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

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Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
100V	0.54Ω @ V_{GS} = 10V	1.67A
	0.75Ω @ V_{GS} = 5V	1.42A

Features and Benefits

- BV_{DSS} > 100V
- $R_{DS(ON)}$ ≤ 0.54Ω @ V_{GS} = 10V
- Maximum Continuous Drain Current I_D = 1.67A

Description and Applications

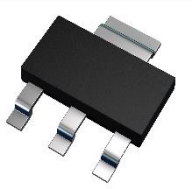
This MOSFET is designed to minimize the on-state resistance yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- DC-DC converters
- Solenoids/relay driver for automotive applications

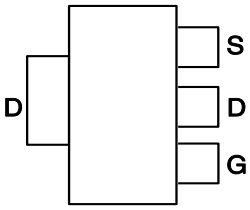
Mechanical Data

- Package: SOT223
- Package 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 e3
- Weight: 0.112 grams (Approximate)

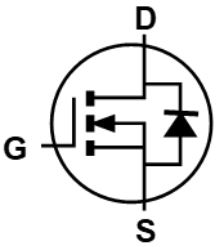
SOT223 (Type DN)



Top View



Pin Out - Top View



Equivalent Circuit

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	1.67	A
Pulsed Drain Current (Note 6)	I_{DM}	12	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	41.7	°C/W
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	8.84	°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 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	V_{GS} = 0V, I_D = 1mA
Zero Gate Voltage Drain Current, T_J = +25°C	I_{DSS}	—	—	10 100	μA μA	V_{DS} = 100V, V_{GS} = 0V V_{DS} = 80V, V_{GS} = 0V, T_A = +125°C
Gate-Source Leakage	I_{GSS}	—	—	±20	nA	V_{GS} = ±20V, V_{DS} = 0V
On-State Drain Current	$I_{D(ON)}$	9	—	—	A	V_{GS} = 10V, V_{DS} = 10V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	V_{DS} = V_{GS}, I_D = 1mA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.4 0.5	0.54 0.75	Ω	V_{GS} = 10V, I_D = 3.3A V_{GS} = 5V, I_D = 1.5A
Forward Transconductance	g_{fs}	0.6	—	—	S	V_{DS} = 10V, I_D = 3.3A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	—	350	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	—	140	pF	
Reverse Transfer Capacitance	C_{rss}	—	—	20	pF	
Turn-On Delay Time	$t_{D(ON)}$	—	—	8	ns	V_{DD} = 25V, I_D = 3A, V_{GEN} = 10V, R_{GS} = 50Ω
Turn-On Rise Time	t_R	—	—	25	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	—	30	ns	
Turn-Off Fall Time	t_F	—	—	16	ns	

Notes:
5. For a device mounted on 50mm X 50mm X 1.6mm FR-4 PCB with high coverage of single sided 2oz copper, in still air condition.
6. Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.
7. Thermal resistance from junction to solder-point (at the end of the drain lead).
8. Short duration pulse test used to minimize self-heating effect.

Electrical Characteristics

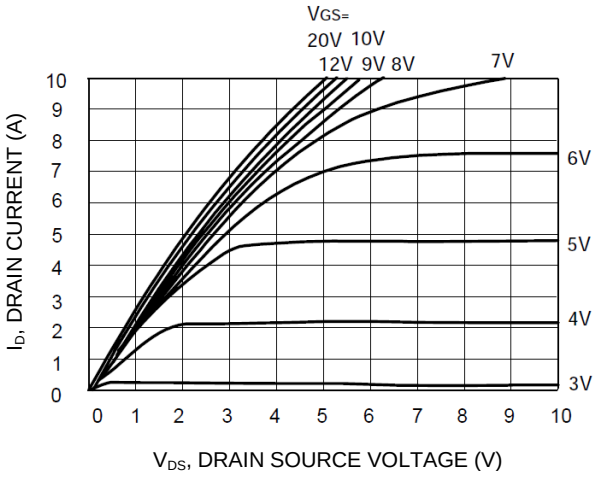


Figure 1. Saturation Characteristics

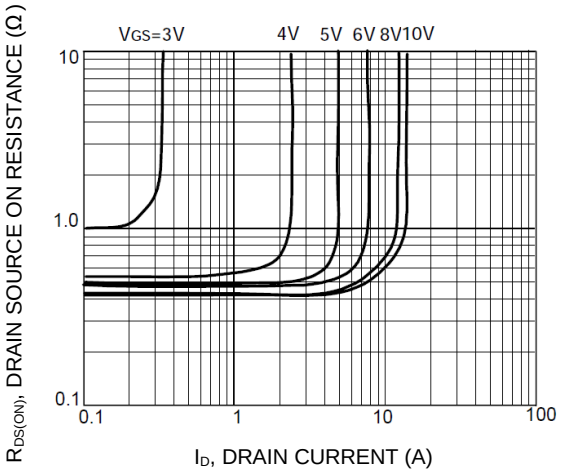


Figure 2. On-Resistance vs. Drain Current

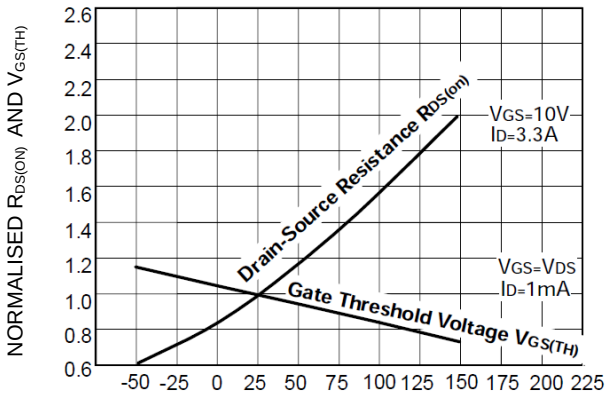


Figure 3. Normalised $R_{DS(ON)}$ and $V_{GS(TH)}$ vs. Temperature

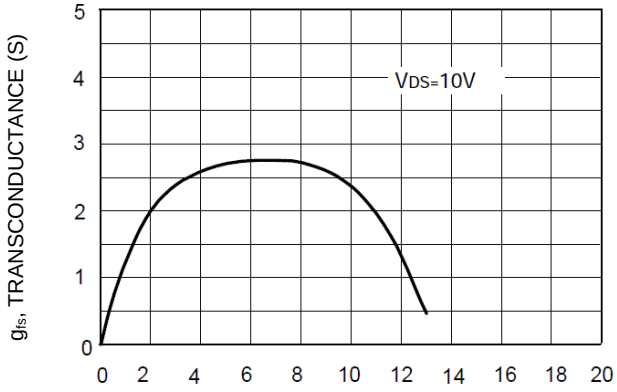


Figure 4. Transconductance vs. Drain Current

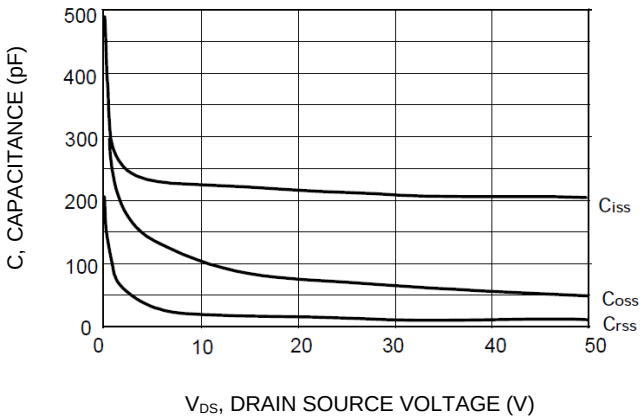


Figure 5. Capacitance vs. Drain-Source Voltage

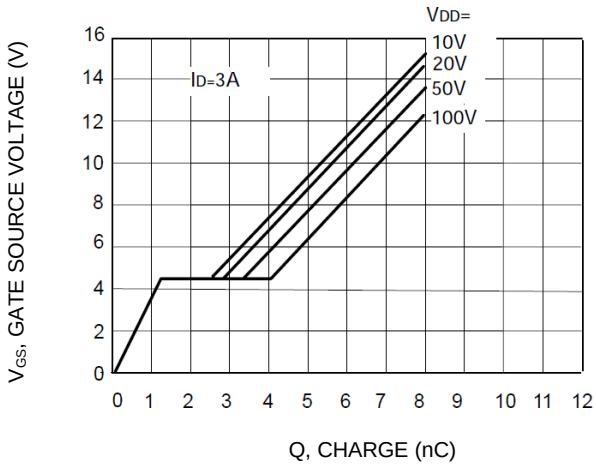
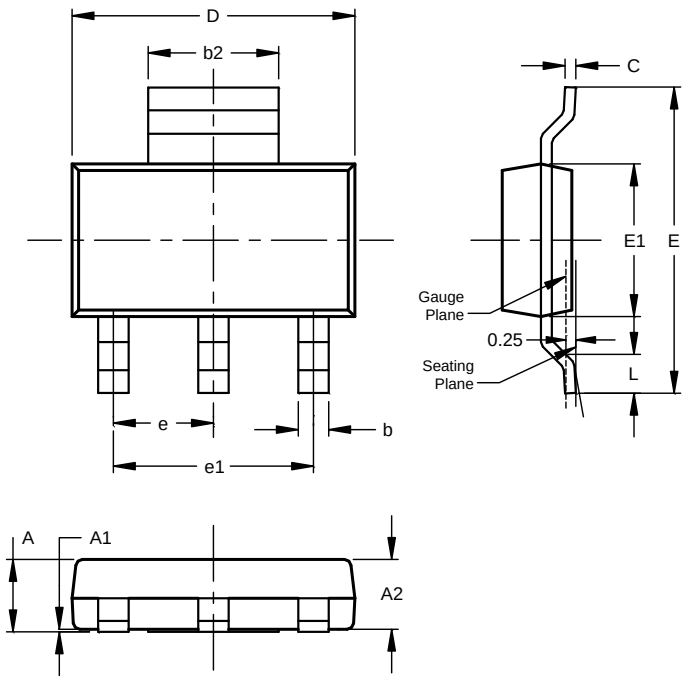


Figure 6. Gate Charge vs. Gate-Source Voltage

Package Outline Dimensions

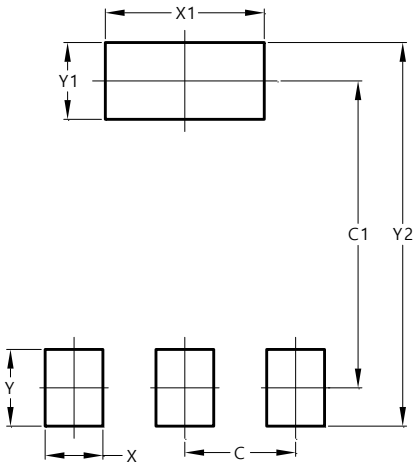
SOT223 (Type DN)



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