



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
30V	26.5m Ω @ $V_{GS} = 10V$	5.8A
	32m Ω @ $V_{GS} = 4.5V$	5.0A

Features and Benefits


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

Description and Applications

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.

- Battery charging
- Power management functions
- DC-DC converters
- Portable power adaptors

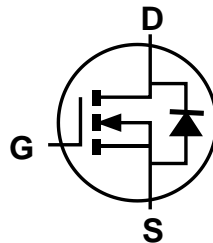
Mechanical Data

- Package: SOT23 (Standard)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Annealed over Copper Lead-Frame. Solderable per MIL-STD-202, Method 208 
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)

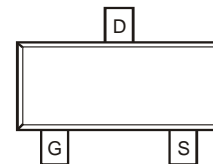
SOT23 (Standard)



Top View



Internal Schematic



Top View

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}	± 12	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	I_D	5.8	A
		$T_A = +70^\circ\text{C}$		4.0	
Maximum Body Diode Forward Current (Note 6)			I_S	1.5	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	30	A

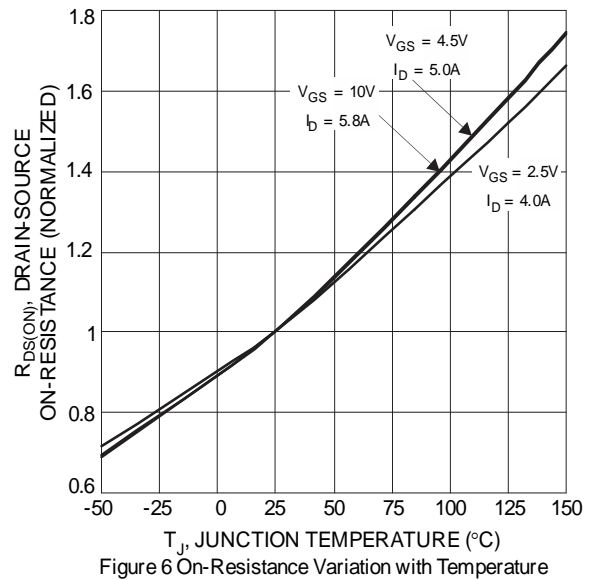
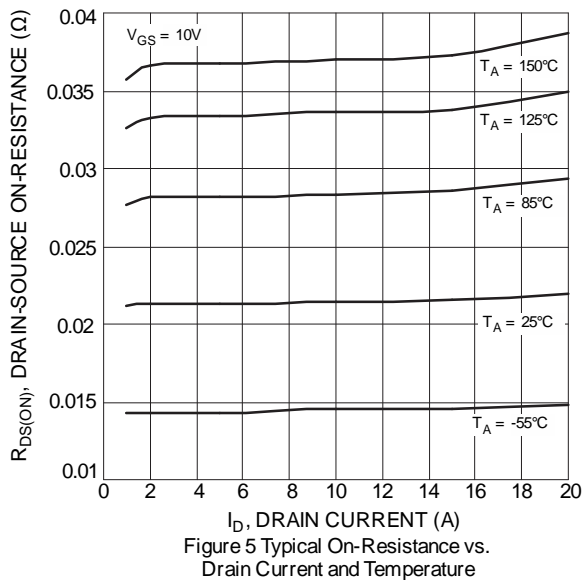
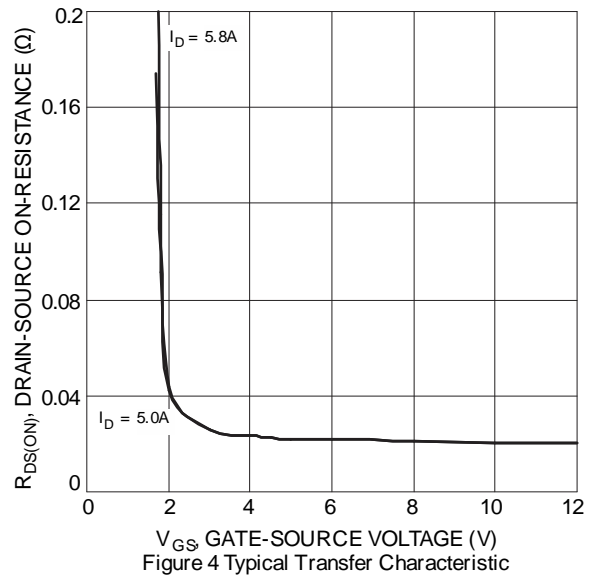
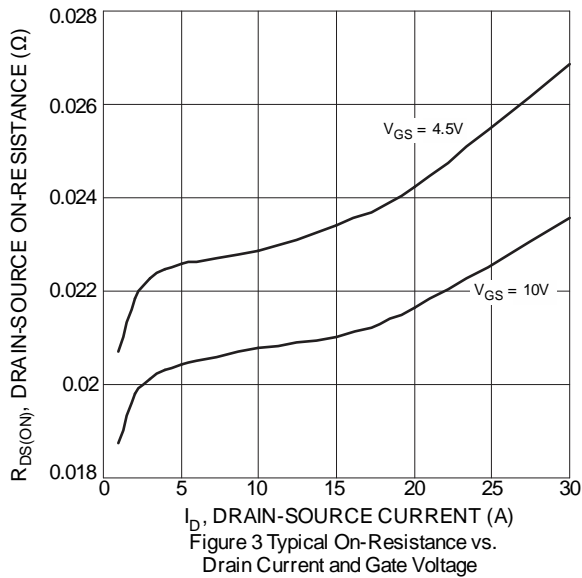
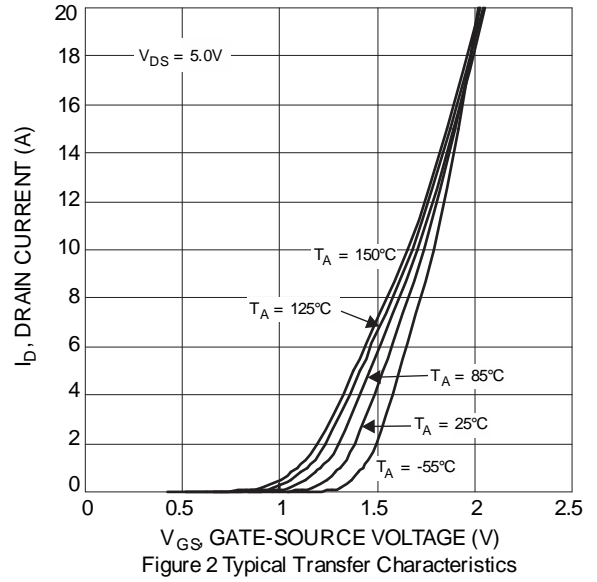
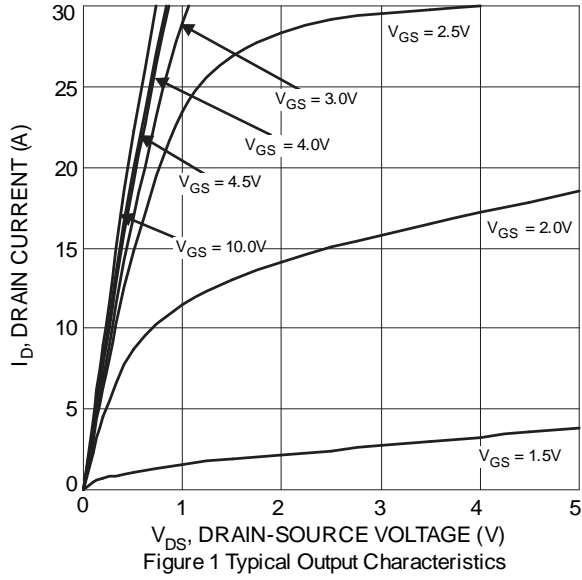
Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P_D	0.72	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	171	$^\circ\text{C/W}$
Power Dissipation (Note 6)		P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	93	$^\circ\text{C/W}$
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	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.6	—	1.4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	21	26.5	m Ω	$V_{GS} = 10V, I_D = 5.8A$
		—	23	32		$V_{GS} = 4.5V, I_D = 5.0A$
		—	29	48		$V_{GS} = 2.5V, I_D = 4.0A$
		—	—	—		$V_{GS} = 2.5V, I_D = 4.0A$
Diode Forward Voltage	V_{SD}	—	0.7	1.2	V	$V_{GS} = 0V, I_S = 1A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	570	860	pF	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	C_{oss}	—	63	95		
Reverse Transfer Capacitance	C_{rss}	—	53	80		
Gate Resistance	R_G	—	3.2	4.5	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge ($V_{GS} = 10V$)	Q_g	—	13.3	20	nC	$V_{DS} = 15V, I_D = 6.9A$
Total Gate Charge ($V_{GS} = 4.5V$)	Q_g	—	6.1	8		
Gate-Source Charge	Q_{gs}	—	1.0	1.5		
Gate-Drain Charge	Q_{gd}	—	1.6	2.5		
Turn-On Delay Time	$t_{D(on)}$	—	1.5	2.4	nS	$V_{GS} = 10V, V_{DD} = 15V, R_G = 3\Omega,$ $I_D = 6.9A$
Turn-On Rise Time	t_r	—	3.3	5		
Turn-Off Delay Time	$t_{D(off)}$	—	13.9	22		
Turn-Off Fall Time	t_f	—	4.9	7		
Body Diode Reverse Recovery Time	t_{rr}	—	7.8	12	nS	$I_S = 5A, dI/dt = 100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	—	1.9	3	nC	$I_S = 5A, dI/dt = 100A/\mu s$

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.



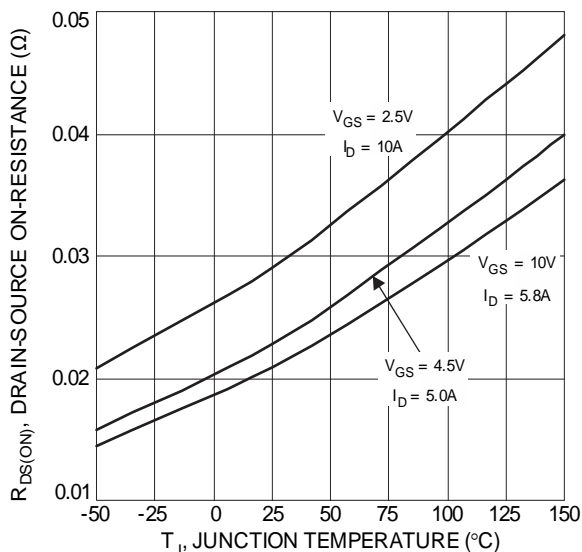


Figure 7 On-Resistance Variation with Temperature

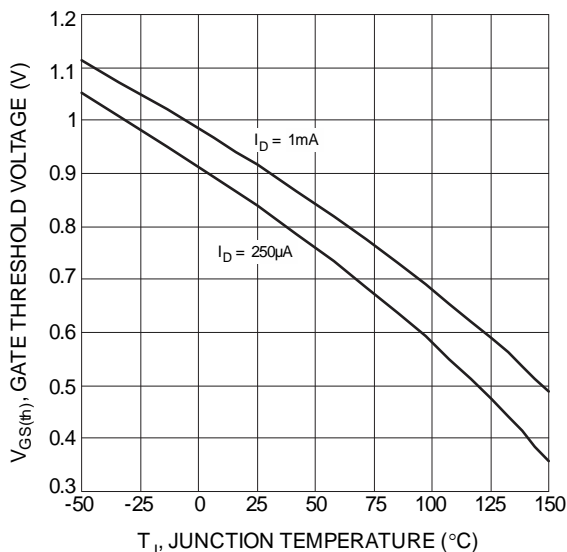


Figure 8 Gate Threshold Variation vs. Ambient Temperature

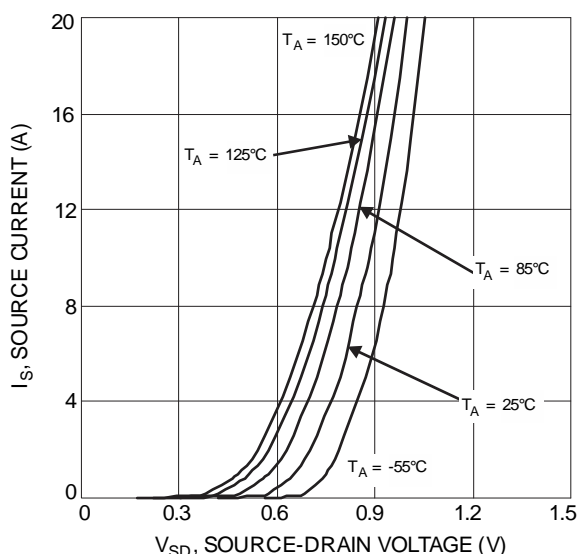


Figure 9 Diode Forward Voltage vs. Current

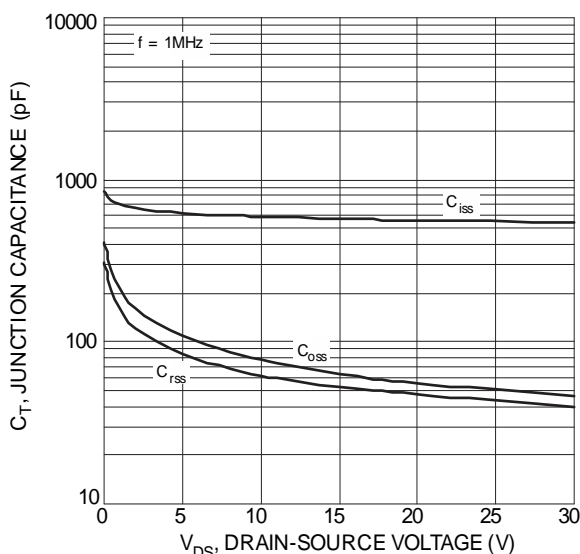


Figure 10 Typical Junction Capacitance

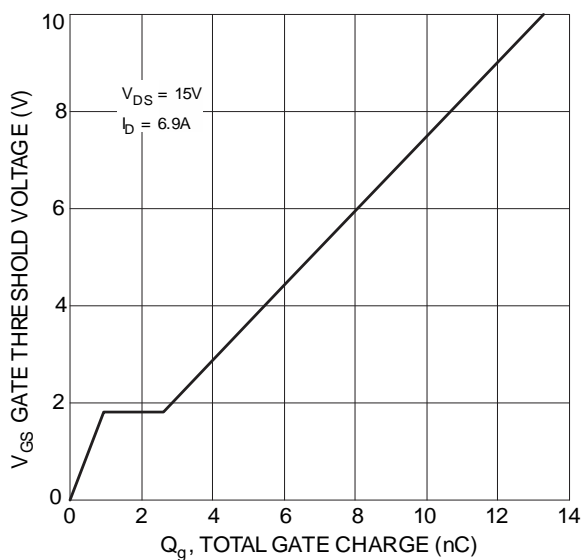


Figure 11 Gate Charge

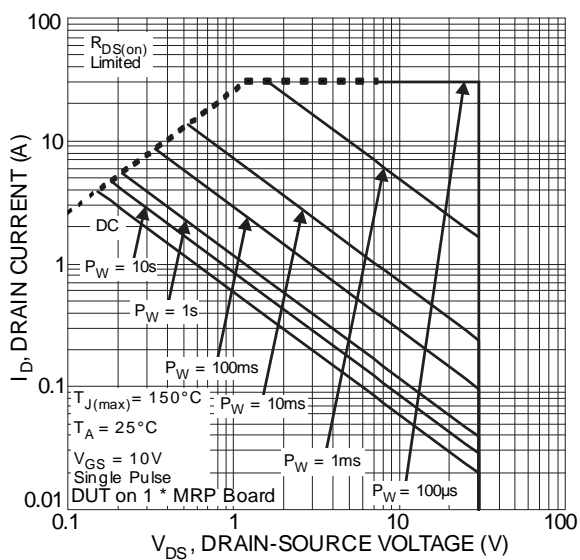
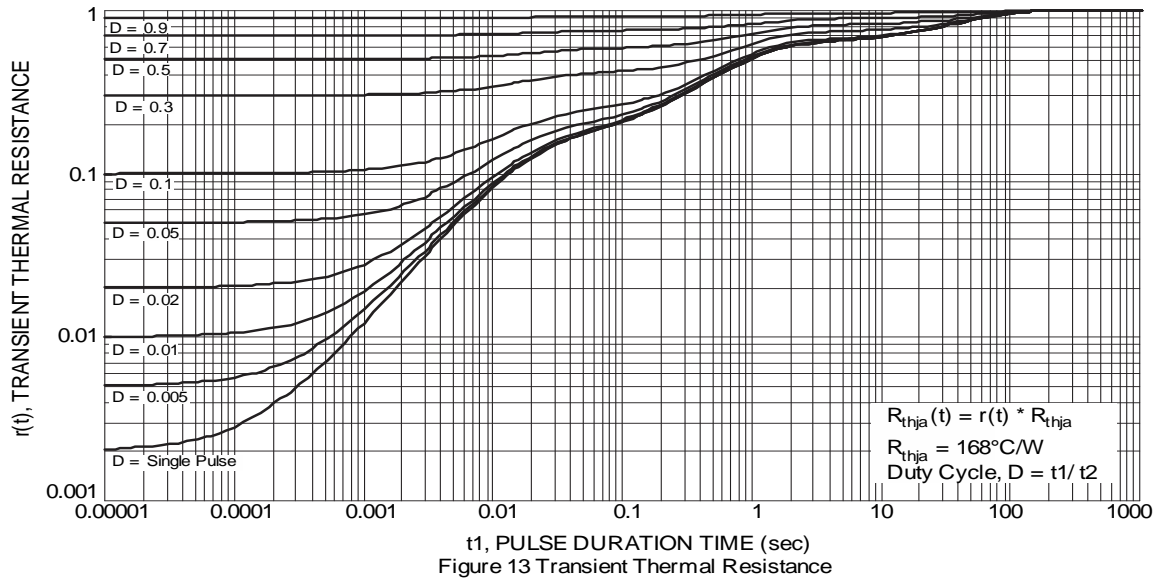
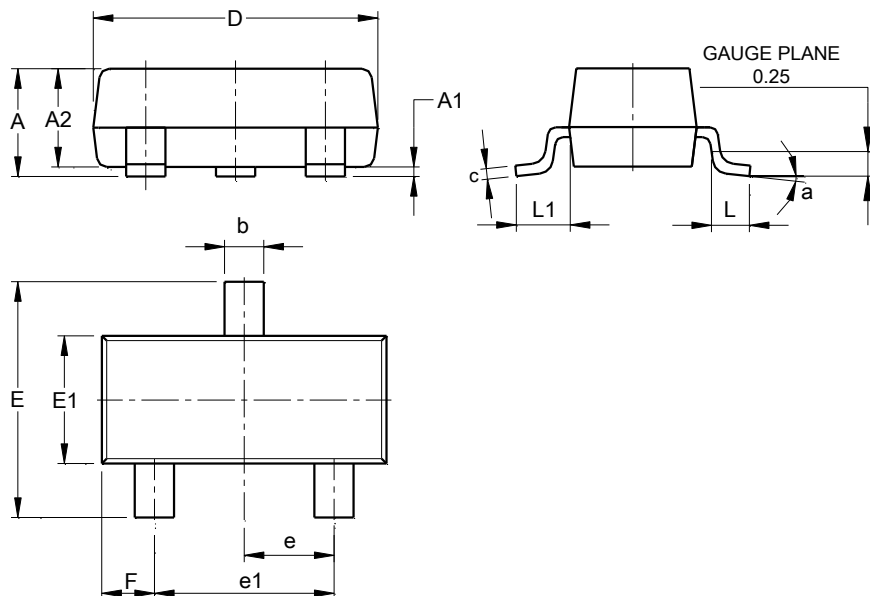


Figure 12 SOA, Safe Operation Area



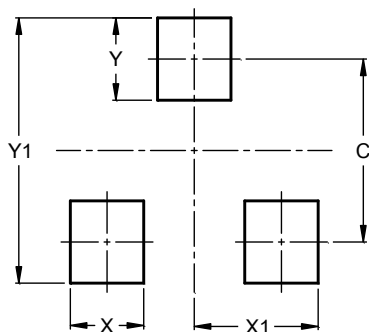
Package Outline Dimensions

SOT23 (Standard)



SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9