ZXMN3A14F

30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	Max $R_{DS(on)}$	Max I_D T_A = 25°C (Note 4)
30V	65mΩ @ V_{GS} = 10V	3.2A
	95mΩ @ V_{GS} = 4.5V	2.6A

Features and Benefits

- Low on-resistance
- Fast switching speed
- Low gate charge
- Low threshold
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description and Applications

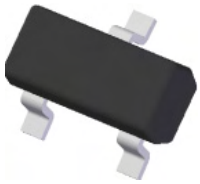
This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed, making it ideal for high-efficiency power management applications.

- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

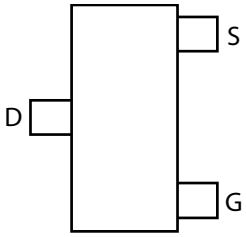
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (approximate)

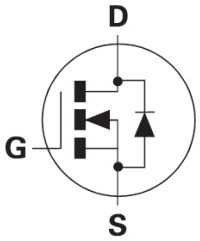
SOT23



Top View



Top View
Pin Out



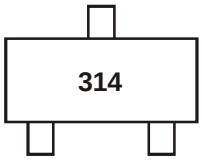
Equivalent Circuit

Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN3A14FTA	314	7	8	3000 Units

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
3. For more packaging details, go to our website at http://www.diodes.com.

Marking Information



314 = Product Type Marking Code

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Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic				Symbol	Value	Units
Drain-Source Voltage				V_{DSS}	30	V
Gate-Source Voltage				V_{GS}	±20	V
Continuous Drain Current	V_{GS} = 10V	T_A = 70°C	(Note 5) (Note 5) (Note 4)	I_D	3.9 3.2 3.2	A
Pulsed Drain Current (Note 6)				I_{DM}	18	A
Continuous Source Current (Body Diode) (Note 5)				I_S	2.3	A
Pulsed Source Current (Body Diode) (Note 6)				I_{SM}	18	A

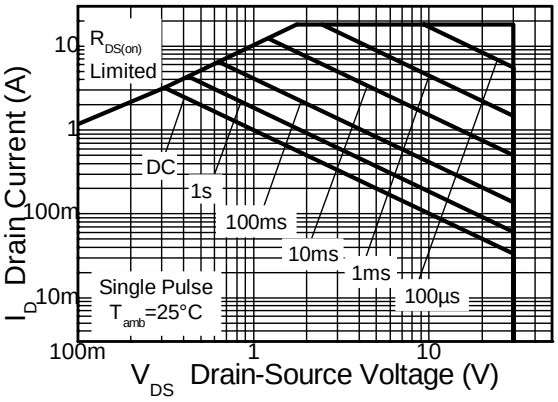
Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) Linear Derating Factor	P_D	1 8	W mW/°C
Power Dissipation (Note 5) Linear Derating Factor	P_D	1.5 12	W mW/°C
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	83	°C/W
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	70.44	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

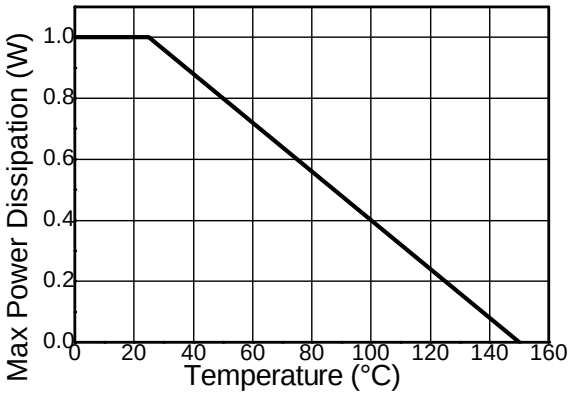
Notes:
4. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
5. For a device surface mounted on FR4 PCB measured at t ≤5 secs.
6. Repetitive rating 25mm x 25mm FR4 PCB, D=0.02 pulse width=300µs - pulse current limited by maximum junction temperature.
7. Thermal resistance from junction to solder-point (at the end of the drain lead).

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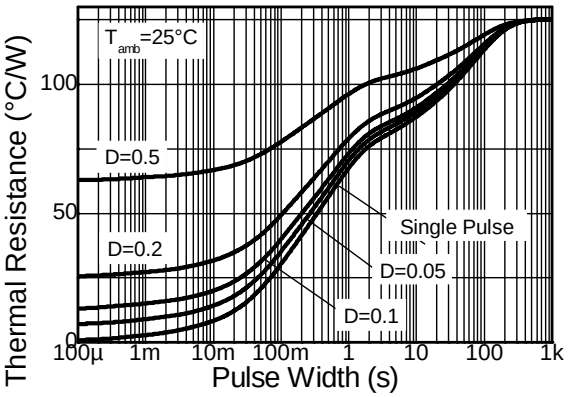
Thermal Characteristics



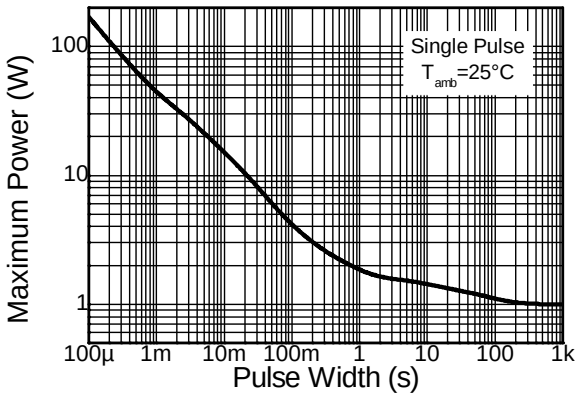
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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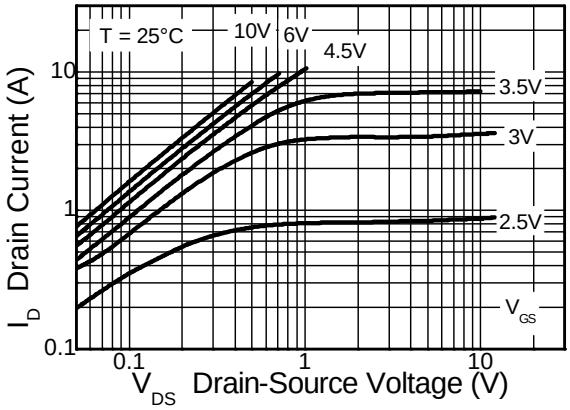
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.2	V	I_D = 250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	48	65	mΩ	V_{GS} = 10V, I_D = 3.2A
			69	95		V_{GS} = 4.5V, I_D = 2.6A
Forward Transconductance (Notes 8 and 10)	g_{fs}	—	7.1	—	S	V_{DS} = 15V, I_D = 3.2A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.85	0.95	V	T_J = 25°C, I_S = 2.5A, V_{GS} = 0V
Reverse Recovery Time (Note 10)	t_{rr}	—	13	—	ns	T_J = 25°C, I_F = 1.6A, di/dt = 100A/μs
Reverse Recovery Charge (Note 10)	Q_{rr}	—	7	—	nC	
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	448	—	pF	V_{DS} = 15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	82	—		
Reverse Transfer Capacitance	C_{rss}	—	49	—		
Turn-On Delay Time (Note 9)	$t_{D(on)}$	—	2.4	—	ns	V_{DD} = 15V, I_D = 1A, $R_G \cong 6.0\Omega$, V_{GS} = 10V
Turn-On Rise Time (Note 9)	t_r	—	2.5	—		
Turn-Off Delay Time (Note 9)	$t_{D(off)}$	—	13.1	—		
Turn-Off Fall Time (Note 9)	t_f	—	5.3	—		
Total Gate Charge (Note 9)	Q_g	—	8.6	—	nC	V_{DS} =15V, V_{GS} = 10V, I_D = 3.2A
Gate-Source Charge (Note 9)	Q_{gs}	—	1.4	—		
Gate-Drain Charge (Note 9)	Q_{gd}	—	1.8	—		

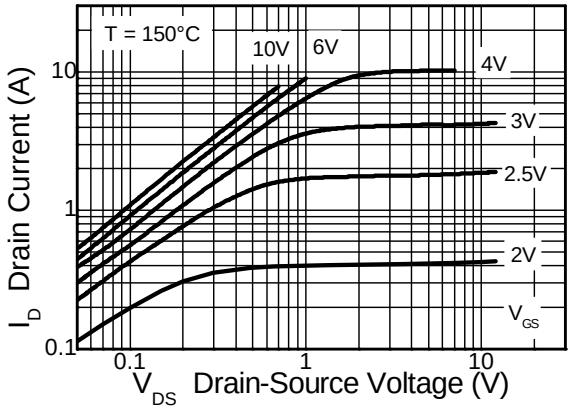
Notes:
8. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.
9. Switching characteristics are independent of operating junction temperature.
10. For design aid only, not subject to production testing.

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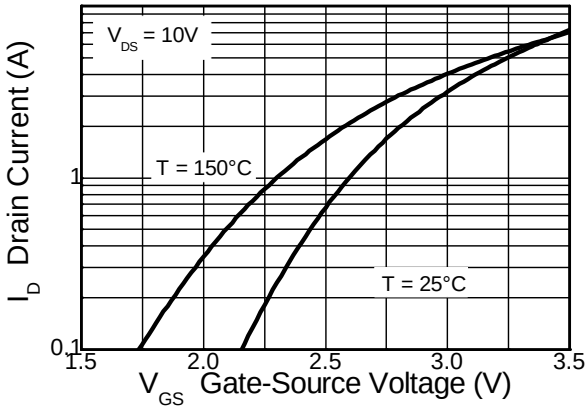
Typical Characteristics



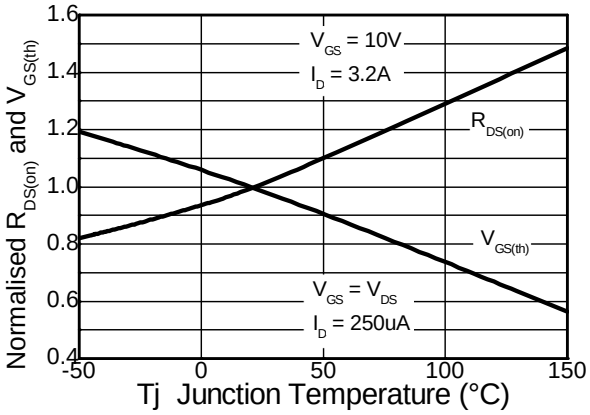
Output Characteristics



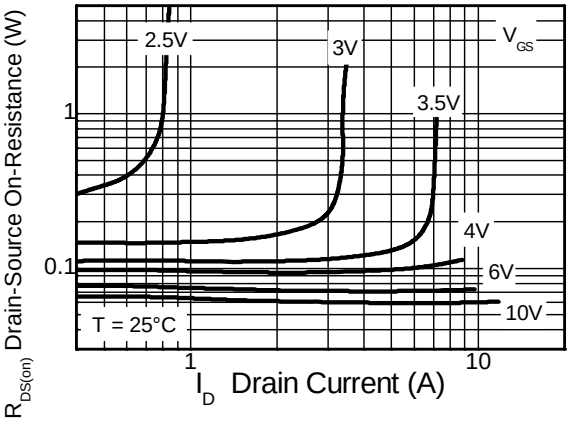
Output Characteristics



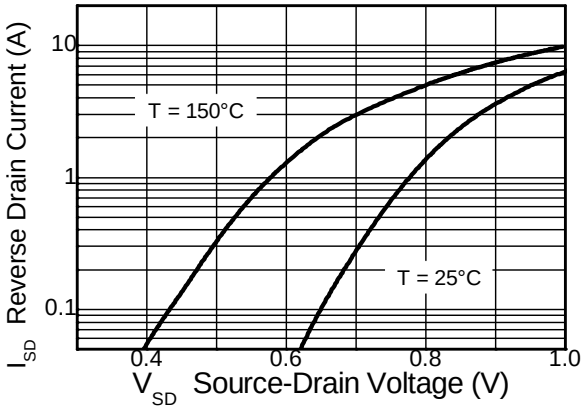
Typical Transfer Characteristics



Normalised Curves v Temperature



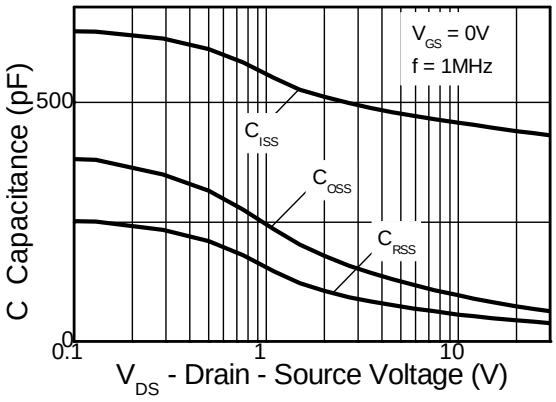
On-Resistance v Drain Current



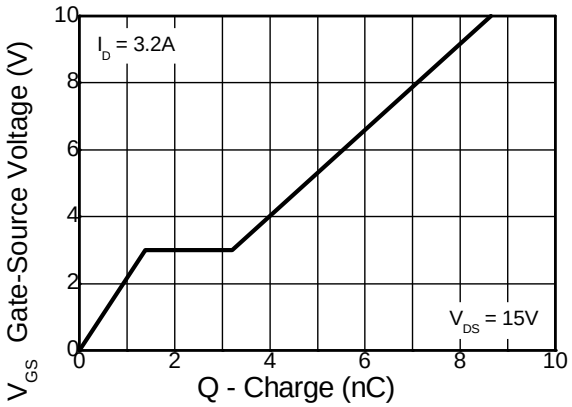
Source-Drain Diode Forward Voltage

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Typical Characteristics - continued

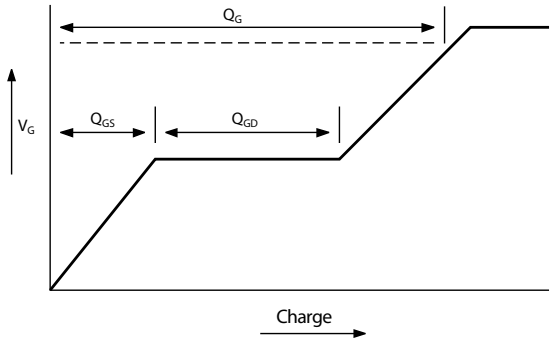


Capacitance v Drain-Source Voltage

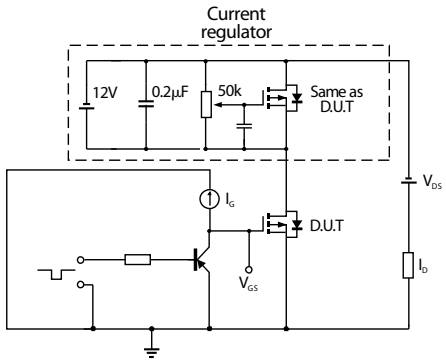


Gate-Source Voltage v Gate Charge

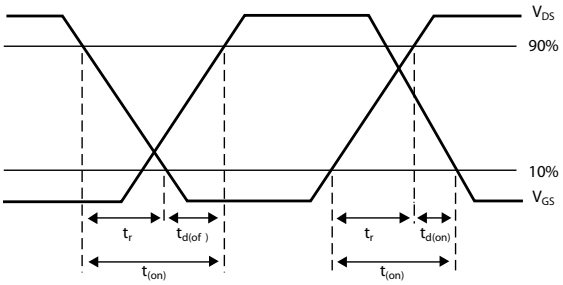
Test Circuits



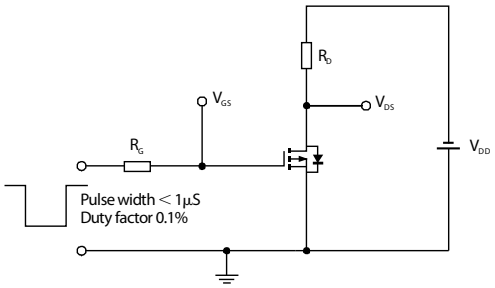
Basic gate charge waveform



Gate charge test circuit



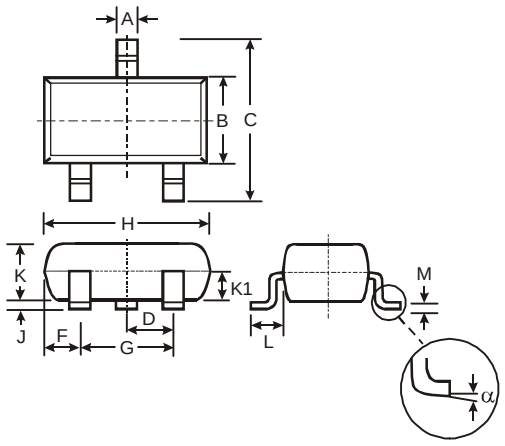
Switching time waveforms



Switching time test circuit

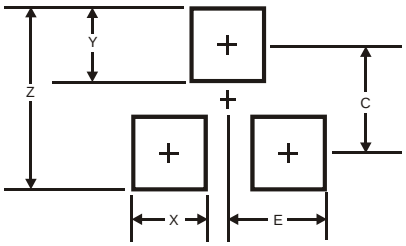
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Package Outline Dimensions



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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