



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

BV _{DSS}	R _{DS(on)}	I _D
		T _A = +25°C
-60V	125mΩ @ V _{GS} = -10V	-4.3A
	190mΩ @ V _{GS} = -4.5V	-3.5A

Features and Benefits

- Fast Switching Speed
- Low Gate Drive
- Low Input Capacitance

Description and Applications

This mosfet is designed to minimize the on-state resistance yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

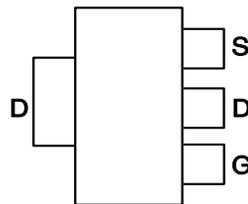
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)



Top View



Pin Out - Top View

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

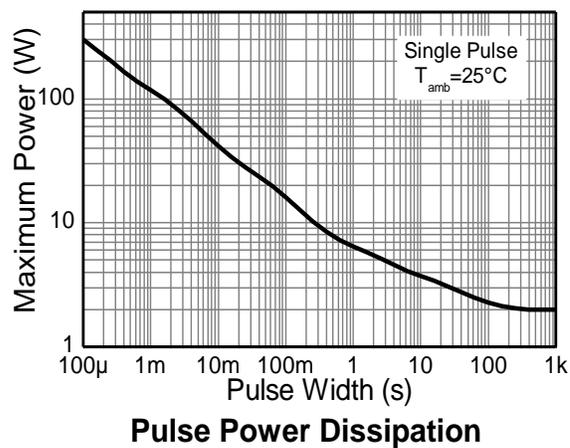
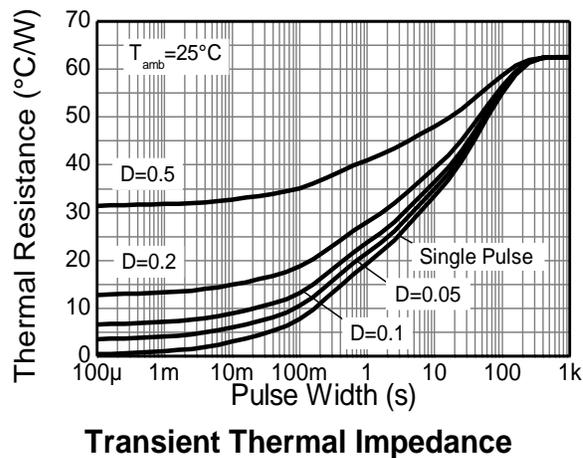
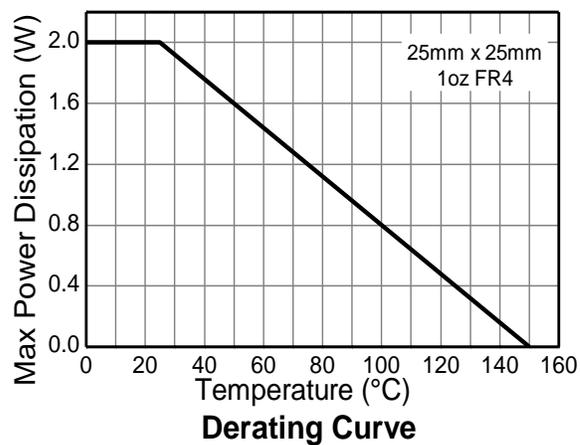
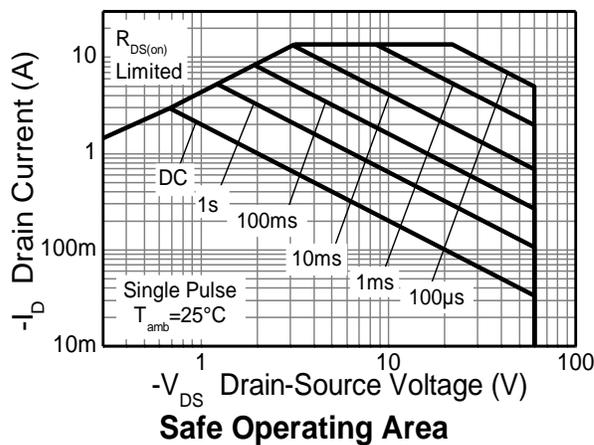
Characteristic			Symbol	Value	Unit	
Drain-Source Voltage			V _{DSS}	-60	V	
Gate-Source Voltage			V _{GSS}	±20	V	
Continuous Drain Current	V _{GS} = 10V	(Note 6)	I _D	-4.3	A	
		T _A = +70°C (Note 6)		-3.5		
		(Note 5)		-3.0		
Pulsed Drain Current	V _{GS} = 10V	(Note 7)	I _{DM}	-13.7	A	
Continuous Source Current (Body Diode)			(Note 6)	I _S	-4.3	A
Pulsed Source Current (Body Diode)			(Note 7)	I _{SM}	-13.7	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P _D	2.0	W mW/°C
			16	
	(Note 6)		3.9 31	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	62.5	°C/W
	(Note 6)		32.0	
Thermal Resistance, Junction to Lead	(Note 8)	R _{θJL}	9.8	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as Note 5, except the device is measured at t ≤ 10sec.
 7. Same as Note 5, except the device is pulsed with D = 0.02 and pulse width 300μs. The pulse current is limited by the maximum junction temperature.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics

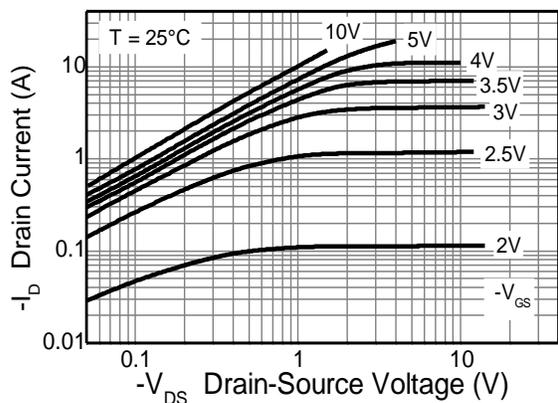


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

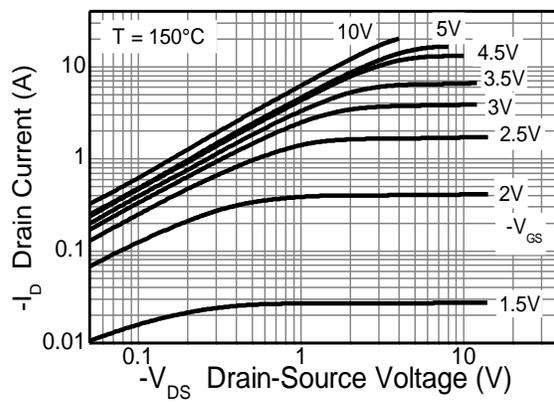
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-60	—	—	V	I _D = -250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-0.5	μA	V _{DS} = -60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 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 9)	R _{DS(ON)}	—	96	125	mΩ	V _{GS} = -10V, I _D = -2.2A
			120	190		V _{GS} = -4.5V, I _D = -1.8A
Forward Transconductance (Notes 9 & 10)	g _{fs}	—	4.7	—	S	V _{DS} = -15V, I _D = -2.2A
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.85	-0.95	V	I _S = -2.0A, V _{GS} = 0V, T _J = +25°C
Reverse Recovery Time (Note 10)	t _{rr}	—	25.1	—	ns	I _S = -1.7A, di/dt = 100A/μs, T _J = +25°C
Reverse Recovery Charge (Note 10)	Q _{rr}	—	27.2	—	nC	
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	637	—	pF	V _{DS} = -30V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	70.0	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	53.0	—	pF	
Total Gate Charge (Note 11)	Q _g	—	9.0	—	nC	V _{GS} = -4.5V
Total Gate Charge (Note 11)	Q _g	—	17.7	—	nC	V _{GS} = -10V V _{DS} = -30V I _D = -2.2A
Gate-Source Charge (Note 11)	Q _{gs}	—	1.6	—	nC	
Gate-Drain Charge (Note 11)	Q _{gd}	—	4.4	—	nC	
Turn-On Delay Time (Note 11)	t _{D(on)}	—	2.6	—	ns	V _{DD} = -30V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω
Turn-On Rise Time (Note 11)	t _r	—	3.4	—	ns	
Turn-Off Delay Time (Note 11)	t _{D(off)}	—	26.2	—	ns	
Turn-Off Fall Time (Note 11)	t _f	—	11.3	—	ns	

- Notes:
9. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 10. For design aid only, not subject to production testing.
 11. Switching characteristics are independent of operating junction temperatures.

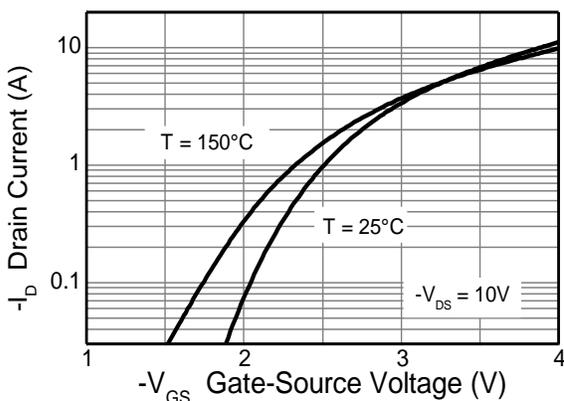
Typical Characteristics



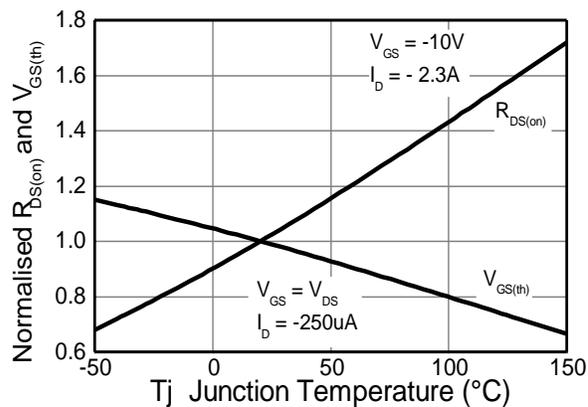
Output Characteristics



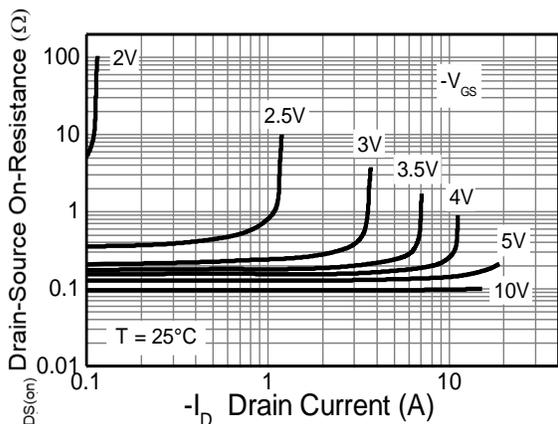
Output Characteristics



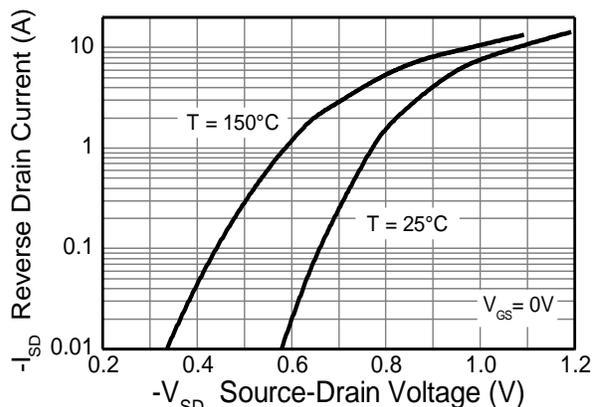
Typical Transfer Characteristics



Normalised Curves v Temperature

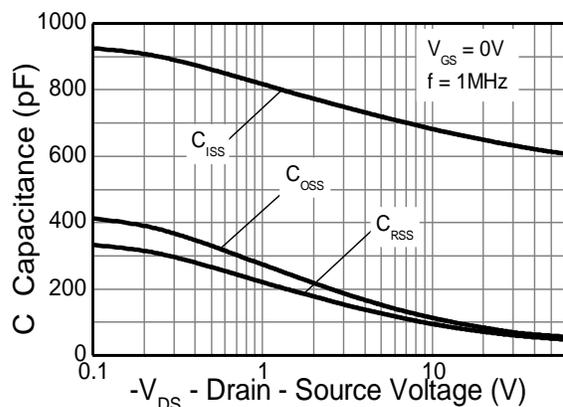


On-Resistance v Drain Current

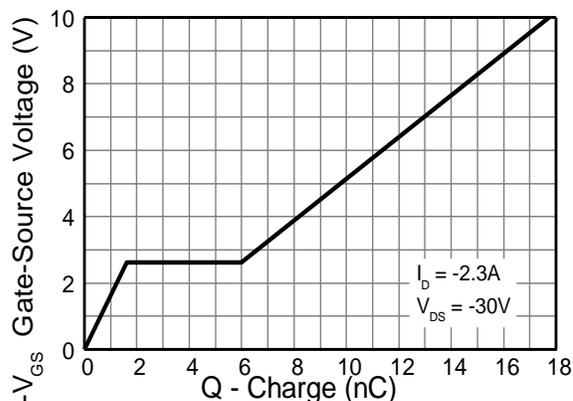


Source-Drain Diode Forward Voltage

Typical Characteristics (continued)

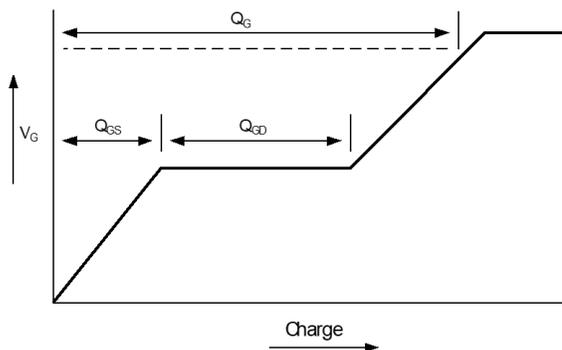


Capacitance v Drain-Source Voltage

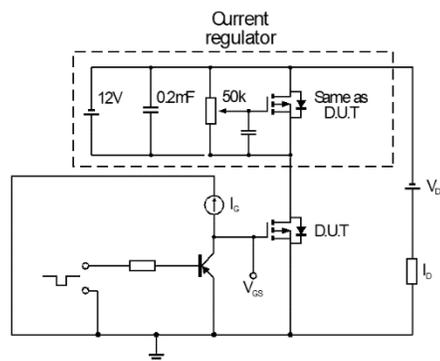


Gate-Source Voltage v Gate Charge

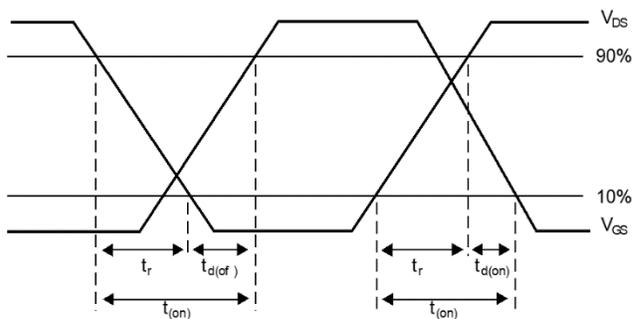
Test Circuits



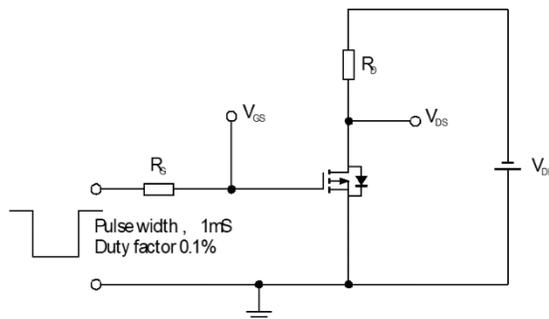
Basic gate charge waveform



Gate charge test circuit



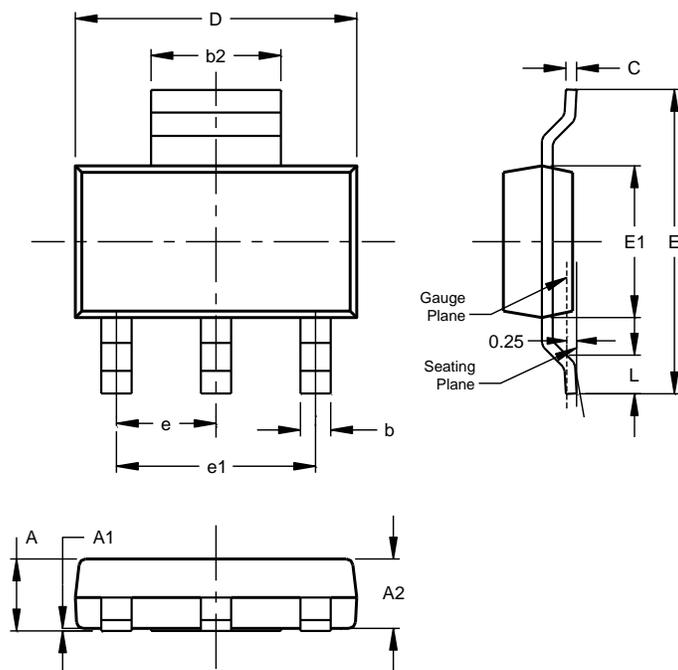
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

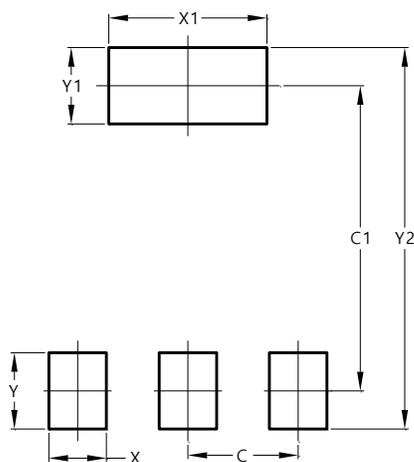
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00