# **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.



**SO8** 

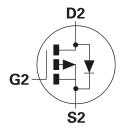
# **FEATURES**

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

# **APPLICATIONS**

- Motor Drive
- · LCD backlighting

# G1 F1



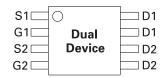
# **ORDERING INFORMATION**

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

# **DEVICE MARKING**

ZXMP 3A16

# **PINOUT**



Top view



# **ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current@ $V_{GS}=10V; T_A=25^{\circ}C^{(b)(d)}$	I <sub>D</sub>	-5.5 -4.4 -4.2	A A A
Pulsed Drain Current <sup>(c)</sup>	I <sub>DM</sub>	-20	А
Continuous Source Current (Body Diode) <sup>(b)</sup>	I <sub>S</sub>	-3.2	А
Pulsed Source Current (Body Diode) <sup>(c)</sup>	I <sub>SM</sub>	-20	А
Power Dissipation at T <sub>A</sub> =25°C <sup>(a)(d)</sup> Linear Derating Factor	P <sub>D</sub>	1.25 10	W mW/°C
Power Dissipation at T <sub>A</sub> =25°C <sup>(a)(e)</sup> Linear Derating Factor	P <sub>D</sub>	1.8 14	W mW/°C
Power Dissipation at T <sub>A</sub> =25°C <sup>(b)(d)</sup> Linear Derating Factor	P <sub>D</sub>	2.1 17	W mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> :T <sub>stg</sub>	-55 to +150	°C

# THERMAL RESISTANCE

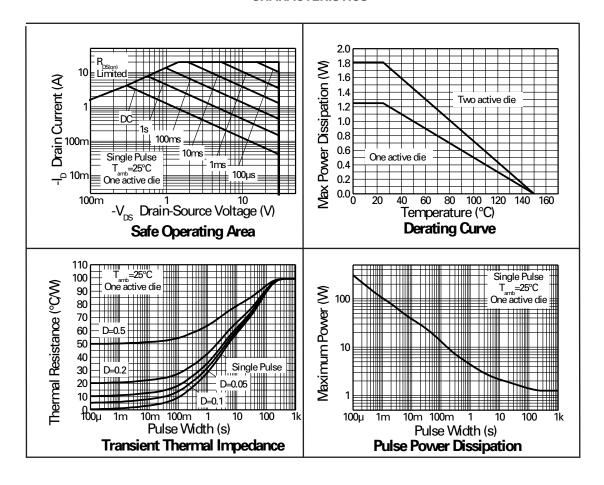
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient <sup>(a)(d)</sup>	$R_{\theta JA}$	100	°C/W
Junction to Ambient (b)(e)	$R_{\theta JA}$	70	°C/W
Junction to Ambient (b)(d)	$R_{\theta JA}$	60	°C/W

## 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 $\mu$ s 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.



# **CHARACTERISTICS**





# **ELECTRICAL CHARACTERISTICS** (at $T_{amb} = 25$ °C unless otherwise stated)

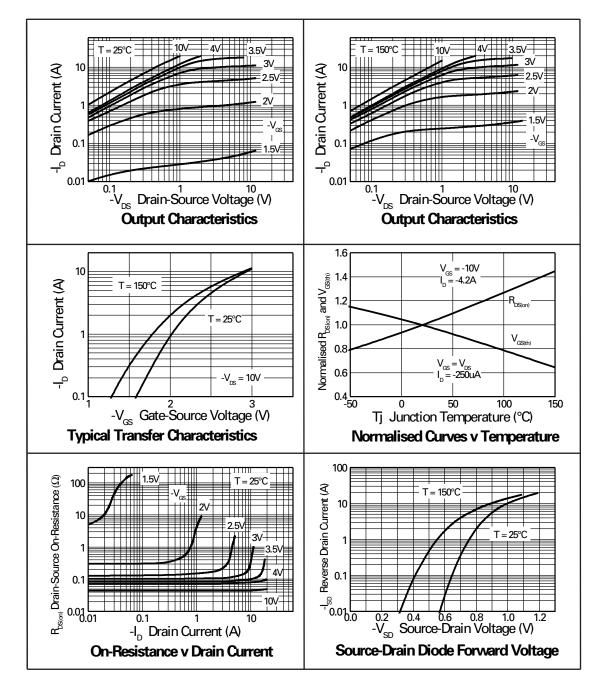
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS		
STATIC	'	1						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	-30			V	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>			-1.0	μΑ	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V		
Gate-Body Leakage	I <sub>GSS</sub>			100	nA	$V_{GS}=\pm 20V$ , $V_{DS}=0V$		
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	-1.0			V	I <sub>D</sub> =-250μA, V <sub>DS</sub> = V <sub>GS</sub>		
Static Drain-Source On-State Resistance (1)	R <sub>DS(on)</sub>			0.045 0.070	$\Omega$ $\Omega$	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.2A V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.4A		
Forward Transconductance (1)(3)	9 <sub>fs</sub>		9.2		S	V <sub>DS</sub> =-15V,I <sub>D</sub> =-4.2A		
DYNAMIC (3)								
Input Capacitance	C <sub>iss</sub>		1022		pF			
Output Capacitance	Coss		267		pF	V <sub>DS</sub> =-15 V, V <sub>GS</sub> =0V, f=1MHz		
Reverse Transfer Capacitance	C <sub>rss</sub>		229		pF			
SWITCHING <sup>(2) (3)</sup>		•			•			
Turn-On Delay Time	t <sub>d(on)</sub>		3.8		ns			
Rise Time	t <sub>r</sub>		6.5		ns	V <sub>DD</sub> =-15V, I <sub>D</sub> =-1A		
Turn-Off Delay Time	t <sub>d(off)</sub>		37.1		ns	$R_{G} = 6.0\Omega$ , $V_{GS} = -10V$		
Fall Time	t <sub>f</sub>		21.4		ns			
Gate Charge	$Q_g$		17.2		nC	V <sub>DS</sub> =-15V,V <sub>GS</sub> =-5V, I <sub>D</sub> =-4.2A		
Total Gate Charge	Qg		29.6		nC			
Gate-Source Charge	Q <sub>gs</sub>		2.8		nC	V <sub>DS</sub> =-15V,V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.2A		
Gate-Drain Charge	Q <sub>gd</sub>		8.6		nC			
SOURCE-DRAIN DIODE								
Diode Forward Voltage <sup>(1)</sup>	V <sub>SD</sub>		-0.85	-0.95	V	T <sub>J</sub> =25°C, I <sub>S</sub> =-3.6A, V <sub>GS</sub> =0V		
Reverse Recovery Time (3)	t <sub>rr</sub>		21.7		ns	T <sub>J</sub> =25°C, I <sub>F</sub> =-2A,		
Reverse Recovery Charge <sup>(3)</sup>	Q <sub>rr</sub>		16.1		nC	di/dt= 100 A/μs		

# NOTES

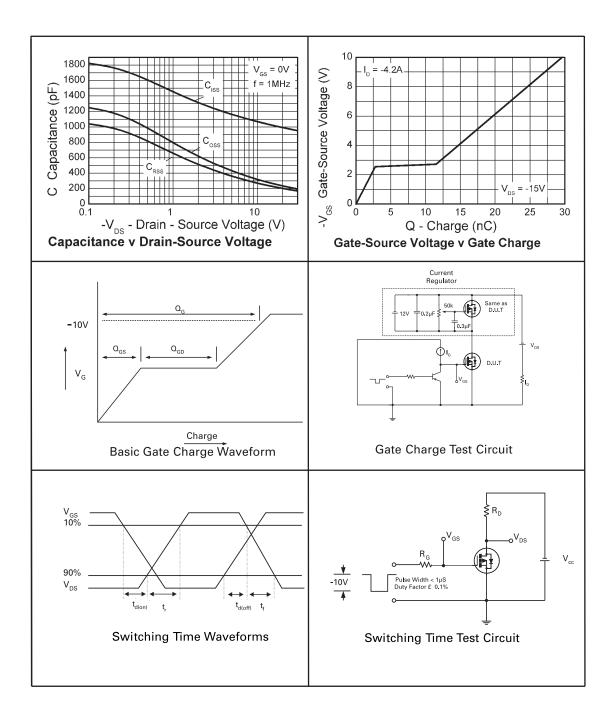
- (1) Measured under pulsed conditions. Width  $\leq\!\!300\mu s.$  Duty cycle  $\leq\!2\%$  .
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.



# **TYPICAL CHARACTERISTICS**









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## Product status key:

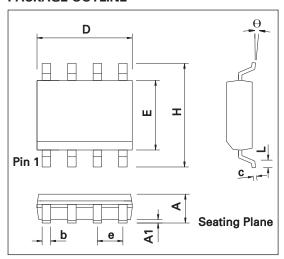
- "Preview"Future device intended for production at some point. Samples may be available
- "Active"Product status recommended for new designs
- "Last time buy (LTB)"Device will be discontinued and last time buy period and delivery is in effect
- "Not recommended for new designs"Device is still in production to support existing designs and production
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# **PACKAGE OUTLINE**



CONTROLLING DIMENSIONS ARE IN INCHES APPROX IN MILLIMETRES

# **PACKAGE DIMENSIONS**

	Millimeters		Inches			Millimeters		Inches	
DIM	Min	Max	Min	Max	DIM	Min	Max	Min	Max
Α	1.35	1.75	0.053	0.069	е	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	С	0.19	0.25	0.008	0.010
Н	5.80	6.20	0.228	0.244	θ	0°	8°	0°	8°
Е	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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