

# ZVP4525G

## 250V P-CHANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

$V_{(BR)DSS} = -250V$ ;  $R_{DS(ON)} = 14V$ ;  $I_D = -265mA$

### DESCRIPTION

This 250V enhancement mode P-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 SOT23-6 versions are also available.

### FEATURES

- High voltage
- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- Complementary N-channel type ZVN4525G
- SOT223 package

### APPLICATIONS

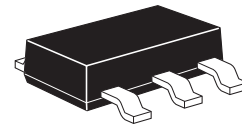
- Earth recall and dialling switches
- Electronic hook switches
- High voltage power MOSFET drivers
- Telecom call routers
- Solid state relays

### ORDERING INFORMATION

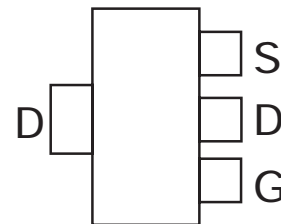
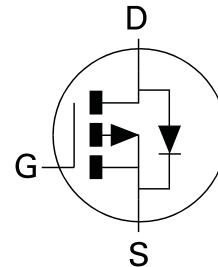
DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZVP4525GTA	7"	8mm embossed	1000 units
ZVP4525GTC	13"	8mm embossed	4000 units

### DEVICE MARKING

- ZVP4525G



SOT223



TOP VIEW

# ZVP4525G

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	$V_{DSS}$	250	V
Gate source voltage	$V_{GS}$	$\pm 40$	V
Continuous drain current ( $V_{GS}=10V$ ; $T_A=25^\circ C$ ) <sup>(a)</sup> ( $V_{GS}=10V$ ; $T_A=70^\circ C$ ) <sup>(a)</sup>	$I_D$ $I_D$	-265 -212	mA mA
Pulsed drain current <sup>(c)</sup>	$I_{DM}$	-1	A
Continuous source current (body diode)	$I_S$	-0.75	A
Pulsed source current (body diode)	$I_{SM}$	-1	A
Power dissipation at $T_A=25^\circ C$ <sup>(a)</sup> Linear derating factor	$P_D$	2 16	W mW/ $^\circ C$
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	$^\circ C$

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	63	$^\circ C/W$
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	26	$^\circ C/W$

### 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

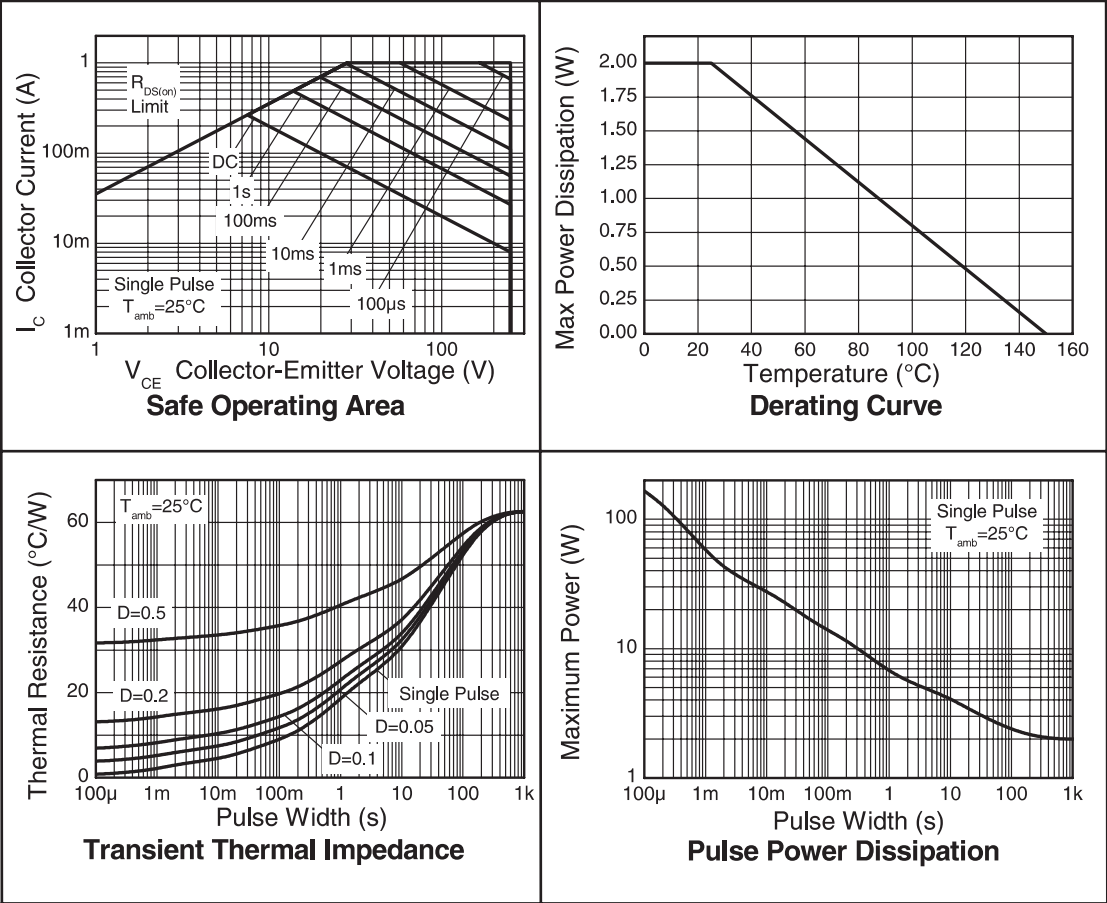
(b) For a device surface mounted on FR4 PCB measured at  $t \leq 5$  secs.

(c) 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.

CHARACTERISTICS



# ZVP4525G

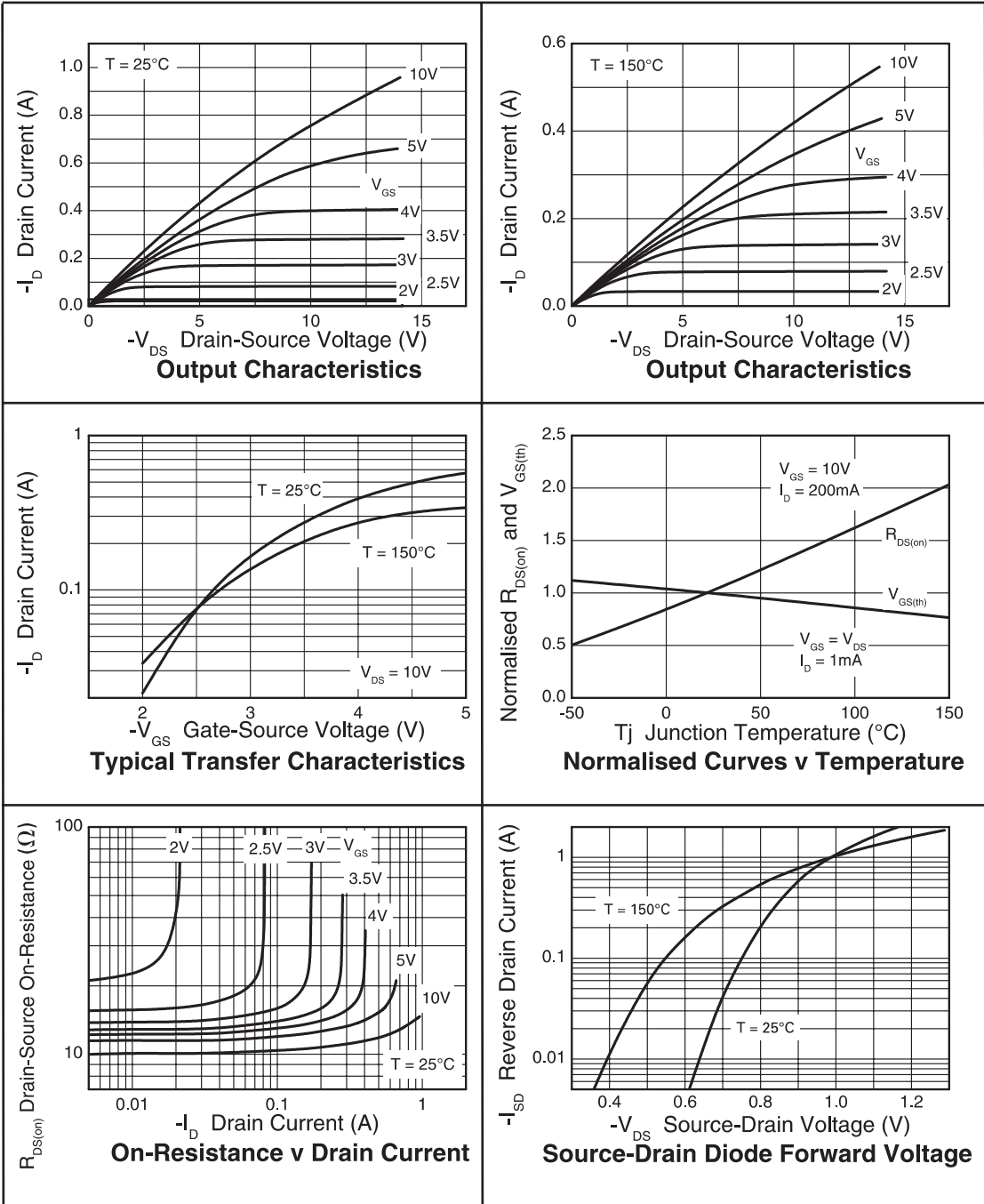
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
<b>STATIC</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	-250	-285		V	$I_D = -1\text{mA}$ , $V_{GS} = 0\text{V}$
Zero gate voltage drain current	$I_{DSS}$		-30	-500	nA	$V_{DS} = -250\text{V}$ , $V_{GS} = 0\text{V}$
Gate-body leakage	$I_{GSS}$		$\pm 1$	$\pm 100$	nA	$V_{GS} = \pm 40\text{V}$ , $V_{DS} = 0\text{V}$
Gate-source threshold voltage	$V_{GS(th)}$	-0.8	-1.5	-2.0	V	$I_D = -1\text{mA}$ , $V_{DS} = V_{GS}$
Static drain-source on-state resistance <sup>(1)</sup>	$R_{DS(on)}$		10 13	14 18	$\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -200\text{mA}$ $V_{GS} = -3.5\text{V}$ , $I_D = -100\text{mA}$
Forward transconductance <sup>(3)</sup>	$g_{fs}$	80	200		mS	$V_{DS} = -10\text{V}$ , $I_D = -0.15\text{A}$
<b>DYNAMIC</b> <sup>(3)</sup>						
Input capacitance	$C_{iss}$		73		pF	$V_{DS} = -25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output capacitance	$C_{oss}$		12.8		pF	
Reverse transfer capacitance	$C_{rss}$		3.91		pF	
<b>SWITCHING</b> <sup>(2)</sup> <sup>(3)</sup>						
Turn-on delay time	$t_{d(on)}$		1.53		ns	$V_{DD} = -30\text{V}$ , $I_D = -200\text{mA}$ $R_G = 50\Omega$ , $V_{GS} = -10\text{V}$ (refer to test circuit)
Rise time	$t_r$		3.78		ns	
Turn-off delay time	$t_{d(off)}$		17.5		ns	
Fall time	$t_f$		7.85		ns	
Total gate charge	$Q_g$		2.45	3.45	nC	$V_{DS} = -25\text{V}$ , $V_{GS} = -10\text{V}$ , $I_D = -200\text{mA}$ (refer to test circuit)
Gate-source charge	$Q_{gs}$		0.22	0.31	nC	
Gate drain charge	$Q_{gd}$		0.45	0.63	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode forward voltage <sup>(1)</sup>	$V_{SD}$			0.97	V	$T_j = 25^{\circ}\text{C}$ , $I_S = -200\text{mA}$ , $V_{GS} = 0\text{V}$
Reverse recovery time <sup>(3)</sup>	$t_{rr}$		205	290	ns	$T_j = 25^{\circ}\text{C}$ , $I_F = -200\text{mA}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse recovery charge <sup>(3)</sup>	$Q_{rr}$		21	29	nC	

### NOTES:

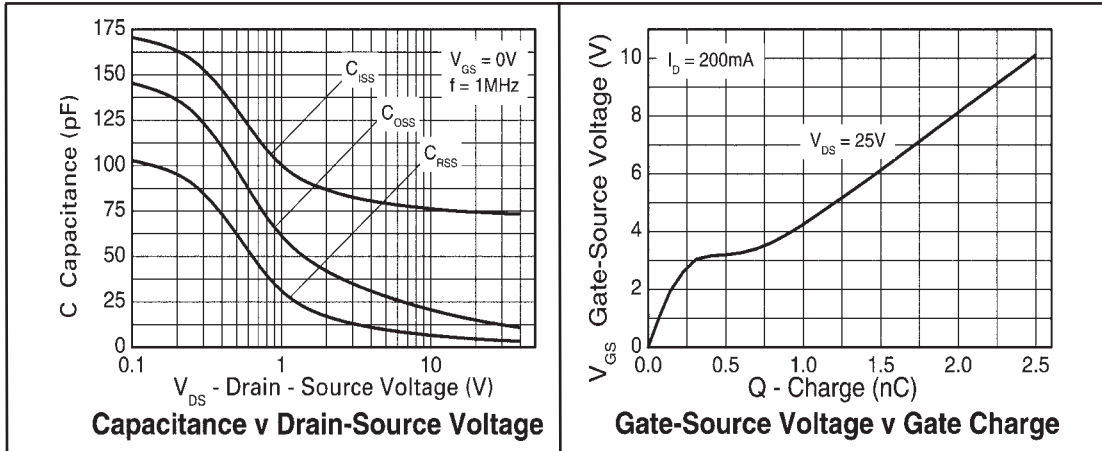
- (1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

TYPICAL CHARACTERISTICS



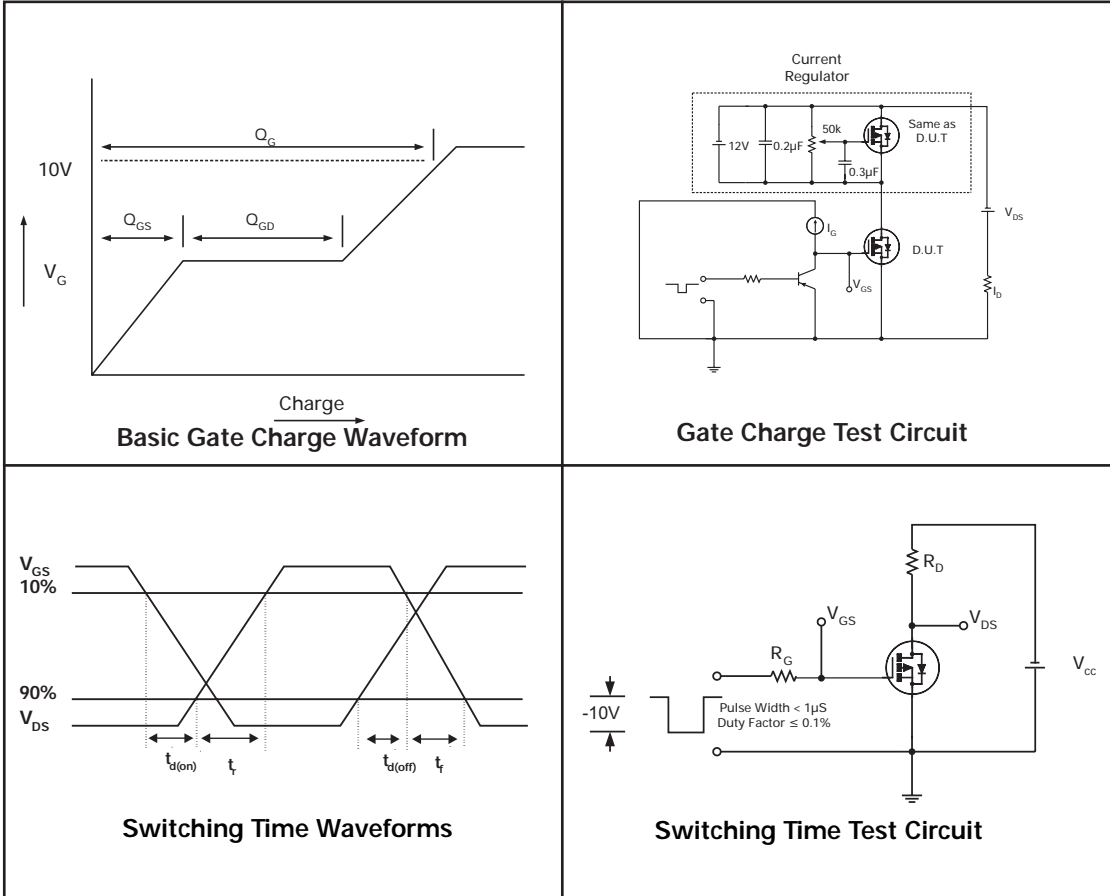
# ZVP4525G

## CHARACTERISTICS



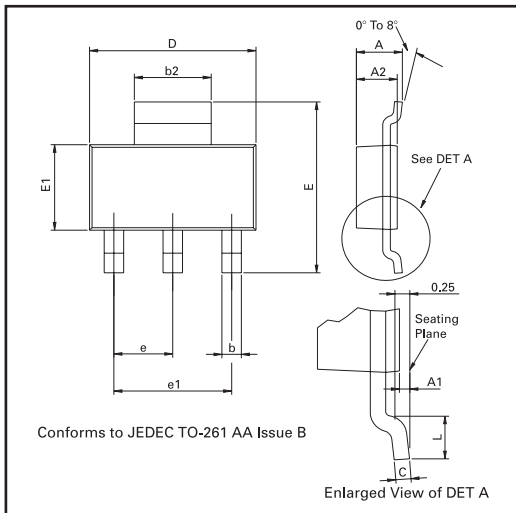
# TEST CIRCUITS

## ZVP4525G

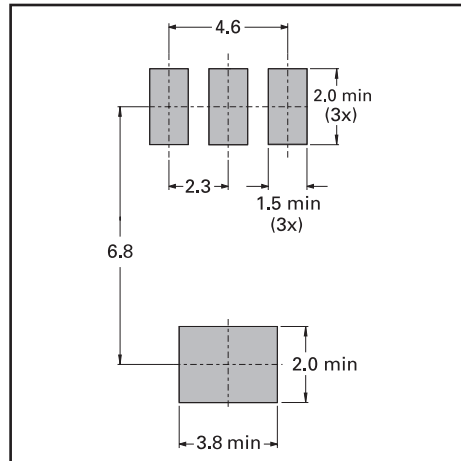


# ZVP4525G

## PACKAGE OUTLINE



## PAD LAYOUT DETAILS



Controlling dimensions are in millimeters. Approximate conversions are given in inches

## PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-
D	6.30	6.70	0.248	0.264	-	-	-	-	-

© Zetex Semiconductors plc 2004

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex plc Lansdowne Road, Chadderton Oldham, OL9 9TY United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 <a href="mailto:europa.sales@zetex.com">europa.sales@zetex.com</a>	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 <a href="mailto:usa.sales@zetex.com">usa.sales@zetex.com</a>	Telephone: (852) 26100 611 Fax: (852) 24250 494 <a href="mailto:asia.sales@zetex.com">asia.sales@zetex.com</a>	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 <a href="mailto:hq@zetex.com">hq@zetex.com</a>

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to [www.zetex.com](http://www.zetex.com)



ISSUE 4 - JUNE 2004