

ZXMP2120E5

200V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -200V$; $R_{DS(ON)} = 28\Omega$; $I_D = -122mA$

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 4 pin SOT223 version is also available (ZXMP2120G4).

FEATURES

- High voltage
- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- SOT23-5 package variant engineered to increase spacing between high voltage pins.

APPLICATIONS

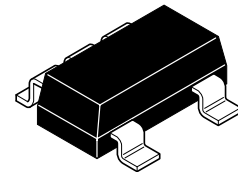
- Active clamping of primary side MOSFETs in 48 volt DC-DC converters

ORDERING INFORMATION

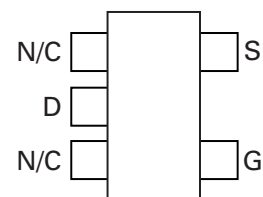
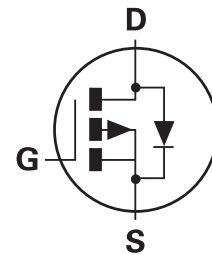
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXMP2120E5TA	7	8mm embossed	3,000 units

DEVICE MARKING

- P120



SOT23-5



PINOUT - TOP VIEW

ZXMP2120E5

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	-200	V
Gate Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($V_{GS}=10V$; $T_{amb}=25^{\circ}C$) ^(a)	I_D	-122	mA
Pulsed Drain Current (c)	I_{DM}	-0.7	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	-0.7	A
Power Dissipation at $T_{amb}=25^{\circ}C$ ^(a)	P_D	0.75	W
Linear Derating Factor		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 ^(a)	$R_{\theta JA}$	167	$^{\circ}C/W$

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.

ZXMP2120E5

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-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	μA μA	$V_{DS} = -200\text{V}$, $V_{GS} = 0$ $V_{DS} = -160\text{V}$, $V_{GS} = 0\text{V}$, $T = 125^{\circ}\text{C}$ (2)
On-State Drain Current ⁽¹⁾	$I_{D(on)}$	-300			mA	$V_{DS} = -25\text{V}$, $V_{GS} = -10\text{V}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			28	Ω	$V_{GS} = -10\text{V}$, $I_D = -150\text{mA}$
Forward Transconductance ⁽¹⁾⁽²⁾	g_{fs}	50			mS	$V_{DS} = -25\text{V}$, $I_D = -150\text{mA}$
DYNAMIC						
Input Capacitance ⁽²⁾	C_{iss}			100	pF	$V_{DS} = -25\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance ⁽²⁾	C_{oss}			25	pF	
Reverse Transfer Capacitance ⁽²⁾	C_{rss}			7	pF	
SWITCHING						
Turn-On Delay Time ⁽²⁾⁽³⁾	$t_{d(on)}$			7	ns	$V_{DD} = -25\text{V}$, $I_D = -150\text{mA}$
Rise Time ⁽²⁾⁽³⁾	t_r			15	ns	
Turn-Off Delay Time ⁽²⁾⁽³⁾	$t_{d(off)}$			12	ns	
Fall Time ⁽²⁾⁽³⁾	t_f			15	ns	

NOTES:

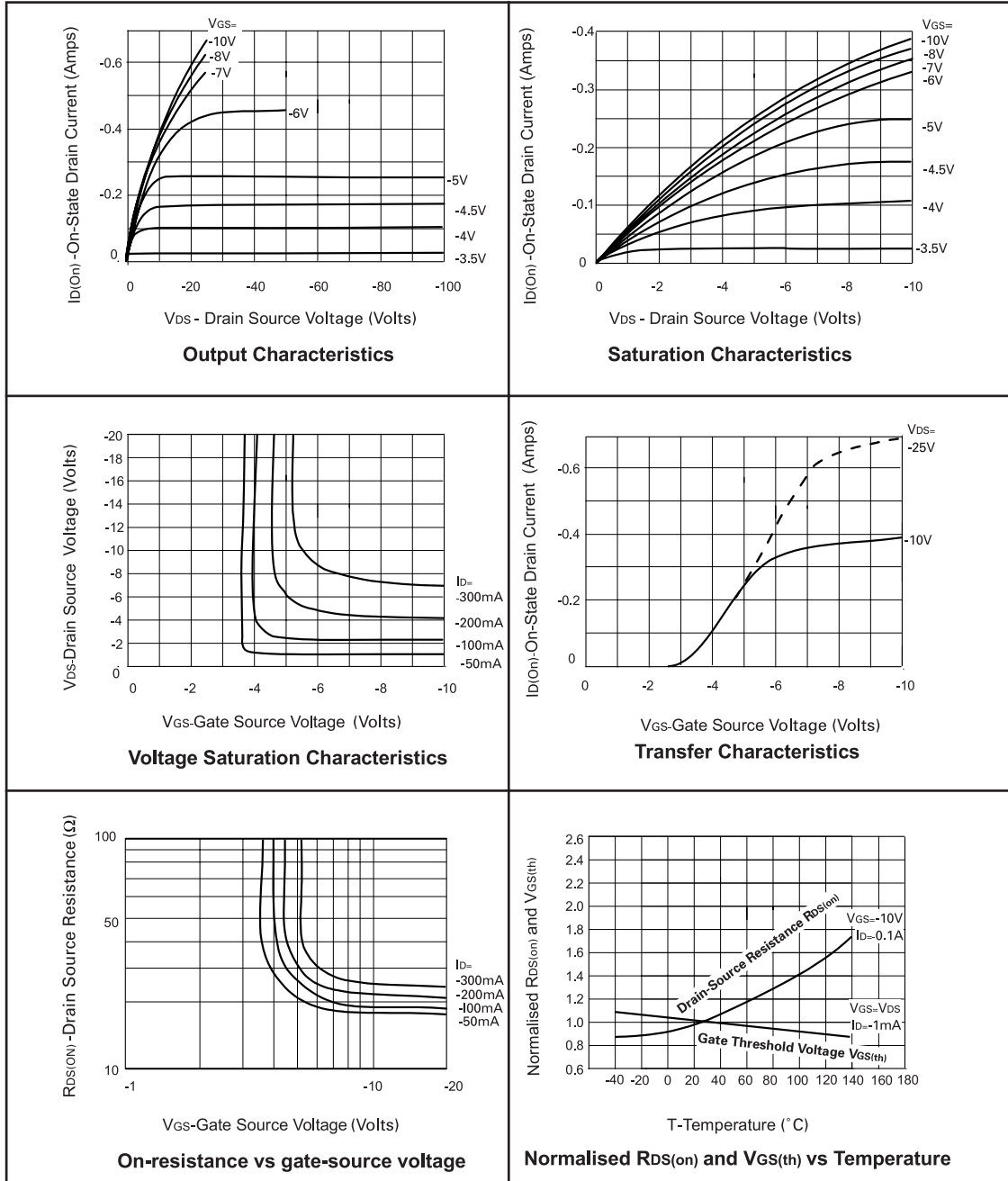
(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

(2) Sample test.

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

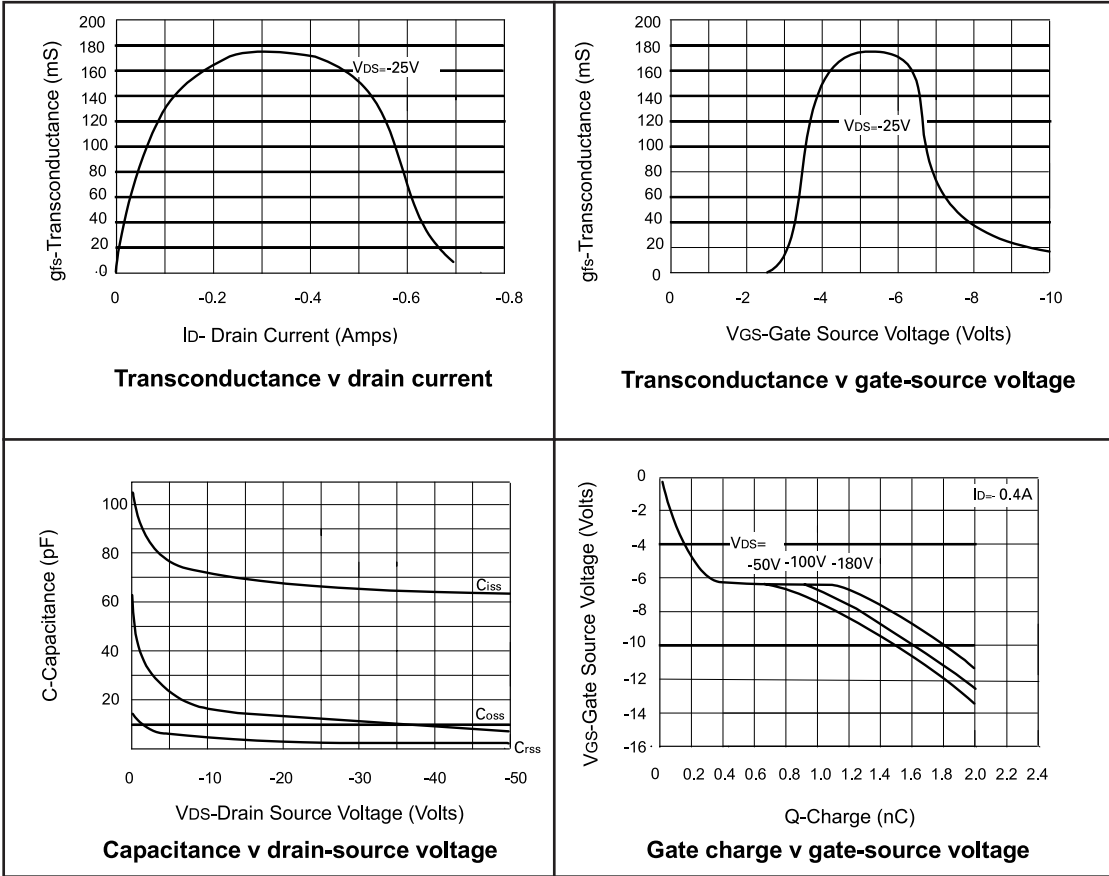
ZXMP2120E5

TYPICAL CHARACTERISTICS



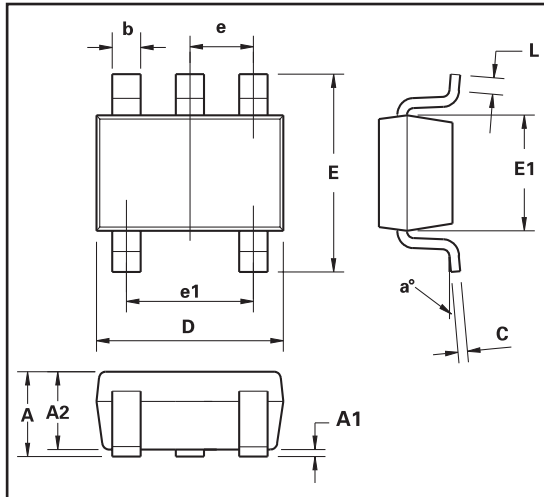
ZXMP2120E5

CHARACTERISTICS

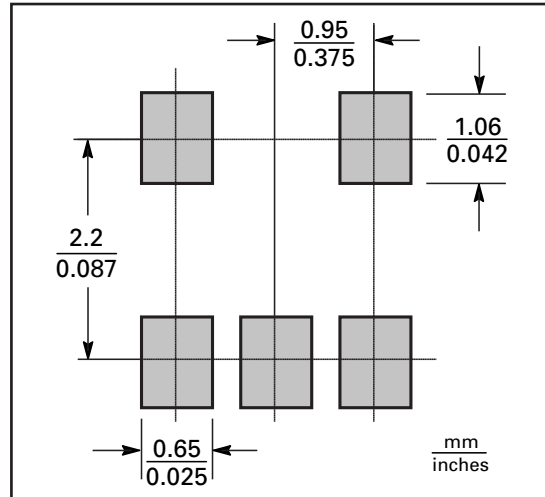


ZXMP2120E5

PACKAGE OUTLINE



PAD LAYOUT DETAILS



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

PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.90	1.45	0.0354	0.0570
A1	-	0.15	-	0.0059
A2	0.90	1.30	0.0354	0.0511
b	0.20	0.50	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.70	3.10	0.1062	0.1220

DIM	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
E	2.20	3.20	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
e	0.95 REF		0.0374 REF	
e1	1.90 REF		0.0748 REF	
L	0.10	0.60	0.0039	0.0236
a	0°	30°	0°	30°

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