

ZXMP3A16DN8

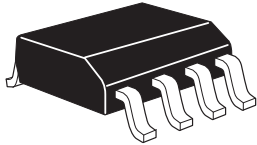
DUAL P-CHANNEL 30V ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -30V$; $R_{DS(ON)} = 0.045\Omega$; $I_D = -5.5A$

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.



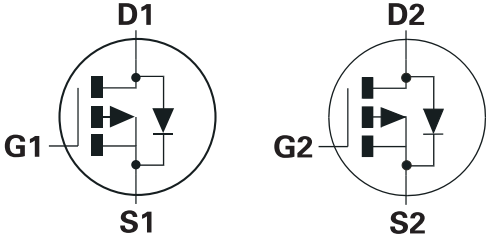
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FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

APPLICATIONS

- Motor Drive
- LCD backlighting



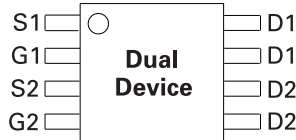
ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXMP3A16DN8TA	7"	12mm	500 units
ZXMP3A16DN8TC	13"	12mm	2500 units

DEVICE MARKING

ZXMP
3A16

PINOUT



Top view

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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)(d)} @ $V_{GS}=10V$; $T_A=70^\circ C$ ^{(b)(d)} @ $V_{GS}=10V$; $T_A=25^\circ C$ ^{(a)(d)}	I_D	-5.5 -4.4 -4.2	A A A
Pulsed Drain Current ^(c)	I_{DM}	-20	A
Continuous Source Current (Body Diode) ^(b)	I_S	-3.2	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	-20	A
Power Dissipation at $T_A=25^\circ C$ ^{(a)(d)} Linear Derating Factor	P_D	1.25 10	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^{(a)(e)} Linear Derating Factor	P_D	1.8 14	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^{(b)(d)} Linear Derating Factor	P_D	2.1 17	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_J:T_{stg}$	-55 to +150	$^\circ C$

THERMAL RESISTANCE

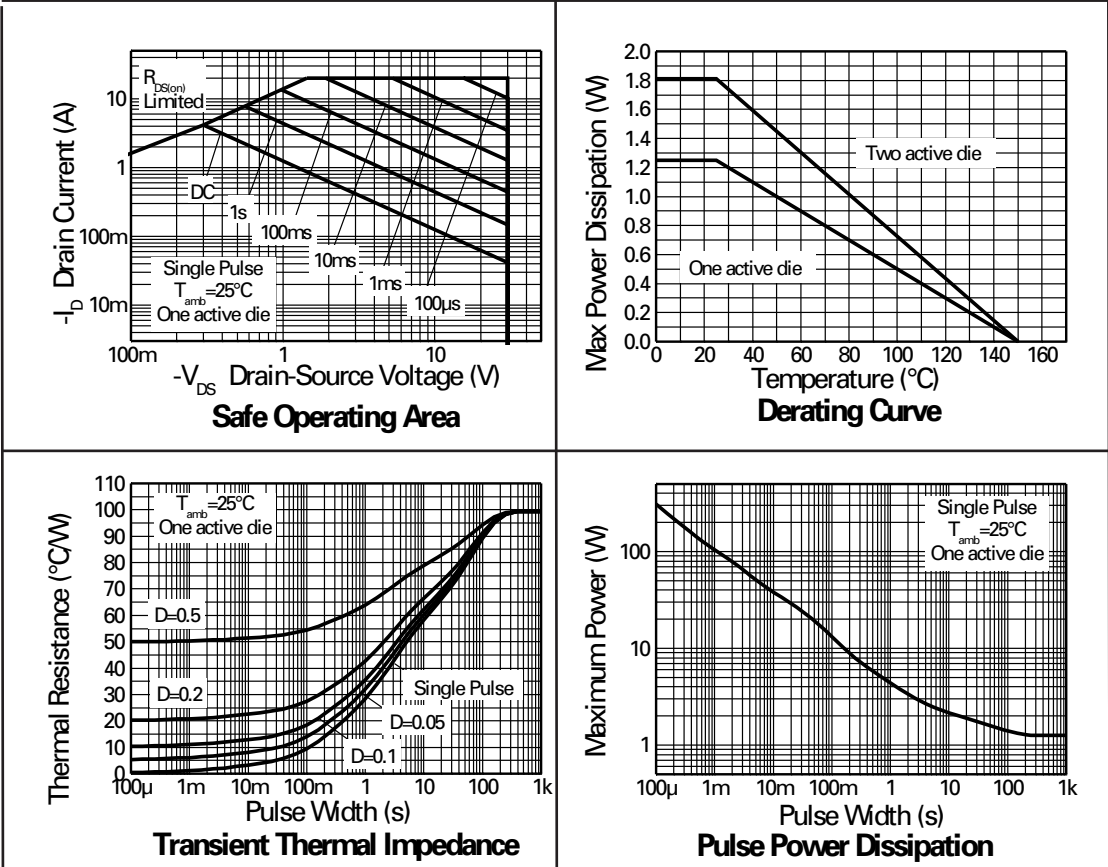
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient ^{(a)(d)}	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient ^{(b)(e)}	$R_{\theta JA}$	70	$^\circ C/W$
Junction to Ambient ^{(b)(d)}	$R_{\theta JA}$	60	$^\circ C/W$

Notes

- (a) For a dual device surface mounted on 25mm x 25mm FR4 PCB with coverage of single sided 1oz copper in still air conditions.
 (b) For a dual device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
 (c) Repetitive rating 25mm x 25mm FR4 PCB, $D=0.05$ pulse width=10 μs - pulse width limited by maximum junction temperature.
 (d) For a dual device with one active die.
 (e) For dual device with 2 active die running at equal power.

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CHARACTERISTICS



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

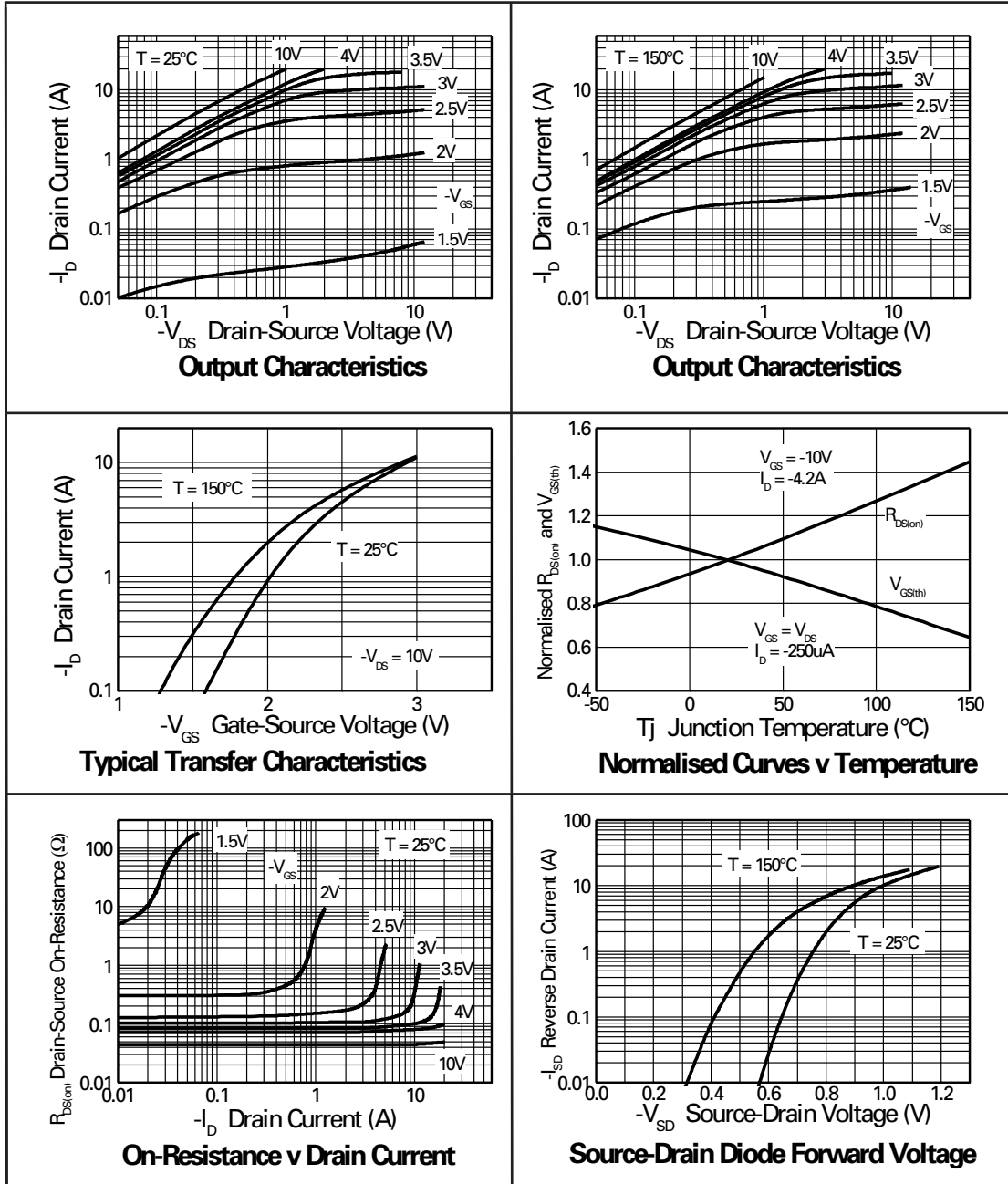
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1.0	μA	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.0			V	$I_D = -250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			0.045 0.070	Ω Ω	$V_{GS} = -10\text{V}$, $I_D = -4.2\text{A}$ $V_{GS} = -4.5\text{V}$, $I_D = -3.4\text{A}$
Forward Transconductance ⁽¹⁾⁽³⁾	g_{fs}		9.2		S	$V_{DS} = -15\text{V}$, $I_D = -4.2\text{A}$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{iss}		1022		pF	$V_{DS} = -15\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{oss}		267		pF	
Reverse Transfer Capacitance	C_{rss}		229		pF	
SWITCHING ^{(2) (3)}						
Turn-On Delay Time	$t_{d(on)}$		3.8		ns	$V_{DD} = -15\text{V}$, $I_D = -1\text{A}$ $R_G = 6.0\Omega$, $V_{GS} = -10\text{V}$
Rise Time	t_r		6.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		37.1		ns	
Fall Time	t_f		21.4		ns	
Gate Charge	Q_g		17.2		nC	$V_{DS} = -15\text{V}$, $V_{GS} = -5\text{V}$, $I_D = -4.2\text{A}$
Total Gate Charge	Q_g		29.6		nC	$V_{DS} = -15\text{V}$, $V_{GS} = -10\text{V}$, $I_D = -4.2\text{A}$
Gate-Source Charge	Q_{gs}		2.8		nC	
Gate-Drain Charge	Q_{gd}		8.6		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}		-0.85	-0.95	V	$T_J = 25^{\circ}\text{C}$, $I_S = -3.6\text{A}$, $V_{GS} = 0\text{V}$
Reverse Recovery Time ⁽³⁾	t_{rr}		21.7		ns	$T_J = 25^{\circ}\text{C}$, $I_F = -2\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge ⁽³⁾	Q_{rr}		16.1		nC	

NOTES

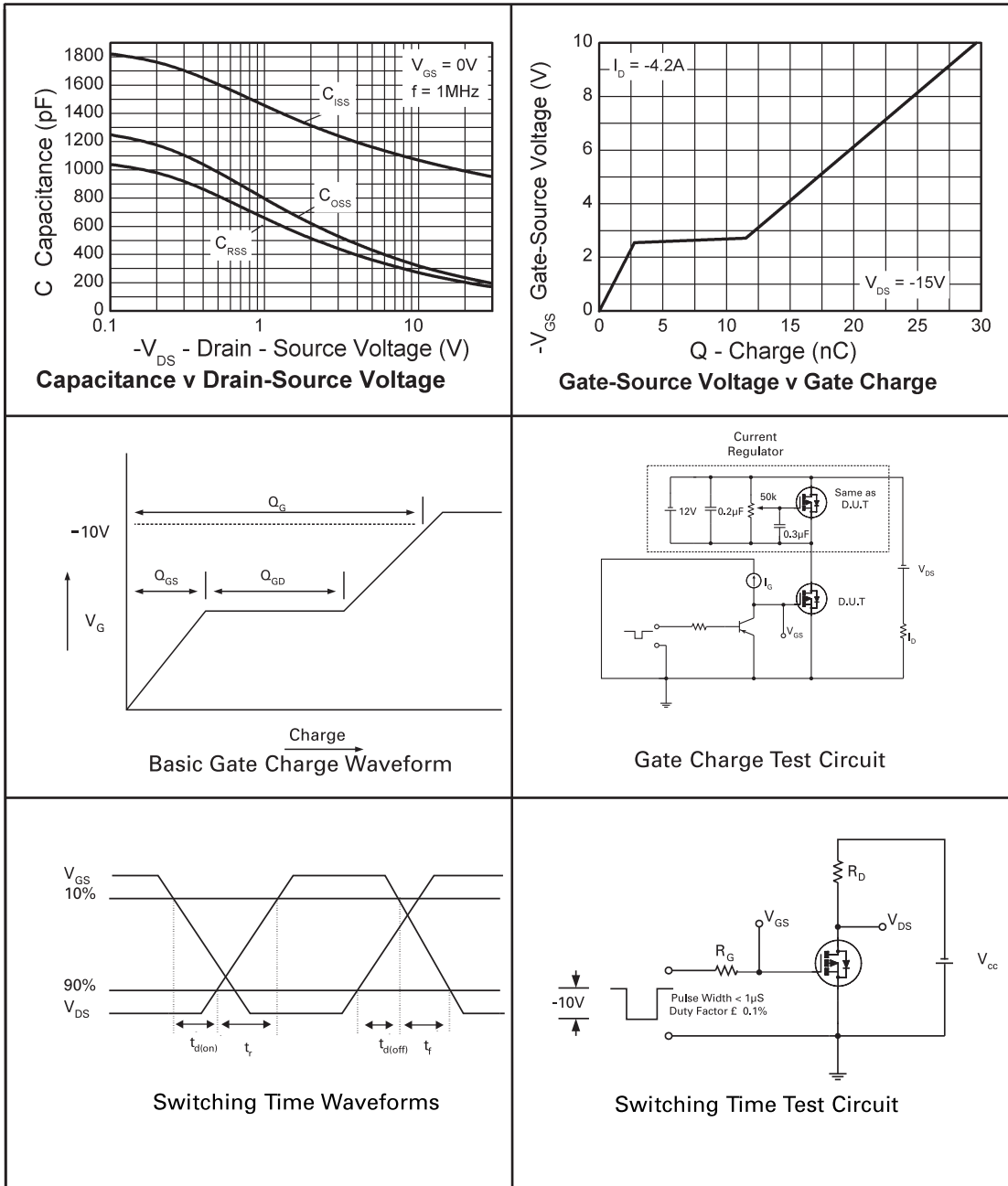
- (1) Measured under pulsed conditions. Width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.
 (2) Switching characteristics are independent of operating junction temperature.
 (3) For design aid only, not subject to production testing.

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TYPICAL CHARACTERISTICS



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"Preview"Future device intended for production at some point. Samples may be available

"Active"Product status recommended for new designs

"Last time buy (LTB)"Device will be discontinued and last time buy period and delivery is in effect

"Not recommended for new designs"Device is still in production to support existing designs and production

"Obsolete"Production has been discontinued

Datasheet status key:

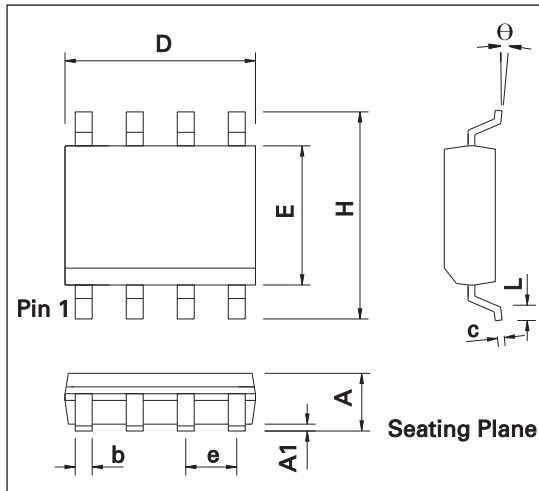
"Draft version" This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.

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PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES
APPROX IN MILLIMETRES

PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.35	1.75	0.053	0.069	e	1.27 BSC		0.050 BSC	
A1	0.10	0.25	0.004	0.010	b	0.33	0.51	0.013	0.020
D	4.80	5.00	0.189	0.197	c	0.19	0.25	0.008	0.010
H	5.80	6.20	0.228	0.244	Θ	0°	8°	0°	8°
E	3.80	4.00	0.150	0.157	h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050	-	-	-	-	-

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