30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D T_A = +25°C
30V	0.12Ω @ V_{GS} = 10V	2.0A

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions
- Motor Control

Features

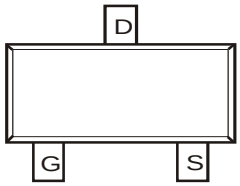
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Small Surface Mount Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

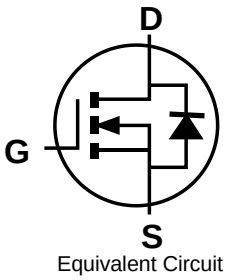
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 e3
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



Top View



Top View
Pin Configuration



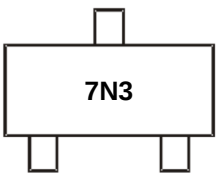
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
ZXMN3A01FTA	SOT23	3,000/Tape & Reel
ZXMN3A01FTC	SOT23	10,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



7N3 = Product Type Marking Code

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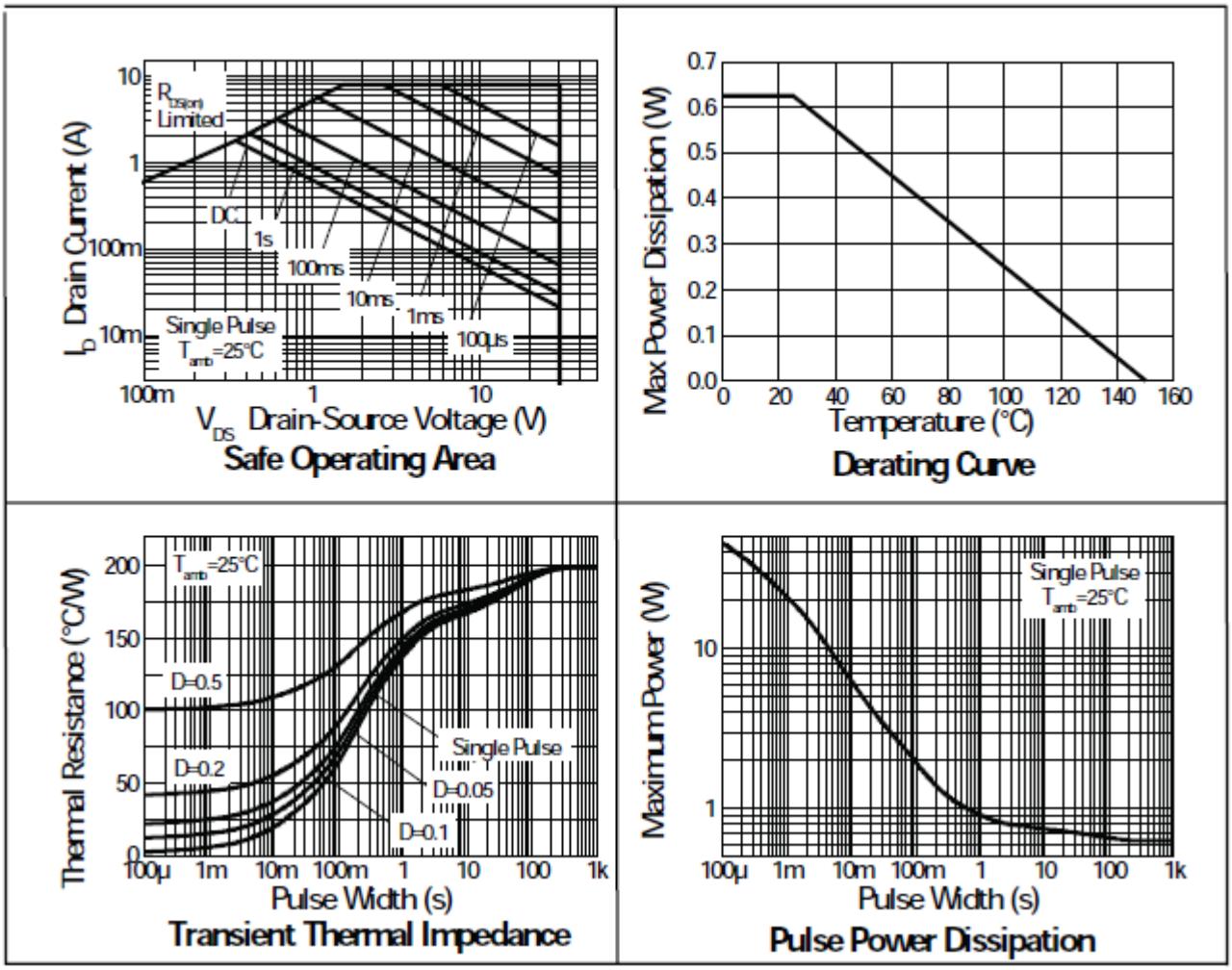
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current, V_{GS} = 10V	(Note 6) (Note 6) (Note 5)	T_A = +25°C T_A = +70°C T_A = +25°C	I_D	2.0 1.6 1.8	A
Pulsed Drain Current (Note 7)			I_{DM}	8	A
Maximum Body Diode Continuous Current (Note 6)			I_S	1.3	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Total Power Dissipation Linear Derating Factor	(Note 5)	P_D	625 5	mW mW/°C
Total Power Dissipation Linear Derating Factor	(Note 6)	P_D	806 6.4	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 5) (Note 6)	$R_{\theta JA}$	200 155	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. For a device surface mounted on FR-4 PCB measured at t≦5 secs.
7. Repetitive rating 25mm x 25mm FR-4 PCB, D = 0.05, pulse width 10μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.



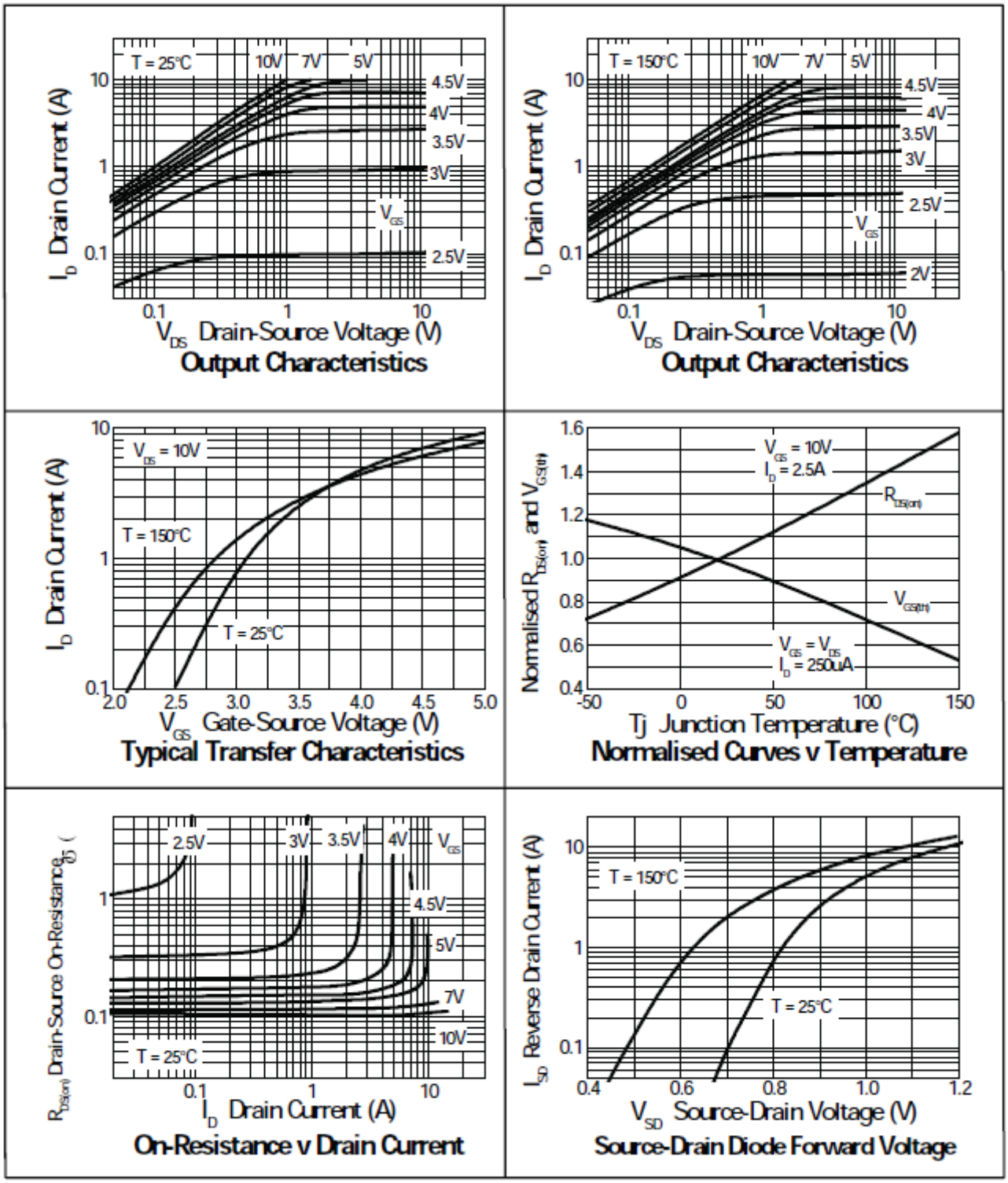
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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

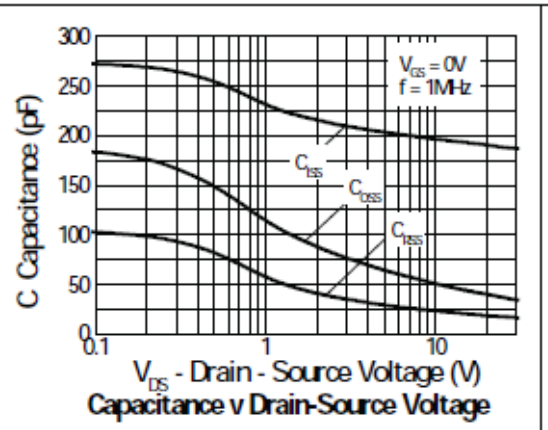
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	2.5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	0.11	0.12	Ω	V_{GS} = 10V, I_D = 2.5A
		—	—	0.18	Ω	V_{GS} = 4.5V, I_D = 2A
Forward Transconductance	g_{FS}	—	3.5	—	S	V_{DS} = 4.5V, I_D = 2.5A
Diode Forward Voltage (Note 8 & 10)	V_{SD}	—	0.85	0.95	V	V_{GS} = 0V, I_S = 1.7A, T_J = +25°C
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	190	—	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	38	—		
Reverse Transfer Capacitance	C_{rss}	—	20	—		
Gate Charge (Note 9)	Q_g	—	2.3	—	nC	V_{DS} = 15V, V_{GS} = 5V, I_D = 2.5A
Total Gate Charge (Note 9)	Q_g	—	3.9	—		V_{DS} = 15V, V_{GS} = 10V, I_D = 2.5A
Gate-Source Charge (Note 9)	Q_{gs}	—	0.6	—		
Gate-Drain Charge (Note 9)	Q_{gd}	—	0.9	—		
Turn-On Delay Time (Note 9)	$t_{D(on)}$	—	1.7	—	ns	V_{DD} = 15V , I_D = 2.5A, R_G = 6Ω, V_{GS} = 10V
Turn-On Rise Time (Note 9)	t_r	—	2.3	—		
Turn-Off Delay Time (Note 9)	$t_{D(off)}$	—	6.6	—		
Turn-Off Fall Time (Note 9)	t_f	—	2.9	—		
Reverse Recovery Time	t_{rr}	—	17.7	—	ns	T_J = +25°C, I_F = 2.5A, di/dt= 100A/µs
Reverse Recovery Charge	Qrr	—	13	—	nC	

Notes: 8. Measured under pulsed conditions. Width=300µs. Duty cycle ≦ 2%.
9. Switching characteristics are independent of operating junction temperature.
10. Guaranteed by design. Not subject to production testing.

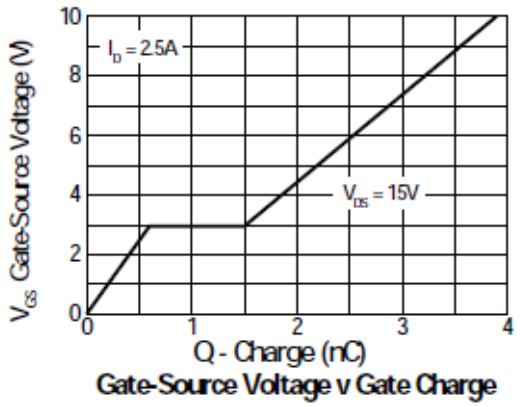
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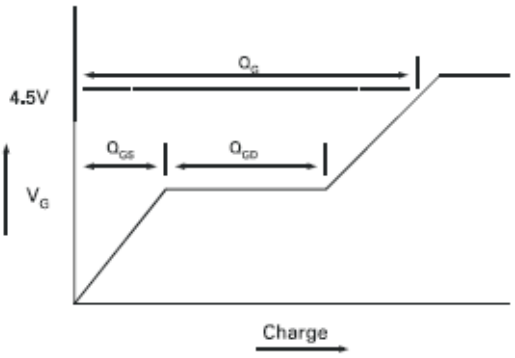
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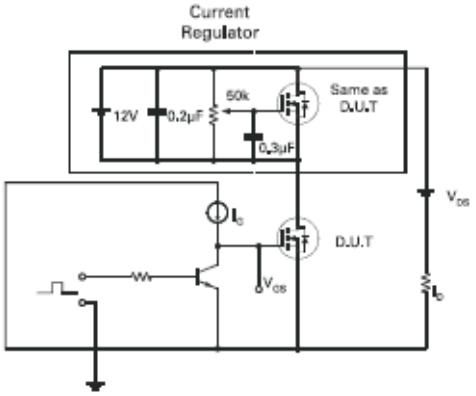
Capacitance v Drain-Source Voltage



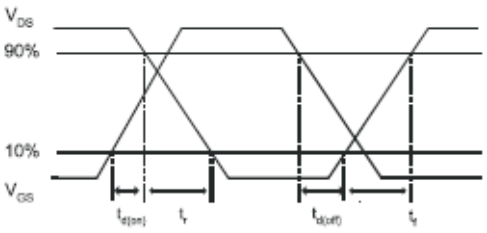
Gate-Source Voltage v Gate Charge



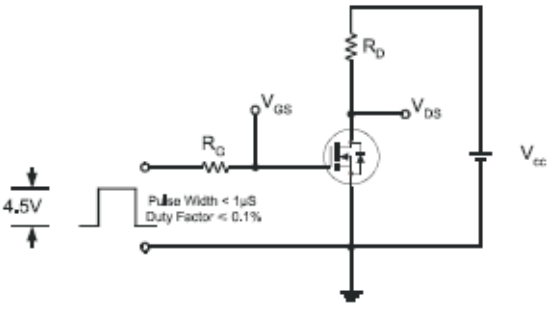
Basic Gate Charge Waveform



Gate Charge Test Circuit



Switching Time Waveforms

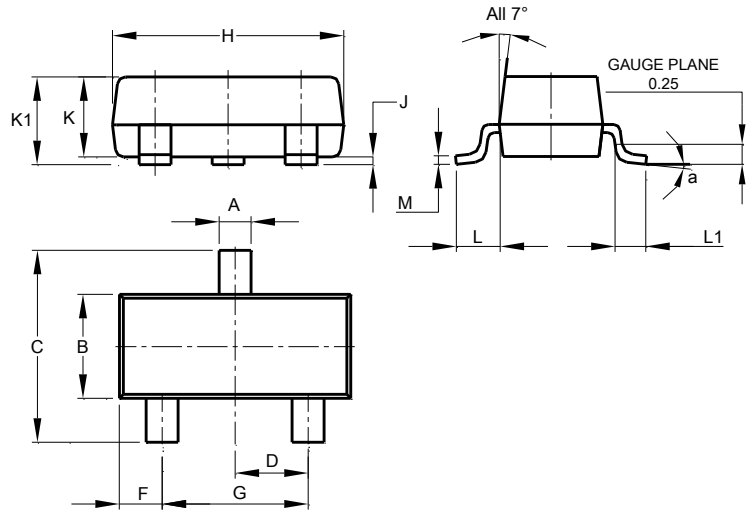


Switching Time Test Circuit

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Package Outline Dimensions

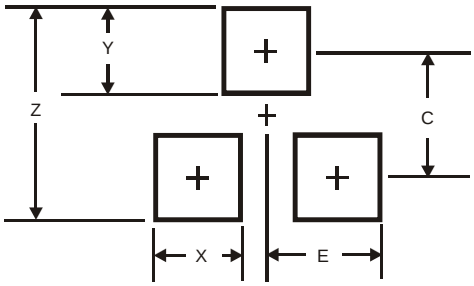
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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

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