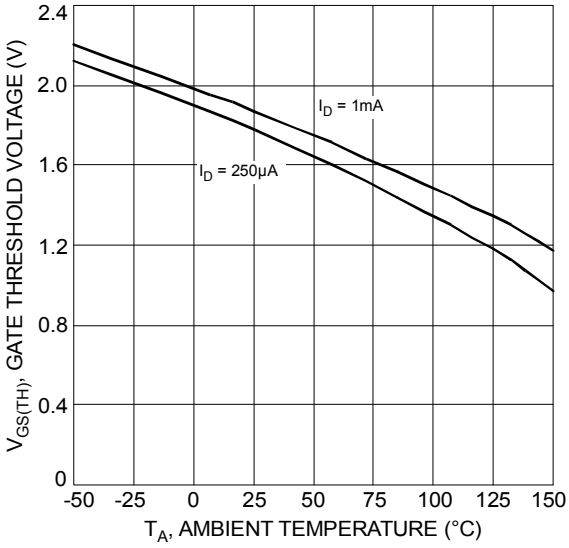


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

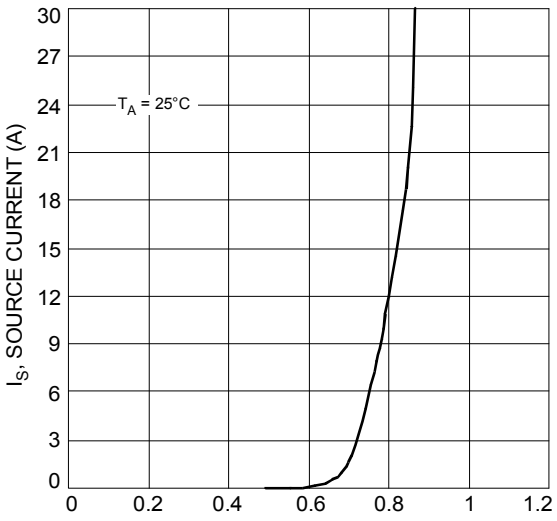


Fig. 7 Diode Forward Voltage vs. Current

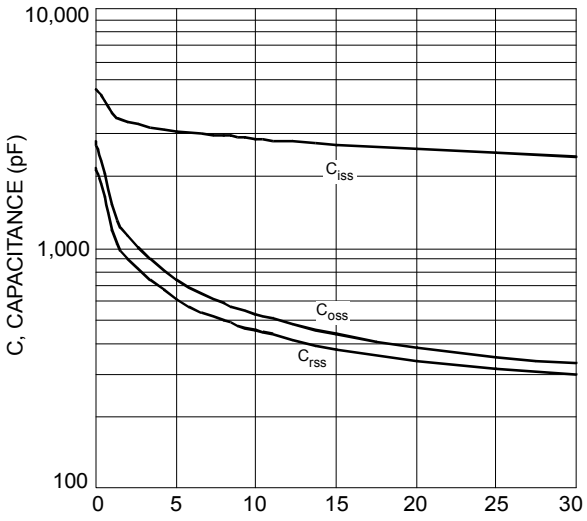


Fig. 8 Typical Total Capacitance

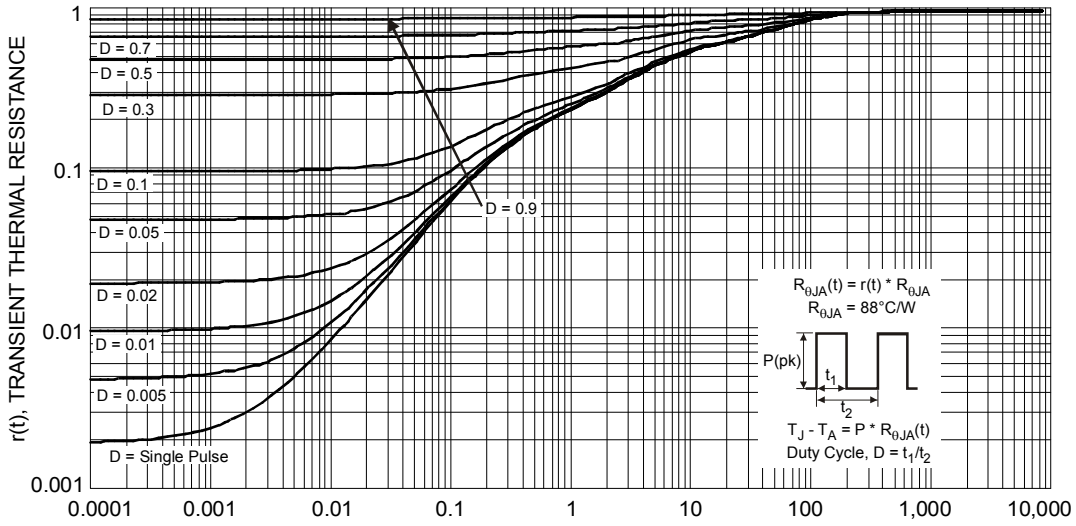
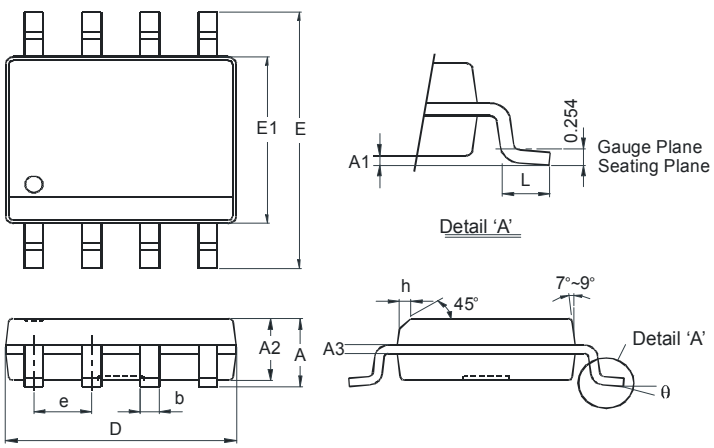


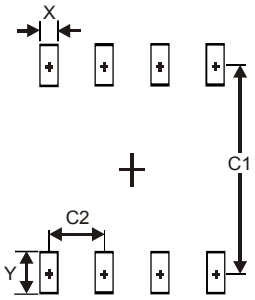
Fig. 9 Transient Thermal Response

Package Outline Dimensions



SO-8		
Dim	**Min**	**Max**
A	—	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	—	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27