

20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=20V$; $R_{DS(ON)}=0.1\Omega$; $I_D=3.2A$

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

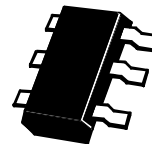
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

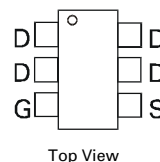
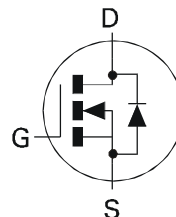
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM62N02E6TA	7	8mm embossed	3000 units
ZXM62N02E6TC	13	8mm embossed	10000 units

DEVICE MARKING

- 2N02



SOT23-6



ZXM62N02E6

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate Source Voltage	V_{GS}	± 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	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	$^{\circ}C/W$

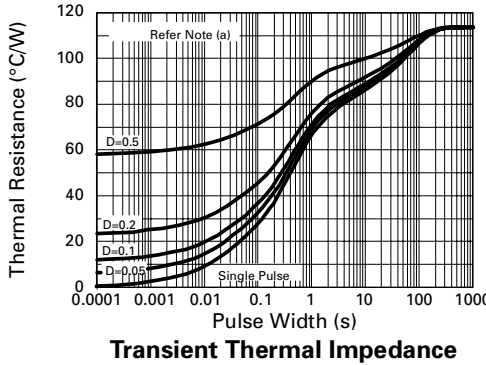
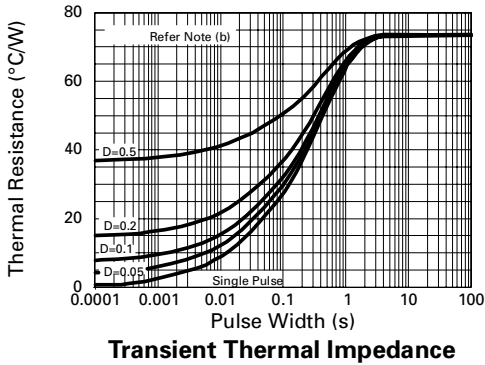
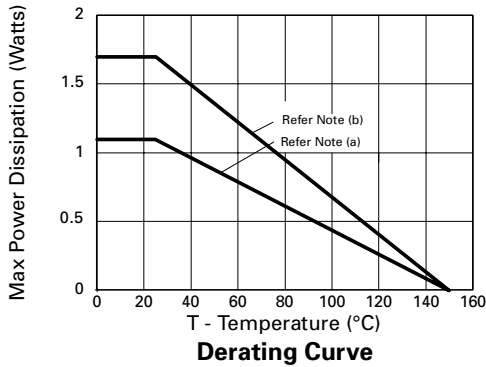
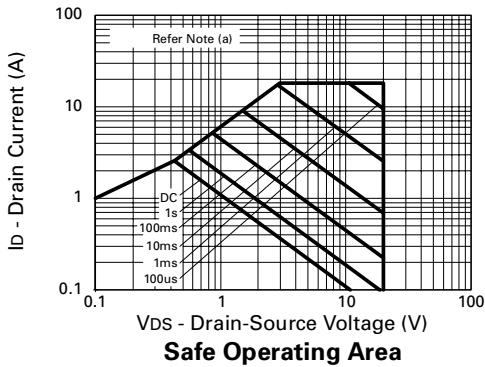
NOTES

(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



ZXM62N02E6

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

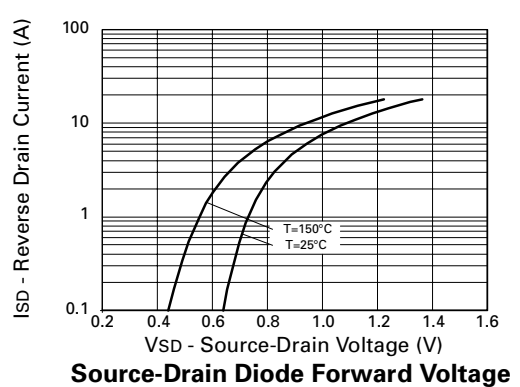
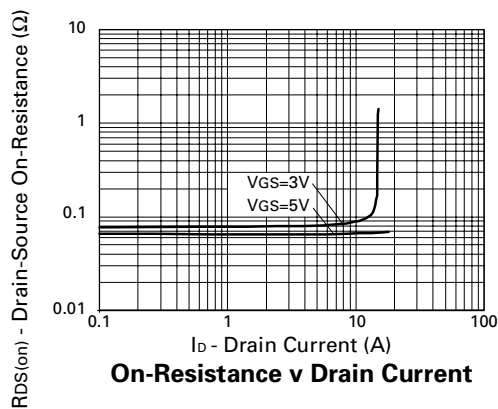
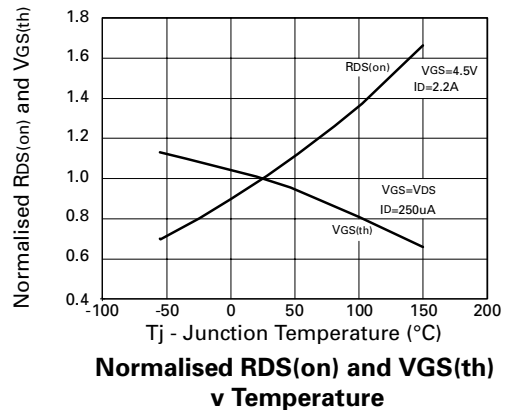
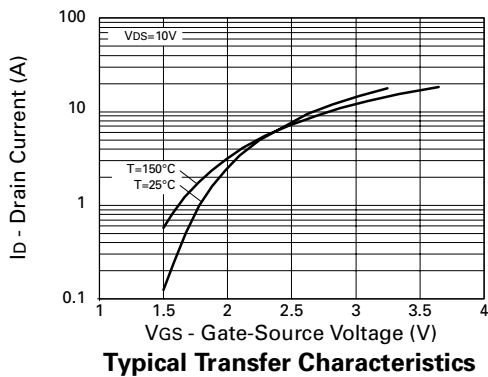
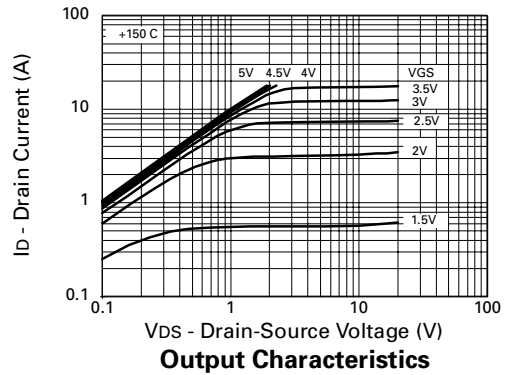
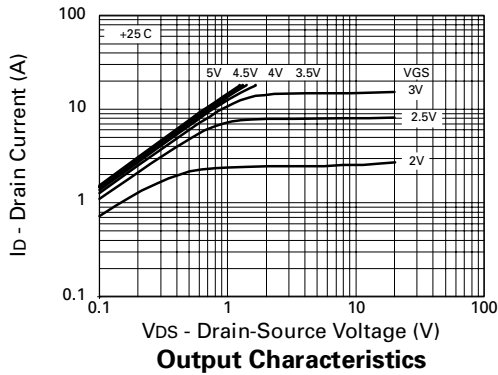
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	20			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =20V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =± 12V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	0.7			V	I _D =250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.1 0.125	Ω Ω	V _{GS} =4.5V, I _D =2.2A V _{GS} =2.7V, I _D =1.1A
Forward Transconductance	g _{fs}	3.2			S	V _{DS} =10V, I _D =1.1A
DYNAMIC (3)						
Input Capacitance	C _{iss}		460		pF	V _{DS} =15 V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{oss}		150		pF	
Reverse Transfer Capacitance	C _{rss}		50		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t _{d(on)}		4.0		ns	V _{DD} =10V, I _D =2.2A R _G =6.0Ω, R _D =4.4Ω (refer to test circuit)
Rise Time	t _r		10.4		ns	
Turn-Off Delay Time	t _{d(off)}		16.9		ns	
Fall Time	t _f		8.0		ns	
Total Gate Charge	Q _g			6.3	nC	V _{DS} =16V, V _{GS} =4.5V, I _D =2.2A (refer to test circuit)
Gate-Source Charge	Q _{gs}			1.5	nC	
Gate Drain Charge	Q _{gd}			2.5	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V _{SD}			0.95	V	T _j =25°C, I _S =2.2A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		17.5		ns	T _j =25°C, I _F =2.2A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q _{rr}		8.6		nC	

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

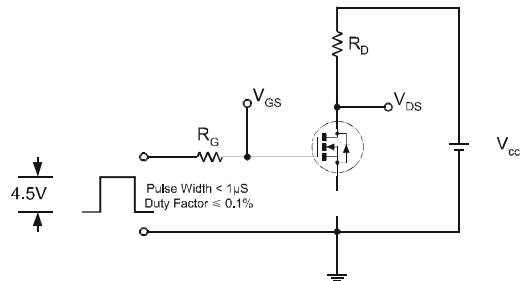
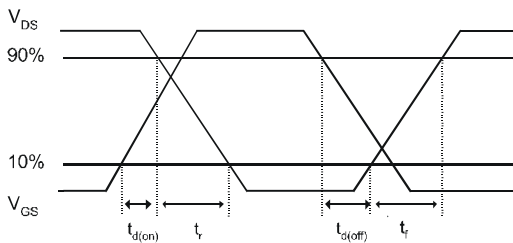
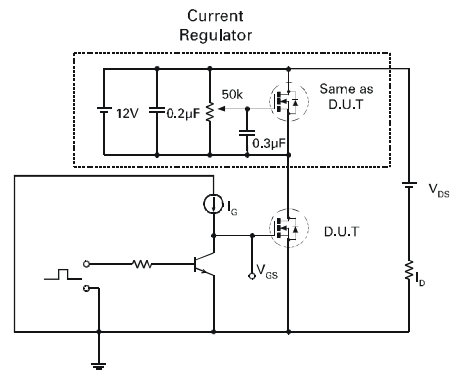
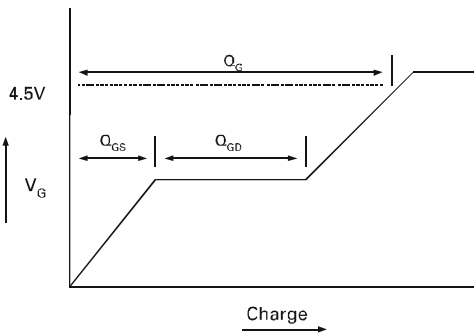
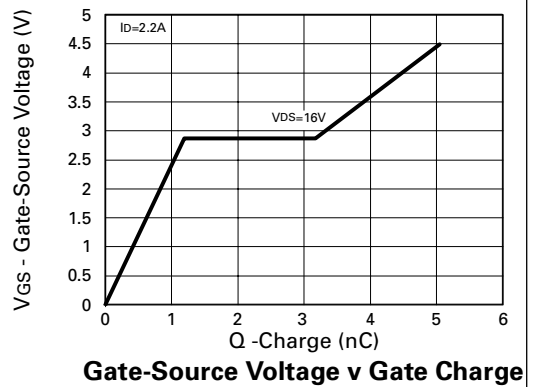
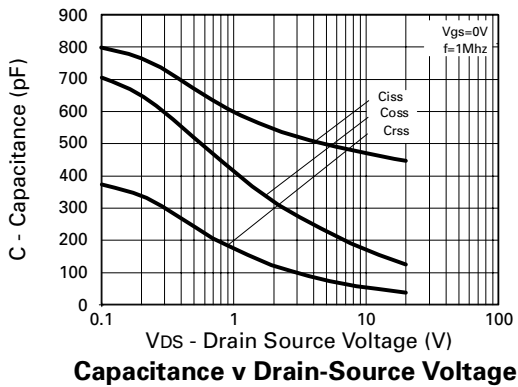
(2) Switching characteristics are independent of operating junction temperature.

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

TYPICAL CHARACTERISTICS

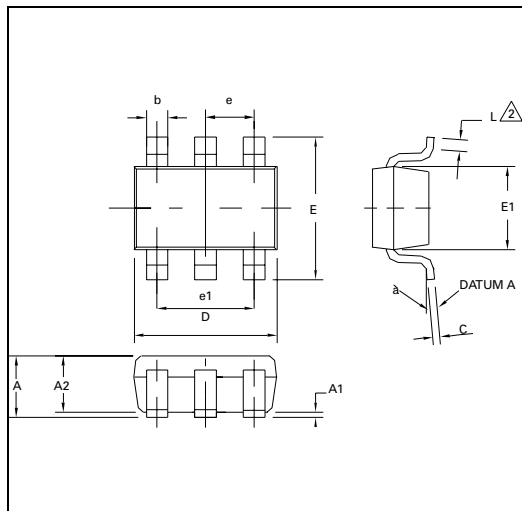


TYPICAL CHARACTERISTICS



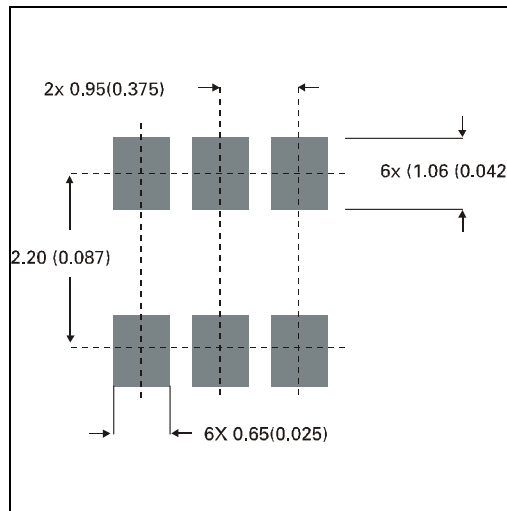
ZXM62N02E6

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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