

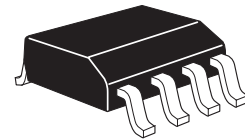
ZXMHC10A07T8

COMPLEMENTARY 100V ENHANCEMENT MODE MOSFET H-BRIDGE

SUMMARY

N-Channel = $V_{(BR)DSS} = 100V$; $R_{DS(on)} = 0.7\Omega$; $I_D = 1.4A$

P-Channel = $V_{(BR)DSS} = -100V$; $R_{DS(on)} = 1.0\Omega$; $I_D = -1.3A$



SM8

DESCRIPTION

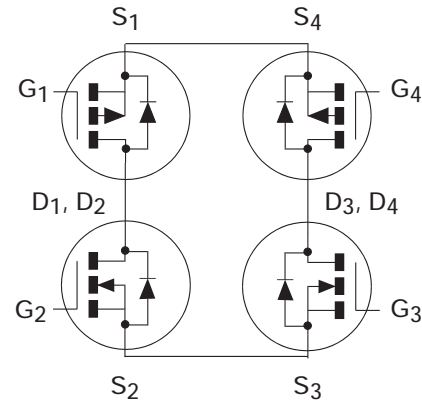
This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

FEATURES

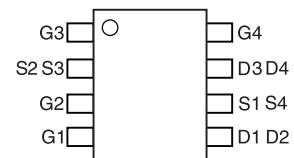
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Single SM-8 Surface Mount Package

APPLICATIONS

- Single Phase DC Fan Motor Drive



PINOUT



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMHC10A07T8TA	7"	12mm	1000 units
ZXMHC10A07T8TC	13"	12mm	4000 units

DEVICE MARKING

- ZXMH
C10A7

ZXMHC10A07T8

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	N-channel	P-channel	UNIT
Drain-Source Voltage	V_{DSS}	100	-100	V
Gate-Source Voltage	V_{GS}	± 20	± 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	1.1	-0.9	A
		0.9	-0.8	A
		1.0	-0.8	A
Pulsed Drain Current (c)	I_{DM}	5.2	-4.5	A
Continuous Source Current (Body Diode) (b)	I_S	2.3	-2.2	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	5.2	-4.5	A
Power Dissipation at $T_A=25^\circ C$ (a) (d)	P_D	1.3		W
Linear Derating Factor		10.4		mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) (d)	P_D	1.3		W
Linear Derating Factor		10.4		mW/ $^\circ C$
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +150		$^\circ C$

THERMAL RESISTANCE

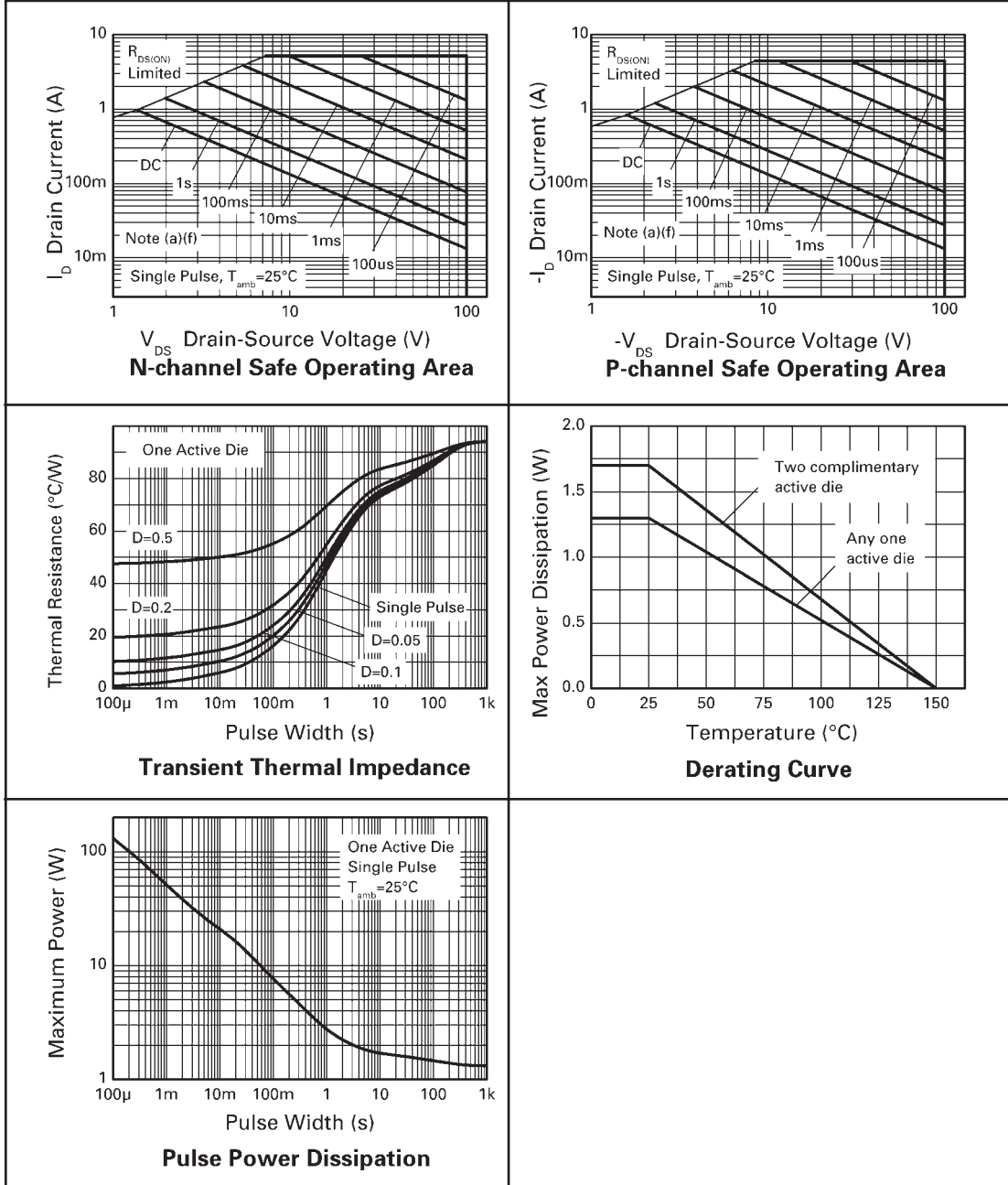
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a) (d)	$R_{\theta JA}$	94.5	$^\circ C/W$
Junction to Ambient (b) (d)	$R_{\theta JA}$	73.3	$^\circ C/W$

NOTES

- (a) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions, with the heat sink split into two equal areas one for each drain connection.
- (b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
- (c) Repetitive rating on 50mm x 50mm x 1.6mm FR4 PCB, $D=0.02$, pulse width = 300 μs - pulse width limited by maximum junction temperature. Refer to transient thermal impedance graph.
- (d) For device with one active die.

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TYPICAL CHARACTERISTICS



ZXMHC10A07T8

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	$V_{(BR)DSS}$	100			V	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	2.0		4.0	V	$I_D = 250\mu\text{A}, V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			0.7 0.9	Ω	$V_{GS} = 10\text{V}, I_D = 1.5\text{A}$ $V_{GS} = 6\text{V}, I_D = 1.0\text{A}$
Forward Transconductance ^{(1) (3)}	g_{fs}		1.6		S	$V_{DS} = 15\text{V}, I_D = 1.0\text{A}$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{iss}		138		pF	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}		12		pF	
Reverse Transfer Capacitance	C_{rss}		6		pF	
SWITCHING ^{(2) (3)}						
Turn-On-Delay Time	$t_{d(on)}$		1.8		ns	$V_{DD} = 50\text{V}, I_D = 1.0\text{A}$ $R_G \cong 6.0\Omega, V_{GS} = 10\text{V}$
Rise Time	t_r		1.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		4.1		ns	
Fall Time	t_f		2.1		ns	
Total Gate Charge	Q_g		2.9		nC	$V_{DS} = 50\text{V}, V_{GS} = 10\text{V}$ $I_D = 1.0\text{A}$
Gate-Source Charge	Q_{gs}		0.7		nC	
Gate Drain Charge	Q_{gd}		1.0		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}			0.95	V	$T_J = 25^{\circ}\text{C}, I_S = 1.5\text{A}, V_{GS} = 0\text{V}$
Reverse Recovery Time ⁽³⁾	t_{rr}		27		ns	$T_J = 25^{\circ}\text{C}, I_S = 1.8\text{A},$
Reverse Recovery Charge ⁽³⁾	Q_{rr}		12		nC	$di/dt = 100\text{A}/\mu\text{s}$

NOTES

- (1) Measured under pulsed conditions. Pulse 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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P-Channel

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

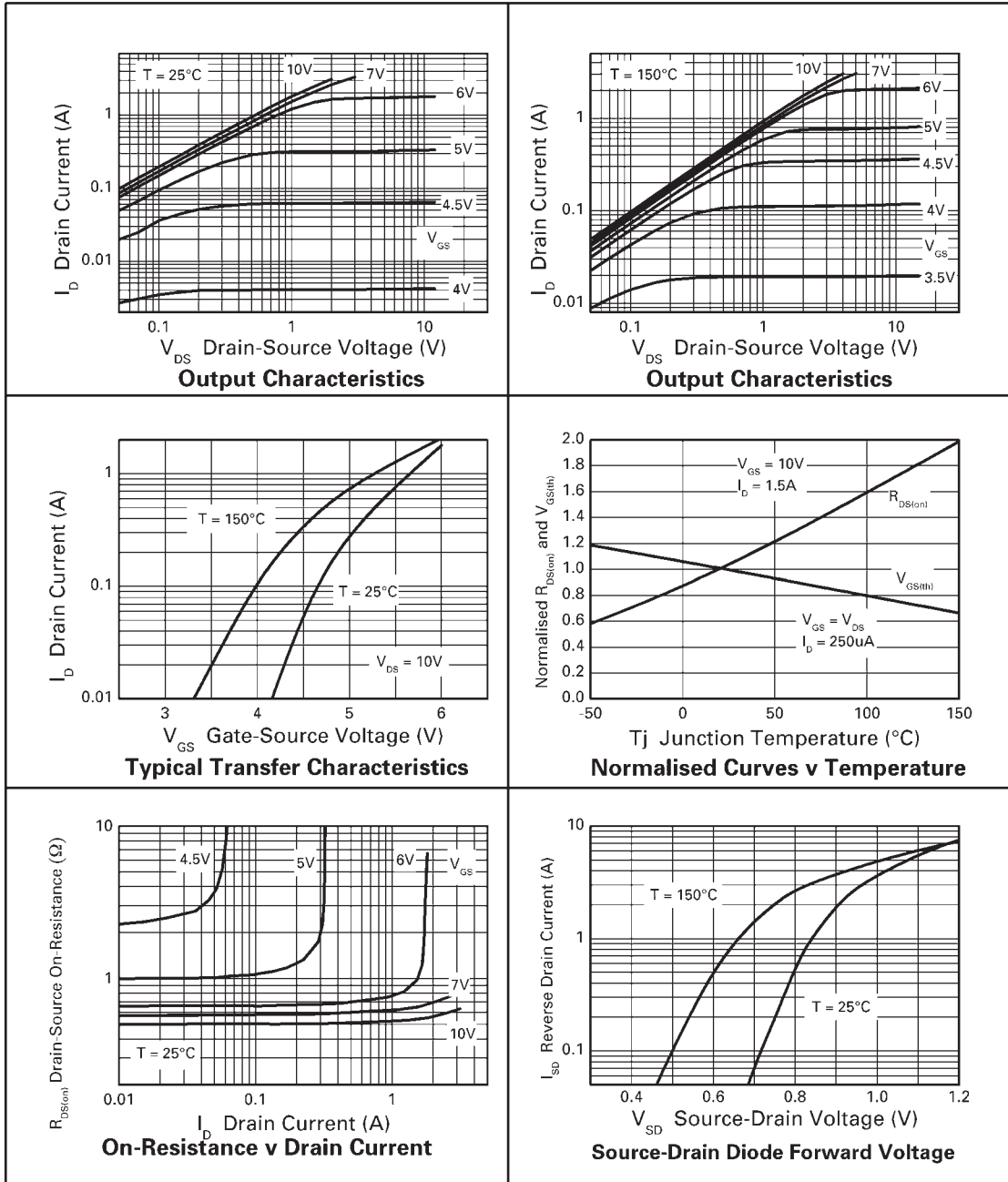
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-100			V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1.0	μA	$V_{DS} = -100\text{V}$, $V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-2.0		-4.0	V	$I_D = -250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			1 1.45	Ω	$V_{GS} = -10\text{V}$, $I_D = -0.6\text{A}$ $V_{GS} = -6\text{V}$, $I_D = -0.5\text{A}$
Forward Transconductance ^{(1) (3)}	g_{fs}		1.2		S	$V_{DS} = -15\text{V}$, $I_D = -0.6\text{A}$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{iss}		141		pF	$V_{DS} = -50\text{V}$, $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}		13.1		pF	
Reverse Transfer Capacitance	C_{rss}		10.8		pF	
SWITCHING ^{(2) (3)}						
Turn-On-Delay Time	$t_{d(on)}$		1.6		ns	$V_{DD} = -50\text{V}$, $I_D = -1\text{A}$ $R_G \equiv 6.0\Omega$, $V_{GS} = -10\text{V}$
Rise Time	t_r		2.1		ns	
Turn-Off Delay Time	$t_{d(off)}$		5.9		ns	
Fall Time	t_f		3.3		ns	
Gate Charge	Q_g		1.6		nC	
Total Gate Charge	Q_g		3.5		nC	$V_{DS} = -50\text{V}$, $V_{GS} = -10\text{V}$ $I_D = -0.6\text{A}$
Gate-Source Charge	Q_{gs}		0.6		nC	
Gate Drain Charge	Q_{gd}		1.6		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}		-0.85	-0.95	V	$T_J = 25^{\circ}\text{C}$, $I_S = -0.75\text{A}$, $V_{GS} = 0\text{V}$
Reverse Recovery Time ⁽³⁾	t_{rr}		29		ns	$T_J = 25^{\circ}\text{C}$, $I_S = -0.9\text{A}$,
Reverse Recovery Charge ⁽³⁾	Q_{rr}		31		nC	$di/dt = 100\text{A}/\mu\text{s}$

NOTES

- (1) Measured under pulsed conditions. Pulse 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.

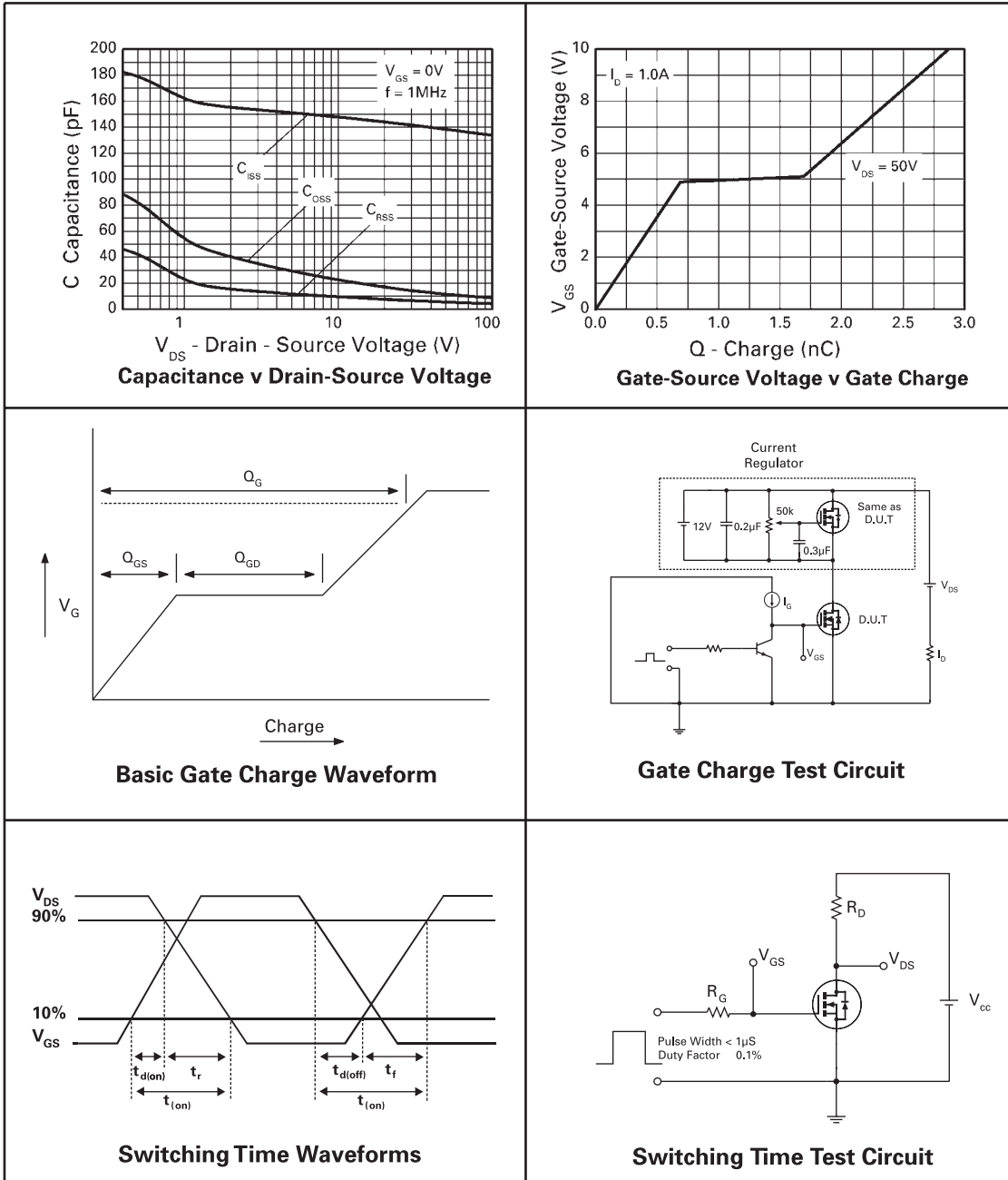
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N-CHANNEL TYPICAL CHARACTERISTICS



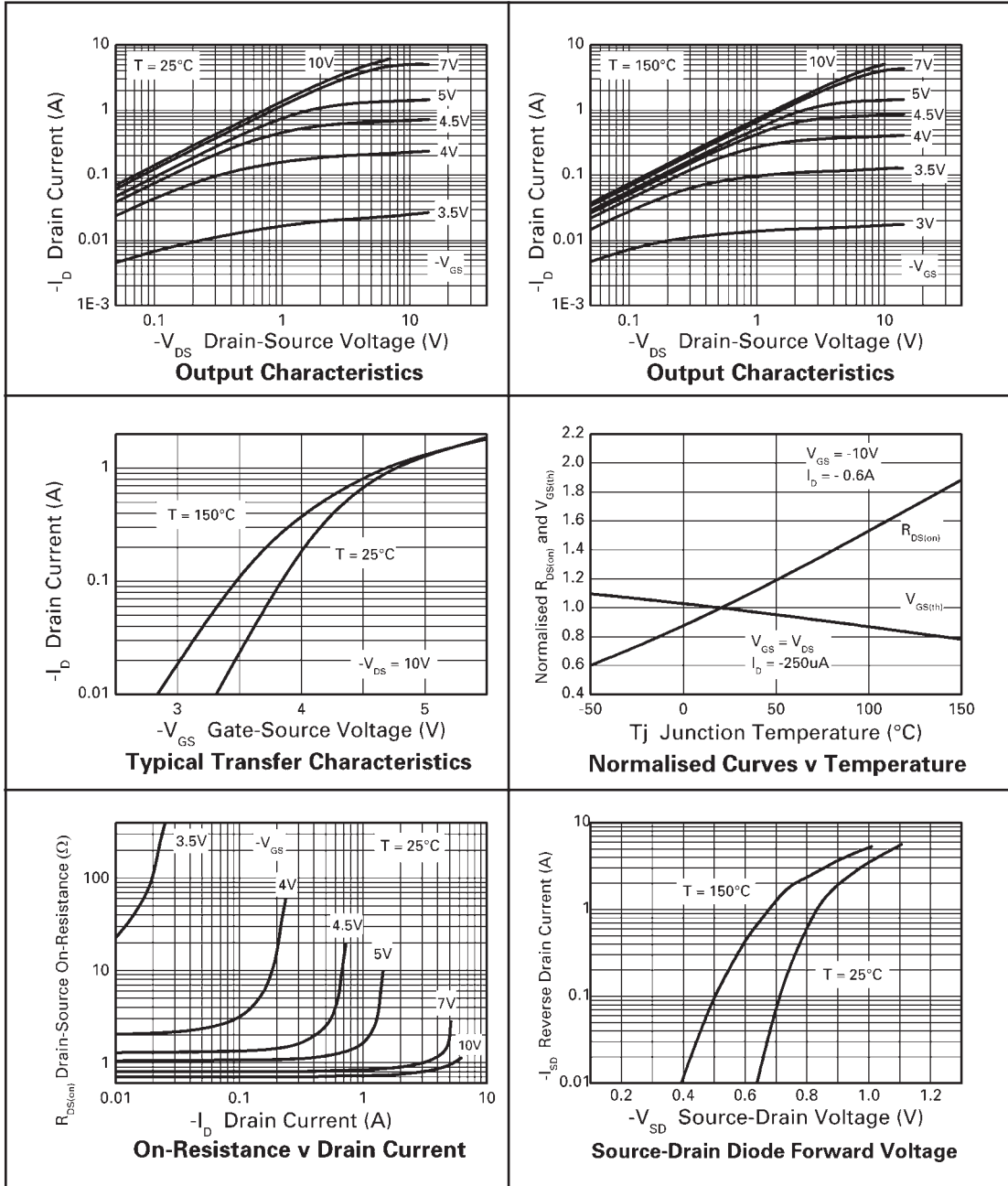
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N-CHANNEL TYPICAL CHARACTERISTICS



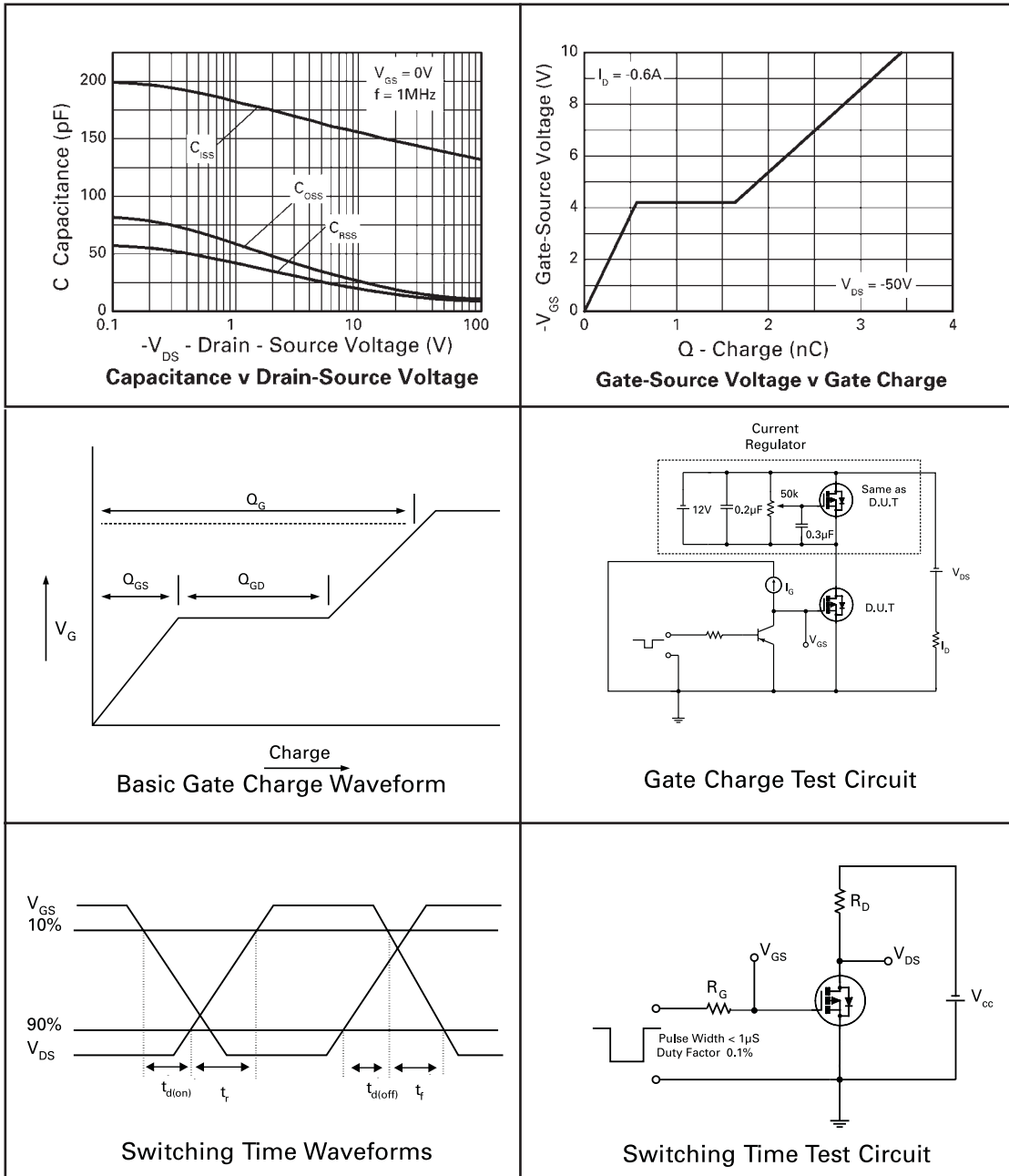
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P-CHANNEL TYPICAL CHARACTERISTICS



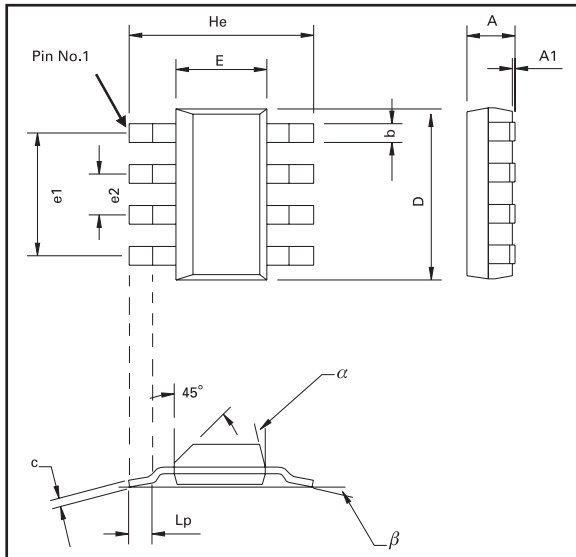
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P-CHANNEL TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE



PACKAGE DIMENSIONS

DIM	Millimetres			Inches		
	MIN	TYP	MAX	MIN	TYP	MAX
A	-	-	1.7	-	-	0.067
A1	0.02	-	0.1	0.0008	-	0.004
b	-	0.7	-	-	0.028	-
c	0.24	-	0.32	0.009	-	0.013
D	6.3	-	6.7	0.248	-	0.264
E	3.3	-	3.7	0.130	-	0.145
e1	-	4.59	-	-	0.180	-
e2	-	1.53	-	-	0.060	-
He	6.7	-	7.3	0.264	-	0.287
Lp	0.9	-	-	0.035	-	-
α	-	-	15°	-	-	15°
β	-	10°	-	-	10°	-

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

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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 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
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.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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Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru