



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

$V_{(BR)DSS}$	$R_{DS(ON) \max}$	$I_D \max$ $T_A = +25^\circ\text{C}$
30V	20m Ω @ $V_{GS} = 10\text{V}$	6.9A
	27m Ω @ $V_{GS} = 4.5\text{V}$	5.8A

Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

Description

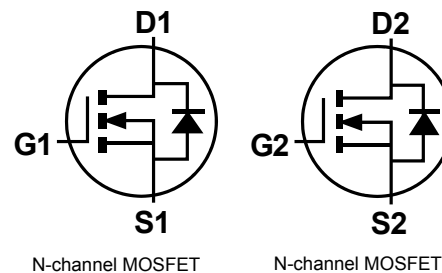
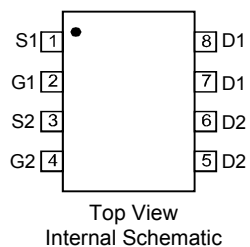
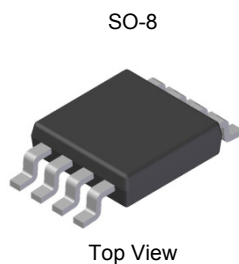
This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

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
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.072grams (approximate)



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	I _D	6.9	A
		T _A = +70°C		5.8	
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 _{θJA}	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	20	mΩ	V _{GS} = 10V, I _D = 6.9A
		—	22	27		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						
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						
Total Gate Charge	Q _g	—	6.4	—	nC	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 5A
		—	13	—		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	
		—	30	—		

- Notes:
- Device mounted on 2 oz. Copper pads on FR-4 PCB with R_{θJA} = 62.5°C/W
 - Pulse width ≤ 10μs, Duty Cycle ≤ 1%.
 - Short duration pulse test used to minimize self-heating effect.

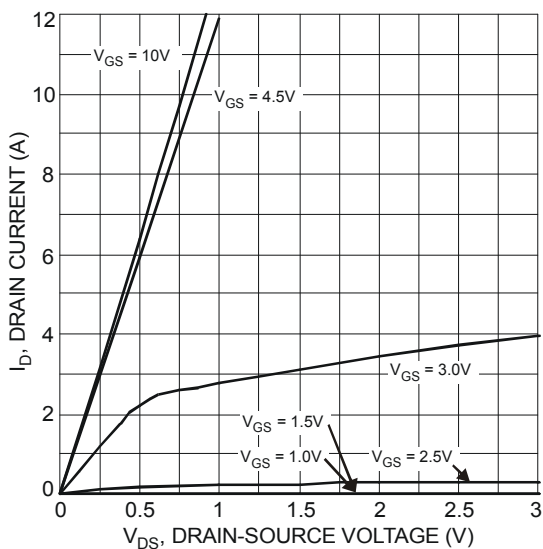


Fig. 1 Typical Output Characteristics

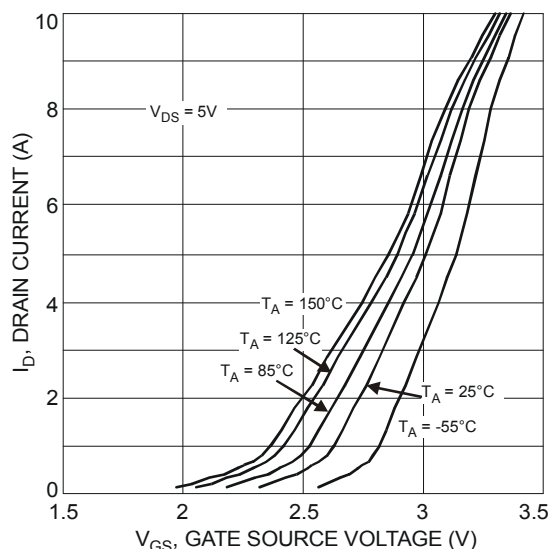


Fig. 2 Typical Transfer Characteristics

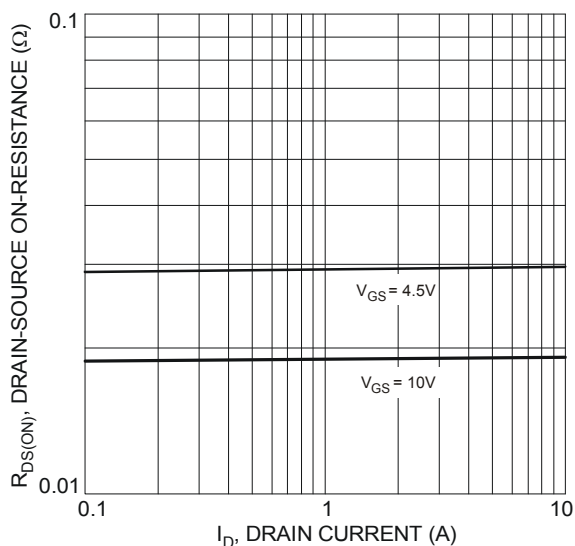


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

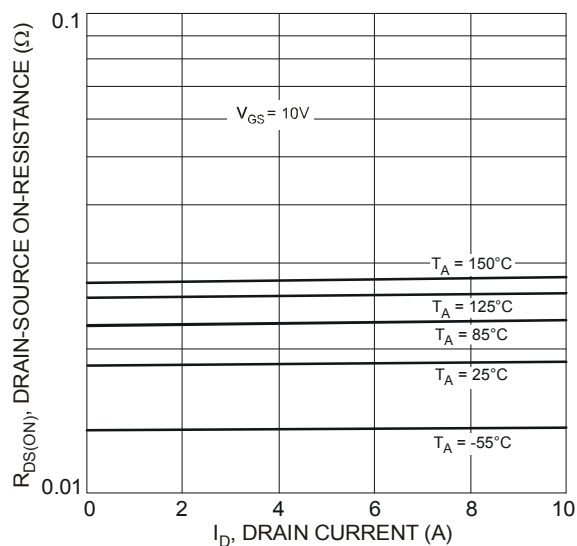


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

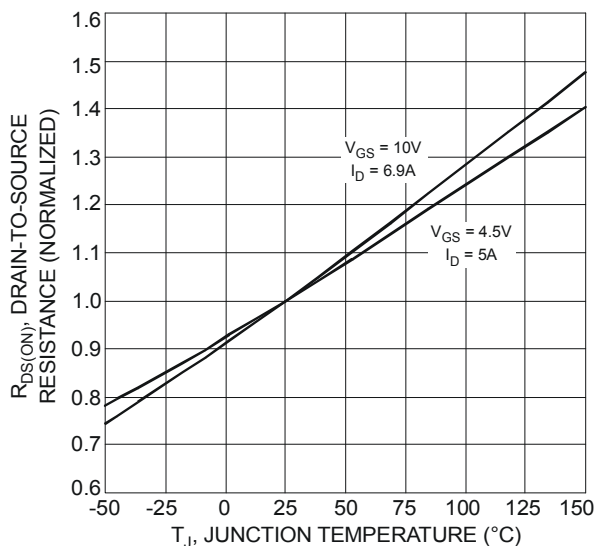


Fig. 5 On-Resistance Variation with Temperature

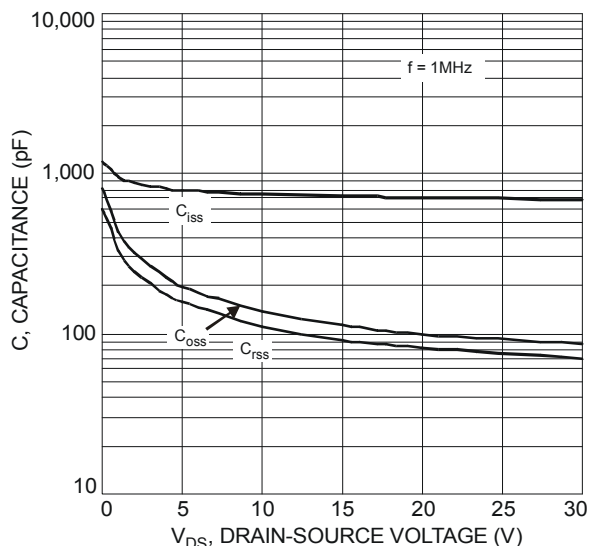


Fig. 6 Typical Capacitance

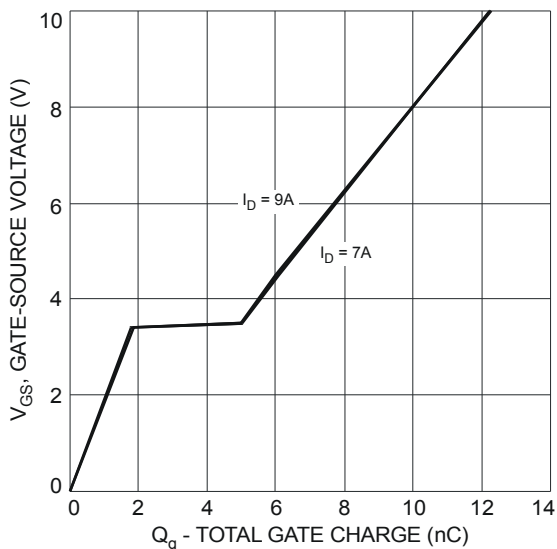


Fig. 7 Gate Charge

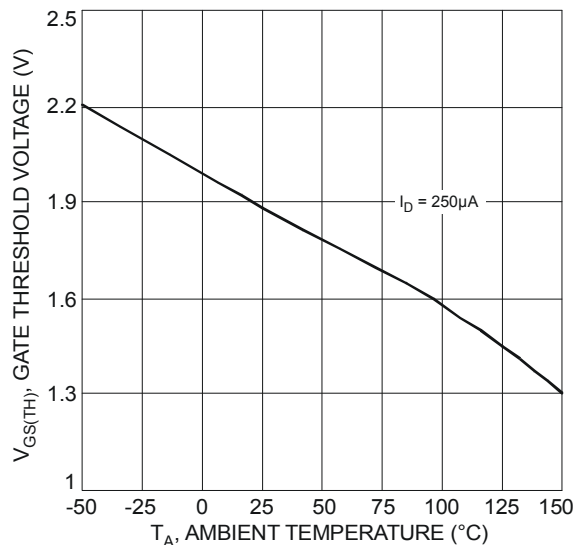


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

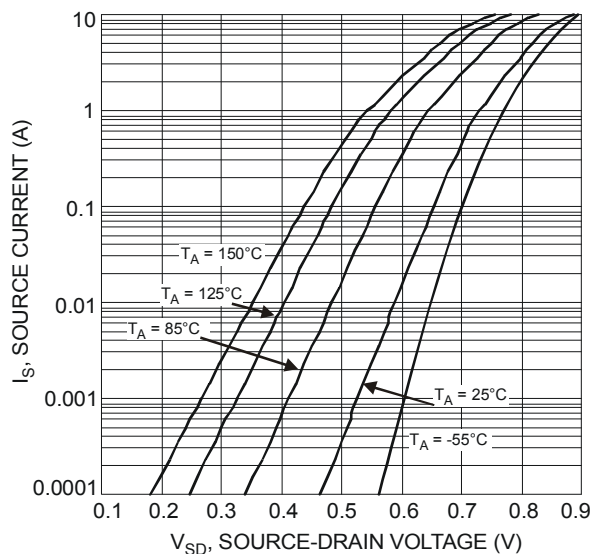


Fig. 9 Diode Forward Voltage vs. Current

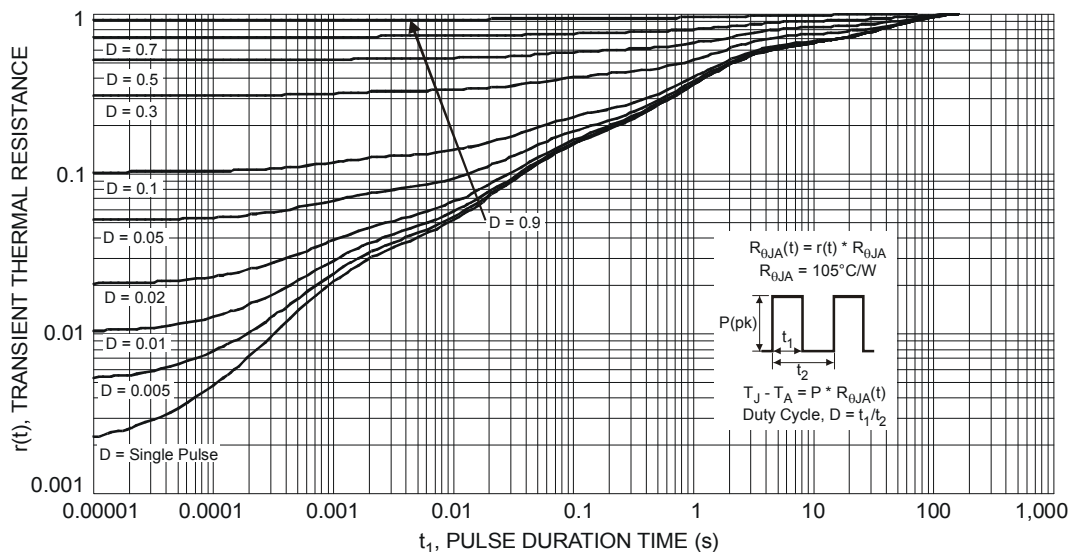
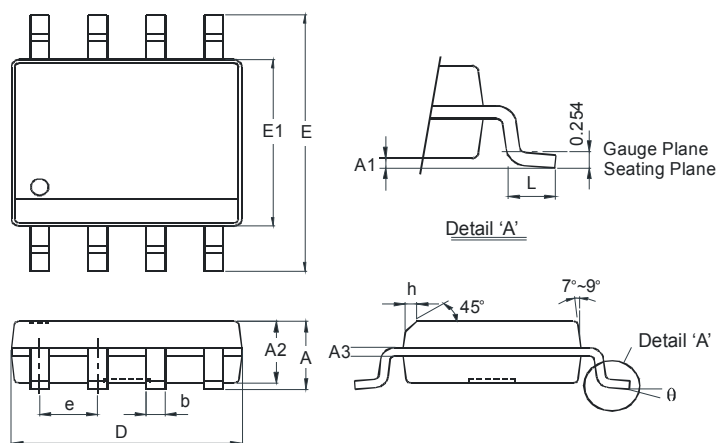


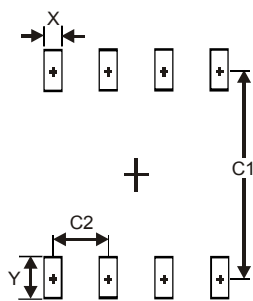
Fig. 10 Transient Thermal Response

Package Outline Dimensions



SO-8		
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