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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Product Summary

BV_{DSS}	$R_{DS(on)}$ max	I_D T_A = +25°C
30V	30mΩ @ V_{GS} = 10V	6A
	40mΩ @ V_{GS} = 4.5V	4A

Features

- Low Gate Charge
- Low $R_{DS(ON)}$
- Low Input/Output Leakage

Description and Applications

This new generation small-signal enhancement mode MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

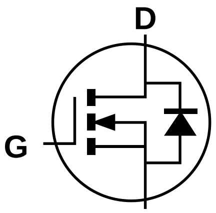
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

Mechanical Data

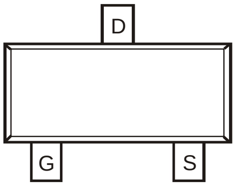
- Case: SC-59
- Case Material - Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe;
- Solderable per MIL-STD-202, Method 208 ⓔ3
- Weight: 0.014 grams (Approximate)

SC-59

Top View



Equivalent Circuit



Pin Configuration

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current (Note 6) Continuous T_A = +25°C T_A = +70°C	I_D	6 5	A
Pulsed Drain Current (Note 7)	I_{DM}	24	A
Body-Diode Continuous Current (Note 6)	I_S	2.25	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 6) t ≤10s	$R_{\theta JA}$	90	°C /W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 6. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width t ≤10s.
7. Repetitive Rating, pulse width limited by junction temperature.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	I_D = 250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current (Note 9) T_J = 25°C T_J = 55°C	I_{DSS}	—	—	1 5	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Body Leakage Current	I_{GSS}	—	—	±100	nA	V_{DS} = 0V, V_{GS} = ±20V
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.1	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	25 36	30 40	mΩ	V_{GS} = 10V, I_D = 6A V_{GS} = 4.5V, I_D = 5A
Forward Transconductance (Note 8)	g_{FS}	—	5	—	S	V_{DS} = 10V, I_D = 8A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.7	1.1	V	I_S = 2.25A, V_{GS} = 0V
DYNAMIC PARAMETERS (Note 9)						
Total Gate Charge	Q_g	—	10.5	—	nC	V_{GS} = 5V, V_{DS} = 15V, I_D = 6A
Gate-Source Charge	Q_{gs}	—	3.8	—	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 6A
Gate-Drain Charge	Q_{gd}	—	2.9	—	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 6A
Turn-On Delay Time	$t_{D(on)}$	—	11	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_D = 1.8Ω, R_G = 6Ω
Turn-On Rise Time	t_r	—	7	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	63	—	ns	
Turn-Off Fall Time	t_f	—	30	—	ns	
Input Capacitance	C_{iss}	—	755	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	136	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	108	—	pF	

Notes: 8. Test pulse width t = 300ms.
9. Guaranteed by design. Not subject to production testing.

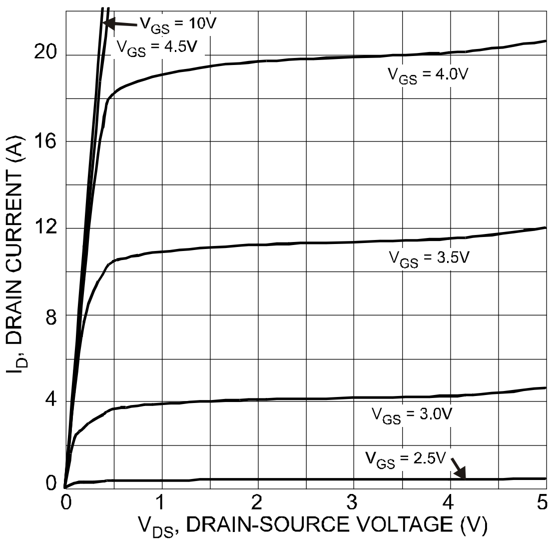


Fig. 1 Typical Output Characteristics

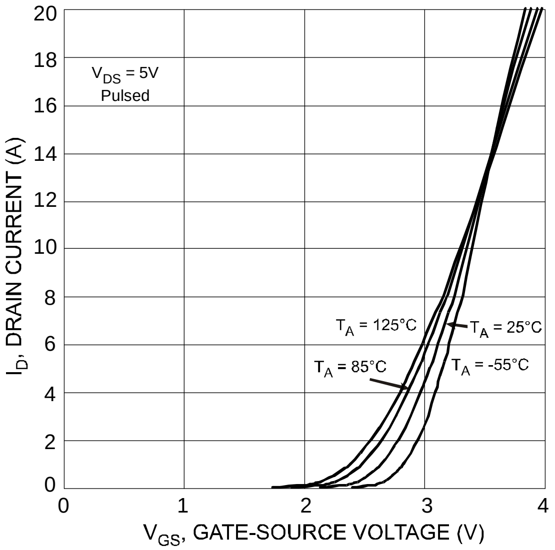


Fig. 2 Typical Transfer Characteristics

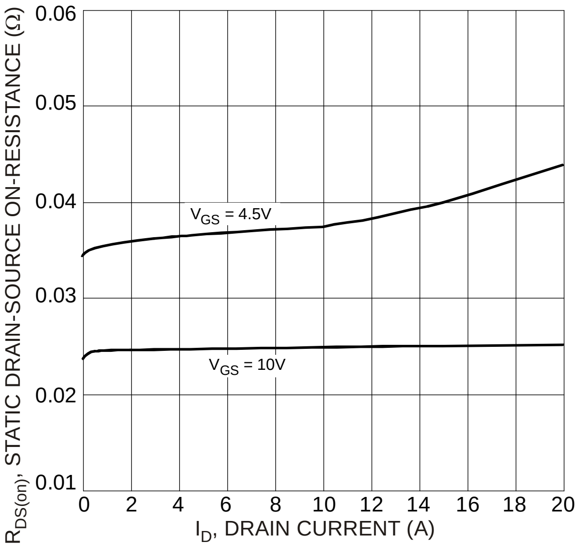


Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

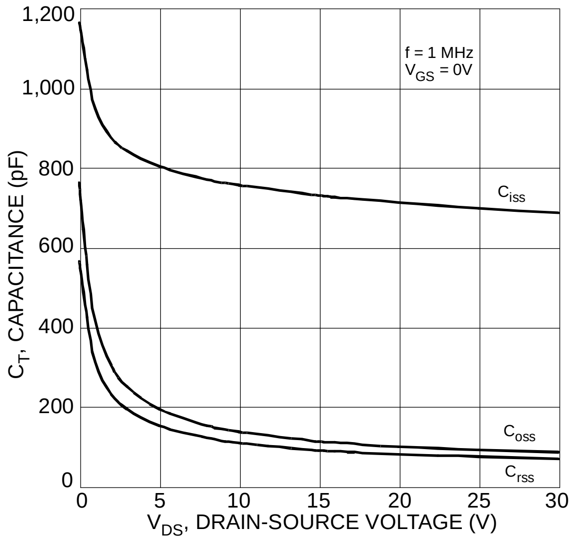


Fig. 4 Typical Total Capacitance

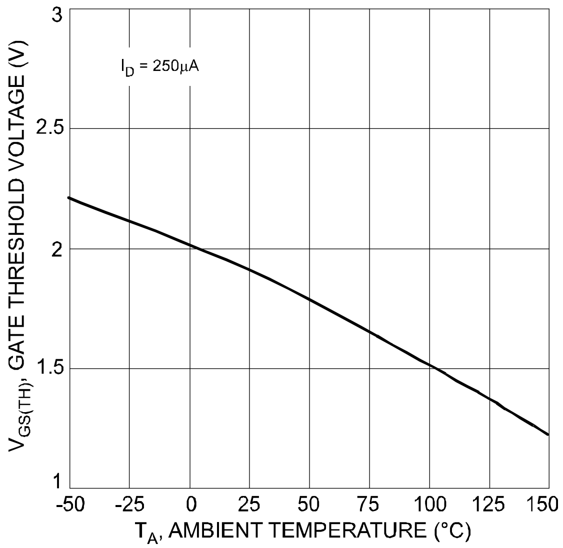


Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

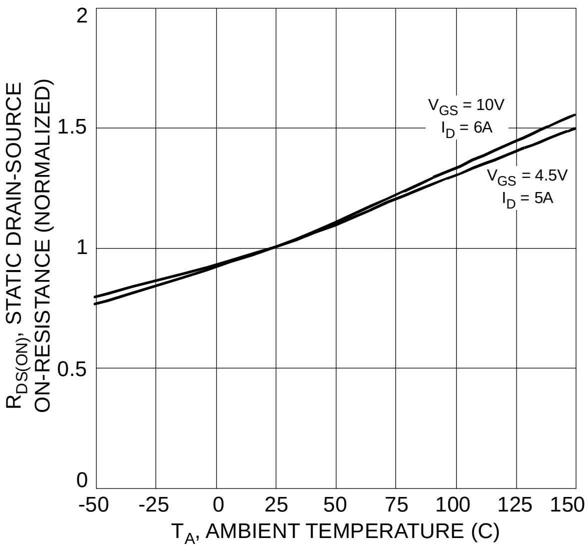


Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

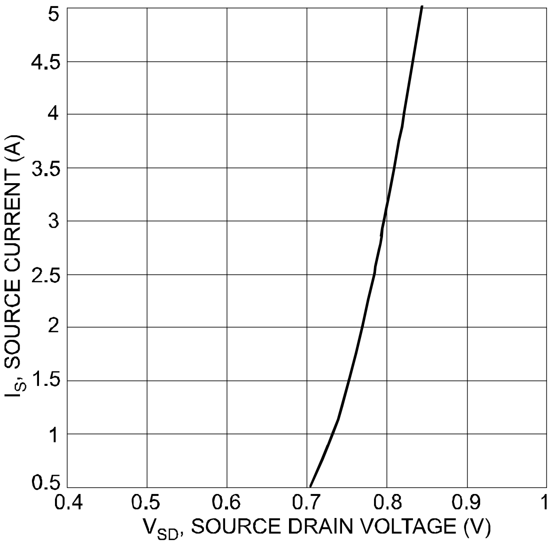
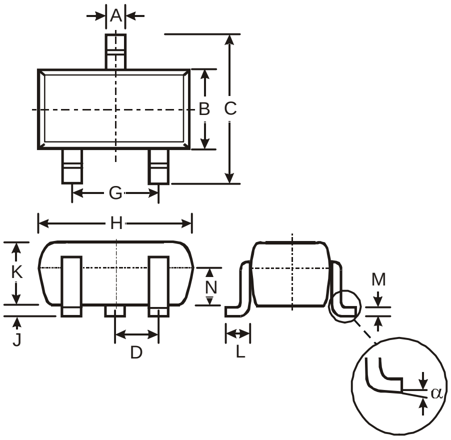


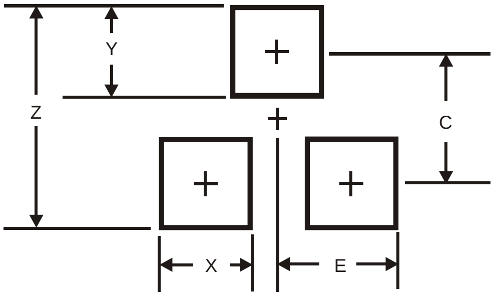
Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

Package Outline Dimensions



SC-59			
Dim	**Min**	**Max**	**Typ**
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	-	-	0.95
G	-	-	1.90
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
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