

# ZVP4525Z

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## 250V P-CHANNEL ENHANCEMENT MODE MOSFET

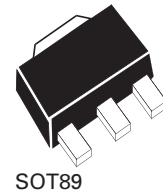
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### SUMMARY

$V_{(BR)DSS} = -250V$ ;  $R_{DS(ON)} = 14\Omega$ ;  $I_D = -205mA$

### DESCRIPTION

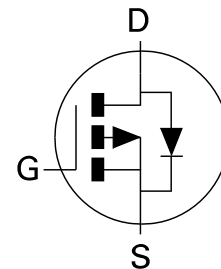
This 250V enhancement mode P-channel MOSFET provides users with a competitive specification offering efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdown. Applications benefiting from this device include a variety of Telecom and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



SOT223 and SOT23-6 versions are also available.

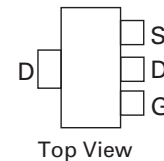
### FEATURES

- High voltage
- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- Complementary N-channel Type ZVN4525Z
- SOT89 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
ZVP4525ZTA	7	12mm embossed	1000 units
ZVP4525ZTC	13	12mm embossed	4000 units

### DEVICE MARKING

- P52

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## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	250	V
Gate Source Voltage	V <sub>GS</sub>	±40	V
Continuous Drain Current (V <sub>GS</sub> =10V; T <sub>A</sub> =25°C)(a) (V <sub>GS</sub> =10V; T <sub>A</sub> =70°C)(a)	I <sub>D</sub> I <sub>D</sub>	-205 -164	mA mA
Pulsed Drain Current (c)	I <sub>DM</sub>	-1	A
Continuous Source Current (Body Diode)	I <sub>S</sub>	-0.75	A
Pulsed Source Current (Body Diode)	I <sub>SM</sub>	-1	A
Power Dissipation at T <sub>A</sub> =25°C (a) Linear Derating Factor	P <sub>D</sub>	1.2 9.6	W mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> ; T <sub>stg</sub>	-55 to +150	°C

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	R <sub>θJA</sub>	103	°C/W
Junction to Ambient (b)	R <sub>θJA</sub>	50	°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 Impedance graph.

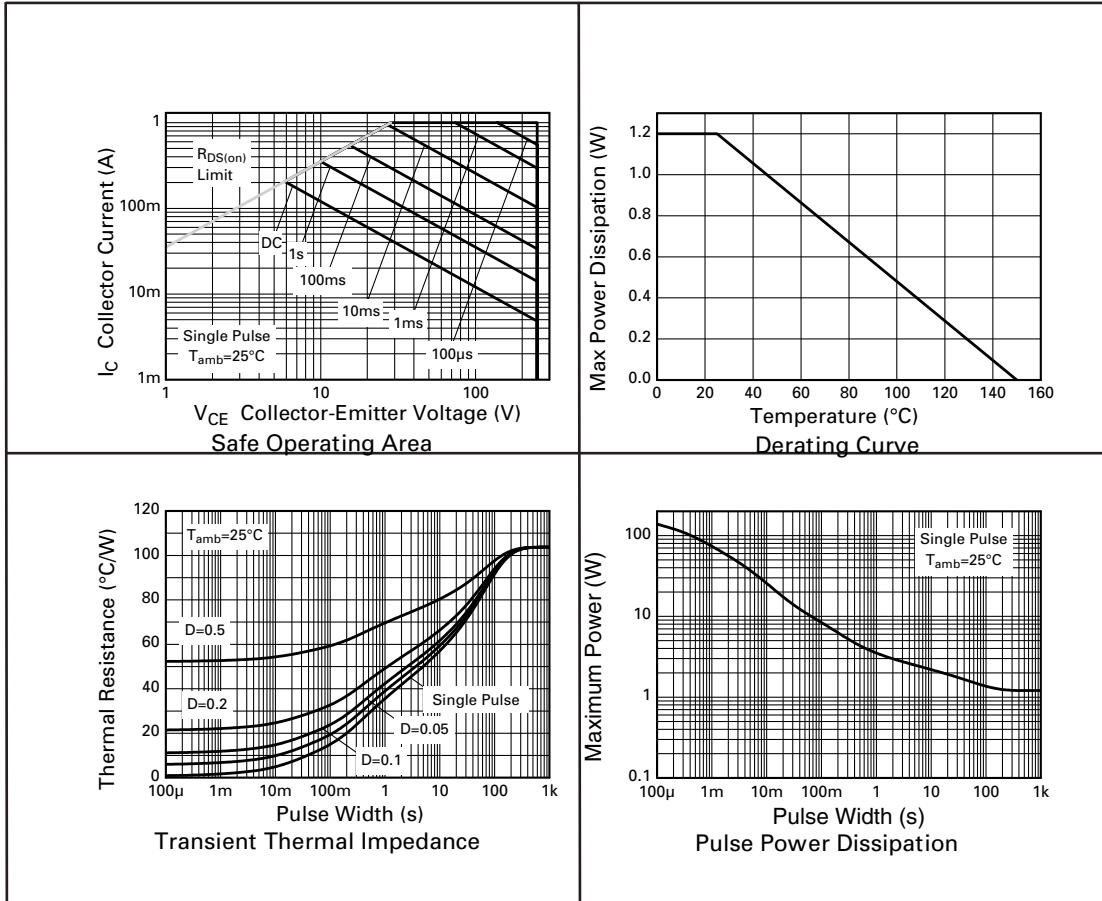
### NB High Voltage Applications

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



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## CHARACTERISTICS



# ZVP4525Z

## 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 (1)	$R_{DS(on)}$		10 13	14 18	$\Omega$ $\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -200\text{mA}$ $V_{GS} = -3.5\text{V}$ , $I_D = -100\text{mA}$
Forward Transconductance (3)	$g_{fs}$	80	200		mS	$V_{DS} = -10\text{V}$ , $I_D = -0.15\text{A}$
<b>DYNAMIC (3)</b>						
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(2) (3)</b>						
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 (1)	$V_{SD}$			0.97	V	$T_j = 25^{\circ}\text{C}$ , $I_S = -200\text{mA}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		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 (3)	$Q_{rr}$		21	29	nC	

(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$  .

(2) Switching characteristics are independent of operating junction temperature.

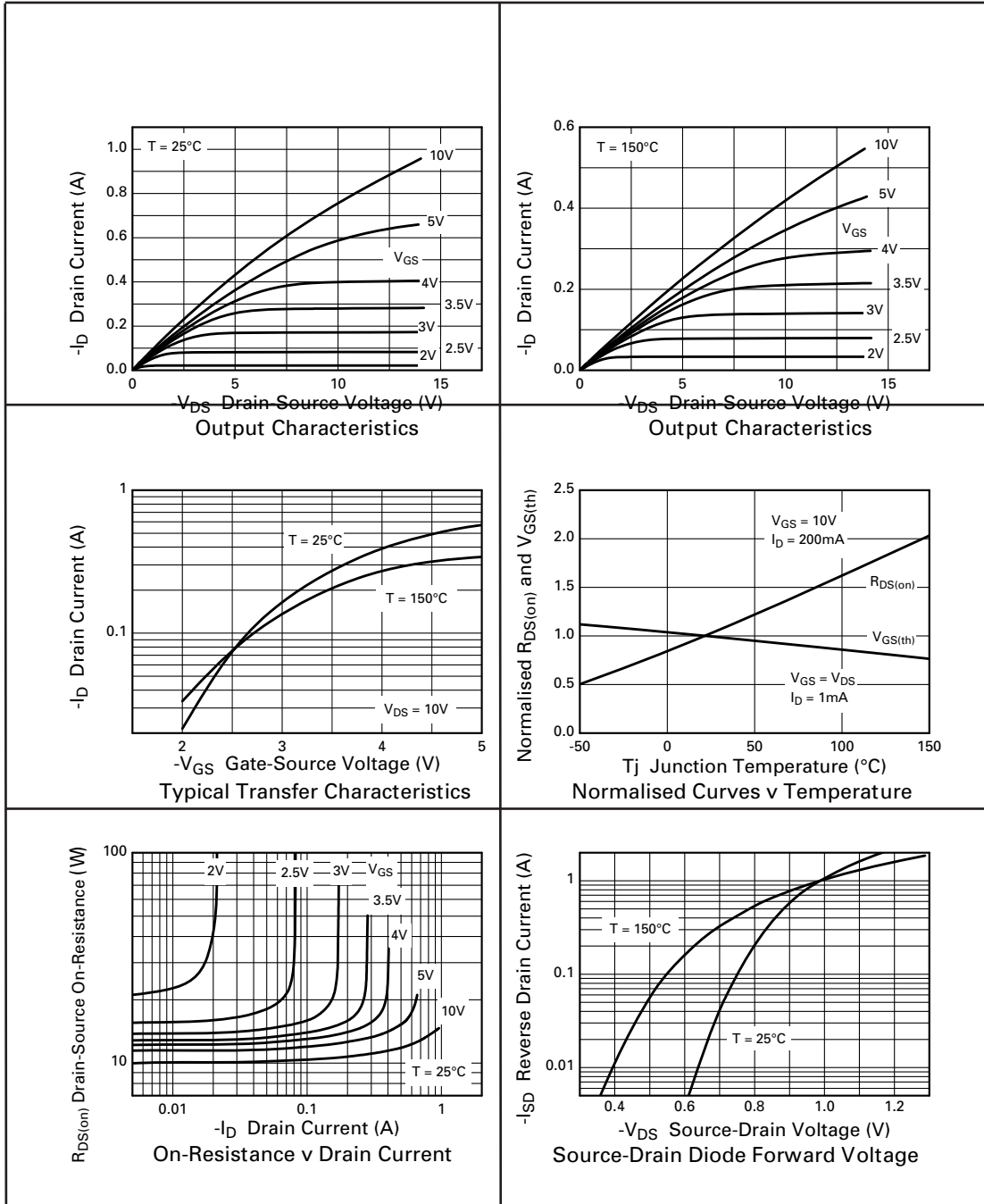
(3) For design aid only, not subject to production testing.



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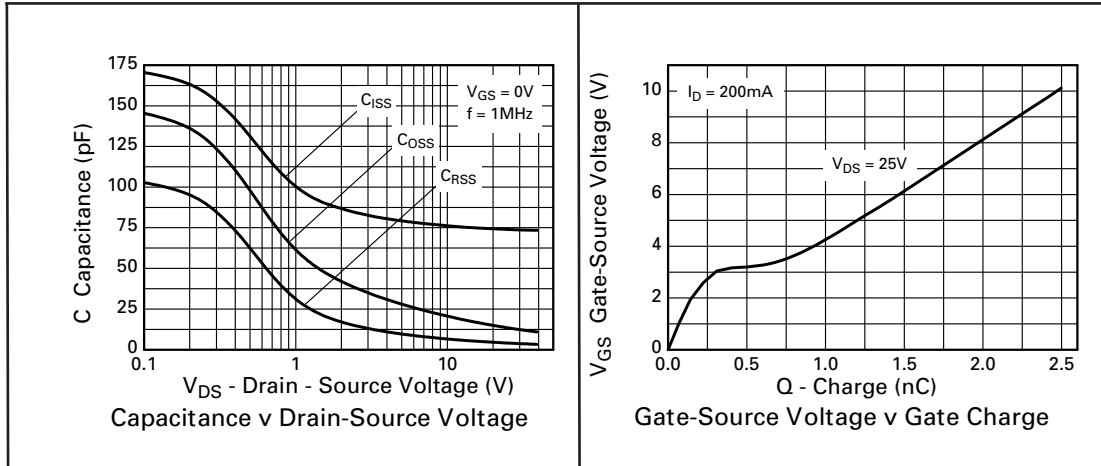
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## TYPICAL CHARACTERISTICS

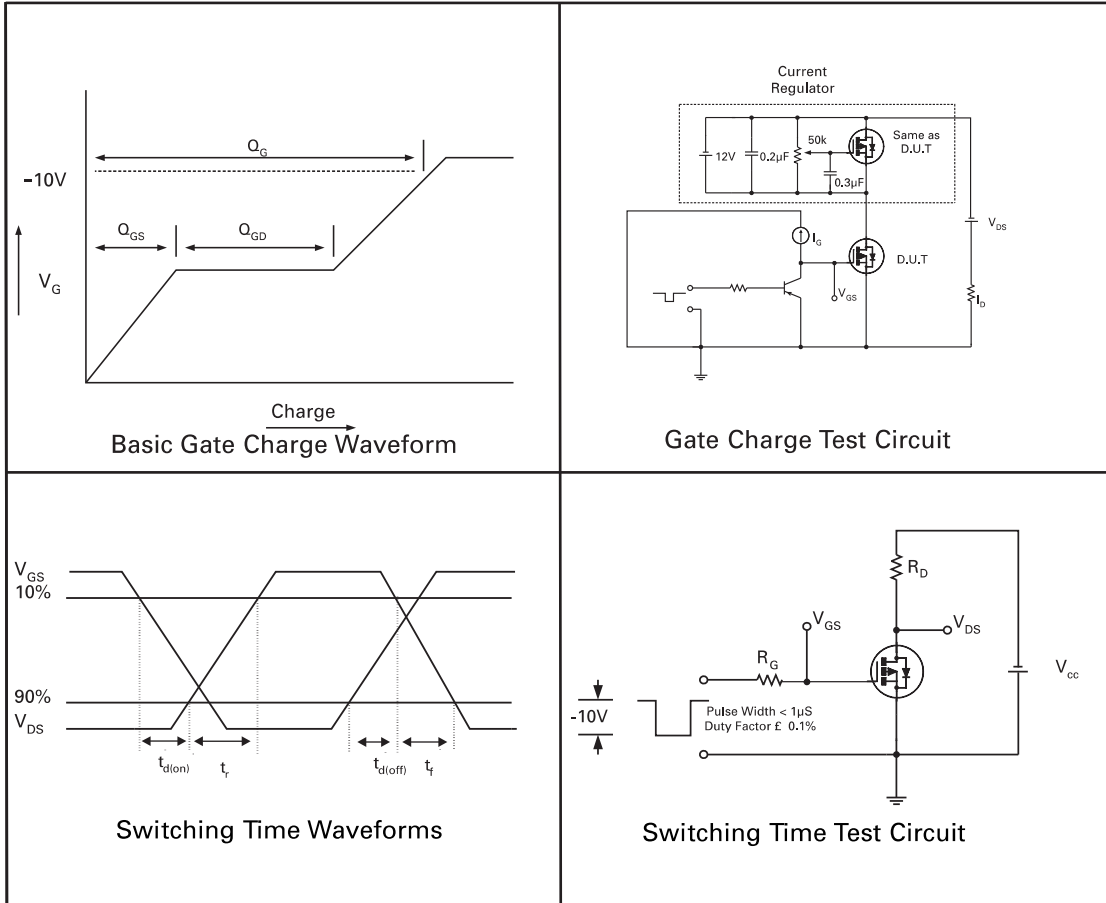


# ZVP4525Z

## CHARACTERISTICS



TEST CIRCUITS



# ZVP4525Z

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### Product status key:

"Preview"Future device intended for production at some point. Samples may be available

"Active"Product status recommended for new designs

"Last time buy (LTB)"Device will be discontinued and last time buy period and delivery is in effect

"Not recommended for new designs"Device is still in production to support existing designs and production

"Obsolete"Production has been discontinued

Datasheet status key:

"Draft version" This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.

"Provisional version" This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice.

"Issue" This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice.



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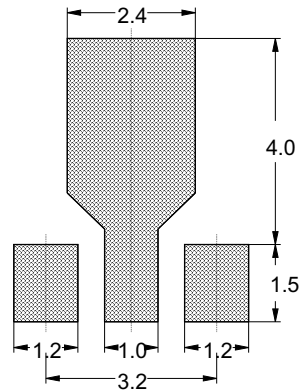


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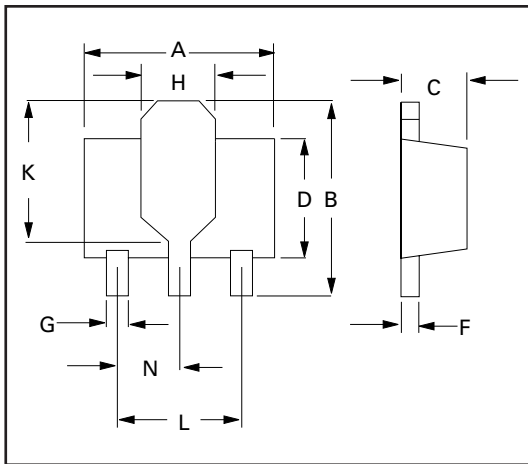
## PACKAGE DIMENSIONS

DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
B	3.75	4.25	0.150	0.167
C	1.40	1.60	0.550	0.630
D	-	2.60	-	0.102
F	0.28	0.45	0.011	0.018
G	0.38	0.55	0.015	0.022
H	1.50	1.80	0.060	0.072
K	2.60	2.85	0.102	0.112
L	2.90	3.10	0.114	0.122
N	1.40	1.60	0.055	0.063

## PAD LAYOUT DETAILS



SOT89 pattern.  
Minimum Pad Size (dimensions in mm)



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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 Semiconductors plc Zetex Technology Park Chadderton, Oldham, OL9 9LL United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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