

ZXMN6A11Z

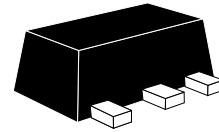
60V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 60V$; $R_{DS(ON)} = 0.140\Omega$ $I_D = 3.2A$

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.



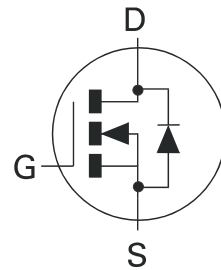
SOT89

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT89 package

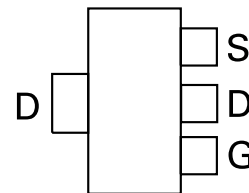
APPLICATIONS

- DC-DC Converters
- Power Management Functions
- Relay and solenoid driving
- Motor control



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN6A11ZTA	7"	12mm	1000 units



Top View

DEVICE MARKING

- 11N6

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Gate Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ $V_{GS}=10\text{V}; T_A=25^{\circ}\text{C}$ (b) @ $V_{GS}=10\text{V}; T_A=70^{\circ}\text{C}$ (b) @ $V_{GS}=10\text{V}; T_A=25^{\circ}\text{C}$ (a)	I_D	3.2 2.6 2.4	A
Pulsed Drain Current (c)	I_{DM}	12.3	A
Continuous Source Current (Body Diode) (b)	I_S	5.0	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	12.3	A
Power Dissipation at $T_A=25^{\circ}\text{C}$ (a) Linear Derating Factor	P_D	1.5 12	W mW/ $^{\circ}\text{C}$
Power Dissipation at $T_A=25^{\circ}\text{C}$ (b) Linear Derating Factor	P_D	2.6 21	W mW/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}\text{C}$

THERMAL RESISTANCE

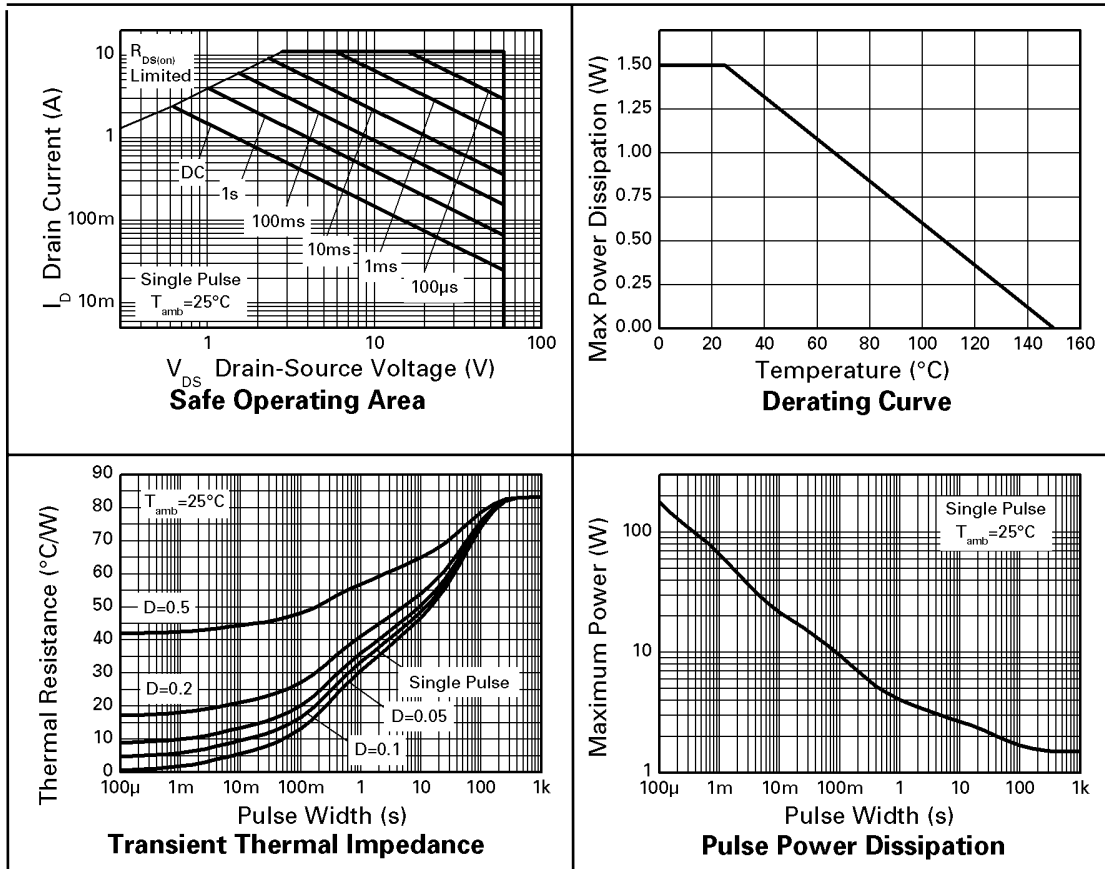
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	83.3	$^{\circ}\text{C}/\text{W}$
Junction to Ambient (b)	$R_{\theta JA}$	47.4	$^{\circ}\text{C}/\text{W}$

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, $D = 0.02$, pulse width 300 μs - pulse width limited by maximum junction temperature. Refer to transient Thermal Impedance graph

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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.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	60			V	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			1.0	μA	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$
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 (1)	$R_{DS(on)}$			0.14 0.25	Ω Ω	$V_{GS}=10\text{V}$, $I_D=4.4\text{A}$ $V_{GS}=4.5\text{V}$, $I_D=3.8\text{A}$
Forward Transconductance (1)(3)	g_{fs}		4.9		S	$V_{DS}=15\text{V}$, $I_D=2.5\text{A}$
DYNAMIC (3)						
Input Capacitance	C_{iss}		330		pF	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$
Output Capacitance	C_{oss}		35		pF	
Reverse Transfer Capacitance	C_{rss}		17		pF	
SWITCHING (2) (3)						
Turn-On Delay Time	$t_{d(on)}$		1.95		ns	$V_{DD}=30\text{V}$, $I_D=2.5\text{A}$ $R_G=6.0\Omega$, $V_{GS}=10\text{V}$
Rise Time	t_r		3.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		8.2		ns	
Fall Time	t_f		4.6		ns	
Gate Charge	Q_g		3.0		nC	$V_{DS}=15\text{V}$, $V_{GS}=5\text{V}$ $I_D=2.5\text{A}$
Total Gate Charge	Q_g		5.7		nC	$V_{DS}=15\text{V}$, $V_{GS}=10\text{V}$, $I_D=2.5\text{A}$
Gate-Source Charge	Q_{gs}		1.25		nC	
Gate-Drain Charge	Q_{gd}		0.86		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}		0.85	0.95	V	$T_J=25^{\circ}\text{C}$, $I_S=2.8\text{A}$, $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	t_{rr}		21.5		ns	$T_J=25^{\circ}\text{C}$, $I_F=2.5\text{A}$, $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	Q_{rr}		20.5		nC	

NOTES

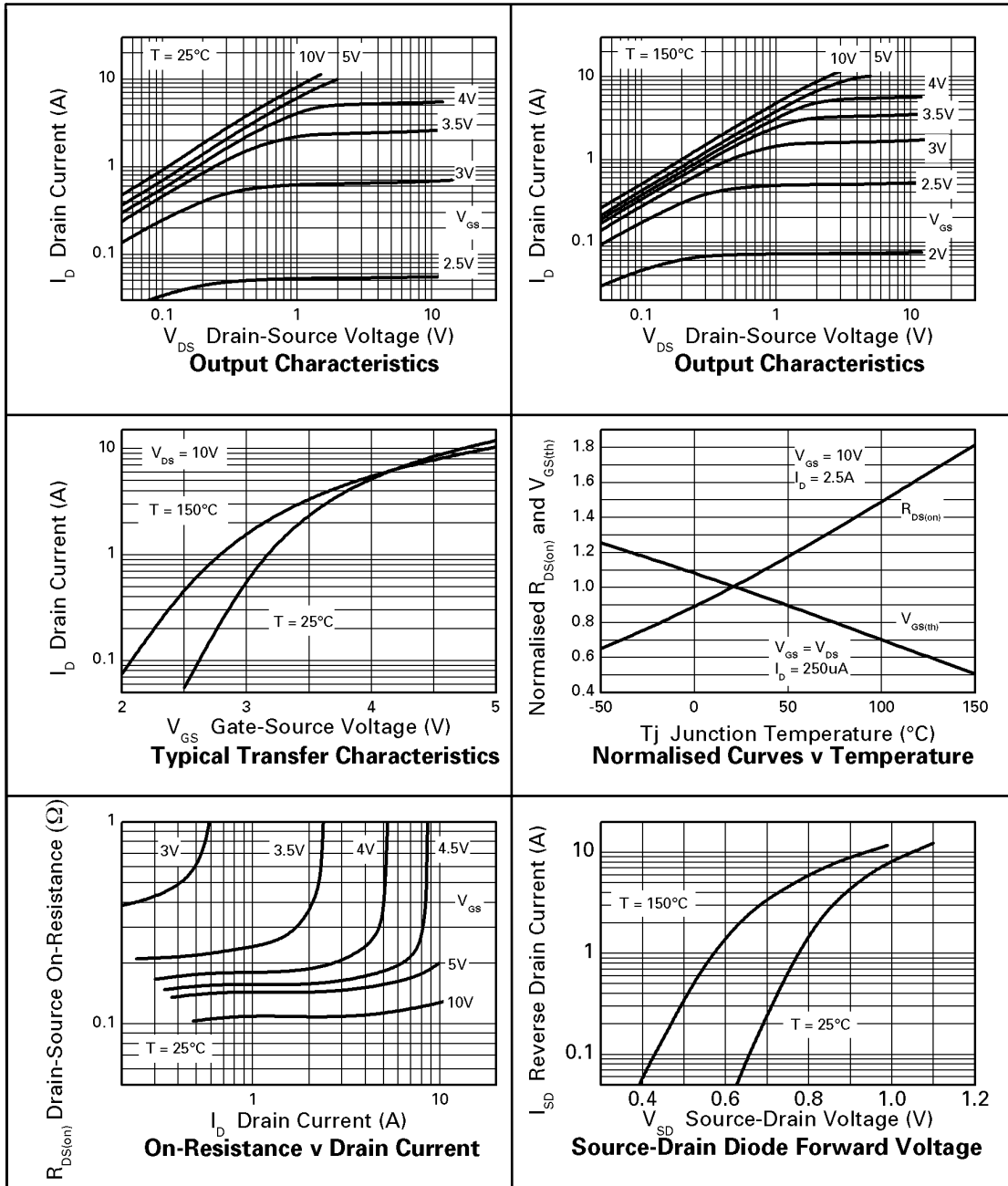
- (1) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.



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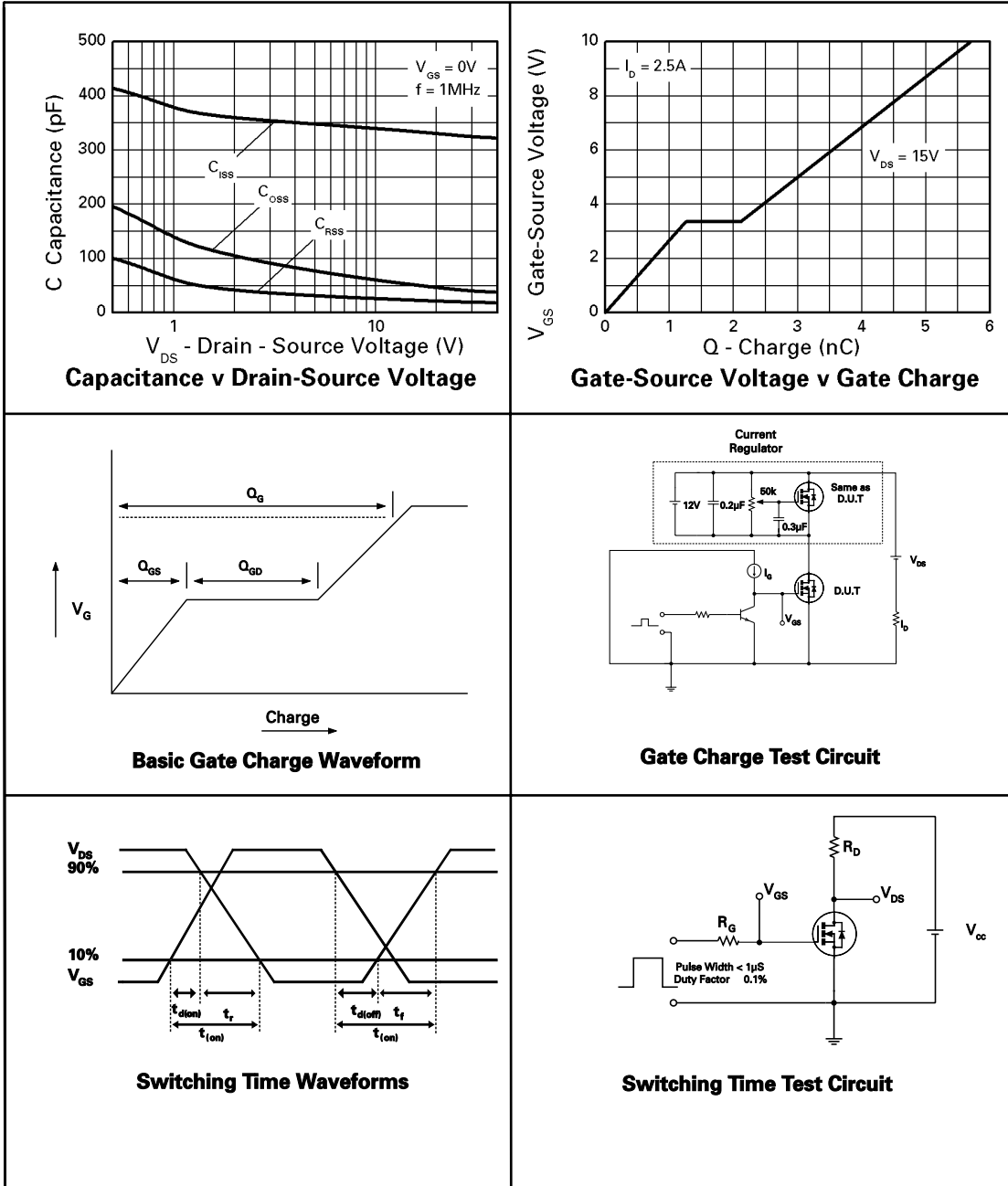
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TYPICAL CHARACTERISTICS



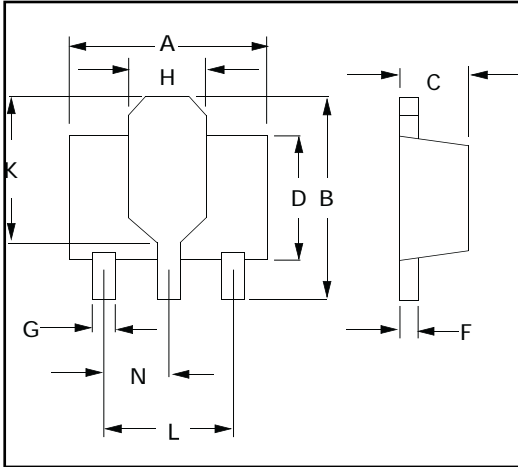
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TYPICAL CHARACTERISTICS

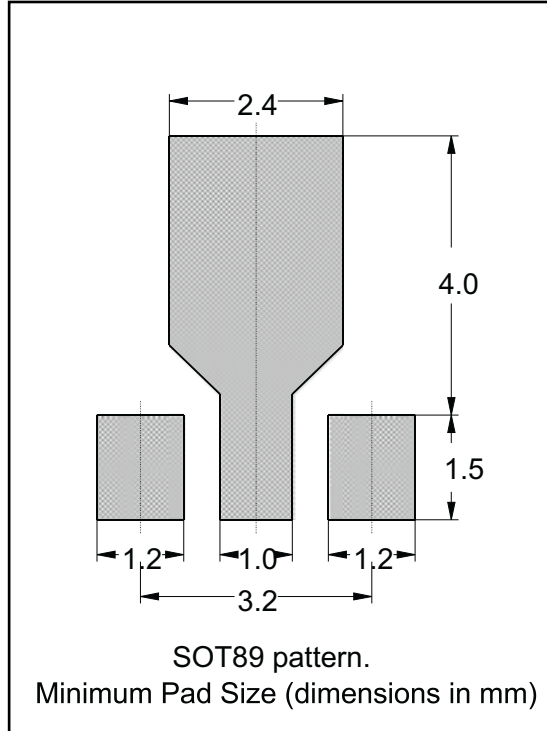


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PACKAGE DIMENSIONS



PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
B	3.75	4.25	.150	0.167
C	1.40	1.60	0.550	0.630
D	-	2.60	-	0.102
F	0.28	0.45	0.011	0.018
G	0.38	0.55	0.015	0.022
H	1.50	1.80	0.060	0.072
K	2.60	2.85	0.102	0.112
L	2.90	3.10	0.114	0.112
N	1.4	1.60	0.055	0.063

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