



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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企业微信二维码



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Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ Max	I_D max $T_A = 25^\circ\text{C}$ (Note 6)
100V	700m Ω @ $V_{GS} = 10\text{V}$	1.4A
	900m Ω @ $V_{GS} = 6\text{V}$	1.2A

Description and Applications

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.

- DC-DC Converters
- Power Management functions
- Motor control
- Disconnect switches

Features and Benefits

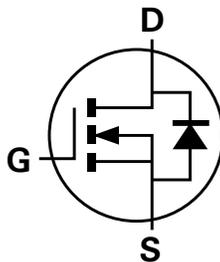
- Low On-Resistance
- Low Threshold
- Fast Switching Speed
- Low Gate Drive

Mechanical Data

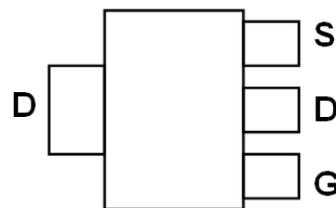
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (approximate)



Top View



Device symbol



Top View
Pin-Out

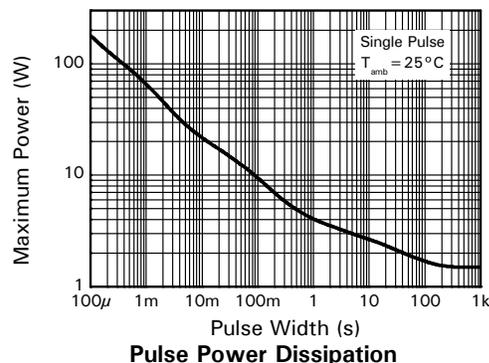
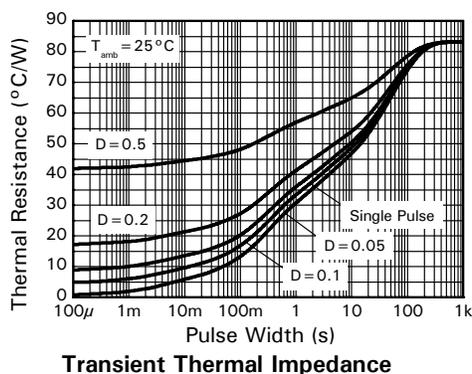
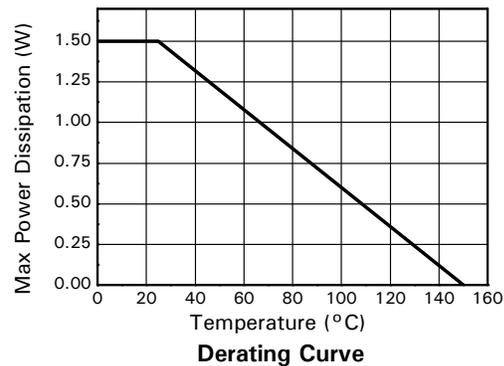
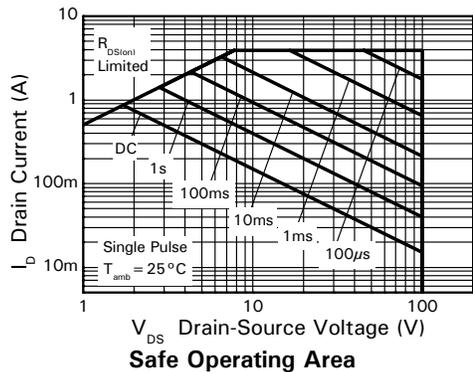
Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	Steady State	@ $V_{GS} = 10\text{V}$; $T_A = 25^\circ\text{C}$ (Note 6)	1.4	A
		@ $V_{GS} = 10\text{V}$; $T_A = 70^\circ\text{C}$ (Note 6)	1.1	
		@ $V_{GS} = 10\text{V}$; $T_A = 25^\circ\text{C}$ (Note 5)	1.0	
Pulsed Drain Current (Note 7)		I_{DM}	4.2	A
Continuous Source Current (Body Diode) (Note 6)		I_S	2.1	A
Pulsed Source Current (Body Diode) (Note 7)		I_{SM}	4.2	A

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P_D	1.5	W
Linear Derating Factor			12	mW/ $^\circ\text{C}$
Power Dissipation (Note 6)		P_D	2.6	W
Linear Derating Factor			21	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	83.3	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 6)		$R_{\theta JA}$	47.4	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 8)		$R_{\theta JL}$	6.36	$^\circ\text{C/W}$
Operating and Storage Temperature Range		T_L, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 - For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
 - Repetitive rating - 25mm x 25mm FR4 PCB, $D = 0.02$, pulse width 300 μs – pulse width limited by maximum junction temperature.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).

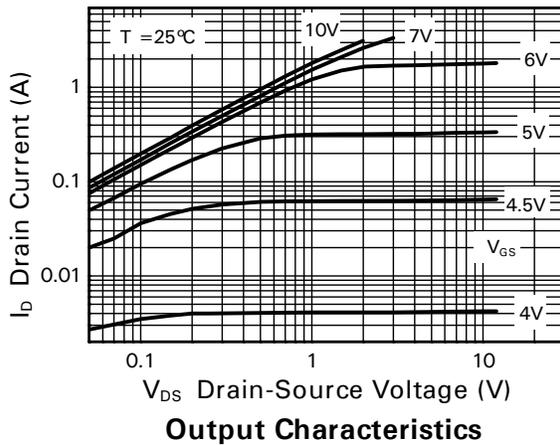
Thermal Characteristics


Electrical Characteristics @T_A = 25°C unless otherwise specified

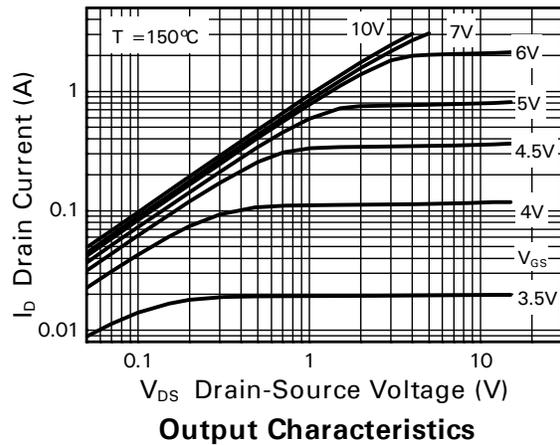
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	100	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	-	-	1.0	μA	V _{DS} = 100V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	2	-	4	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance (Note 9)	R _{DS(on)}	-	-	700	mΩ	V _{GS} = 10V, I _D = 1.5A
			-	900		V _{GS} = 6V, I _D = 1A
Forward Transconductance (Note 9 & 11)	g _{ES}	-	1.6	-	S	V _{DS} = 15V, I _D = 1A
Diodes Forward Voltage (Note 9)	V _{SD}	-	0.85	0.95	V	T _J = 25°C, I _S = 1.5A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 10 & 11)	C _{iss}	-	138	-	pF	V _{DS} = 50V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance (Note 10 & 11)	C _{oss}	-	12	-	pF	
Reverse Transfer Capacitance (Note 10 & 11)	C _{rss}	-	6	-	pF	
Gate Resistance (Note 10 & 11)	R _g	1.8	-	2.6	Ω	f = 1MHz, V _{GS} = 0V, V _{DS} = 0V
Total Gate Charge (Note 10 & 11)	Q _g	-	2.9	-	nC	V _{GS} = 10V, V _{DS} = 50V, I _D = 1A
Gate-Source Charge (Note 10 & 11)	Q _{gs}	-	0.7	-	nC	
Gate-Drain Charge (Note 10 & 11)	Q _{gd}	-	1	-	nC	
Reverse Recovery Time (Note 11)	t _{rr}	-	27	-	ns	T _J = 25°C, I _F = 1A, di/dt = 100A/μs
Reverse Recovery Charge (Note 11)	Q _{rr}	-	12	-	nC	
Turn-On Delay Time (Note 10 & 11)	t _{D(on)}	-	1.8	-	ns	V _{GS} = 10V, V _{DD} = 50V, R _G = 6Ω, I _D = 1A
Turn-On Rise Time (Note 10 & 11)	t _r	-	1.5	-	ns	
Turn-Off Delay Time (Note 10 & 11)	t _{D(off)}	-	4.1	-	ns	
Turn-Off Fall Time (Note 10 & 11)	t _f	-	2.1	-	ns	

- Notes:
9. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 10. Switching characteristics are independent of operating junction temperature.
 11. For design aid only, not subject to production testing.

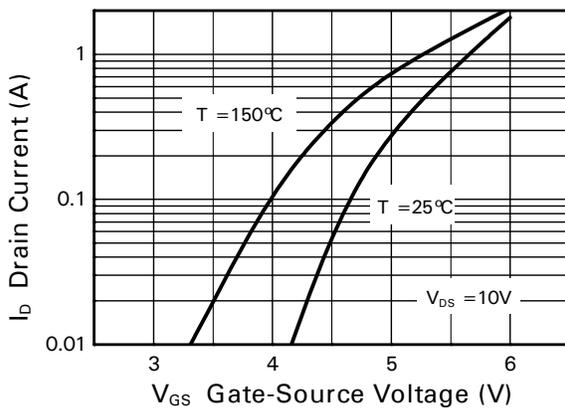
Typical Characteristics



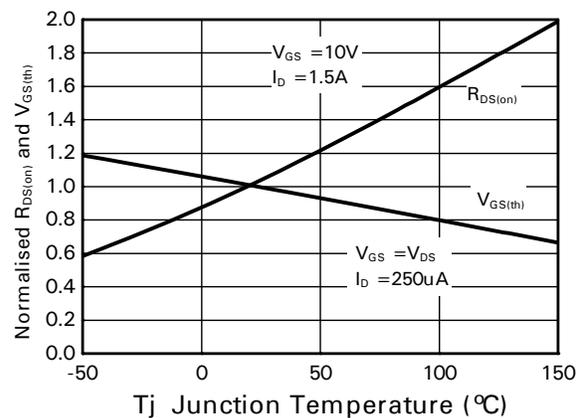
Output Characteristics



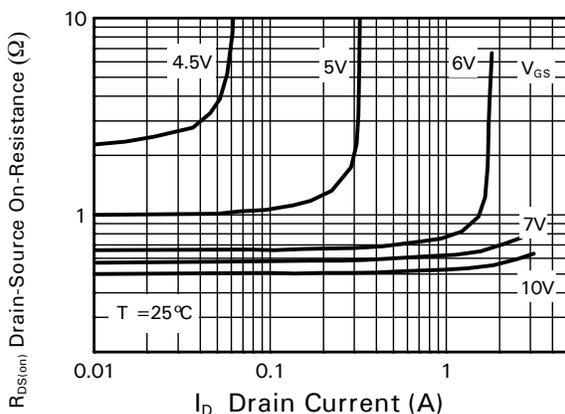
Output Characteristics



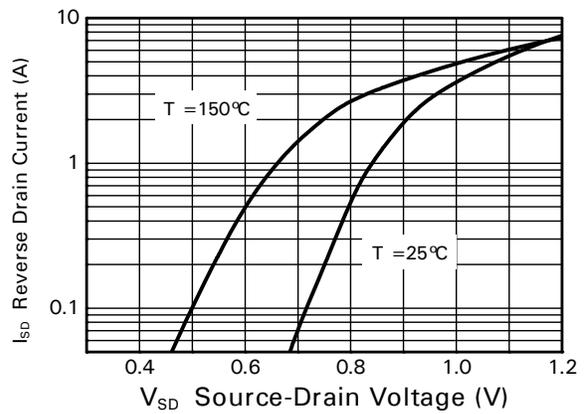
Typical Transfer Characteristics



Normalised Curves v Temperature

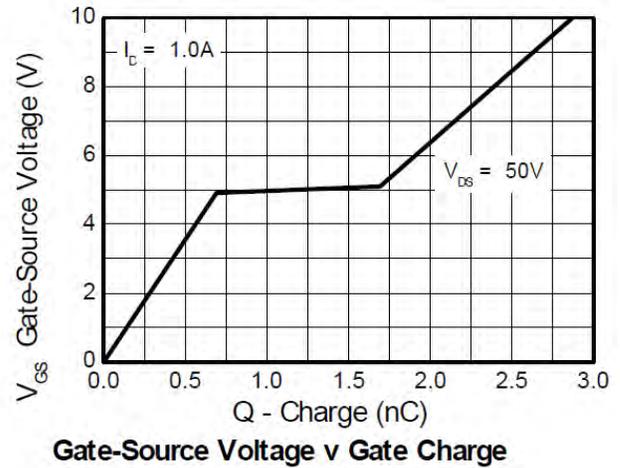
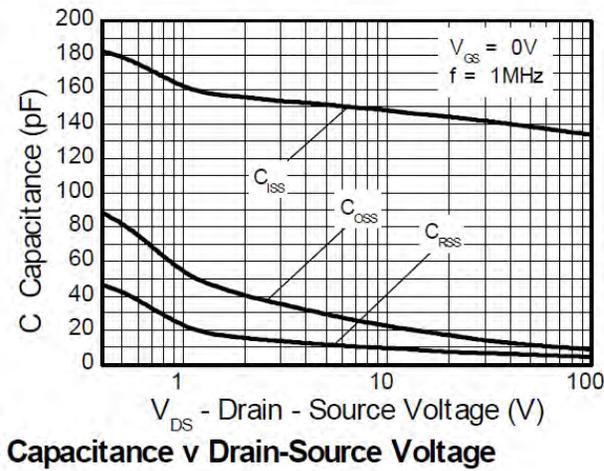


On-Resistance v Drain Current

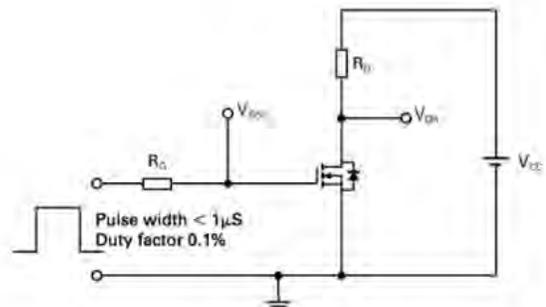
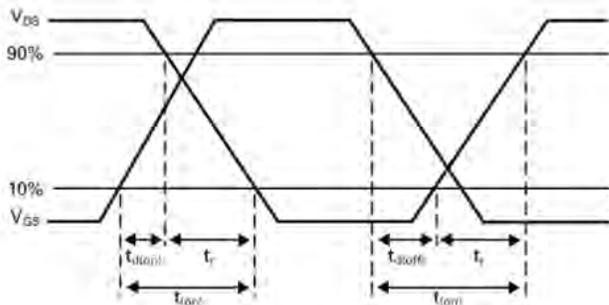
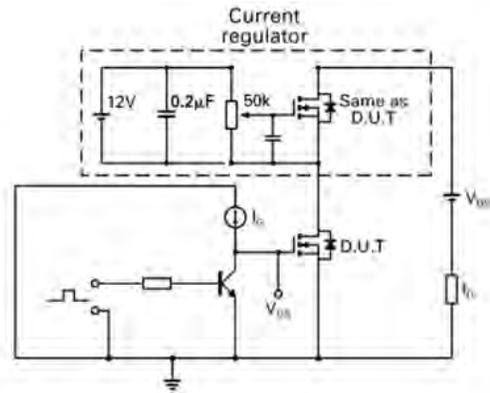
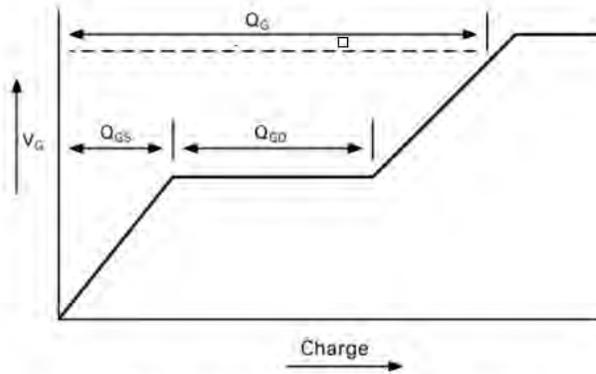


Source-Drain Diode Forward Voltage

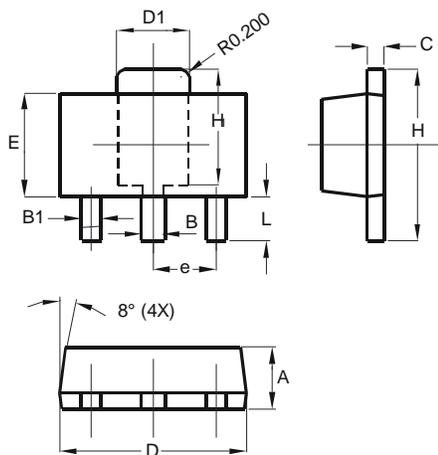
Typical Characteristics - Continued



Test Circuits

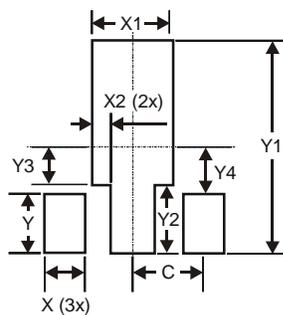


Package Outline Dimensions



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500