



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 $T_A = +25^\circ\text{C}$
-30V	45m Ω @ $V_{GS} = -10\text{V}$	-6.9A
	65m Ω @ $V_{GS} = -4.5\text{V}$	-5.1A

Description

This new generation 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

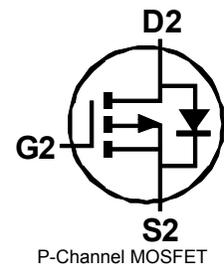
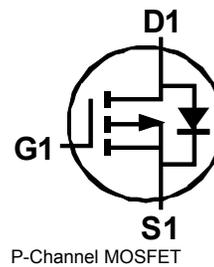
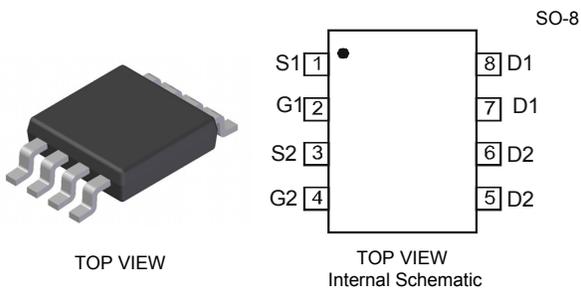
- Power Management Functions
- Backlighting
- DC-DC Converters

Features

- Dual P-Channel MOSFET
- Low On-Resistance
- 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
- Terminal Connections Indicator: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208 $\text{\textcircled{3}}$
- Weight: 0.072g (approximate)



Maximum Ratings (@ $T_A = +25^\circ\text{C}$, 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)	I_D	$T_A = +25^\circ\text{C}$	-6.9
Steady State		$T_A = +70^\circ\text{C}$	-5.8
Pulsed Drain Current (Note 6)	I_{DM}	-24	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	50	$^\circ\text{C/W}$
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}	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100 ± 800	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$ $V_{GS} = \pm 25V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-1.7	-2.1	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	45 65	m Ω	$V_{GS} = -10V, I_D = -6.0A$ $V_{GS} = -4.5V, I_D = -5.0A$
Forward Transconductance	g_{fs}	—	8	—	S	$V_{DS} = -10V, I_D = -5.3A$
Diode Forward Voltage (Note 7)	V_{SD}	-0.5	—	-1.2	V	$V_{GS} = 0V, I_S = -1.7A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	722	—	pF	$V_{DS} = -25V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	114	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	92	—	pF	
Gate Resistance	R_G	—	3.3	—	Ω	$V_{DS} = 0V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_G	—	6.8	—	nC	$V_{DS} = -15V, V_{GS} = -4.5V,$ $I_D = -6A$
	Q_G	—	13.7	—	nC	
Gate-Source Charge	Q_{GS}	—	1.6	—	nC	$V_{DS} = -15V, V_{GS} = -10V,$ $I_D = -6A$
Gate-Drain Charge	Q_{GD}	—	4.2	—	nC	
Turn-On Delay Time	$t_{d(on)}$	—	6.4	—	ns	$V_{DS} = -15V, V_{GS} = -10V,$ $I_D = -1A, R_G = 6.0\Omega$
Rise Time	t_r	—	5.3	—		
Turn-Off Delay Time	$t_{d(off)}$	—	26.5	—		
Fall Time	t_f	—	14.7	—		

- Notes:
- Device mounted on 2 oz. 1" x 1" Copper pads on 2" x 2" FR-4 PCB.
 - Pulse width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
 - Short duration pulse test used to minimize self-heating effect.

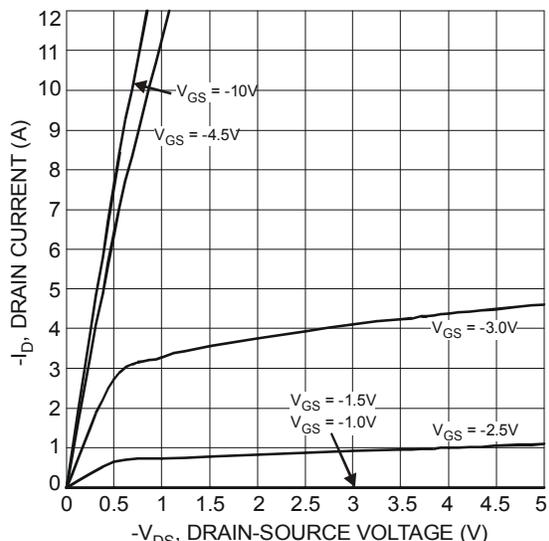


Fig. 1 Typical Output Characteristics

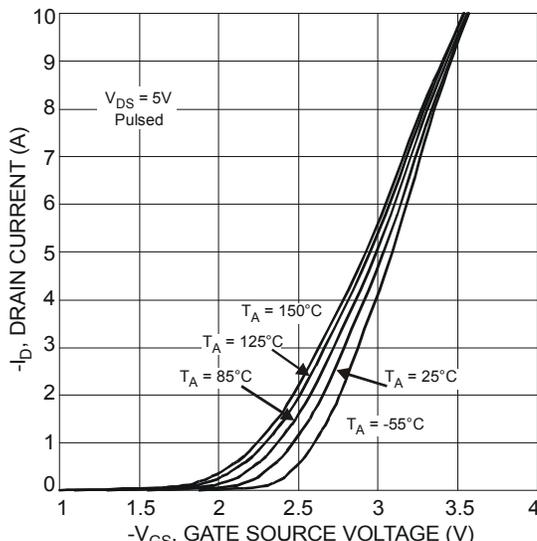


Fig. 2 Typical Transfer Characteristics

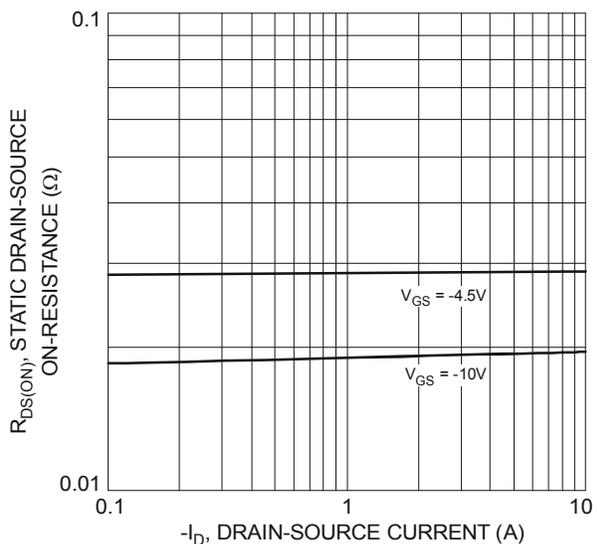


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

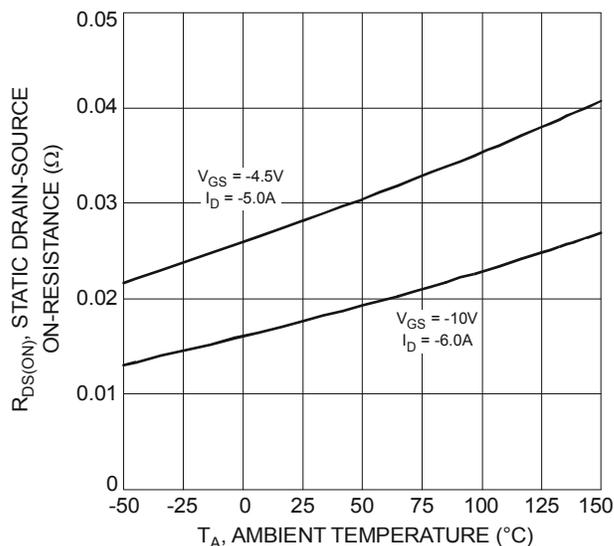


Fig. 4 Static Drain-Source On-Resistance vs. Ambient Temperature

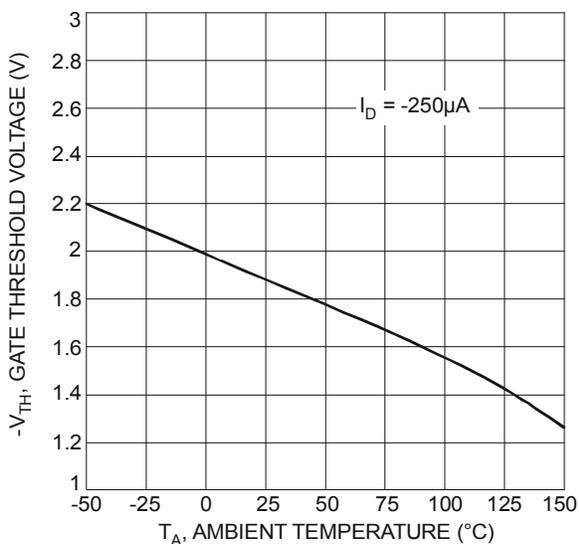


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

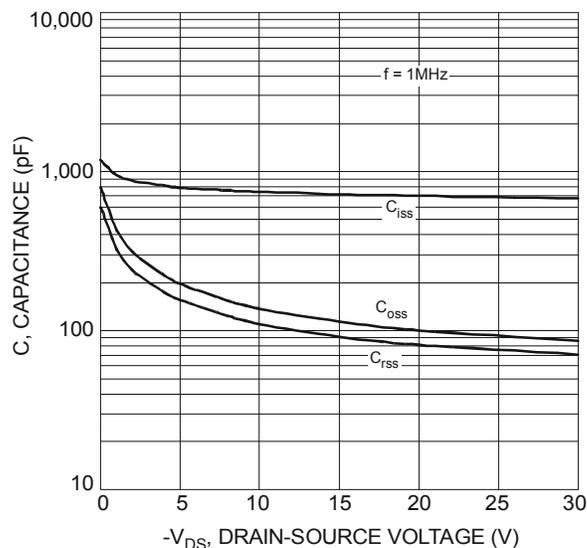


Fig. 6 Typical Total Capacitance

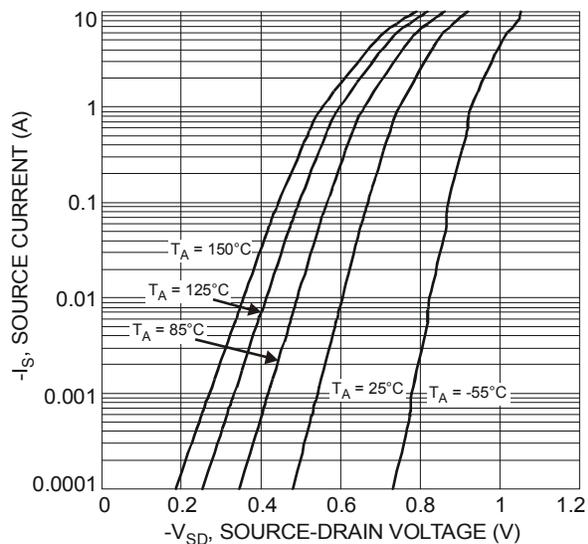
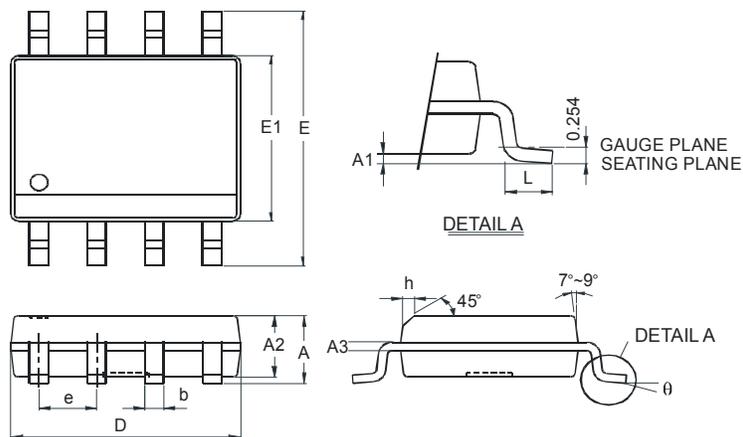


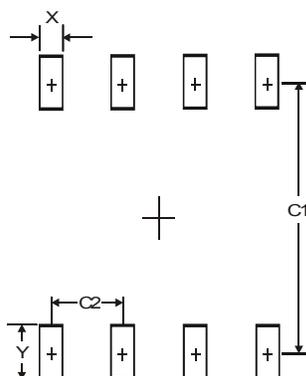
Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

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