



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

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ\text{C}$
30V	0.12Ω @ $V_{GS} = 10\text{V}$	2.0A

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions
- Motor Control

Features

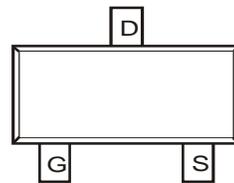
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Small Surface Mount Package

Mechanical Data

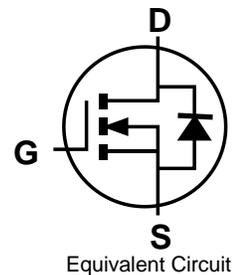
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 Ⓔ3
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



Top View



Top View
Pin Configuration



Equivalent Circuit

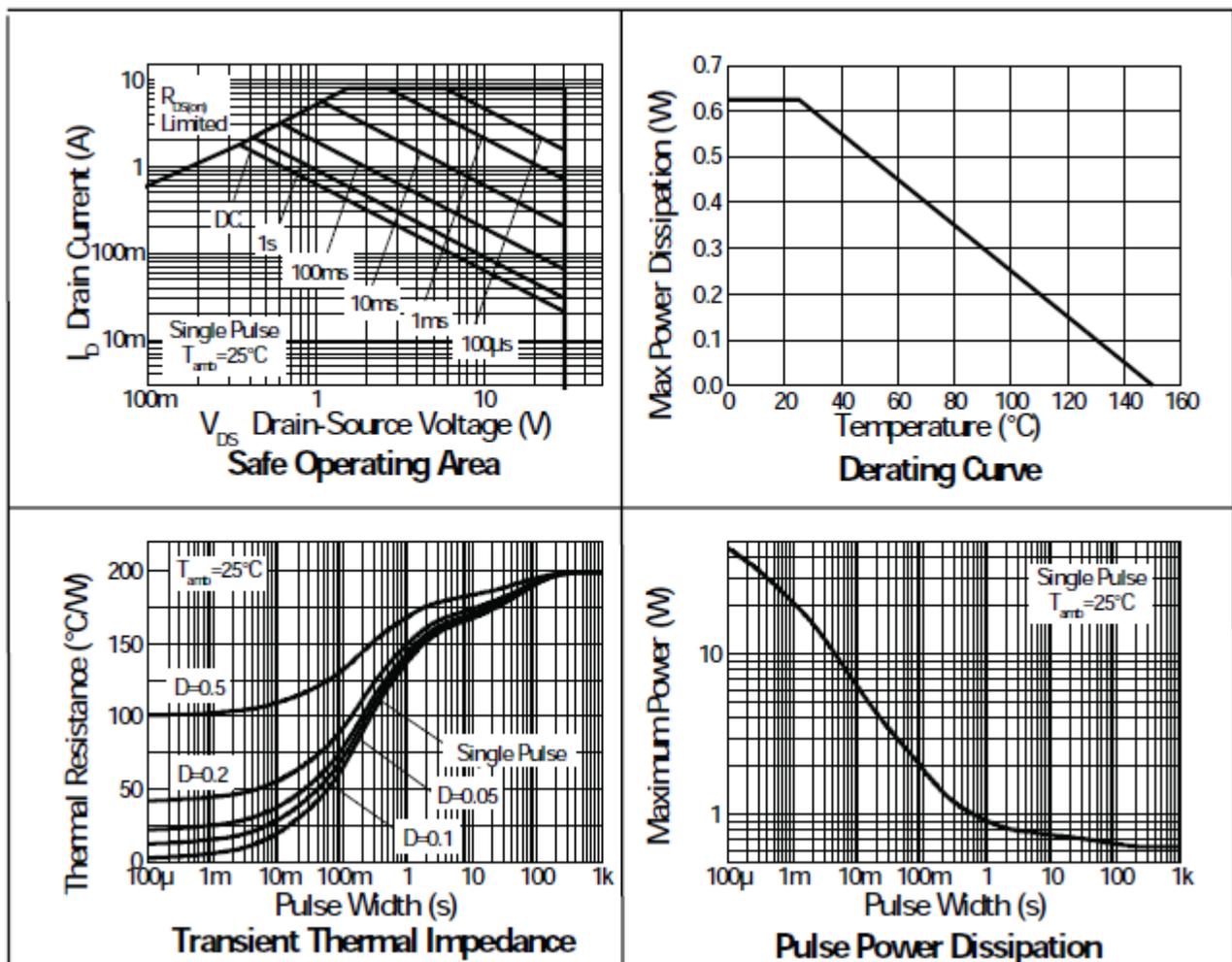
Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DS}	30	V
Gate-Source Voltage			V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} = 10\text{V}$	(Note 6)	$T_A = +25^\circ\text{C}$	I_D	2.0	A
	(Note 6)	$T_A = +70^\circ\text{C}$		1.6	
	(Note 5)	$T_A = +25^\circ\text{C}$		1.8	
Pulsed Drain Current (Note 7)			I_{DM}	8	A
Maximum Body Diode Continuous Current (Note 6)			I_S	1.3	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P_D	625	mW
Linear Derating Factor			5	mW/ $^\circ\text{C}$
Total 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	$^\circ\text{C/W}$
	(Note 6)		155	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

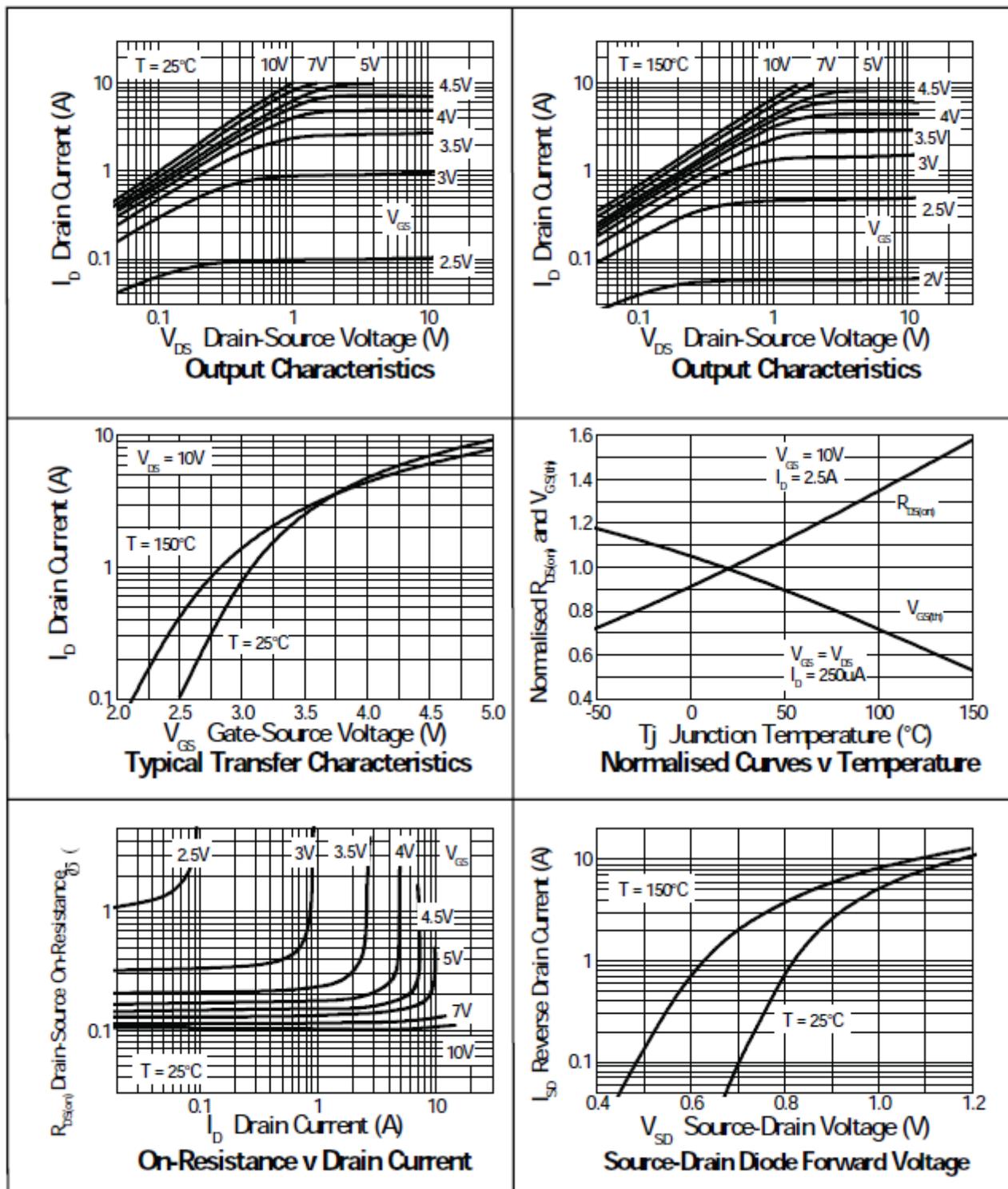
- Notes:
- For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 - For a device surface mounted on FR-4 PCB measured at $t \leq 5$ secs.
 - Repetitive rating 25mm x 25mm FR-4 PCB, $D = 0.05$, pulse width 10 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

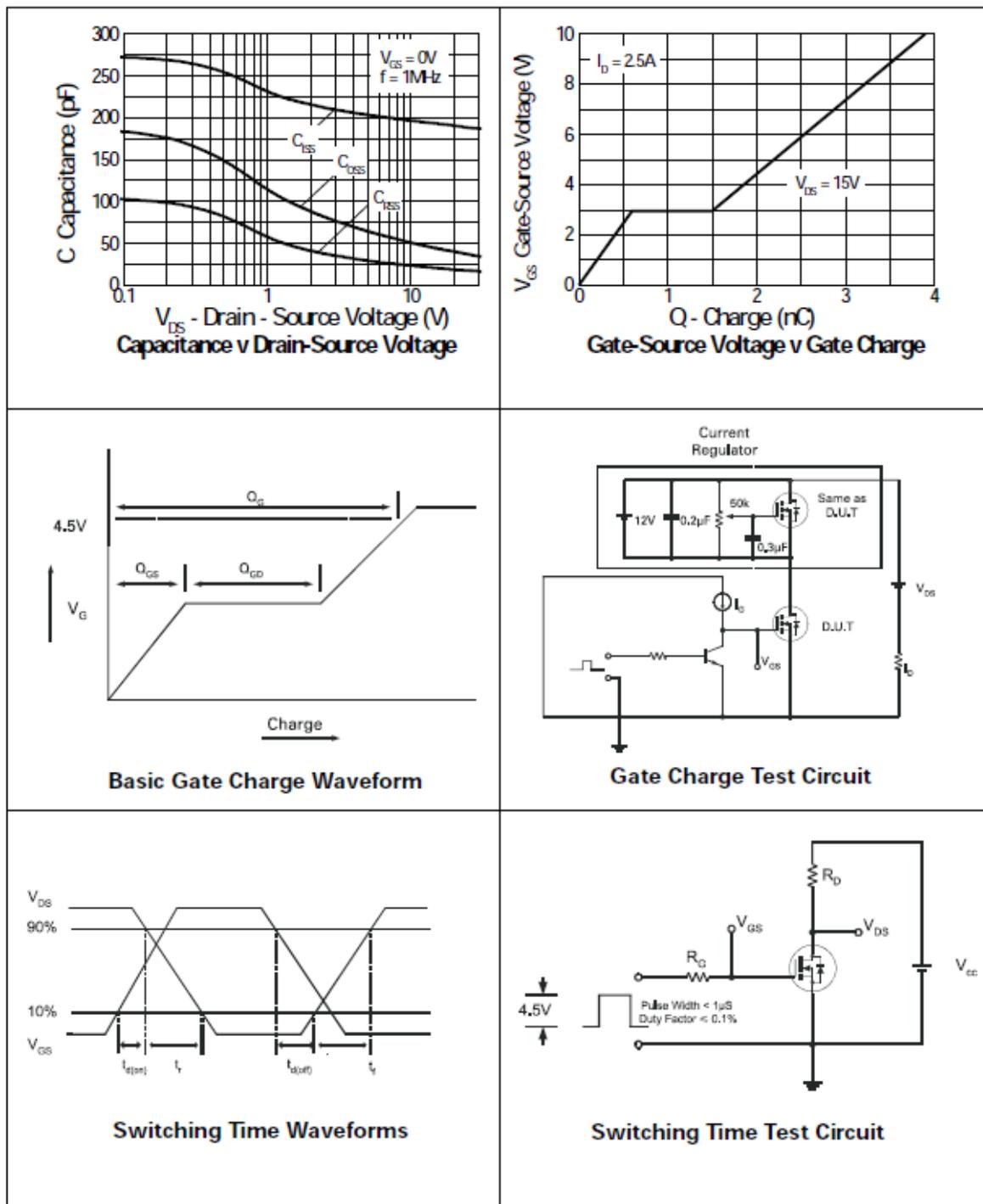


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

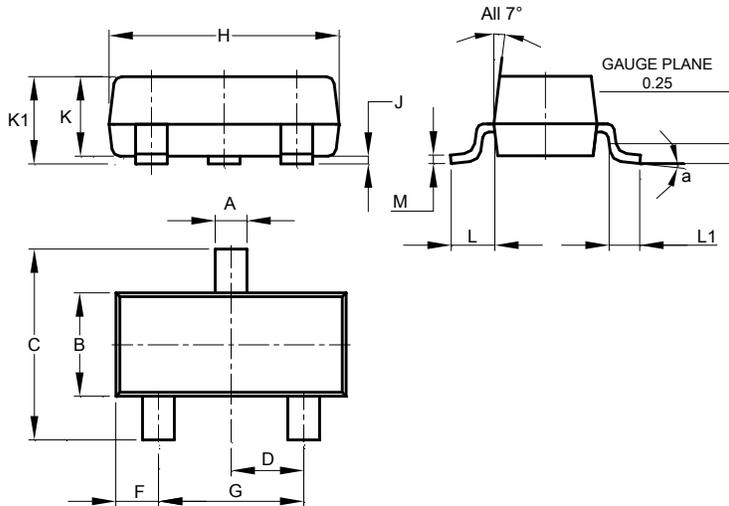
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	1	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance (Note 8)	R _{DS(on)}	—	0.11	0.12	Ω	V _{GS} = 10V, I _D = 2.5A
		—	—	0.18	Ω	V _{GS} = 4.5V, I _D = 2A
Forward Transconductance	g _{FS}	—	3.5	—	S	V _{DS} = 4.5V, I _D = 2.5A
Diode Forward Voltage (Note 8 & 10)	V _{SD}	—	0.85	0.95	V	V _{GS} = 0V, I _S = 1.7A, T _J = +25°C
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	190	—	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	38	—		
Reverse Transfer Capacitance	C _{rss}	—	20	—		
Gate Charge (Note 9)	Q _g	—	2.3	—	nC	V _{DS} = 15V, V _{GS} = 5V, I _D = 2.5A
Total Gate Charge (Note 9)	Q _g	—	3.9	—		
Gate-Source Charge (Note 9)	Q _{gs}	—	0.6	—		
Gate-Drain Charge (Note 9)	Q _{gd}	—	0.9	—		
Turn-On Delay Time (Note 9)	t _{D(on)}	—	1.7	—	ns	V _{DD} = 15V, I _D = 2.5A, R _G = 6Ω, V _{GS} = 10V
Turn-On Rise Time (Note 9)	t _r	—	2.3	—		
Turn-Off Delay Time (Note 9)	t _{D(off)}	—	6.6	—		
Turn-Off Fall Time (Note 9)	t _f	—	2.9	—		
Reverse Recovery Time	t _{rr}	—	17.7	—	ns	T _J = +25°C, I _F = 2.5A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{rr}	—	13	—	nC	

- Notes:
8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.
 9. Switching characteristics are independent of operating junction temperature.
 10. Guaranteed by design. Not subject to production testing.



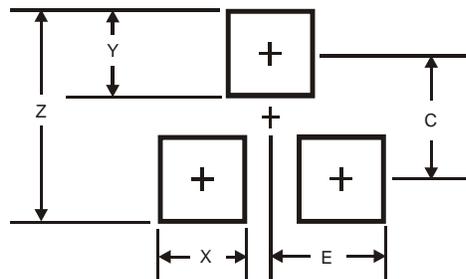


Package Outline Dimensions



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	8°		
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35