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

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

企业微信二维码

企业QQ二维码

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = +25°C
60V	7.5Ω @ V_{GS} = 5V	210mA

Features and Benefits

- N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package

Description and Applications

This MOSFET is 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.

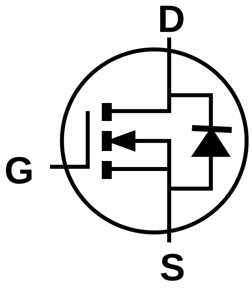
- Motor Control
- Power Management Functions

Mechanical Data

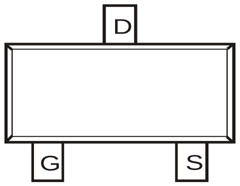
- Case: SOT23
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- 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}	60	V
Gate-Source Voltage		Continuous Pulsed	V_{GSS}	±20 ±40	V
Continuous Drain Current (Note 5) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +85°C T_A = +100°C	I_D	170 120 105	mA
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +85°C T_A = +100°C	I_D	210 150 135	mA
Maximum Body Diode Forward Current (Note 6)		Continuous Pulsed	I_S	0.5 2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	500	mA

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

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P_D	370	mW
	(Note 6)		510	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	341	°C/W
	(Note 6)		249	
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}	60	—	—	V	V_{GS} = 0V, I_D = 10µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	µA	V_{DS} = 60V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	2.0	—	3.0	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\,(ON)}$	—	3.0	7.5	Ω	V_{GS} = 5.0V, I_D = 0.05A
Diode Forward Voltage	V_{SD}	—	0.78	1.5	V	V_{GS} = 0V, I_S = 115mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	26	—	pF	V_{DS} = 25V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	2.8	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	2.1	—	pF	
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	352	—	pC	V_{DS} = 10V, I_D = 250mA
Gate-Source Charge	Q_{gs}	—	203	—		
Gate-Drain Charge	Q_{gd}	—	123	—		
Turn-On Delay Time	$t_{D(on)}$	—	3.7	—	ns	V_{DD} = 30V, I_D = 0.2A, R_L = 150Ω, V_{GEN} = 10V, R_{GEN} = 25Ω
Turn-On Rise Time	t_r	—	2.9	—		
Turn-Off Delay Time	$t_{D(off)}$	—	8.4	—		
Turn-Off Fall Time	t_f	—	4.7	—		
Body Diode Reverse Recovery Time	t_{rr}	-	9.3	-	ns	I_S = 0.5A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{rr}	-	3.5	-	nC	I_S = 0.5A, dI/dt = 100A/µs

Notes:
5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Device mounted on 1” x 1” FR-4 PCB with high coverage 2oz. Copper, single sided.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

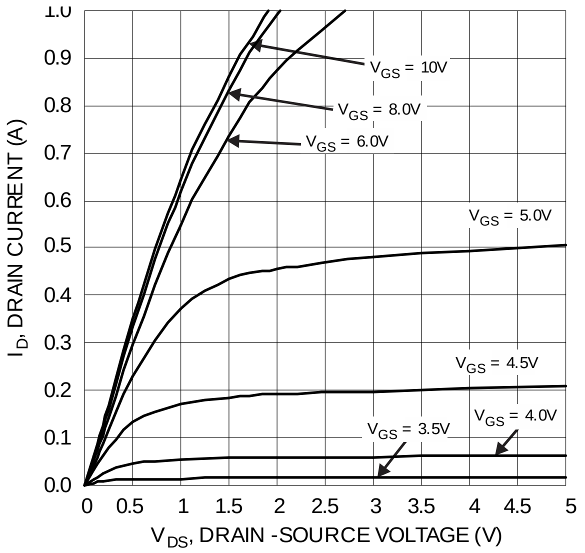


Figure 1 Typical Output Characteristics

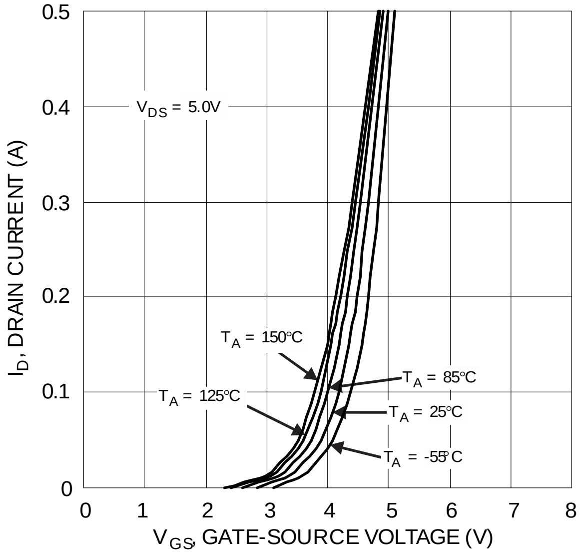


Figure 2 Typical Transfer Characteristics

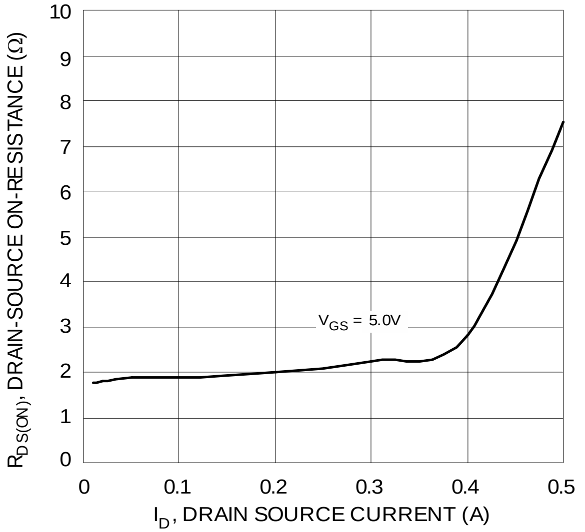


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

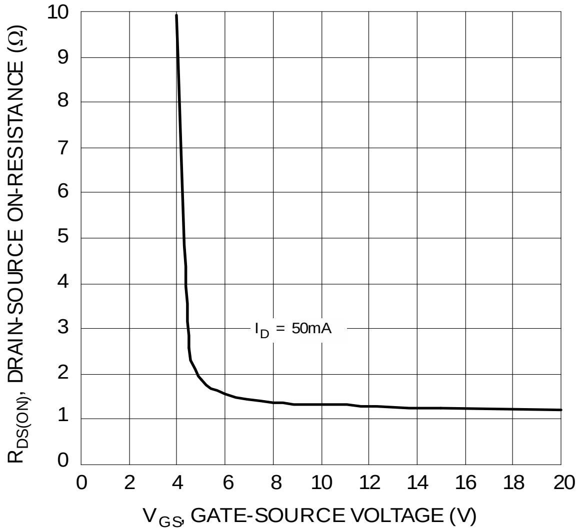


Figure 4 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

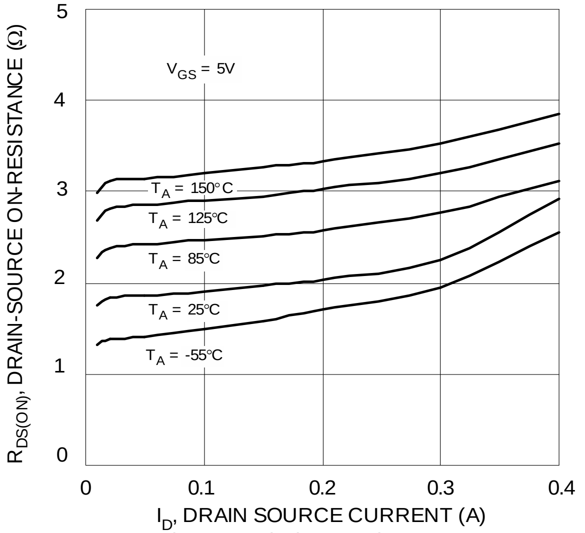


Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

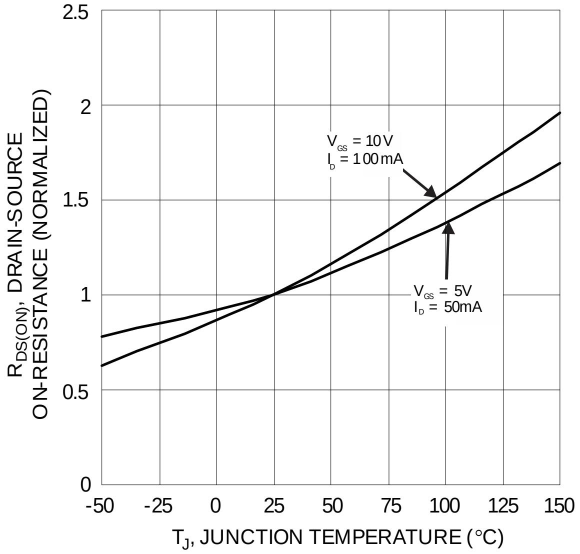


Figure 6 On-Resistance Variation with Temperature

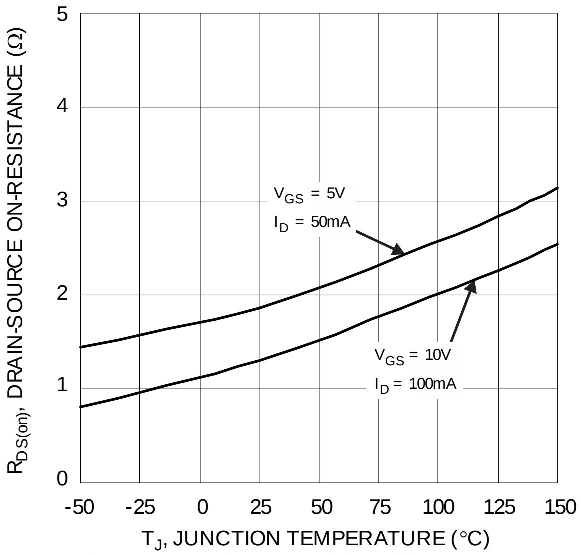


Figure 7 On-Resistance Variation with Temperature

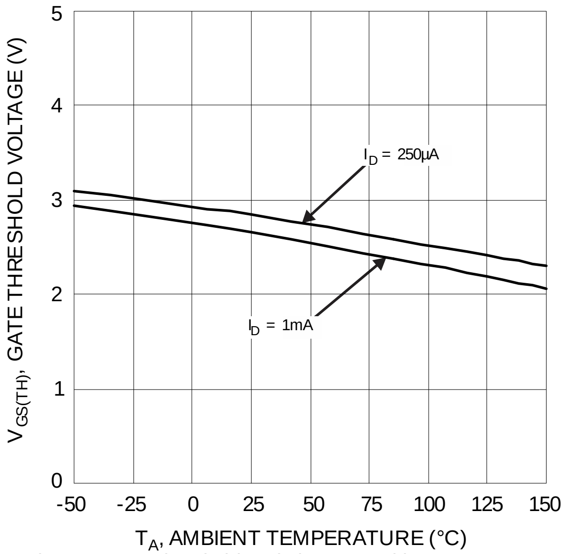


Figure 8 Gate Threshold Variation vs. Ambient Temperature

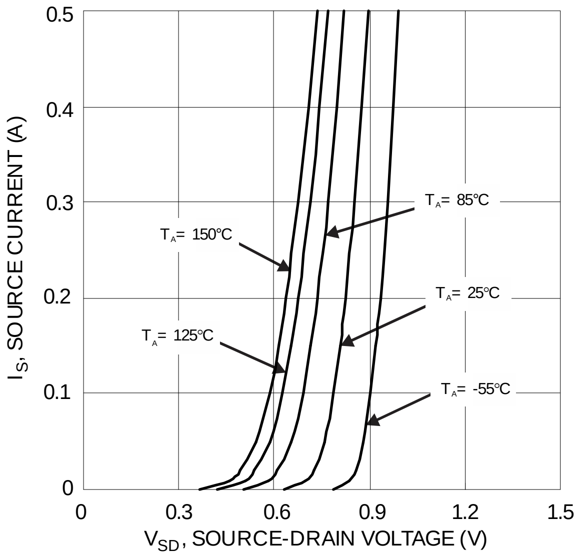


Figure 9 Diode Forward Voltage vs. Current

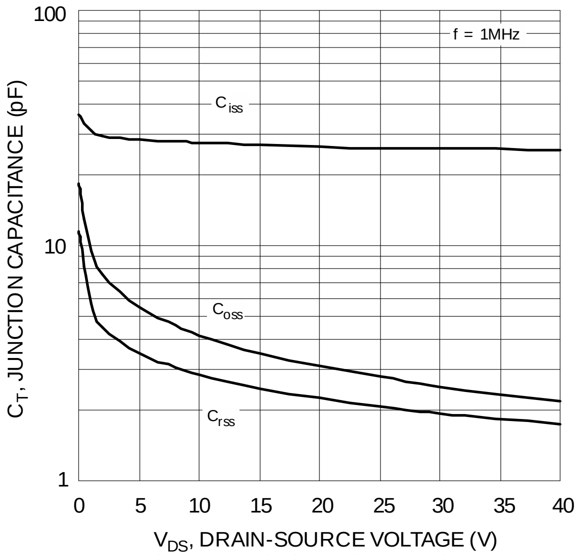


Figure 10 Typical Junction Capacitance

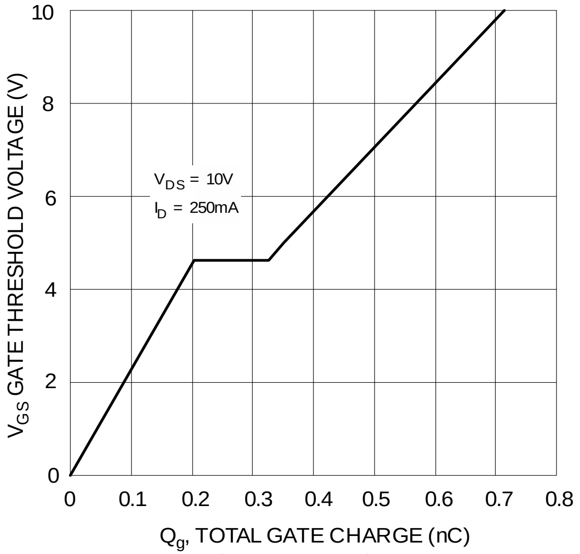


Figure 11 Gate Charge

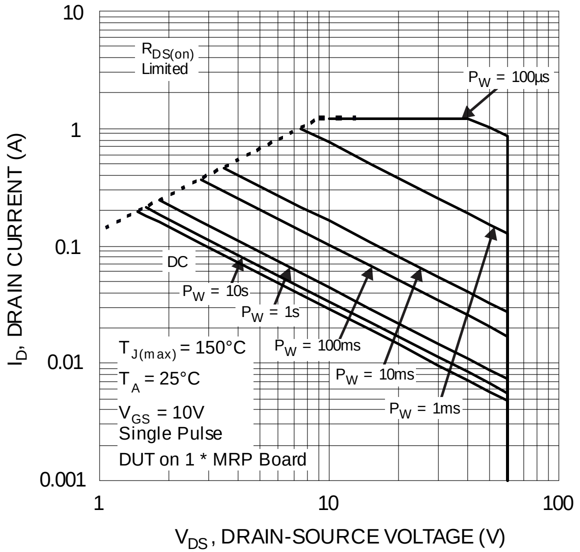


Figure 12 SOA, Safe Operation Area

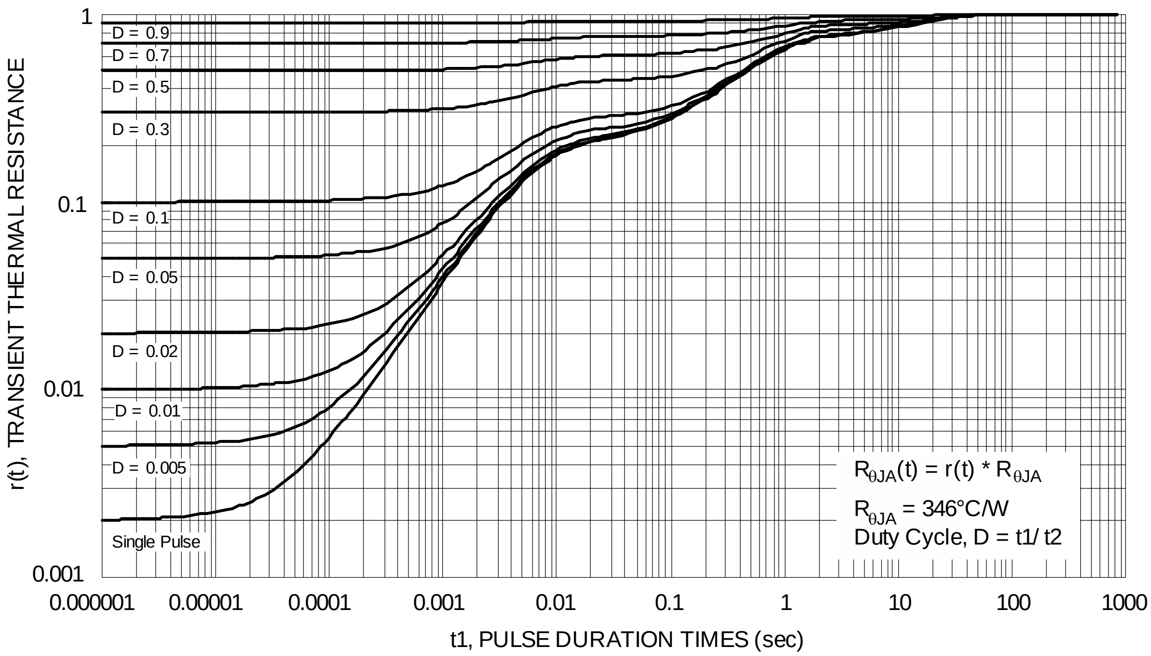
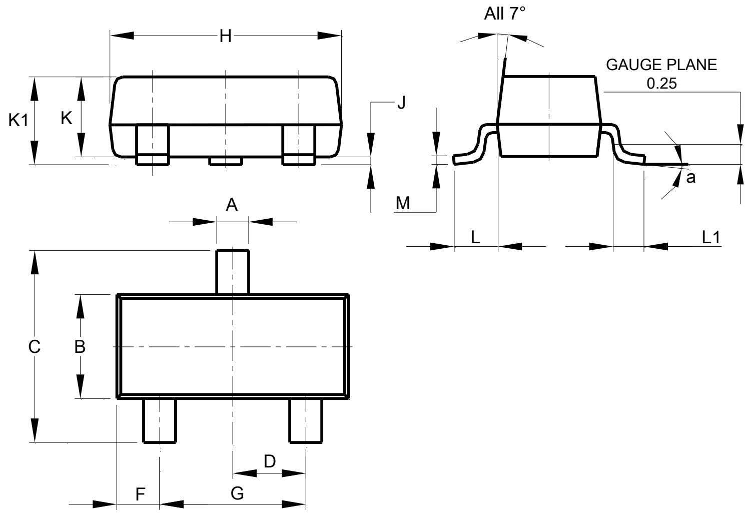


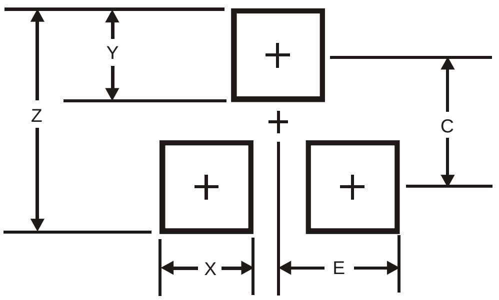
Figure 15 Transient Thermal Resistance

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	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	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