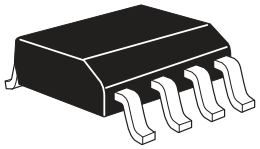
ZXMP3A16N8

30V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY
$V_{(BR)DSS}$ = -30V; $R_{DS(ON)}$ = 0.040Ω; I_D = -6.7A

DESCRIPTION

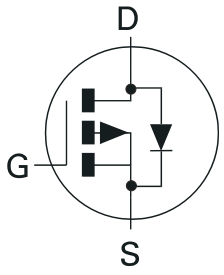
This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



SO8

FEATURES

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



APPLICATIONS

- Disconnect switches
- Motor control

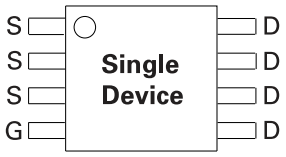
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMP3A16N8TA	7″	12mm	500 units
ZXMP3A16N8TC	13″	12mm	2500 units

DEVICE MARKING

- ZXMP
  3A16

PINOUT



Top View

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°C (b) V_{GS}=-10V; T_A=70°C (b) V_{GS}=-10V; T_A=25°C (a)	I_D	-6.7 -5.4 -5.6	A
Pulsed Drain Current (c)	I_{DM}	-26	A
Continuous Source Current (Body Diode) (b)	I_S	-3.2	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	-26	A
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	1.9 15.2	W mW/°C
Power Dissipation at T_A=25°C (b) Linear Derating Factor	P_D	2.8 22.4	W mW/°C
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	65	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	45	°C/W

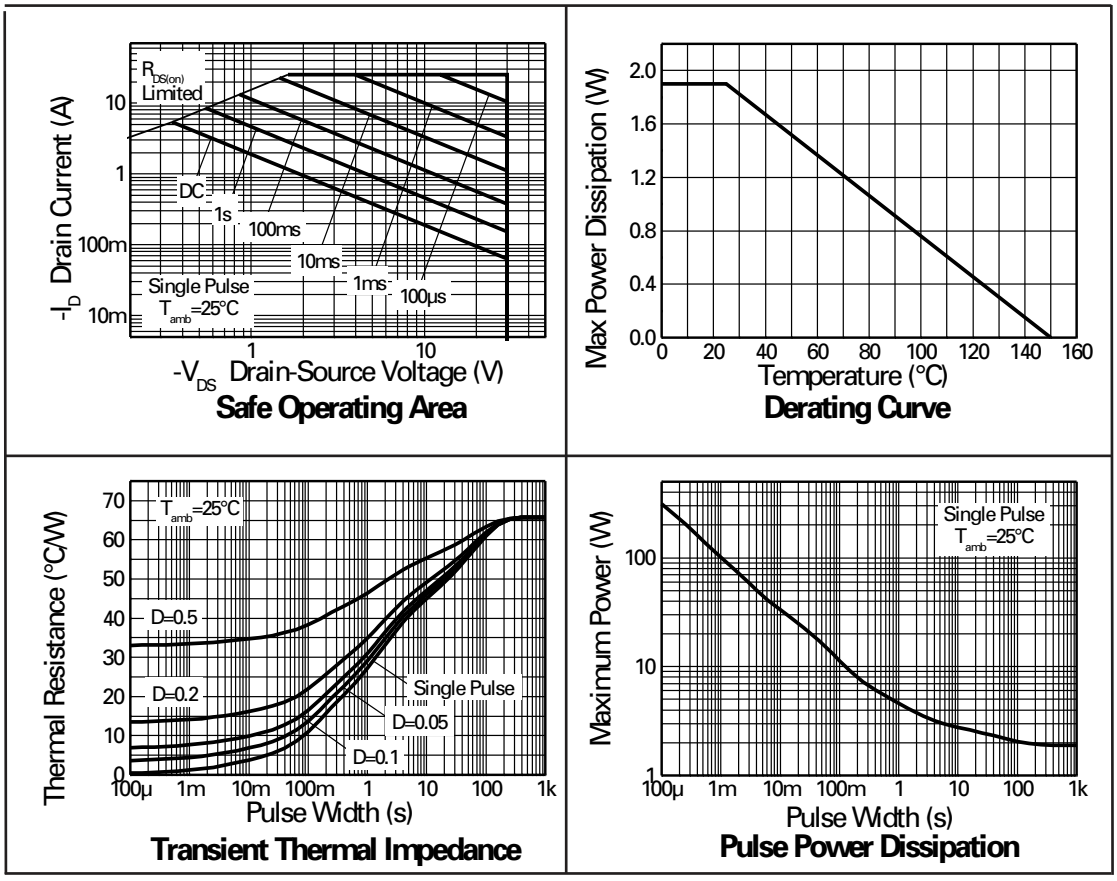
NOTES

(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≤5 secs.

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

CHARACTERISTICS



ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°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}			-1.0	μA	V_{DS}=-30V, V_{GS}=0V
Gate-Body Leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.0			V	I_D=-250μA,V_{DS}= V_{GS}
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.040 0.070	Ω Ω	V_{GS}=-10V, I_D=-4.2A V_{GS}=-4.5V, I_D=-3.4A
Forward Transconductance (1)(3)	g_{fs}		9.2		S	V_{DS}=-15V,I_D=-4.2A
DYNAMIC (3)						
Input Capacitance	C_{iss}		1022		pF	V_{DS}=-15 V, V_{GS}=0V, f=1MHz
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} =-15V, I_D=-1A R_G=6.0Ω, V_{GS}=-10V
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}=-15V,V_{GS}=-5V, I_D=-4.2A
Total Gate Charge	Q_g		29.6		nC	V_{DS}=-15V,V_{GS}=-10V, I_D=-4.2A
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°C, I_S=-3.6A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		21.7		ns	T_J=25°C, I_F=-2A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		16.1		nC	

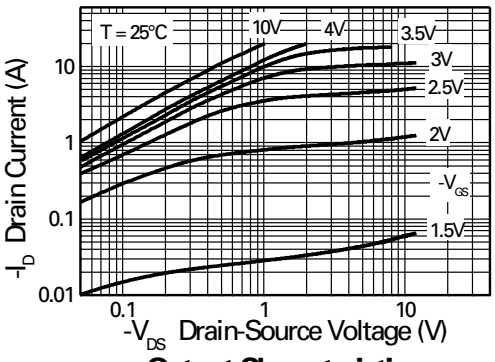
NOTES

(1) Measured under pulsed conditions. Width ≤300μs. Duty cycle ≤ 2% .

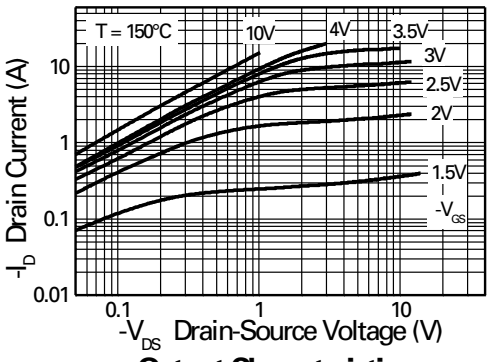
(2) Switching characteristics are independent of operating junction temperature.

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

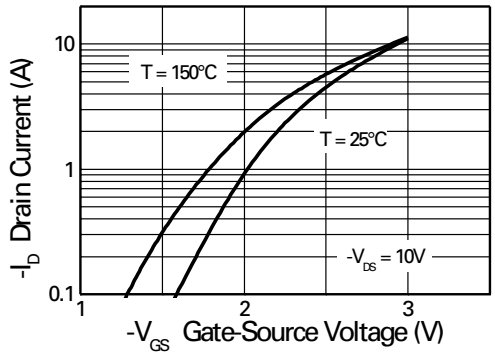
CHARACTERISTICS



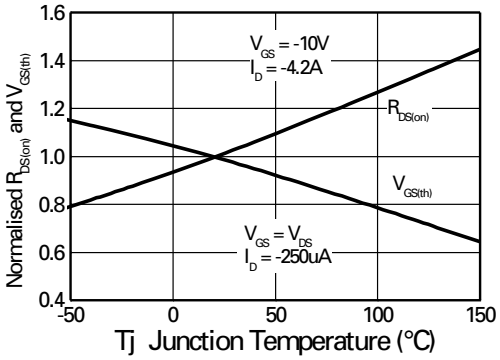
Output Characteristics



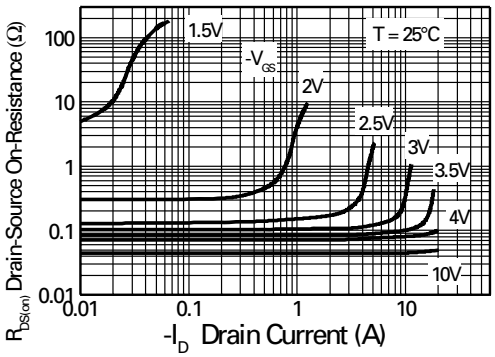
Output Characteristics



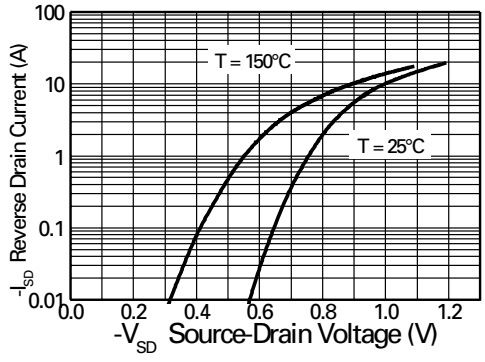
Typical Transfer Characteristics



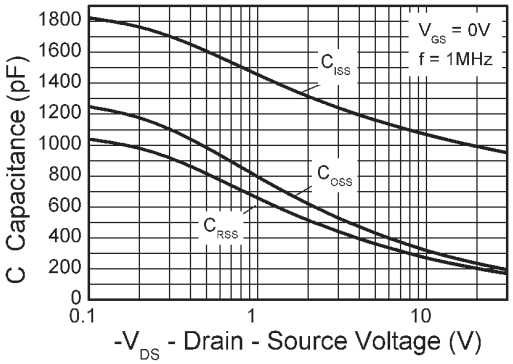
Normalised Curves v Temperature



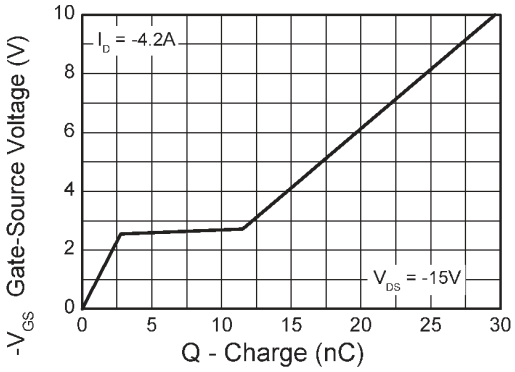
On-Resistance v Drain Current



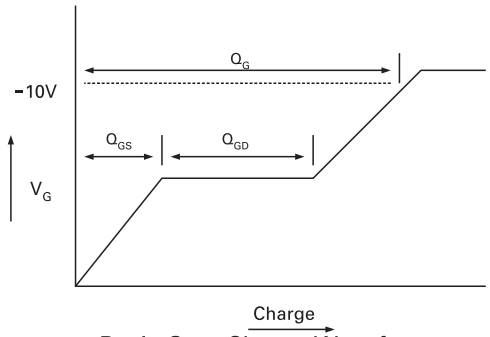
Source-Drain Diode Forward Voltage



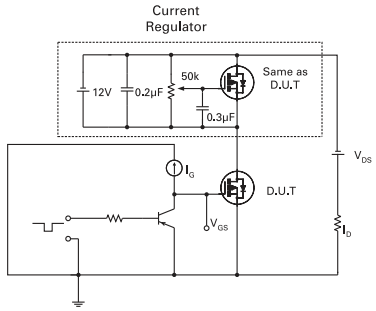
Capacitance v Drain-Source Voltage



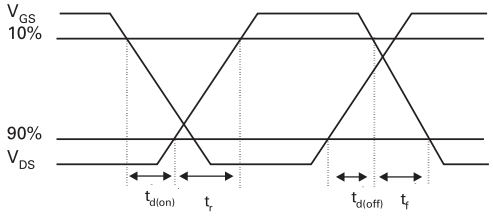
Gate-Source Voltage v Gate Charge



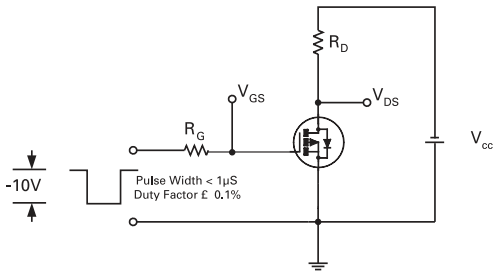
Basic Gate Charge Waveform



Gate Charge Test Circuit



Switching Time Waveforms



Switching Time Test Circuit

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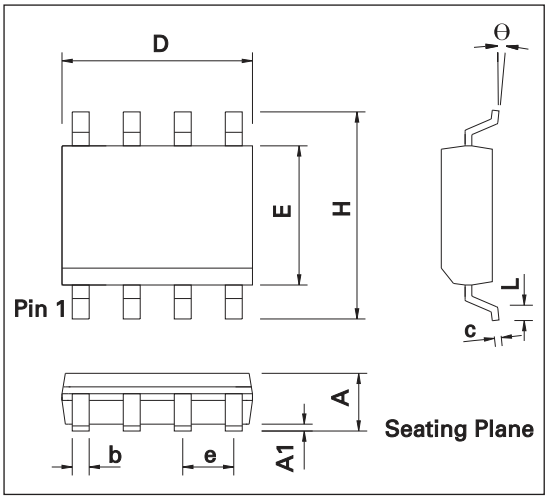
ZXMP3A16N8

PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES
APPROX IN MILLIMETERS

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	-	-	-	-	-

Europe

Zetex GmbH
Kustermann-Park
Balanstraße 59
D-81541 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas

Zetex Inc
700 Veterans Memorial Hwy
Hauppauge, NY 11788
USA

Telephone: (1) 631 360 2222
Fax: (1) 631 360 8222
usa.sales@zetex.com

Asia Pacific

Zetex (Asia) Ltd
3701-04 Metroplaza Tower 1
Hing Fong Road, Kwai Fong
Hong Kong

Telephone: (852) 26100 611
Fax: (852) 24250 494
asia.sales@zetex.com

Corporate Headquarters

Zetex Semiconductors plc
Zetex Technology Park
Chadderton, Oldham, OL9 9LL
United Kingdom

Telephone (44) 161 622 4444
Fax: (44) 161 622 4446
hq@zetex.com