



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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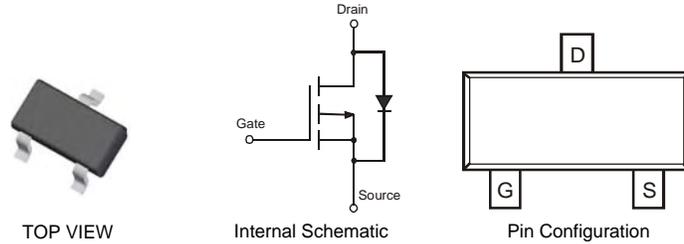
Features

- Low $R_{DS(ON)}$:
 - 40 m Ω @ $V_{GS} = -4.5V$
 - 70 m Ω @ $V_{GS} = -2.5V$
- Low Input/Output Leakage

Mechanical Data

- Case: SC-59
- Case Material – Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 4
- Ordering Information: See page 4
- Weight: 0.014 grams (approximate)

SC-59



Maximum Ratings @ $T_A = 25^\circ C$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current (Note 1) Continuous	I_D	$T_A = 25^\circ C$	-4.6
		$T_A = 70^\circ C$	-3.7
Pulsed Drain Current (Note 2)	I_{DM}	-18	A
Body-Diode Continuous Current (Note 1)	I_S	2.0	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	1.25	W
Thermal Resistance, Junction to Ambient (Note 1); Steady-State	$R_{\theta JA}$	100	$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

- Notes:
1. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width $t \leq 10s$.
 2. Repetitive Rating, pulse width limited by junction temperature.
 3. No purposefully added lead.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$T_J = 25^\circ\text{C}, V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$
Gate-Body Leakage Current	I_{GSS}	—	—	± 100	nA	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$
Gate Threshold Voltage	$V_{GS(th)}$	-0.6	-0.96	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
On State Drain Current (Note 5)	$I_{D(ON)}$	-15	—	—	A	$V_{GS} = -4.5\text{V}, V_{DS} = -5\text{V}$
Static Drain-Source On-Resistance (Note 5)	$R_{DS(ON)}$	—	29 55	40 70	$\text{m}\Omega$	$V_{GS} = -4.5\text{V}, I_D = -4.6\text{A}$ $V_{GS} = -2.5\text{V}, I_D = -3.8\text{A}$
Forward Transconductance (Note 5)	g_{FS}	—	9	—	S	$V_{DS} = -10\text{V}, I_D = -4.5\text{A}$
Diode Forward Voltage (Note 5)	V_{SD}	-0.5	-0.72	-1.4	V	$I_S = -2.1\text{A}, V_{GS} = 0\text{V}$
Maximum Body-Diode Continuous Current (Note 1)	I_S	—	—	1.7	A	—
DYNAMIC PARAMETERS (Note 6)						
Input Capacitance	C_{iss}	—	820	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	200	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	160	—	pF	
Gate Resistance	R_G	—	2.5	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_G	—	10.1	—	nC	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $I_D = -4.5\text{A}$
Gate-Source Charge	Q_{GS}	—	1.5	—		
Gate-Drain Charge	Q_{GD}	—	4.3	—		
Turn-On Delay Time	$t_{d(on)}$	—	4.4	—	ns	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $I_D = -1\text{A}, R_G = 6.0\Omega$
Rise Time	t_r	—	9.9	—		
Turn-Off Delay Time	$t_{d(off)}$	—	28.0	—		
Fall Time	t_f	—	23.4	—		

Notes: 5. Test pulse width $t = 300\mu\text{s}$.
6. Guaranteed by design. Not subject to production testing.

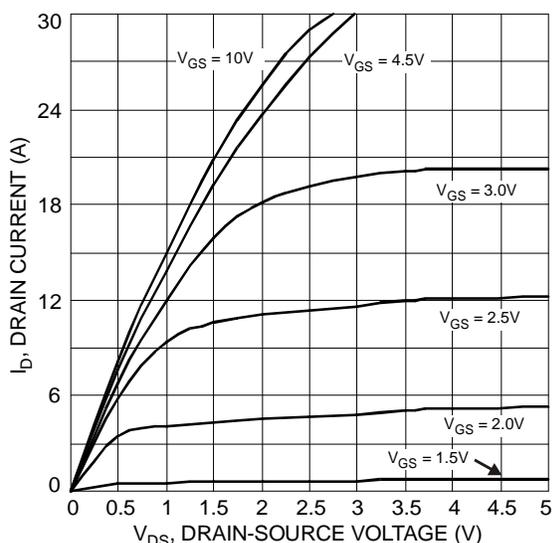


Fig. 1 Typical Output Characteristic

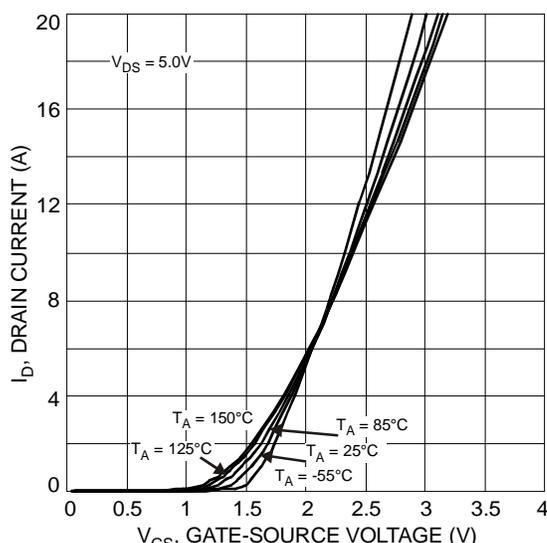


Fig. 2 Typical Transfer Characteristic

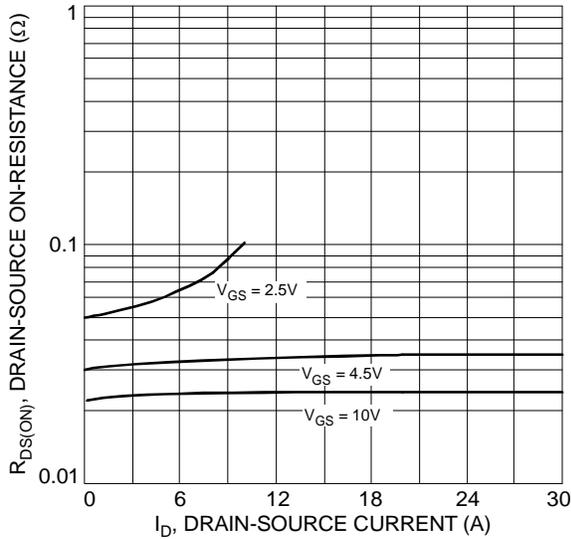


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

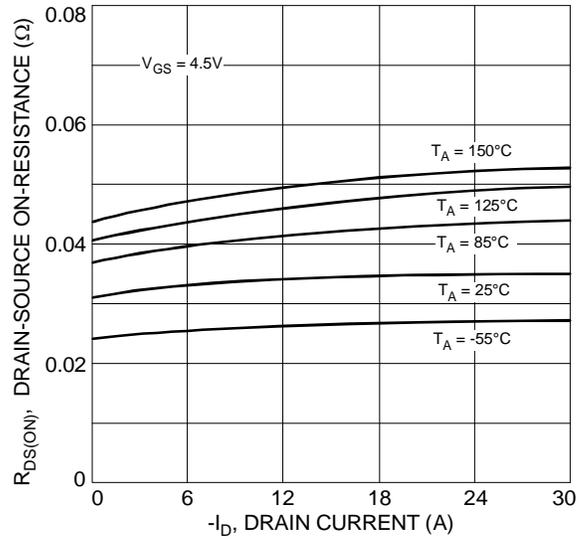


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

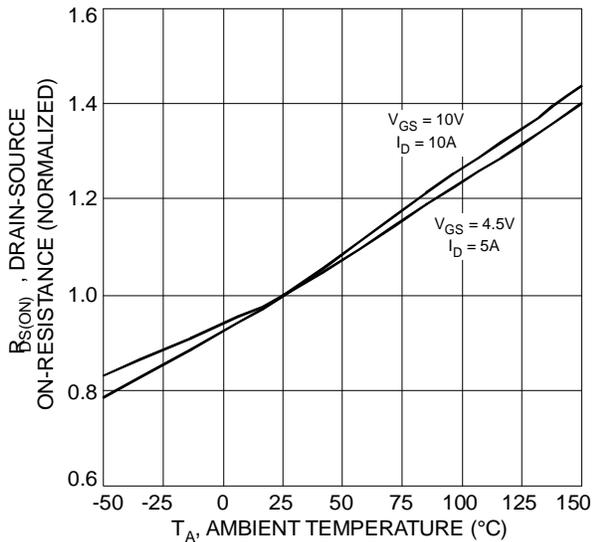


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

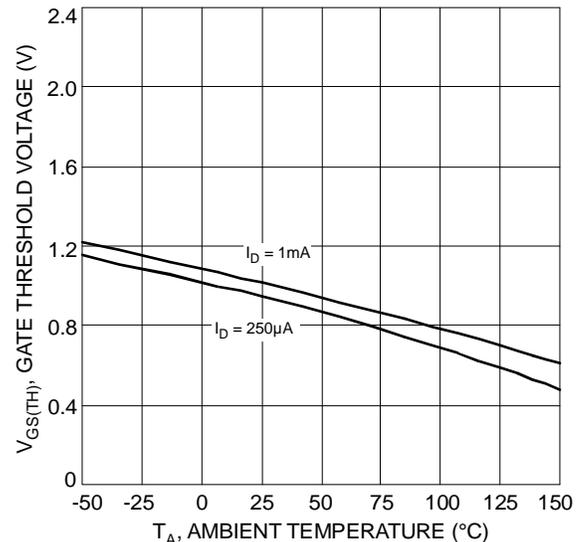


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

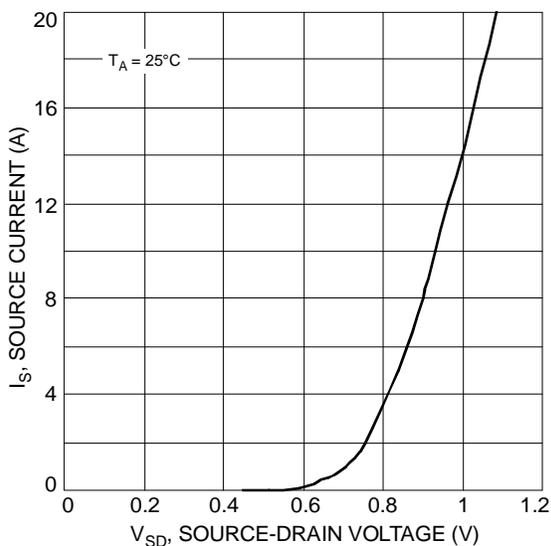


Fig. 7 Diode Forward Voltage vs. Current

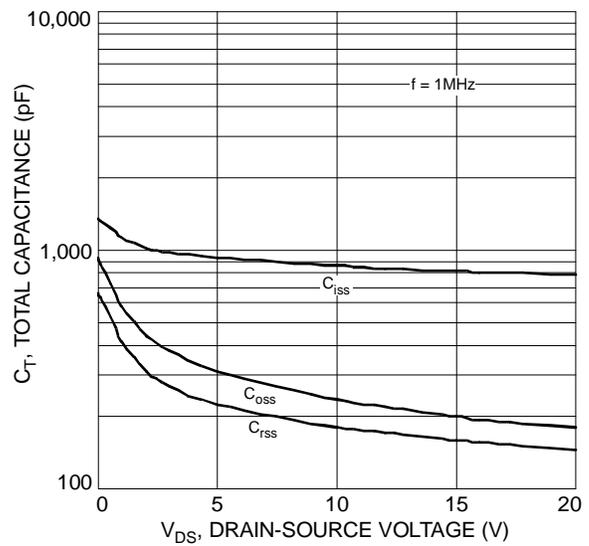
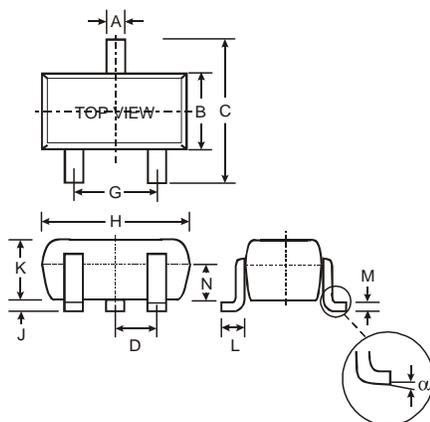


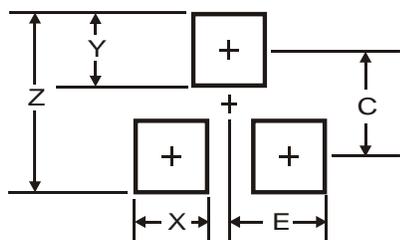
Fig. 8 Typical Total Capacitance

Package Outline Dimensions



SC-59		
Dim	Min	Max
A	0.35	0.50
B	1.50	1.70
C	2.70	3.00
D	0.95	
G	1.90	
H	2.90	3.10
J	0.013	0.10
K	1.00	1.30
L	0.35	0.55
M	0.10	0.20
N	0.70	0.80
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.4
X	0.8
Y	1.0
C	2.4
E	1.35