



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



企业QQ二维码

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> MAX T <sub>A</sub> = +25°C
60V	120mΩ @ V <sub>GS</sub> = 10V	3.2A
	180mΩ @ V <sub>GS</sub> = 4.5V	2.6A

## Features and Benefits

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

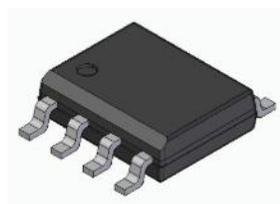
## Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

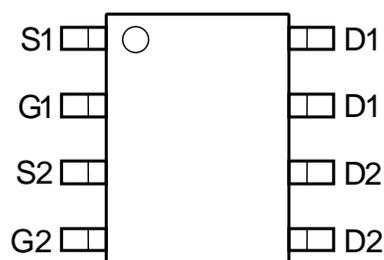
- DC-DC Converters
- Power Management Functions
- Motor Control

## Mechanical Data

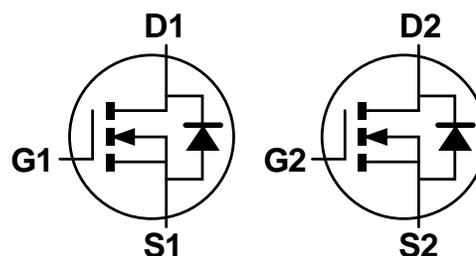
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.074 grams (Approximate)



Top View



Top View  
Pin Configuration



Equivalent Circuit

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (V <sub>GS</sub> = 10V)	Steady State t < 10s	T <sub>A</sub> = +25°C (Note 6)	I <sub>D</sub>	3.2	A
		T <sub>A</sub> = +70°C (Note 6)		2.6	
		T <sub>A</sub> = +25°C (Note 5)		2.5	
Maximum Body Diode Forward Current (Note 6)			I <sub>S</sub>	3.1	A
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	13.7	A
Pulsed Body Diode Forward Current (Note 7)			I <sub>SM</sub>	13.7	A

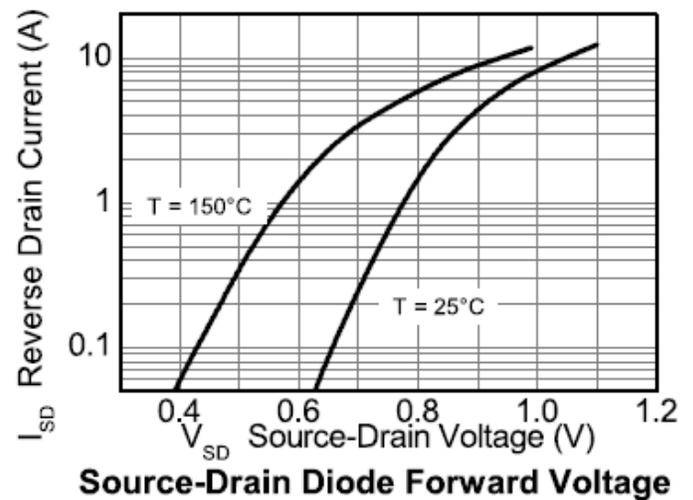
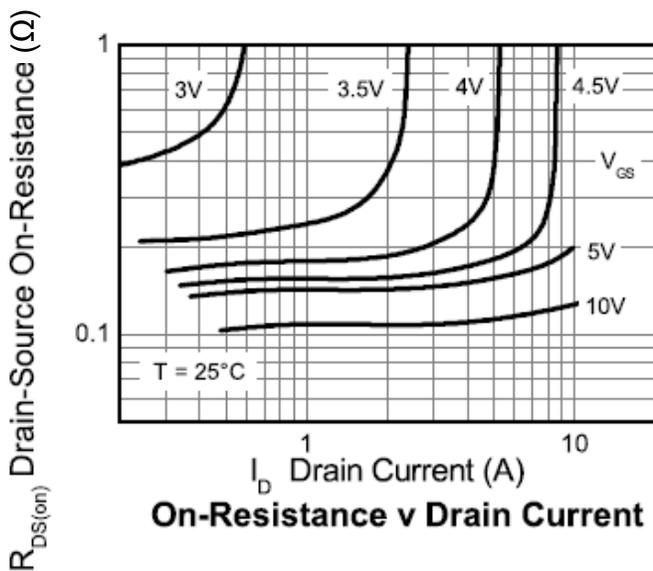
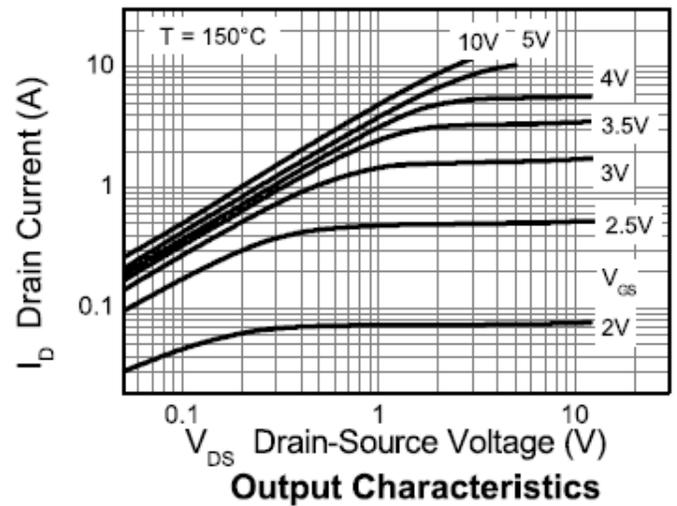
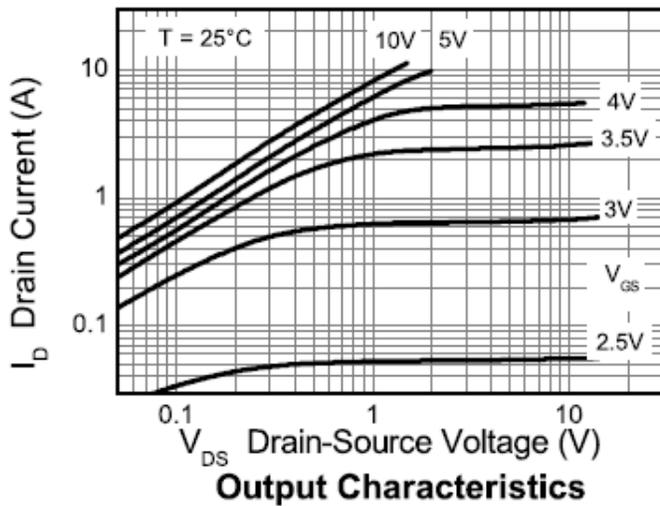
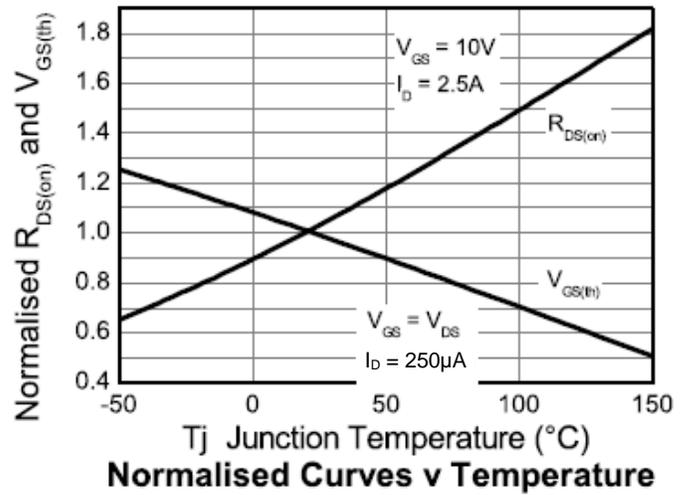
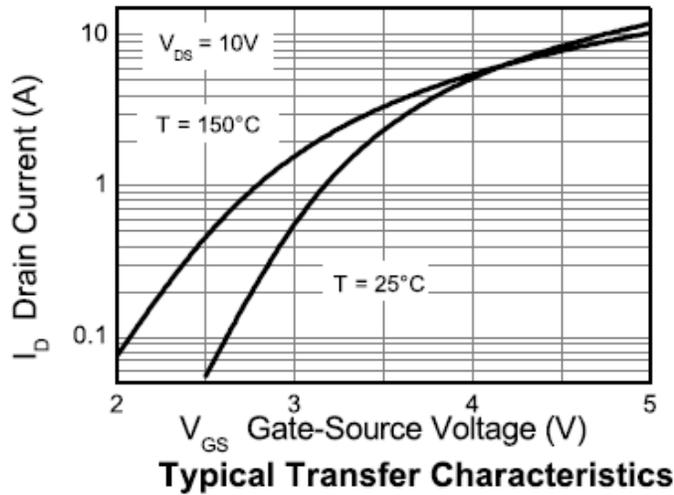
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

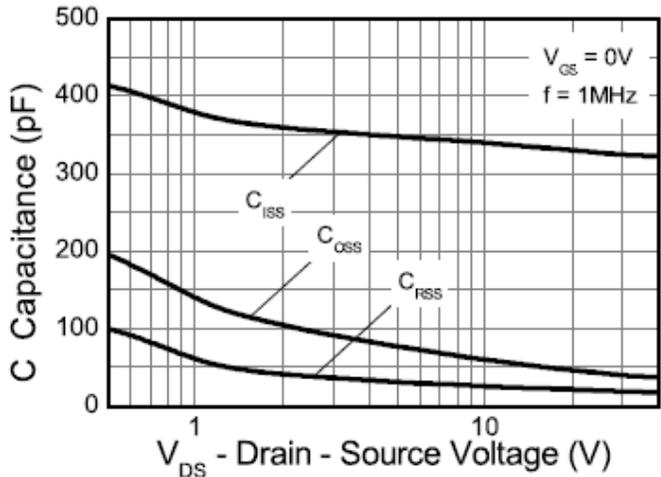
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5 & Note 8)	P <sub>D</sub>	1.25	W
Thermal Resistance, Junction to Ambient (Note 5 & Note 8)	R <sub>θJA</sub>	100	°C/W
Total Power Dissipation (Note 5 & Note 9)	P <sub>D</sub>	1.8	W
Thermal Resistance, Junction to Ambient (Note 5 & Note 9)	R <sub>θJA</sub>	70	°C/W
Total Power Dissipation (Note 6 & Note 8)	P <sub>D</sub>	2.1	W
Thermal Resistance, Junction to Ambient (Note 6 & Note 8)	R <sub>θJA</sub>	60	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

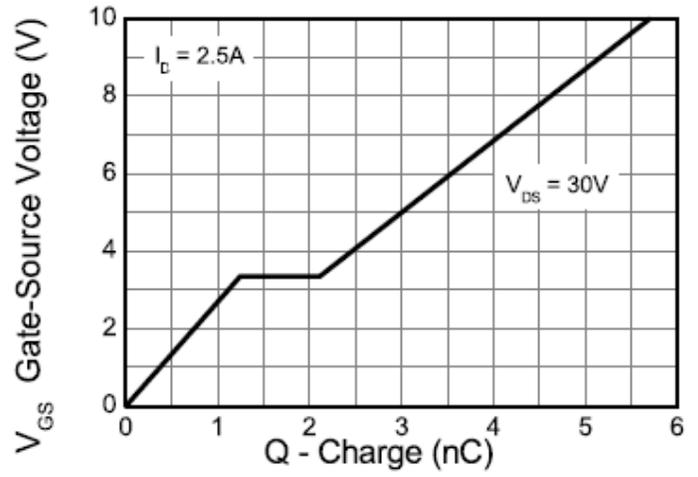
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 10)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 10)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1	—	—	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	120	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A
		—	—	180		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2A
Forward Transconductance	g <sub>fs</sub>	—	4.9	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 2.5A
Diode Forward Voltage	V <sub>SD</sub>	—	0.85	0.95	V	T <sub>J</sub> = +25°C, V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.8A
<b>DYNAMIC CHARACTERISTICS</b> (Note 11)						
Input Capacitance	C <sub>iss</sub>	—	330	—	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	35.2	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	17.1	—		
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	5.7	—	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 2.5A
Total Gate Charge (V <sub>GS</sub> = 5V)	Q <sub>g</sub>	—	3	—		
Gate-Source Charge	Q <sub>gs</sub>	—	1.25	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	0.86	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	1.95	—	ns	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 30V, R <sub>g</sub> = 6Ω, I <sub>D</sub> = 2.5A
Turn-On Rise Time	t <sub>R</sub>	—	3.5	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	8.2	—		
Turn-Off Fall Time	t <sub>F</sub>	—	4.6	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	21.5	—	ns	T <sub>J</sub> = +25°C, I <sub>S</sub> = 2.5A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	20.5	—	nC	T <sub>J</sub> = +25°C, I <sub>S</sub> = 2.5A, di/dt = 100A/μs

- 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.
  - Repetitive rating - 25mm x 25mm FR4 PCB, D=0.02, pulse width 300μs - pulse width limited by maximum junction temperature.
  - For a dual device with one active die.
  - For a device with two active dice running at equal power.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

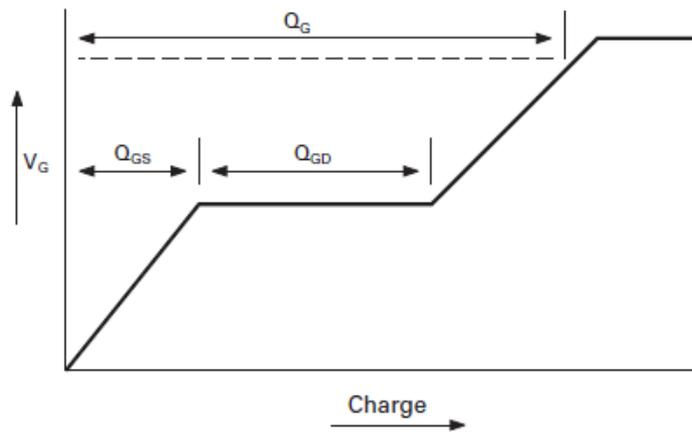




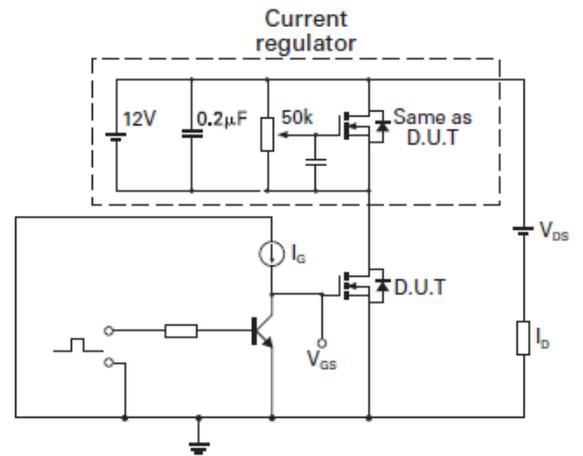
Capacitance v Drain-Source Voltage



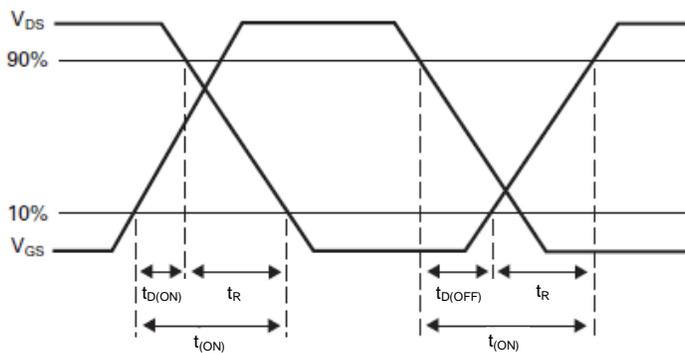
Gate-Source Voltage v Gate Charge



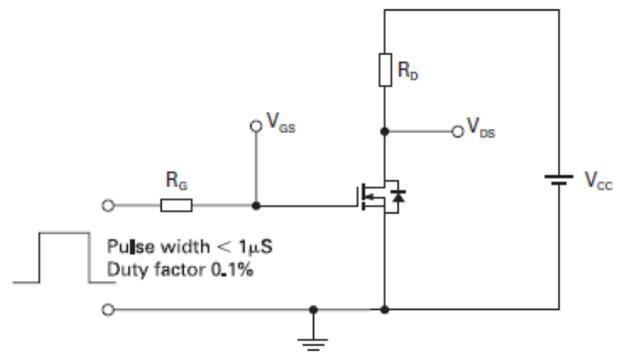
Basic gate charge waveform



Gate charge test circuit



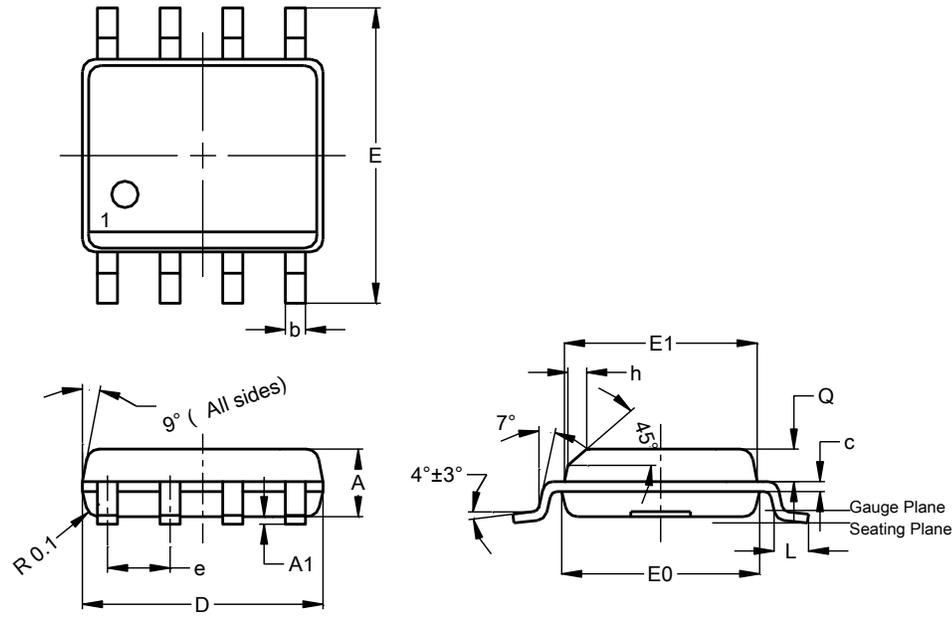
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

SO-8

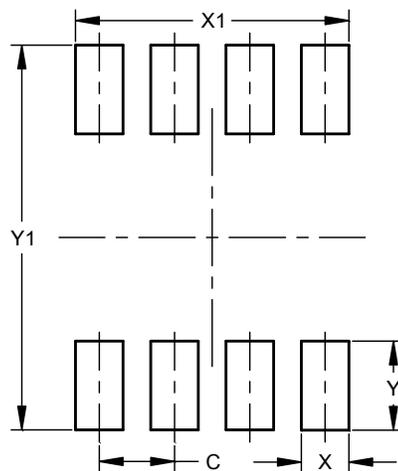


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65

All Dimensions in mm

Suggested Pad Layout

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50