

ZXMC3A17DN8

COMPLEMENTARY 30V ENHANCEMENT MODE MOSFET

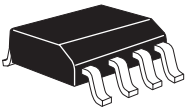
SUMMARY

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

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

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.



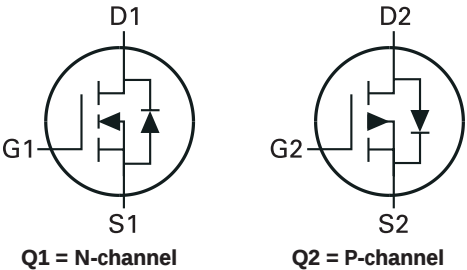
SO8

FEATURES

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

APPLICATIONS

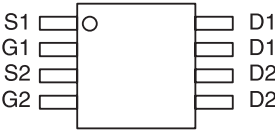
- Motor Drive
- LCD backlighting



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

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 ($V_{GS} = 10V$; $T_A = 25^\circ C$) ^{(b)(d)} ($V_{GS} = 10V$; $T_A = 70^\circ C$) ^{(b)(d)} ($V_{GS} = 10V$; $T_A = 25^\circ C$) ^{(a)(d)}	I_D	5.4 4.3 4.1	-4.4 -3.6 -3.4	A
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 $T_A = 25^\circ C$ ^{(a) (d)} Linear Derating Factor	P_D	1.25 10		W mW/ $^\circ C$
Power Dissipation at $T_A = 25^\circ C$ ^{(a) (e)} Linear Derating Factor	P_D	1.8 14		W mW/ $^\circ C$
Power Dissipation at $T_A = 25^\circ C$ ^{(b) (d)} Linear Derating Factor	P_D	2.1 17		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 ^{(a) (d)}	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient ^{(a) (e)}	$R_{\theta JA}$	70	$^\circ C/W$
Junction to Ambient ^{(b) (d)}	$R_{\theta JA}$	60	$^\circ C/W$

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 $t \leq 10$ sec.

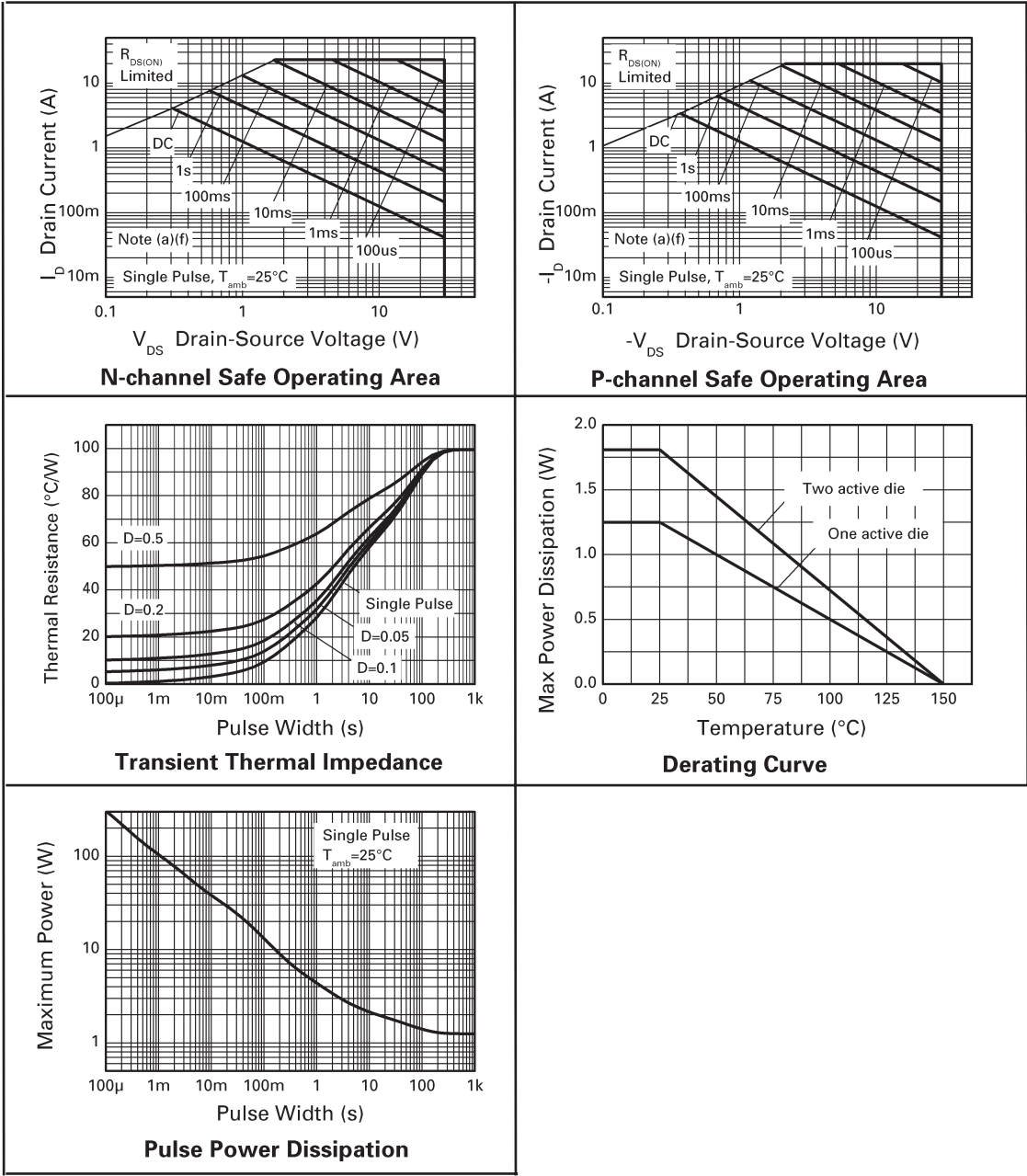
(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.02$, pulse width = 300 μs - pulse width limited by maximum junction temperature.

(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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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}	30			V	I _D = 250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			0.5	μA	V _{DS} =30V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	1.0			V	I _D = 250μA, V _{DS} =V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			0.050	Ω	V _{GS} = 10V, I _D = 7.8A
				0.065	Ω	V _{GS} = 4.5V, I _D = 6.8A
Forward Transconductance ^{(1) (3)}	g _{fs}		10		S	V _{DS} = 10V, I _D = 7.8A
DYNAMIC ⁽³⁾						
Input Capacitance	C _{iss}		600		pF	V _{DS} = 25V, V _{GS} =0V f=1MHz
Output Capacitance	C _{oss}		104		pF	
Reverse Transfer Capacitance	C _{rss}		58.5		pF	
SWITCHING ^{(2) (3)}						
Turn-On-Delay Time	t _{d(on)}		2.9		ns	V _{DD} = 15V, I _D =3.5A R _G ≅ 6.0Ω, V _{GS} = 10V
Rise Time	t _r		6.4		ns	
Turn-Off Delay Time	t _{d(off)}		16		ns	
Fall Time	t _f		11.2		ns	
Gate Charge	Q _g		6.9		nC	V _{DS} = 15V, V _{GS} = 5V I _D = 3.5A
Total Gate Charge	Q _g		12.2		nC	V _{DS} = 15V, V _{GS} = 10V I _D = 3.5A
Gate-Source Charge	Q _{gs}		1.7		nC	
Gate-Drain Charge	Q _{gd}		2.4		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V _{SD}		0.85	0.95	V	T _j =25°C, I _S = 3.2A, V _{GS} =0V
Reverse Recovery Time ⁽³⁾	t _{rr}		18.8		ns	T _j =25°C, I _F = 3.5A, di/dt=100A/μs
Reverse Recovery Charge ⁽³⁾	Q _{rr}		14.1		nC	

(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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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}	-30			V	I _D = -250μA, 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} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	-1.0			V	I _D = -250μA, V _{DS} =V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			0.070 0.110	Ω 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 ≅ 6.0Ω, 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°C, I _S = -2.5A, V _{GS} =0V
Reverse Recovery Time ⁽³⁾	t _{rr}		19.5		ns	T _j =25°C, I _S = -1.7A, di/dt=100A/μs
Reverse Recovery Charge ⁽³⁾	Q _{rr}		16.3		nC	

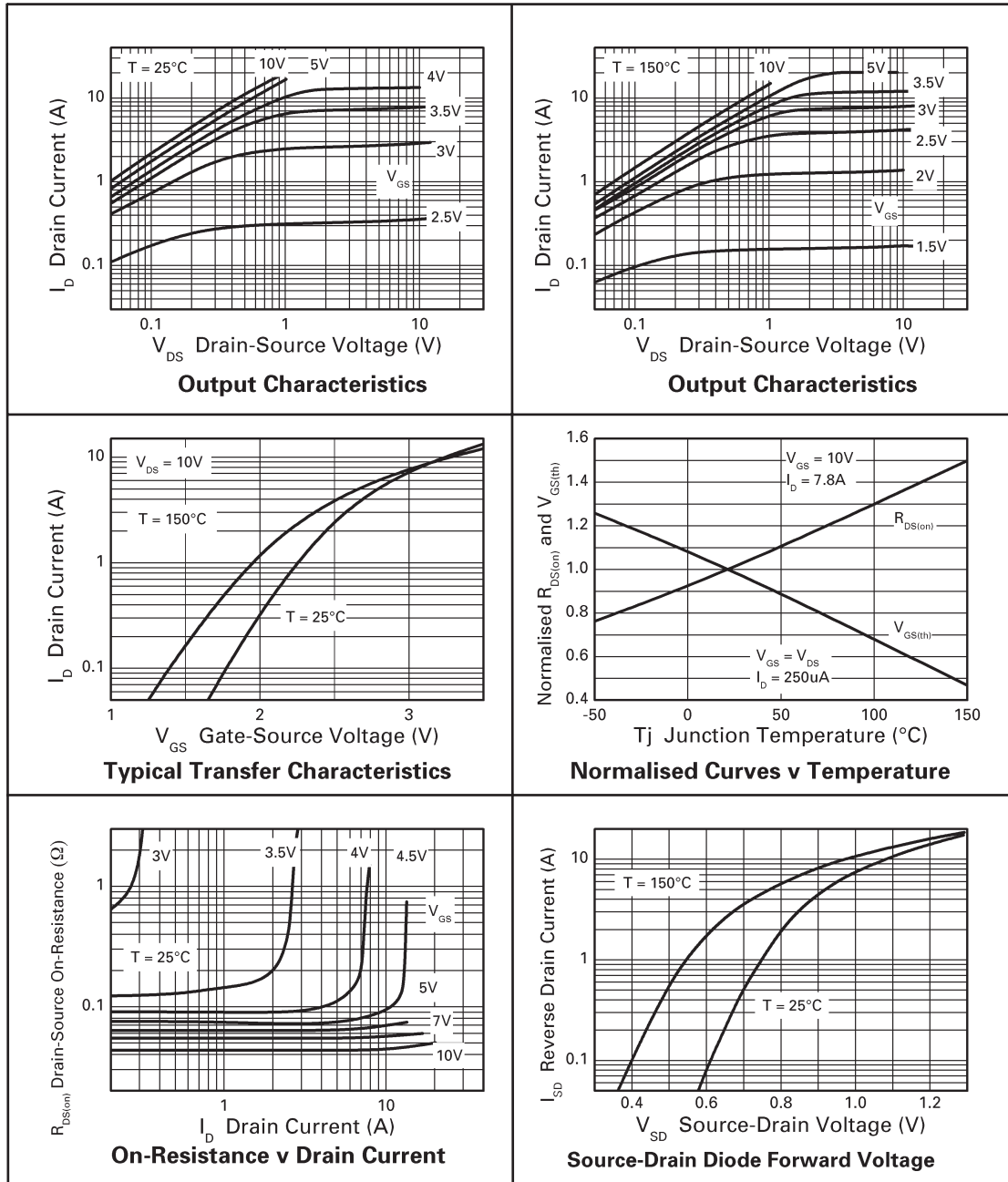
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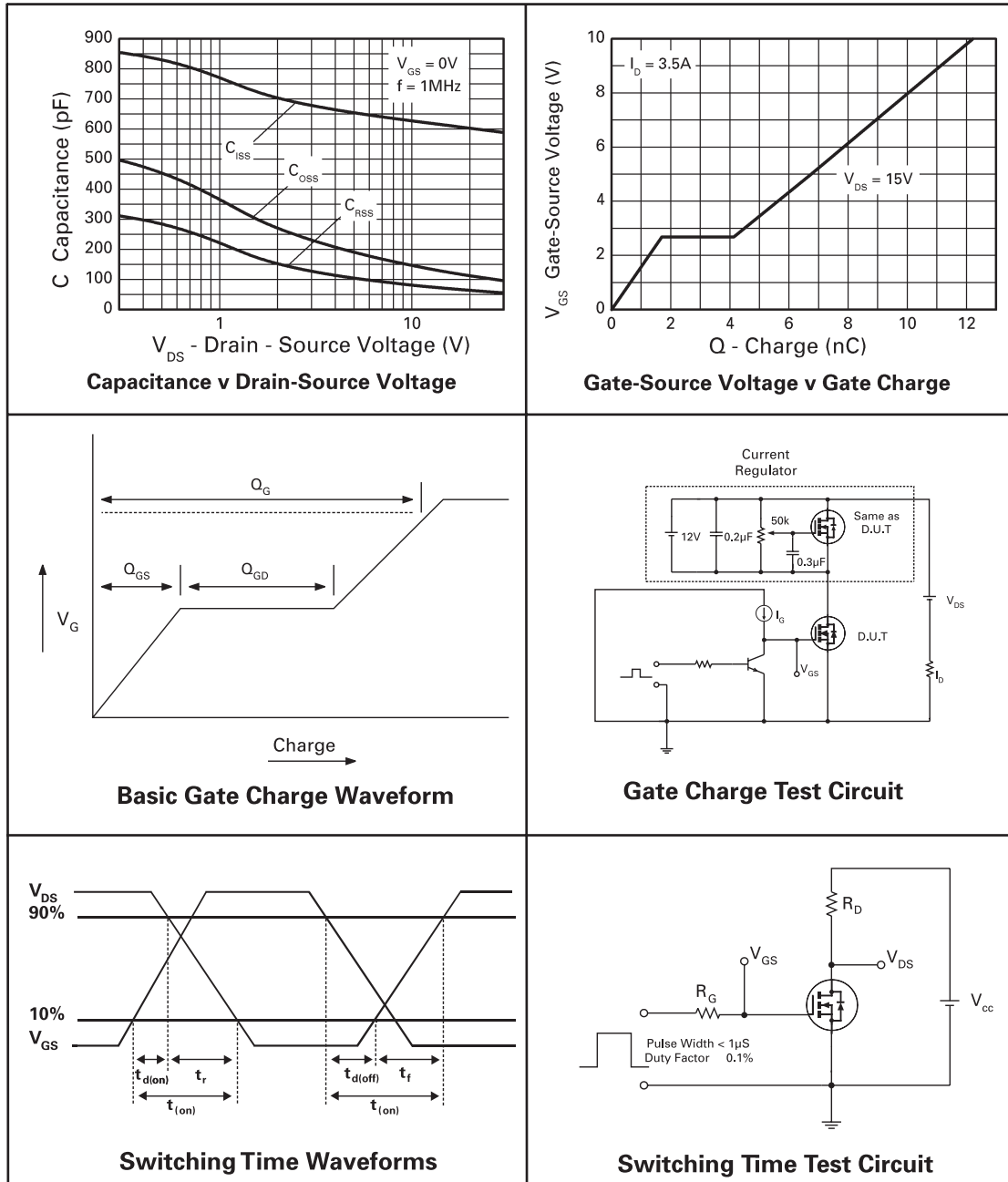
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N-CHANNEL TYPICAL CHARACTERISTICS



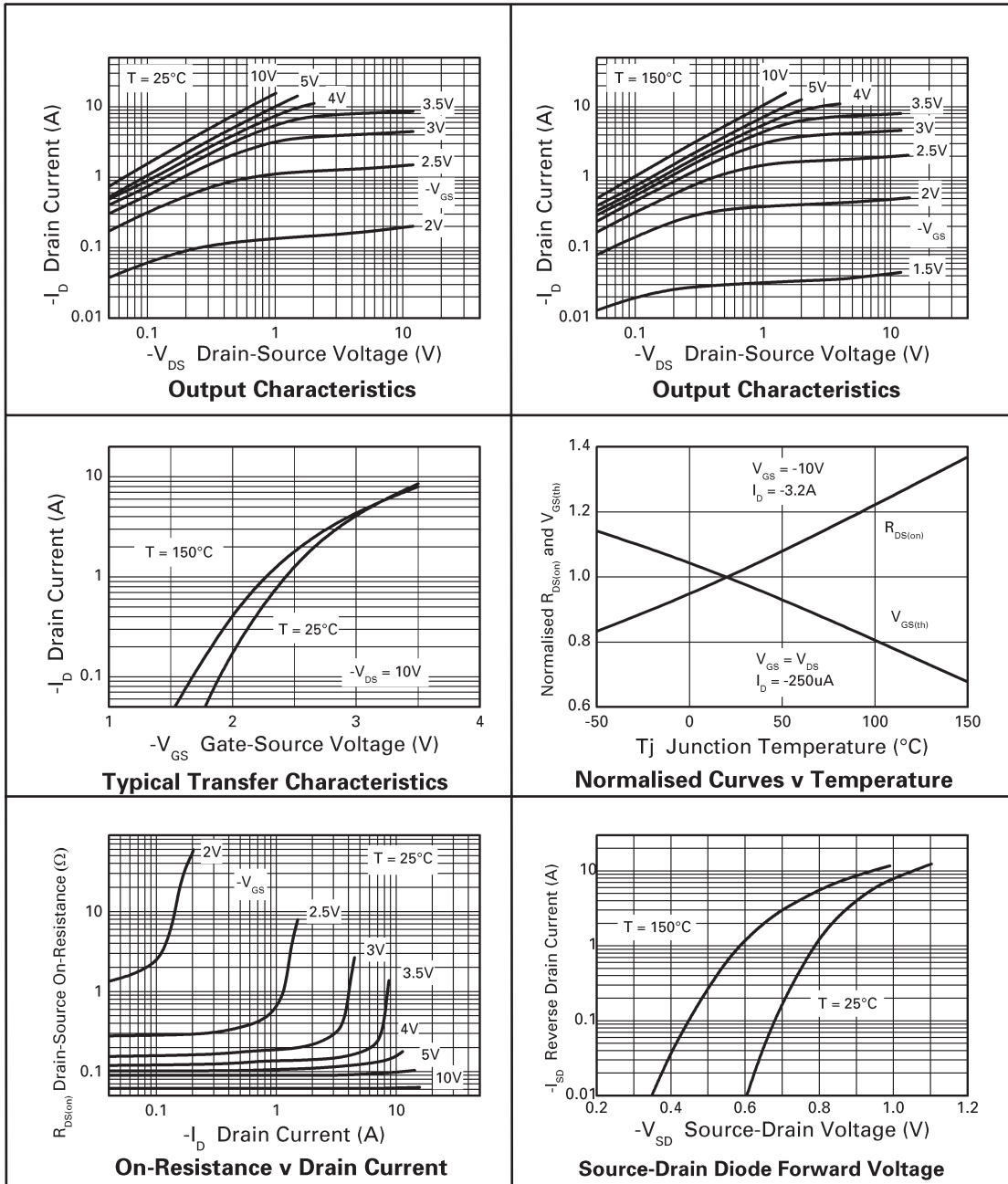
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N-CHANNEL TYPICAL CHARACTERISTICS



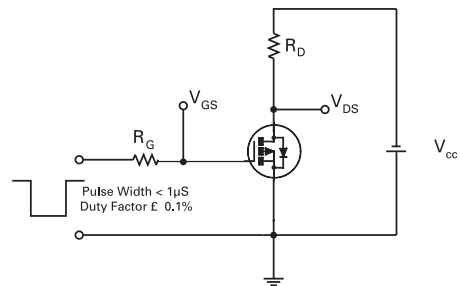
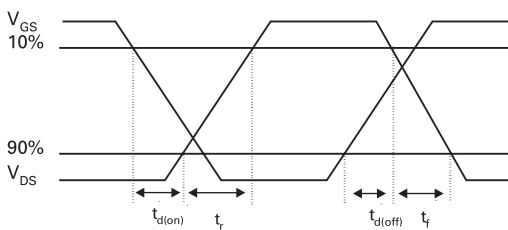
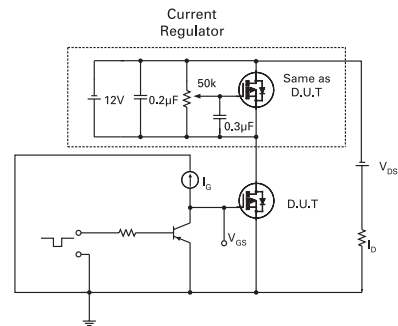
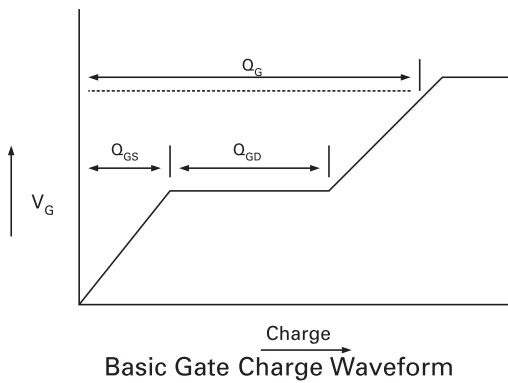
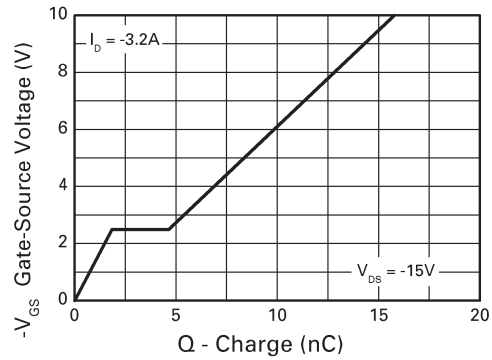
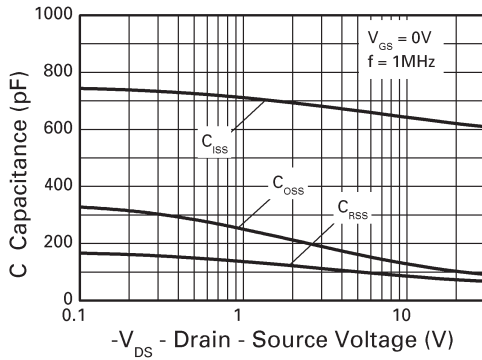
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P-CHANNEL TYPICAL CHARACTERISTICS



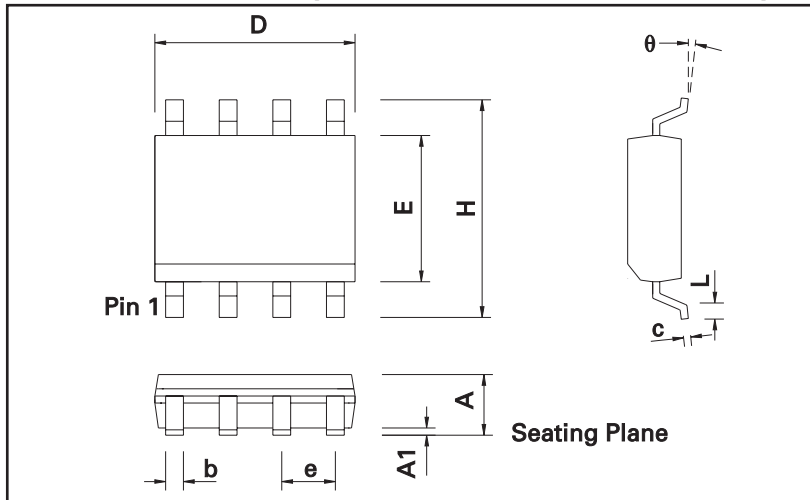
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P-CHANNEL TYPICAL CHARACTERISTICS



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



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

PACKAGE DIMENSIONS

DIM	Millimetres		Inches		DIM	Millimetres		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.35	1.75	0.053	0.069	e	1.27BSC		0.050BSC	
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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