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

$V_{(BR)DSS}$	Max $R_{DS(ON)}$	Package	Max I_D T_A = +25°C
-30V	0.21Ω @ V_{GS}= -10V	SOT23	-1.6A
	0.33Ω @ V_{GS}= -4.5V		-1.1A

Features

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive

Description

This new generation of trench MOSFETs utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, and power management applications.

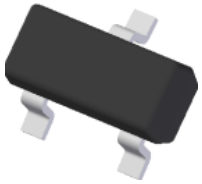
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

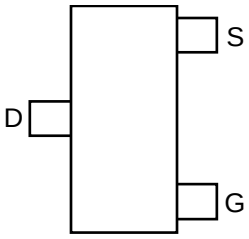
Applications

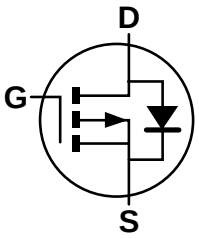
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

SOT23



Top View





Equivalent Circuit

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

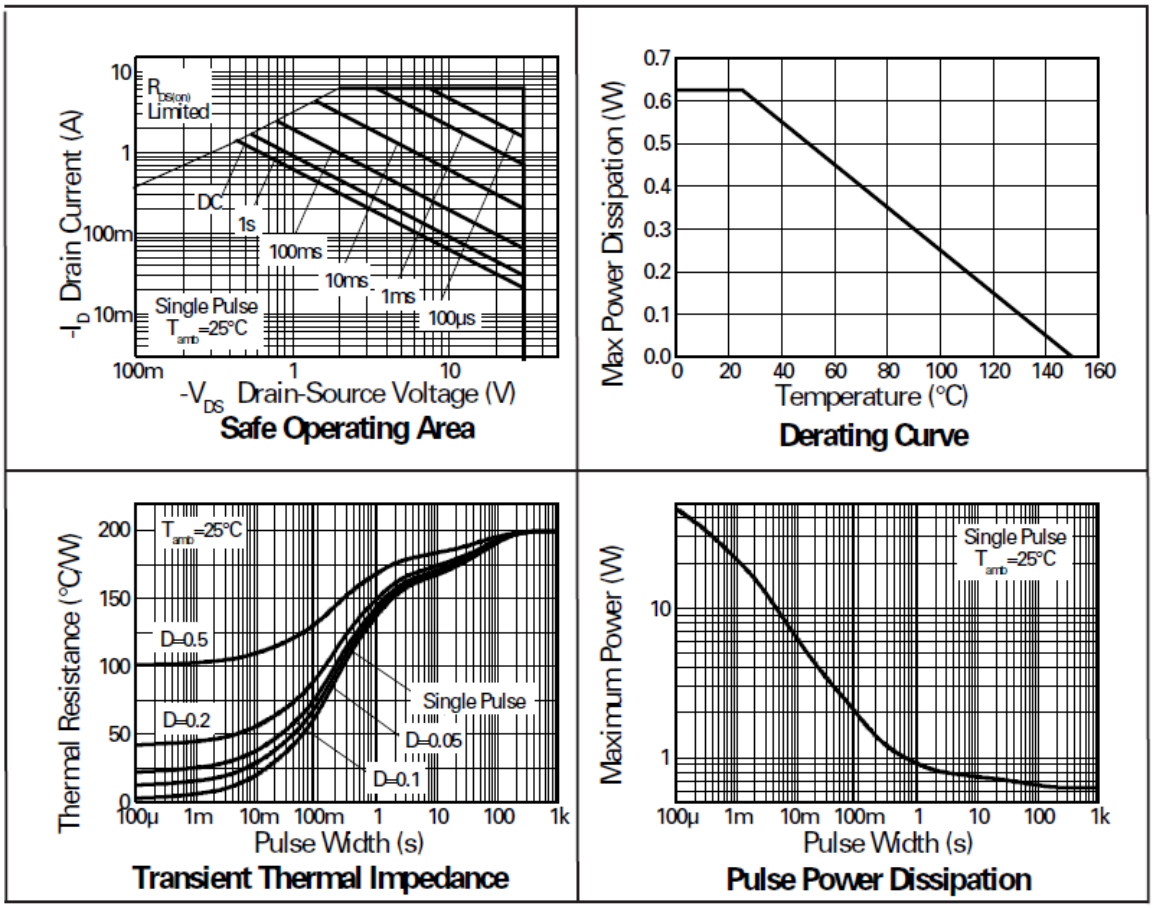
Characteristic				Symbol	Value	Units
Drain-Source Voltage				V_{DSS}	-30	V
Gate-Source Voltage				V_{GS}	±20	V
Continuous Drain Current	V_{GS} = 10V	T_A = +70°C	(Note 6) (Note 6) (Note 5)	I_D	-1.6 -1.3 -1.4	A
Pulsed Drain Current (Note 7)				I_{DM}	-6	A
Continuous Source Current (Body Diode) (Note 6)				I_S	-1.2	A
Pulsed Source Current (Body Diode) (Note 7)				I_{SM}	-6	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	625 5	mW mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	806 6.4	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
6. For a device surface mounted on FR4 PCB measured at t ≤5 secs.
7. Repetitive rating 25mm x 25mm FR4 PCB, D=0.05 pulse width=10μs - pulse current limited by maximum junction temperature.

Thermal Characteristics

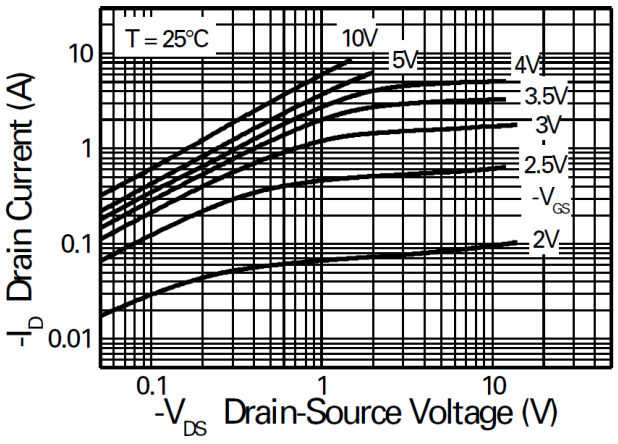


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

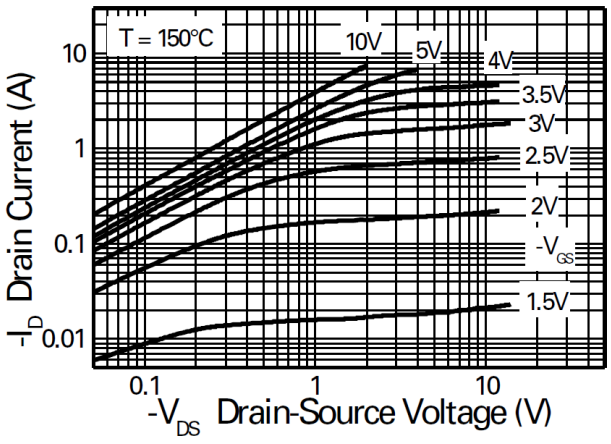
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	I_D = -250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	μA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	—	—	V	I_D = -250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	—	0.21	Ω	V_{GS} = -10V, I_D = -1.4A
				0.33		V_{GS} = -4.5V, I_D = -1.1A
Forward Transconductance (Notes 8 & 10)	g_{fs}	—	2.4	—	S	V_{DS} = -15V, I_D = -1.4A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	206	—	pF	V_{DS} = -15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	59.3	—		
Reverse Transfer Capacitance	C_{rss}	—	49.2	—		
SWITCHING (Notes 9 & 10)						
Turn-On Delay Time	$t_{d(ON)}$	—	1.5	—	nS	V_{DD} = -15V, I_D = -1.0A, $R_G \cong 6.0\Omega$, V_{GS} = -10V
Rise Time	t_R	—	3.0	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	11.1	—		
Fall Time	t_f	—	7.6	—		
Gate Charge	Q_g	—	3.8	—	nC	V_{DS} = -15V, V_{GS} = -5.0V, I_D = -1.4A
Total Gate Charge	Q_g	—	6.4	—	nC	V_{DS} = -15V, V_{GS} = -10V, I_D = -1.4A
Gate-Source Charge	Q_{gs}	—	0.69	—		
Gate-Drain Charge	Q_{gd}	—	2.0	—		
SOURCE-DRAIN DIODE						
Diode Forward Voltage (Note 8)	V_{SD}	—	-0.85	-0.95	V	T_J = +25°C, I_S = -1.1A, V_{GS} = 0V
Reverse Recovery Time (Note 10)	t_{RR}	—	15.6	—	nS	T_J = +25°C, I_F = -0.95A, di/dt = 100A/μs
Reverse Recovery Charge (Note 10)	Q_{RR}	—	9.6	—	nC	

Notes: 8. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.
9. Switching characteristics are independent of operating junction temperature.
10. For design aid only, not subject to production testing.

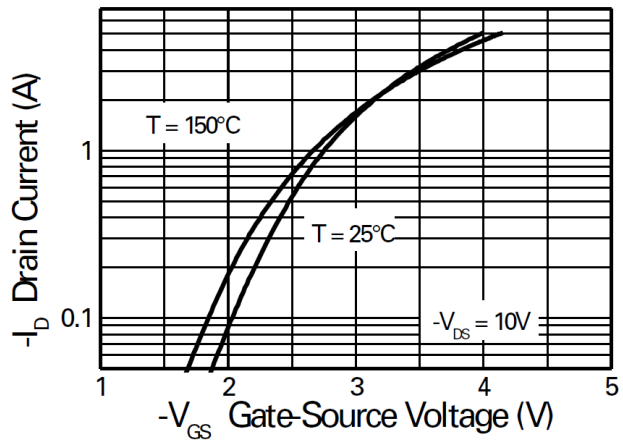
Typical Characteristics



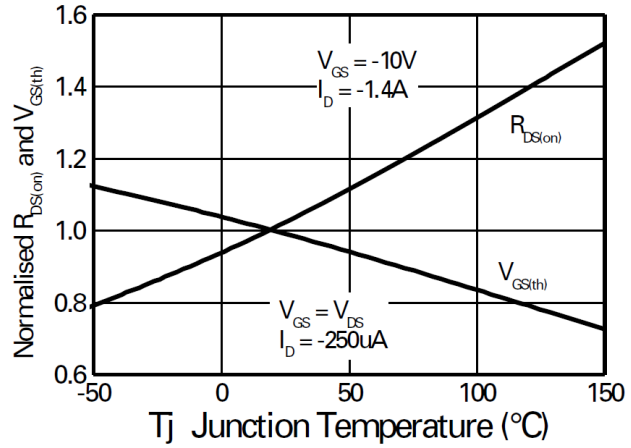
Output Characteristics



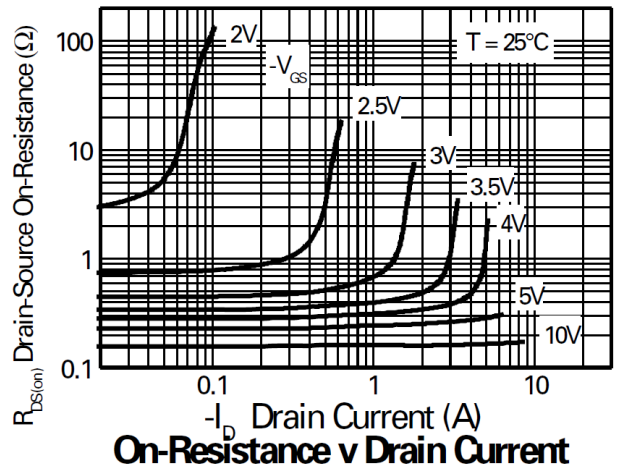
Output Characteristics



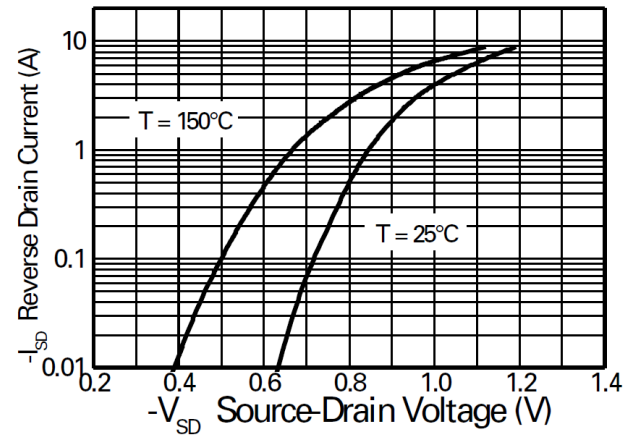
Typical Transfer Characteristics



Normalised Curves v Temperature

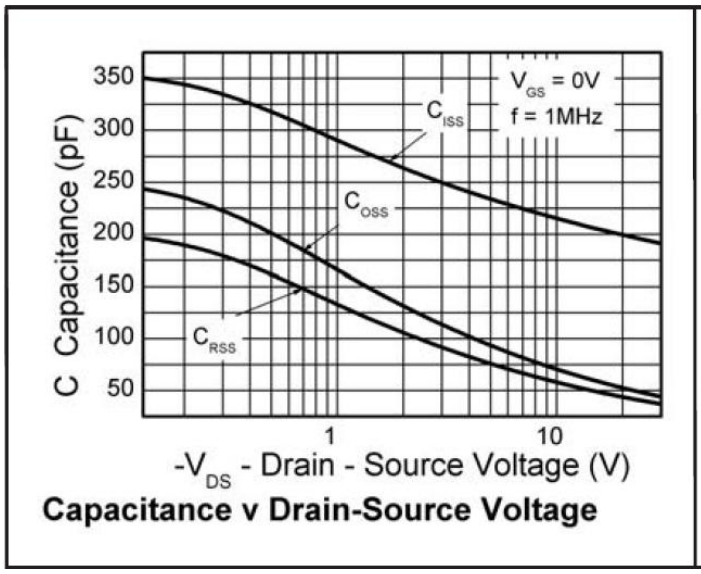


On-Resistance v Drain Current

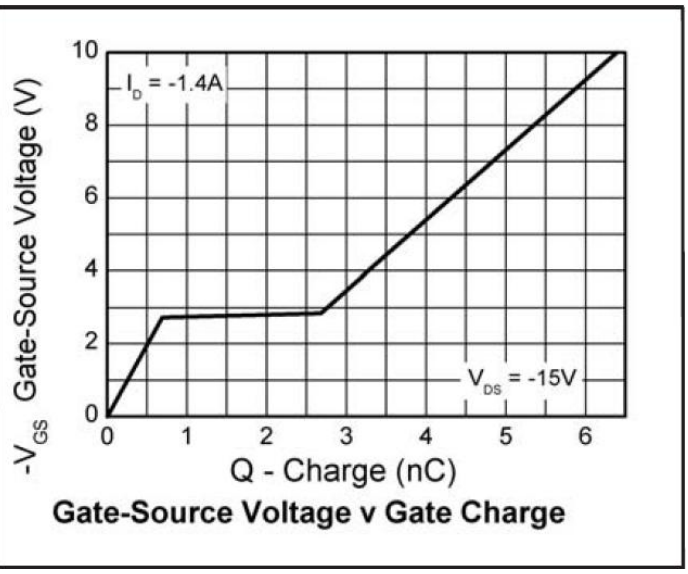


Source-Drain Diode Forward Voltage

Typical Characteristics (Continued)

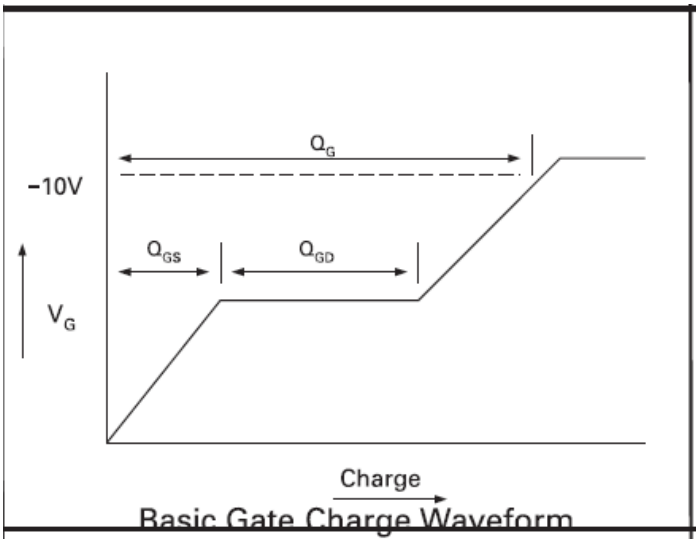


Capacitance v Drain-Source Voltage

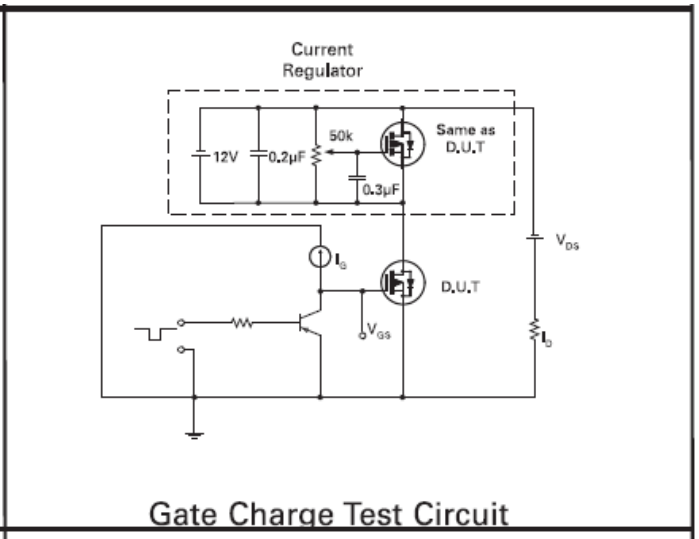


Gate-Source Voltage v Gate Charge

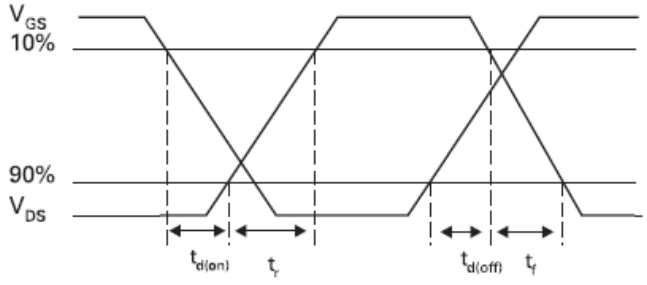
Test Circuits



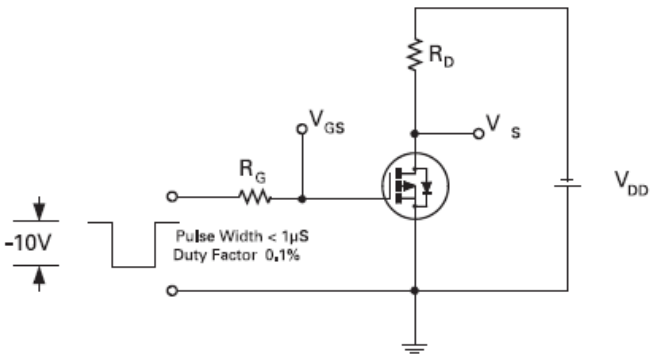
Basic Gate Charge Waveform



Gate Charge Test Circuit



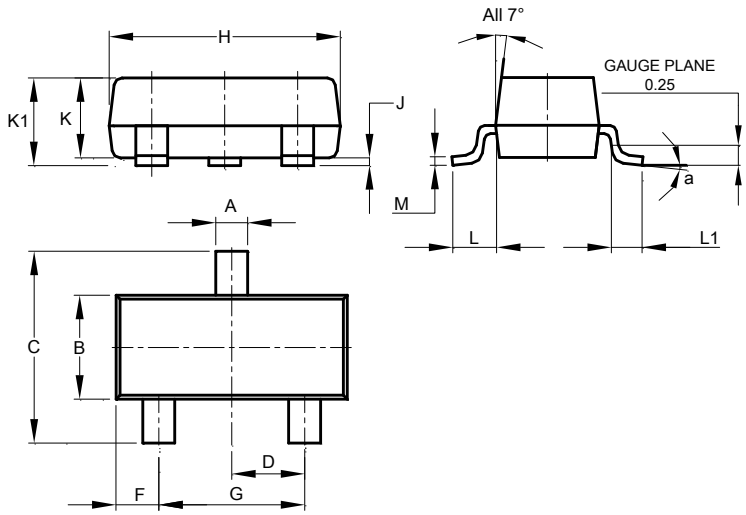
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

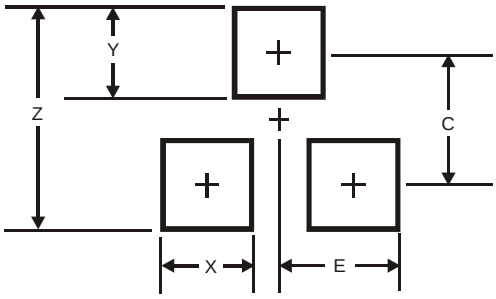
SOT23



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

SOT23



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35