



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

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ\text{C}$
25V	$4\Omega @ V_{GS} = 4.5V$	0.24A
	$5\Omega @ V_{GS} = 2.7V$	0.22A

Description

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

Applications

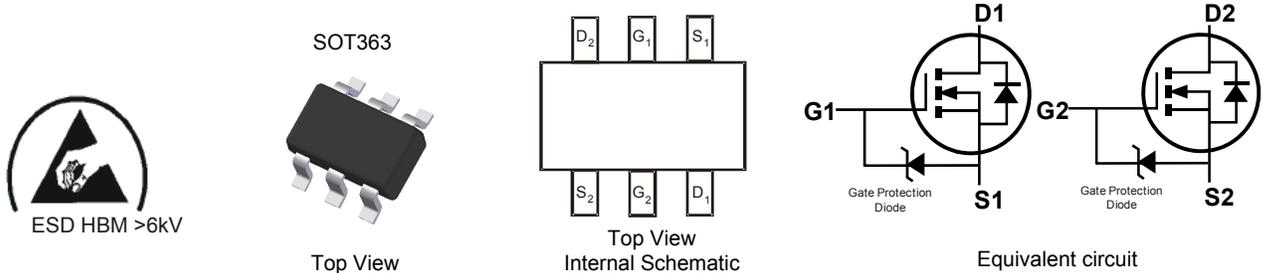
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate (>6kV Human Body Model)

Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)



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

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	V_{DSS}	25	V	
Gate-Source Voltage	V_{GSS}	8	V	
Continuous Drain Current, $V_{GS} = 4.5\text{V}$ (Note 6)	I_D	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	0.24 0.19	A
Continuous Drain Current, $V_{GS} = 2.7\text{V}$ (Note 6)		$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	0.22 0.17	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)	I_{DM}	1.5	A	

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation	P_D	(Note 5) 0.3	W
		(Note 6) 0.37	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 5) 409	$^\circ\text{C/W}$
		(Note 6) 334	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	137	$^\circ\text{C}$
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}	25	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}	—	—	100	nA	$V_{GS} = 8\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.65	0.85	1.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	3.8	4	Ω	$V_{GS} = 4.5\text{V}, I_D = 0.4\text{A}$
		—	3.1	5	Ω	$V_{GS} = 2.7\text{V}, I_D = 0.2\text{A}$
Forward Transconductance	$ Y_{fs} $	—	1	—	S	$V_{DS} = 5\text{V}, I_D = 0.4\text{A}$
Diode Forward Voltage	V_{SD}	—	0.76	1.2	V	$V_{DS} = V_{GS}, I_D = 0.25\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	27.9	—	pF	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	6.1	—		
Reverse Transfer Capacitance	C_{rss}	—	2	—		
Total Gate Charge	Q_g	—	0.36	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 5\text{V}, I_D = 0.2\text{A}$
Gate-Source Charge	Q_{gs}	—	0.06	—		
Gate-Drain Charge	Q_{gd}	—	0.04	—		
Turn-On Delay Time	$t_{D(on)}$	—	2.9	—	nS	$V_{GS} = 4.5\text{V}, V_{DS} = 6\text{V}, I_D = 0.5\text{A}, R_{\theta} = 50\Omega$
Turn-On Rise Time	t_r	—	1.8	—		
Turn-Off Delay Time	$t_{D(off)}$	—	6.6	—		
Turn-Off Fall Time	t_f	—	2.3	—		

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - 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 production testing.

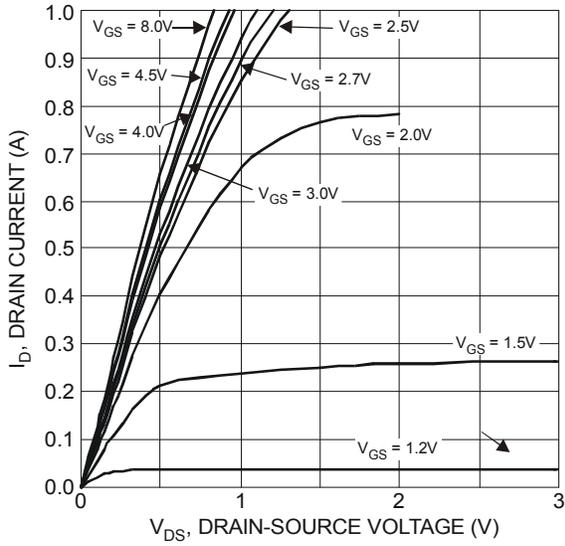


Figure 1 Typical Output Characteristics

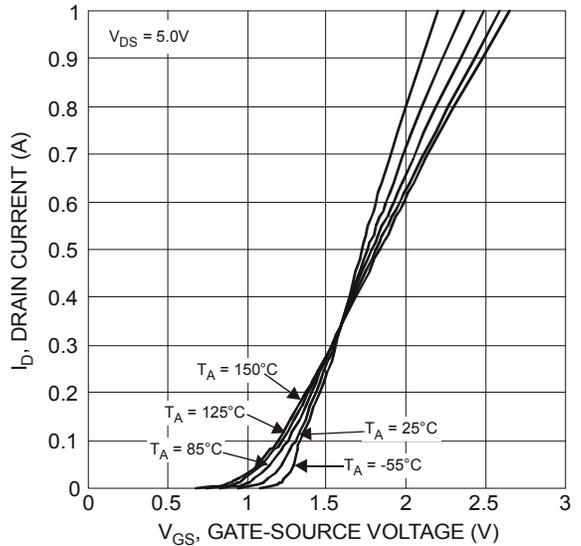


Figure 2 Typical Transfer Characteristics

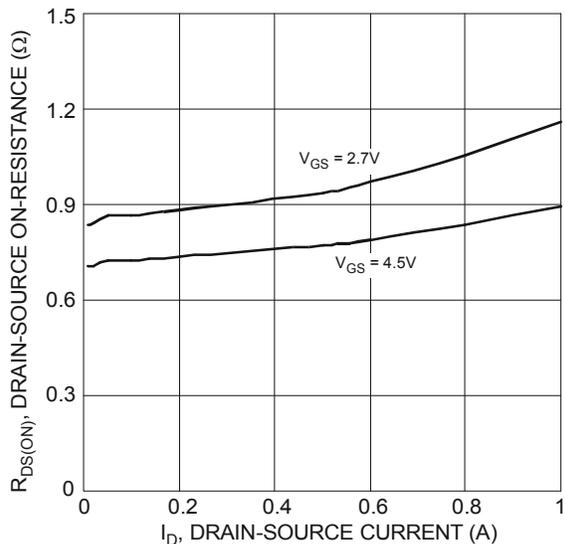


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

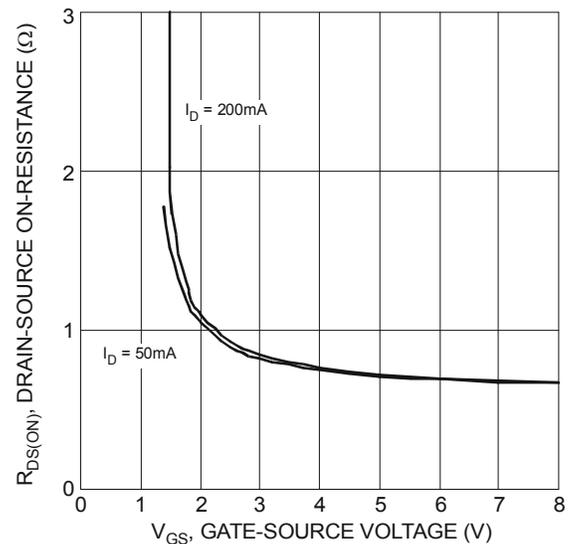


Figure 4 Typical Transfer Characteristics

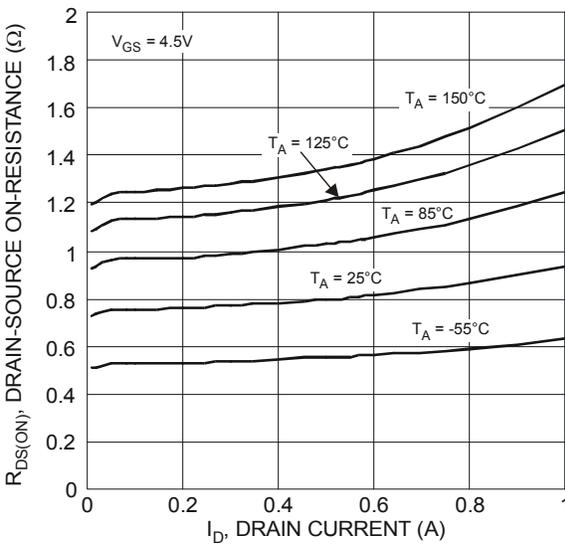


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

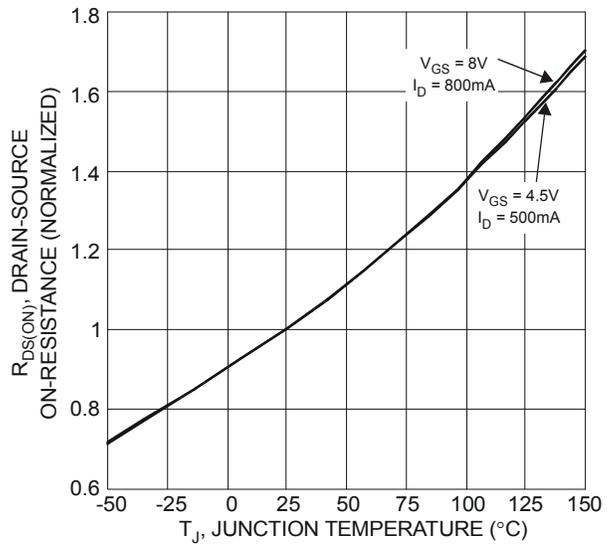


Figure 6 On-Resistance Variation with Temperature

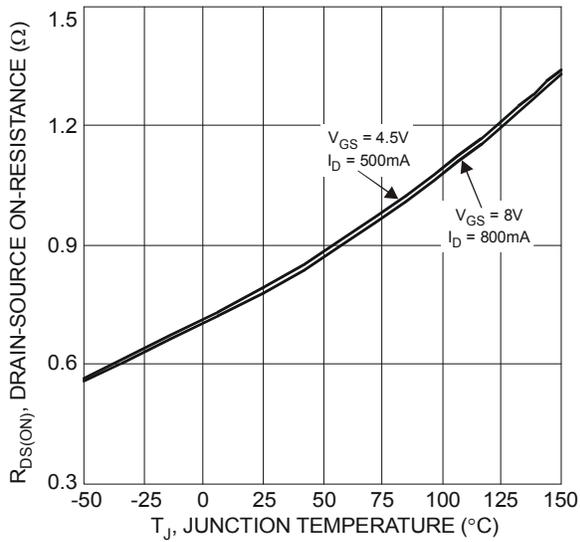


Figure 7 On-Resistance Variation with Temperature

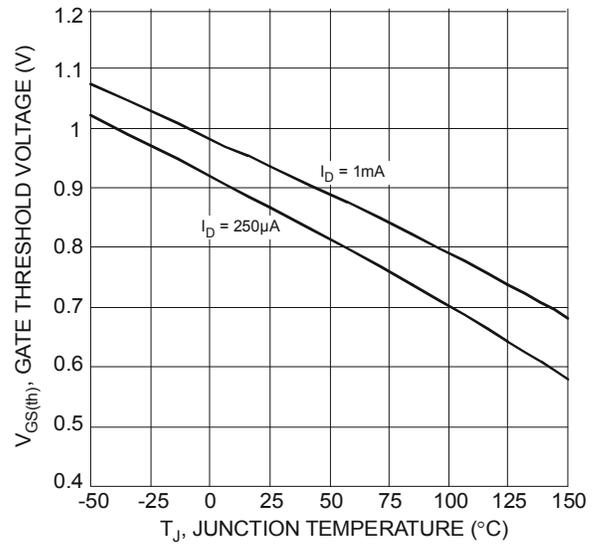


Figure 8 Gate Threshold Variation vs. Ambient Temperature

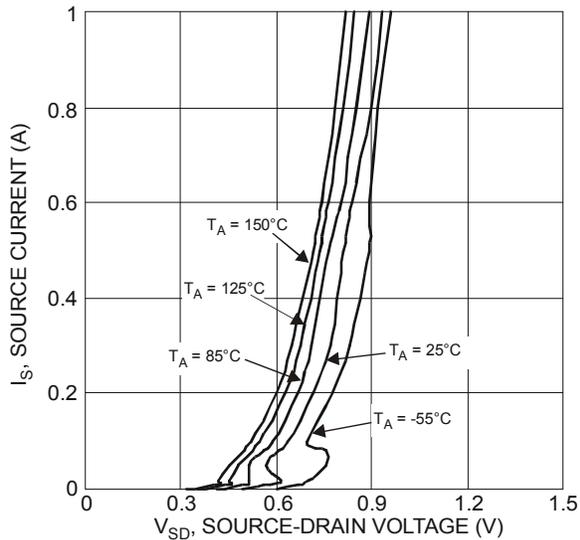


Figure 9 Diode Forward Voltage vs. Current

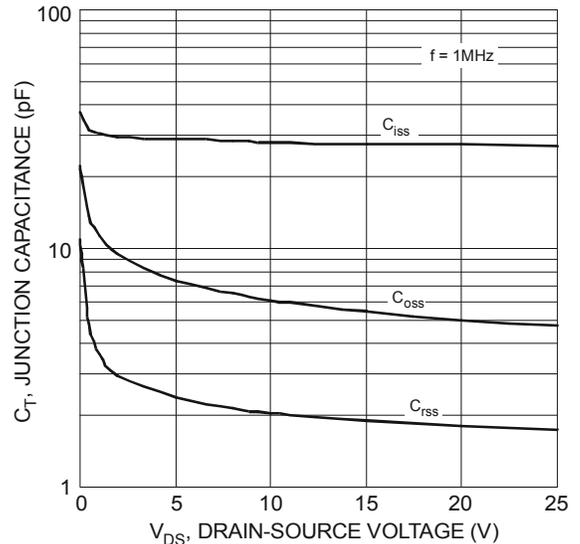


Figure 10 Typical Junction Capacitance

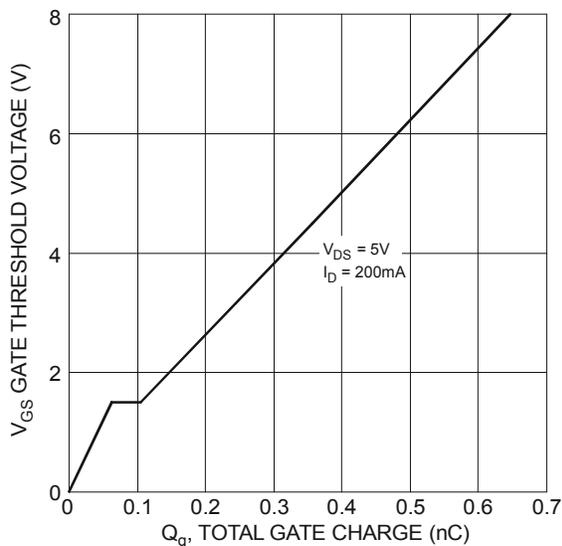
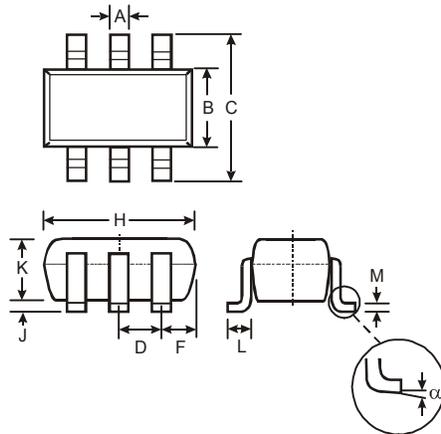


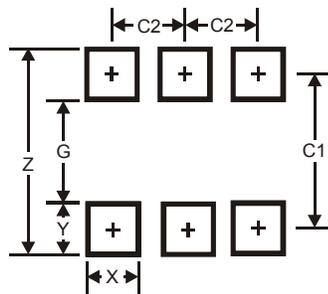
Figure 11 Gate Charge

Package Outline Dimensions



SOT363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65