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

BV_{DSS}	Max $R_{DS(ON)}$	Max I_D T_A = +25°C
250V	8.5Ω @ V_{GS} = 10V	230mA

Description and Applications

This 250V enhancement mode N-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 breakdowns. Applications benefiting from this device include a variety of telecom and general high-voltage circuits.

SOT89 and SOT223 versions are also available.

- Earth recall and dialing switches
- Electronic hook switches
- High-voltage power MOSFET drivers
- Telecom call routers
- Solid-state relays

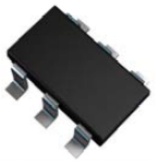
Features and Benefits

- High Voltage
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Complementary P-Channel Type ZVP4525E6

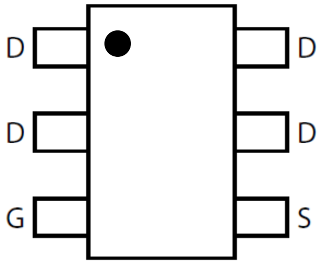
Mechanical Data

- Package: SOT26
- Package Material: Molded Plastic, “Green” Molding Compound. 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 e3
- Weight: 0.015 grams (Approximate)

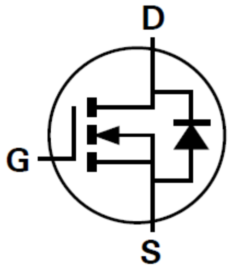
SOT26



Top View



Pinout Top-View



Device Symbol

Maximum Ratings (@T_A = +25°C, 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	T_A = +25°C (Note 5)	I_D	230	mA
		T_A = +70°C (Note 5)		183	
Pulsed Drain Current (Note 7)			I_{DM}	1.44	A
Continuous Source Current (Body Diode)			I_S	1.1	A
Pulsed Source Current (Body Diode)			I_{SM}	1.44	A

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

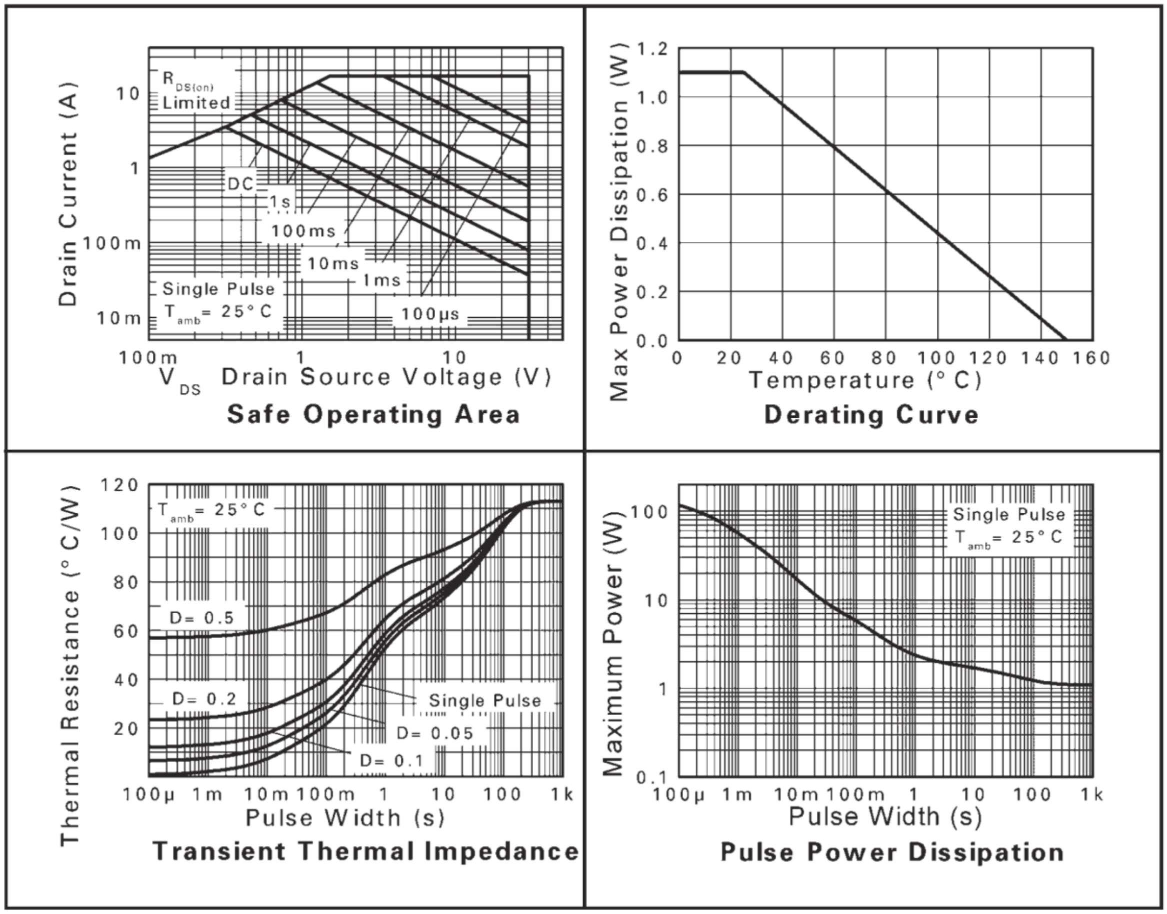
Characteristic	Symbol	Value	Unit
Power Dissipation at T_A = +25°C (Note 5) Linear Derating Factor	P_D	1.1 8.8	W mW/°C
Junction to Ambient (Note 5)	$R_{\theta JA}$	113	°C/W
Junction to Ambient (Note 6)	$R_{\theta JA}$	65	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm × 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
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.

NB High Voltage Applications

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

Thermal Characteristics

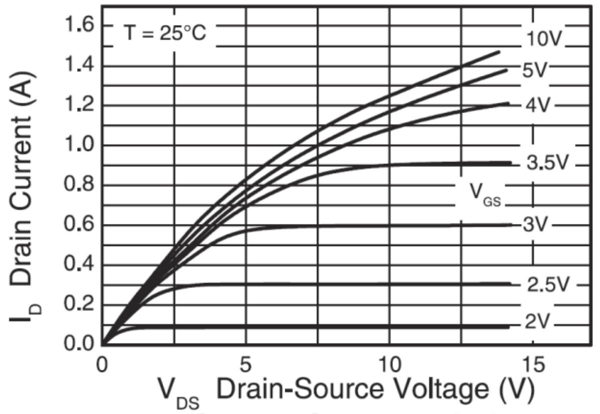


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

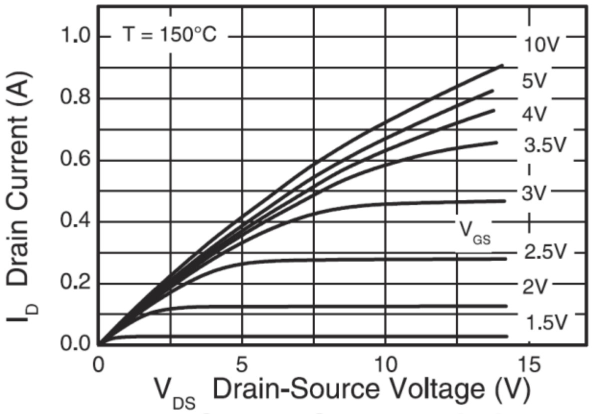
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	250	285	—	V	I_D = 1mA, V_{GS} = 0
Zero Gate Voltage Drain Current	I_{DSS}	—	35	500	nA	V_{DS} = 250V, V_{GS} = 0
Gate-Body Leakage	I_{GSS}	—	±1	100	nA	V_{GS} = ±40V, V_{DS} = 0
ON CHARACTERISTICS						
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.8	1.4	1.8	V	I_D = 1mA, V_{DS} = V_{GS}
Static Drain-Source On-State Resistance (Note 8)	$R_{DS(ON)}$	—	5.6	8.5	Ω	V_{GS} = 10V, I_D = 500mA
			5.9	9.0		V_{GS} = 4.5V, I_D = 360mA
			6.4	9.5		V_{GS} = 2.4V, I_D = 20mA
Forward Transconductance (Note 10)	g_{fs}	0.3	0.475	—	S	V_{DS} = 10V, I_D = 0.3A
Diode Forward Voltage (Note 8)	V_{SD}	—	—	0.97	V	T_J = +25°C, I_S = 360mA, V_{GS} = 0
DYNAMIC CHARACTERISTICS (Notes 9 & 10)						
Input Capacitance	C_{iss}	—	72	—	pF	V_{DS} = 25V, V_{GS} = 0, f = 1MHz
Output Capacitance	C_{oss}	—	11	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	3.6	—	pF	
Total Gate Charge	Q_g	—	2.6	3.65	nC	V_{GS} = 10V, V_{DS} = 25V, I_D = 360mA (refer to test circuit)
Gate-Source Charge	Q_{gs}	—	0.2	0.28	nC	
Gate-Drain Charge	Q_{gd}	—	0.5	0.7	nC	
Reverse-Recovery Time (Note 10)	t_{rr}	—	186	260	ns	T_J = +25°C, I_F = 360A, di/dt = 100A/μs
Reverse-Recovery Charge (Note 10)	Q_{rr}	—	34	48	nC	
Turn-On Delay Time	$t_{d(on)}$	—	1.25	—	ns	V_{DD} = 30V, V_{GS} = 10V, I_D = 360mA, R_G = 50Ω (refer to test circuit)
Turn-On Rise Time	t_r	—	1.7	—	ns	
Turn-Off Delay Time	$t_{d(off)}$	—	11.40	—	ns	
Turn-Off Fall Time	t_f	—	3.5	—	ns	

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

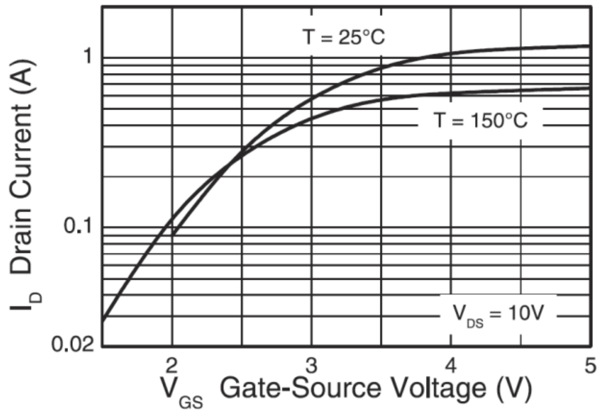
Typical Characteristics



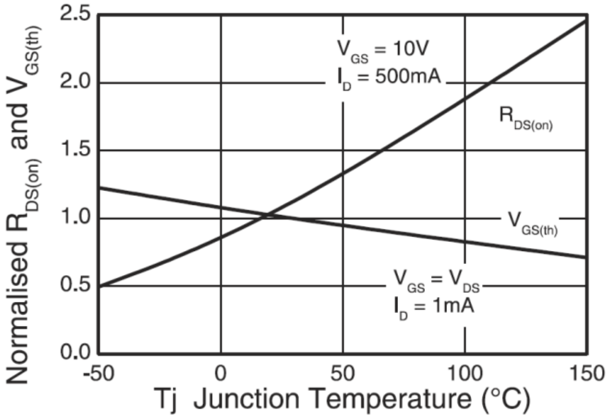
Output Characteristics



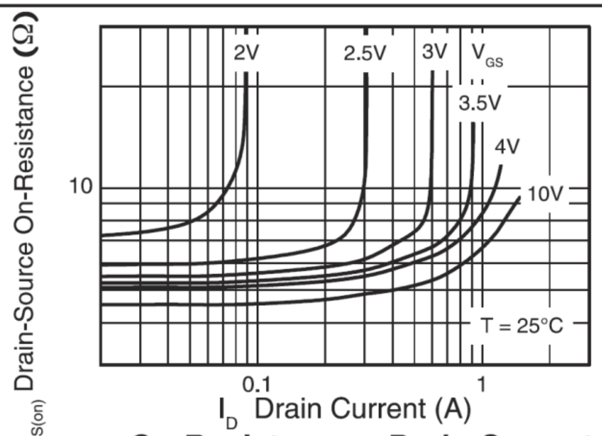
Output Characteristics



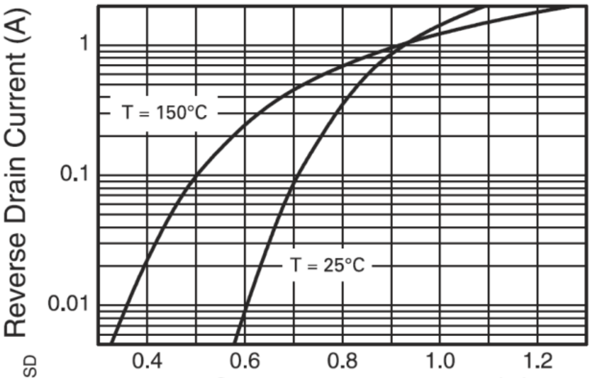
Typical Transfer Characteristics



Normalised Curves v Temperature

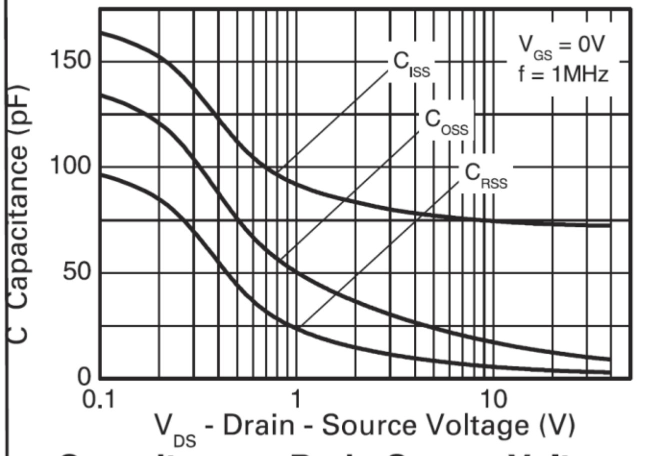


On-Resistance v Drain Current

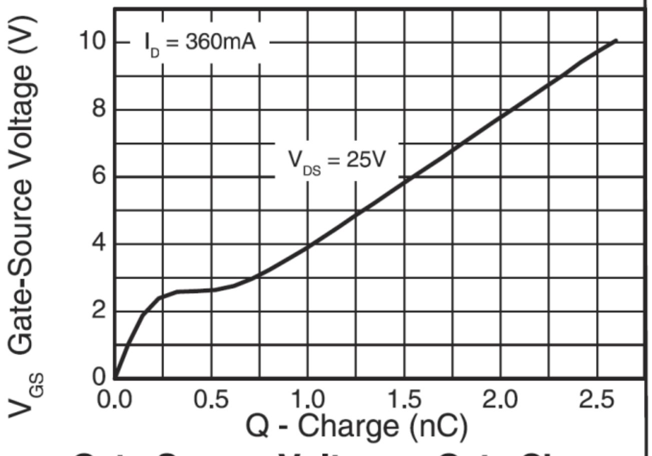


Source-Drain Diode Forward Voltage

Typical Characteristics (continued)

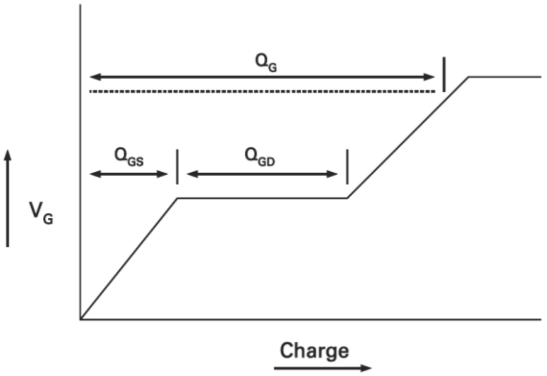


Capacitance v Drain-Source Voltage

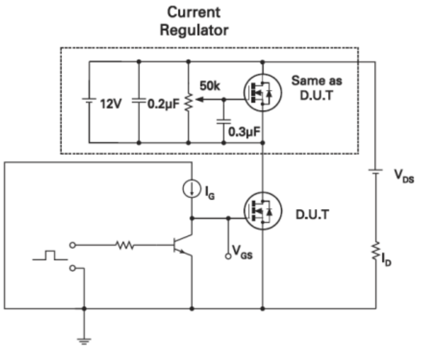


Gate-Source Voltage v Gate Charge

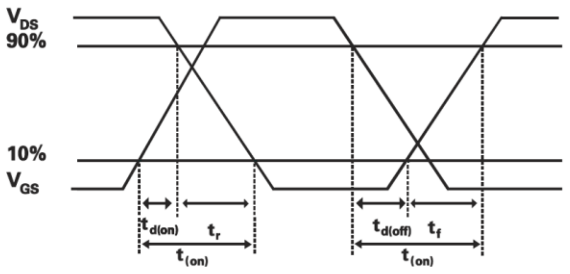
Test Circuits



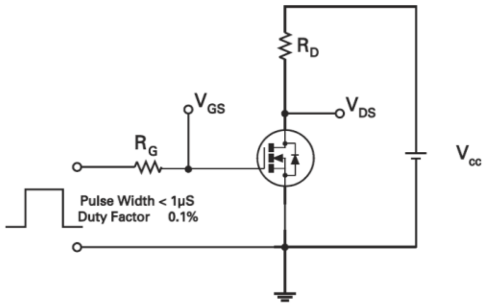
Basic Gate Charge Waveform



Gate Charge Test Circuit



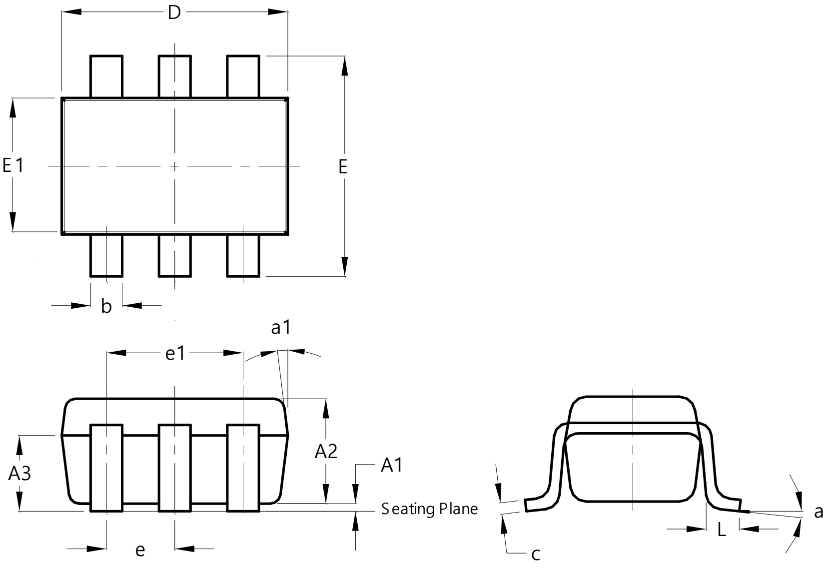
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

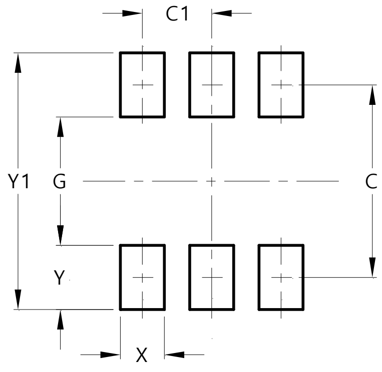
SOT26



SOT26			
Dim	**Min**	**Max**	
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

SOT26



Dimensions	
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20