



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

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
100V	6Ω @ V _{GS} = 10V	230mA
	10Ω @ V _{GS} = 4.5V	178mA

Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Small Servo Motor Control
- Power MOSFET Gate Drivers
- Switching Applications

Features and Benefits

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- High Drain-Source Voltage Rating

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

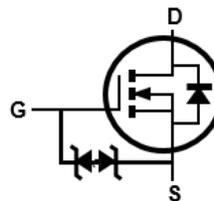
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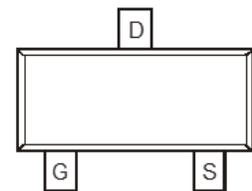
SOT23



Top View



Equivalent Circuit



Top View

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

Characteristic				Symbol	Value	Unit
Drain-Source Voltage				V_{DS}	100	V
Gate-Source Voltage				V_{GS}	± 20	V
Continuous Drain Current (Note 6)	$V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	I_D	230	mA
			$T_A = +70^\circ\text{C}$		184	
Maximum Body Diode Forward Current				I_S	230	mA
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)				I_{DM}	600	mA
Pulsed Source Current (10 μs Pulse, Duty Cycle = 1%)				I_{SM}	600	mA

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P_D	0.5	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		$R_{\theta JA}$	264	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)			P_D	0.7	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		$R_{\theta JA}$	178	$^\circ\text{C/W}$
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}	100	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	μA	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.8	—	2.0	V	$V_{DS} = V_{GS}, I_D = 1\text{mA}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	3.6	6	Ω	$V_{GS} = 10\text{V}, I_D = 0.17\text{A}$
			3.8	10		$V_{GS} = 4.5\text{V}, I_D = 0.17\text{A}$
Diode Forward Voltage	V_{SD}	—	0.87	1.3	V	$V_{GS} = 0\text{V}, I_S = 0.34\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	38	—	pF	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	2.9	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	1.8	—	pF	
Gate Resistance	R_g	—	37	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	0.7	—	nC	$V_{DS} = 50\text{V}, I_D = 0.23\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	1.3	—	nC	
Gate-Source Charge	Q_{gs}	—	0.2	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.4	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	2.9	—	ns	
Turn-On Rise Time	t_r	—	2.4	—	ns	$V_{DD} = 50\text{V}, V_{GS} = 10\text{V},$ $R_g = 50\Omega, I_D = 0.23\text{A}$
Turn-Off Delay Time	$t_{D(OFF)}$	—	15.3	—	ns	
Turn-Off Fall Time	t_f	—	6.7	—	ns	

- 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 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

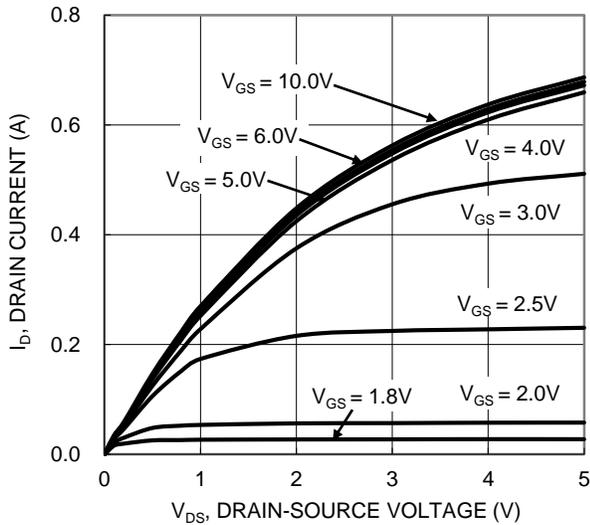


Figure 1. Typical Output Characteristic

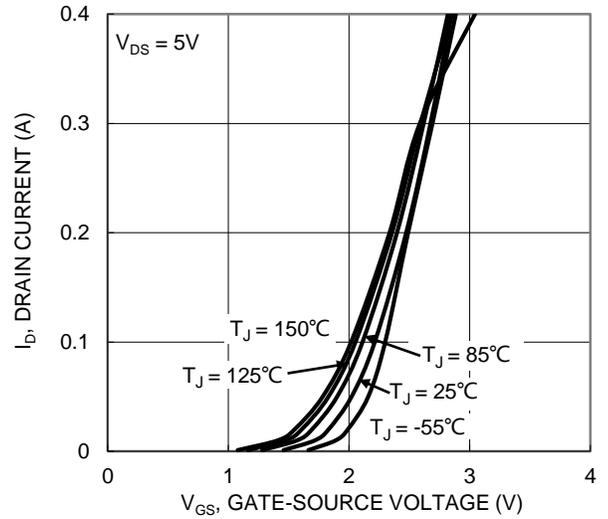


Figure 2. Typical Transfer Characteristic

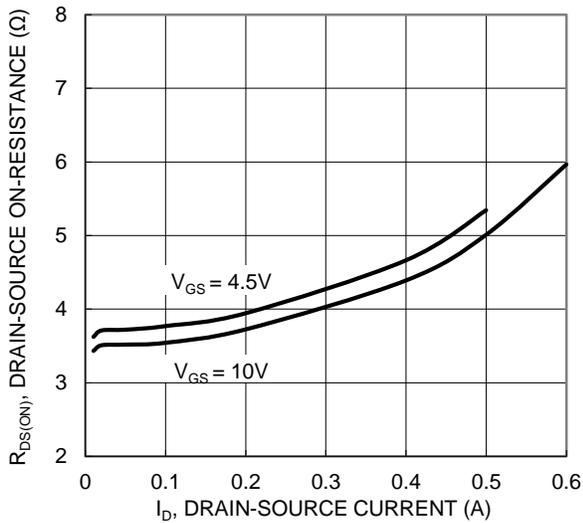


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

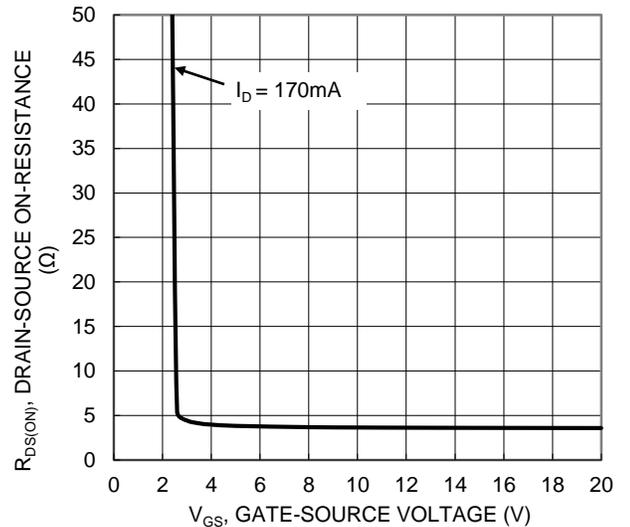


Figure 4. Typical Transfer Characteristic

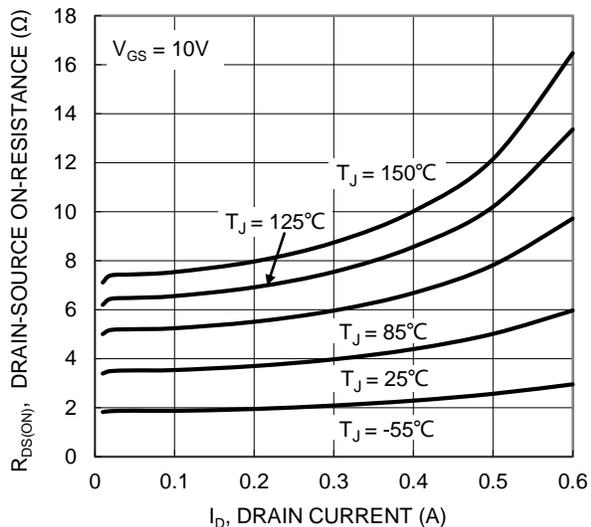


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

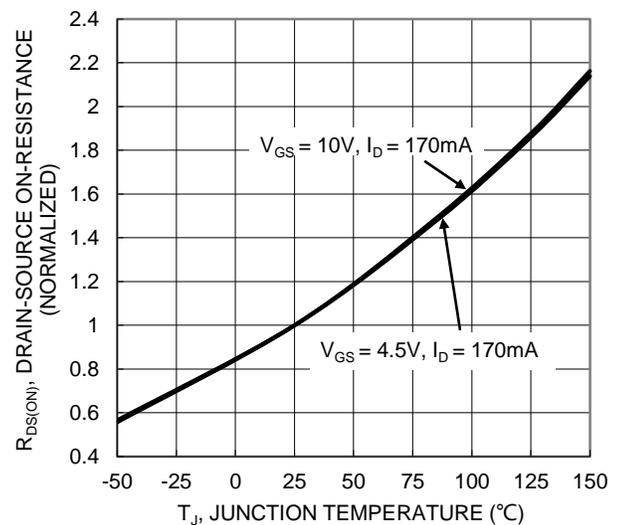


Figure 6. On-Resistance Variation with Junction Temperature

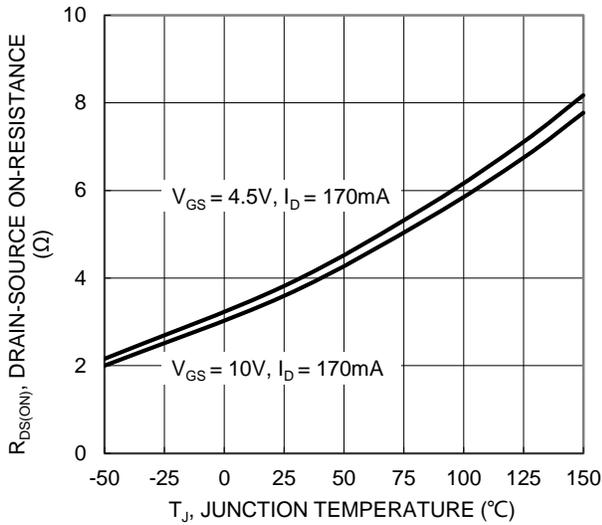


Figure 7. On-Resistance Variation with Junction Temperature

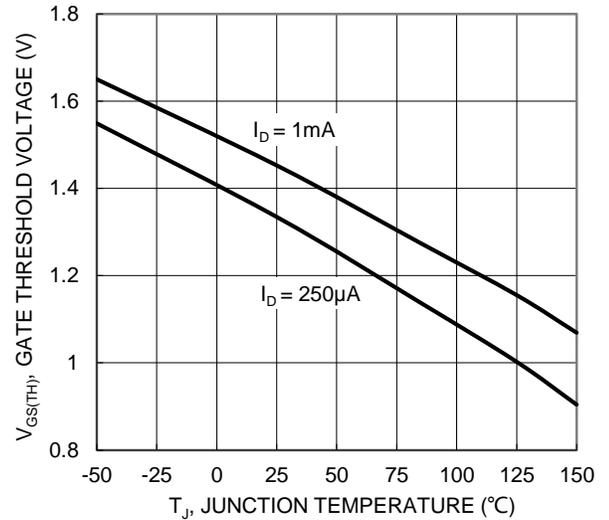


Figure 8. Gate Threshold Variation vs. Junction Temperature

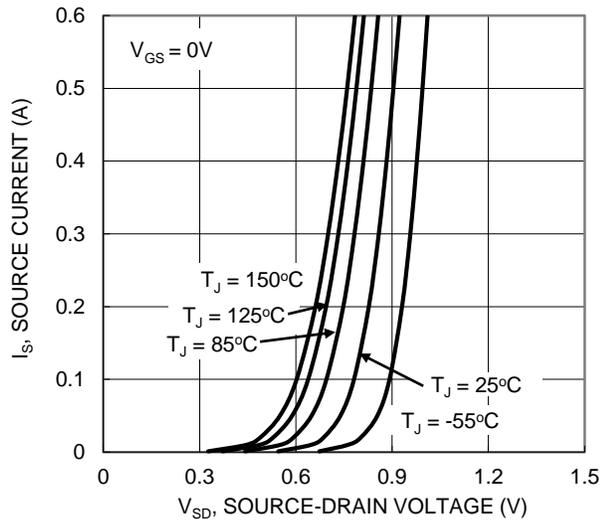


Figure 9. Diode Forward Voltage vs. Current

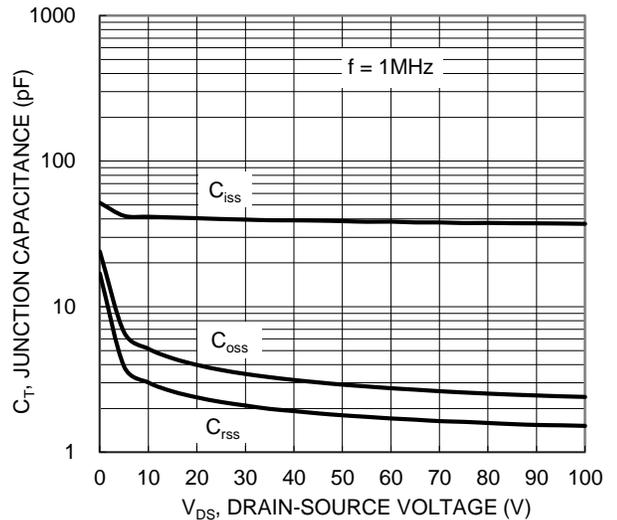


Figure 10. Typical Junction Capacitance

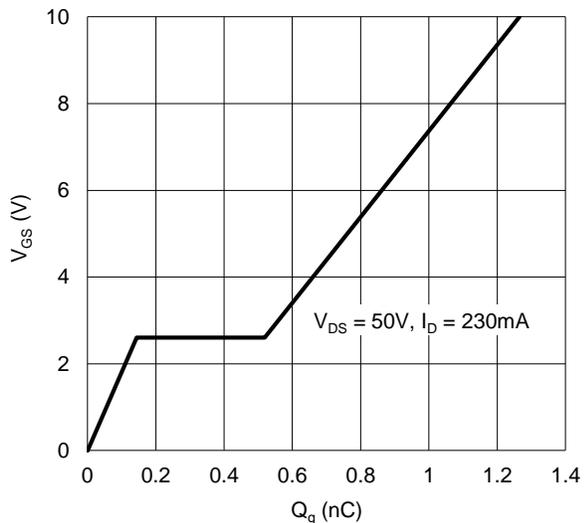


Figure 11. Gate Charge

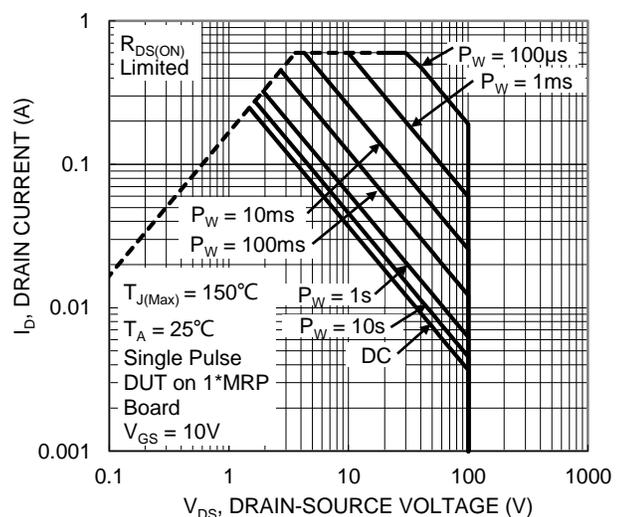


Figure 12. SOA, Safe Operation Area

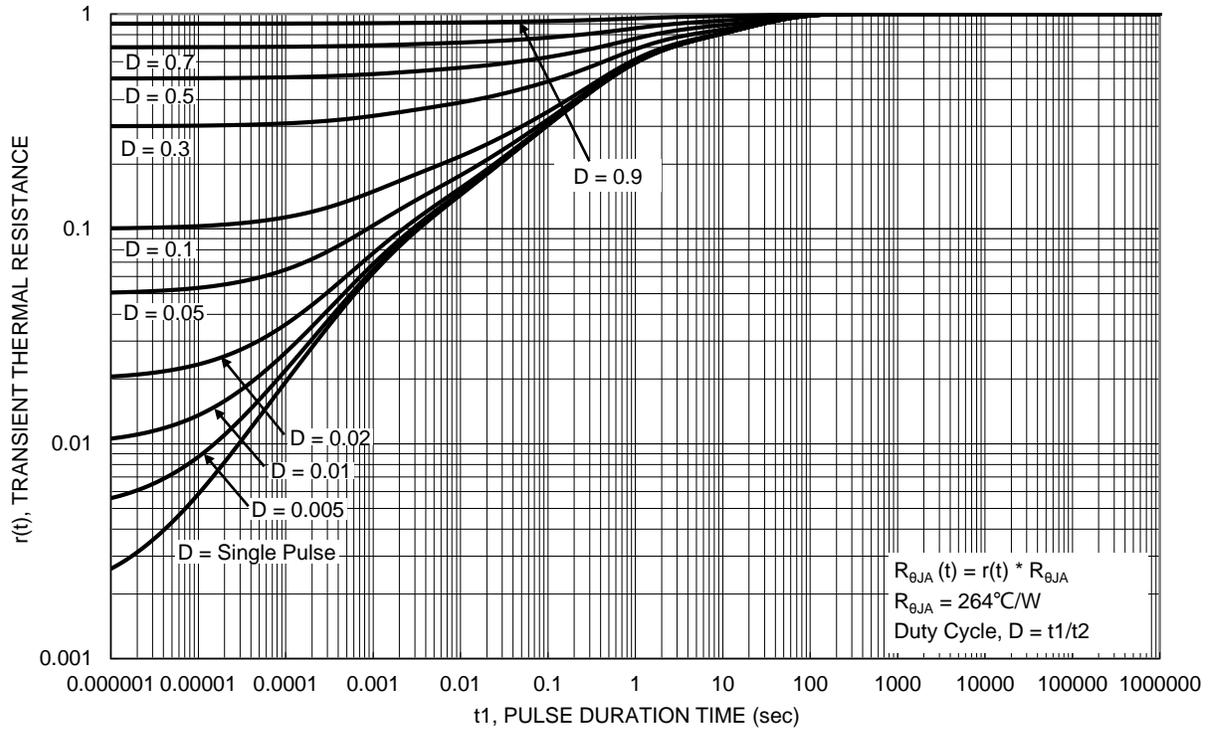
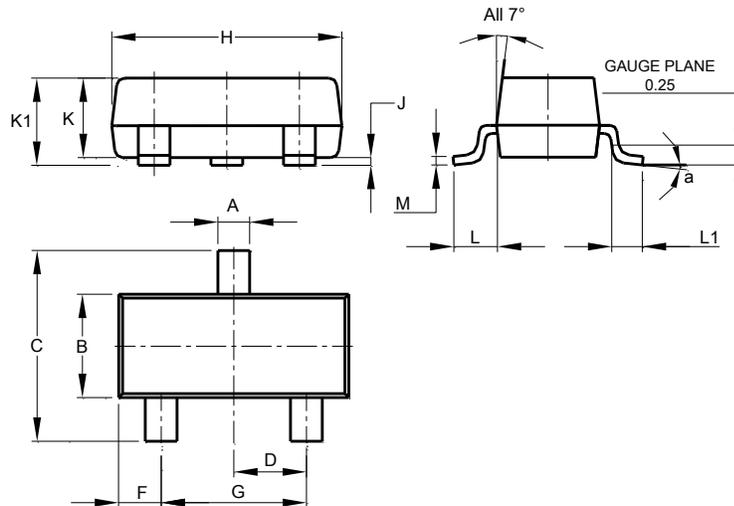


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

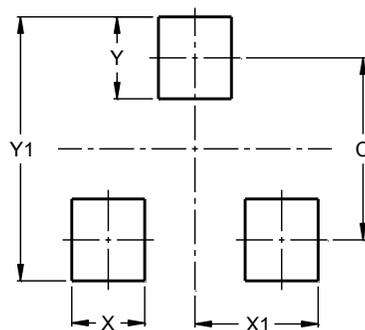
SOT23



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	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

SOT23



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