

# ZXMP2120G4

## 200V P-CHANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

$V_{(BR)DSS} = -200V$ ;  $R_{DS(ON)} = 25\Omega$ ;  $I_D = 200mA$

### DESCRIPTION

This 200V 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.

A SOT23-5 version is also available (ZXMP2120E5).

### FEATURES

- High voltage
- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- SOT223 package variant engineered to increase spacing between high voltage pins.

### APPLICATIONS

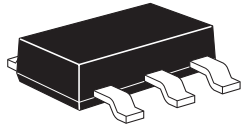
- Active clamping of primary side MOSFETs in 48 volt DC-DC converters

### ORDERING INFORMATION

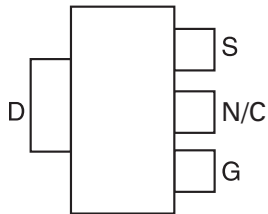
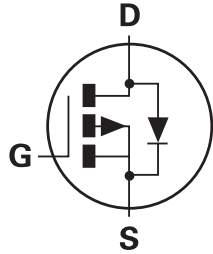
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXMP2120G4TA	7	12mm embossed	1,000 units
ZXMP2120G4TC	13	12mm embossed	4,000 units

### DEVICE MARKING

ZXMP  
2120



SOT223



PINOUT - TOP VIEW

# ZXMP2120G4

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	$V_{DS}$	-200	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $V_{GS}=10V$ ; $T_{amb}=25^{\circ}C$ ) <sup>(a)</sup>	$I_D$	-200	mA
Pulsed Drain Current <sup>(c)</sup>	$I_{DM}$	-1.2	A
Pulsed Source Current (Body Diode) <sup>(c)</sup>	$I_{SM}$	-1.2	A
Power Dissipation at $T_{amb}=25^{\circ}C$ <sup>(a)</sup>	$P_{tot}$	2.0	W
Linear derating factor		1.6	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>	$R_{\theta JA}$	62.5	$^{\circ}C/W$
Junction to Ambient <sup>(b)</sup>	$R_{\theta JA}$	32	$^{\circ}C/W$

### 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.

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

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	CONDITIONS
Drain-Source Breakdown Voltage	$BV_{DSS}$	-200		V	$I_D = -1\text{mA}$ , $V_{GS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.5	-3.5	V	$I_D = -1\text{mA}$ , $V_{DS} = V_{GS}$
Gate-Body Leakage	$I_{GSS}$		20	nA	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$		-10 -100	$\mu\text{A}$ $\mu\text{A}$	$V_{DS} = -200\text{V}$ , $V_{GS} = 0\text{V}$ $V_{DS} = -160\text{V}$ , $V_{GS} = 0\text{V}$ , $T = 125^{\circ}\text{C}$ (2)
On-State Drain Current <sup>(1)</sup>	$I_{D(on)}$	-300		mA	$V_{DS} = -25\text{V}$ , $V_{GS} = -10\text{V}$
Static Drain-Source On-State Resistance <sup>(1)</sup>	$R_{DS(on)}$		25	$\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -150\text{mA}$
Forward Transconductance <sup>(1)(2)</sup>	$g_{fs}$	50		mS	$V_{DS} = -25\text{V}$ , $I_D = -150\text{mA}$
Input Capacitance <sup>(2)</sup>	$C_{iss}$		100	pF	$V_{DS} = -25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Common Source Output Capacitance <sup>(2)</sup>	$C_{oss}$		25	pF	
Reverse Transfer Capacitance <sup>(2)</sup>	$C_{rss}$		7	pF	
Turn-On Delay Time <sup>(2)(3)</sup>	$t_{d(on)}$		7	ns	$V_{DD} = -25\text{V}$ , $I_D = -150\text{mA}$
Rise Time <sup>(2)(3)</sup>	$t_r$		15	ns	
Turn-Off Delay Time <sup>(2)(3)</sup>	$t_{d(off)}$		12	ns	
Fall Time <sup>(2)(3)</sup>	$t_f$		15	ns	

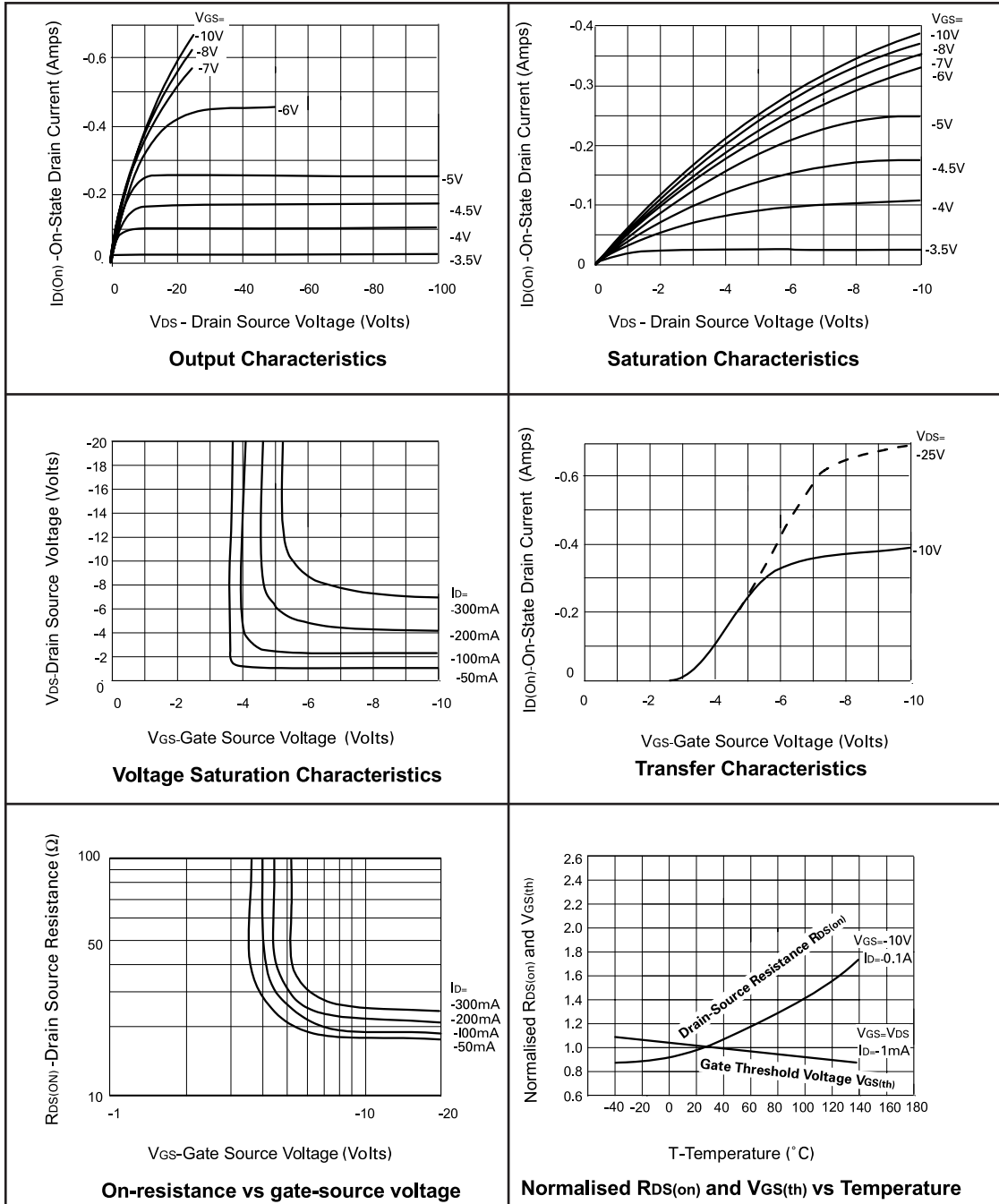
(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle @2%

(2) Sample test.

(3) Switching times measured with 50 $\Omega$  source impedance and <5ns rise time on a pulse generator

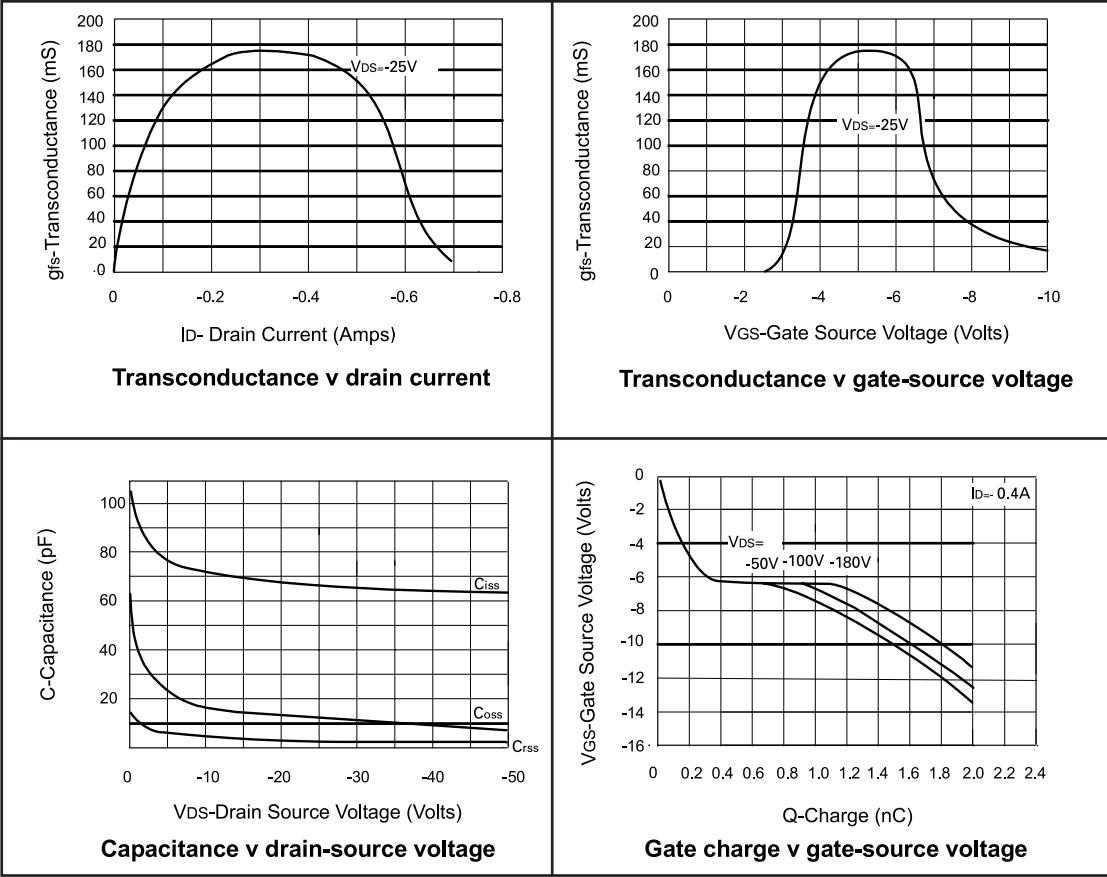
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## TYPICAL CHARACTERISTICS



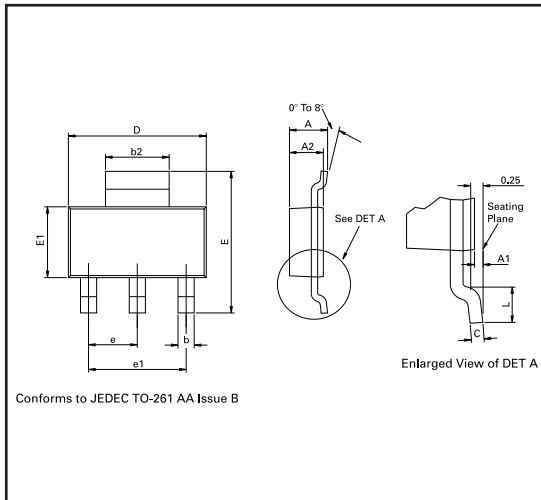
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## CHARACTERISTICS

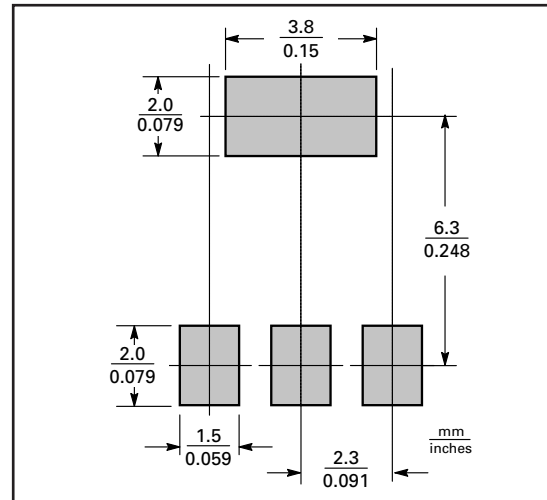


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## PACKAGE OUTLINE



## 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	-	-	-	-	-

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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 <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>

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