优尚

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

$V_{(BR)DSS}$	$R_{DS(on)}$ Max	I_D Max $T_A = +25°C$ (Note 6)
-60V	125mΩ @ V_{GS} = -10V	-3.0 A
	190mΩ @ V_{GS} = -4.5V	-2.4 A

Description

This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

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

Features and Benefits

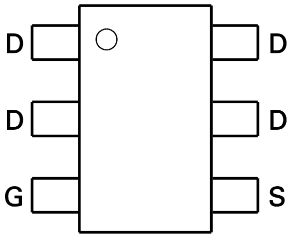
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Input Capacitance

Mechanical Data

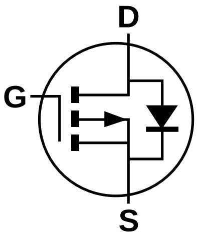
- Case: SOT-26
- Case Material: Molded Plastic; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208
- Weight: 0.018 grams (Approximate)

SOT-26

Top View



Pin Out - Top View



Equivalent Circuit

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

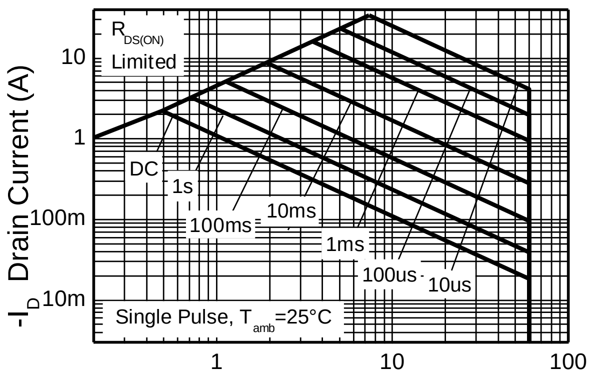
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-60	V
Gate-Source Voltage			V_{GS}	±20	V
Continuous Drain Current	V_{GS} = -10V	(Note 6)	I_D	-3	A
		T_A = +70°C (Note 6)		-2.4	
		(Note 5)		-2.3	
Pulsed Drain Current	V_{GS} = -10V	(Note 7)	I_{DM}	-13.6	A
Continuous Source Current (Body Diode)		(Note 6)	I_S	-2.5	A
Pulsed Source Current (Body Diode)		(Note 7)	I_{SM}	-13.6	A

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

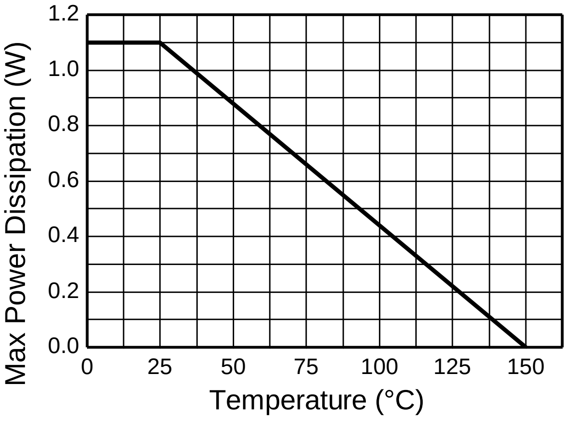
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	1.1 8.8	W mW/°C
	(Note 6)		1.92 15.4	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	°C/W
	(Note 6)		65	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Same as Note 5, except the device is measured at t ≤ 5 sec.
7. Same as Note 5, except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.

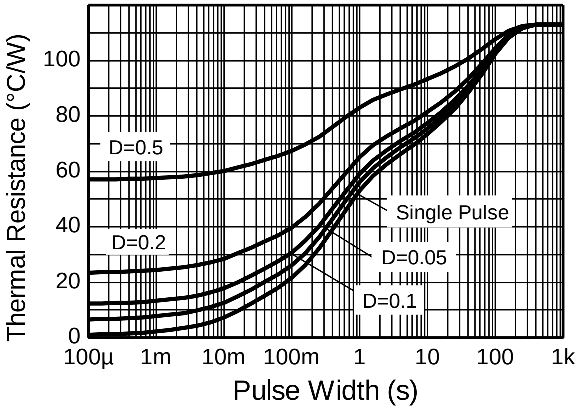
Thermal Characteristics



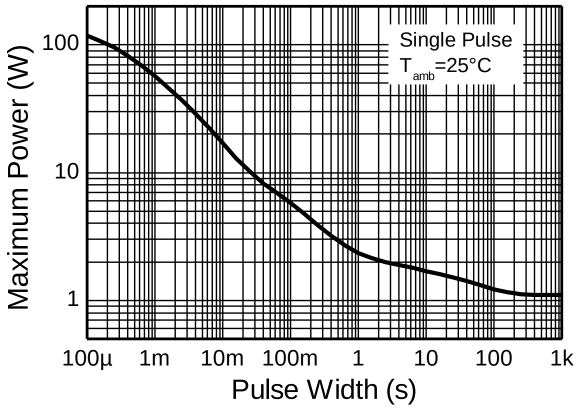
P-channel Safe Operating Area



Derating Curve



Transient Thermal Impedance



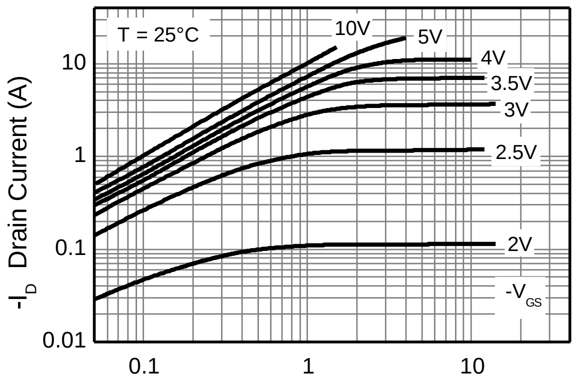
Pulse Power Dissipation

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

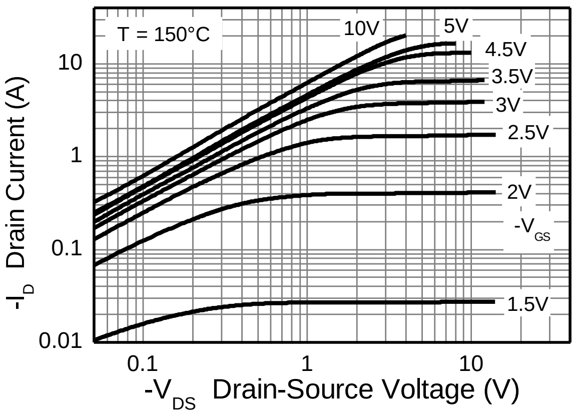
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	-60	—	—	V	I_D = -250μA, V_{GS} = 0V	
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	V_{DS} = -60V, V_{GS} = 0V	
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(th)}$	-1	—	-3	V	I_D = -250μA, V_{DS} = V_{GS}	
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	0.100	0.125	Ω	V_{GS} = -10V, I_D = -2.3A	
			0.130	0.190		V_{GS} = -4.5V, I_D = -1.9A	
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	4.7	—	S	V_{DS} = -15V, I_D = -2.3A	
Diode Forward Voltage (Note 8)	V_{SD}	—	-0.85	-0.95	V	I_S = -2A, V_{GS} = 0V	
Reverse Recovery Time (Note 9)	t_{rr}		25.1	—	ns	I_F = -1.7A, di/dt = 100A/μs	
Reverse Recovery Charge (Note 9)	Q_{rr}	—	27.2	—	nC		
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C_{iss}	—	637	—	pF	V_{DS} = -30V, V_{GS} = 0V f = 1MHz	
Output Capacitance	C_{oss}	—	70	—	pF		
Reverse Transfer Capacitance	C_{rss}	—	53	—	pF		
Total Gate Charge (Note 10)	Q_g	—	9.8	—	nC	V_{GS} = -5V	V_{DS} = -30V I_D = -2.3A
Total Gate Charge (Note 10)	Q_g	—	17.7	—	nC	V_{GS} = -10V	
Gate-Source Charge (Note 10)	Q_{gs}	—	1.6	—	nC		
Gate-Drain Charge (Note 10)	Q_{gd}	—	4.4	—	nC		
Turn-On Delay Time (Note 10)	$t_{D(on)}$	—	2.6	—	ns	V_{DD} = -30V, V_{GS} = -10V I_D = -1A, R_G ≅ 6Ω	
Turn-On Rise Time (Note 10)	t_r	—	3.4	—	ns		
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	—	26.2	—	ns		
Turn-Off Fall Time (Note 10)	t_f	—	11.3	—	ns		

Notes:
8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

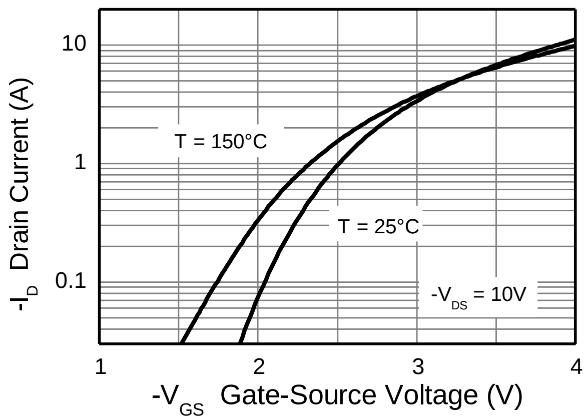
Typical Characteristics



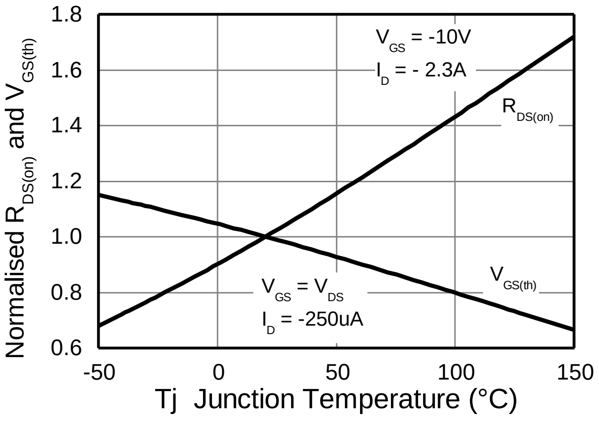
Output Characteristics



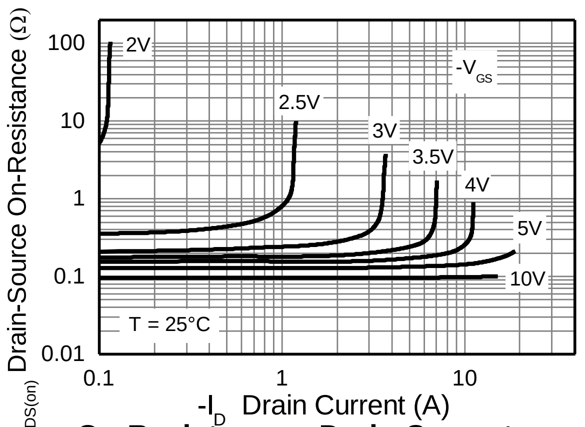
Output Characteristics



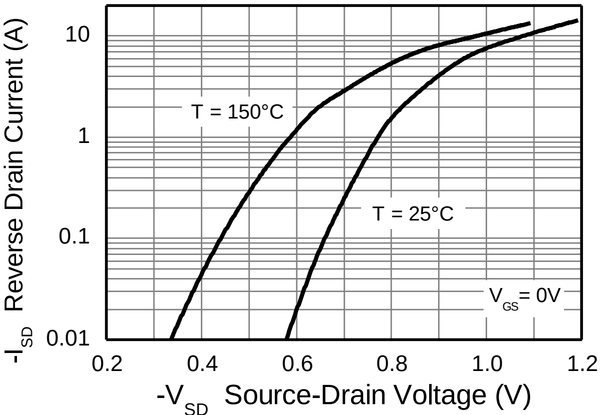
Typical Transfer Characteristics



Normalised Curves v Temperature

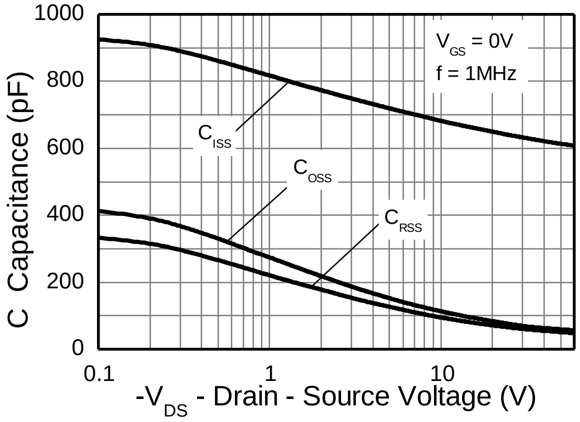


On-Resistance v Drain Current

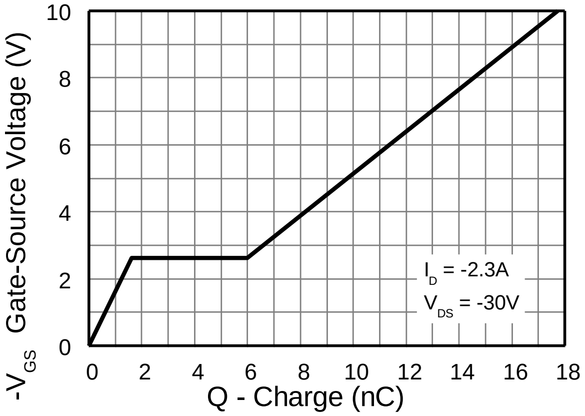


Source-Drain Diode Forward Voltage

Typical Characteristics (cont.)

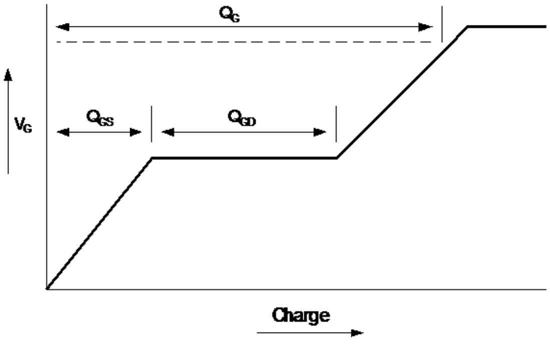


Capacitance v Drain-Source Voltage

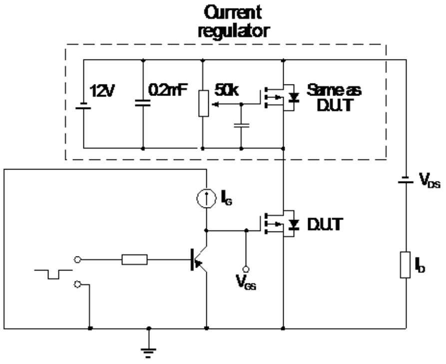


Gate-Source Voltage v Gate Charge

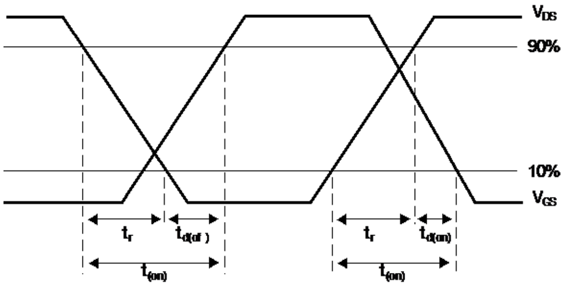
Test Circuits



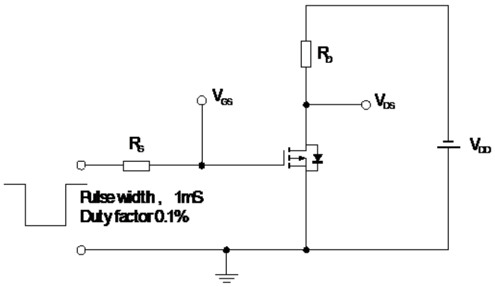
Basic gate charge waveform



Gate charge test circuit

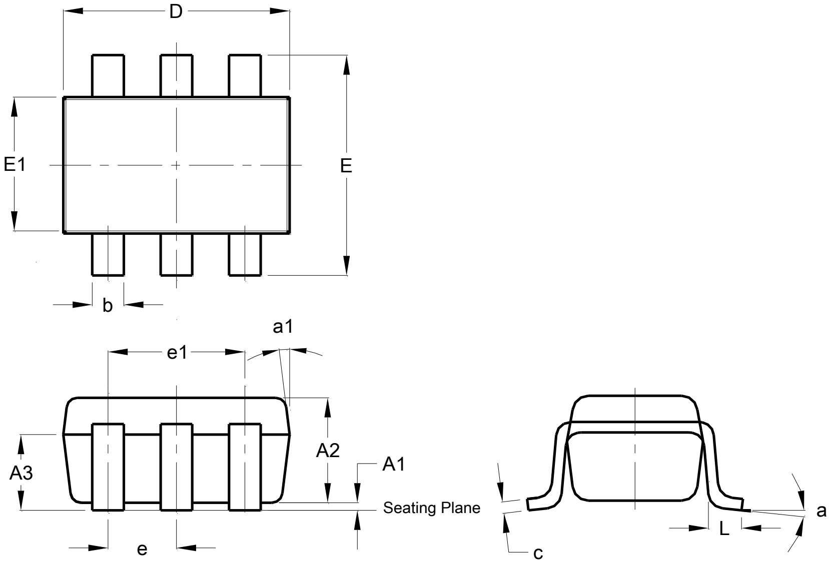


Switching time waveforms



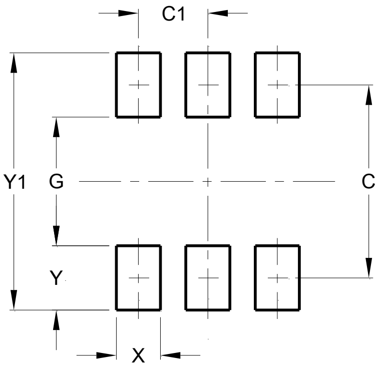
Switching time test circuit

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