

## 30V N-CHANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

**$V_{(BR)DSS}=30V$ ;  $R_{DS(ON)}=0.11\Omega$ ;  $I_D=3.2A$**

### DESCRIPTION

This new generation of high density MOSFETs from Zetex utilise 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

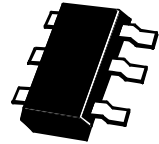
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

### ORDERING INFORMATION

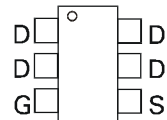
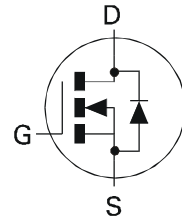
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM62N03E6TA	7	8mm embossed	3000 units
ZXM62N03E6TC	13	8mm embossed	10000 units

### DEVICE MARKING

- 2N03



**SOT23-6**



Top View

# ZXM62N03E6

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $V_{GS}=10V$ ; $T_A=25^\circ C$ )(b) ( $V_{GS}=10V$ ; $T_A=70^\circ C$ )(b)	$I_D$	3.2 2.6	A
Pulsed Drain Current (c)	$I_{DM}$	18	A
Continuous Source Current (Body Diode) (b)	$I_S$	2.1	A
Pulsed Source Current (Body Diode)	$I_{SM}$	18	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/ $^\circ C$

## 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	$^\circ C/W$

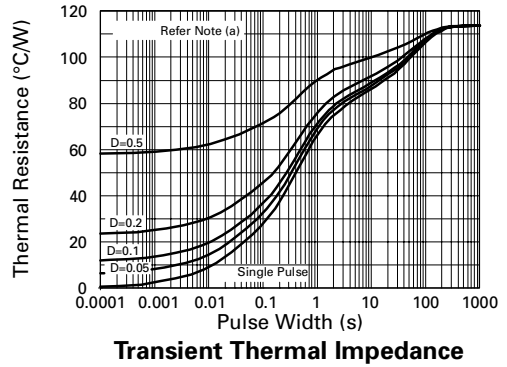
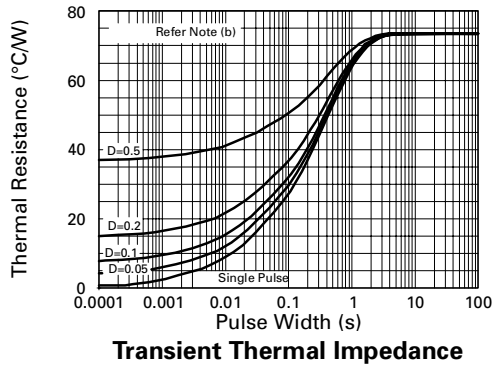
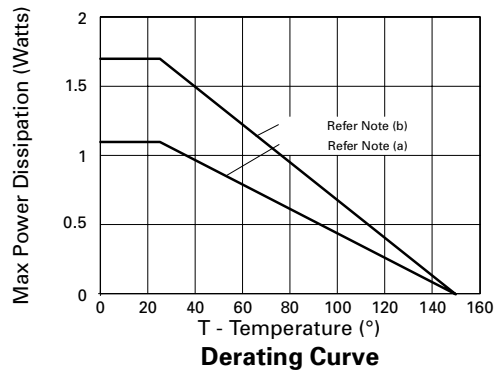
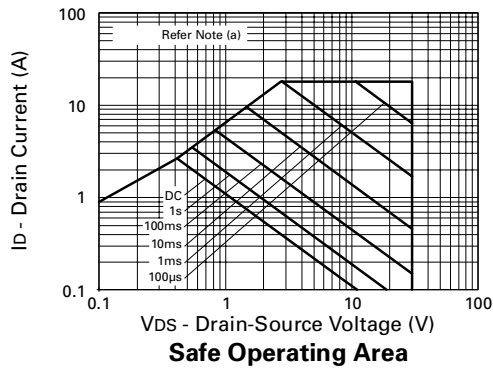
### NOTES

(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



# ZXM62N03E6

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

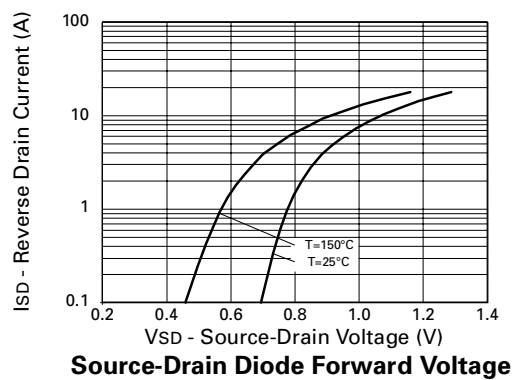
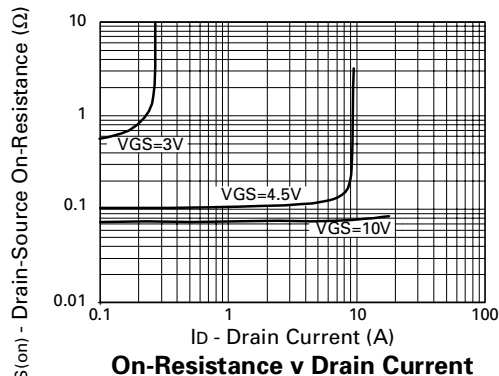
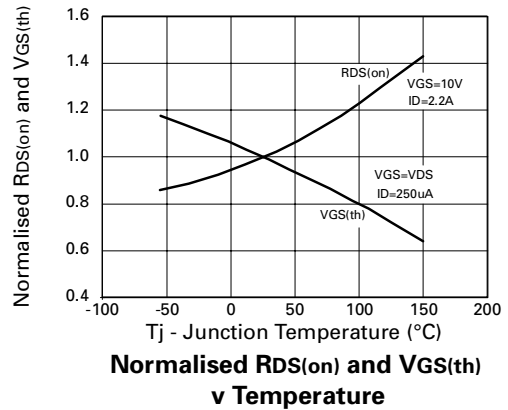
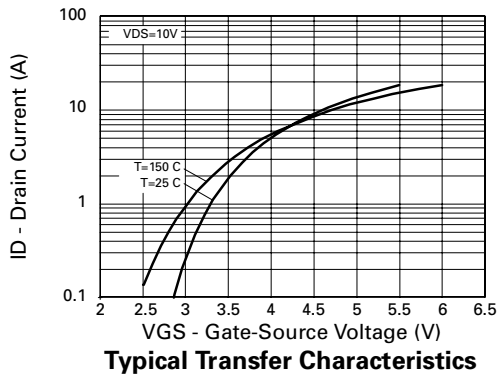
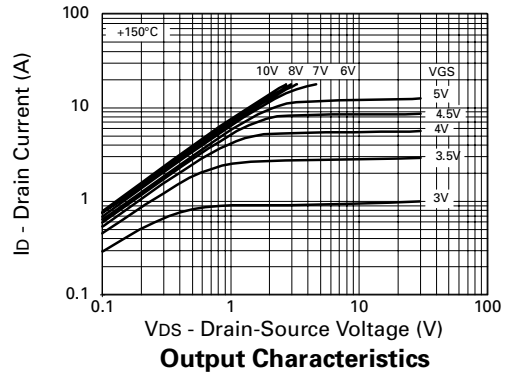
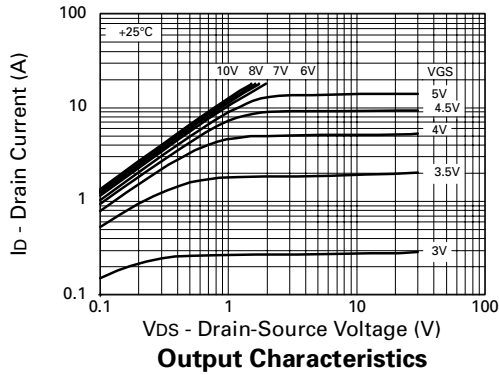
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.11 0.15	$\Omega$ $\Omega$	$V_{GS}=10\text{V}, I_D=2.2\text{A}$ $V_{GS}=4.5\text{V}, I_D=1.1\text{A}$
Forward Transconductance	$g_{fs}$	1.1			S	$V_{DS}=10\text{V}, I_D=1.1\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		380		pF	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		90		pF	
Reverse Transfer Capacitance	$C_{rss}$		30		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		2.9		ns	$V_{DD}=15\text{V}, I_D=2.2\text{A}$ $R_G=6.0\Omega, R_D=6.7\Omega$ (refer to test circuit)
Rise Time	$t_r$		5.6		ns	
Turn-Off Delay Time	$t_{d(off)}$		11.7		ns	
Fall Time	$t_f$		6.4		ns	
Total Gate Charge	$Q_g$			9.6	nC	
Gate-Source Charge	$Q_{gs}$			1.7	nC	$V_{DS}=24\text{V}, V_{GS}=10\text{V},$ $I_D=2.2\text{A}$ (refer to test circuit)
Gate Drain Charge	$Q_{gd}$			2.8	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			0.95	V	$T_j=25^{\circ}\text{C}, I_S=2.2\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		18.8		ns	$T_j=25^{\circ}\text{C}, I_F=2.2\text{A},$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		11.4		nC	

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

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

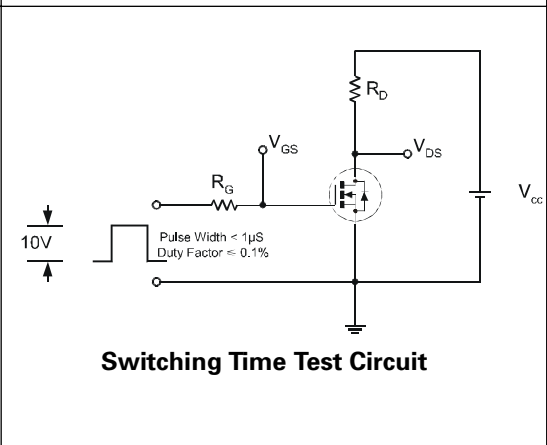
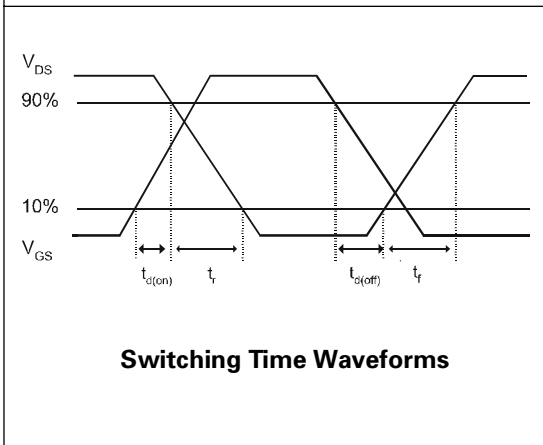
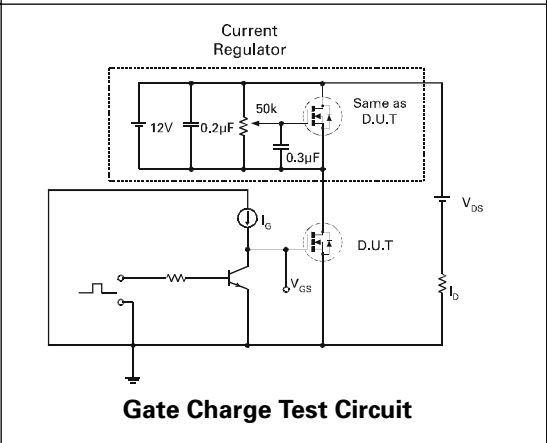
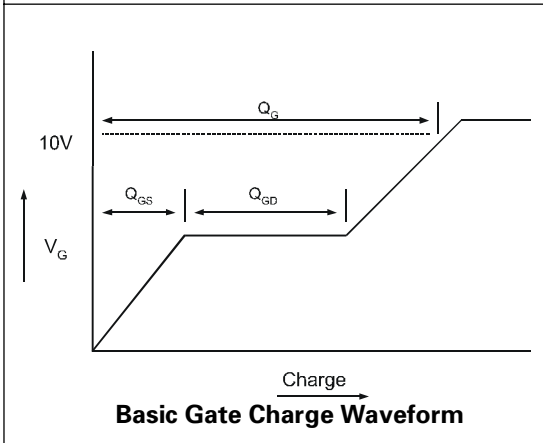
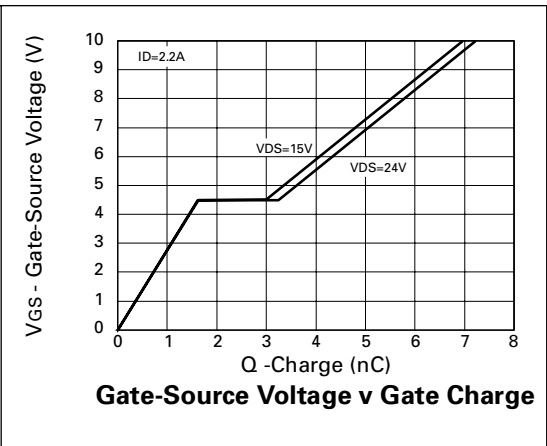
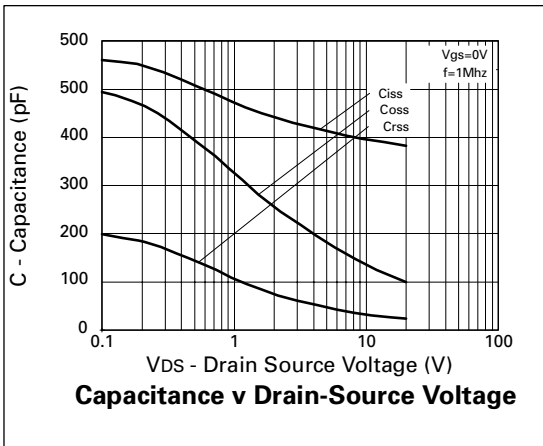
(3) For design aid only, not subject to production testing.

## TYPICAL CHARACTERISTICS



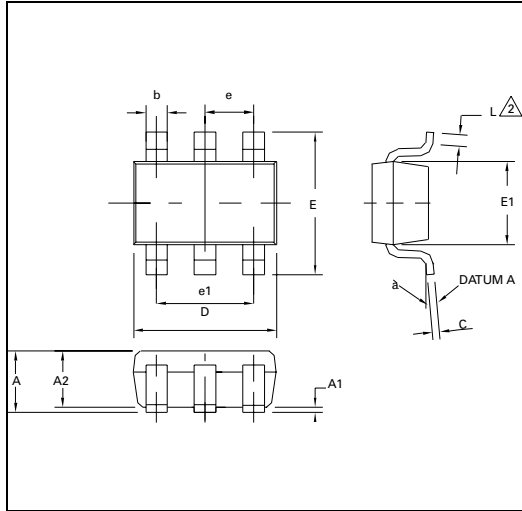
# ZXM62N03E6

## TYPICAL CHARACTERISTICS



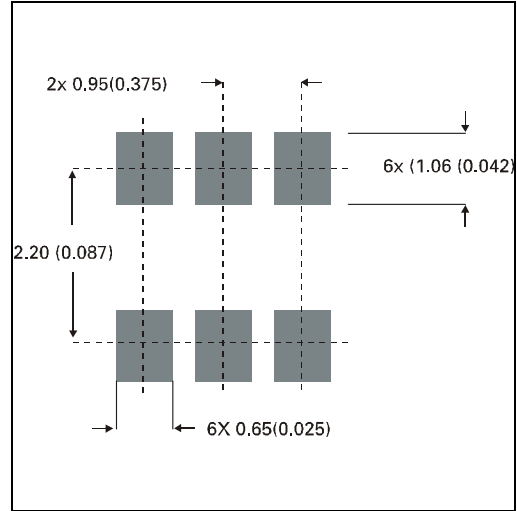
# ZXM62N03E6

## PACKAGE DIMENSIONS



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

## PAD LAYOUT DETAILS



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