



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 <sub>DSS</sub>	R <sub>DS(on)</sub> max	I <sub>D</sub> max T <sub>A</sub> = 25°C
100V	3.0Ω @ V <sub>GS</sub> = 10V	0.6A
	4.5Ω @ V <sub>GS</sub> = 5.0V	0.5A

## Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(on)</sub>) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- DC-DC converters
- Power management functions

## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

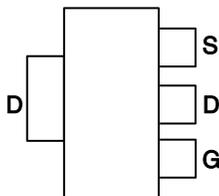
## Mechanical Data

- Package: SOT223 (Type DN)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.112 grams (Approximate)

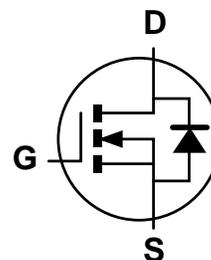
SOT223 (Type DN)



Top View



Pin Out - Top View



Equivalent Circuit

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	100	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	$I_D$	0.6	A
		$T_A = +70^\circ\text{C}$		0.5	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle $\leq 1\%$ )			$I_{DM}$	6	A
Maximum Body Diode Continuous Current (Note 6)			$I_S$	0.6	A

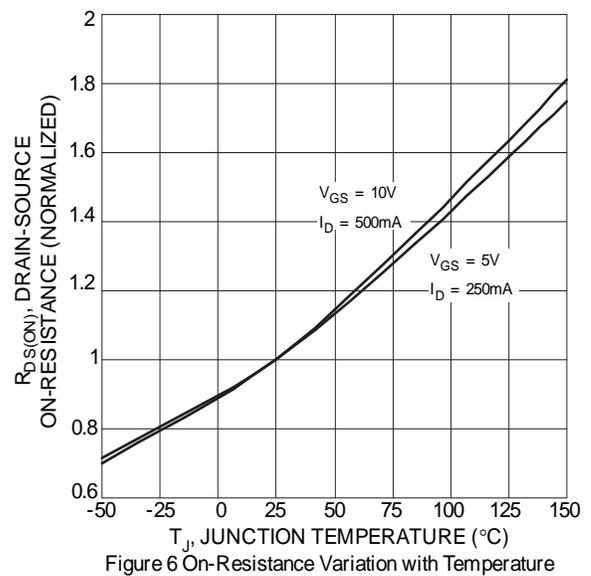
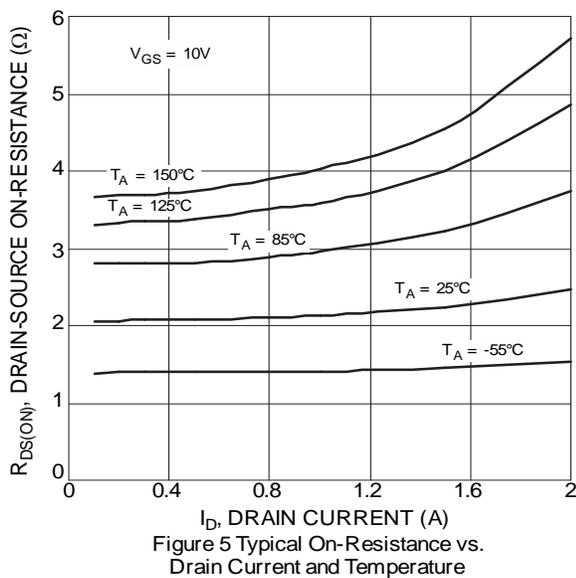
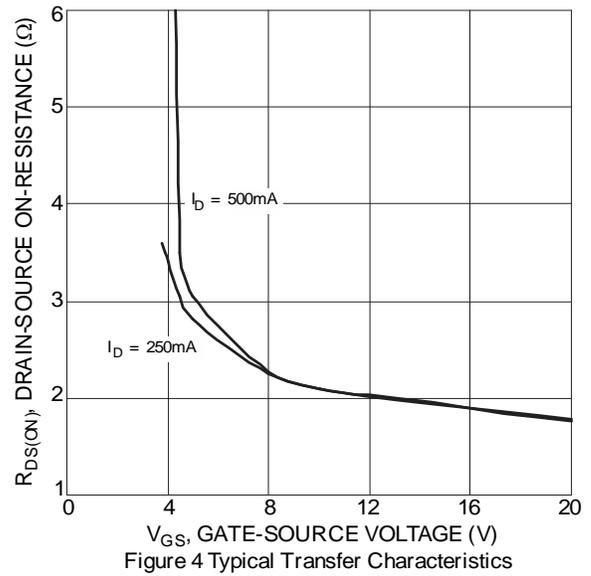
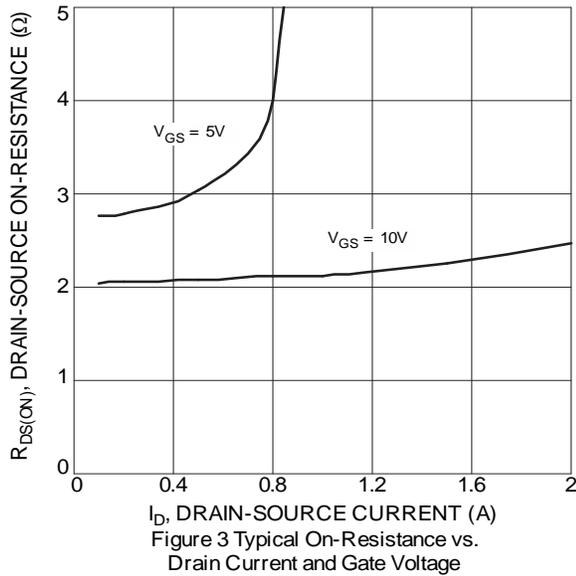
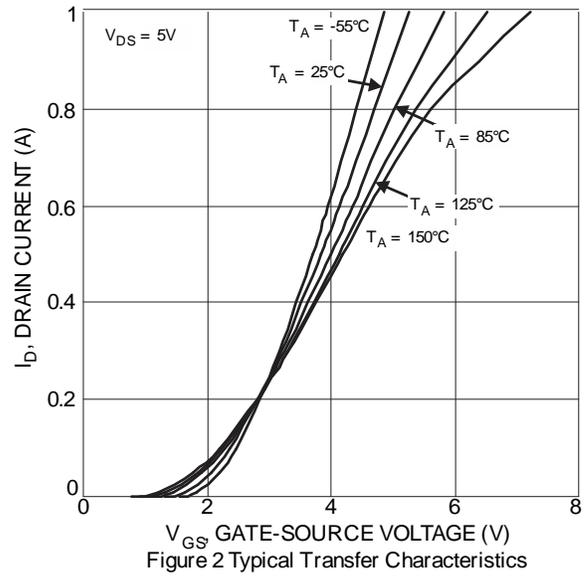
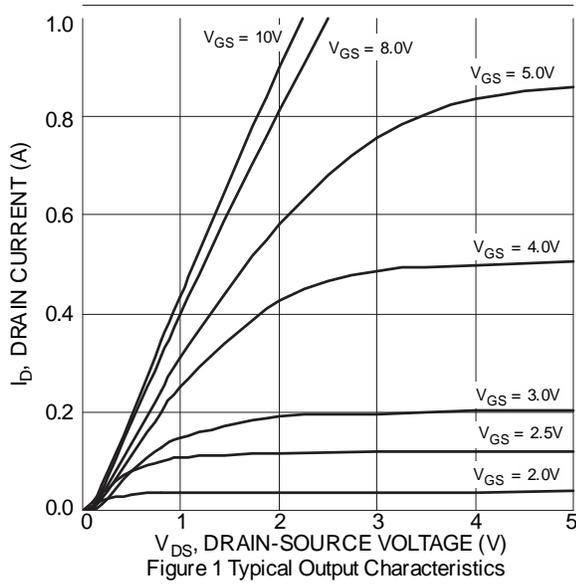
**Thermal Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

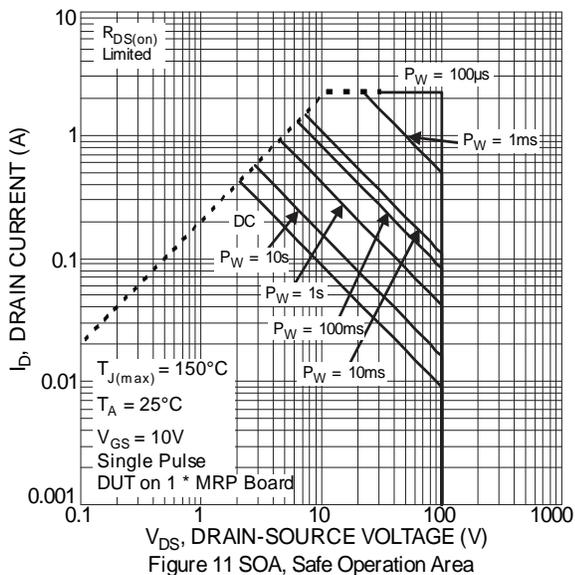
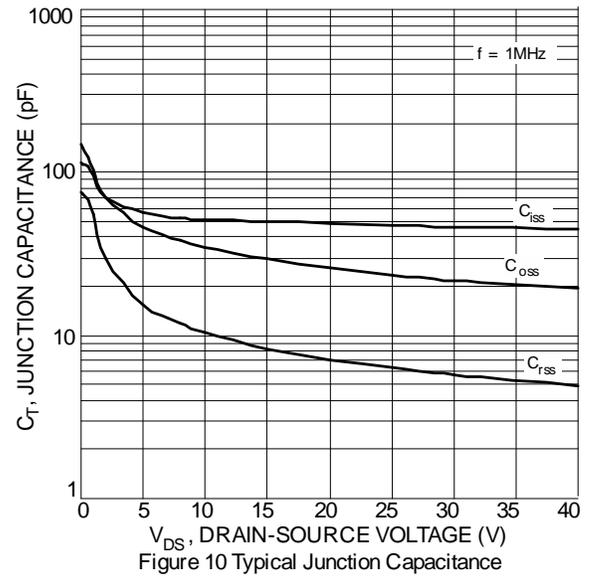
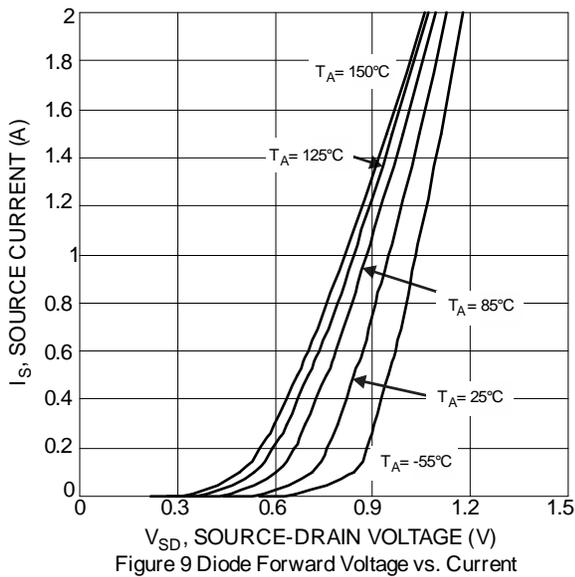
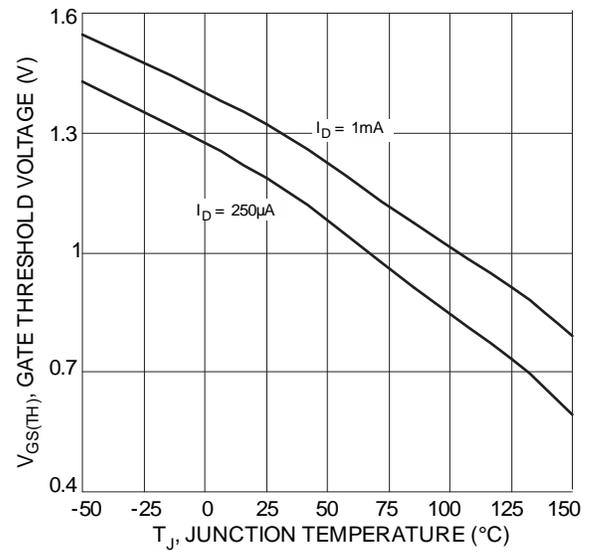
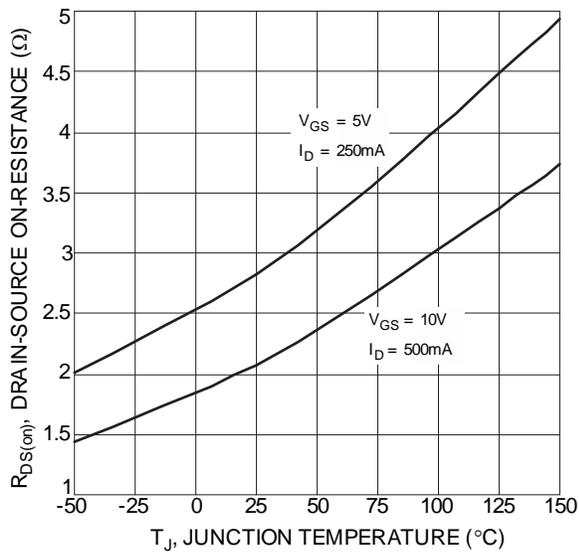
Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	$P_D$	1.1	W
	(Note 6)		2.0	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	$^\circ\text{C/W}$
	(Note 6)		61	
Thermal Resistance, Junction to Case	(Note 6)	$R_{\theta JC}$	6.6	$^\circ\text{C}$
Operating and Storage 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
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	100	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	10 100	$\mu\text{A}$	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$ $V_{DS} = 80\text{V}, V_{GS} = 0\text{V}, T_J = +125^\circ\text{C}$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
On-State Drain Current	$I_{D(on)}$	750	—	—	mA	$V_{DS} = 25\text{V}, V_{GS} = 5\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.75	—	1.5	V	$V_{DS} = V_{GS}, I_D = 1\text{mA}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	3.0	$\Omega$	$V_{GS} = 10\text{V}, I_D = 500\text{mA}$
		—	—	4.5		$V_{GS} = 5.0\text{V}, I_D = 250\text{mA}$
Forward Transconductance	$g_{fs}$	225	—	—	mS	$V_{DS} = 25\text{V}, I_D = 500\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	47	75	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	23	25		
Reverse Transfer Capacitance	$C_{rss}$	—	6	8		
Turn-On Delay Time	$t_{D(on)}$	—	2	7	ns	$V_{DD} = 25\text{V}, V_{GS} = 10\text{V},$ $R_G = 6.0\Omega, I_D = 1.0\text{A}$
Turn-On Rise Time	$t_R$	—	3	12		
Turn-Off Delay Time	$t_{D(off)}$	—	5	15		
Turn-Off Fall Time	$t_F$	—	2	13		

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.





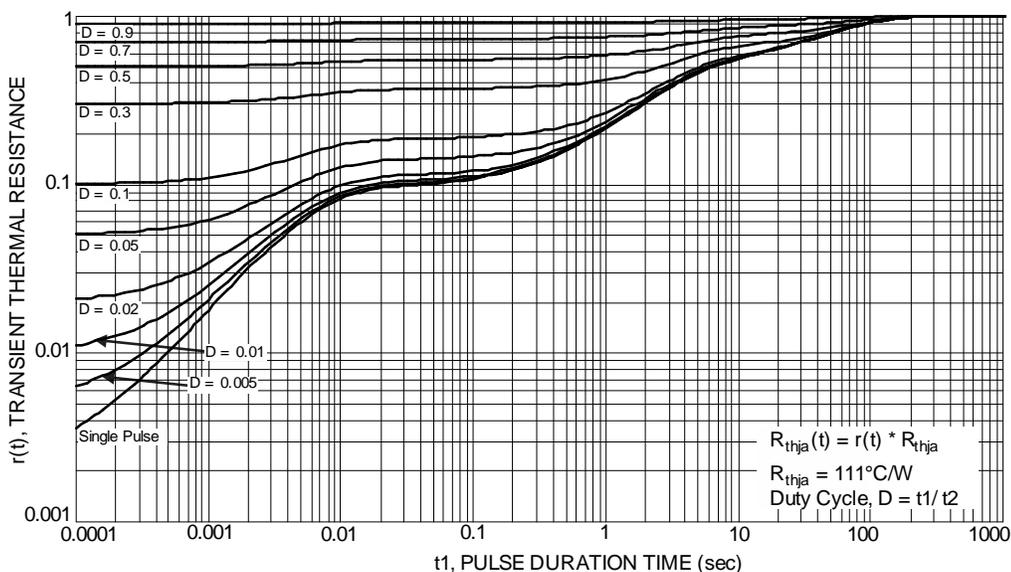
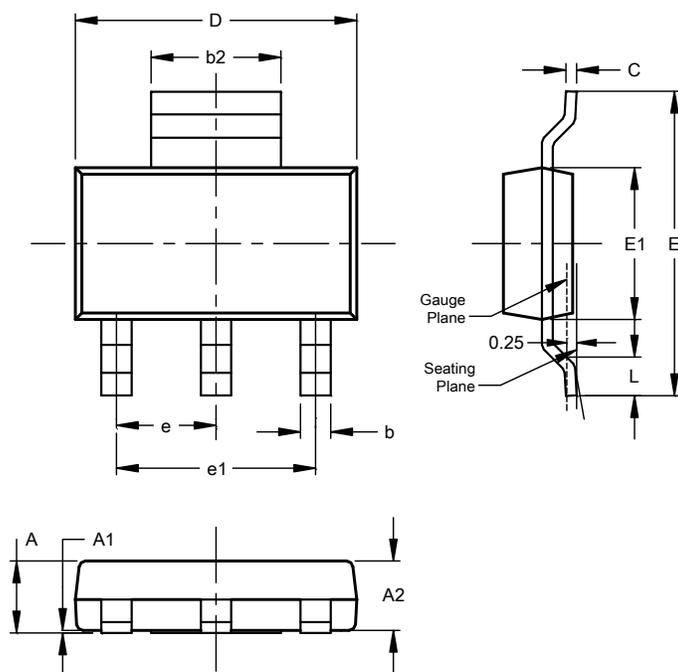


Figure 12 Transient Thermal Resistance

### Package Outline Dimensions

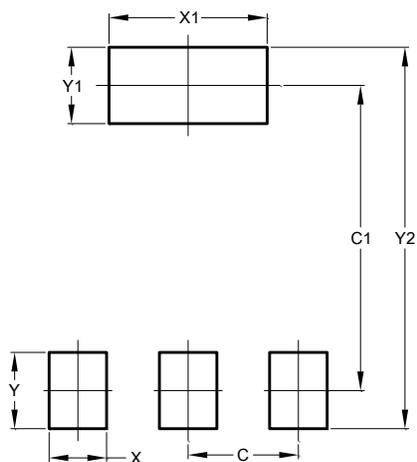
SOT223 (Type DN)



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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