

# ZXMP4A16G

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## 40V P-CHANNEL ENHANCEMENT MODE MOSFET

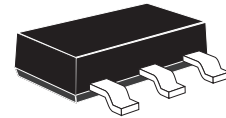
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### SUMMARY

$V_{(BR)DSS} = -40V$ ;  $R_{DS(on)} = 0.060\Omega$ ;  $I_D = -6.4A$

### 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.



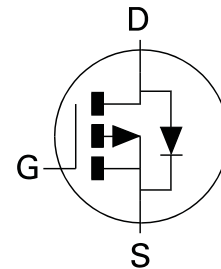
SOT223

### FEATURES

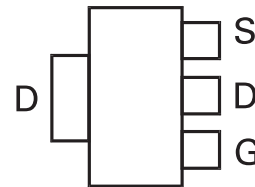
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT223 package

### APPLICATIONS

- DC-DC Converters
- Disconnect switches
- Audio output stages
- Motor Control



### PINOUT



Top View

### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMP4A16GTA	7"	12mm	1000 units
ZXMP4A16GTC	13"	12mm	4000 units

### DEVICE MARKING

ZXMP  
4A16

# ZXMP4A16G

## ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $V_{GS} = -10V$ ; $T_A = 25^\circ C$ ) <sup>(b)</sup> ( $V_{GS} = -10V$ ; $T_A = 70^\circ C$ ) <sup>(b)</sup> ( $V_{GS} = -10V$ ; $T_A = 25^\circ C$ ) <sup>(a)</sup>	$I_D$	-6.4 -5.1 -4.6	A
Pulsed Drain Current <sup>(c)</sup>	$I_{DM}$	-21	A
Continuous Source Current (Body Diode) <sup>(b)</sup>	$I_S$	-5.2	A
Pulsed Source Current (Body Diode) <sup>(c)</sup>	$I_{SM}$	-21	A
Power Dissipation at $T_A = 25^\circ C$ <sup>(a)</sup> Linear Derating Factor	$P_D$	2.0 16	W mW/ $^\circ C$
Power Dissipation at $T_A = 25^\circ C$ <sup>(b)</sup> Linear Derating Factor	$P_D$	3.9 31	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^\circ C$

## THERMAL RESISTANCE

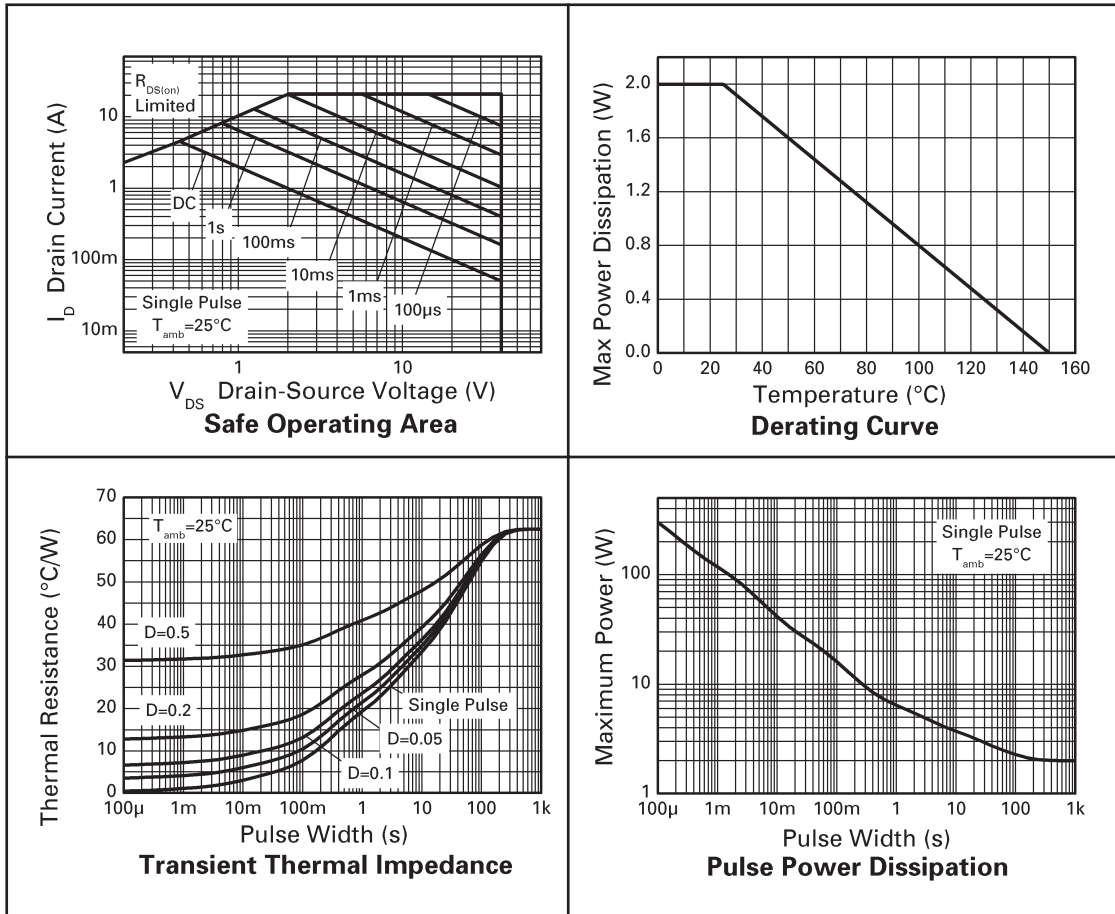
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient <sup>(a)</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to Ambient <sup>(b)</sup>	$R_{\theta JA}$	32.2	$^\circ C/W$

### 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 limited by maximum junction temperature.

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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
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-40			V	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS} = -40\text{V}$ , $V_{GS} = 0\text{V}$
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 <sup>(1)</sup>	$R_{DS(on)}$			0.060 0.100	$\Omega$ $\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -3.8\text{A}$ $V_{GS} = -4.5\text{V}$ , $I_D = -2.9\text{A}$
Forward Transconductance <sup>(1)(3)</sup>	$g_{fs}$		8.85		S	$V_{DS} = -15\text{V}$ , $I_D = -3.8\text{A}$
<b>DYNAMIC <sup>(3)</sup></b>						
Input Capacitance	$C_{iss}$		1007		pF	$V_{DS} = -20\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		130		pF	
Reverse Transfer Capacitance	$C_{rss}$		85		pF	
<b>SWITCHING <sup>(2)(3)</sup></b>						
Turn-On Delay Time	$t_{d(on)}$		2.33		ns	$V_{DD} = -20\text{V}$ , $I_D = -1\text{A}$ $R_G \approx 6.0\Omega$ , $V_{GS} = -10\text{V}$
Rise Time	$t_r$		8.84		ns	
Turn-Off Delay Time	$t_{d(off)}$		29.18		ns	
Fall Time	$t_f$		12.54		ns	
Gate Charge	$Q_g$		13.6		nC	$V_{DS} = -20\text{V}$ , $V_{GS} = -5\text{V}$ , $I_D = -3.8\text{A}$
Total Gate Charge	$Q_g$		26.1		nC	$V_{DS} = -20\text{V}$ , $V_{GS} = -10\text{V}$ , $I_D = -3.8\text{A}$
Gate-Source Charge	$Q_{gs}$		2.8		nC	
Gate-Drain Charge	$Q_{gd}$		4.8		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage <sup>(1)</sup>	$V_{SD}$		-0.85	-1.2	V	$T_J = 25^{\circ}\text{C}$ , $I_S = -3.4\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time <sup>(3)</sup>	$t_{rr}$		27.2		ns	$T_J = 25^{\circ}\text{C}$ , $I_F = -3\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge <sup>(3)</sup>	$Q_{rr}$		25.4		nC	

### NOTES

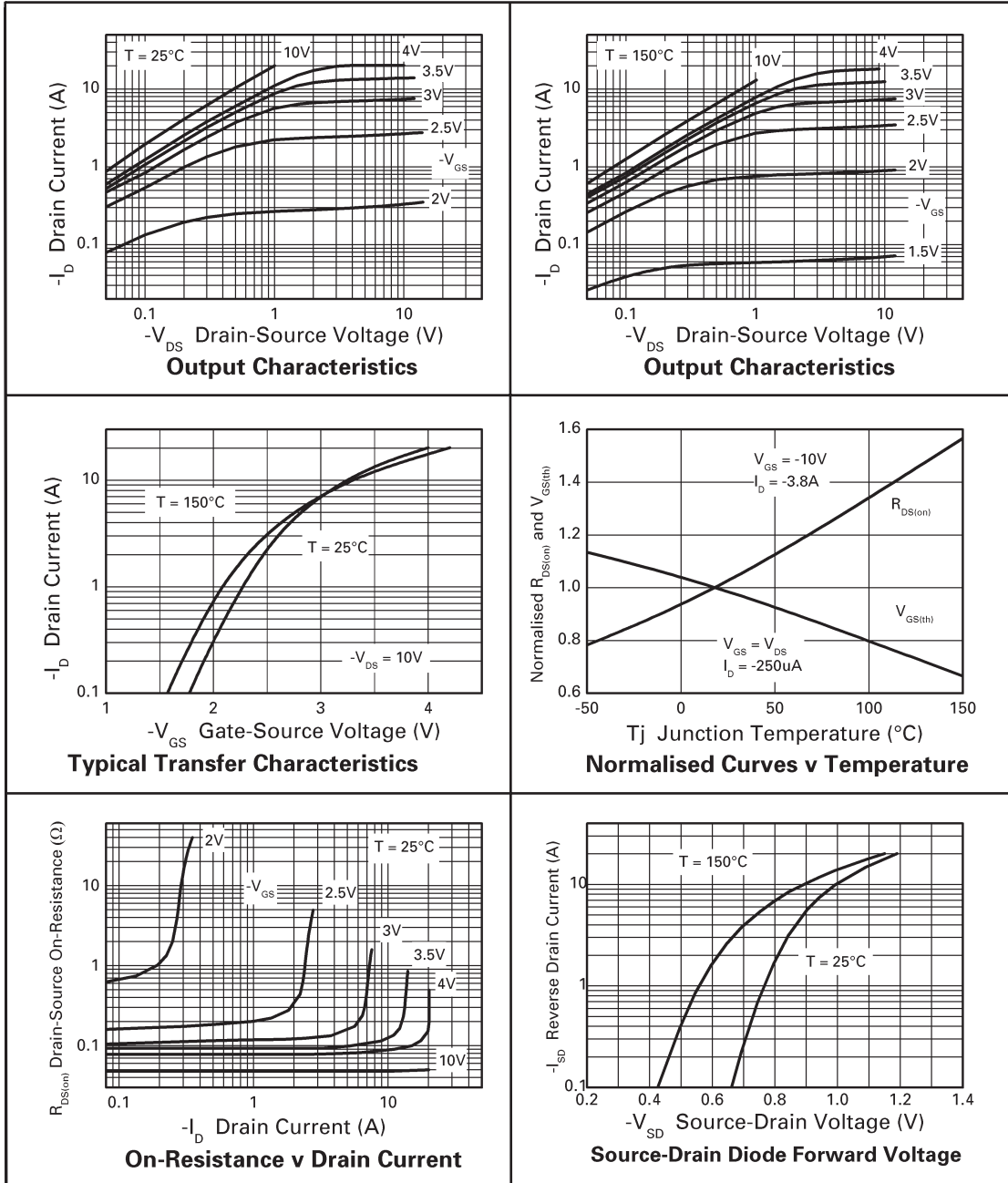
(1) Measured under pulsed conditions. Width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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

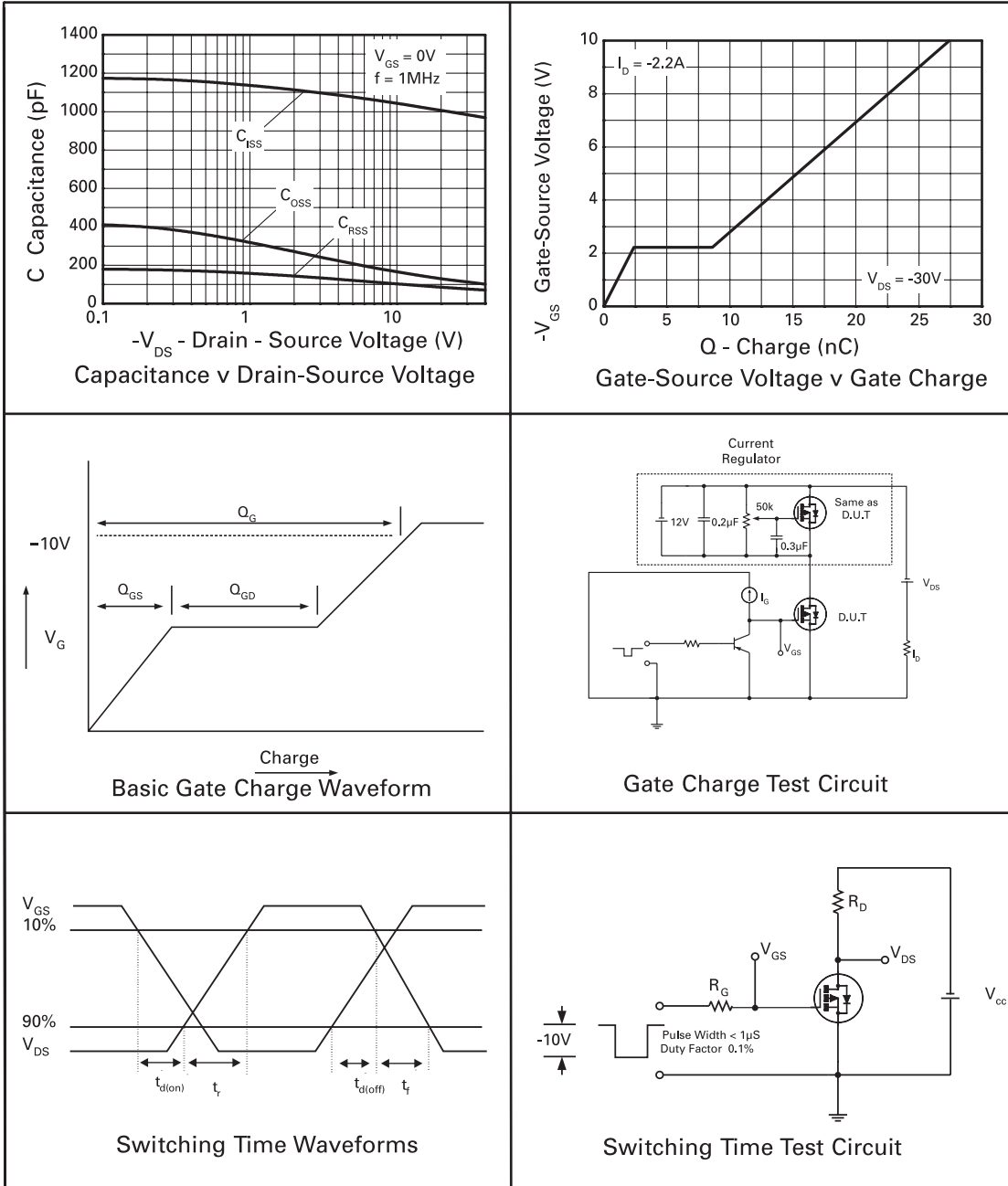
(3) For design aid only, not subject to production testing.

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## TYPICAL CHARACTERISTICS

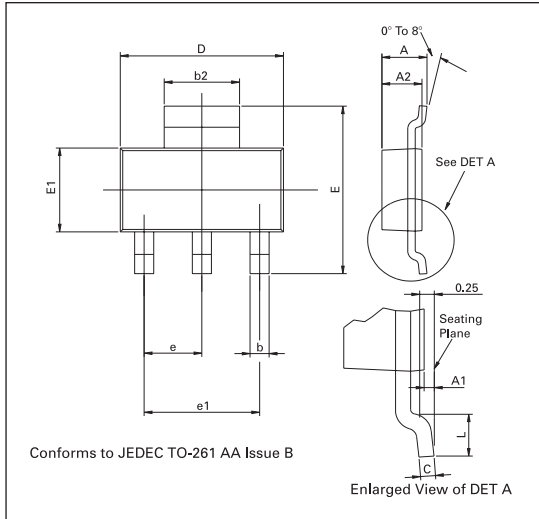


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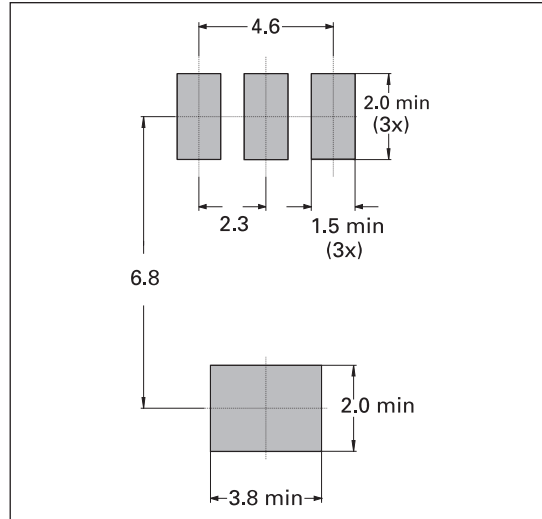


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## PACKAGE OUTLINE



## PAD LAYOUT DETAILS



## PACKAGE DIMENSIONS

DIM	Millimetres		Inches		DIM	Millimetres		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.0355	-
D	6.30	6.70	0.248	0.264					

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