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 T_A = +25°C
20V	55mΩ @ V_{GS} = 4.5V	4.6A
	100mΩ @ V_{GS} = 2.5V	3.4A

Description

This new generation MOSFET is 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
- Backlighting

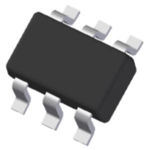
Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed

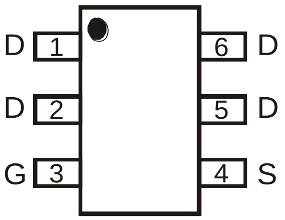
Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.018 grams (Approximate)

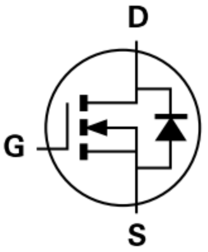
SOT26



Top View



Top View
Pin Configuration



Equivalent Circuit

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current, V_{GS} = 10V	Steady State	T_A = +25°C (Note 6)	I_D	4.6	A
		T_A = +70°C (Note 6)		3.7	
		T_A = +25°C (Note 5)		3.7	
Maximum Body Diode Forward Current (Note 6)			I_S	2.7	A
Pulsed Drain Current (Note 7)			I_{DM}	16	A
Pulsed Source Current (Note 7)			I_{SM}	16	A

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

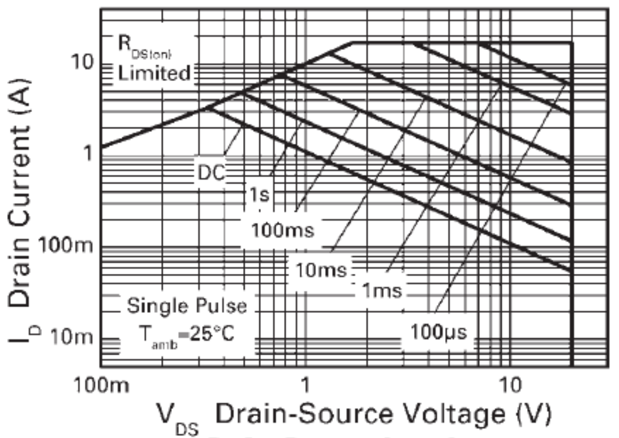
Characteristic		Symbol	Value	Unit
Total Power Dissipation Linear Derating Factor	T_A = +25°C (Note 5)	P_D	1.1 8.8	W mW/°C
Total Power Dissipation Linear Derating Factor	T_A = +25°C (Note 6)	P_D	1.7 13.6	W mW/°C
Thermal Resistance, Junction to Ambient	Steady State (Note 5)	$R_{\theta JA}$	113	°C/W
	Steady State (Note 6)		70	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

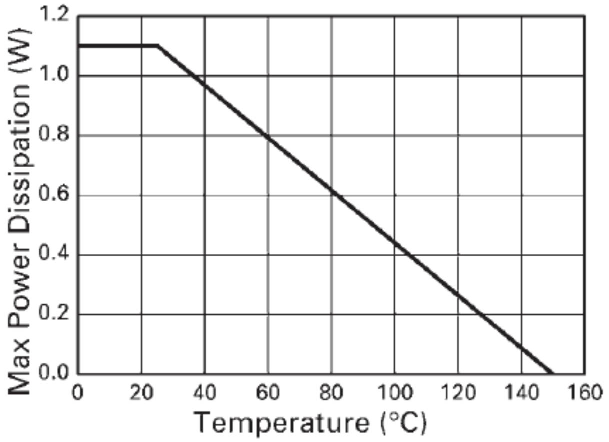
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.7	—	—	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	—	55	mΩ	V_{GS} = 4.5V, I_D = 7.2A
		—	—	100		V_{GS} = 2.5V, I_D = 4.6A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.85	0.95	V	V_{GS} = 0V, I_S = 4.1A
Forward Transconductance (Notes 8 & 10)	g_{fs}	—	13	—	S	V_{DS} = 10V, I_D = 7.2A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	837	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	168	—		
Reverse Transfer Capacitance	C_{rss}	—	90	—		
Total Gate Charge	Q_g	—	8.2	—	nC	V_{DS} = 10V, I_D = 7.2A, V_{GS} = 4.5V
Gate-Source Charge	Q_{gs}	—	2.3	—		
Gate-Drain Charge	Q_{gd}	—	2.0	—		
Turn-On Delay Time	$t_{D(ON)}$	—	4.7	—	ns	V_{GS} = 4.5V, V_{DD} = 10V, R_G = 6.0Ω, I_D= 1.0A
Turn-On Rise Time	t_R	—	5.7	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	18.5	—		
Turn-Off Fall Time	t_F	—	10.5	—		
Body Diode Reverse Recovery Time	t_{RR}	—	12	—	ns	I_F = 1.9A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	4.9	—	nC	

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 ≤5 secs.
7. Repetitive rating 25mm x 25mm FR-4 PCB, D = 0.05, pulse width 10µs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
8. Measured under pulsed conditions. Width=300µs. Duty cycle ≤ 2%.
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

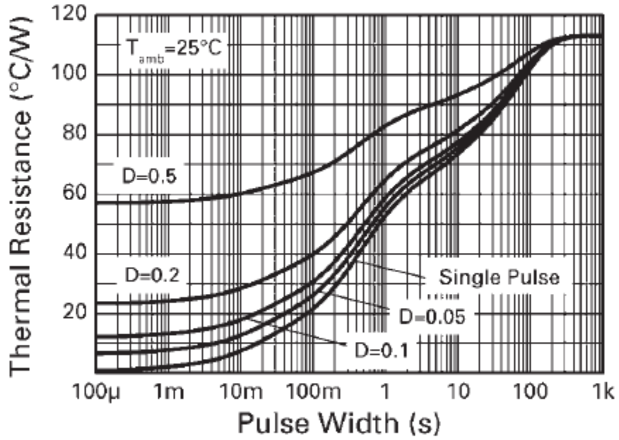
TYPICAL CHARACTERISTICS



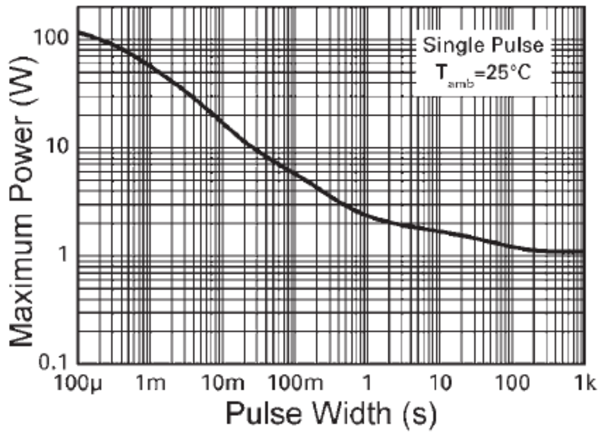
Safe Operating Area



Derating Curve

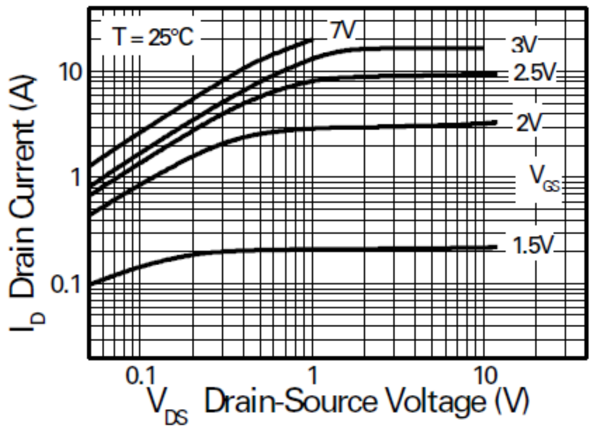


Transient Thermal Impedance

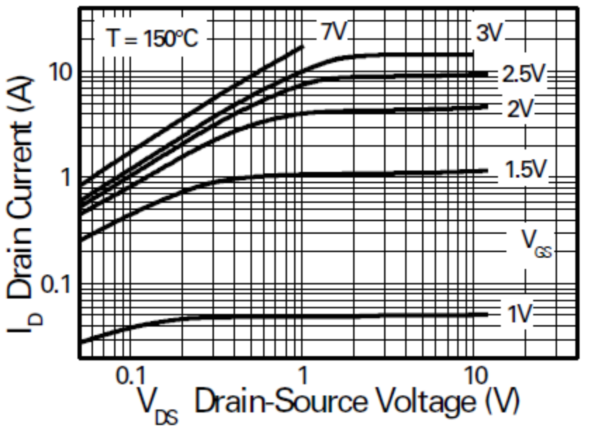


Pulse Power Dissipation

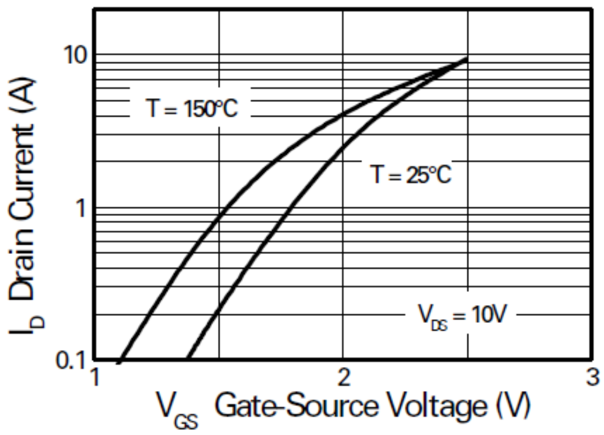
TYPICAL CHARACTERISTICS



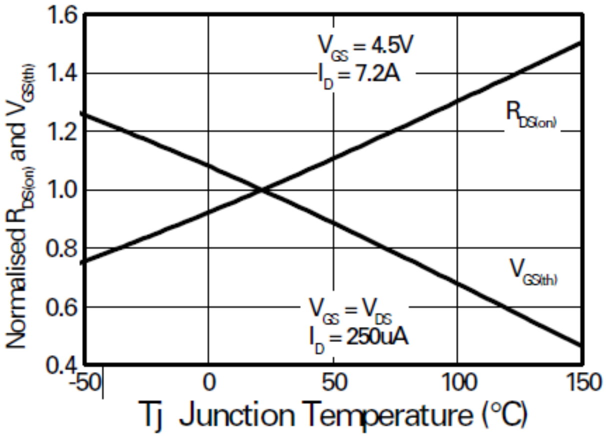
Output Characteristics



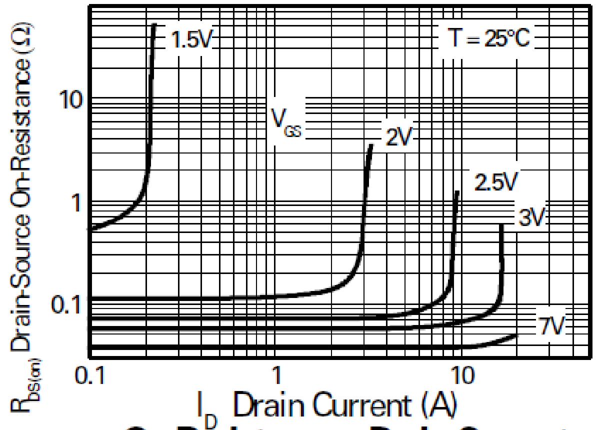
Output Characteristics



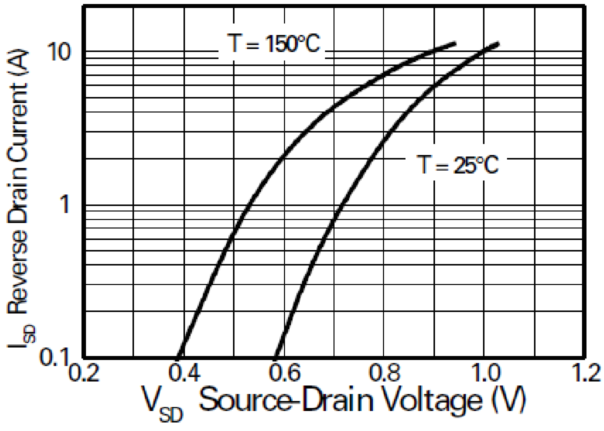
Typical Transfer Characteristics



Normalised Curves v Temperature

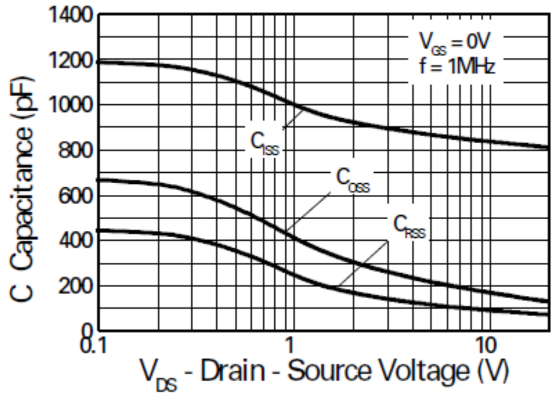


On-Resistance v Drain Current

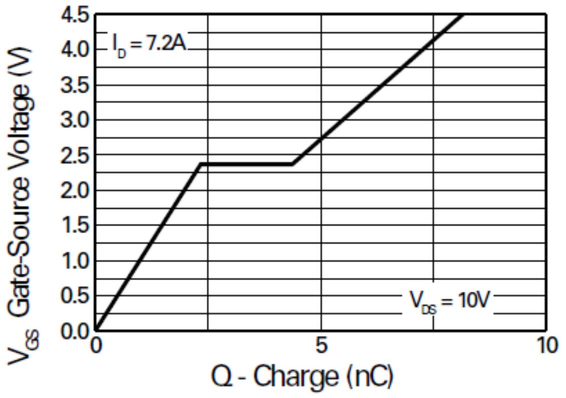


Source-Drain Diode Forward Voltage

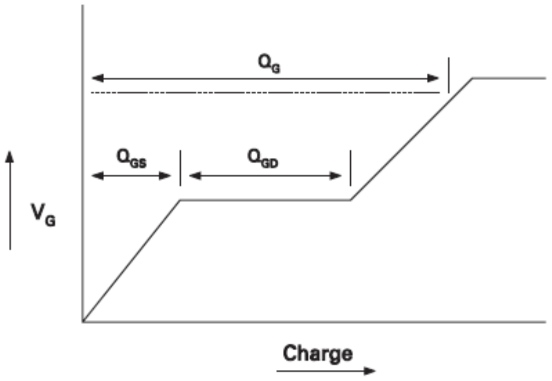
TYPICAL CHARACTERISTICS



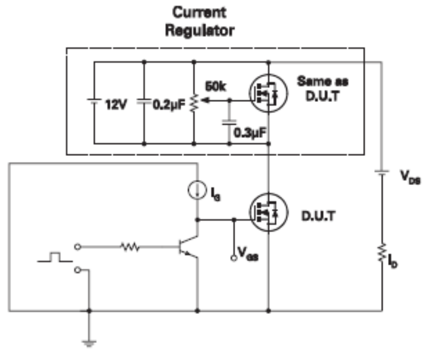
Capacitance v Drain-Source Voltage



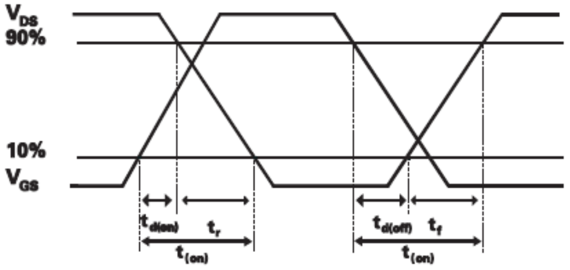
Gate-Source Voltage v Gate Charge



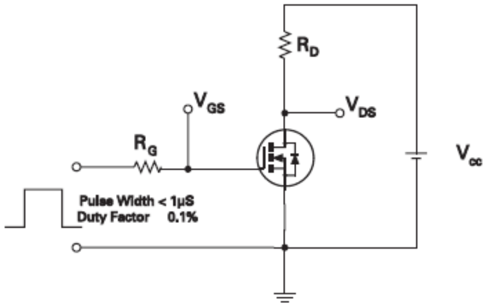
Basic Gate Charge Waveform



Gate Charge Test Circuit

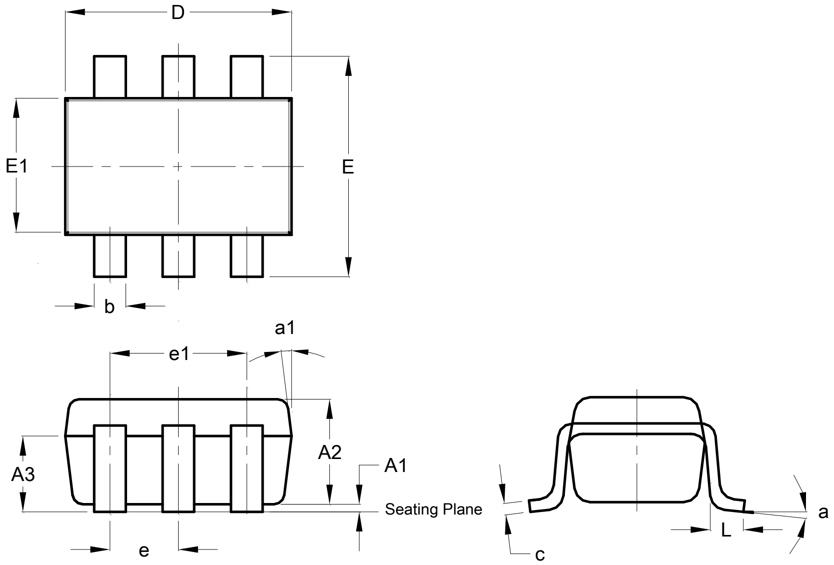


Switching Time Waveforms



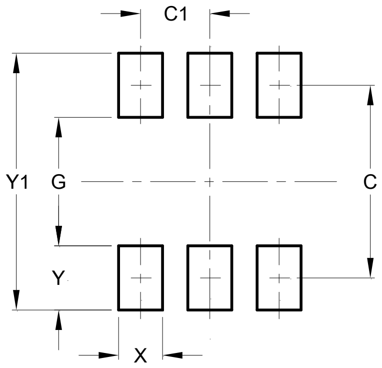
Switching Time Test Circuit

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