

ZXMN3A03E6

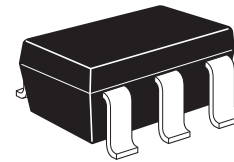
30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 30V$; $R_{DS(ON)} = 0.050\Omega$; $I_D = 4.6A$

DESCRIPTION

This new generation of TRENCH MOSFETs from Zetex utilizes 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.



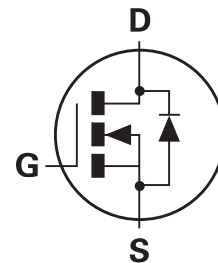
SOT23-6

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

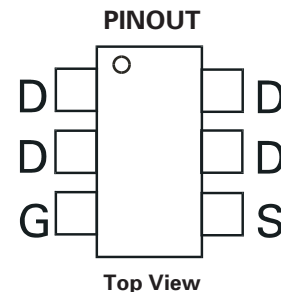


ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A03E6TA	7"	8mm	3000 units
ZXMN3A03E6TC	13"	8mm	10000 units

DEVICE MARKING

- 3A3



Top View

ZXMN3A03E6

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{DSS}	30	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current $V_{GS}=10V$; $T_A=25^{\circ}C$ ^(b) $V_{GS}=10V$; $T_A=70^{\circ}C$ ^(b) $V_{GS}=10V$; $T_A=25^{\circ}C$ ^(a)	I_D	4.6 3.7 3.7	A
Pulsed drain current ^(c)	I_{DM}	17	A
Continuous source current (body diode) ^(b)	I_S	2.6	A
Pulsed source current (body diode) ^(c)	I_{SM}	17	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:

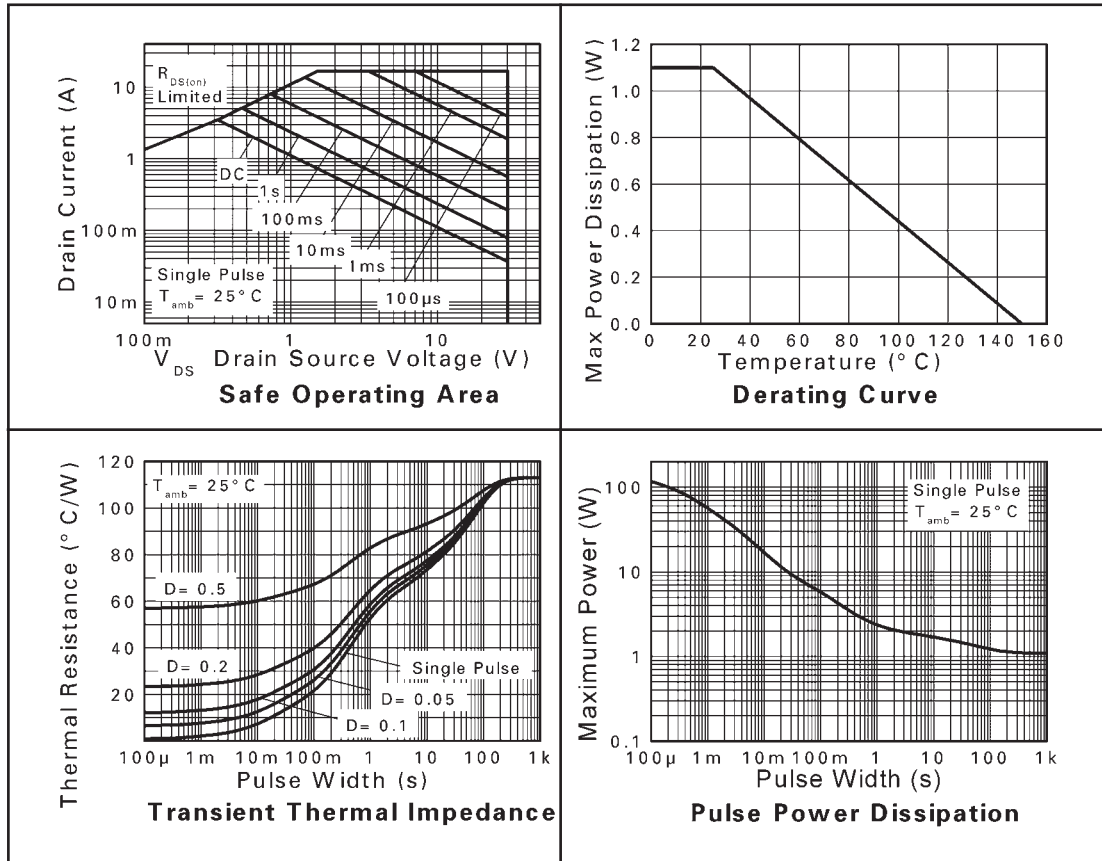
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width 10 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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CHARACTERISTICS



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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-source breakdown voltage	V _{(BR)DSS}	30			V	I _D =250μA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}			0.5	μA	V _{DS} =30V, V _{GS} =0V
Gate-body leakage	I _{GSS}			100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-source threshold voltage	V _{GS(th)}	1			V	I _D =250μA, V _{DS} = V _{GS}
Static drain-source on-state resistance ⁽¹⁾	R _{DS(on)}			0.050 0.065	Ω Ω	V _{GS} =10V, I _D =7.8A V _{GS} =4.5V, I _D =6.8A
Forward transconductance ⁽¹⁾⁽³⁾	g _{fs}		10		S	V _{DS} =10V, I _D =7.8A
DYNAMIC ⁽³⁾						
Input capacitance	C _{iss}		600		pF	V _{DS} =25 V, V _{GS} =0V, f=1MHz
Output capacitance	C _{oss}		104		pF	
Reverse transfer capacitance	C _{rss}		58.5		pF	
SWITCHING ^{(2) (3)}						
Turn-on delay time	t _{d(on)}		2.9		ns	V _{DD} =15V, I _D =3.5A R _G =6.0Ω, V _{GS} =10V
Rise time	t _r		6.4		ns	
Turn-off delay time	t _{d(off)}		16.0		ns	
Fall time	t _f		11.2		ns	
Gate charge	Q _g		6.9		nC	V _{DS} =15V, V _{GS} =5V, I _D =3.5A
Total gate charge	Q _g		12.6		nC	V _{DS} =15V, V _{GS} =10V, I _D =3.5A
Gate-source charge	Q _{gs}		2.0		nC	
Gate-drain charge	Q _{gd}		2.0		nC	
SOURCE-DRAIN DIODE						
Diode forward voltage ⁽¹⁾	V _{SD}		0.85	0.95	V	T _J =25°C, I _S =3.2A, V _{GS} =0V
Reverse recovery time ⁽³⁾	t _{rr}		18.8		ns	T _J =25°C, I _F =3.5A, di/dt= 100A/μs
Reverse recovery charge ⁽³⁾	Q _{rr}		14.1		nC	

NOTES:

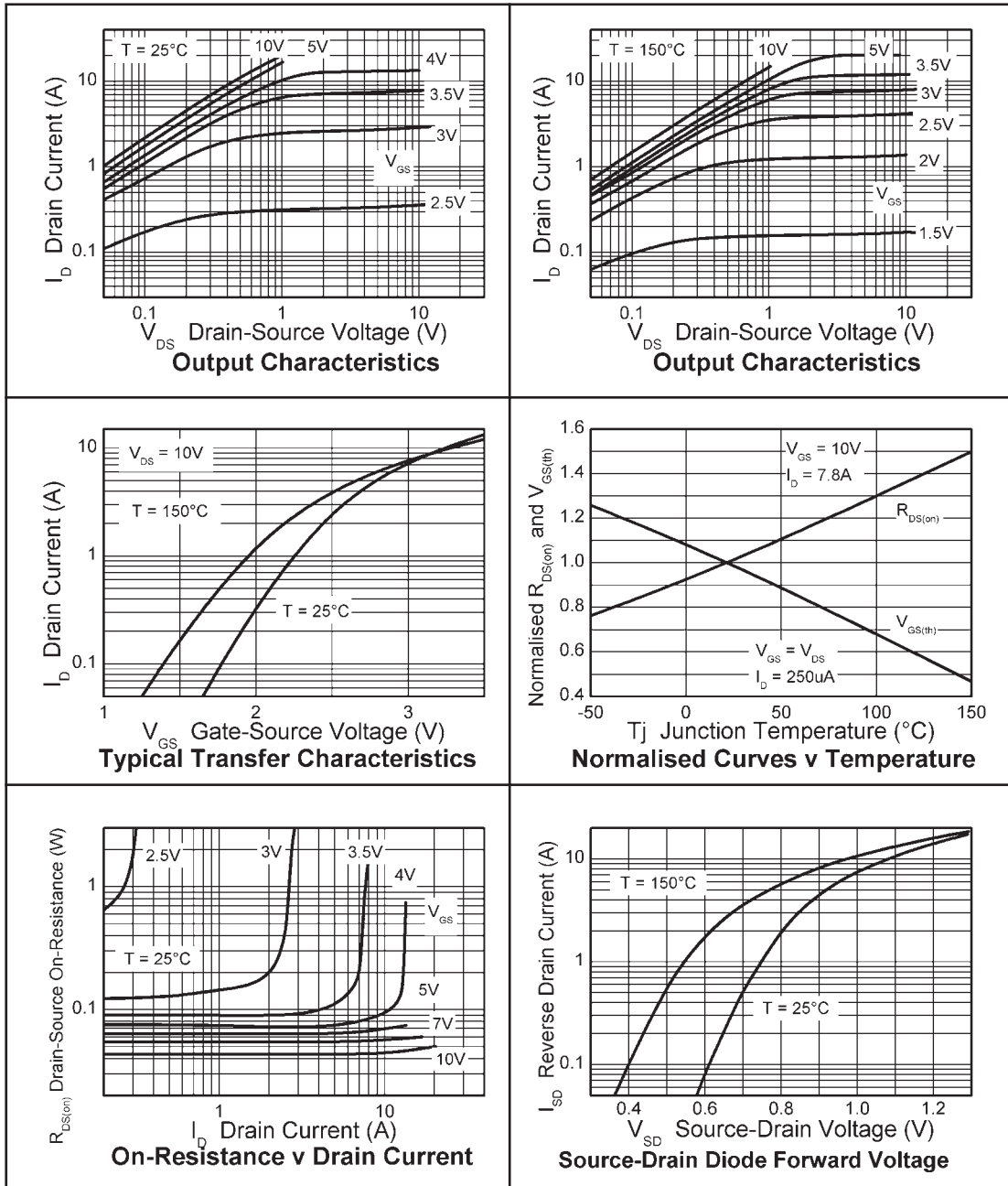
(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

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

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

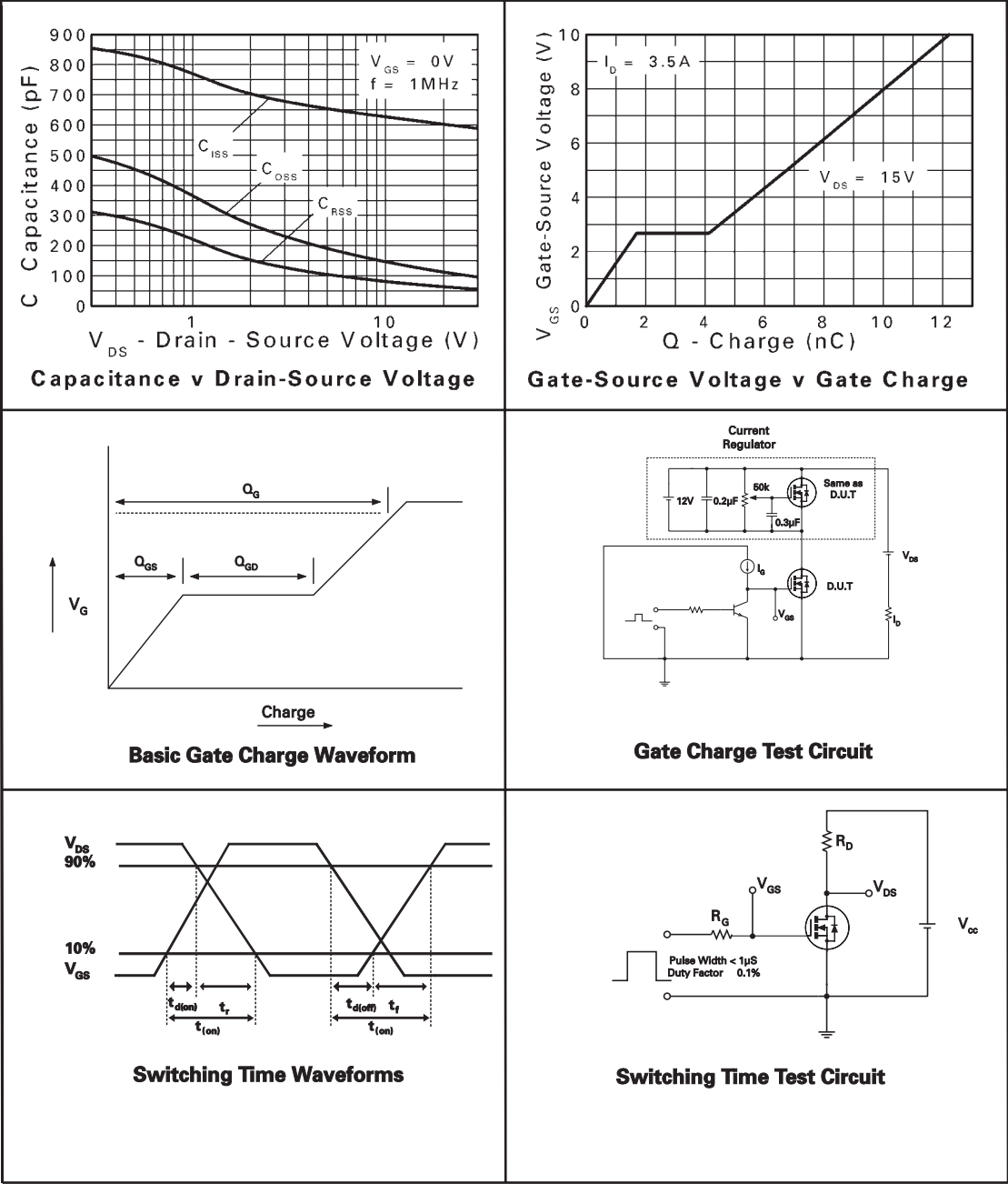
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TYPICAL CHARACTERISTICS



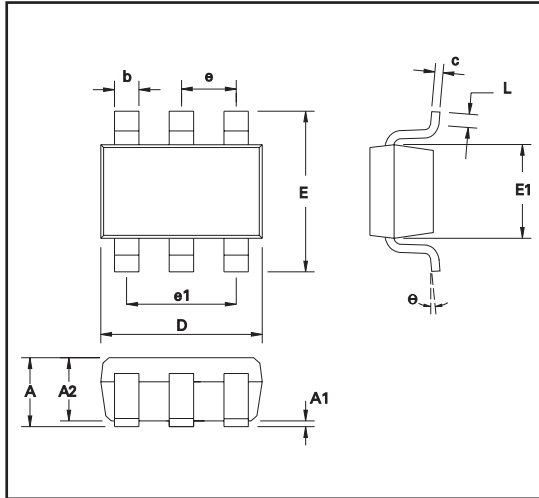
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TYPICAL CHARACTERISTICS

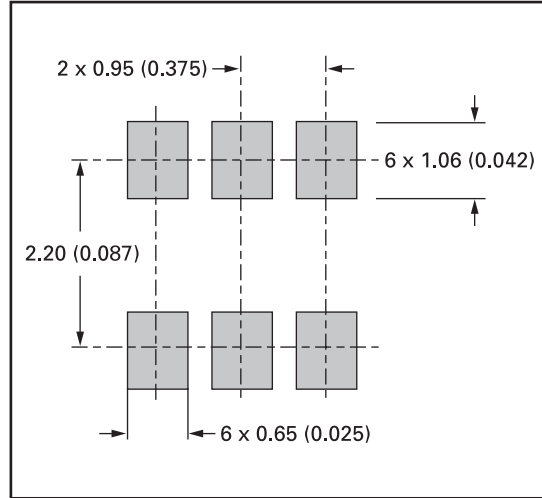


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PACKAGE OUTLINE



PAD LAYOUT DETAILS



CONTROLLING DIMENSIONS IN MILLIMETERS APPROX CONVERSIONS INCHES.

PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.90	1.45	0.35	0.057	E	2.60	3.00	0.102	0.118
A1	0.00	0.15	0	0.006	E1	1.50	1.75	0.059	0.069
A2	0.90	1.30	0.035	0.051	L	0.10	0.60	0.004	0.002
b	0.35	0.50	0.014	0.019	e	0.95 REF		0.037 REF	
C	0.09	0.20	0.0035	0.008	e1	1.90 REF		0.074 REF	
D	2.80	3.00	0.110	0.118	L	0°	10°	0°	10°

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ISSUE 3 - OCTOBER 2005