

ZXMN3A03E6

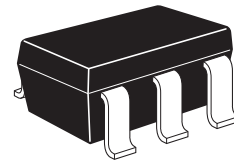
30V N-CANNEL ENHANCEMENT MODE MOSFET

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.



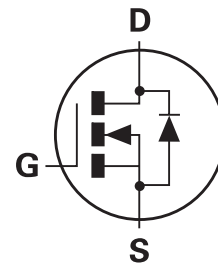
SOT23-6

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

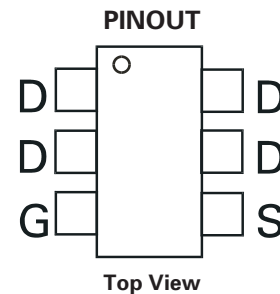


ORDERING INFORMATION

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

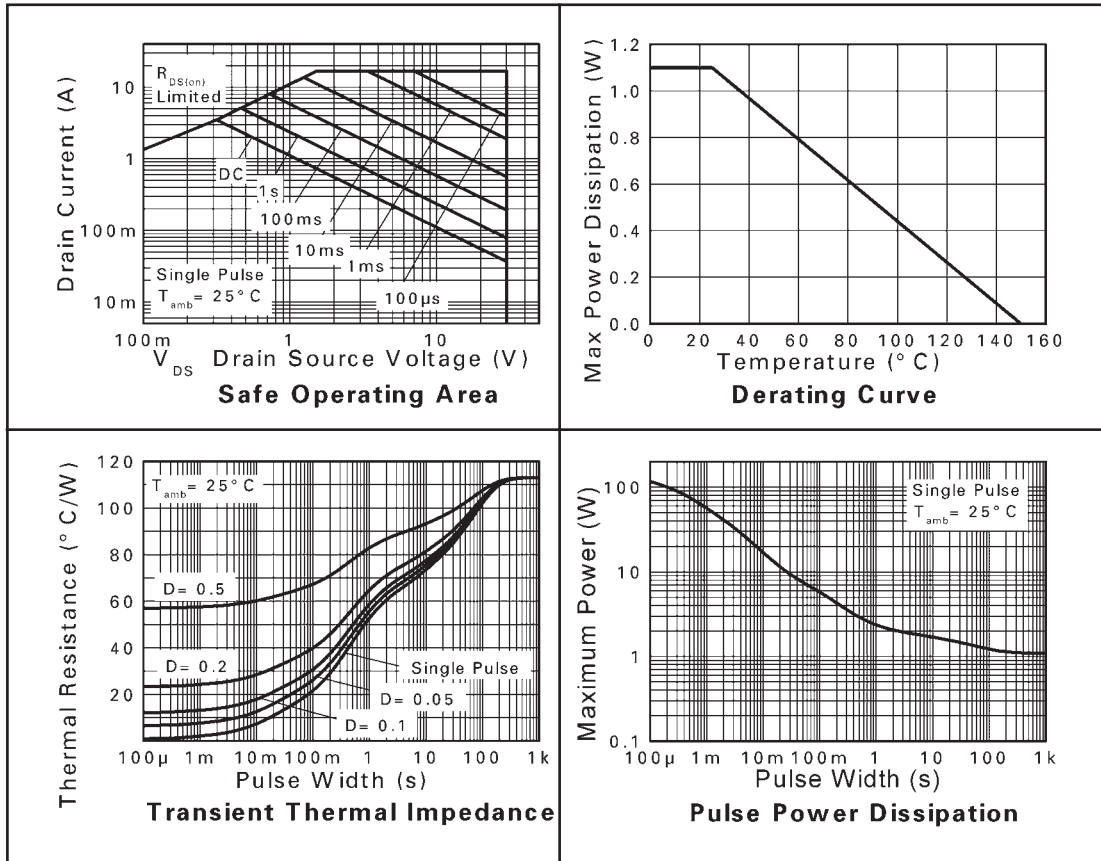
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	113	$^{\circ}C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	73	$^{\circ}C/W$

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)

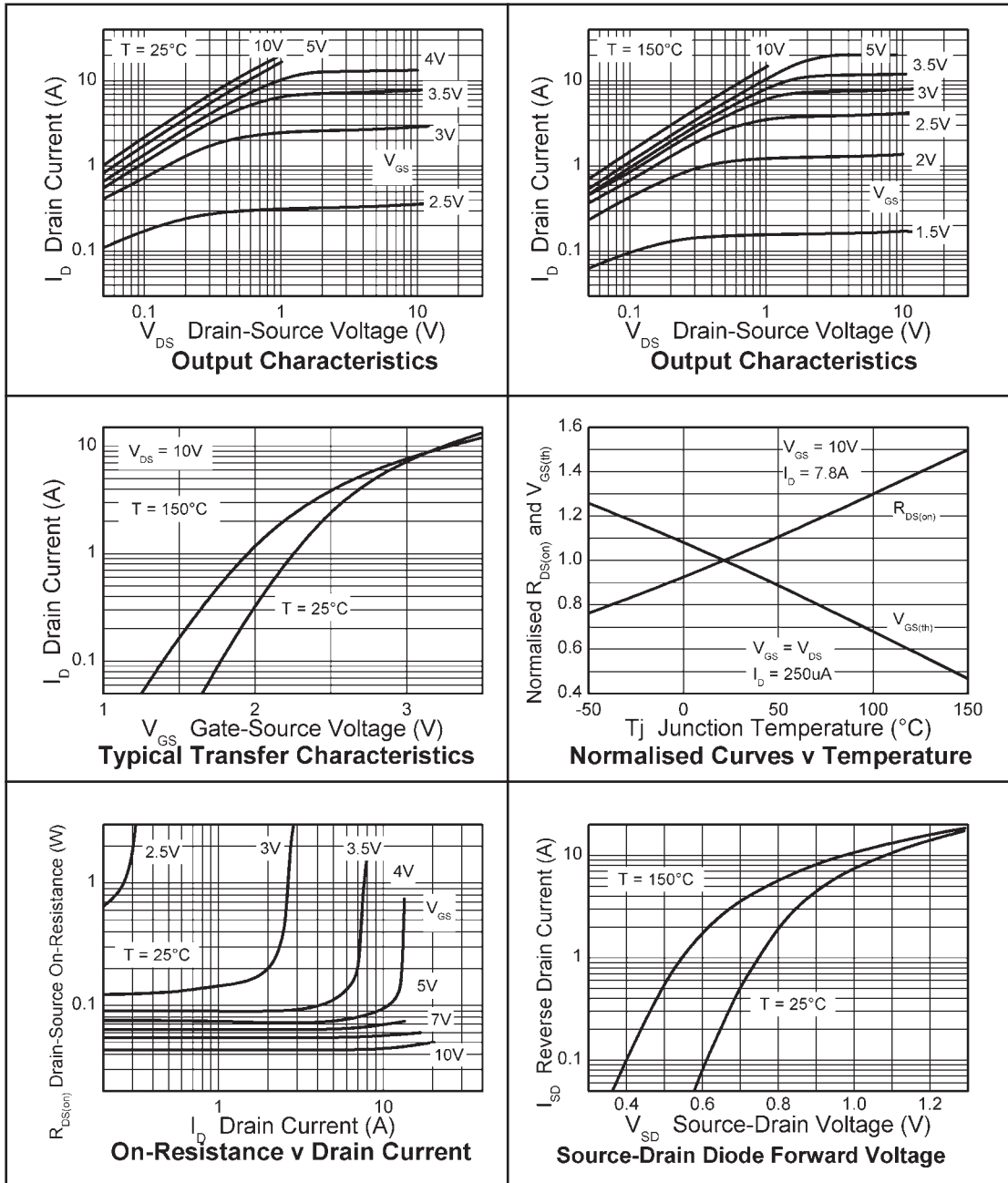
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-source breakdown voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$
Zero gate voltage drain current	I_{DSS}			0.5	μA	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$
Gate-body leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$
Gate-source threshold voltage	$V_{GS(th)}$	1			V	$I_D=250\mu\text{A}$, $V_{DS}=V_{GS}$
Static drain-source on-state resistance ⁽¹⁾	$R_{DS(on)}$			0.050 0.065	Ω	$V_{GS}=10\text{V}$, $I_D=7.8\text{A}$ $V_{GS}=4.5\text{V}$, $I_D=6.8\text{A}$
Forward transconductance ⁽¹⁾⁽³⁾	g_{fs}		10		S	$V_{DS}=10\text{V}$, $I_D=7.8\text{A}$
DYNAMIC ⁽³⁾						
Input capacitance	C_{iss}		600		pF	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$
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	$V_{DD}=15\text{V}$, $I_D=3.5\text{A}$ $R_G=6.0\Omega$, $V_{GS}=10\text{V}$
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	$V_{DS}=15\text{V}$, $V_{GS}=5\text{V}$, $I_D=3.5\text{A}$
Total gate charge	Q_g		12.6		nC	$V_{DS}=15\text{V}$, $V_{GS}=10\text{V}$, $I_D=3.5\text{A}$
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	$T_J=25^\circ\text{C}$, $I_S=3.2\text{A}$, $V_{GS}=0\text{V}$
Reverse recovery time ⁽³⁾	t_{rr}		18.8		ns	$T_J=25^\circ\text{C}$, $I_F=3.5\text{A}$, $di/dt= 100\text{A}/\mu\text{s}$
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.

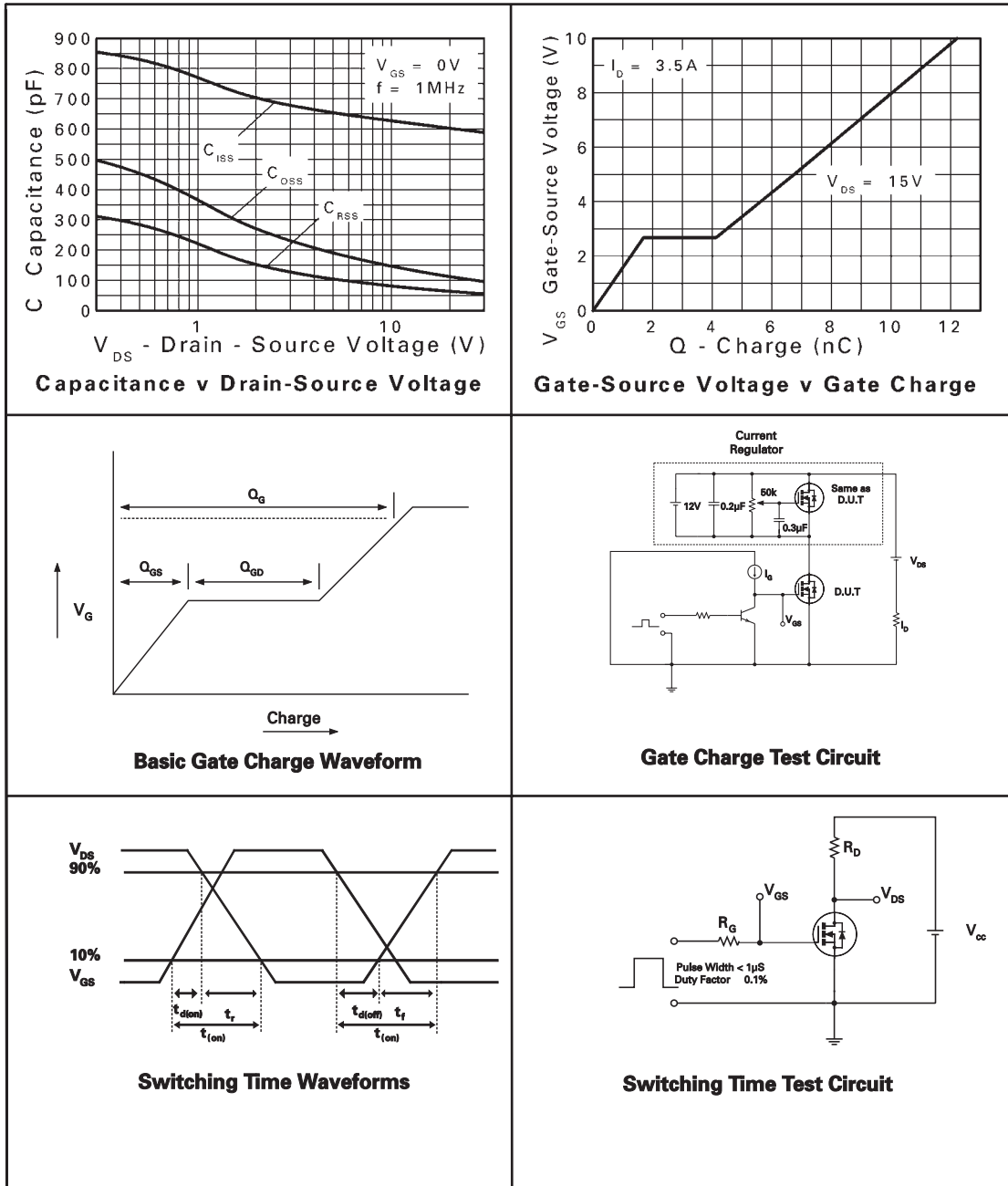
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TYPICAL CHARACTERISTICS



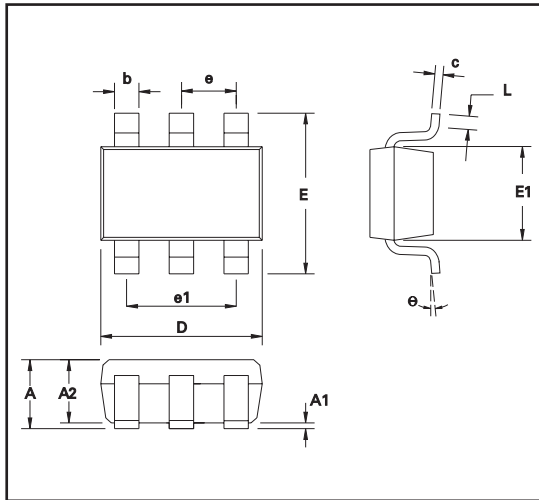
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TYPICAL CHARACTERISTICS

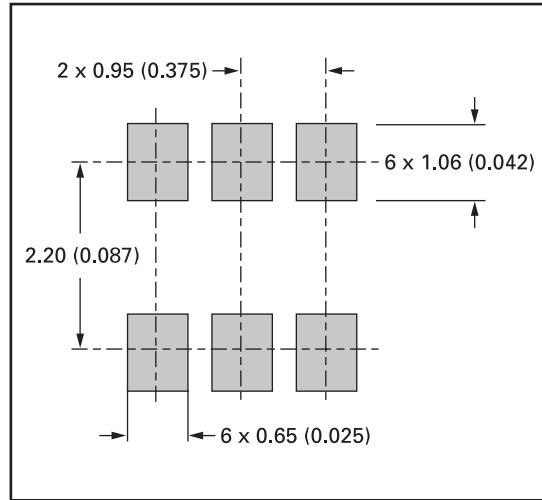


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PACKAGE OUTLINE



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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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park Chadderton, Oldham, OL9 9LL United Kingdom
Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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ISSUE 3 - OCTOBER 2005