



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
-50V	8Ω @ V _{GS} = -5V	-220mA

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed

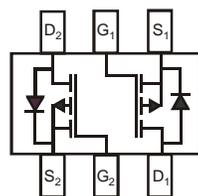
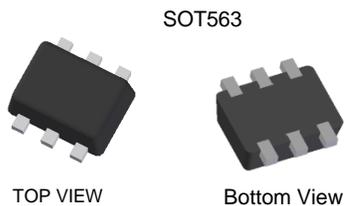
Description and Applications

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

- General purpose interfacing switches
- Power management functions
- Analog switches

Mechanical Data

- Package: SOT563
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable Per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.003 grams (Approximate)



TOP VIEW
Internal Schematic

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-50	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = -5V	Steady State	T _A = +25°C T _A = +70°C	I _D	-220 -180	mA
Maximum Body Diode Forward Current (Note 6)			I _S	-220	mA
Pulsed Drain Current (Note 6)			I _{DM}	-1	A
Pulsed Source Current (Note 6)			I _{SM}	-1	A

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P _D	0.49	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R _{θJA}	259	°C/W
Total Power Dissipation (Note 6)			P _D	0.78	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R _{θJA}	159	°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}	-50	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	μA	V _{DS} = -50V, V _{GS} = 0V
		—	—	500	nA	V _{DS} = -25V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.8	—	-2.0	V	V _{DS} = V _{GS} , I _D = -250uA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	2.2	8	Ω	V _{GS} = -5V, I _D = -100mA
Diode Forward Voltage	V _{SD}	—	-0.8	-1.4	V	V _{GS} = 0V, I _S = -100mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	37	—	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	5.8	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	3.5	—	pF	
Gate Resistance	R _g	—	240	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = -5V)	Q _g	—	0.6	—	nC	V _{DS} = -10V, I _D = -100mA
Total Gate Charge (V _{GS} = -10V)	Q _g	—	1.2	—	nC	
Gate-Source Charge	Q _{gs}	—	0.3	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.01	—	nC	
Turn-On Delay Time	t _{D(on)}	—	2.6	—	ns	V _{DD} = -30V, V _{GS} = -10V, R _G = 50Ω, I _D = -270mA
Turn-On Rise Time	t _r	—	12	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	36.6	—	ns	
Turn-Off Fall Time	t _f	—	21	—	ns	
Body Diode Reverse Recovery Time	t _{RR}	—	67	—	ns	I _F = -1A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	78	—	nC	I _F = -1A, di/dt = 100A/μs

- 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 pad layout.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

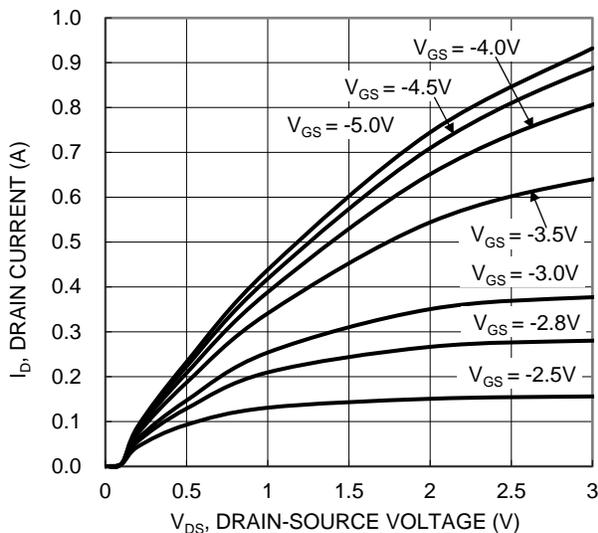


Figure 1. Typical Output Characteristic

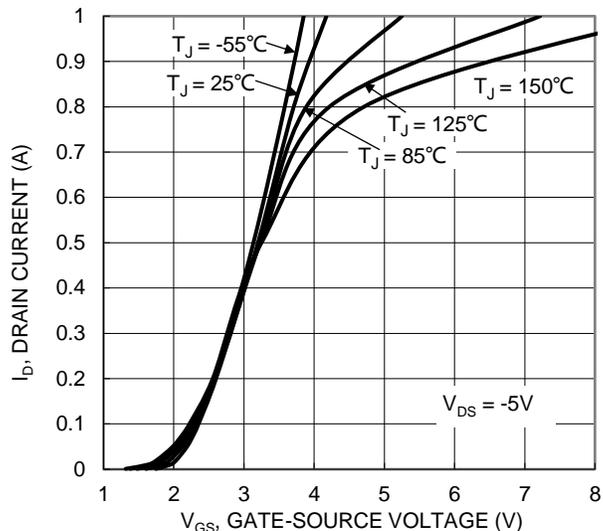


Figure 2. Typical Transfer Characteristic

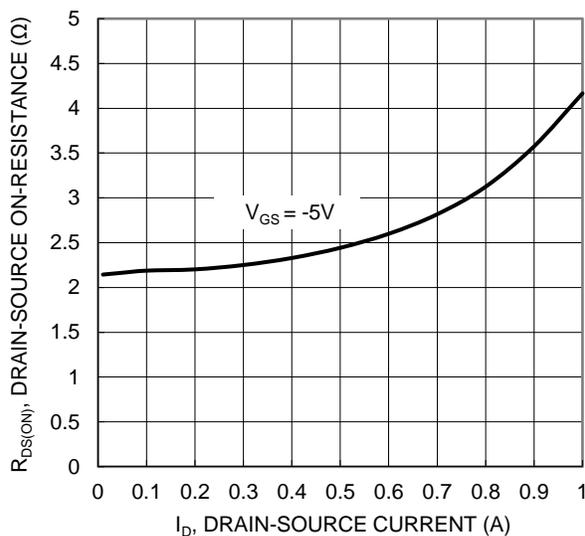


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

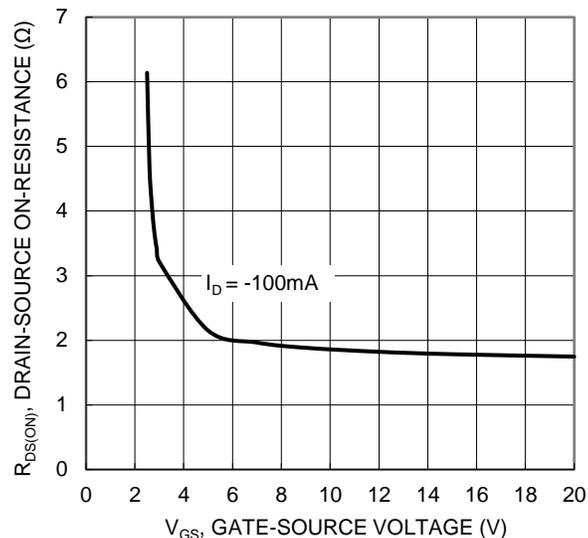


Figure 4. Typical Transfer Characteristic

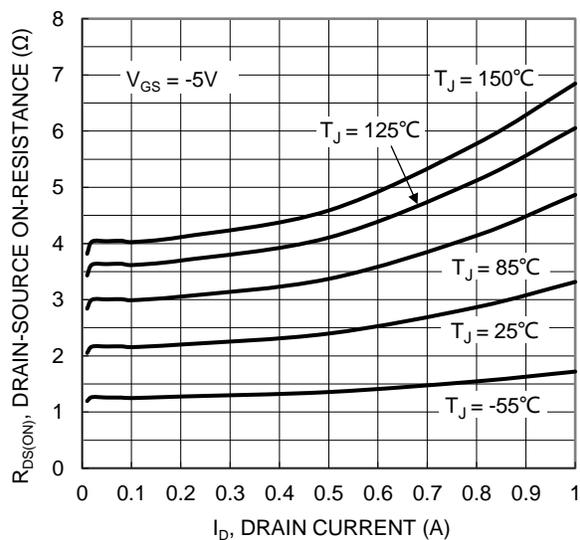


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

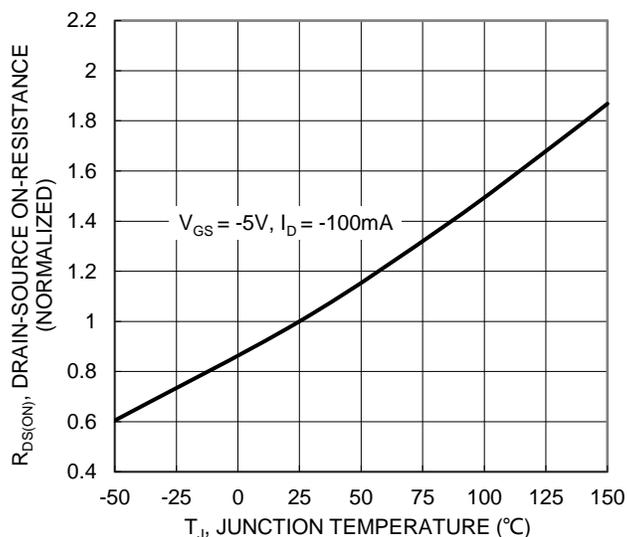


Figure 6. On-Resistance Variation with Temperature

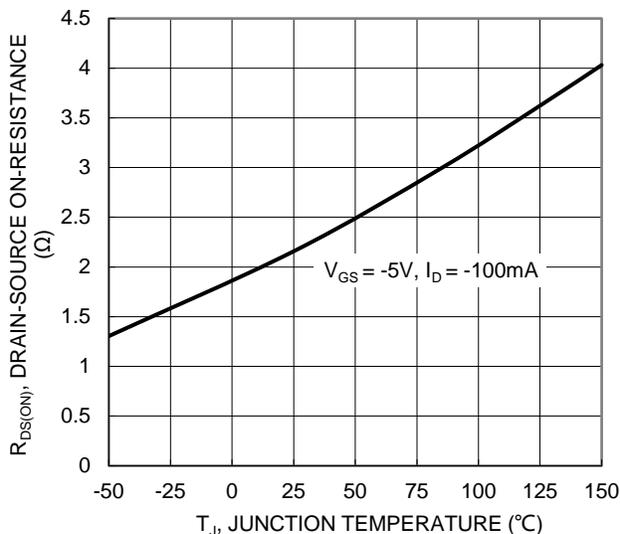


Figure 7. On-Resistance Variation with Temperature

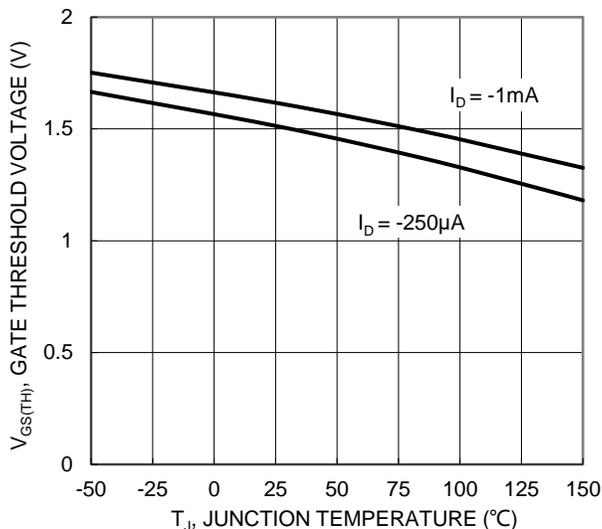


Figure 8. Gate Threshold Variation vs. Junction Temperature

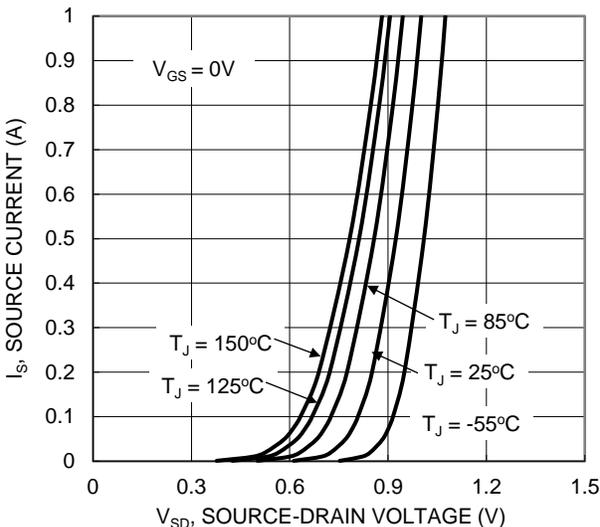


Figure 9. Diode Forward Voltage vs. Current

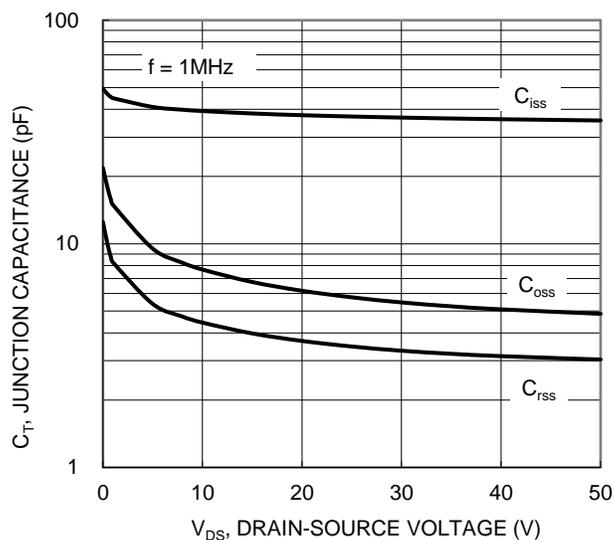


Figure 10. Typical Junction Capacitance

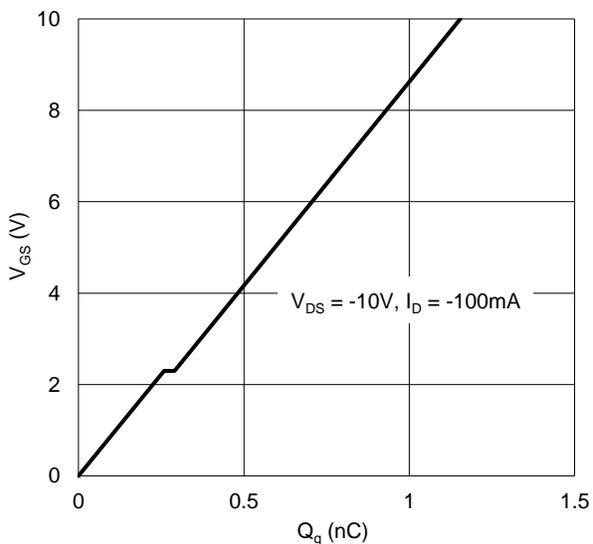


Figure 11. Gate Charge

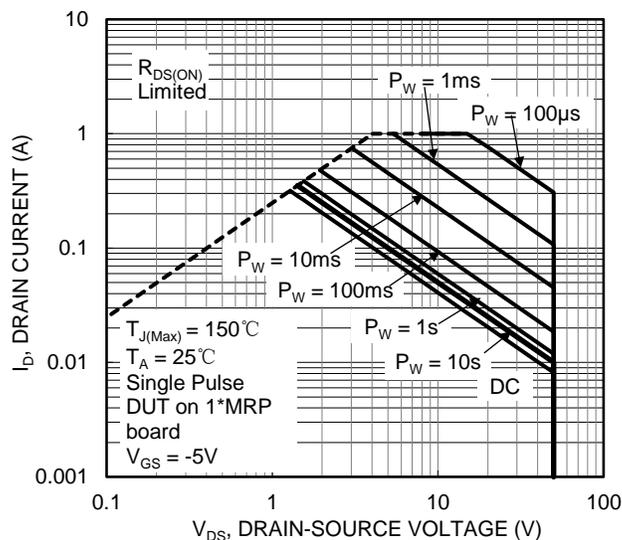


Figure 12. SOA, Safe Operation Area

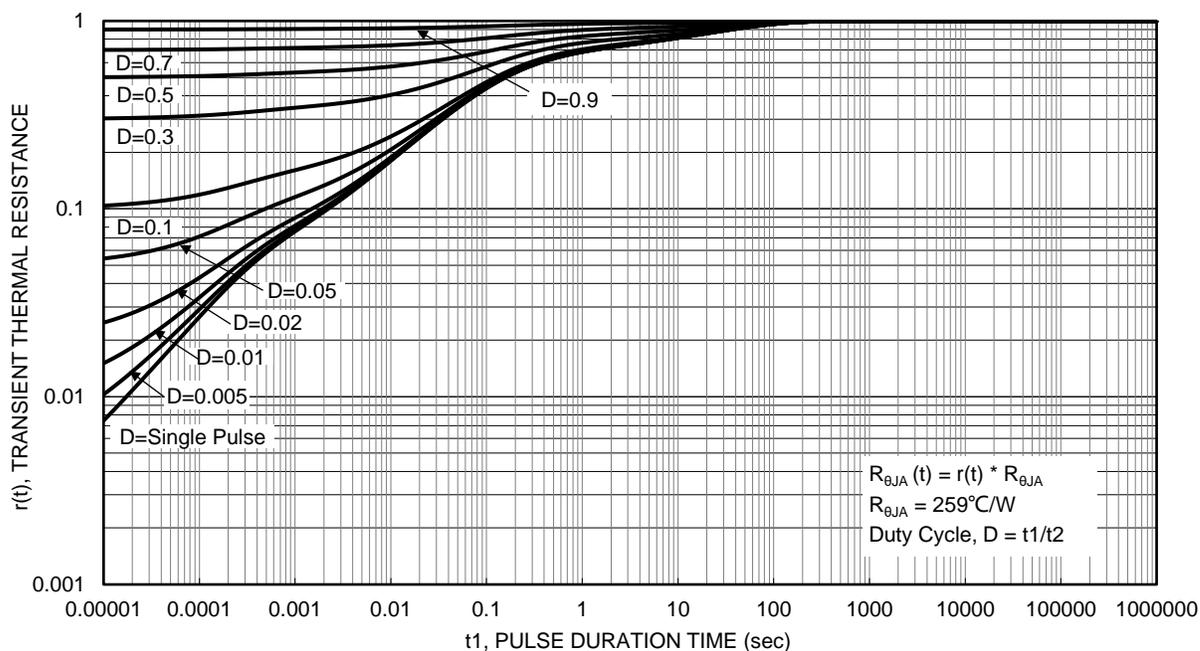
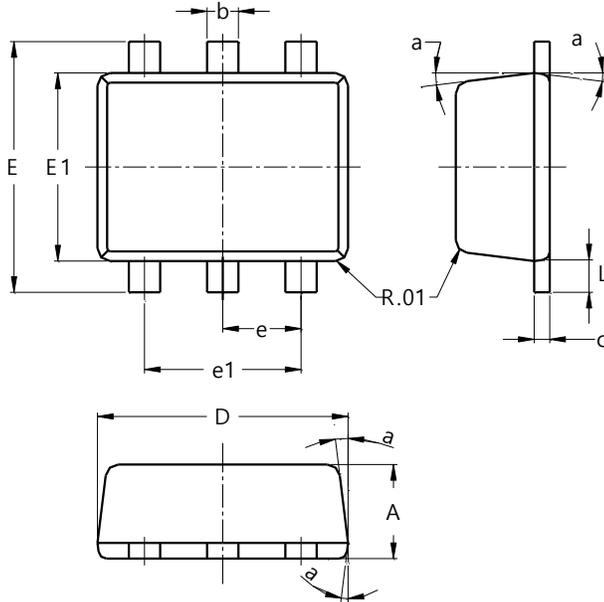


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

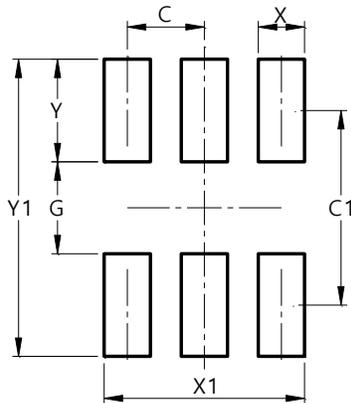
SOT563



SOT563			
Dim	Min	Max	Typ
A	0.55	0.60	--
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

Suggested Pad Layout

SOT563



Dimensions	Value (in mm)
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940