



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



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Product Summary

BV_{DSS}	Max R_{DS(ON)}	Max I_D T_A = +25°C (Note 7)
60V	250mΩ @ V _{GS} = 10V	1.4A
	350mΩ @ V _{GS} = 4.5V	1.2A

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Charge

Description and Applications

This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with a fast switching speed, making it ideal for high-efficiency power-management applications.

- DC-DC converters
- Power-management functions
- Relay and solenoid driving
- Motor controls

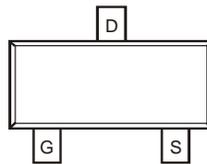
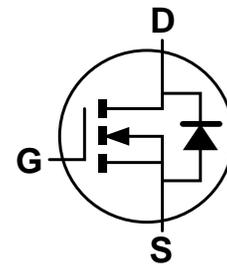
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish 
- Weight: 0.008 grams (Approximate)



Top View

SOT23


 Top View
Pin Out


Equivalent Circuit

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

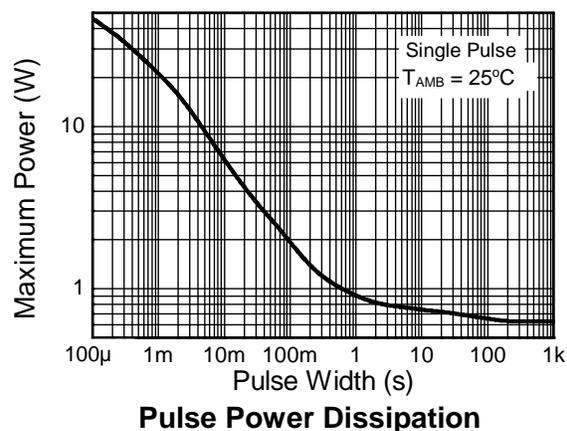
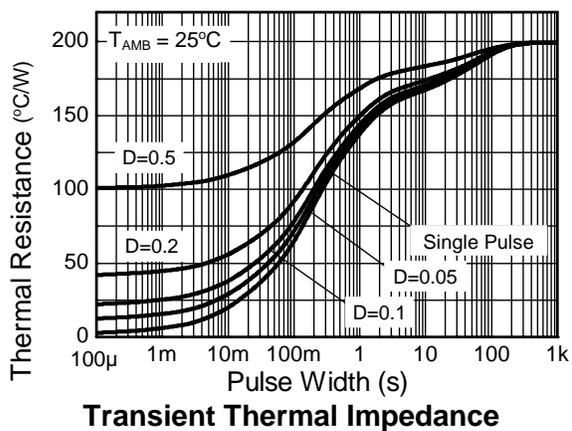
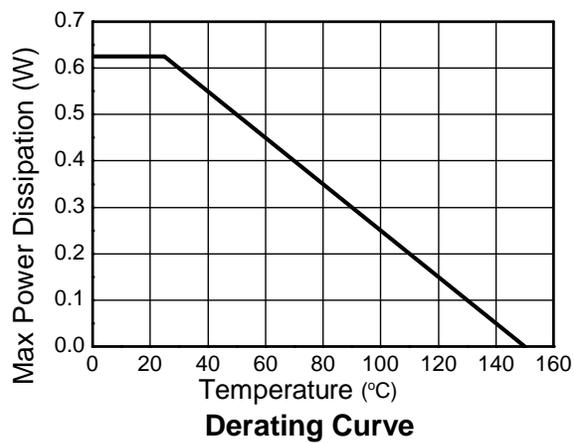
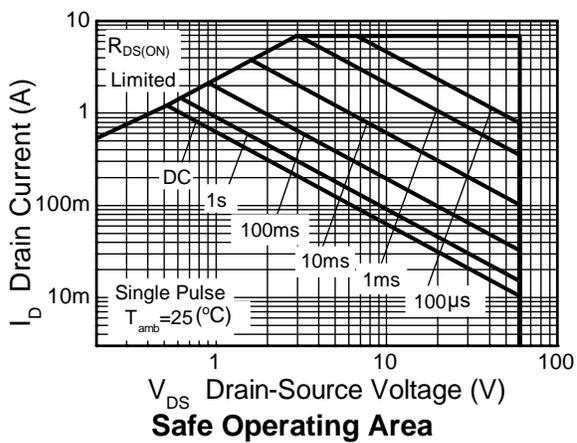
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	V _{GS} = 10V	T _A = +25°C (Note 6)	1.4	A
		T _A = +70°C (Note 6)	1.1	
		T _A = +25°C (Note 5)	1.2	
Pulsed Drain Current (Note 7)		I _{DM}	6.9	A
Continuous Source Current (Body Diode) (Note 6)		I _S	1	A
Pulsed Source Current (Body Diode) (Note 7)		I _{SM}	6.9	A

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P _D	625	mW
Linear Derating Factor			5	mW/°C
Power Dissipation (Note 6)		P _D	806	mW
Linear Derating Factor			6.4	mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	200	°C/W
	(Note 6)		155	
Thermal Resistance, Junction to Ambient (Note 8)		R _{θJL}	194	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 6. For a device surface mounted on FR4 PCB measured at t ≤ 5secs.
 7. Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02 pulse width = 300μs - pulse current limited by maximum junction temperate.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics (continued)

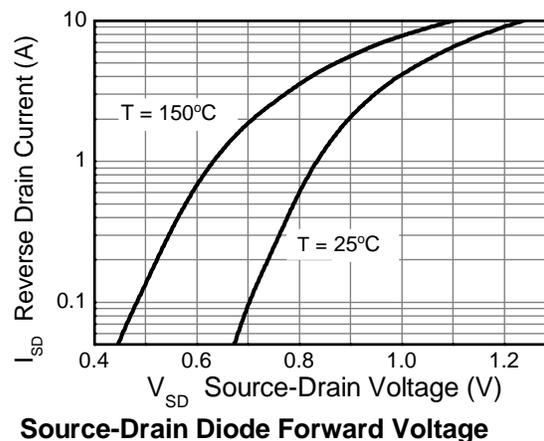
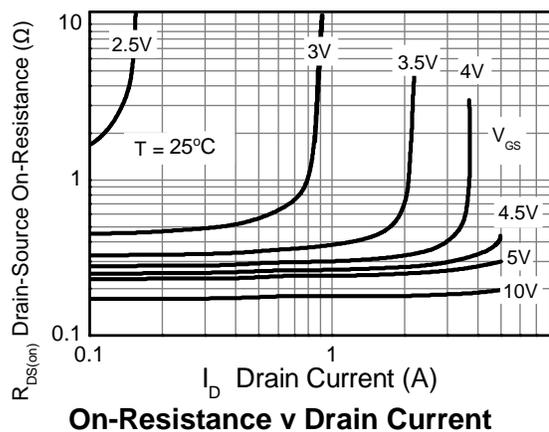
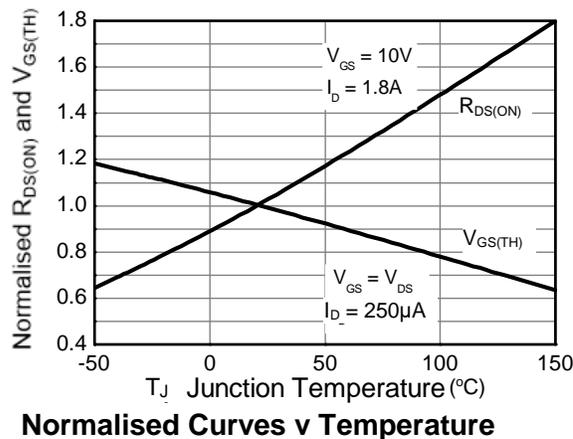
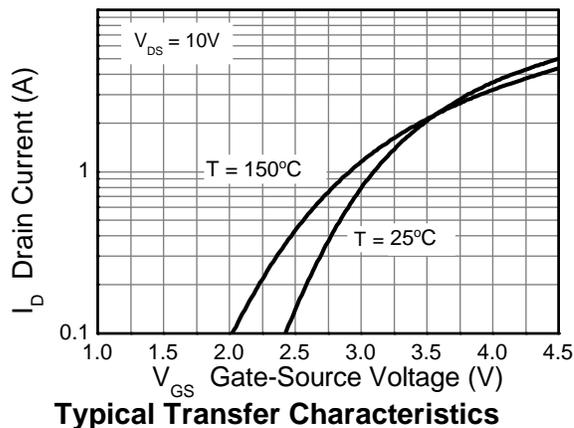
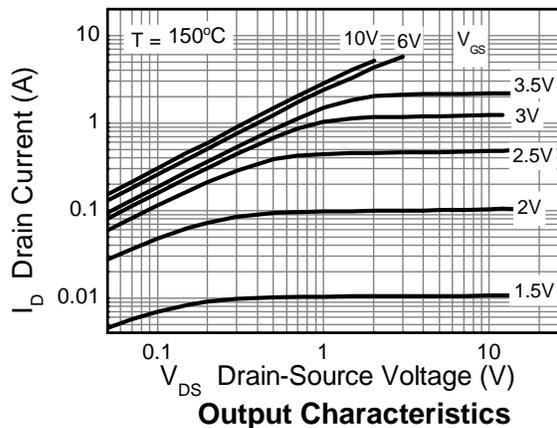
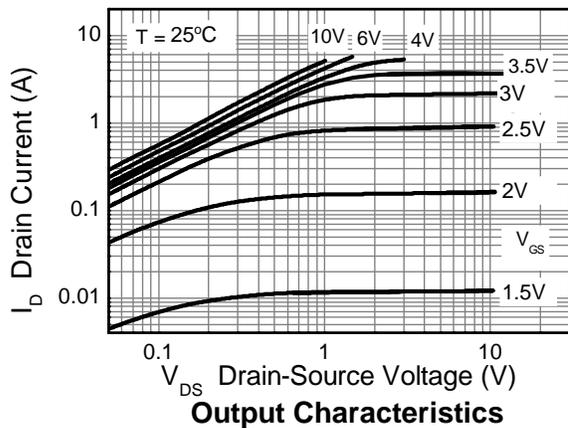


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

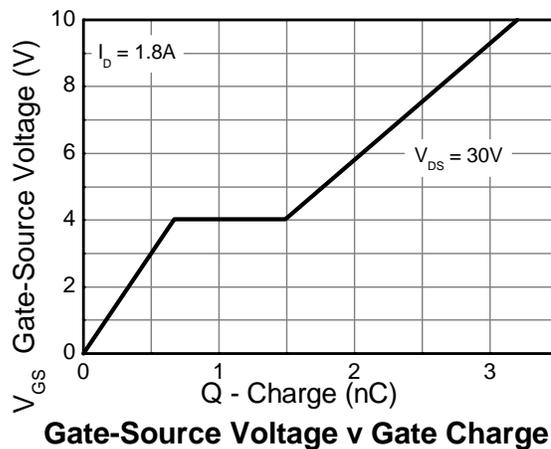
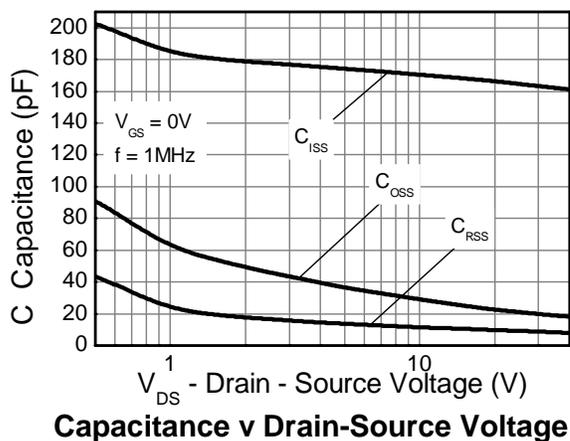
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	3.0	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 9)	R _{DS(ON)}	—	—	0.250	Ω	V _{GS} = 10V, I _D = 1.8A
				0.350		V _{GS} = 4.5V, I _D = 1.3A
Forward Transconductance (Notes 9 and 11)	G _{FS}	—	2.3	—	S	V _{DS} = 15V, I _D = 1.8A
Diode Forward Voltage (Note 9)	V _{SD}	—	0.8	0.95	V	T _J = +25°C, I _S = 0.45A, V _{GS} = 0V
Reverse Recovery Time (Note 11)	t _{RR}	—	20.5	—	ns	T _J = +25°C, I _F = 1.8A,
Reverse Recovery Charge (Note 11)	Q _{RR}	—	21.3	—	nC	di/dt = 100A/μs
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C _{iss}	—	166	—	pF	V _{DD} = 40V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	19.5	—		
Reverse Transfer Capacitance	C _{rss}	—	8.7	—		
Turn-On Delay Time (Note 10)	t _{D(ON)}	—	1.8	—	ns	V _{DD} = 30V, I _D = 1.8A, R _G ≅ 6.0Ω, V _{GS} = 10V
Turn-On Rise Time (Note 10)	t _R	—	1.4	—		
Turn-Off Delay Time (Note 10)	t _{D(OFF)}	—	4.9	—		
Turn-Off Fall Time (Note 10)	t _F	—	2.0	—		
Total Gate Charge (Note 10)	Q _g	—	1.65	—	nC	V _{DS} = 30V, V _{GS} = 5V, I _D = 1.8A
Total Gate Charge (Note 10)	Q _g	—	3.2	—	nC	V _{DS} = 30V, V _{GS} = 10V, I _D = 1.8A
Gate-Source Charge (Note 10)	Q _{gs}	—	0.67	—		
Gate-Drain Charge (Note 10)	Q _{gd}	—	0.82	—		

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

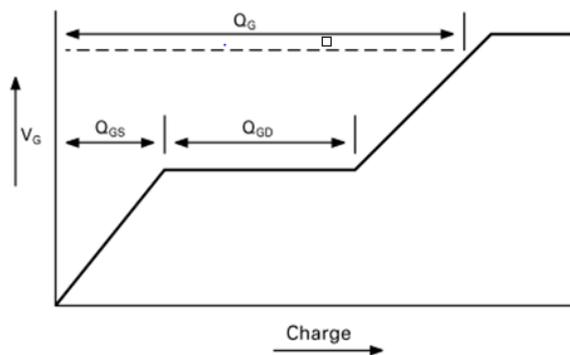
Typical Characteristics



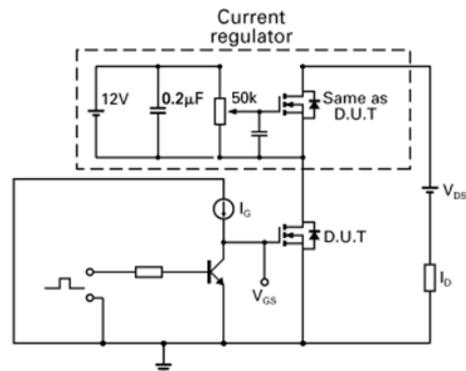
Typical Characteristics (continued)



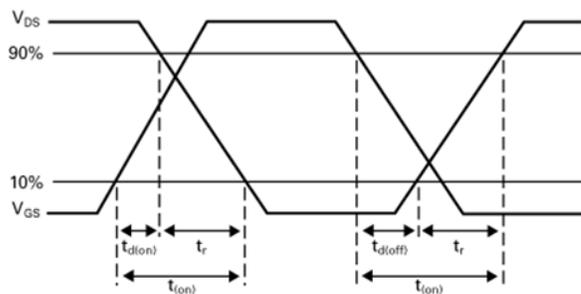
Test Circuits



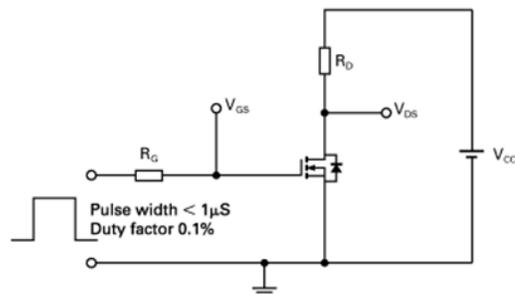
Basic gate charge waveform



Gate charge test circuit

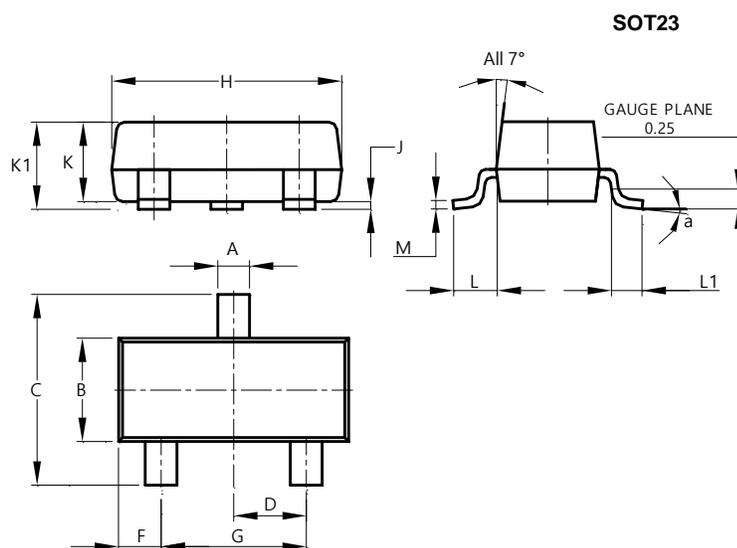


Switching time waveforms



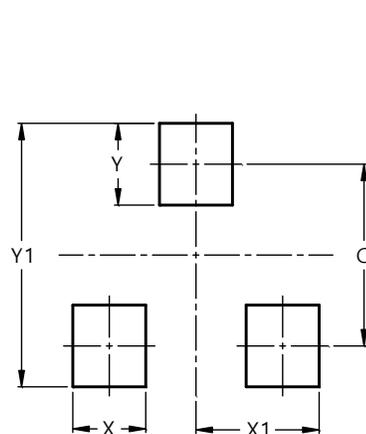
Switching time test circuit

Package Outline Dimensions



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout



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