



20V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _A = +25°C
20V	$0.12\Omega @ V_{GS} = 10V$	2.2A

Description

This new generation MOSFET is 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

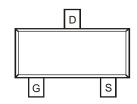
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Small Surface Mount Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

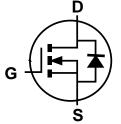
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208e3
- Lead-free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
-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



Top View



Top View Pin Configuration



Equivalent Circuit

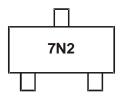
Ordering Information (Note 4)

Part Number	Case	Packaging
ZXMN2A01FTA	SOT23	3,000/Tape & Reel
ZXMN2A01FTC	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



7N2 = Product Type Marking Code



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

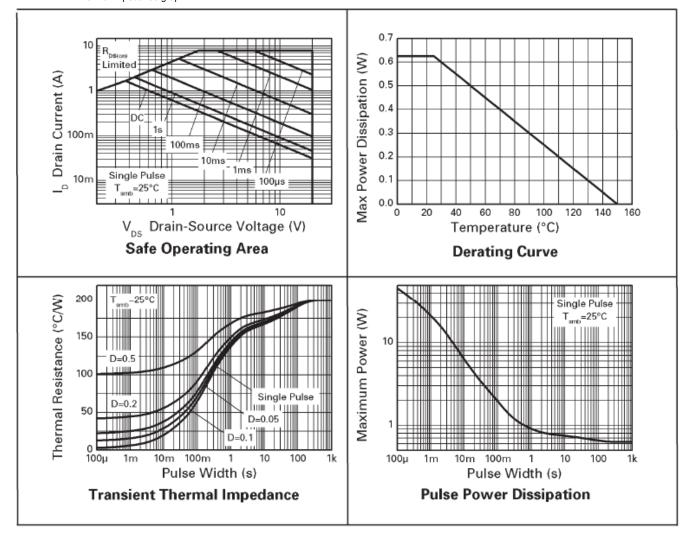
Characteris	Symbol	Value	Units		
Drain-Source Voltage	V_{DSS}	20	V		
Gate-Source Voltage	V _{GSS}	±12	V		
Continuous Drain Current, V _{GS} = 10V	(Note 6) (Note 6) (Note 5)	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$ $T_A = +25^{\circ}C$	I _D	2.2 1.7 1.9	А
Pulsed Drain Current (Note 7)			I _{DM}	8	А
Maximum Body Diode Continuous Current (Note 6)			Is	1.29	А
Maximum Body Diode Continuous Current (Note 7)			I _{SM}	8	А

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

Characteristic		Symbol	Value	Units	
Total Power Dissipation	(Note 5)	6	625	mW	
Linear Derating Factor	(Note 5)	P _D	5	mW/°C	
Total Power Dissipation (Note 6)		-	806	mW	
Linear Derating Factor	(Note 6)	P_{D}	6.4	mW/°C	
Thermal Desigtance, Junction to Ambient	(Note 5)	-	200	°C/W	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	155		
Operating and Storage Temperature Range	•	$T_{J_1}T_{STG}$	-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 FR4 PCB, D = 0.05, pulse width 10µs pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.





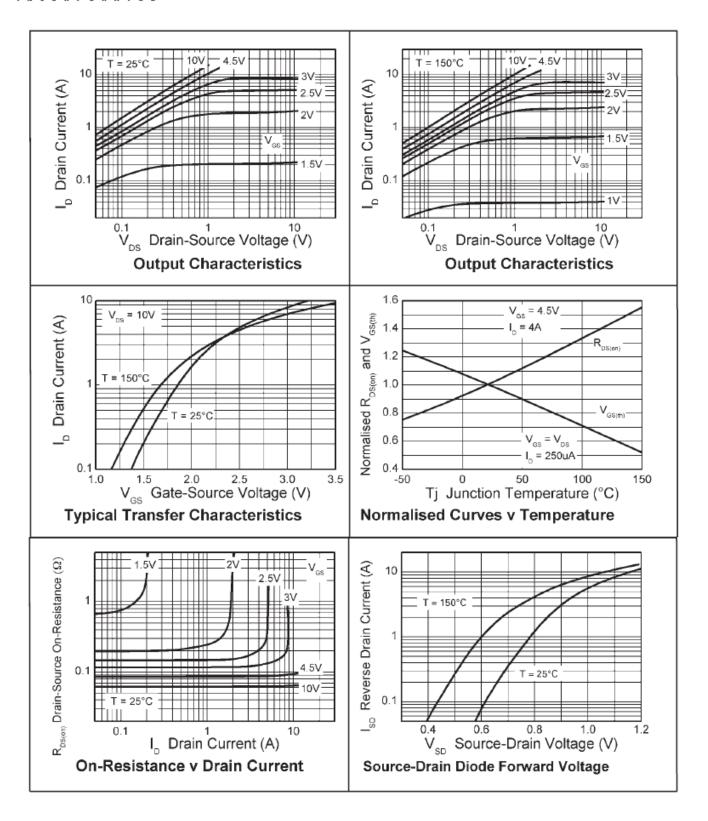
Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	20	_		V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	V _{DS} = 20V, V _{GS} = 0V	
Gate-Body Leakage		_	_	100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(th)}$	0.7	_	_	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance (Note 8)	_	_	_	0.12	Ω	$V_{GS} = 4.5V, I_D = 4A$	
Static Drain-Source On-Resistance (Note 6)	R _{DS(ON)}	_	_	0.225	Ω	$V_{GS} = 2.5V, I_D = 1.5A$	
Forward Transconductance	g _{FS}	_	6.1	_	S	$V_{DS} = 10V, I_{D} = 4A$	
Diode Forward Voltage (Note 8 & 10)	V_{SD}	_	0.85	0.95	V	$V_{GS} = 0V$, $I_S = 3.2A$, $T_J = +25$ °C	
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	Ciss	_	303	_		V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	
Output Capacitance	Coss	_	59		pF		
Reverse Transfer Capacitance	C _{rss}	_	30	_			
Total Gate Charge (Note 9)	Qg	_	3.0	_		101/1/	
Gate-Source Charge (Note 9)	Q_{gs}	_	0.8	_	nC	$V_{DS} = 10V, V_{GS} = 10V,$	
Gate-Drain Charge (Note 9)	Q_{gd}	_	1.0	_		$I_D = 4A$	
Turn-On Delay Time (Note 9)	t _{D(on)}	_	2.49	_			
Turn-On Rise Time (Note 9)	t _r	_	5.21	_	ns	V_{DD} = 10V , I_D =4A, R_G = 6 Ω , V_{GS} = 5V	
Turn-Off Delay Time (Note 9)	t _{D(off)}	_	7.47	_	ns		
Turn-Off Fall Time (Note 9)	t _f		4.62	_			
Reverse Recovery Time	t _{rr}	_	23	_	ns	T .0500 L 4A 45/44 4004/5	
Reverse Recovery Charge	Qrr	_	5.65	_	nC	$T_J = +25$ °C, $I_F = 4A$, di/dt= 100A/ μ s	

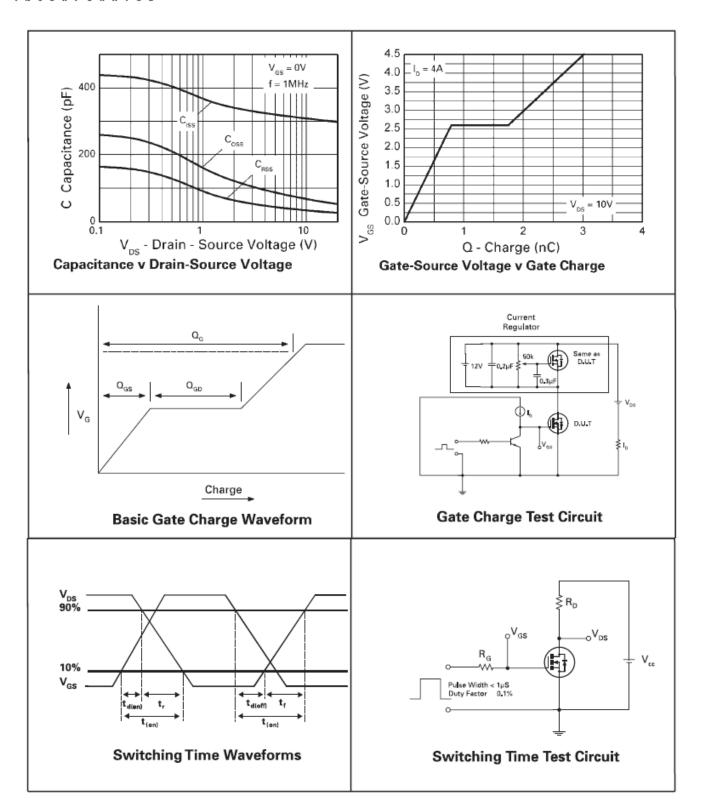
Notes:

- 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.





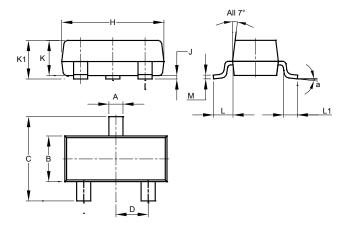






Package Outline Dimensions

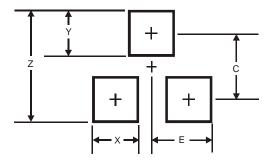
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT23					
Dim	Min	Max	Тур		
Α	0.37	0.51	0.40		
В	1.20	1.40	1.30		
С	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		
Н	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		
а	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				
Х	0.8				
Y	0.9				
С	2.0				
F	1.35				



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