



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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企业微信二维码



企业QQ二维码

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
60V	5Ω @ V <sub>GS</sub> = 10V	210mA
	7.5Ω @ V <sub>GS</sub> = 5V	170mA

## Features and Benefits

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

## Description and Applications

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

- Motor controls
- Power-management functions

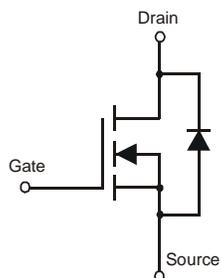
## Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.009 grams (Approximate)

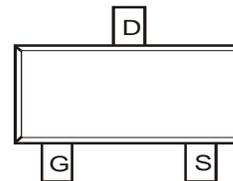
SOT23 (Standard)



Top View



Equivalent Circuit



Top View

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

Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		$V_{DSS}$	60	V	
Drain-Gate Voltage $R_{GS} \leq 1.0M\Omega$		$V_{DGR}$	60	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$ $\pm 40$	V	
Continuous Drain Current (Note 5) $V_{GS} = 10V$	Steady State	$I_D$	$T_A = +25^\circ\text{C}$	170	mA
			$T_A = +85^\circ\text{C}$	120	
			$T_A = +100^\circ\text{C}$	105	
Continuous Drain Current (Note 6) $V_{GS} = 10V$	Steady State	$I_D$	$T_A = +25^\circ\text{C}$	210	mA
			$T_A = +85^\circ\text{C}$	150	
			$T_A = +100^\circ\text{C}$	135	
Maximum Continuous Body Diode Forward Current (Note 6)		$I_S$	0.2	A	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			800		mA

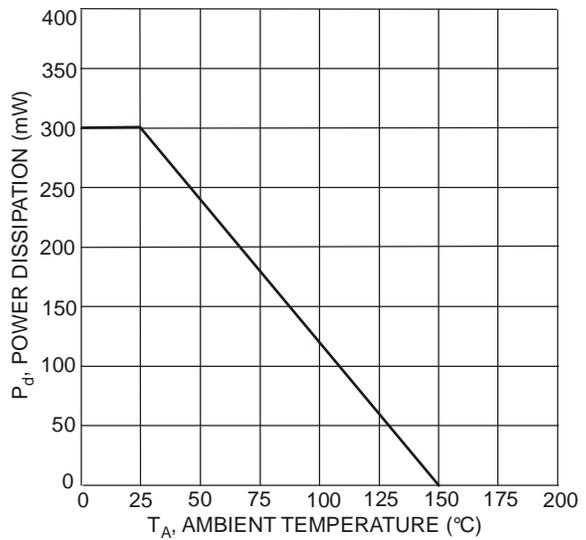
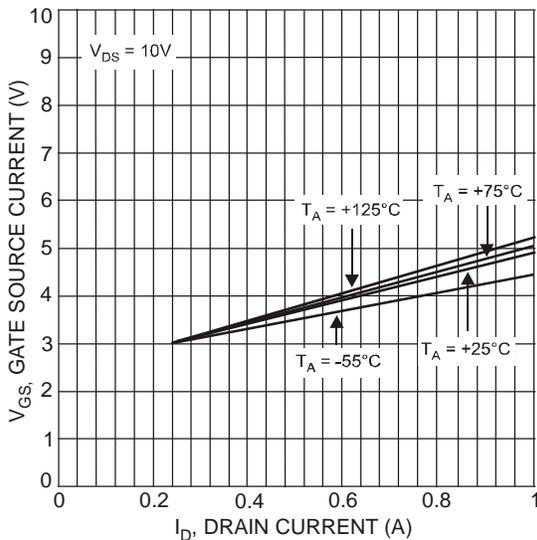
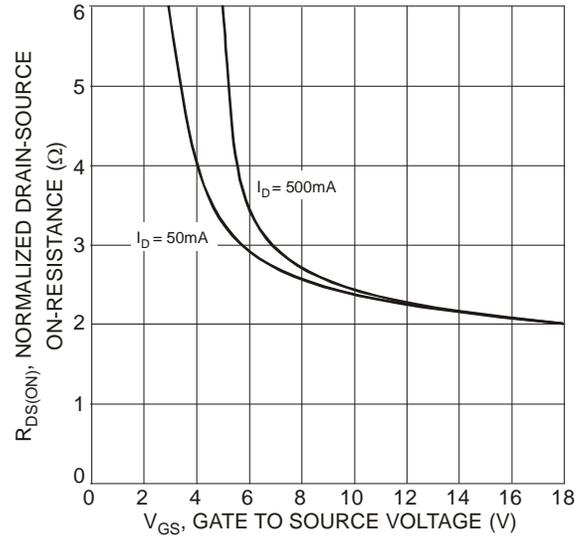
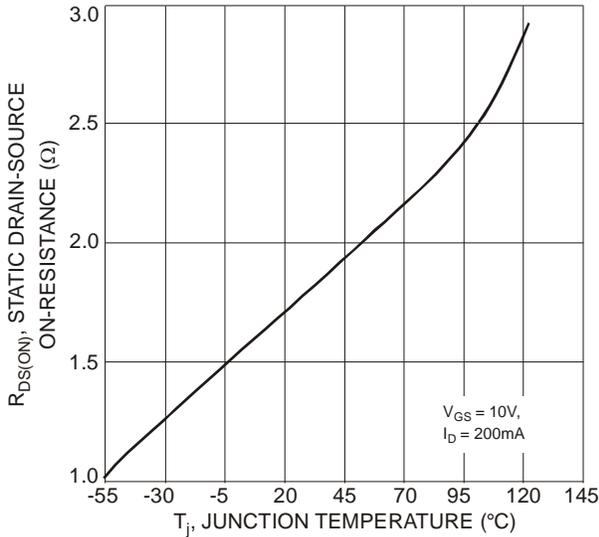
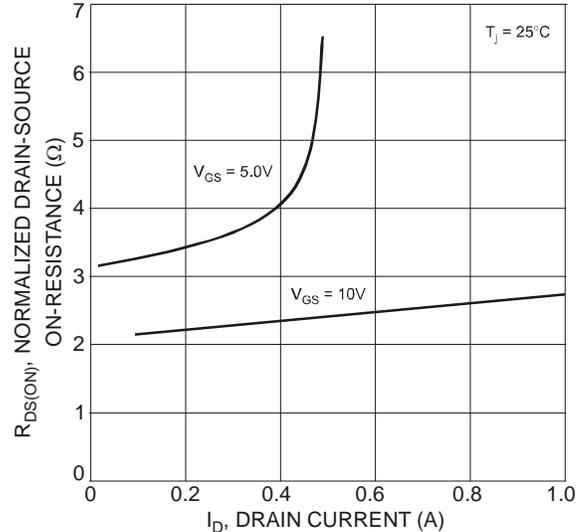
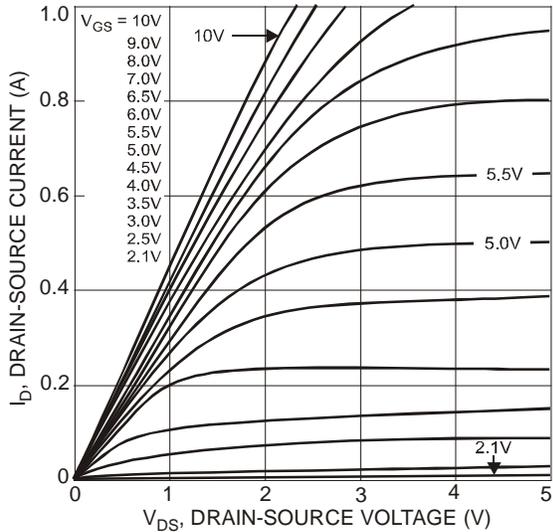
**Thermal Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation	(Note 5)	$P_D$	370	mW
	(Note 6)		540	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	348	$^\circ\text{C/W}$
	(Note 6)		241	
Thermal Resistance, Junction to Case	(Note 6)	$R_{\theta JC}$	91	$^\circ\text{C}$
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.)

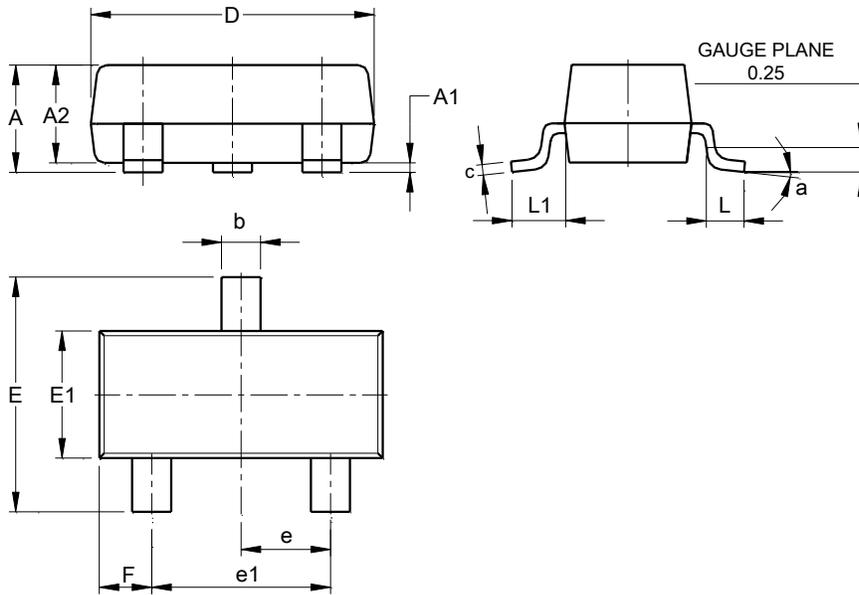
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
<b>OFF CHARACTERISTICS (Note 7)</b>							
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	70	—	V	$V_{GS} = 0V, I_D = 10\mu A$	
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1.0 500	$\mu A$	$V_{DS} = 60V, V_{GS} = 0V$ $@ T_J = +25^\circ\text{C}$ $@ T_J = +125^\circ\text{C}$	
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 10$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
<b>ON CHARACTERISTICS (Note 7)</b>							
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu A$	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$@ T_J = +25^\circ\text{C}$	—	3.2	7.5	$\Omega$	$V_{GS} = 5.0V, I_D = 0.05A$
		$@ T_J = +25^\circ\text{C}$	—	2.4	5.0		$V_{GS} = 10V, I_D = 0.5A$
		$@ T_J = +125^\circ\text{C}$	—	4.4	13.5		$V_{GS} = 10V, I_D = 0.5A$
On-State Drain Current	$I_{D(ON)}$	0.5	1.0	—	A	$V_{GS} = 10V, V_{DS} = 7.5V$	
Forward Transconductance	$g_{FS}$	80	—	—	mS	$V_{DS} = 10V, I_D = 0.2A$	
Diode Forward Voltage	$V_{SD}$	—	0.78	1.5	V	$V_{GS} = 0V, I_S = 115mA$	
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>							
Input Capacitance	$C_{iss}$	—	22	50	pF	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$	
Output Capacitance	$C_{oss}$	—	11	25	pF		
Reverse Transfer Capacitance	$C_{rss}$	—	2.0	5.0	pF		
Gate Resistance	$R_g$	—	120	—	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V$ $f = 1.0MHz$	
Total Gate Charge ( $V_{GS} = 4.5V$ )	$Q_g$	—	223	—	pC	$V_{DS} = 10V, I_D = 250mA$	
Gate-Source Charge	$Q_{gs}$	—	82	—			
Gate-Drain Charge	$Q_{gd}$	—	178	—			
Turn-On Delay Time	$t_{D(ON)}$	—	2.8	—	ns	$V_{DD} = 30V, I_D = 0.2A$ $R_L = 150\Omega, V_{GEN} = 10V$ $R_{GEN} = 25\Omega$	
Turn-On Rise Time	$t_R$	—	3.0	—			
Turn-Off Delay Time	$t_{D(OFF)}$	—	7.6	—			
Turn-Off Fall Time	$t_F$	—	5.6	—			

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



## Package Outline Dimensions

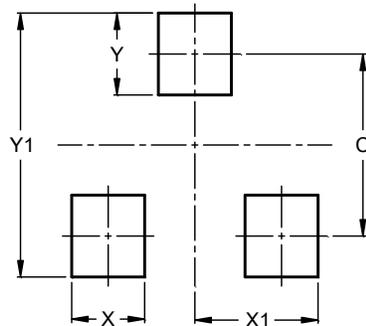
SOT23 (Standard)



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Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

SOT23 (Standard)



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9