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℃
-250V	14Ω @ V_{GS}= -10V	-197mA
	18Ω @ V_{GS}= -3.5V	-175mA

Description

This 250V enhancement mode P-channel MOSFET provides users with a competitive specification. It offers efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdown. Applications benefiting from this device include a variety of Telecom and general high voltage circuits.

SOT89 and SOT223 versions are also available.

Applications

- Earth Recall and Dialing Switches
- Electronic Hook Switches
- High Voltage Power MOSFET Drivers
- Telecom Call Routers
- Solid State Relays

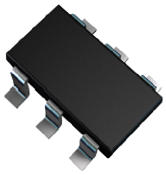
Features and Benefits

- High voltage
- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- Complementary N-channel Type NK-ZVN4525E6
- SOT23-6 package

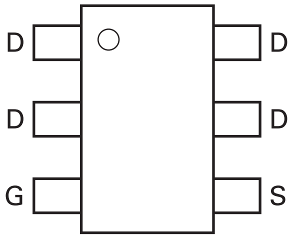
Mechanical Data

- Case: SOT26
- 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 ⓔ3
- Weight 0.018 grams (Approximate)

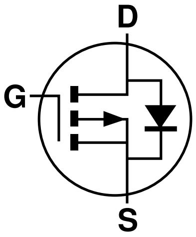
SOT26



Top View



Top View
Pin-Out



Equivalent Circuit

Maximum Ratings (@T$_A$ = +25℃, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-250	V
Gate-Source Voltage			V_{GS}	±40	V
Continuous Drain Current	V_{GS} = 10V	(Note 5)	I_D	-197	mA
		T_A = +70℃ (Note 5)		-157	
Pulsed Drain Current	V_{GS} = 10V	(Note 7)	I_{DM}	-1	A
Continuous Source Current (Body Diode)			I_S	-0.75	A
Pulsed Source Current (Body Diode)			I_{SM}	-1	A

Thermal Characteristics (@T$_A$ = +25℃, unless otherwise specified.)

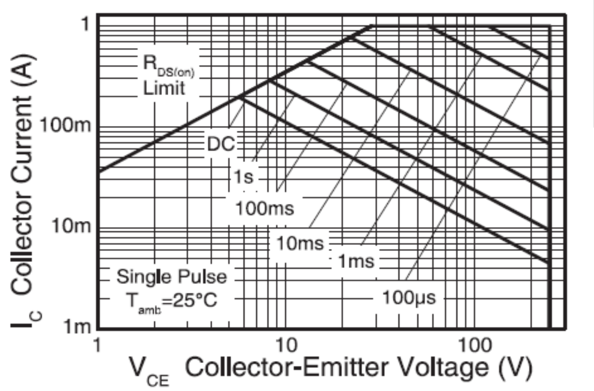
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	1.1 8.8	W mW/℃
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{θJA}$	113	℃/W
	(Note 6)		68	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

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. For a device surface mounted on FR4 PCB measured at t ≤ 5 secs.
7. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

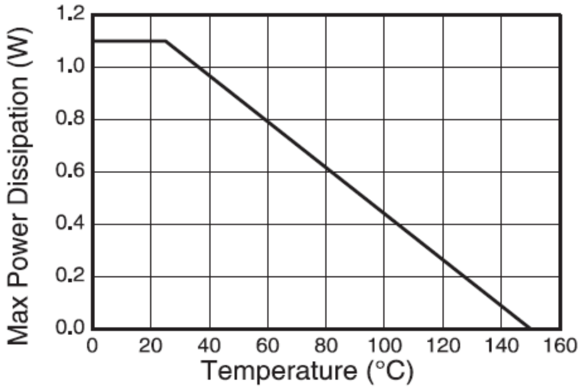
NB High Voltage Applications

For high voltage applications, the appropriate industry sector guidelines should be considered with regard to voltage spacing between conductors.

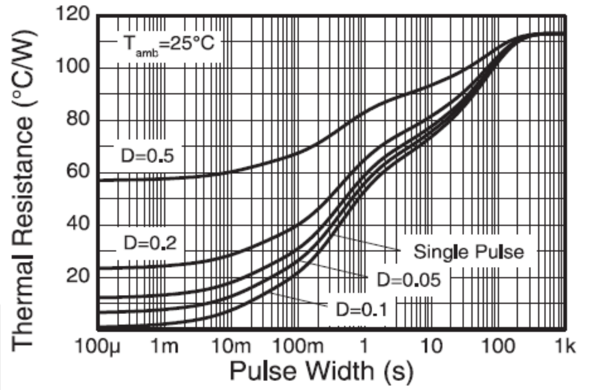
Thermal Characteristics



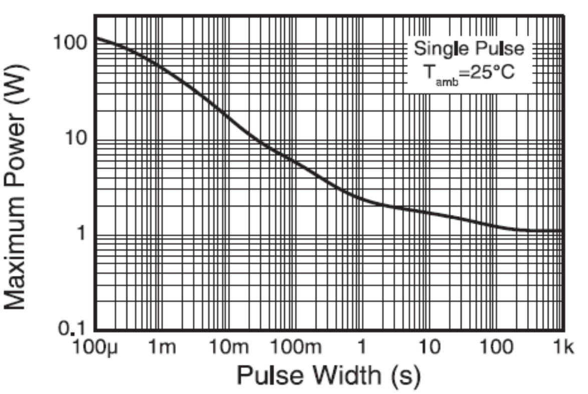
Safe Operating Area



Derating Curve



Transient Thermal Impedance



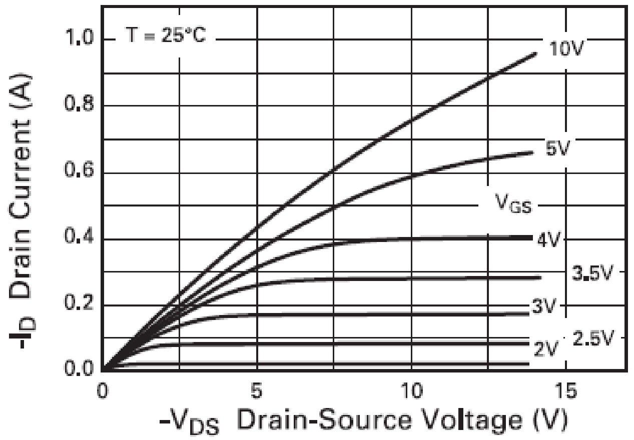
Pulse Power Dissipation

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

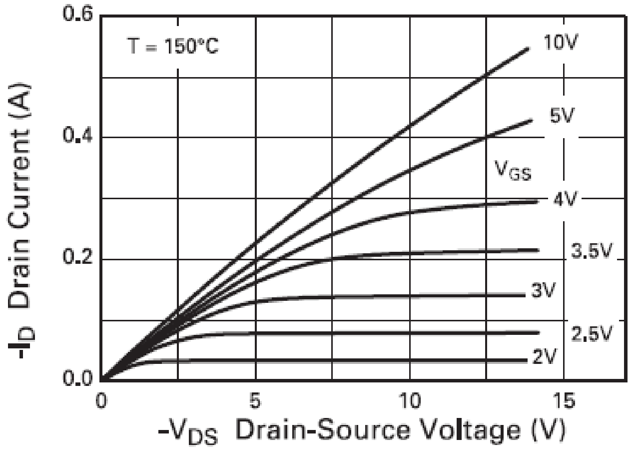
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-250	-285	—	V	I_D = -1mA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	-30	-500	nA	V_{DS} = -250V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	±1	±100	nA	V_{GS} = ±40V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	-0.8	-1.5	-2.0	V	I_D = -1mA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	10	14	Ω	V_{GS} = -10V, I_D = -200mA
		—	13	18		V_{GS} = -3.5V, I_D = -100mA
Forward Transconductance (Notes 10)	g_{fs}	80	200	—	mS	V_{DS} = -10V, I_D = -0.15A
Diode Forward Voltage (Note 9)	V_{SD}	—	-0.86	-0.97	V	I_S = -200mA, V_{GS} = 0V, T_J = +25℃
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	73	—	pF	V_{DS} = -25V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	12.8	—		
Reverse Transfer Capacitance	C_{rss}	—	3.91	—		
Total Gate Charge (Note 9)	Q_g	—	2.45	2.45	nC	V_{DS} = -25V, V_{GS} = -10V, I_D = -200mA (refer to test circuit)
Gate-Source Charge (Note 9)	Q_{gs}	—	0.22	0.31		
Gate-Drain Charge (Note 9)	Q_{gd}	—	0.45	0.63		
Turn-On Delay Time (Note 9)	$t_{D(on)}$	—	1.53	—	ns	V_{DD} = -30V, V_{GS} = -10V I_D = -200mA, R_G = 50Ω (refer to test circuit)
Turn-On Rise Time (Note 9)	t_r	—	3.78	—		
Turn-Off Delay Time (Note 9)	$t_{D(off)}$	—	17.5	—		
Turn-Off Fall Time (Note 9)	t_f	—	7.85	—		
Reverse Recovery Time	t_{rr}	—	205	290	ns	I_F = -200mA, di/dt = 100A/μs, T_J = +25℃
Reverse Recovery Charge	Q_{rr}	—	21	29	nC	

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

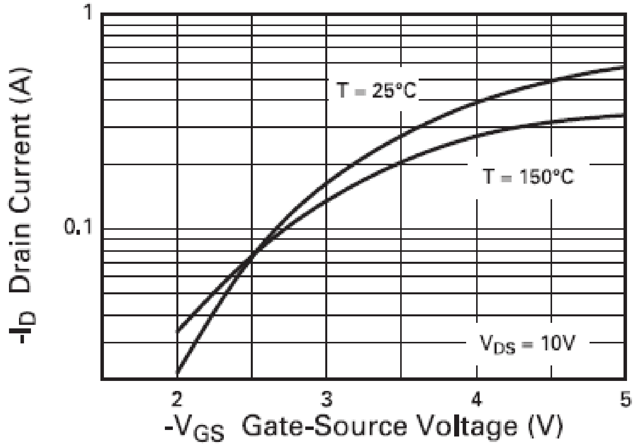
Typical Characteristics



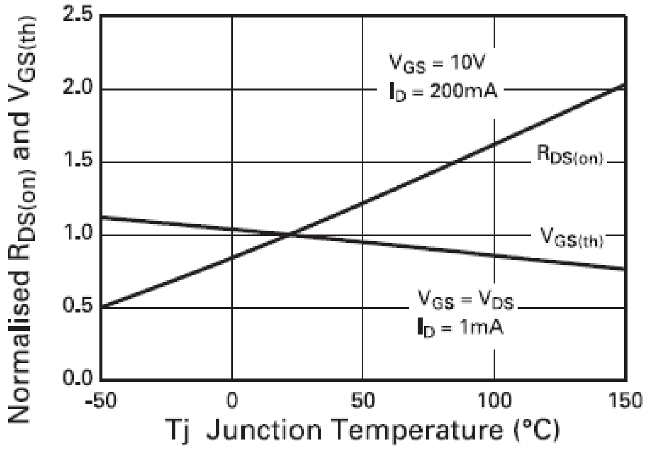
Output Characteristics



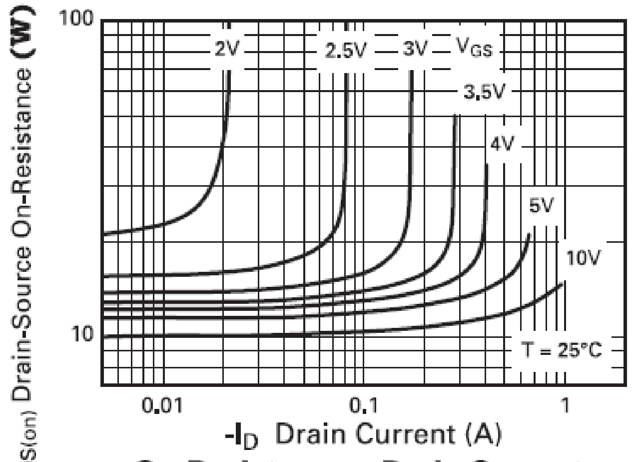
Output Characteristics



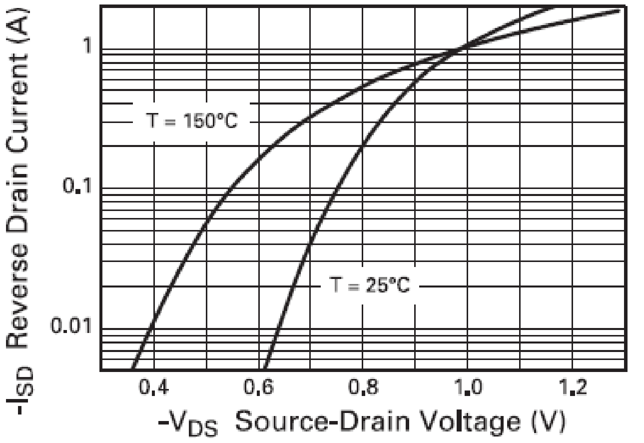
Typical Transfer Characteristics



Normalised Curves v Temperature

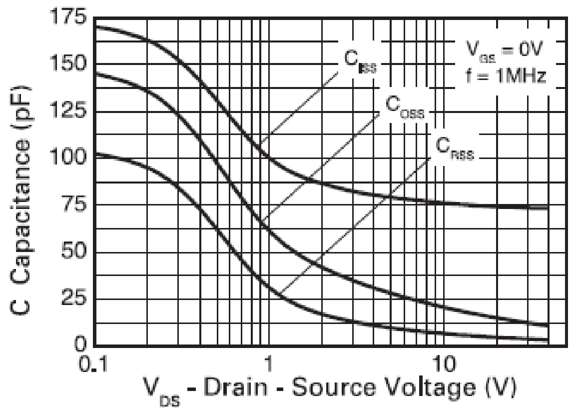


On-Resistance v Drain Current

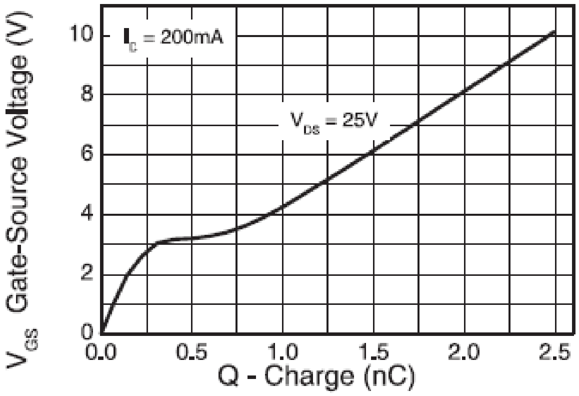


Source-Drain Diode Forward Voltage

Typical Characteristics (continued)

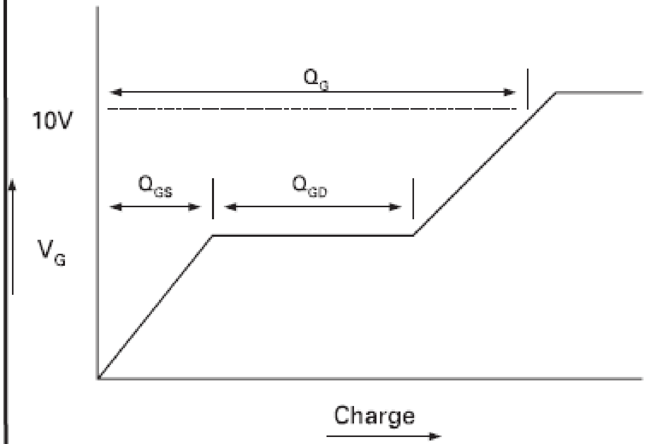


Capacitance v Drain-Source Voltage

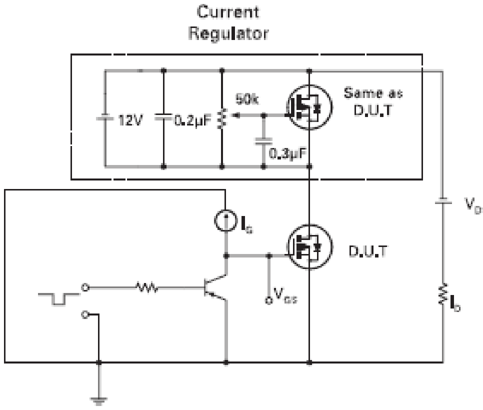


Gate-Source Voltage v Gate Charge

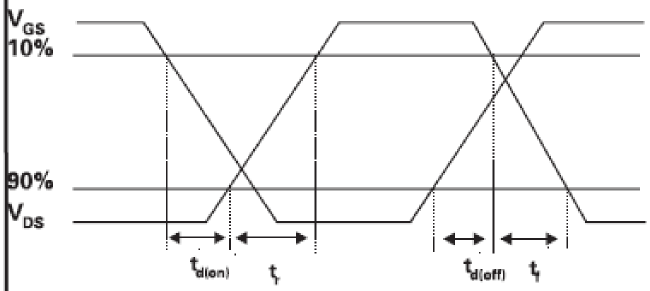
Test Circuits



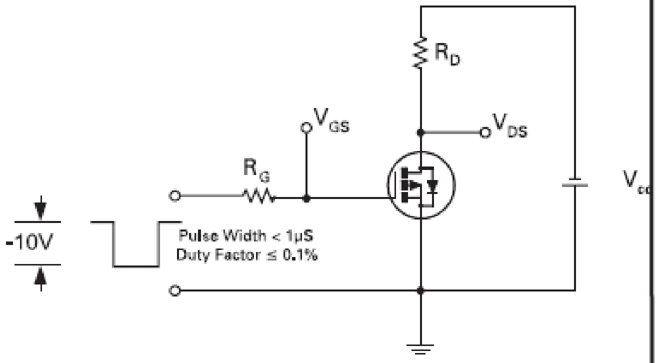
Basic Gate Charge Waveform



Gate Charge Test Circuit

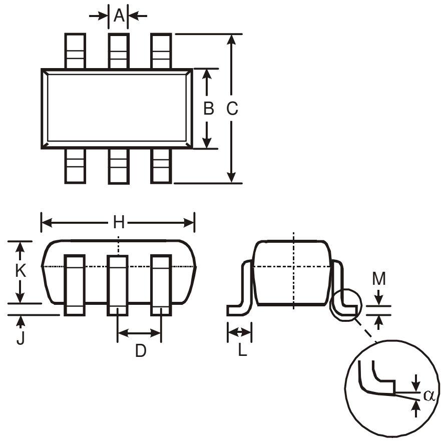


Switching Time Waveforms



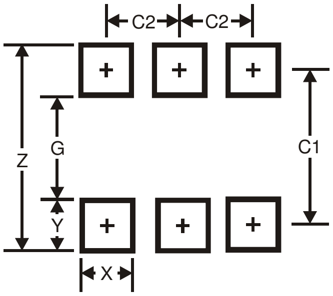
Switching Time Test Circuit

Package Outline Dimensions



SOT26			
Dim	**Min**	**Max**	**Typ**
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D			0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95