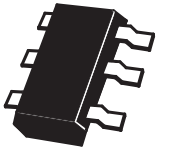
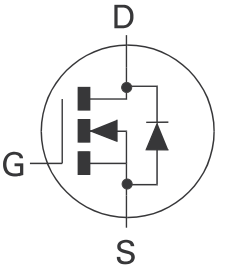
250V N-CHANNEL ENHANCEMENT MODE MOSFET

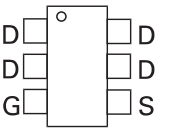
SUMMARY

$V_{(BR)DSS}$=250V; $R_{DS(ON)}$=8.5Ω; I_D=230mA



SOT23-6





Top View

DESCRIPTION

This 250V enhancement mode N-channel MOSFET provides users with a competitive specification offering 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.

FEATURES

- High voltage
- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- Complementary P-channel Type ZVP4525E6
- SOT23-6 package

APPLICATIONS

- Earth Recall and dialling switches
- Electronic hook switches
- High Voltage Power MOSFET Drivers
- Telecom call routers
- Solid state relays

ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZVN4525E6TA	7	8mm embossed	3000 units
ZVN4525E6TC	13	8mm embossed	10000 units

DEVICE MARKING

- N52

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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	250	V
Gate Source Voltage	V_{GS}	±40	V
Continuous Drain Current (V_{GS}=10V; TA=25°C)(a) (V_{GS}=10V; TA=70°C)(a)	I_D I_D	230 183	mA mA
Pulsed Drain Current (c)	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
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	1.1 8.8	W mW/°C
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	65	°C/W

NOTES

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

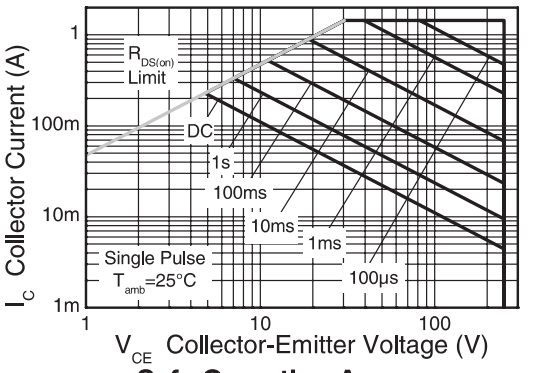
(b) For a device surface mounted on FR4 PCB measured at t≤5 secs.

(c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal

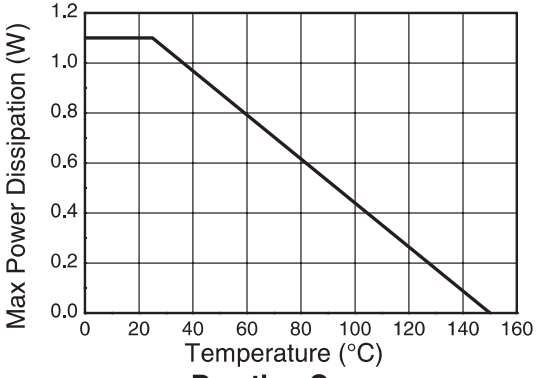
NB High Voltage Applications

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

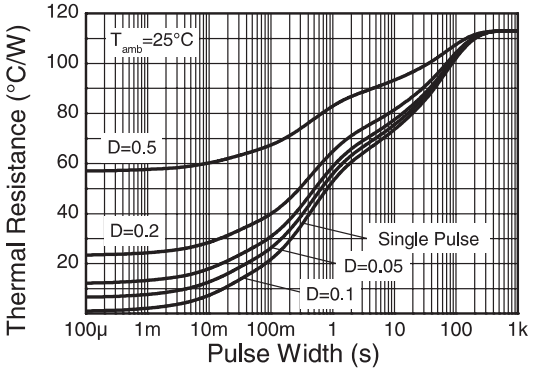
CHARACTERISTICS



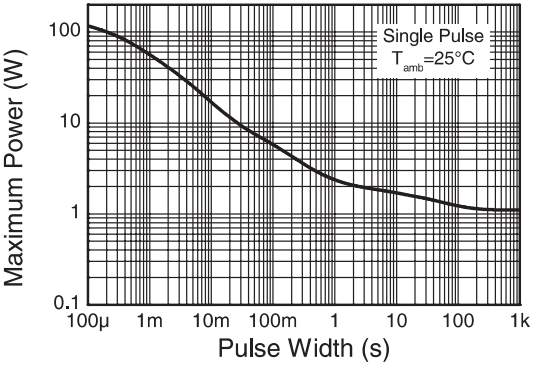
Safe Operating Area



Derating Curve



Transient Thermal Impedance



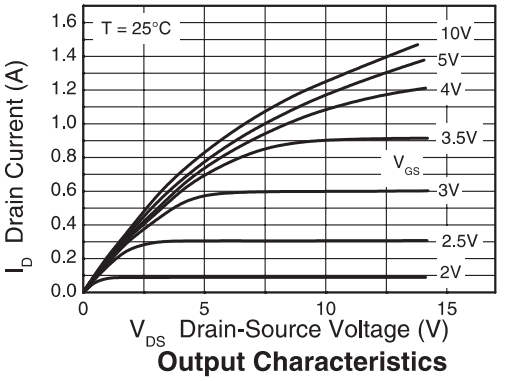
Pulse Power Dissipation

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

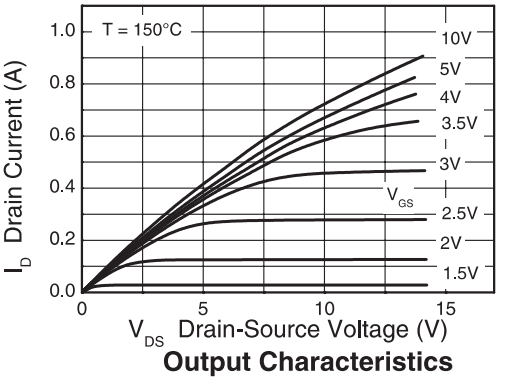
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	250	285		V	I_D=1mA, V_{GS}=0V
Zero Gate Voltage Drain Current	I_{DSS}		35	500	nA	V_{DS}=250V, V_{GS}=0V
Gate-Body Leakage	I_{GSS}		±1	±100	nA	V_{GS}=±40V, V_{DS}=0V
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.8	1.4	1.8	V	I_D=1mA, V_{DS}= V_{GS}
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$		5.6 5.9 6.4	8.5 9.0 9.5	Ω Ω Ω	V_{GS}=10V, I_D=500mA V_{GS}=4.5V, I_D=360mA V_{GS}=2.4V, I_D=20mA
Forward Transconductance (3)	g_{fs}	0.3	0.475		S	V_{DS}=10V,I_D=0.3A
DYNAMIC (3)						
Input Capacitance	C_{iss}		72		pF	V_{DS}=25 V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		11		pF	
Reverse Transfer Capacitance	C_{rss}		3.6		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		1.25		ns	V_{DD} =30V, I_D=360mA R_G=50Ω, V_{qs}=10V (refer to test circuit)
Rise Time	t_r		1.70		ns	
Turn-Off Delay Time	$t_{d(off)}$		11.40		ns	
Fall Time	t_f		3.5		ns	
Total Gate Charge	Q_g		2.6	3.65	nC	V_{DS}=25V,V_{GS}=10V, I_D=360mA(refer to test circuit)
Gate-Source Charge	Q_{gs}		0.2	0.28	nC	
Gate Drain Charge	Q_{gd}		0.5	0.70	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.97	V	T_j=25°C, I_S=360mA, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		186	260	ns	T_j=25°C, I_F=360mA, di/dt= 100A/µs
Reverse Recovery Charge (3)	Q_{rr}		34	48	nC	

(1) Measured under pulsed conditions. Width=300µs. Duty cycle ≤2% .
(2) Switching characteristics are independent of operating junction temperature.
(3) For design aid only, not subject to production testing.

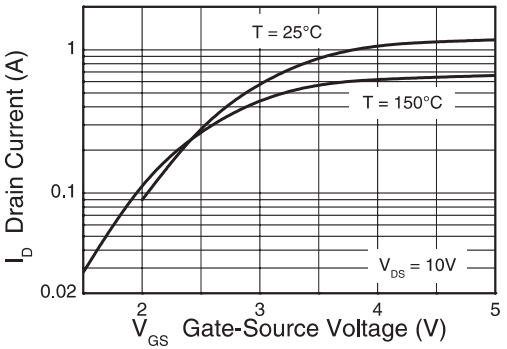
TYPICAL CHARACTERISTICS



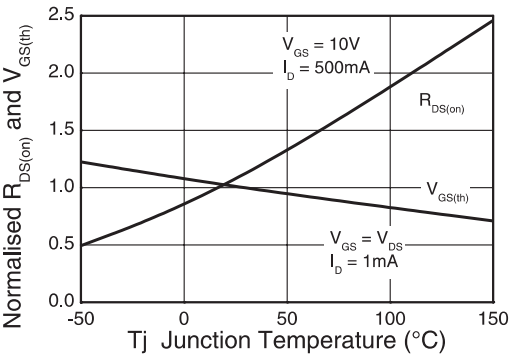
Output Characteristics



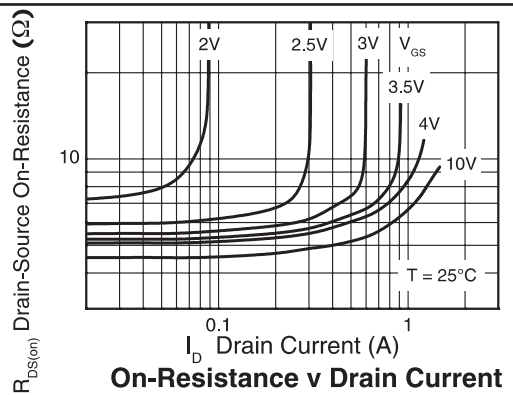
Output Characteristics



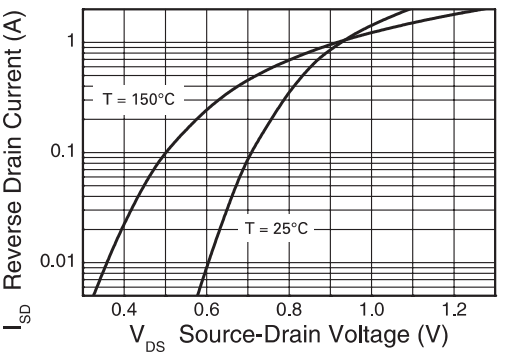
Typical Transfer Characteristics



Normalised Curves v Temperature

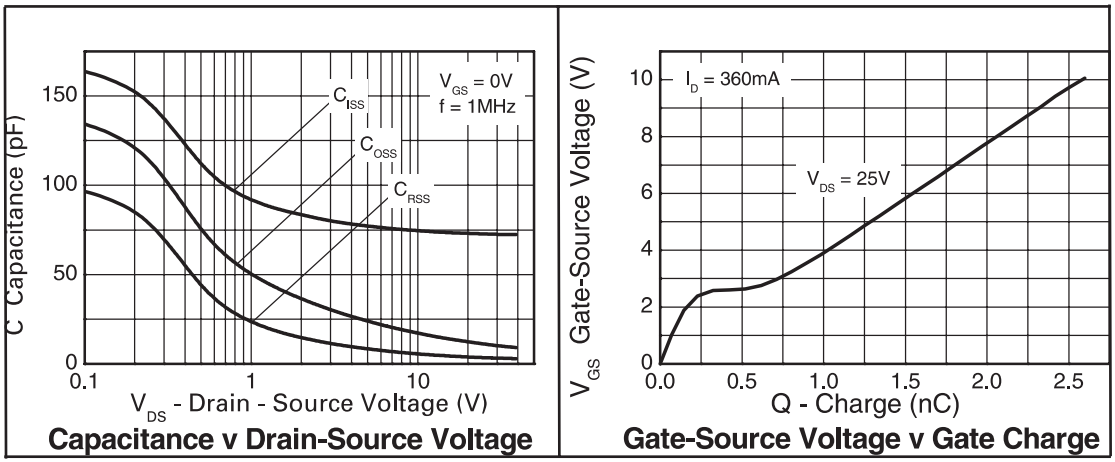


On-Resistance v Drain Current

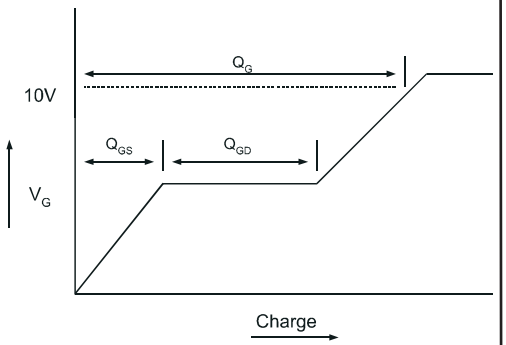


Source-Drain Diode Forward Voltage

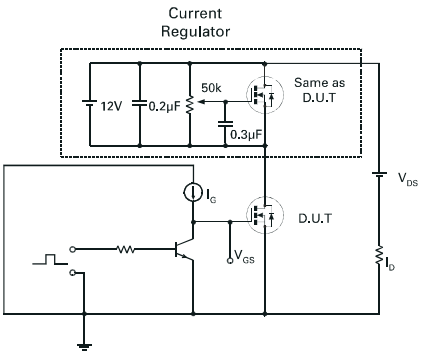
CHARACTERISTICS



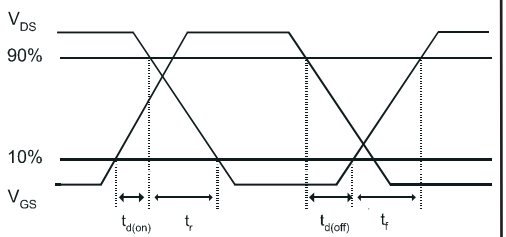
CHARACTERISTICS



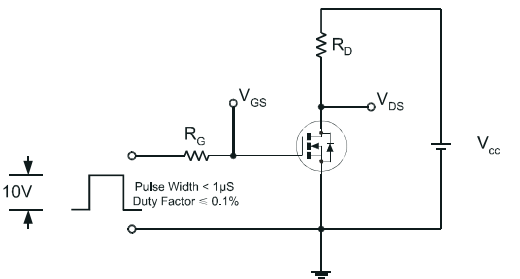
Basic Gate Charge Waveform



Gate Charge Test Circuit



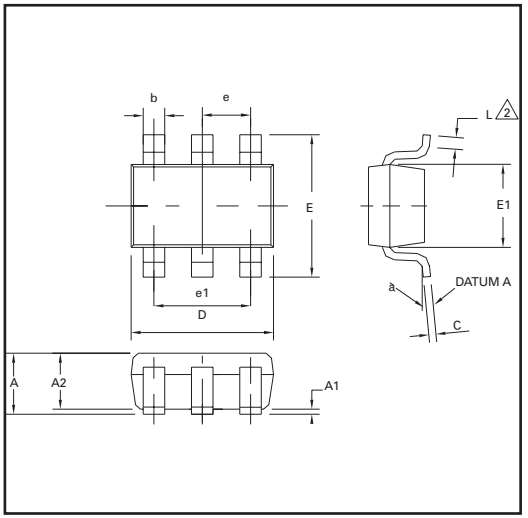
Switching Time Waveforms



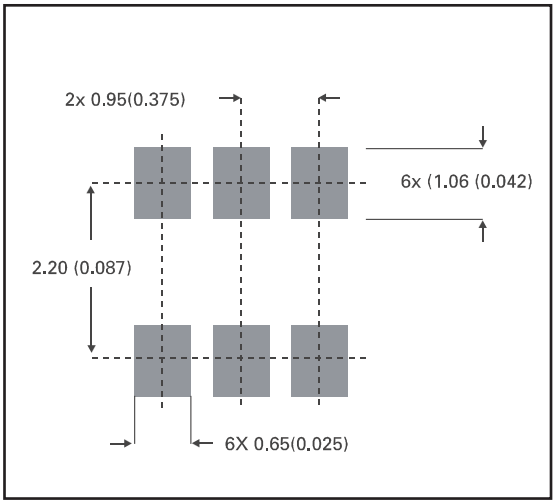
Switching Time Test Circuit

ZVN4525E6

PACKAGE DIMENSIONS



PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°

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