



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_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ C$
-100V	1.0 Ω @ $V_{GS} = -10V$	-0.7A
	1.45 Ω @ $V_{GS} = -6.0V$	-0.5A

Features and Benefits

- Fast Switching Speed
- Low Input Capacitance
- Low Gate Charge
- Low Threshold

Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- DC-DC converters
- Power-management functions
Disconnect switches
Motor controls

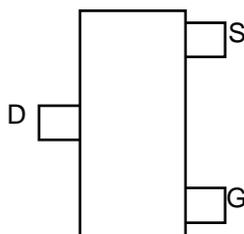
Mechanical Data

- Package: SOT23
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 Ⓜ
- Weight: 0.009 grams (Approximate)

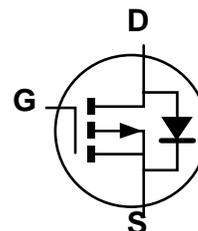
SOT23 (Type DN)



Top View



Top View
Pin Out



Equivalent Circuit

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

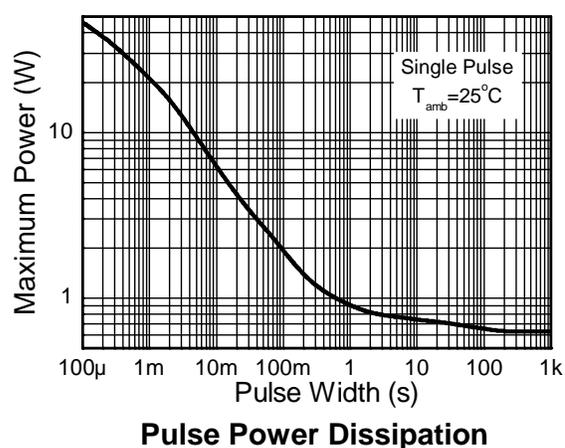
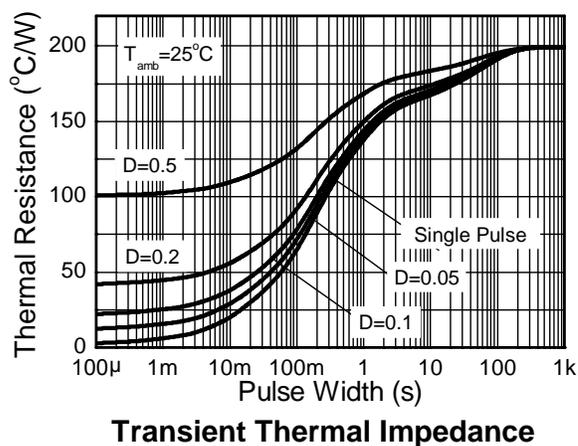
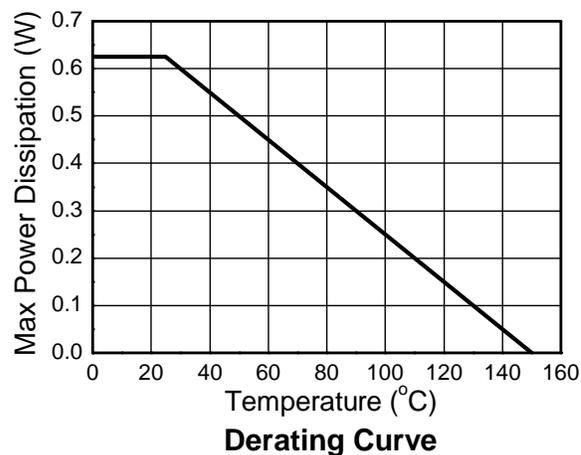
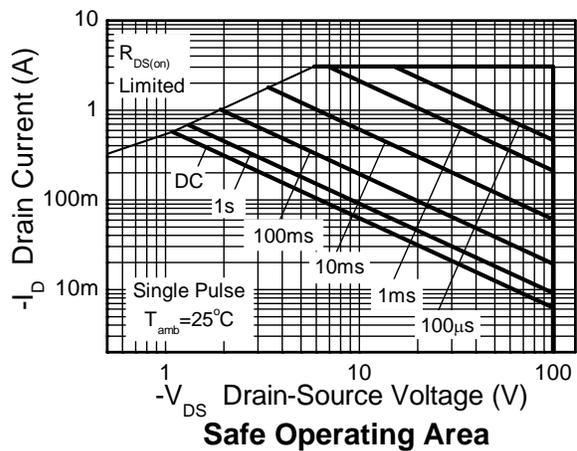
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-100	V
Gate-Source Voltage			V_{GS}	± 20	V
Continuous Drain Current	$V_{GS} = -10\text{V}$	$T_A = +70^{\circ}\text{C}$ (Note 6)	I_D	-0.7	A
		(Note 6)		-0.5	
		(Note 6)		-0.6	
Pulsed Drain Current (Note 7)			I_{DM}	-3.1	A
Continuous Source Current (Body Diode) (Note 5)			I_S	-1.1	A
Pulsed Source Current (Body Diode) (Note 7)			I_{SM}	-3.1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	625	mW
Linear Derating Factor		5	mW/ $^{\circ}\text{C}$
Power Dissipation (Note 6)	P_D	806	mW
Linear Derating Factor		6.4	mW/ $^{\circ}\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	200	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	194	$^{\circ}\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

- Notes:
5. For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 6. For a device surface mounted on FR-4 PCB measured at $t \leq 5$ secs.
 7. Repetitive rating 25mm x 25mm FR-4 PCB, $D = 0.05$ pulse width = $10\mu\text{s}$ - pulse current limited by maximum junction temperature.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics

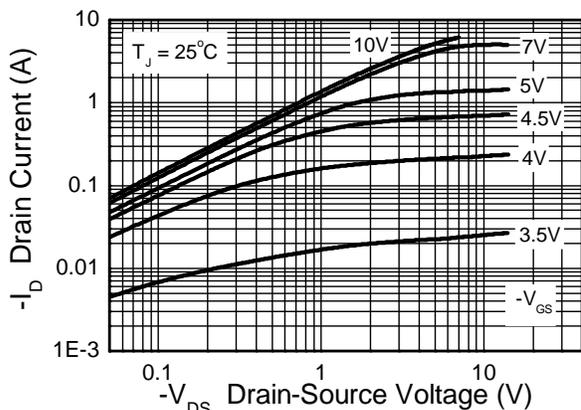


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

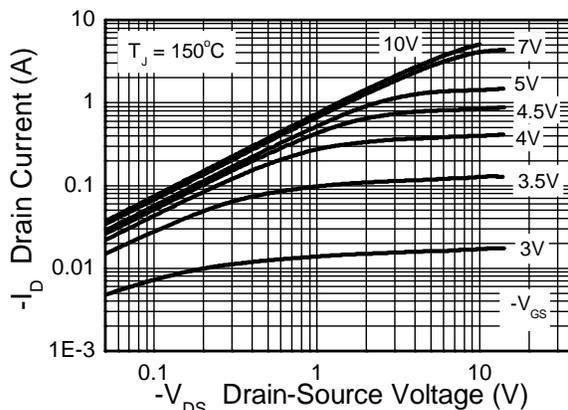
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-100	—	—	V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1.0	μA	$V_{DS} = -100\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	-2.0	—	-4.0	V	$I_D = -250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 9)	$R_{DS(ON)}$	—	—	1.0	Ω	$V_{GS} = -10\text{V}$, $I_D = -0.6\text{A}$
				1.45		$V_{GS} = -6.0\text{V}$, $I_D = -0.5\text{A}$
Forward Transconductance (Notes 9 and 11)	g_{fs}	—	1.2	—	S	$V_{DS} = -15\text{V}$, $I_D = -0.6\text{A}$
Diode Forward Voltage (Note 9)	V_{SD}	—	-0.85	-0.95	V	$T_J = +25^\circ\text{C}$, $I_S = -0.75\text{A}$, $V_{GS} = 0\text{V}$
Reverse Recovery Time (Note 11)	t_{RR}	—	29	—	ns	$T_J = +25^\circ\text{C}$, $I_F = -0.9\text{A}$,
Reverse Recovery Charge (Note 11)	Q_{RR}	—	31	—	nC	$di/dt = 100\text{A}/\mu\text{s}$
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C_{iss}	—	141	—	pF	$V_{DS} = -50\text{V}$, $V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	13.1	—		
Reverse Transfer Capacitance	C_{riss}	—	10.8	—		
Turn-On Delay Time (Note 10)	$t_{D(ON)}$	—	1.6	—	ns	$V_{DD} = -50\text{V}$, $I_D = -1.0\text{A}$, $R_G \approx 6.0\Omega$, $V_{GS} = -10\text{V}$
Turn-On Rise Time (Note 10)	t_R	—	2.1	—		
Turn-Off Delay Time (Note 10)	$t_{D(OFF)}$	—	5.9	—		
Turn-Off Fall Time (Note 10)	t_F	—	3.3	—		
Total Gate Charge (Note 10)	Q_g	—	1.8	—	nC	$V_{DS} = -50\text{V}$, $V_{GS} = -5.0\text{V}$, $I_D = -0.6\text{A}$
Total Gate Charge (Note 10)	Q_g	—	3.5	—	nC	$V_{DS} = -50\text{V}$, $V_{GS} = -10\text{V}$, $I_D = -0.6\text{A}$
Gate-Source Charge (Note 10)	Q_{gs}	—	0.6	—		
Gate-Drain Charge (Note 10)	Q_{gd}	—	1.6	—		

Notes: 9. Measured under pulsed conditions. Pulse width = $300\mu\text{s}$. Duty cycle $\leq 2\%$.
 10. Switching characteristics are independent of operating junction temperature.
 11. For design aid only, not subject to production testing.

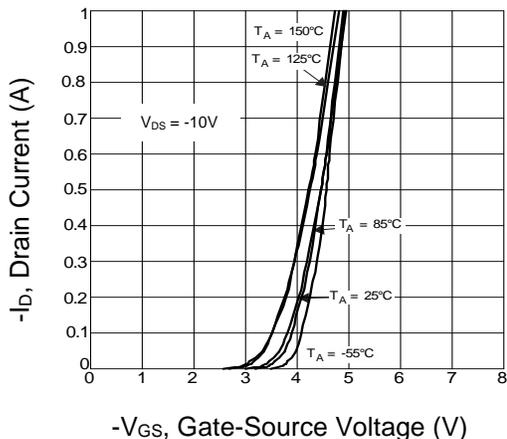
Typical Characteristics



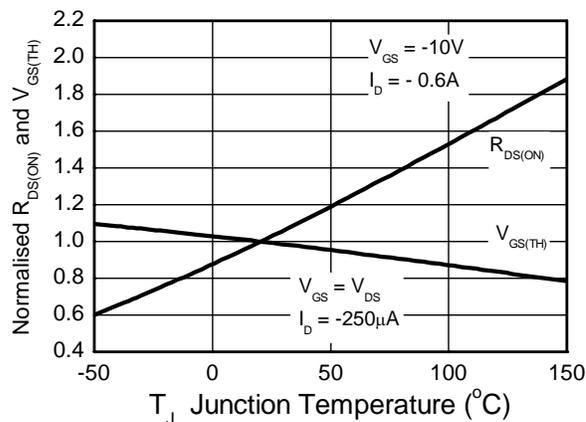
Output Characteristics



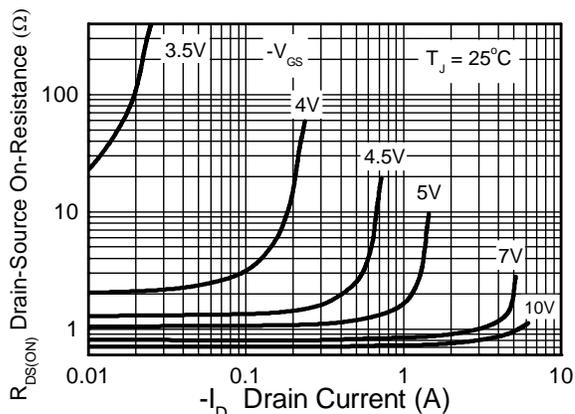
Output Characteristics



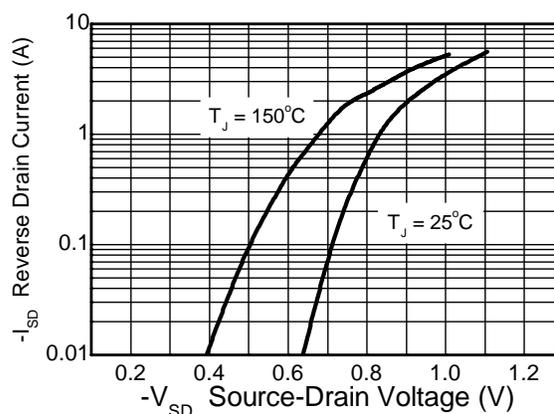
Typical Transfer Characteristics



Normalised Curves v Temperature

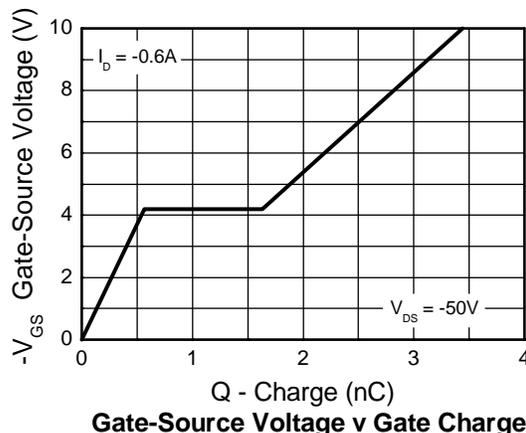
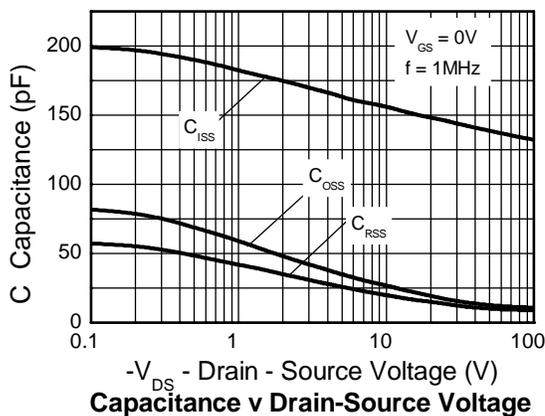


On-Resistance v Drain Current

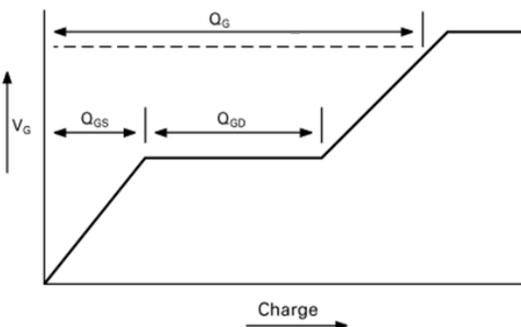


Source-Drain Diode Forward Voltage

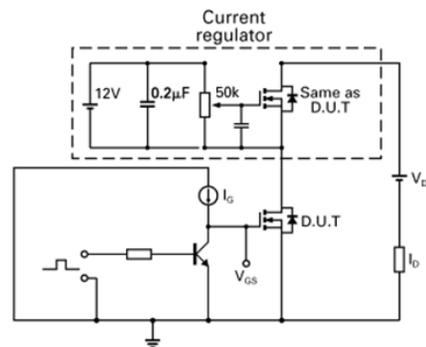
Typical Characteristics (continued)



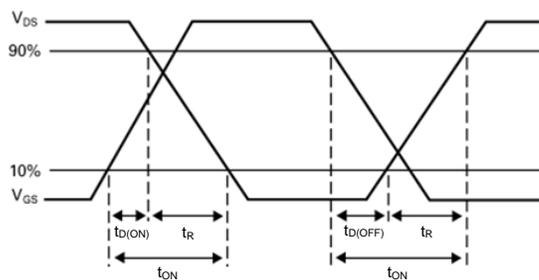
Test Circuits



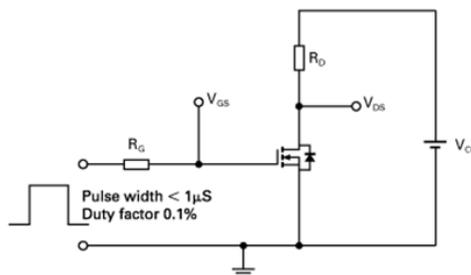
Basic gate charge waveform



Gate charge test circuit



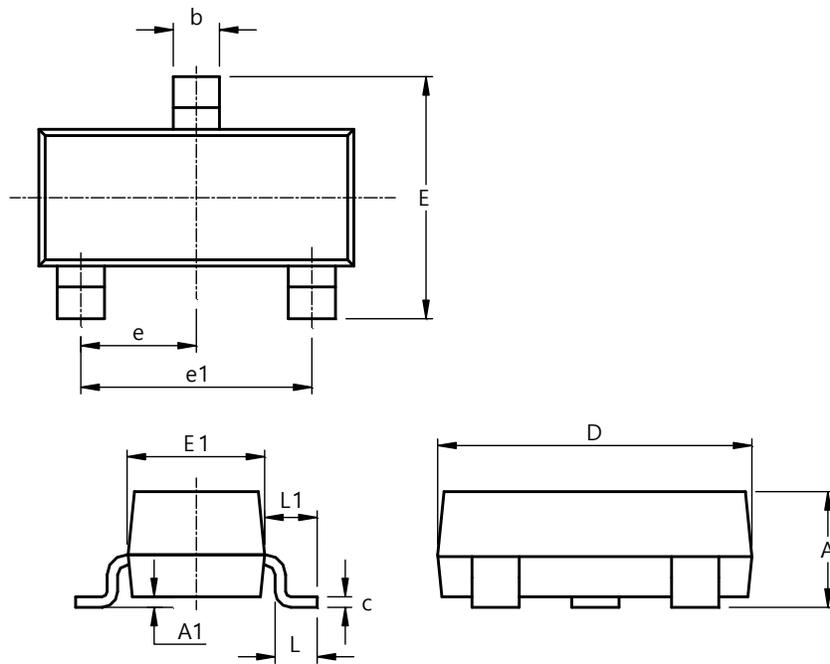
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

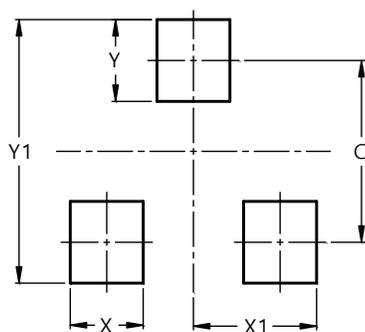
SOT23 (Type DN)



SOT23 Type DN			
Dim	Min	Max	Typ
A	0.89	1.12	1.00
A1	0.01	0.10	0.05
b	0.30	0.51	0.45
c	0.08	0.20	0.10
D	2.80	3.04	3.00
E	2.10	2.64	2.42
E1	1.20	1.40	1.37
e	0.95 REF		
e1	1.90 REF		
L	0.25	0.60	0.30
L1	0.45	0.62	0.54
All Dimensions in mm			

Suggested Pad Layout

SOT23 (Type DN)



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