

**20V P-CHANNEL ENHANCEMENT MODE MOSFET****SUMMARY** **$V_{(BR)DSS}=-20V$ ;  $R_{DS(ON)}=0.20\Omega$ ;  $I_D=-2.3A$** **DESCRIPTION**

This new generation of high density MOSFETs from Zetex utilises a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

**FEATURES**

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package

**APPLICATIONS**

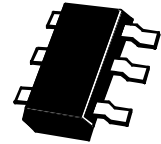
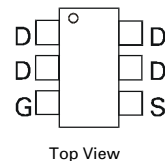
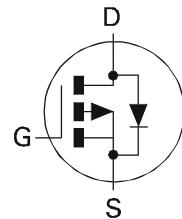
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

**ORDERING INFORMATION**

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM62P02E6TA	7	8mm embossed	3000 units
ZXM62P02E6TC	13	8mm embossed	10000 units

**DEVICE MARKING**

- 2P02

**SOT23-6**

# ZXM62P02E6

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	-20	V
Gate- Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current ( $V_{GS}=-4.5V$ ; $T_A=25^\circ C$ )(b) ( $V_{GS}=-4.5V$ ; $T_A=70^\circ C$ )(b)	$I_D$	-2.3 -1.7	A
Pulsed Drain Current (c)	$I_{DM}$	-13	A
Continuous Source Current (Body Diode)(b)	$I_S$	-1.9	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	-13	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	1.1 8.8	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	1.7 13.6	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 (a)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	73	$^\circ C/W$

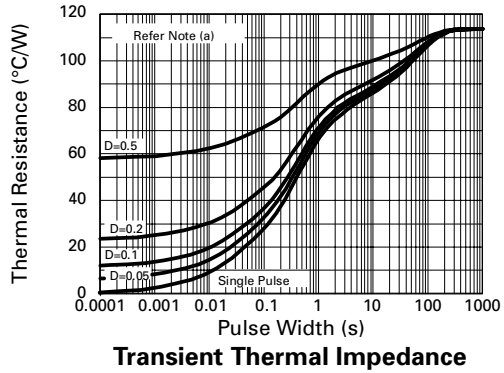
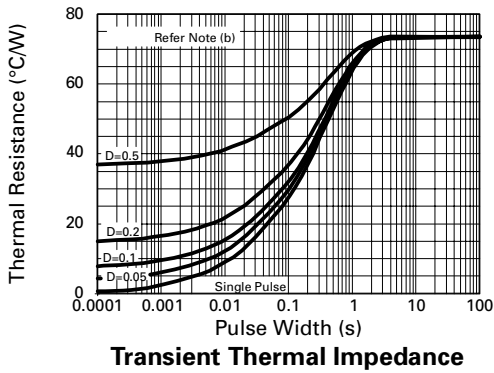
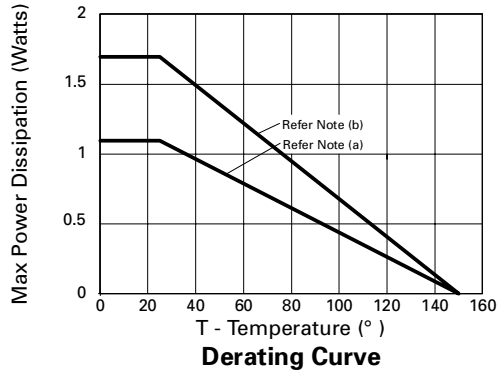
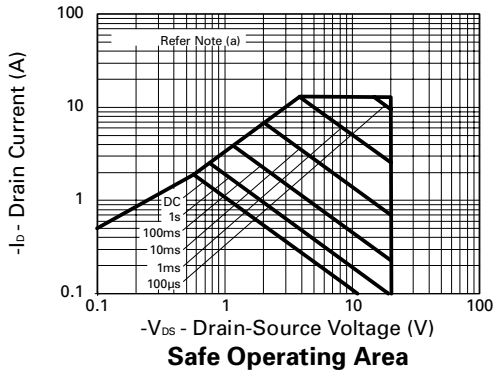
### NOTES

(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.

## CHARACTERISTICS



# ZXM62P02E6

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

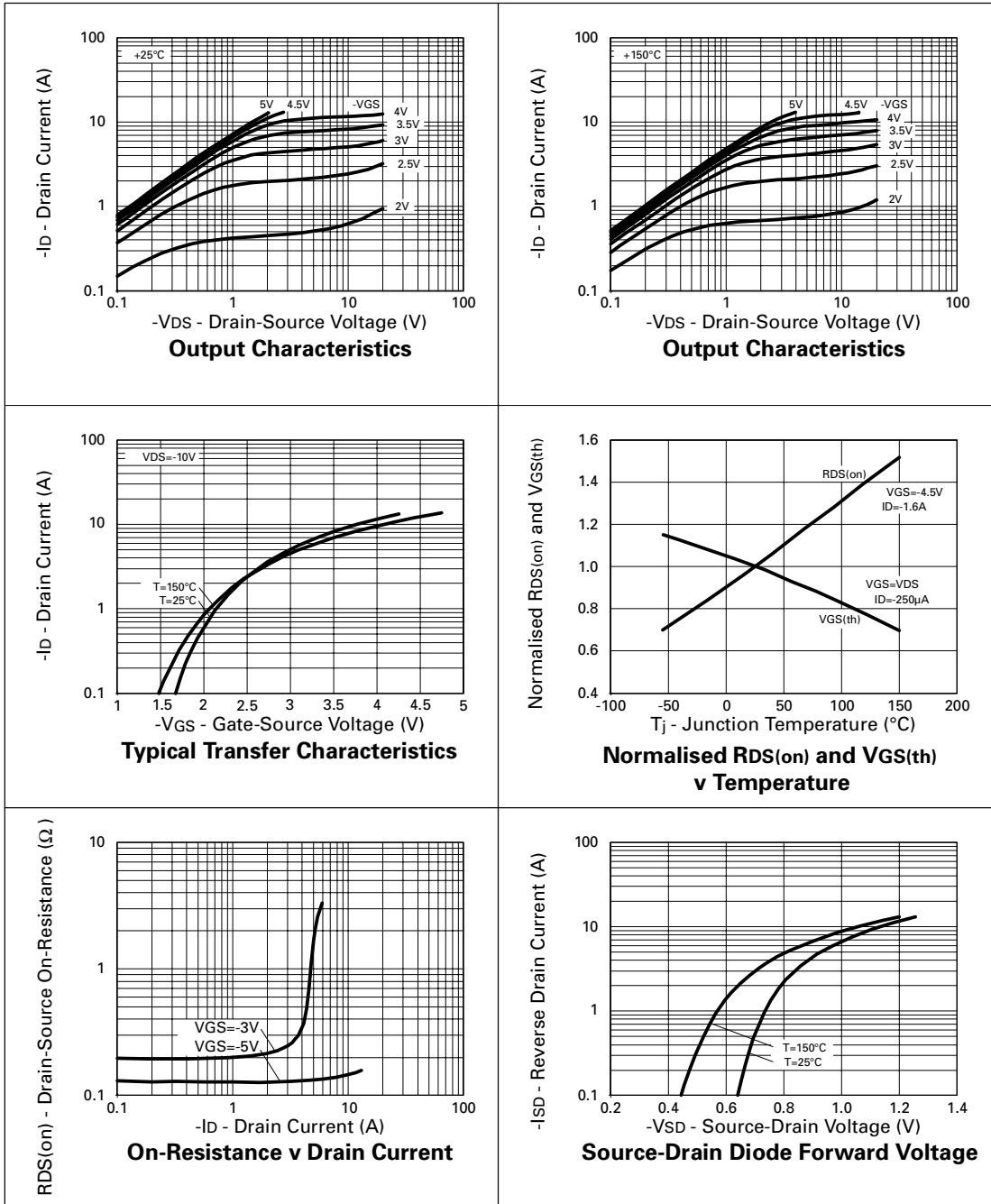
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-20			V	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS} = -20\text{V}$ , $V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$			$\pm 100$	nA	$V_{GS} = \pm 12\text{V}$ , $V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-0.7			V	$I_D = -250\mu\text{A}$ , $V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.2 0.375	$\Omega$	$V_{GS} = -4.5\text{V}$ , $I_D = -1.6\text{A}$ $V_{GS} = -2.7\text{V}$ , $I_D = -0.8\text{A}$
Forward Transconductance (3)	$g_{fs}$	1.5			S	$V_{DS} = -10\text{V}$ , $I_D = -0.8\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		320		pF	$V_{DS} = -15\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		150		pF	
Reverse Transfer Capacitance	$C_{rss}$		75		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		4.1		ns	$V_{DD} = -10\text{V}$ , $I_D = -1.6\text{A}$ $R_G = 6.0\Omega$ , $R_D = 6.1\Omega$ (Refer to test circuit)
Rise Time	$t_r$		15.4		ns	
Turn-Off Delay Time	$t_{d(off)}$		12.0		ns	
Fall Time	$t_f$		19.2		ns	
Total Gate Charge	$Q_g$			5.8	nC	$V_{DS} = -16\text{V}$ , $V_{GS} = -4.5\text{V}$ , $I_D = -1.6\text{A}$ (Refer to test circuit)
Gate-Source Charge	$Q_{gs}$			1.25	nC	
Gate Drain Charge	$Q_{gd}$			2.8	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			-0.95	V	$T_j = 25^{\circ}\text{C}$ , $I_S = -1.6\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		22.5		ns	$T_j = 25^{\circ}\text{C}$ , $I_F = -1.6\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	$Q_{rr}$		10.4		nC	

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

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

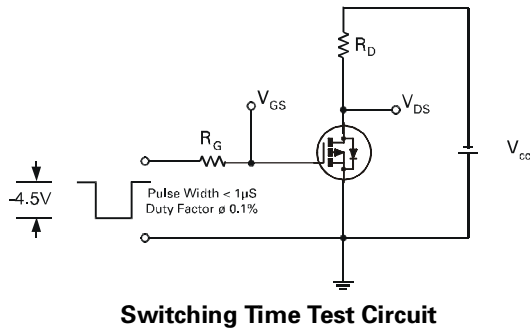
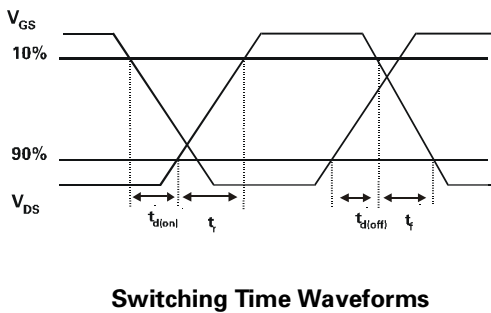
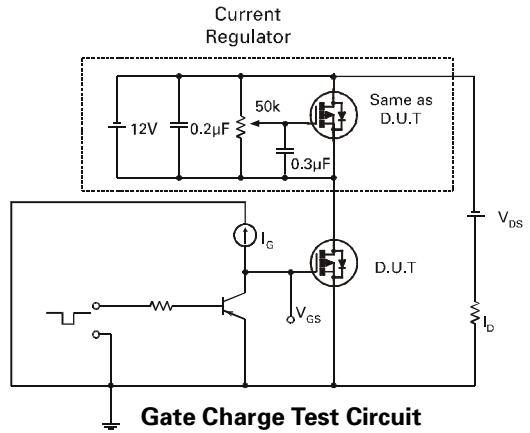
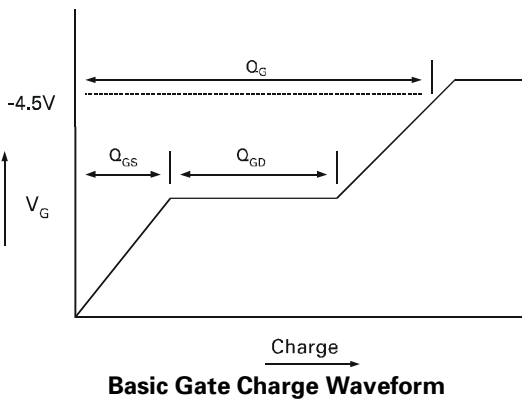
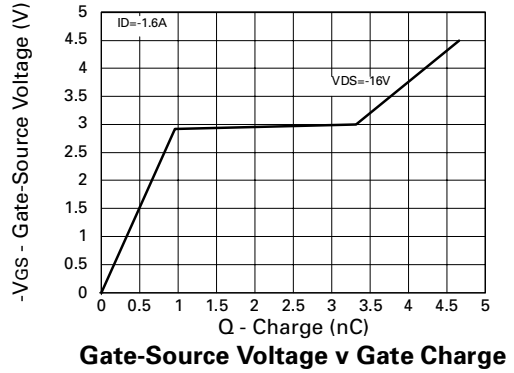
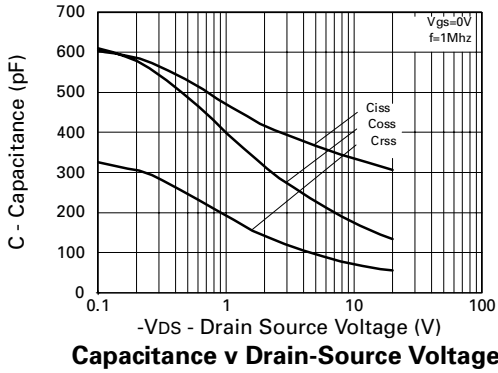
(3) For design aid only, not subject to production testing.

## TYPICAL CHARACTERISTICS



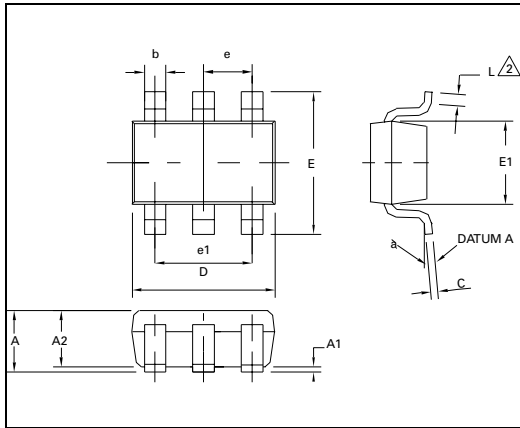
# ZXM62P02E6

## TYPICAL CHARACTERISTICS

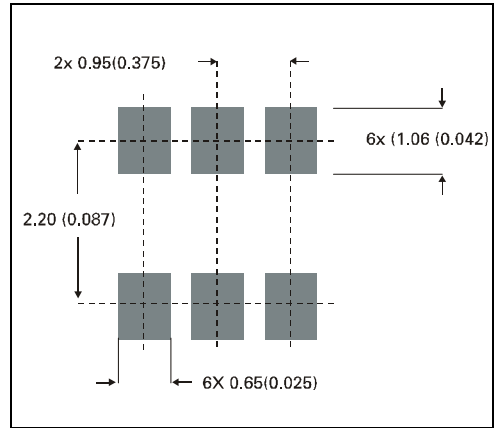


# ZXM62P02E6

## 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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