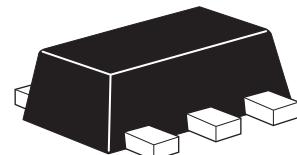


ZXMN6A07Z

60V SOT89 N-channel enhancement mode mosfet

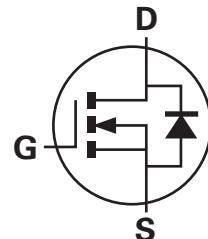
Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ (Ω)	I_D (A)
60	0.250 @ $V_{GS} = 10V$	2.5
	0.350 @ $V_{GS} = 4.5V$	2.1



Description

This new generation trench MOSFET from Zetex utilizes a unique structure combining the benefits of low on-state resistance with fast switching speed.

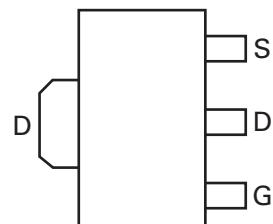


Features

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

Applications

- DC-DC converters
- Power management functions
- Relay and solenoid driving
- Motor control



Top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN6A07ZTA	7	12	1,000

Device marking

7N6

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DSS}	60	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current @ $V_{GS} = 10V$; $T_{amb} = 25^\circ C$ ^(b) @ $V_{GS} = 10V$; $T_{amb} = 70^\circ C$ ^(b) @ $V_{GS} = 10V$; $T_{amb} = 25^\circ C$ ^(a)	I_D	2.5 2.0 1.9	A
Pulsed drain current ^(c)	I_{DM}	6.8	A
Continuous source current (body diode) ^(b)	I_S	3.3	A
Pulsed source current (body diode) ^(c)	I_{SM}	6.8	A
Power dissipation at $T_{amb} = 25^\circ C$ ^(a)	P_D	1.5	W
Linear derating factor		12	$mW/^\circ C$
Power dissipation at $T_{amb} = 25^\circ C$ ^(b)	P_D	2.6	W
Linear derating factor		21	$mW/^\circ C$

Thermal resistance

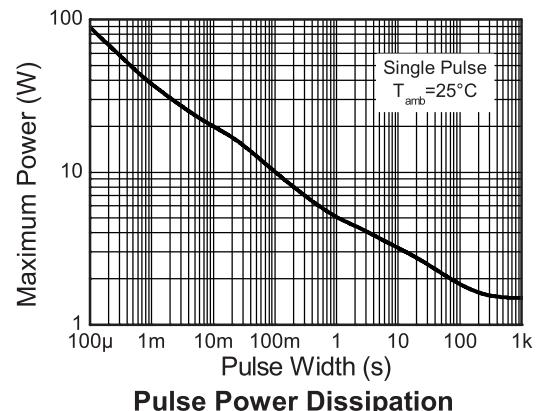
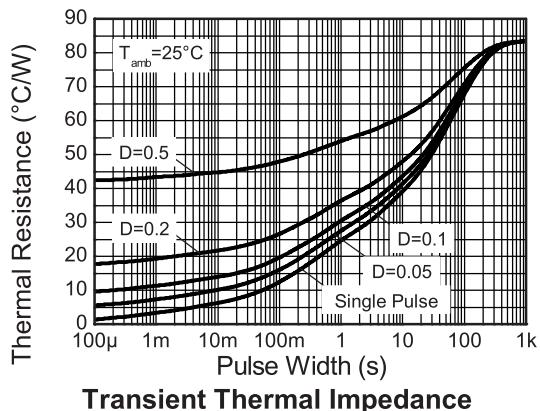
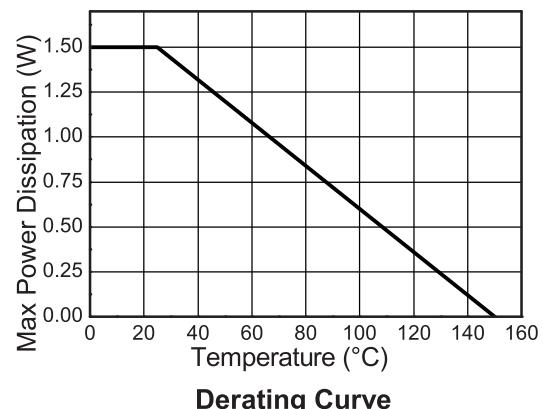
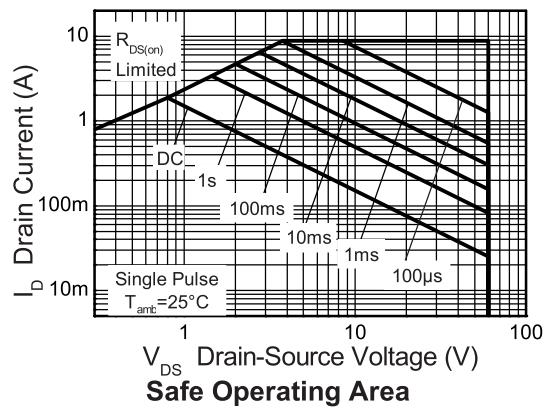
Parameter	Symbol	Limit	Unit
Junction to ambient	$R_{\Theta JA}$	83.3	°C/W
Junction to ambient	$R_{\Theta JA}$	47.4	°C/W

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 $t \leq 10$ sec.

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

Thermal characteristics

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	60			V	$I_D = 250\mu A, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}			1	μA	$V_{DS} = 60V, V_{GS} = 0V$
Gate-body leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Gate-source threshold voltage	$V_{GS(th)}$	1.0		3.0	V	$I_D = 250\mu A, V_{DS} = V_{GS}$
Static drain-source on-state resistance (*)	$R_{DS(on)}$			0.250 0.350	Ω	$V_{GS} = 10V, I_D = 1.8A$ $V_{GS} = 4.5V, I_D = 1.3A$
Forward transconductance ^(*) (†)	g_{fs}		2.3		S	$V_{DS} = 15V, I_D = 1.8A$
Dynamic^(‡)						
Input capacitance	C_{iss}		166		pF	$V_{DS} = 40V, V_{GS} = 0V$ $f = 1MHz$
Output capacitance	C_{oss}		19.5		pF	
Reverse transfer capacitance	C_{rss}		8.7		pF	
Switching^{(†) (‡)}						
Turn-on-delay time	$t_{d(on)}$		1.8		ns	$V_{DD} = 30V, V_{GS} = 10V$ $I_D = 1.8A$ $R_G \approx 6.0\Omega$
Rise time	t_r		1.4		ns	
Turn-off delay time	$t_{d(off)}$		4.9		ns	
Fall time	t_f		2.0		ns	
Total gate charge	Q_g		1.65			$V_{DS} = 30V, V_{GS} = 5V$ $I_D = 1.8A$
Total gate charge	Q_g		3.2		nC	
Gate-source charge	Q_{gs}		0.67		nC	
Gate drain charge	Q_{gd}		0.82		nC	
Source-drain diode						
Diode forward voltage ^(*)	V_{SD}		0.80	0.95	V	$T_j = 25^\circ C, I_S = 0.45A,$ $V_{GS} = 0V$
Reverse recovery time ^(‡)	t_{rr}		20.5		ns	$T_j = 25^\circ C, I_F = 1.8A,$ $di/dt = 100A/\mu s$
Reverse recovery charge ^(‡)	Q_{rr}		21.3		nC	

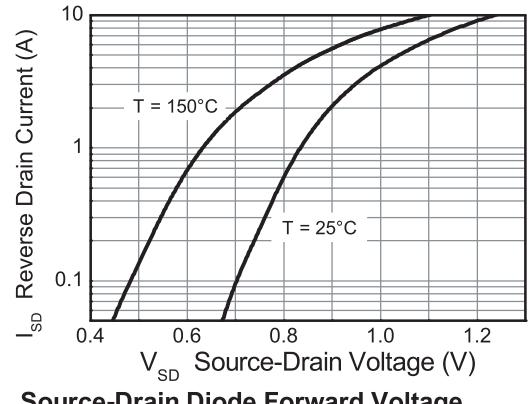
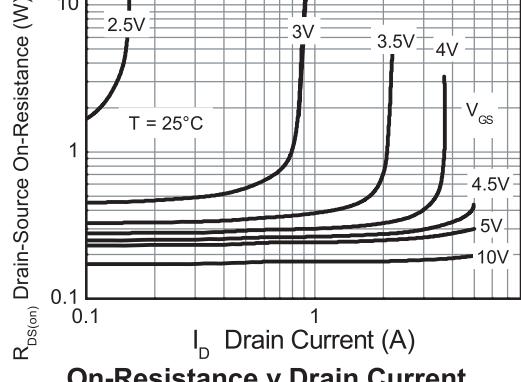
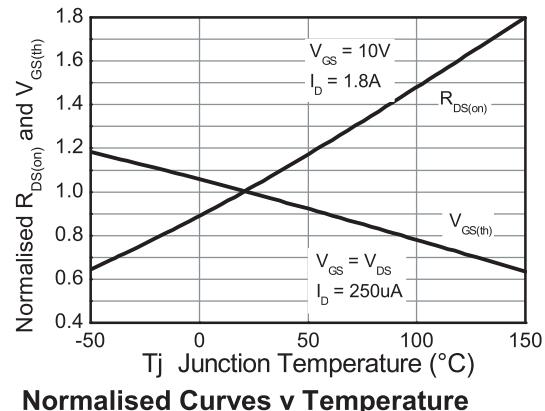
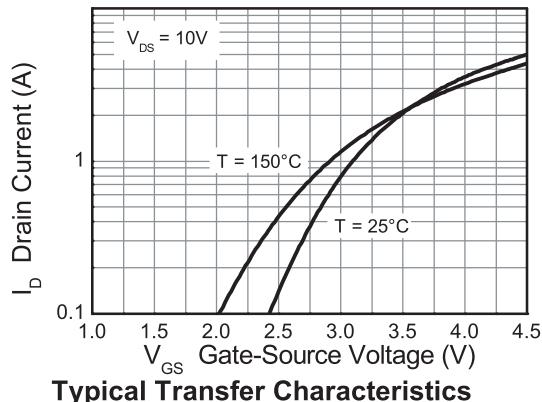
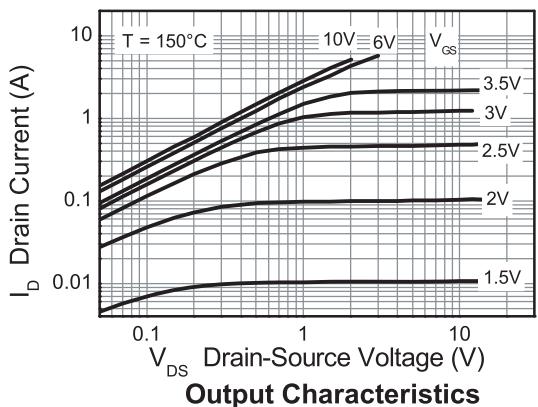
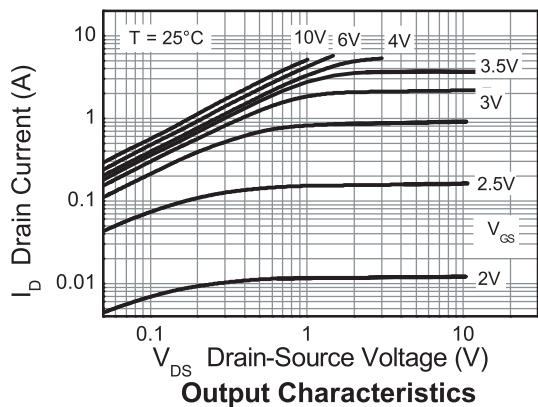
NOTES:

(*) Measured under pulsed conditions. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

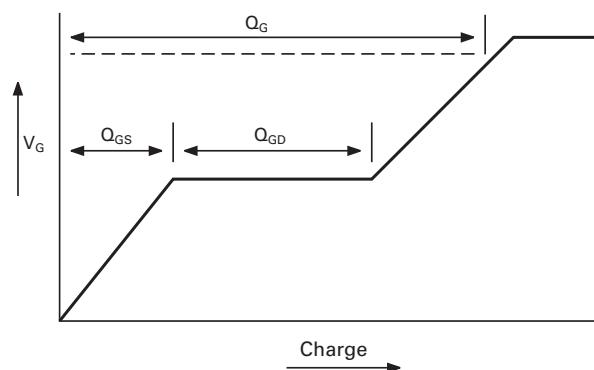
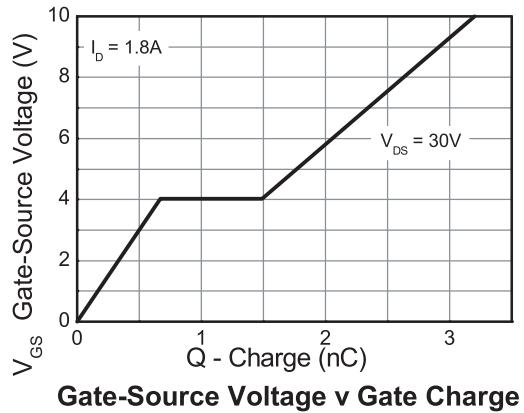
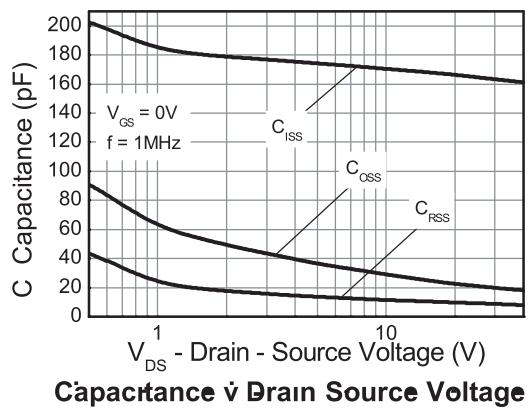
(†) Switching characteristics are independent of operating junction temperature.

(‡) For design aid only, not subject to production testing.

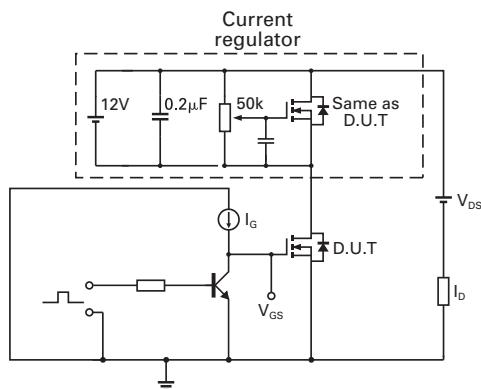
Typical characteristics



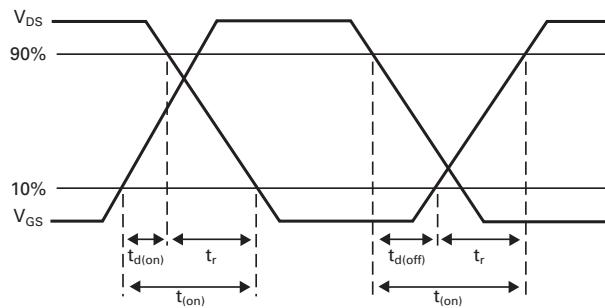
Typical characteristics



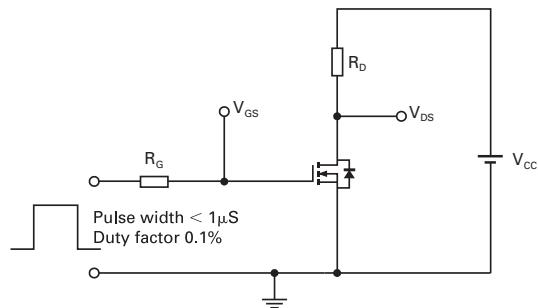
Basic gate charge waveform



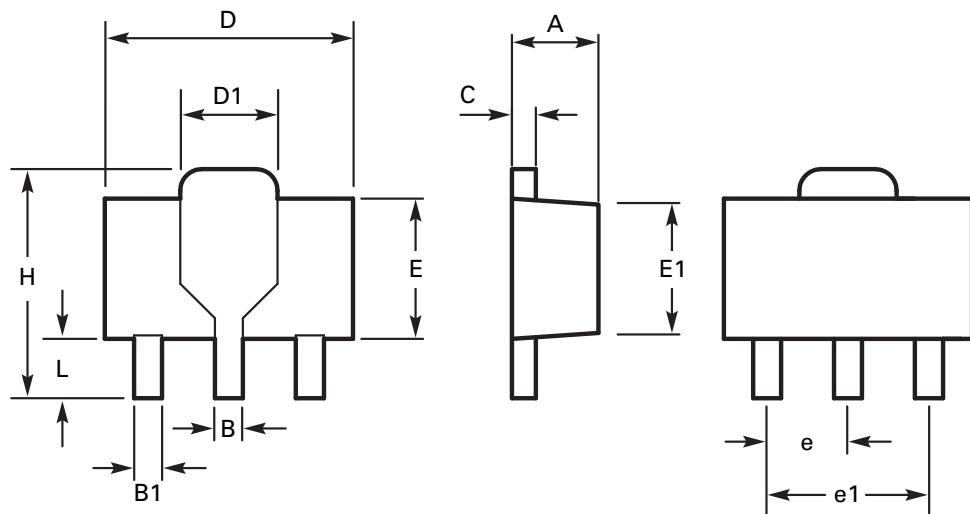
Gate charge test circuit



Switching time waveforms



Switching time test circuit

Package outline - SOT89

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	E	2.29	2.60	0.090	0.102
B	0.44	0.56	0.017	0.022	E1	2.13	2.29	0.084	0.090
B1	0.36	0.48	0.014	0.019	e	1.50 BSC		0.059 BSC	
C	0.35	0.44	0.014	0.017	e1	3.00 BSC		0.118 BSC	
D	4.40	4.60	0.173	0.181	H	3.94	4.25	0.155	0.167
D1	1.62	1.83	0.064	0.072	L	0.89	1.20	0.035	0.047

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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