



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

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ\text{C}$
30V	52m Ω @ $V_{GS} = 10\text{V}$	4A
	65m Ω @ $V_{GS} = 4.5\text{V}$	3A
	85m Ω @ $V_{GS} = 2.5\text{V}$	2A

Features

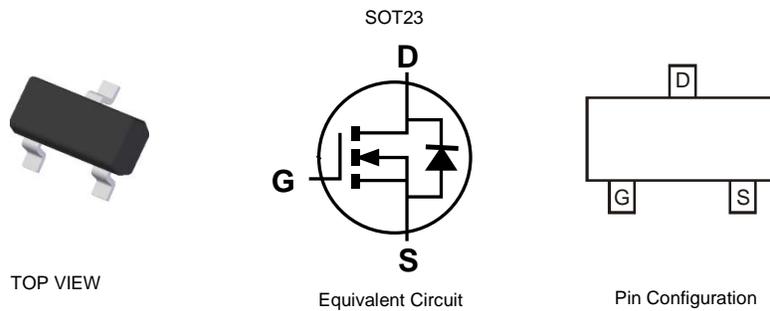
- Low On-Resistance:
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

Applications

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays

Mechanical Data

- Case: SOT23
- Case 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 leadframe.
Solderable per MIL-STD-202, Method 208 **e3**
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)



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

Characteristic	Symbol	Value	Unit
Drain Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current (Note 5)	I_D	4.0	A
Body-Diode Continuous Current (Note 5)	I_S	1.5	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	1.4	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 5)	$R_{\theta JA}$	90	$^\circ\text{C/W}$
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 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Body Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	0.6	—	1.4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	52	m Ω	$V_{GS} = 10V, I_D = 4A$
		—	—	65		$V_{GS} = 4.5V, I_D = 3A$
		—	—	85		$V_{GS} = 2.5V, I_D = 2A$
Forward Transconductance	$ Y_{fs} $	—	6.6	—	S	$V_{DS} = 5V, I_D = 3.1A$
Source-Drain Diode Forward Voltage	V_{SD}	—	—	1.16	V	$V_{GS} = 0V, I_S = 2.0A$
DYNAMIC CHARACTERISTICS (Note 7)						
Gate Resistance	R_g	—	2.2	—	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$
Total Gate Charge (10V)	Q_g	—	11.7	—	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 4A$
Total Gate Charge (4.5V)	$Q_{g4.5V}$	—	5.5	—	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 4A$
Gate-Source Charge	Q_{gs}	—	1.1	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.8	—	nC	$V_{DD} = 15V, V_{GEN} = 10V, R_{GEN} = 3\Omega, R_L = 3.75\Omega$
Turn-On Delay Time	$t_{D(on)}$	—	1.9	—	ns	
Turn-On Rise Time	t_r	—	1.6	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	10.3	—	ns	
Turn-Off Fall Time	t_f	—	2.0	—	ns	
Input Capacitance	C_{iss}	—	464	—	pF	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	49.5	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	43.8	—	pF	

- Notes:
- Device mounted on FR-4 PCB. $t \leq 5$ sec.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

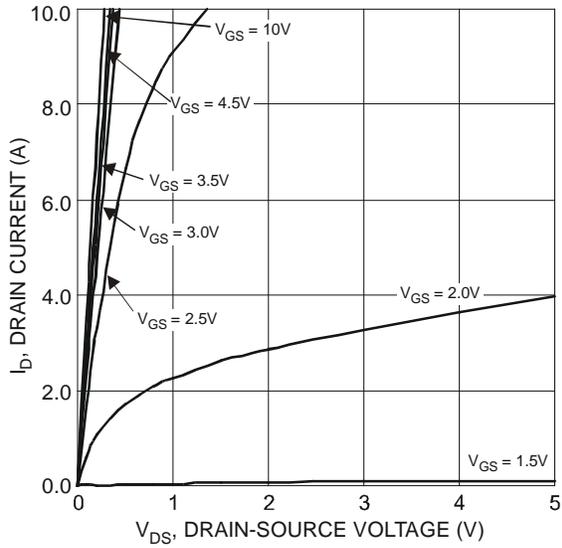


Figure 1 Typical Output Characteristics

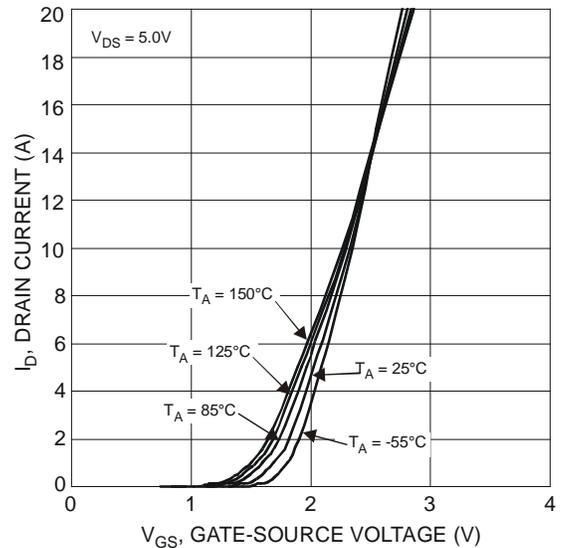


Figure 2 Typical Transfer Characteristics

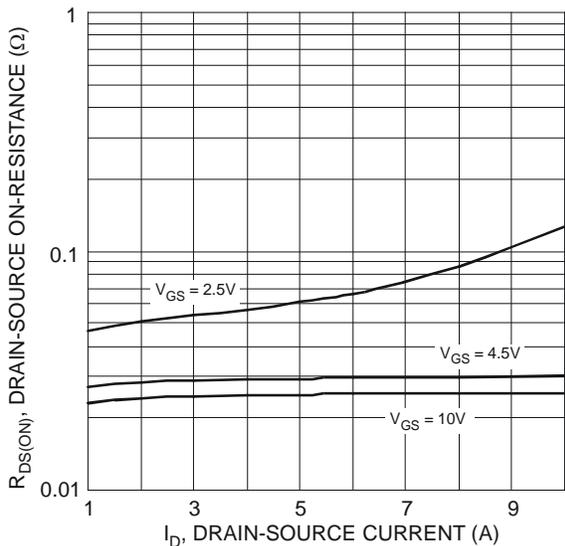


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

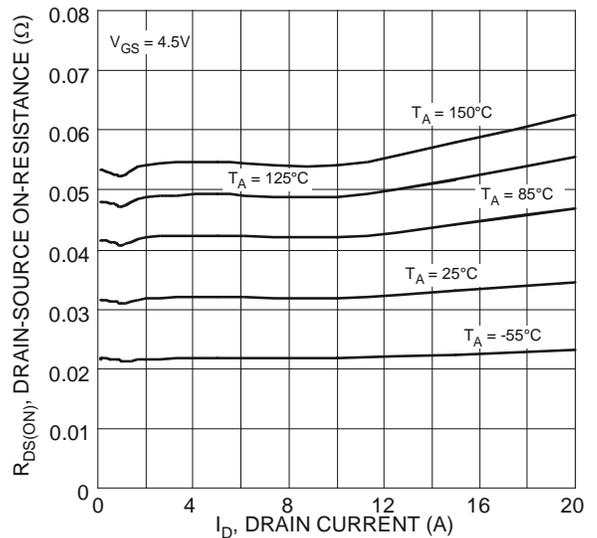


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

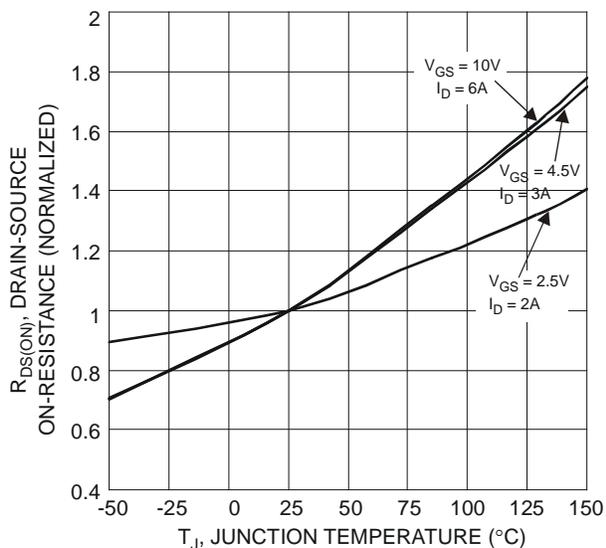


Figure 5 On-Resistance Variation with Temperature

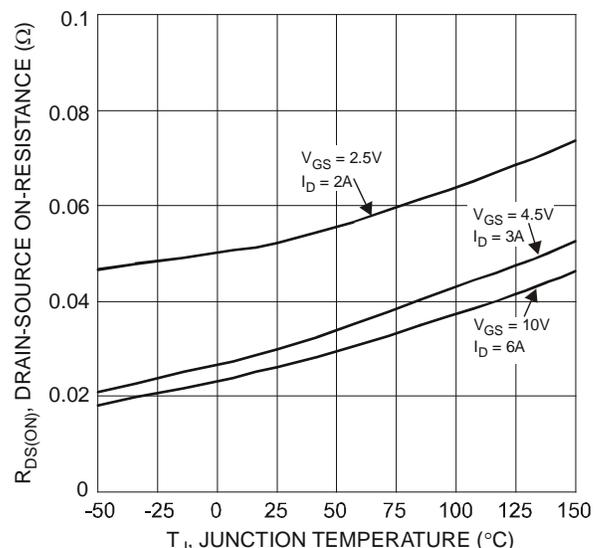


Figure 6 On-Resistance Variation with Temperature

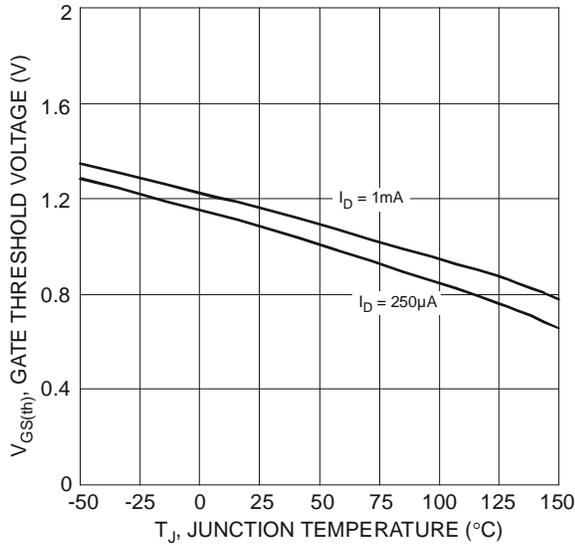


Figure 7 Gate Threshold Variation vs. Ambient Temperature

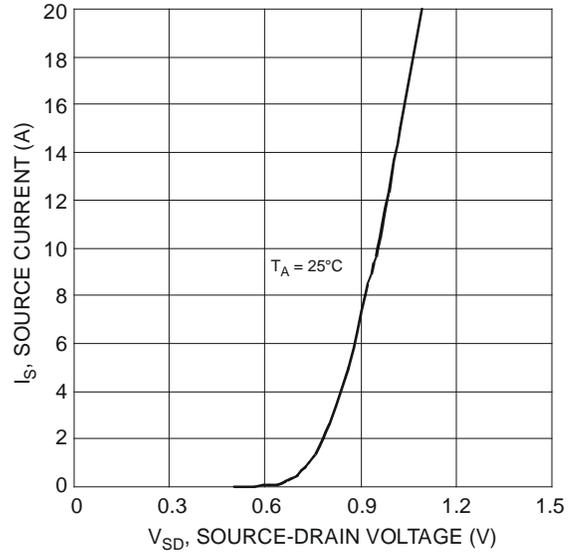


Figure 8 Diode Forward Voltage vs. Current

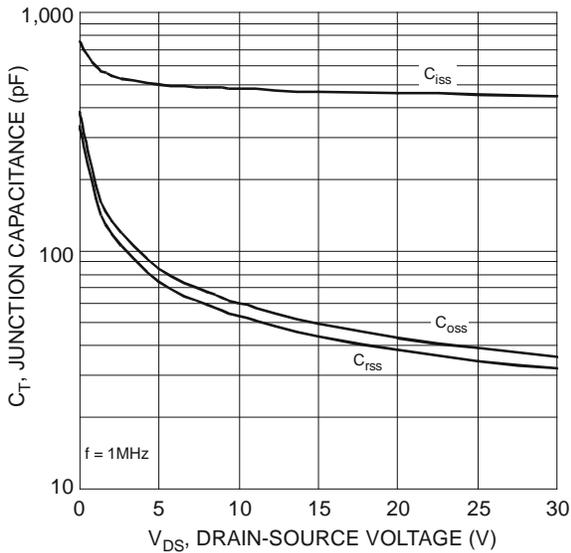


Figure 9 Typical Junction Capacitance

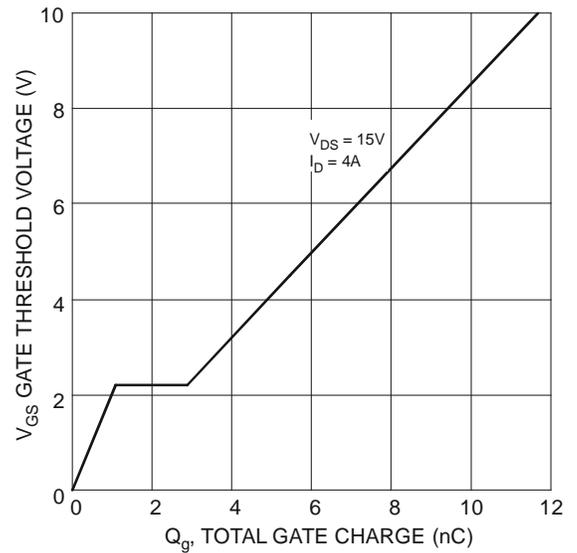


Figure 10 Gate Charge

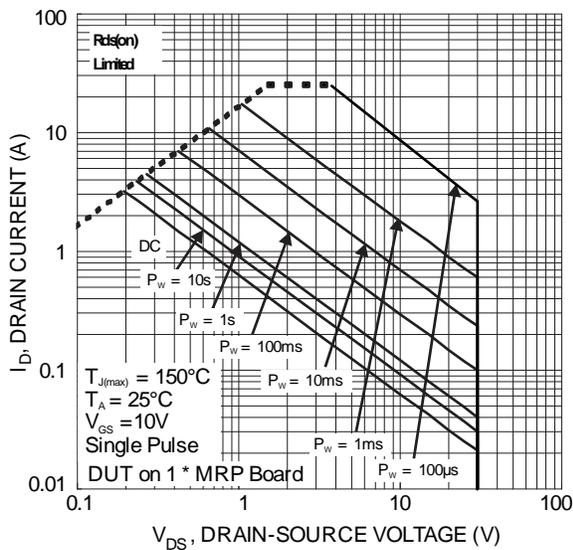
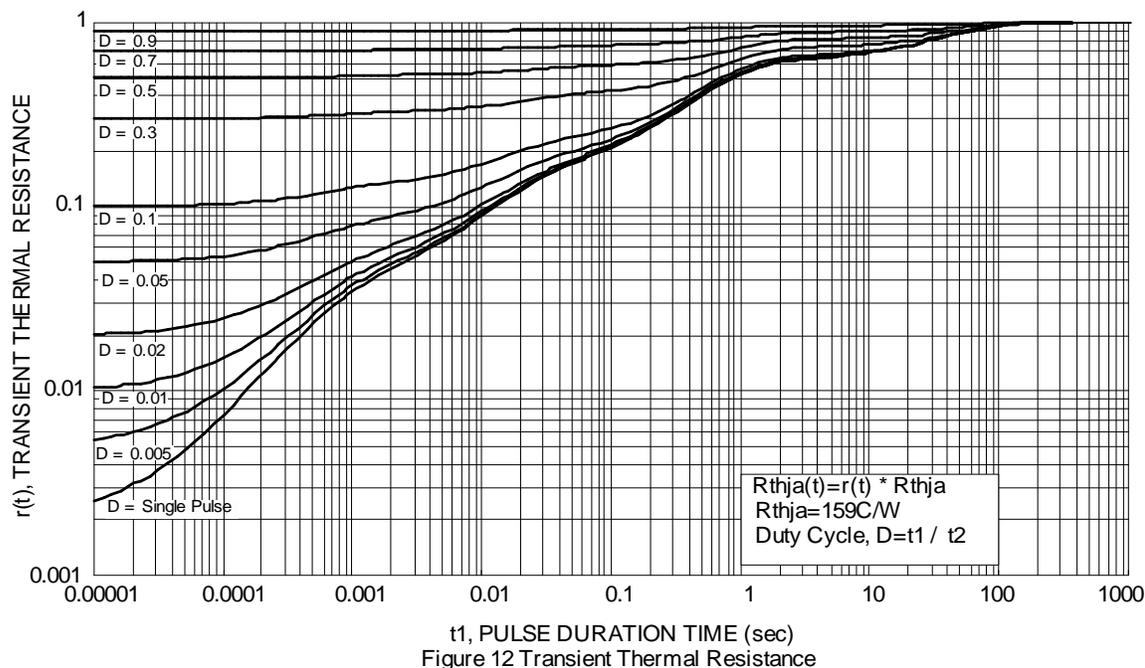
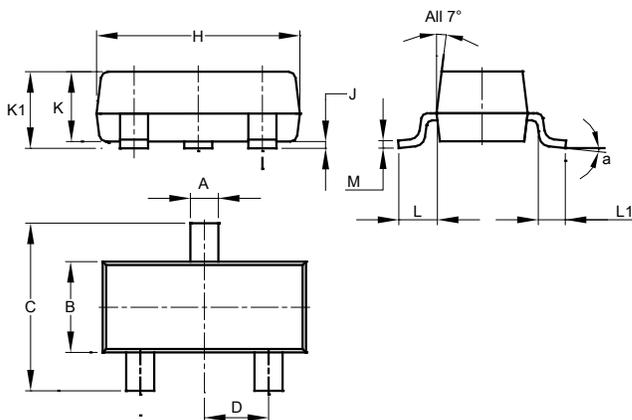


Figure 11 SOA, Safe Operation Area

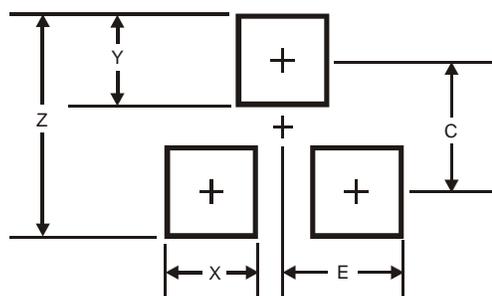


Package Outline Dimensions



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35