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	14mΩ @ V_{GS} = -10V	-12.0A
	25mΩ @ V_{GS} = -4.5V	-8.5A

Description

This MOSFET is 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

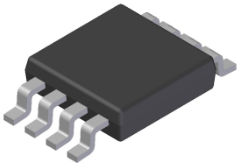
Features

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

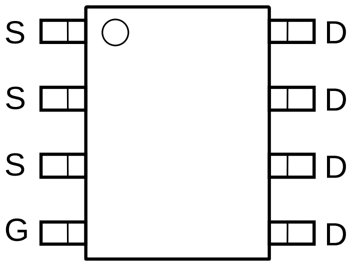
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.074g (Approximate)

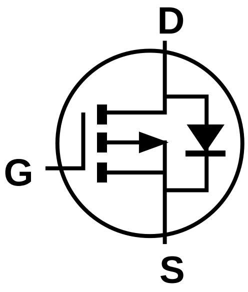
SO-8



Top View



Top View
Internal Schematic



Equivalent Circuit

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}	±25	V
Drain Current (Note 5)	Steady State	T_A = +25°C T_A = +70°C	I_D	-12 -9	A
Pulsed Drain Current (Note 6)			I_{DM}	-80	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
		—	—	±800		V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1	—	-2	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	— —	11.6 18.6	14 25	mΩ	V_{GS} = -10V, I_D = -8A V_{GS} = -4.5V, I_D = -5A
Forward Transconductance	g_{fs}	—	12	—	S	V_{DS} = -10V, I_D = -12A
Diode Forward Voltage (Note 7)	V_{SD}	-0.5	—	-1.1	V	V_{GS} = 0V, I_S = -2A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	1802	—	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	415	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	295	—	pF	
Gate Resistance	R_G	—	2.3	—	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_g	—	15.3 30.7	—	nC	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -8A V_{DS} = -15V, V_{GS} = -10V, I_D = -8A
Gate-Source Charge	Q_{gs}	—	3.5	—		V_{DS} = -15V, V_{GS} = -10V, I_D = -8A
Gate-Drain Charge	Q_{gd}	—	7.9	—		V_{DS} = -15V, V_{GS} = -10V, I_D = -8A
Turn-On Delay Time	$t_{D(ON)}$	—	5.1	—	ns	V_{GS} = -10V, V_{DS} = -15V, R_D = 15Ω, R_G = 6Ω
Rise Time	t_R	—	8	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	46	—		
Fall Time	t_F	—	30	—		

Notes:
5. Device mounted on 2 oz. copper pads on FR-4 PCB with $R_{\theta JA}$ = 50°C/W.
6. Pulse width ≤10μs, Duty Cycle ≤1%.
7. Short duration pulse test used to minimize self-heating effect.

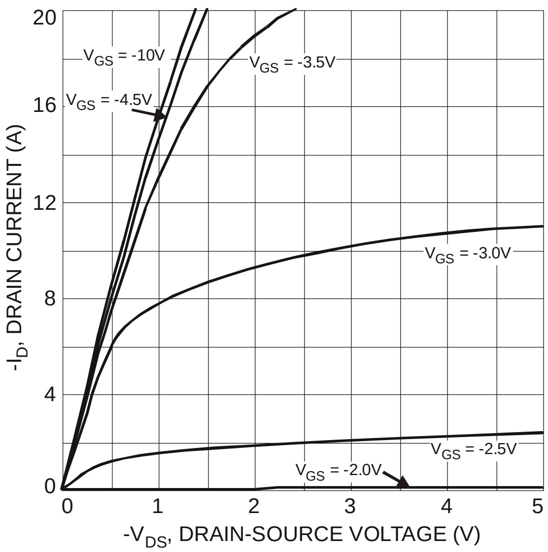


Fig. 1 Typical Output Characteristic

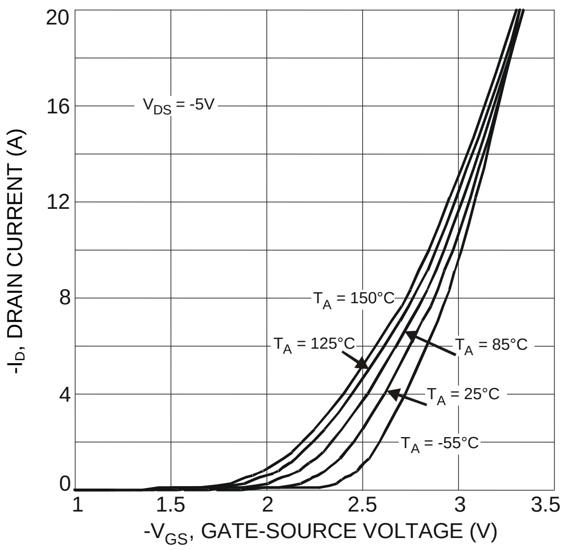


Fig. 2 Typical Transfer Characteristic

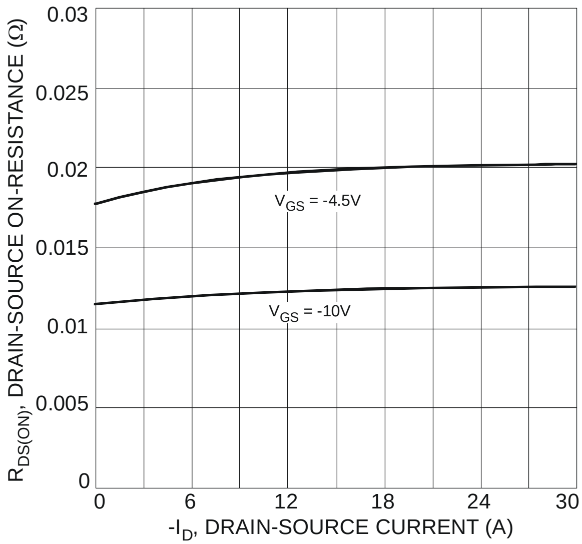


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

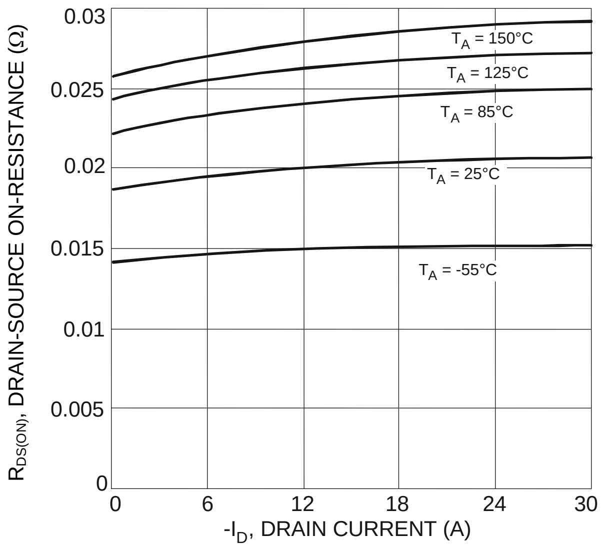


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

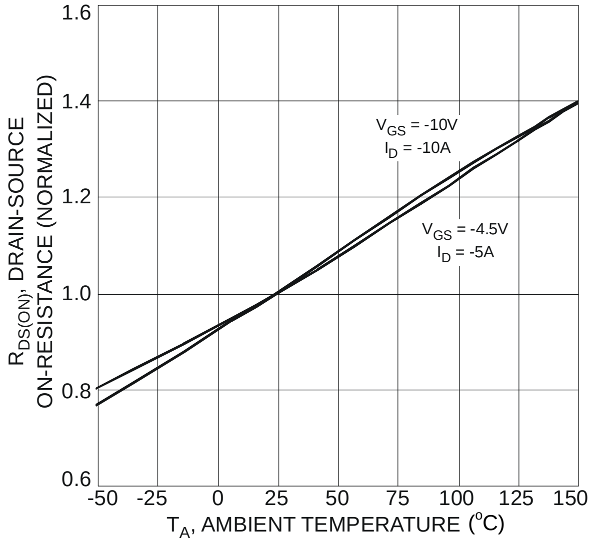


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

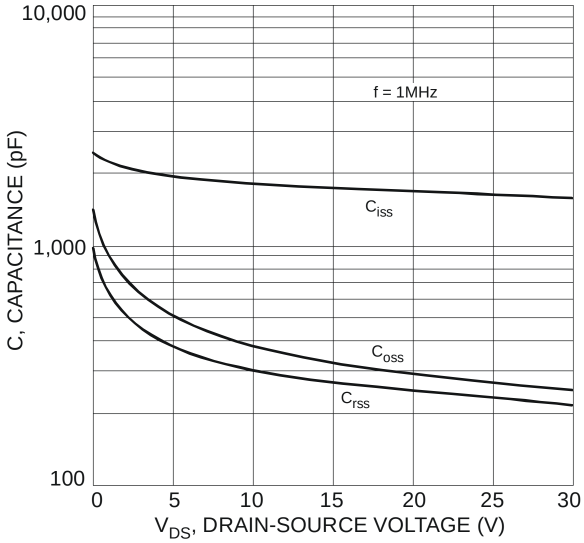


Fig. 6 Typical Total Capacitance

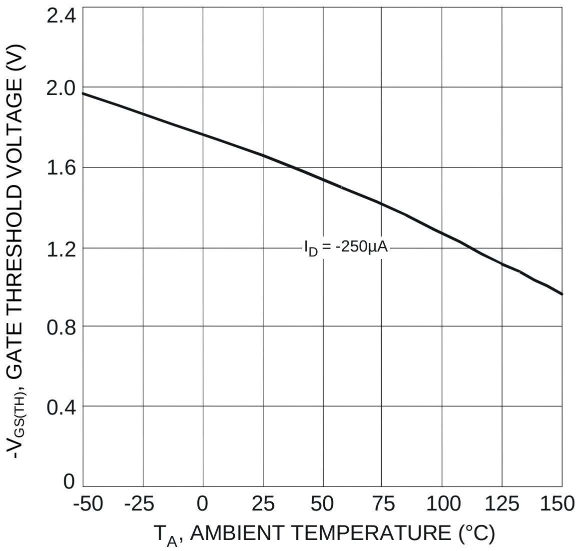


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

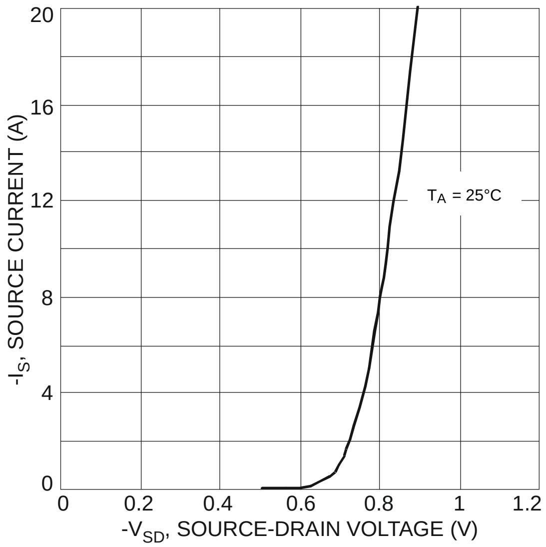


Fig. 8 Diode Forward Voltage vs. Current

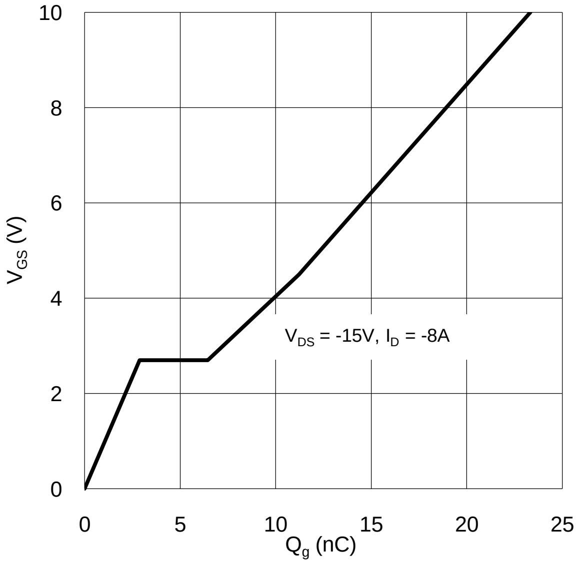


Fig. 9 Gate Charge

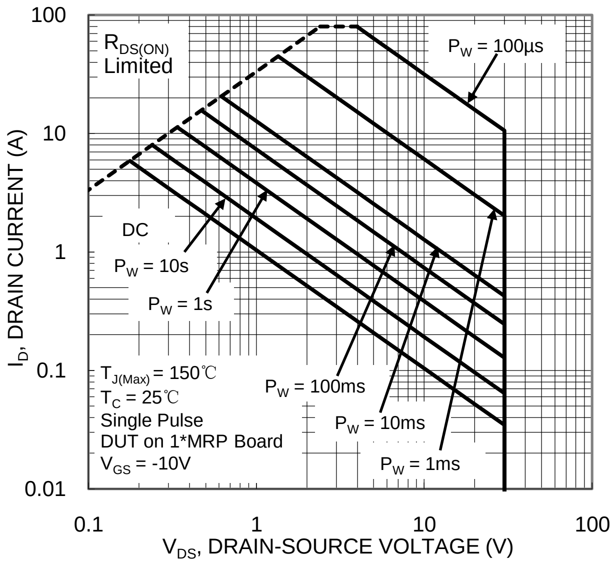


Fig. 10 SOA, Safe Operation Area

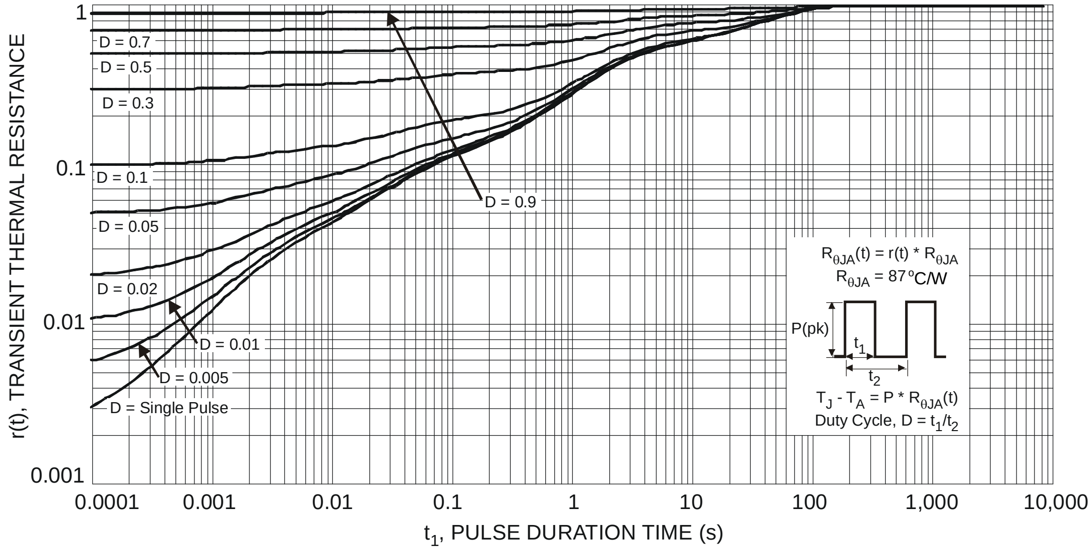
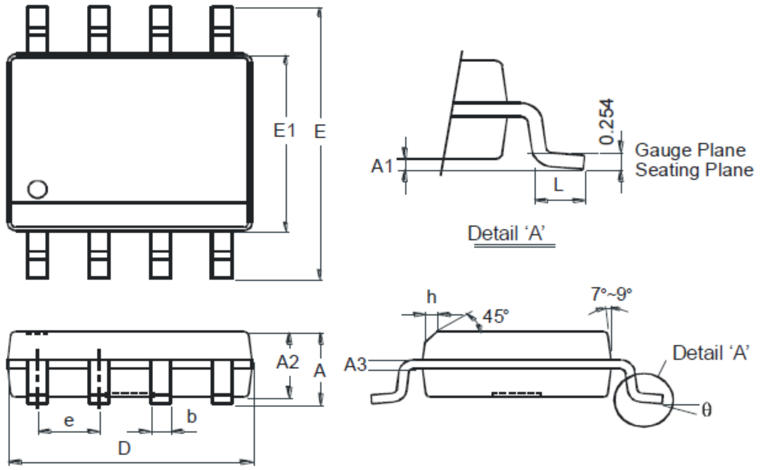


Fig. 11 Transient Thermal Response

Package Outline Dimensions

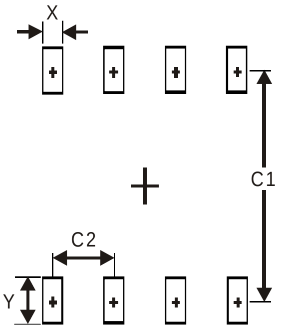
SO-8



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

SO-8



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