



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 $T_A = +25^\circ\text{C}$
100V	125m Ω @ $V_{GS} = 10V$	4.0A
	150m Ω @ $V_{GS} = 6.0V$	3.7A

Features and Benefits

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

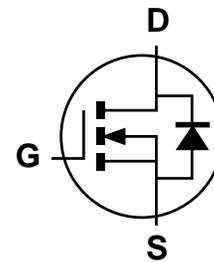
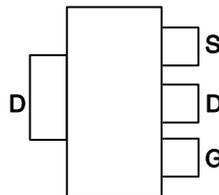
Description and Applications

This new generation 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.

- DC motor control
- DC-AC inverters

Mechanical Data

- Package: SOT223 (Type DN)
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 
- Weight: 0.112 grams (Approximate)



Equivalent Circuit

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

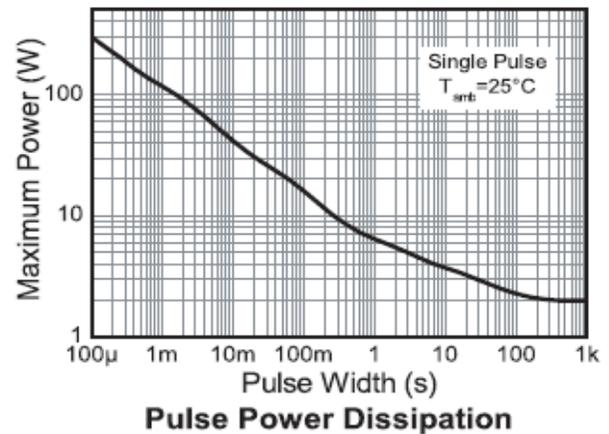
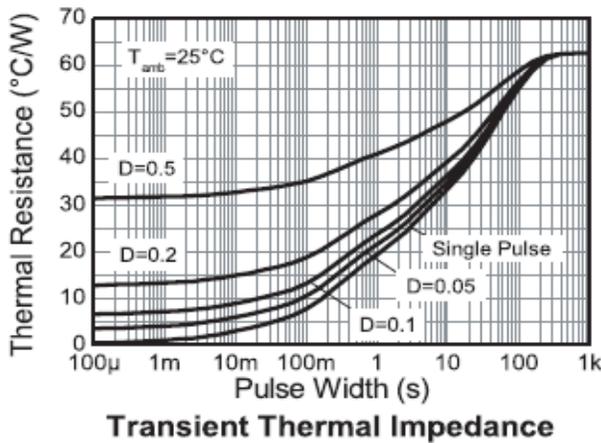
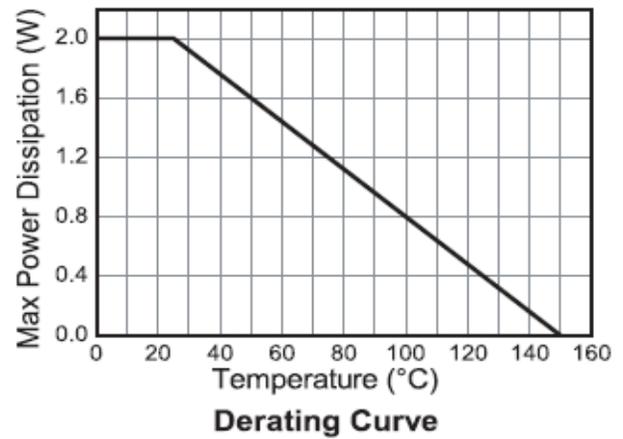
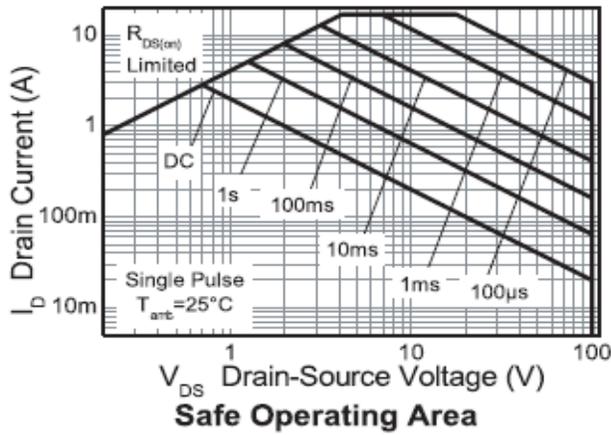
Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current, $V_{GS} = 10\text{V}$, $t \leq 10$ sec	I_D	$T_A = +25^\circ\text{C}$	4.0
		$T_A = +70^\circ\text{C}$	3.2
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	I_D	2.9	A
Maximum Continuous Body Diode Forward Current (Note 5)	I_S	2.9	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)	I_{DM}	17	A
Pulsed Source Current (10 μs pulse, duty cycle = 1%)	I_{SM}	17	A

Thermal Resistance (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5), $T_A = +25^\circ\text{C}$ Linear Derating Factor	P_D	2.0	W
		16	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 5), $T_A = +25^\circ\text{C}$, $t \leq 10$ seconds Linear Derating Factor	P_D	3.9	W
		31	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient, $t \leq 10$ seconds (Note 5)	$R_{\theta JA}$	32	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Note: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1-inch square copper plate

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

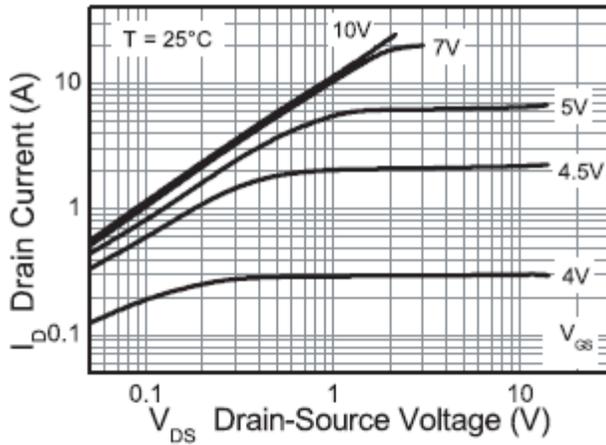


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

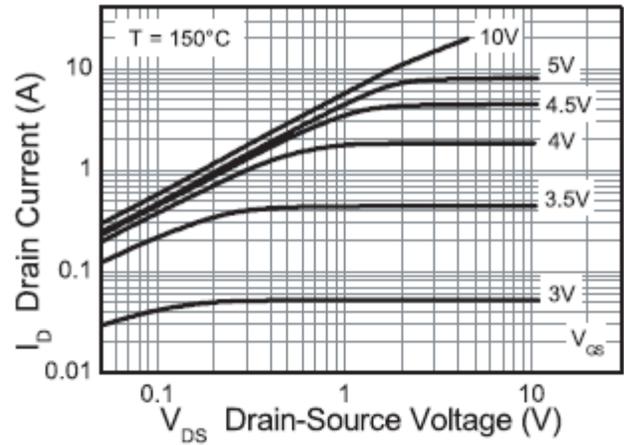
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	$V_{DS} = 100V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	125	m Ω	$V_{GS} = 10V, I_D = 2.9A$
		—	—	150		$V_{GS} = 6.0V, I_D = 2.6A$
Forward Transfer Admittance	$ Y_{fs} $	—	7.3	—	S	$V_{DS} = 15V, I_D = 2.9A$
Diode Forward Voltage	V_{SD}	—	0.85	0.95	V	$V_{GS} = 0V, I_S = 4.0A$
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	859	—	pF	$V_{DS} = 50V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	C_{oss}	—	57	—		
Reverse Transfer Capacitance	C_{rss}	—	33	—		
Total Gate Charge	Q_g	—	9.6	—	nC	$V_{DS} = 50V, V_{GS} = 5.0V, I_D = 2.9A$
Total Gate Charge	Q_g	—	17	—	nC	$V_{DS} = 50V, V_{GS} = 10V, I_D = 2.9A$
Gate-Source Charge	Q_{gs}	—	3.8	—		
Gate-Drain Charge	Q_{gd}	—	5.4	—		
Turn-On Delay Time	$t_{D(on)}$	—	4.9	—	ns	$V_{DS} = 50V, V_{GS} = 10V,$ $I_D = 1.0A, R_G = 6.0\Omega$
Turn-On Rise Time	t_r	—	3.7	—		
Turn-Off Delay Time	$t_{D(off)}$	—	18	—		
Turn-Off Fall Time	t_f	—	9.4	—		
Body Diode Reverse Recovery Time	t_{rr}	—	40.5	—	ns	$V_{GS} = 0V, I_S = 2.9A,$
Body Diode Reverse Recovery Charge	Q_{rr}	—	62	—	nC	$di/dt = 100A/\mu s$

Notes: 6. Short duration pulse test used to minimize self-heating effect.
 7. Guaranteed by design. Not subject to production testing.

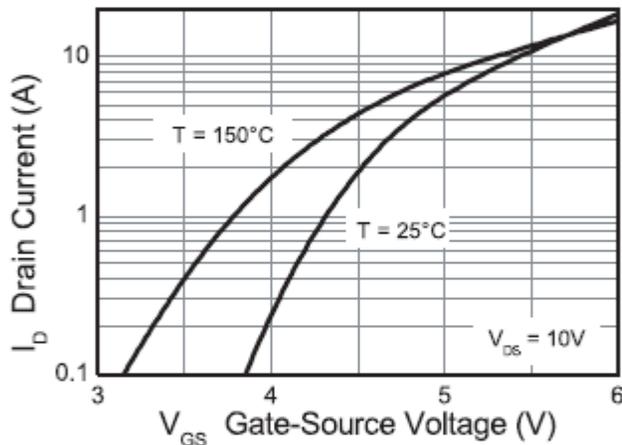
Typical Characteristics



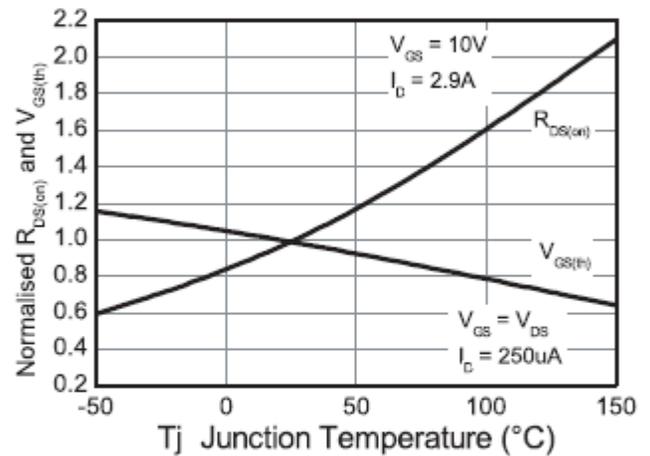
Output Characteristics



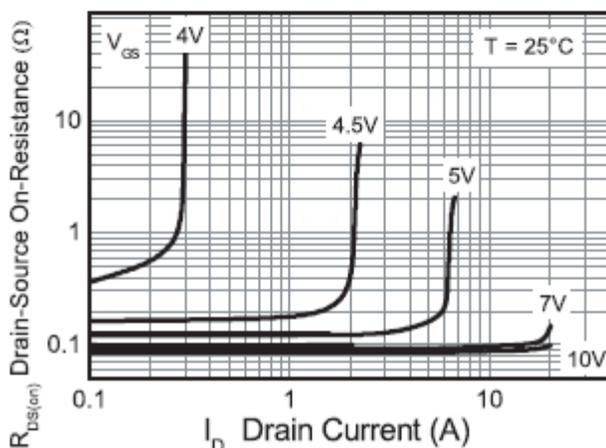
Output Characteristics



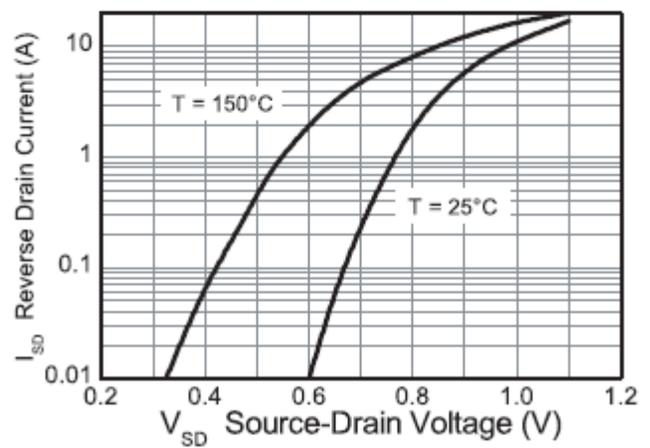
Typical Transfer Characteristics



Normalised Curves v Temperature

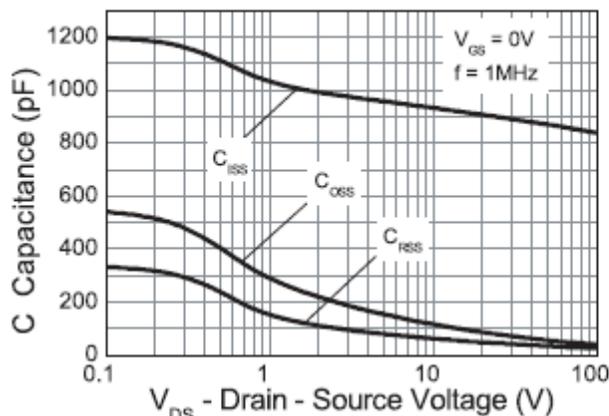


On-Resistance v Drain Current

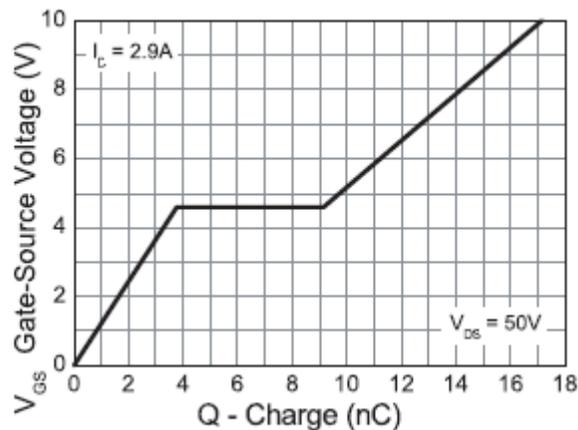


Source-Drain Diode Forward Voltage

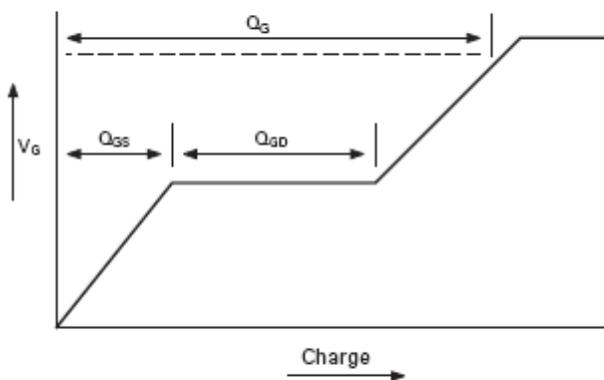
Typical Characteristics



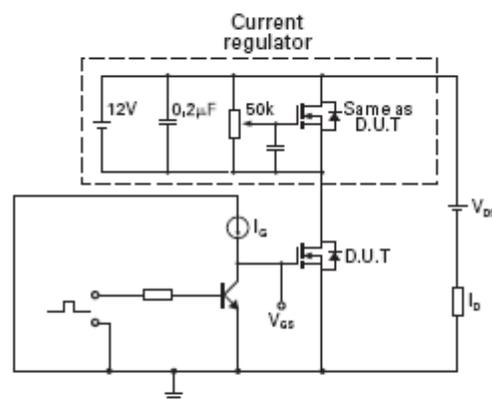
Capacitance v Drain-Source Voltage



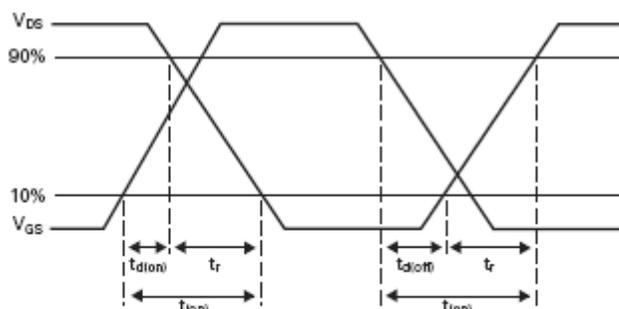
Gate-Source Voltage v Gate Charge



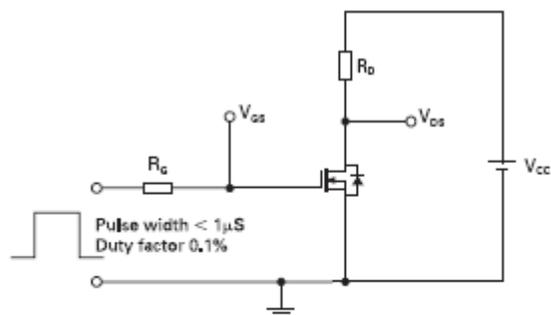
Basic gate charge waveform



Gate charge test circuit



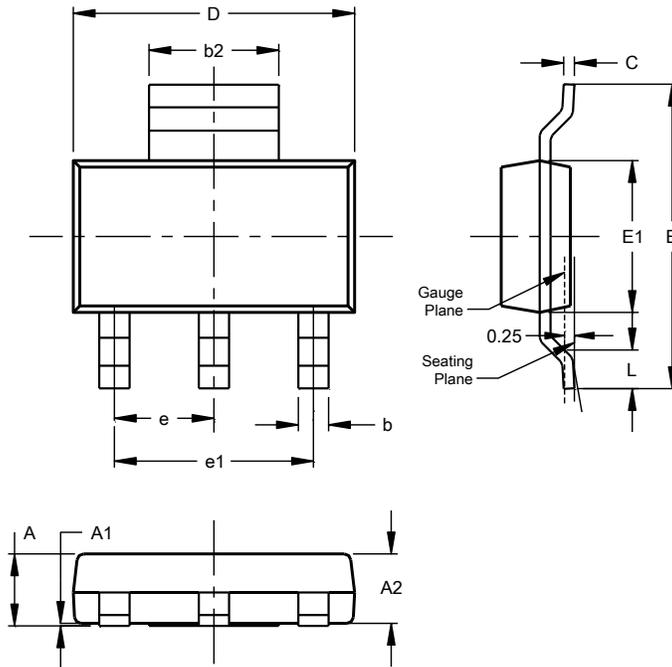
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

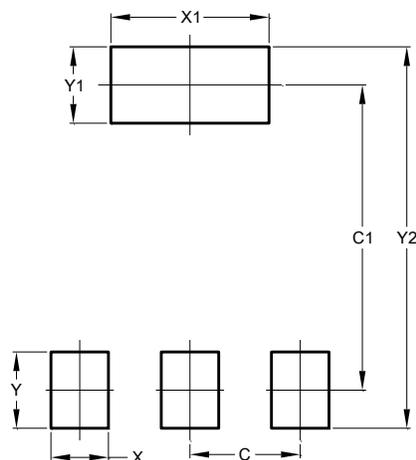
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00