优尚

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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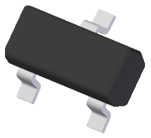
Features

- Low On-Resistance
    - 29mΩ @V_{GS} = 4.5V
    - 50mΩ @V_{GS} = 2.5V
    - 100mΩ @V_{GS} = 2.0V
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed

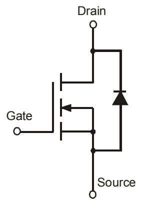
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (approximate)

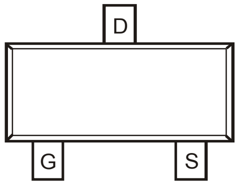
SOT23



Top View



Equivalent Circuit



Top View

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±12	V
Drain Current (Note 5)	I_D	5.9	A
Pulsed Drain Current (Note 6)	I_{DM}	21	A

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	90	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.45	—	1.4	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	24	29	mΩ	V_{GS} = 4.5V, I_D = 5.0A
			42	50		V_{GS} = 2.5V, I_D = 3.1A
			68	100		V_{GS} = 2.0V, I_D = 1.5A
Forward Transfer Admittance	$\lvert Y_{fs} \rvert$	—	8	—	S	V_{DS} =5V, I_D = 2.1A
Diode Forward Voltage (Note 7)	V_{SD}	—	0.9	1.4	V	V_{GS} = 0V, I_S = 2.0A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	532	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	144	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	117	—	pF	
Gate Resistance	R_G	—	1.3	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	Q_g	—	6.7	—	nC	V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5.0A
Gate-Source Charge	Q_{gs}	—	0.8	—		V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5.0A
Gate-Drain Charge	Q_{gd}	—	3.0	—		V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5.0A

Notes:
5. Device mounted on FR-4 PCB, on 2oz Copper pad layout with $R_{\theta JA}$ = 90°C/W.
6. Repetitive rating, pulse width limited by junction temperature.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

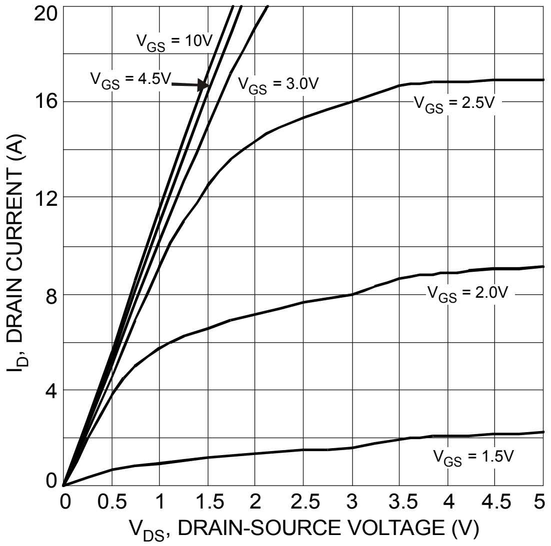


Fig. 1 Typical Output Characteristic

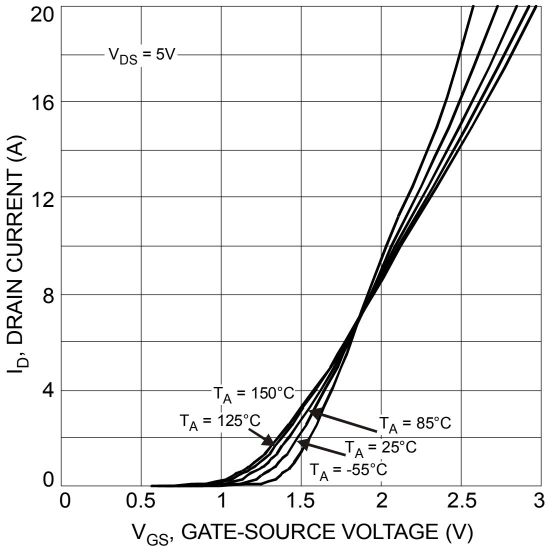


Fig. 2 Typical Transfer Characteristic

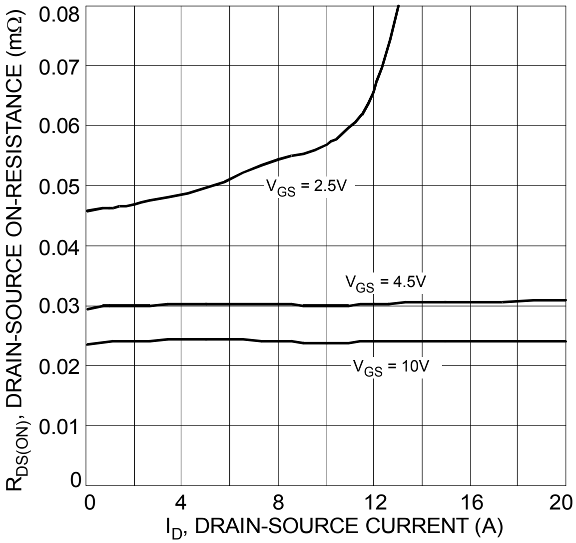


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

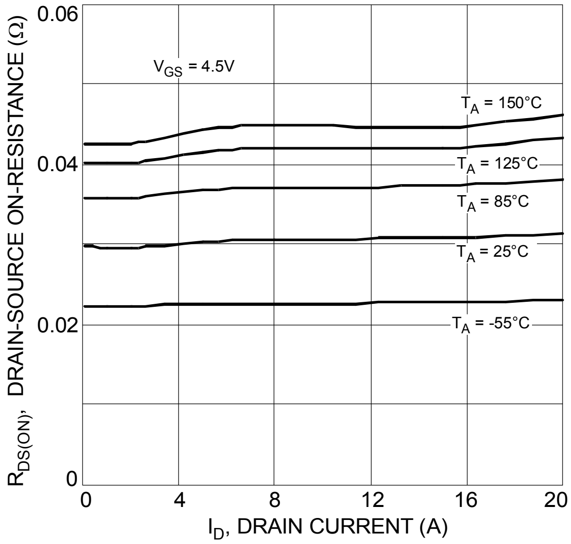


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

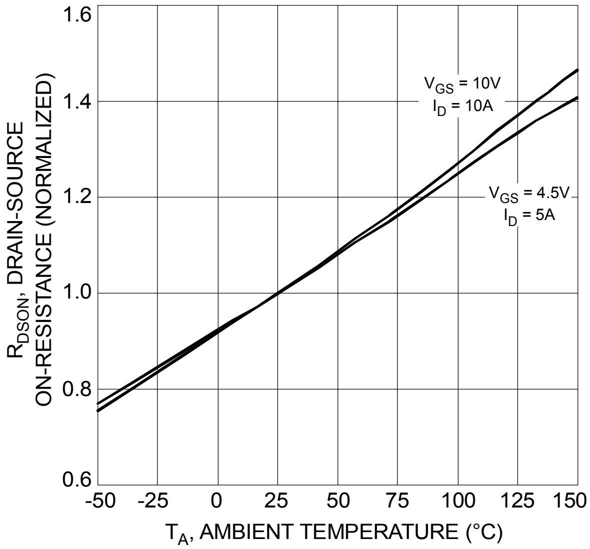


Fig. 5 On-Resistance Variation with Temperature

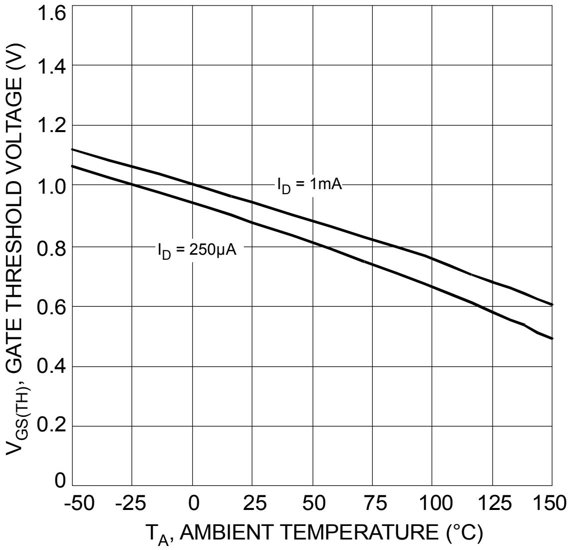


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

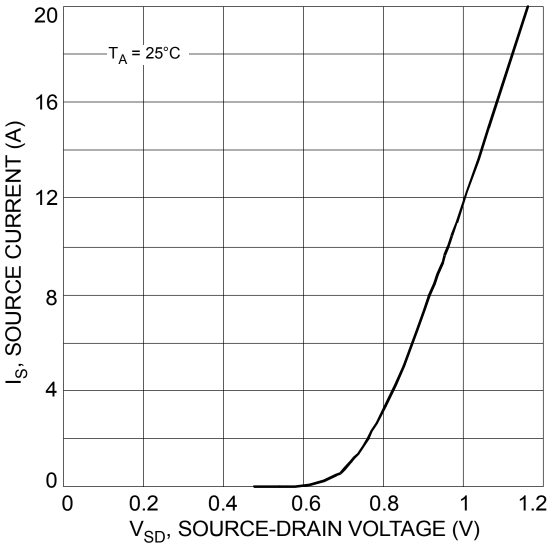


Fig. 7 Diode Forward Voltage vs. Current

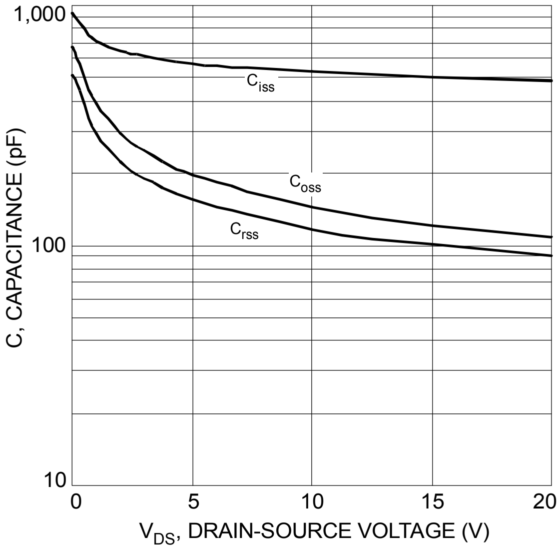


Fig. 8 Typical Total Capacitance

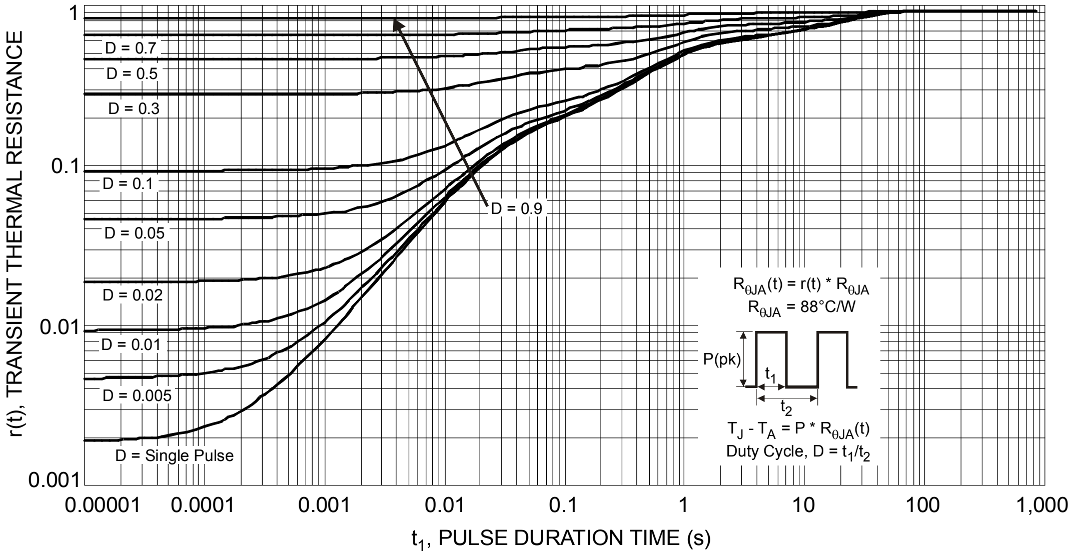
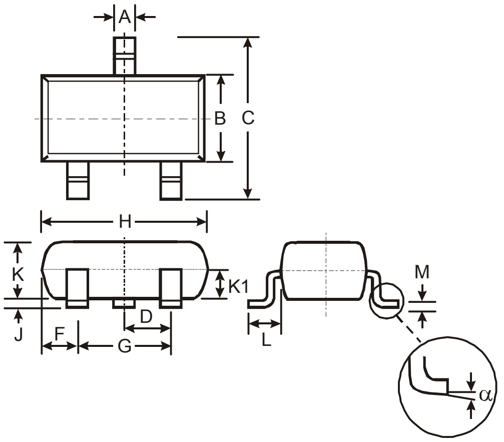


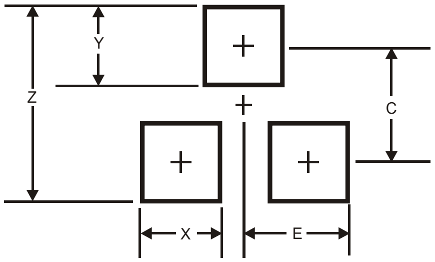
Fig. 9 Transient Thermal Response

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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	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