



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 $T_A = +25^\circ C$
-30V	0.15Ω @ $V_{GS} = -10V$	-2.6A
	0.23Ω @ $V_{GS} = -4.5V$	-1.5A

Features and Benefits

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

Description

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

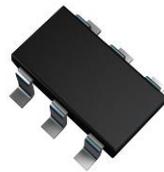
Applications

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

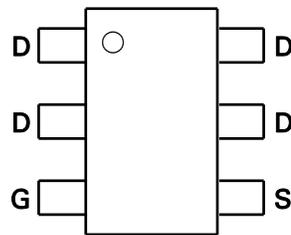
Mechanical Data

- Case: SOT-26
- Case Material: Molded Plastic; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208 
- Weight: 0.015 grams (Approximate)

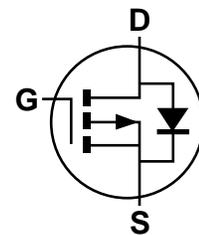
SOT-26



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}	-30	V
Gate-Source Voltage			V_{GS}	± 20	V
Continuous Drain Current	$V_{GS} = -4.5\text{V}$	$T_A = +25^\circ\text{C}$ (Note 5)	I_D	-1.5	A
		$T_A = +70^\circ\text{C}$ (Note 5)		-1.2	
Pulsed Drain Current (Note 7)			I_{DM}	-7.4	A
Continuous Source Current (Body Diode)			I_S	-0.54	A
Pulsed Source Current (Body Diode)			I_{SM}	-7.4	A

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

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)	$R_{\theta JA}$	113	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	73	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

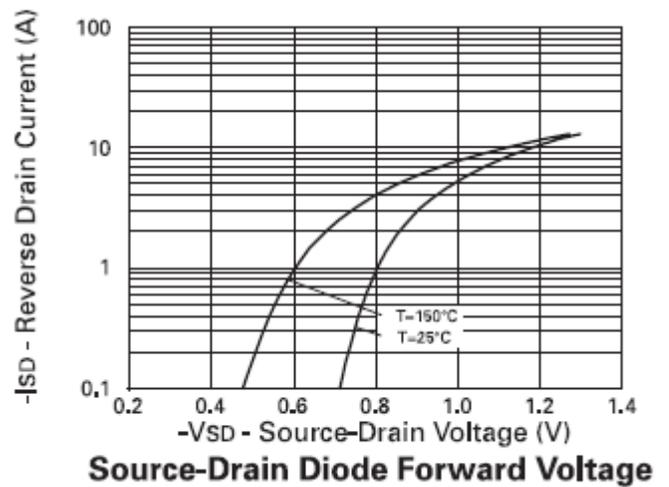
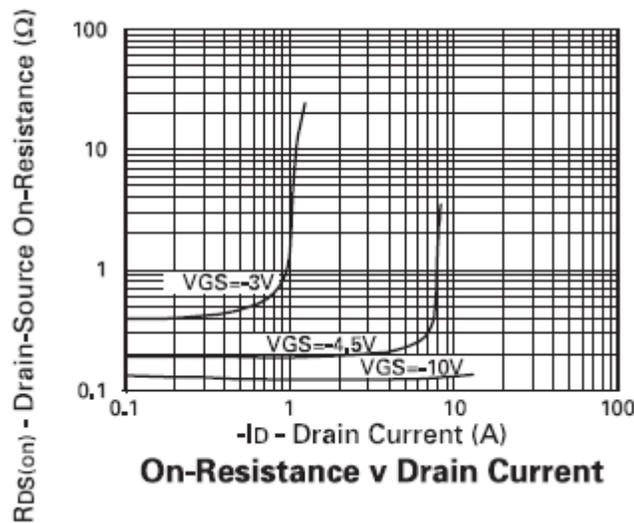
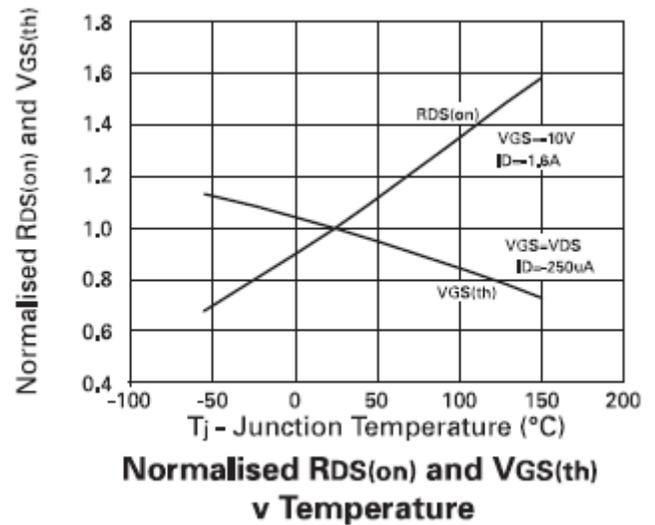
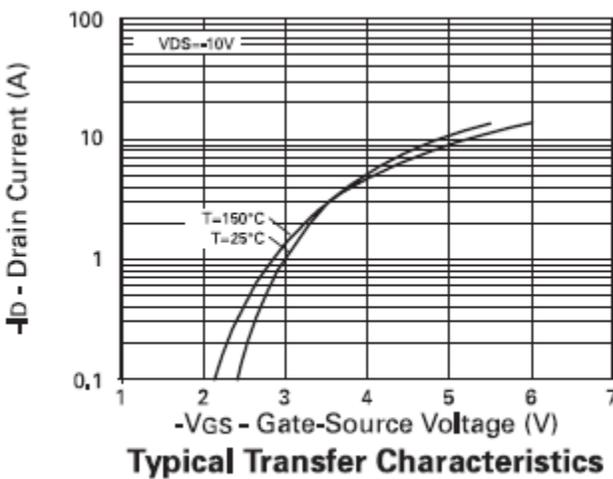
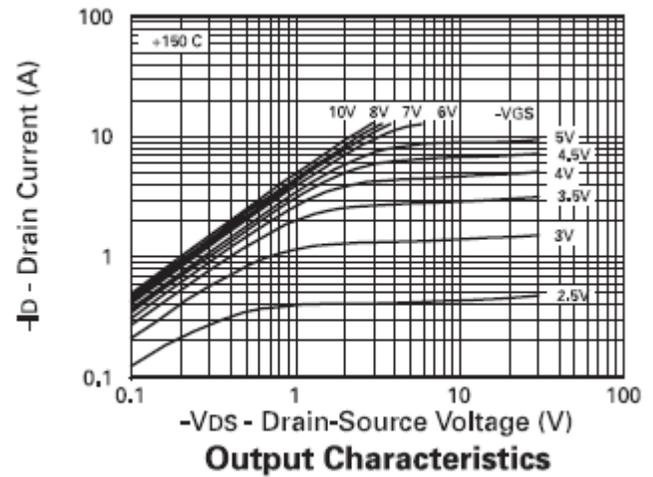
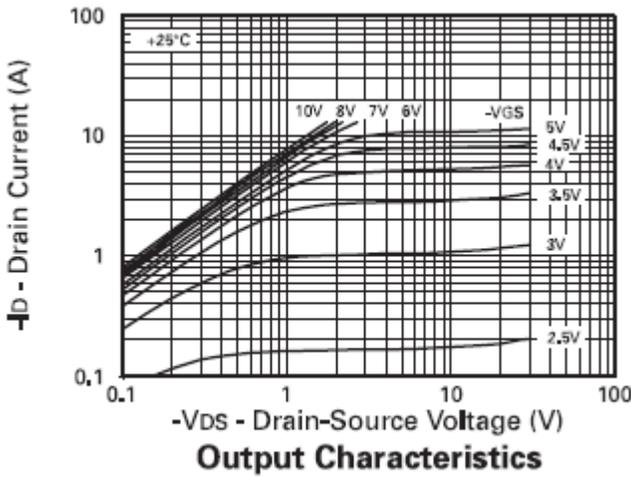
- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
 - For a device surface mounted on FR4 PCB measured at $t \leq 5$ seconds.
 - Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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

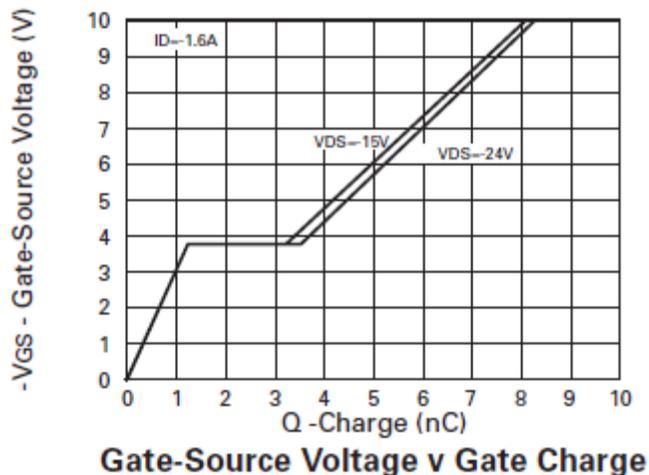
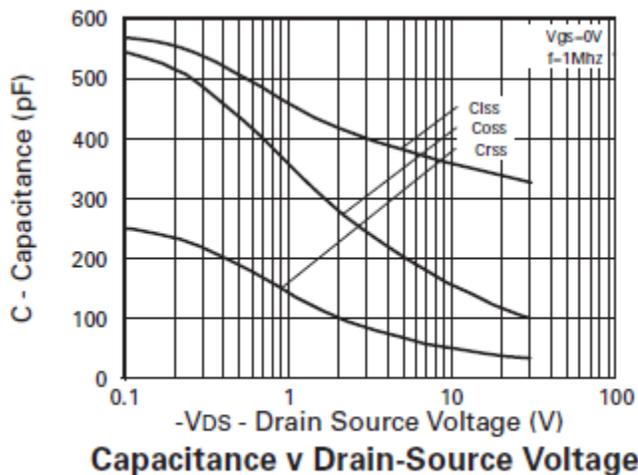
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	-1	—	—	V	$I_D = -250\mu\text{A}, V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	—	0.15	Ω	$V_{GS} = -10\text{V}, I_D = -1.6\text{A}$
				0.23		$V_{GS} = -4.5\text{V}, I_D = -0.8\text{A}$
Forward Transconductance (Notes 8 & 10)	g_{fs}	1.1	—	—	S	$V_{DS} = -10\text{V}, I_D = -0.8\text{A}$
Diode Forward Voltage (Note 8)	V_{SD}	—	—	-0.95	V	$T_J = +25^\circ\text{C}, I_S = -1.6\text{A}, V_{GS} = 0\text{V}$
Reverse Recovery Time (Note 10)	t_{rr}	—	19.9	—	ns	$T_J = +25^\circ\text{C}, I_F = -1.6\text{A}$
Reverse Recovery Charge (Note 10)	Q_{rr}	—	13	—	nC	$di/dt = 100\text{A}/\mu\text{s}$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	330	—	pF	$V_{DS} = -25\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	120	—		
Reverse Transfer Capacitance	C_{rss}	—	45	—		
Turn-On Delay Time (Note 9)	$t_{d(on)}$	—	2.8	—	ns	$V_{DD} = -15\text{V}, I_D = -1.6\text{A}$, $R_G \cong 6.2\Omega, R_D \cong 25\Omega$
Turn-On Rise Time (Note 9)	t_r	—	6.4	—		
Turn-Off Delay Time (Note 9)	$t_{d(off)}$	—	13.9	—		
Turn-Off Fall Time (Note 9)	t_f	—	10.3	—		
Total Gate Charge (Note 9)	Q_g	—	—	10.2	nC	$V_{DS} = -24\text{V}, V_{GS} = -10\text{V}$, $I_D = -1.6\text{A}$
Gate-Source Charge (Note 9)	Q_{gs}	—	—	1.5		
Gate-Drain Charge (Note 9)	Q_{gd}	—	—	3		

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

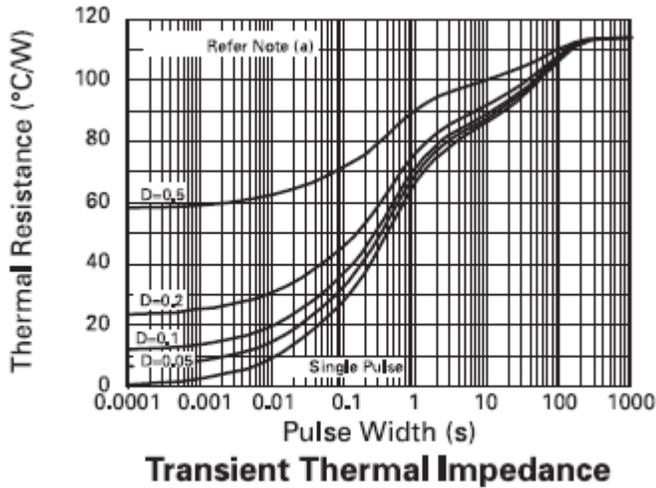
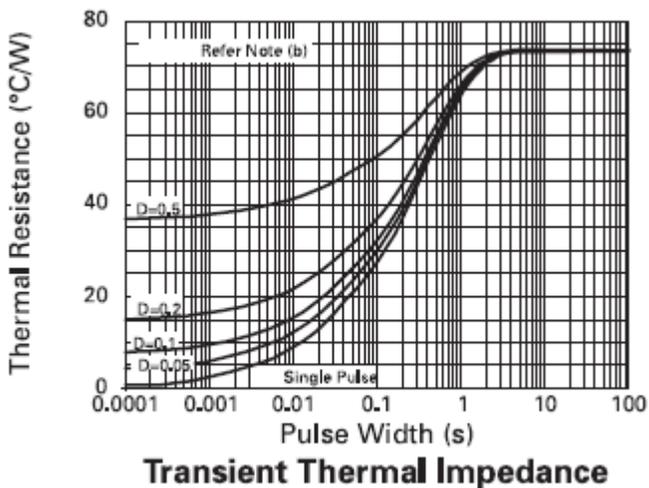
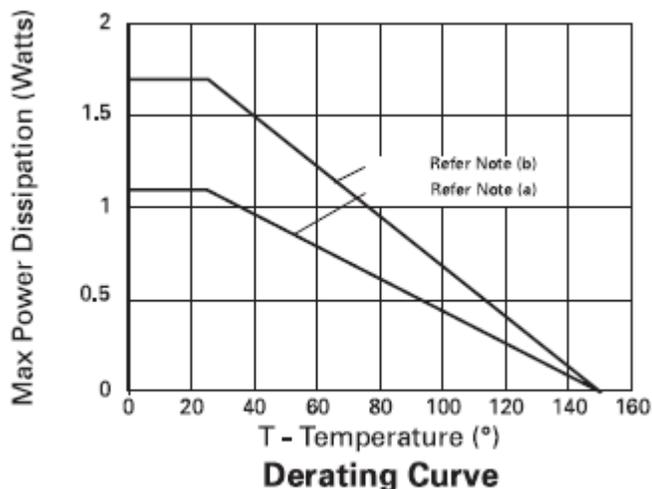
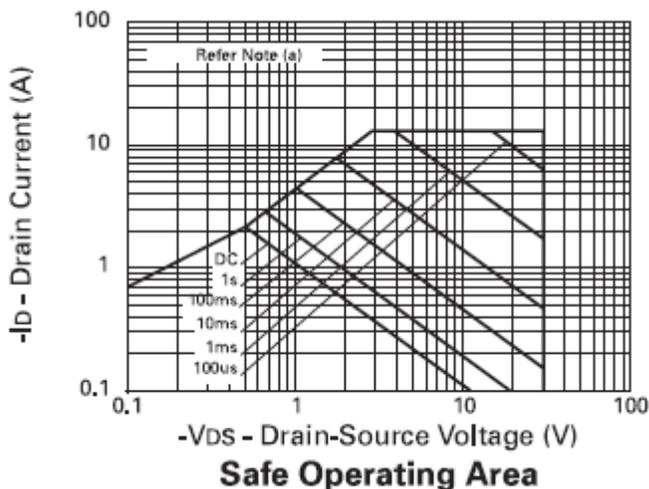
Typical Characteristics



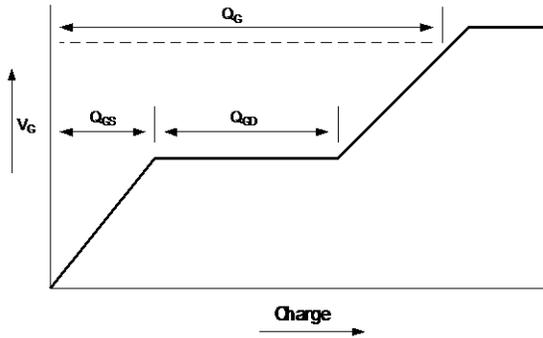
Typical Characteristics (cont.)



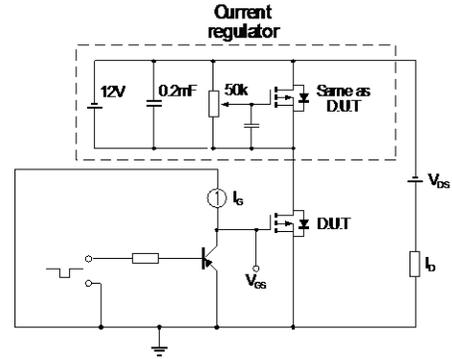
Thermal Characteristics



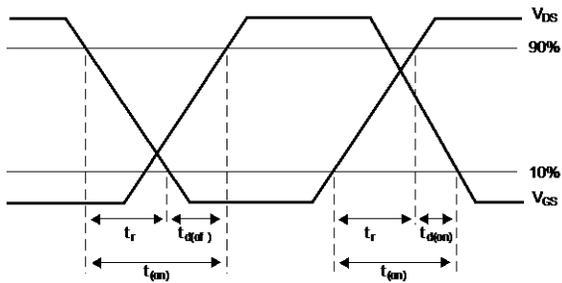
Test Circuits



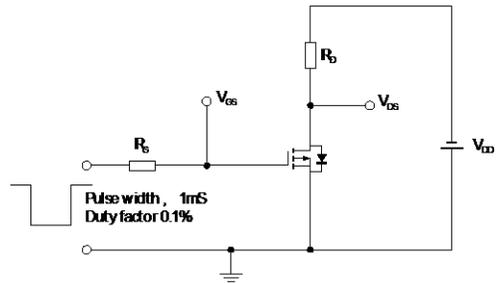
Basic gate charge waveform



Gate charge test circuit

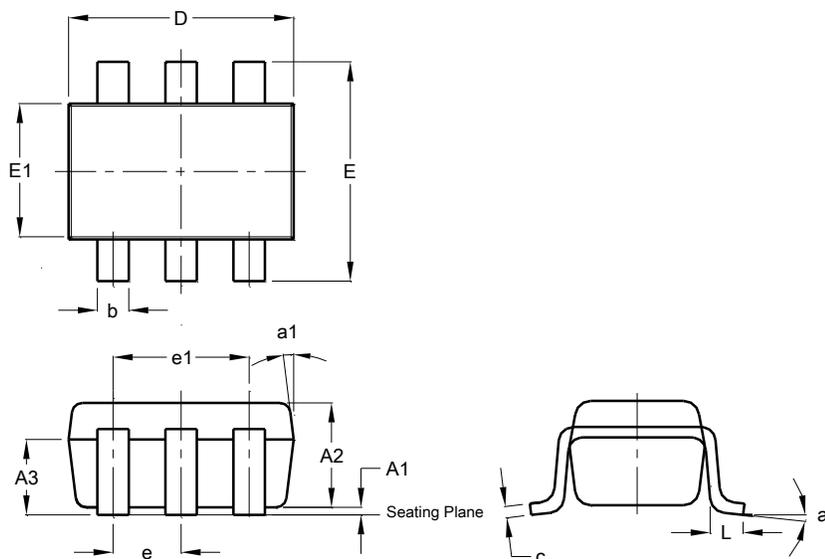


Switching time waveforms



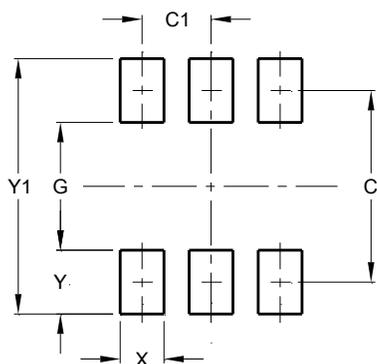
Switching time test circuit

Package Outline Dimensions



SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20