

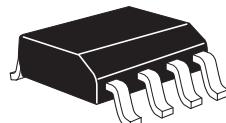
ZXMC3A17DN8

COMPLEMENTARY 30V ENHANCEMENT MODE MOSFET

SUMMARY

N-Channel : $V_{(BR)DSS} = 30V$: $R_{DS(on)} = 0.050\Omega$; $I_D = 5.4A$

P-Channel : $V_{(BR)DSS} = -30V$: $R_{DS(on)} = 0.070\Omega$; $I_D = -4.4A$



SO8

DESCRIPTION

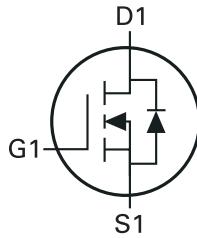
This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

FEATURES

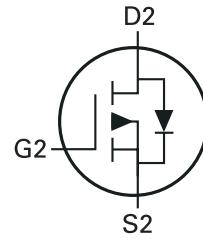
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

APPLICATIONS

- Motor drive
- LCD backlighting



Q1 = N-channel

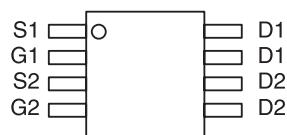


Q2 = P-channel

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMC3A17DN8TA	7"	12mm	500 units
ZXMC3A17DN8TC	13"	12mm	2500 units

PINOUT



Top View

DEVICE MARKING

- ZXMC
3A17

ZXMC3A17DN8

ADVANCE INFORMATION

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	N-channel	P-channel	UNIT
Drain-Source Voltage	V _{DSS}	30	-30	V
Gate-Source Voltage	V _{GS}	±20	±20	V
Continuous Drain Current (V _{GS} = 10V; T _A =25°C) ^{(b)(d)} (V _{GS} = 10V; T _A =70°C) ^{(b)(d)} (V _{GS} = 10V; T _A =25°C) ^{(a)(d)}	I _D	5.4	-4.4	A
		4.3	-3.6	
		4.1	-3.4	
Pulsed Drain Current ^(c)	I _{DM}	23	-20	A
Continuous Source Current (Body Diode) ^(b)	I _S	2.6	-2.5	A
Pulsed Source Current (Body Diode) ^(c)	I _{SM}	23	-20	A
Power Dissipation at T _A =25°C ^{(a) (d)}	P _D	1.25		W
Linear Derating Factor		10		mW/°C
Power Dissipation at T _A =25°C ^{(a) (e)}	P _D	1.8		W
Linear Derating Factor		14		mW/°C
Power Dissipation at T _A =25°C ^{(b) (d)}	P _D	2.1		W
Linear Derating Factor		17		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) (d)}	R _{θJA}	100	°C/W
Junction to Ambient ^{(a) (e)}	R _{θJA}	70	°C/W
Junction to Ambient ^{(b) (d)}	R _{θJA}	60	°C/W

NOTES:

- (a) For a dual device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- (b) For a dual device surface mounted on FR4 PCB measured at t ≤ 10 sec.
- (c) Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02, pulse width = 300 μs - pulse width limited by maximum junction temperature.
- (d) For a dual device with one active die.
- (e) For dual device with two active die running at equal power.

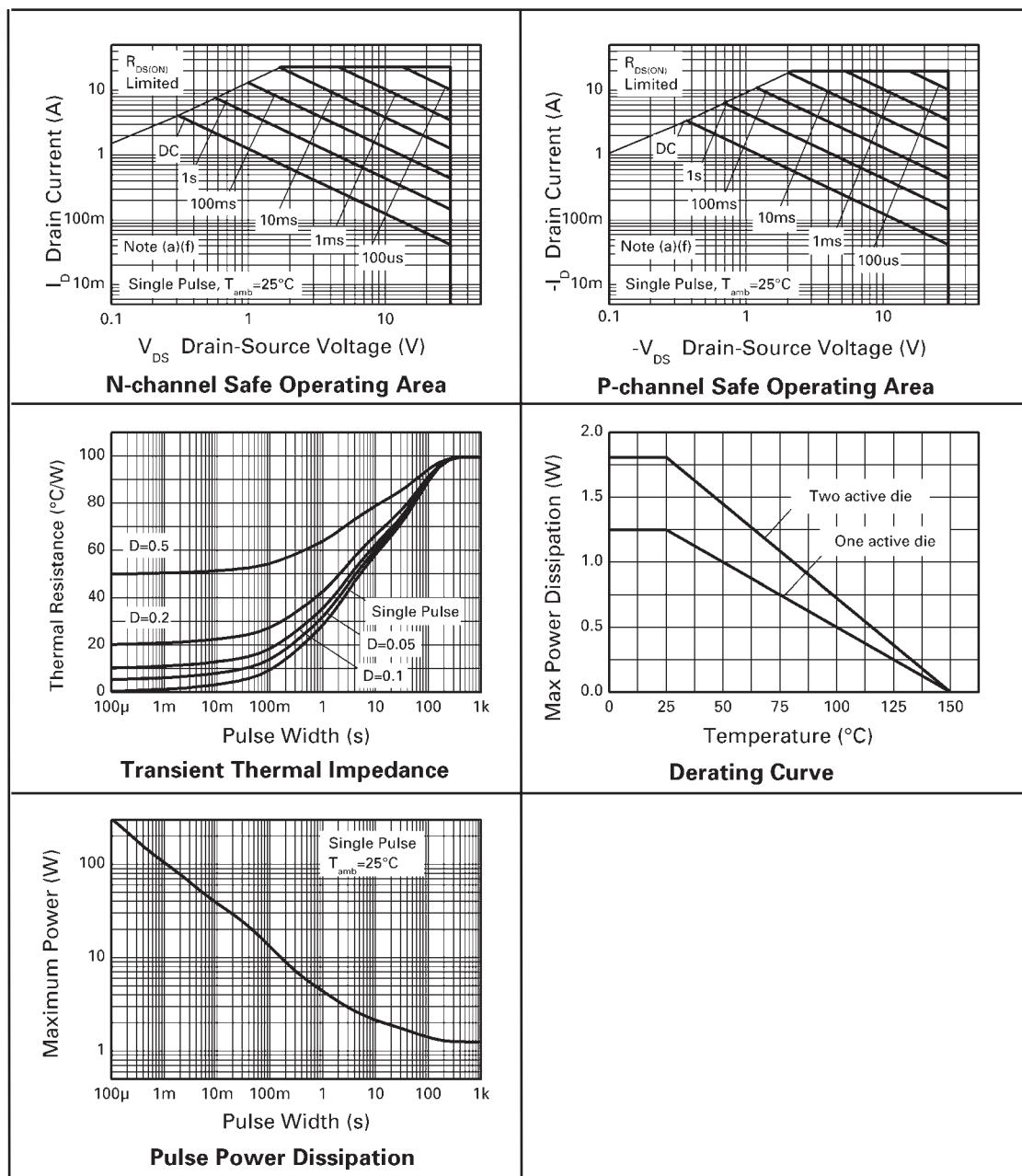


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ADVANCE INFORMATION

CHARACTERISTICS



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ADVANCE INFORMATION

N-CHANNEL

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}			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	$V_{GS(\text{th})}$	1.0			V	$I_D = 250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(\text{on})}$			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	
Output Capacitance	C_{oss}		104		pF	
Reverse Transfer Capacitance	C_{rss}		58.5		pF	
SWITCHING ^{(2) (3)}						
Turn-On-Delay Time	$t_{d(\text{on})}$		2.9		ns	
Rise Time	t_r		6.4		ns	$V_{DD}= 15\text{V}, I_D=3.5\text{A}$
Turn-Off Delay Time	$t_{d(\text{off})}$		16		ns	$R_G \geq 6.0\Omega,$ $V_{GS} = 10\text{V}$
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		12.2		nC	
Gate-Source Charge	Q_{gs}		1.7		nC	$V_{DS}= 15\text{V}, V_{GS}= 10\text{V}$
Gate-Drain Charge	Q_{gd}		2.4		nC	$I_D= 3.5\text{A}$
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	$T_j=25^\circ\text{C}, I_F= 3.5\text{A},$
Reverse Recovery Charge ⁽³⁾	Q_{rr}		14.1		nC	$dI/dt=100\text{A}/\mu\text{s}$

(1) Measured under pulsed conditions. Pulse width $\leq 300\text{ms}$; 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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ADVANCE INFORMATION

P-CHANNEL

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu A, V_{GS}=0V$
Zero Gate Voltage Drain Current	I_{DSS}			-1.0	μA	$V_{DS} = -30V, V_{GS}=0V$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20V, V_{DS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.0			V	$I_D = -250\mu A, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			0.070 0.110	Ω	$V_{GS} = -10V, I_D = -3.2A$ $V_{GS} = -4.5V, I_D = -2.5A$
Forward Transconductance ^{(1) (3)}	g_{fs}		6.4		S	$V_{DS} = -15V, I_D = -3.2A$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{iss}		630		pF	$V_{DS} = -15V, V_{GS}=0V$ $f = 1MHz$
Output Capacitance	C_{oss}		113		pF	
Reverse Transfer Capacitance	C_{rss}		78		pF	
SWITCHING ^{(2) (3)}						
Turn-On-Delay Time	$t_{d(on)}$		1.7		ns	$V_{DD} = -15V, I_D = -1A$ $R_G \geq 6.0\Omega$, $V_{GS} = -10V$
Rise Time	t_r		2.9		ns	
Turn-Off Delay Time	$t_{d(off)}$		29.2		ns	
Fall Time	t_f		8.7		ns	
Gate Charge	Q_g		8.3		nC	$V_{DS} = -15V, V_{GS} = -5V$ $I_D = -3.2A$
Total Gate Charge	Q_g		15.8		nC	$V_{DS} = -15V, V_{GS} = -10V$ $I_D = -3.2A$
Gate-Source Charge	Q_{gs}		1.8		nC	
Gate Drain Charge	Q_{gd}		2.8		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}		-0.85	-0.95	V	$T_j = 25^\circ C, I_S = -2.5A$, $V_{GS}=0V$
Reverse Recovery Time ⁽³⁾	t_{rr}		19.5		ns	$T_j = 25^\circ C, I_S = -1.7A$, $di/dt = 100A/\mu s$
Reverse Recovery Charge ⁽³⁾	Q_{rr}		16.3		nC	

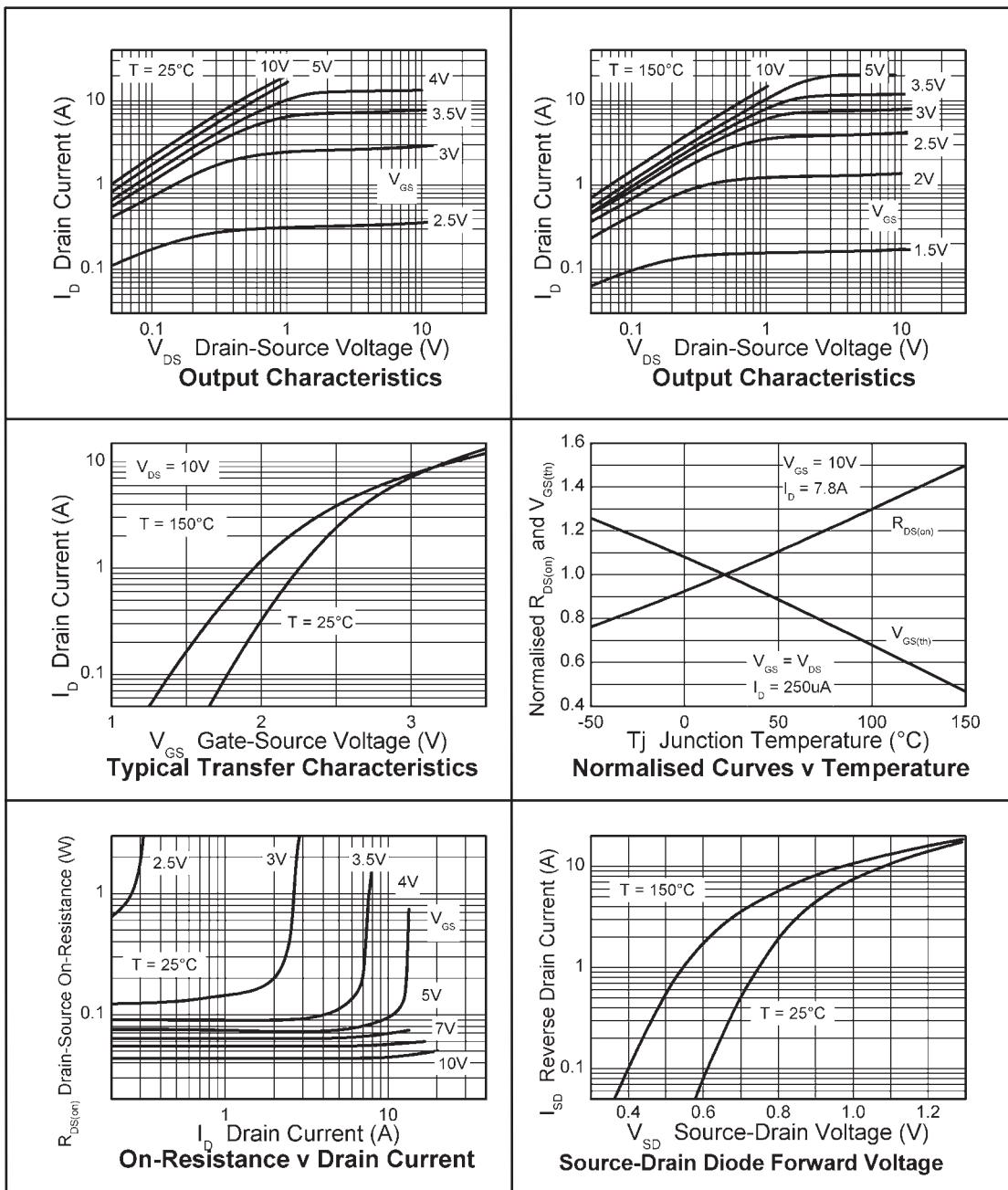
NOTES:

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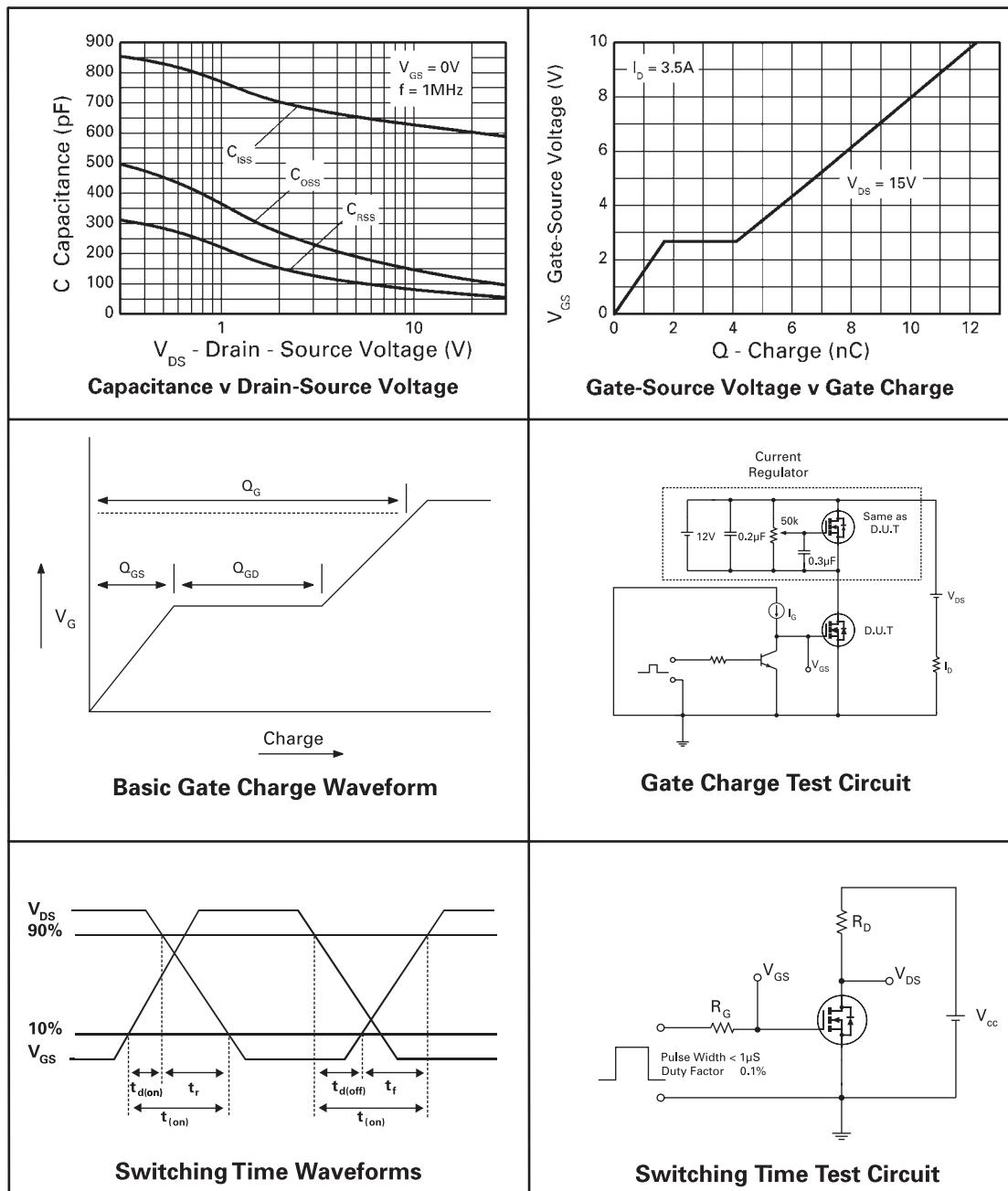
N-CHANNEL TYPICAL CHARACTERISTICS



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N-CHANNEL TYPICAL CHARACTERISTICS

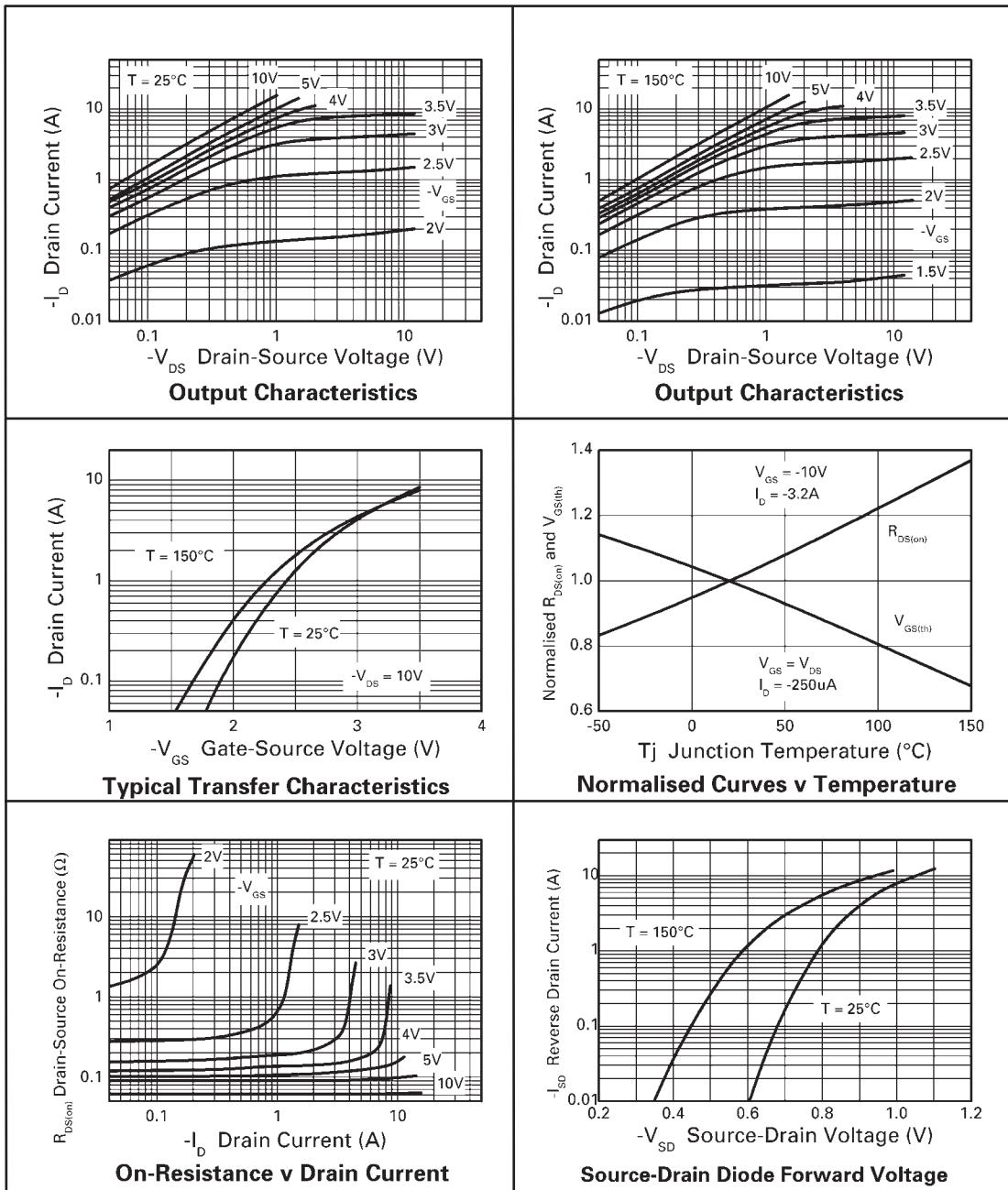


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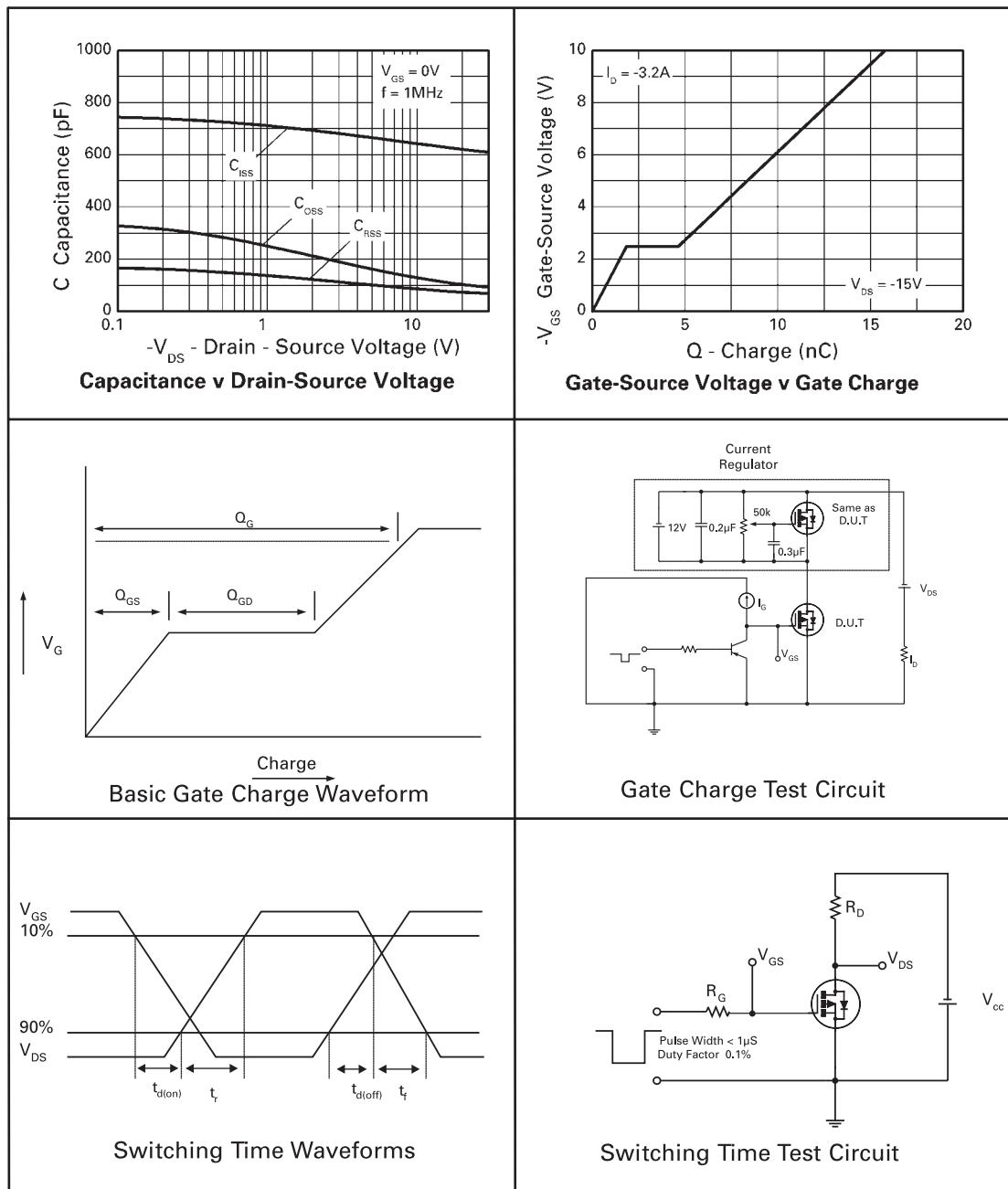
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P-CHANNEL TYPICAL CHARACTERISTICS



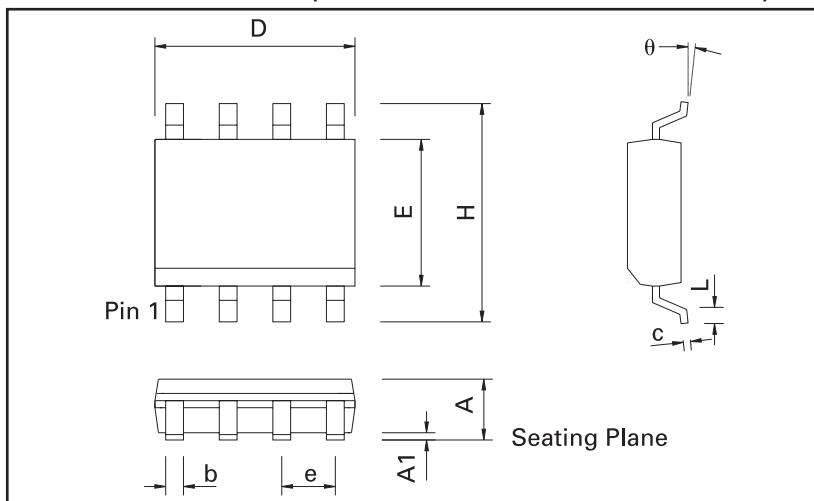
ADVANCE INFORMATION

P-CHANNEL TYPICAL CHARACTERISTICS



ZXMC3A17DN8

SO8 PACKAGE OUTLINE (Conforms to JEDEC MS-012AA Iss. C)



Controlling dimensions are in millimeters. Approximate conversions are given in inches

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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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streifeldstraße 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 europe.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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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.