

ZXMHC10A07T8

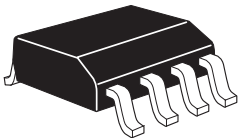
COMPLEMENTARY 100V ENHANCEMENT MODE MOSFET H-BRIDGE

SUMMARY

N-Channel = $V_{(BR)DSS} = 100V$; $R_{DS(on)} = 0.7\Omega$; $I_D = 1.4A$
P-Channel = $V_{(BR)DSS} = -100V$; $R_{DS(on)} = 1.0\Omega$; $I_D = -1.3A$

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.



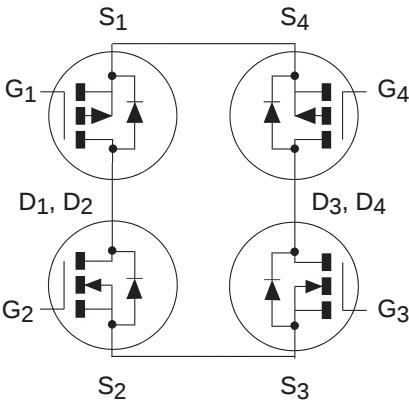
SM8

FEATURES

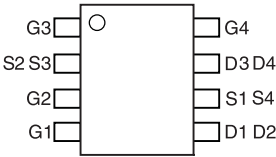
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Single SM-8 Surface Mount Package

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

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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	N-channel	P-channel	UNIT
Drain-Source Voltage	V_{DS}	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/°C
Power Dissipation at $T_A=25^\circ C$ (b) (d)	P_D	1.3		W
Linear Derating Factor		10.4		mW/°C
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +150		°C

THERMAL RESISTANCE

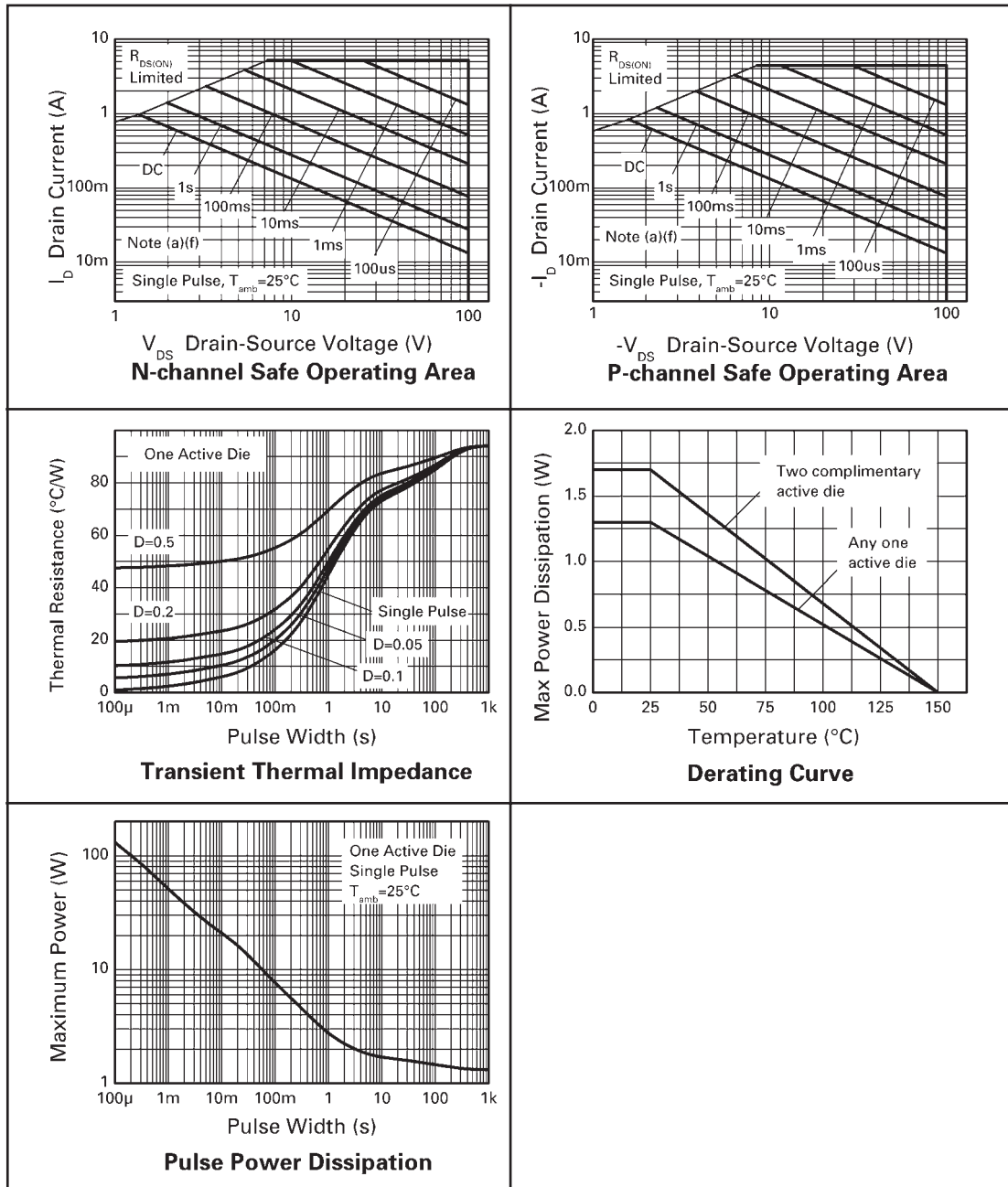
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a) (d)	$R_{\theta JA}$	94.5	°C/W
Junction to Ambient (b) (d)	$R_{\theta JA}$	73.3	°C/W

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



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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 = 250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =100V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	2.0		4.0	V	I _D = 250μA, V _{DS} =V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			0.7	Ω	V _{GS} = 10V, I _D = 1.5A
				0.9	Ω	V _{GS} = 6V, I _D = 1.0A
Forward Transconductance ^{(1) (3)}	g _{fs}		1.6		S	V _{DS} = 15V, I _D = 1.0A
DYNAMIC ⁽³⁾						
Input Capacitance	C _{iss}		138		pF	V _{DS} = 60V, V _{GS} =0V f=1MHz
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} = 50V, I _D = 1.0A R _G ≡ 6.0Ω, V _{GS} = 10V
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} = 50V, V _{GS} = 10V I _D = 1.0A
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°C, I _S = 1.5A, V _{GS} =0V
Reverse Recovery Time ⁽³⁾	t _{rr}		27		ns	T _j =25°C, I _S = 1.8A,
Reverse Recovery Charge ⁽³⁾	Q _{rr}		12		nC	di/dt=100A/μs

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)

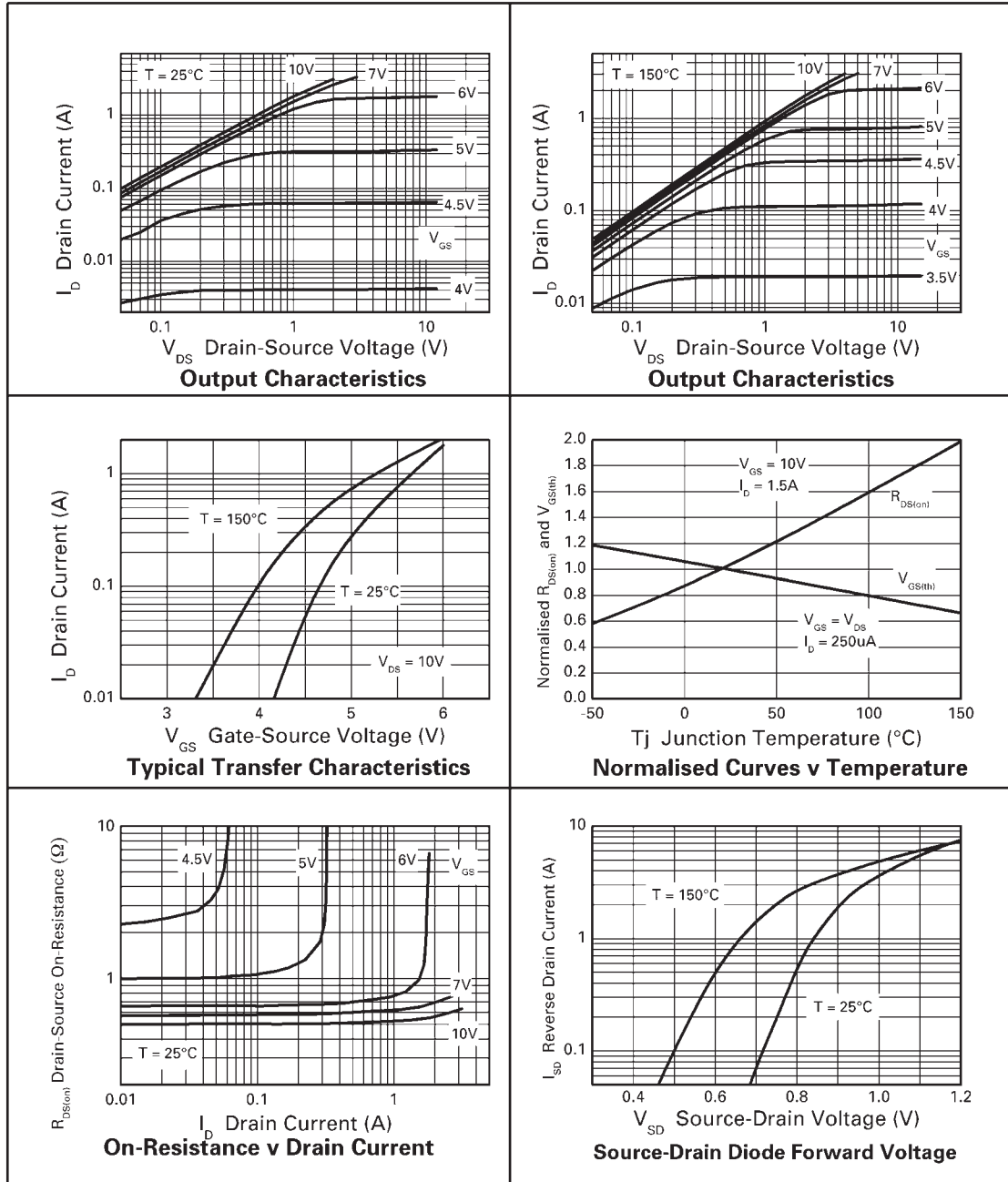
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	-100			V	I _D = -250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			-1.0	μA	V _{DS} = -100V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	-2.0		-4.0	V	I _D = -250μA, V _{DS} =V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			1 1.45	Ω Ω	V _{GS} = -10V, I _D = - 0.6A V _{GS} = -6V, I _D = -0.5A
Forward Transconductance ⁽¹⁾ ⁽³⁾	g _{fs}		1.2		S	V _{DS} = -15V, I _D = -0.6A
DYNAMIC ⁽³⁾						
Input Capacitance	C _{iss}		141		pF	V _{DS} = -50V, V _{GS} =0V f=1MHz
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} = -50V, I _D = -1A R _G ≅ 6.0Ω, V _{GS} = -10V
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	V _{DS} = -50V, V _{GS} = -5V I _D = -0.6A
Total Gate Charge	Q _g		3.5		nC	V _{DS} = -50V, V _{GS} = -10V I _D = -0.6A
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°C, I _S = -0.75A, V _{GS} =0V
Reverse Recovery Time ⁽³⁾	t _{rr}		29		ns	T _j =25°C, I _S = -0.9A,
Reverse Recovery Charge ⁽³⁾	Q _{rr}		31		nC	di/dt=100A/μs

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.

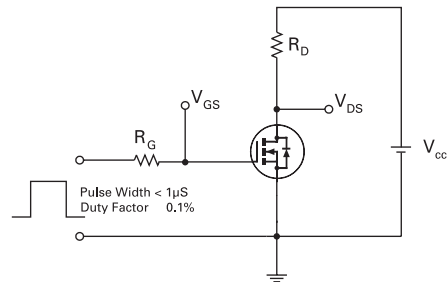
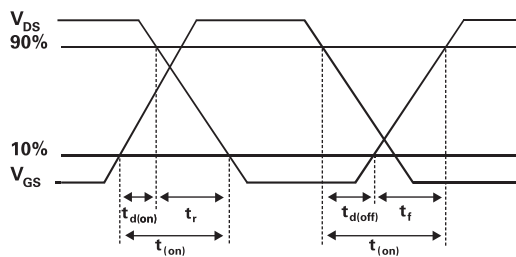
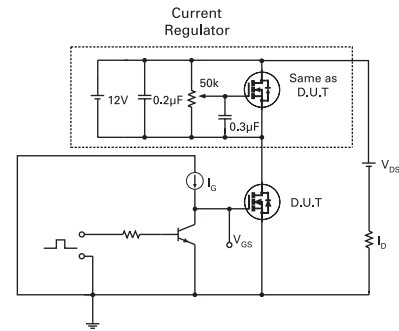
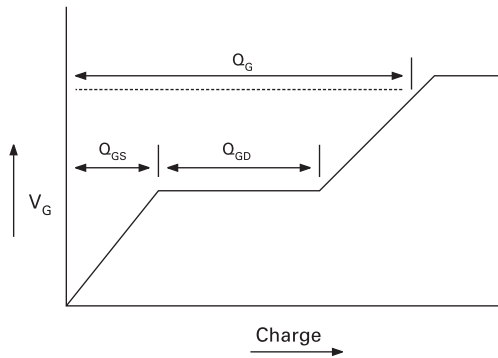
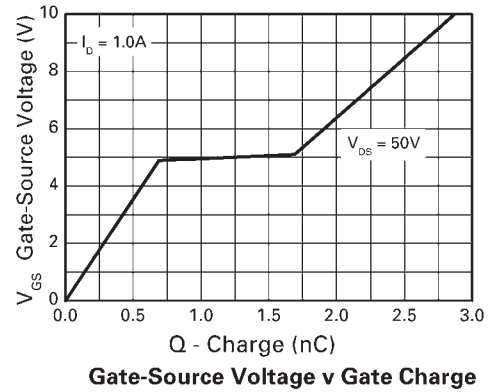
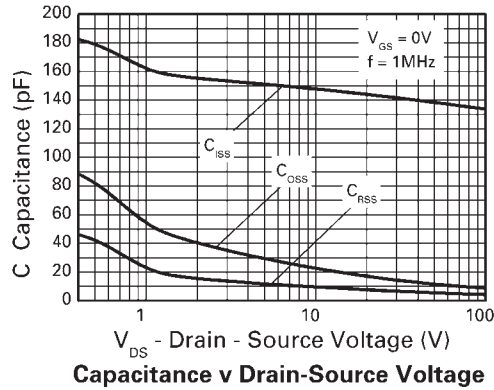
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N-CHANNEL TYPICAL CHARACTERISTICS



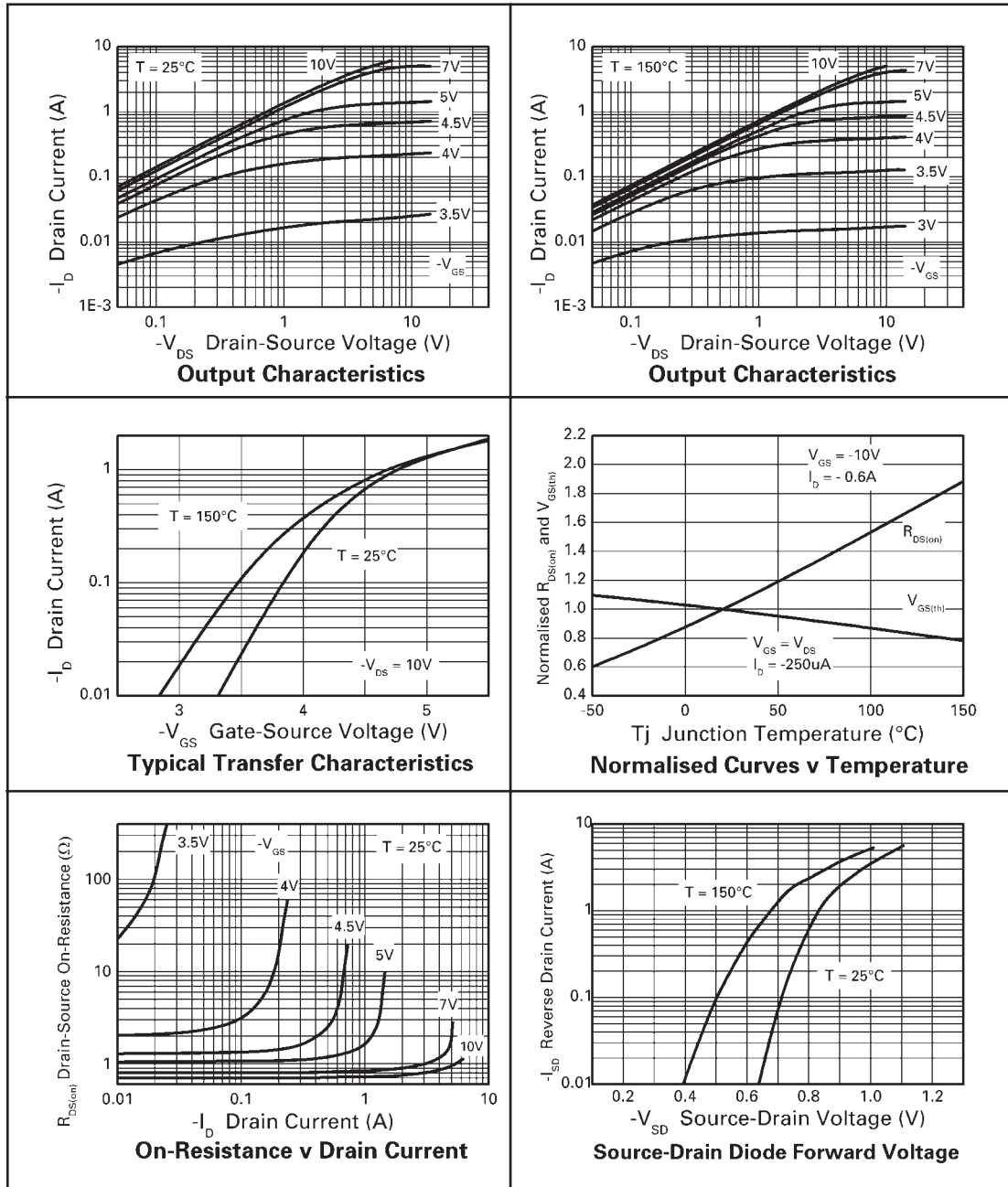
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N-CHANNEL TYPICAL CHARACTERISTICS



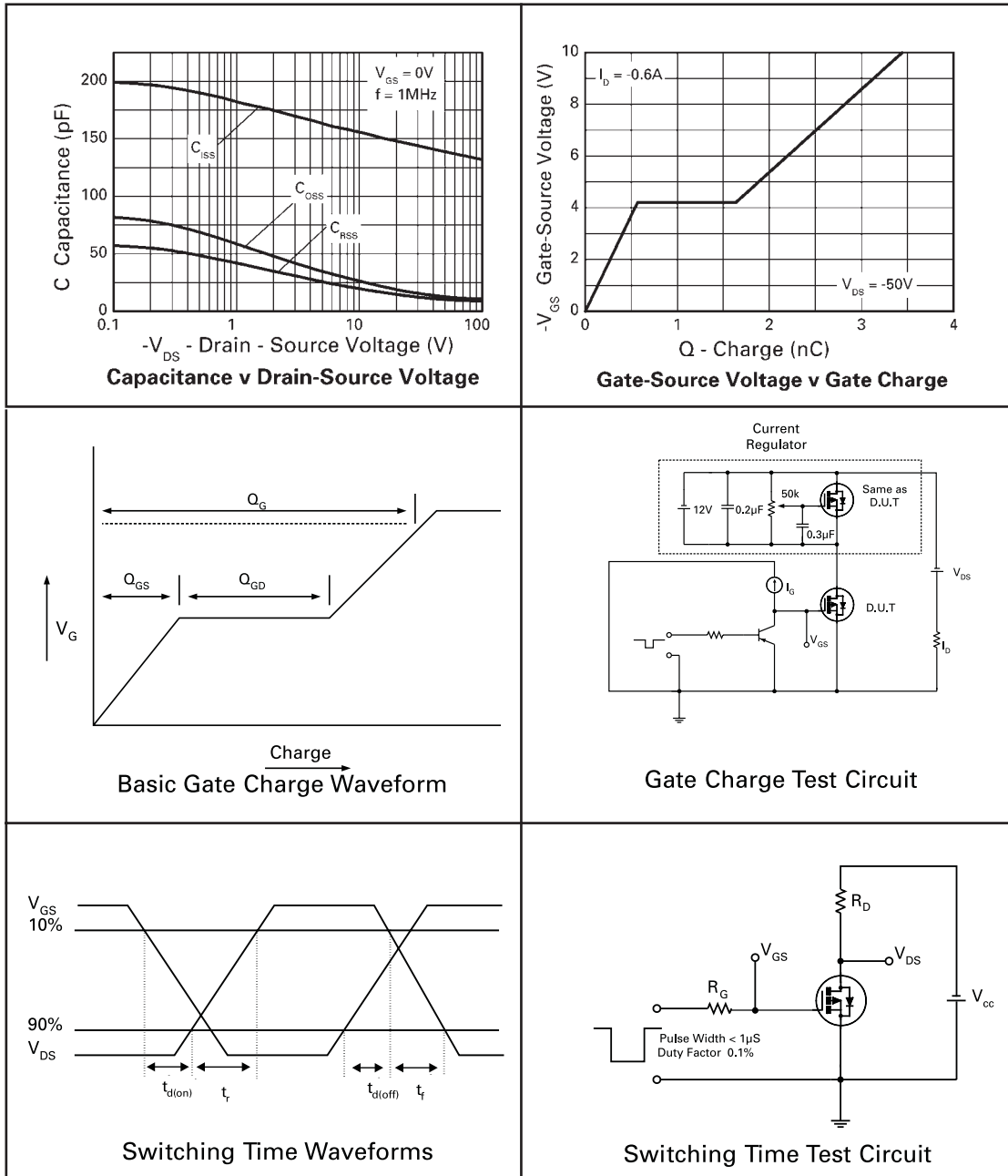
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P-CHANNEL TYPICAL CHARACTERISTICS



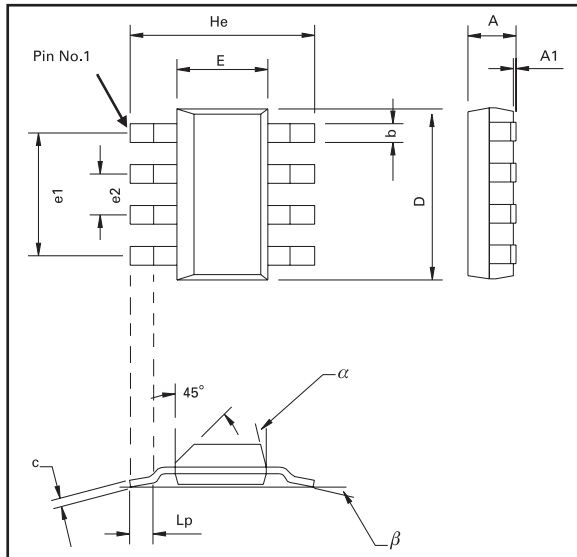
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P-CHANNEL TYPICAL CHARACTERISTICS



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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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