



DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on) max}	I _D T _A = 25°C	
20V	18mΩ @ $V_{GS} = 4.5V$	5.2A	
20 V	30mΩ @ V _{GS} = 1.8V	4.0A	

Description and Applications

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

- Power management functions
- **Battery Pack**
- Load Switch

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- Lead, Halogen, and Antimony Free, RoHS Compliant (Note 1)
- "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: U-DFN3030-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.0172 grams (approximate)

5 5 U-DFN3030-8 D1/D2 G1 3 2 FSD PROTECTED TO 2kV Top View **Bottom View Bottom View** Top View Pin Configuration Equivalent Circuit

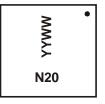
Ordering Information (Note 6)

Part Number	Case	Packaging
DMN2016LFG-7	U-DFN3030-8	3000 / Tape & Reel

Notes:

- 1. No purposefully added lead. Halogen and Antimony Free.
- 2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com. 3. For packaging details, go to our website at http://www.diodes.com

Marking Information



N20 = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 09 for 2009) WW = Week code (01 to 53)



Maximum Ratings @T_A = 25°C unless otherwise specified

Char	Symbol	Value	Unit		
Drain-Source Voltage			V _{DSS}	20	V
Gate-Source Voltage	V _{GSS}	±8	V		
Continuous Drain Current (Note 4)	Steady State	T _A = 25°C T _A = 70°C	ID	5.2 4.1	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	30	Α

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P _D	0.77	W
Thermal Resistance, Junction to Ambient @T _A = 25°C (Note 4)	$R_{ heta JA}$	169	°C/W
Thermal Resistance, Junction to Case @T _A = 25°C (Note 4)	$R_{ heta JC}$	15.8	°C/W
Operating and Storage Temperature Range	T_{J}, T_{STG}	-55 to +150	°C

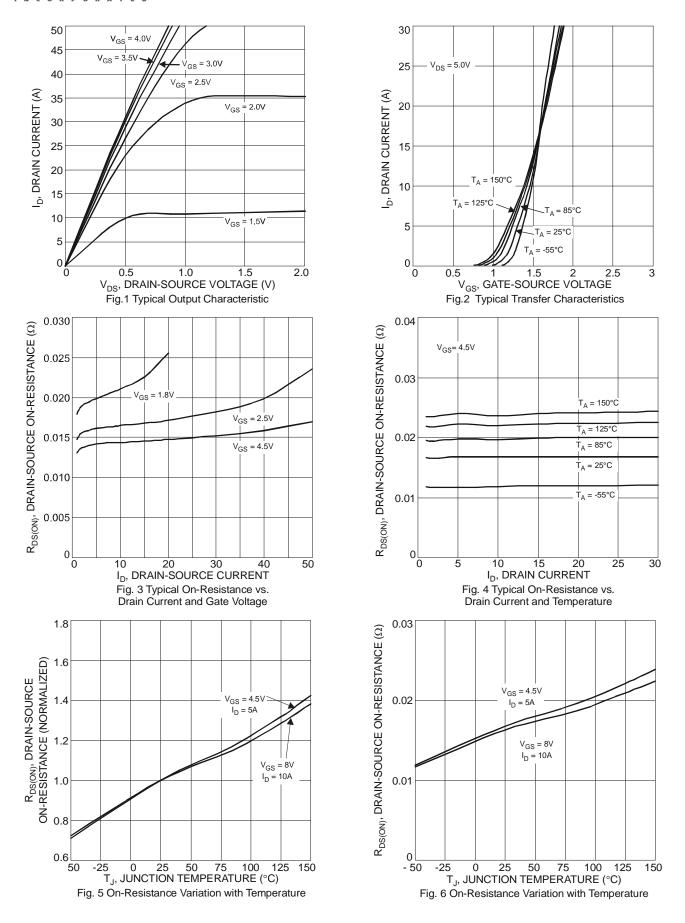
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 5)							
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$	
Gate-Source Breakdown Voltage	BV_{GSO}	±8	-	-	V	$V_{DS} = 0V, I_{G} = \pm 250 \mu A$	
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	1		1.0	μΑ	$V_{DS} = 20V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	ı	1	±10	μΑ	$V_{GS} = \pm 8V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 5)							
Gate Threshold Voltage	$V_{GS(th)}$	0.4	0.71	1.1	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
			13	18	mΩ	$V_{GS} = 4.5V, I_D = 6A$	
			13.5	19		$V_{GS} = 4.0V, I_D = 6A$	
Static Drain-Source On-Resistance	R _{DS (ON)}	-	14	20.5		$V_{GS} = 3.1V, I_D = 6A$	
			15	22		$V_{GS} = 2.5V, I_D = 6A$	
			21	30		$V_{GS} = 1.8V, I_D = 6A$	
Forward Transfer Admittance	Y _{fs}	-	25	-	S	$V_{DS} = 5V, I_{D} = 6A$	
Diode Forward Voltage	V _{SD}	-	0.75	1.0	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 6)							
Input Capacitance	Ciss	i	1472	-	pF	V 40V V 0V	
Output Capacitance	Coss	-	311	-	pF	$V_{DS} = 10V, V_{GS} = 0V,$ -f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	-	141	-	pF	1 = 1:01VII 12	
Gate Resistance	R_g	-	1.46	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Qg	-	16.0	-	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6A	
Gate-Source Charge	Qgs	-	36.6	-	nC		
Gate-Drain Charge	Q _{gd}	-	2.1	-	nC		
Turn-On Delay Time	t _{D(on)}	-	2.6	-	ns	$V_{DD} = 10V, V_{GS} = 5V,$ $R_{GEN} = 3\Omega, R_{L} = 1.7\Omega$	
Turn-On Rise Time	t _r	-	13.2	-	ns		
Turn-Off Delay Time	t _{D(off)}	-	84.5	-	ns		
Turn-Off Fall Time	t _f	1	46.8	-	ns		

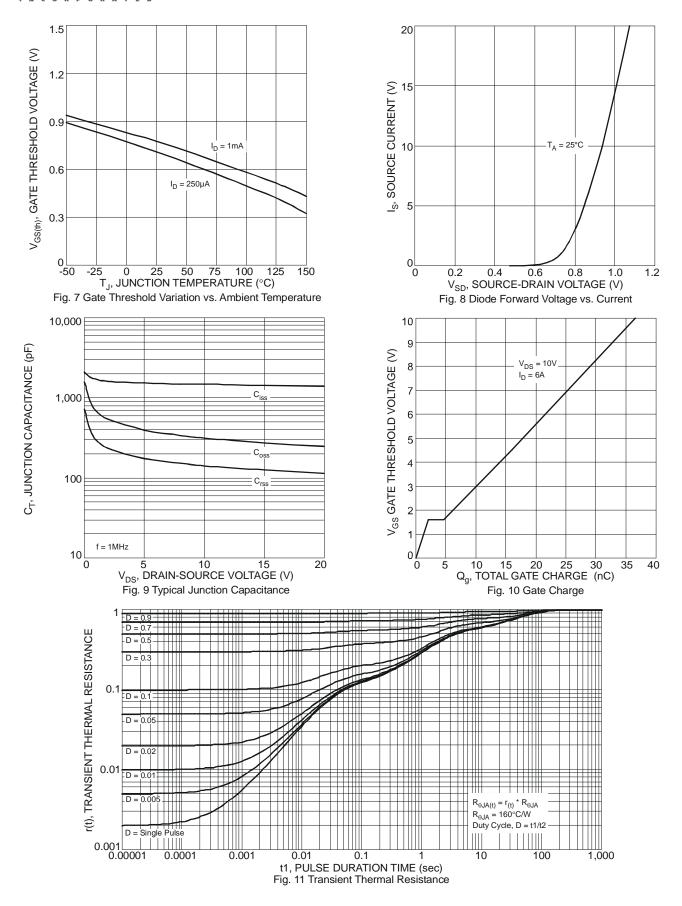
Notes:

- 4. Device mounted on FR-4 PCB, with minimum recommended pad layout.5. Repetitive rating, pulse width limited by junction temperature6. Guaranteed by design. Not subject to product testing



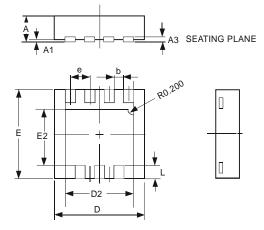






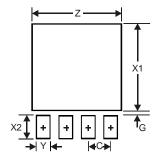


Package Outline Dimensions



U-DFN3030-8						
Dim	Min	Max	Тур			
Α	0.57	0.63	0.60			
A1	0	0.05	0.02			
A3	_		0.15			
b	0.29	0.39	0.34			
D	2.90	3.10	3.00			
D2	2.19	2.39	2.29			
е	—	_	0.65			
Е	2.90	3.10	3.00			
E2	1.64	1.84	1.74			
L	0.30	0.60	0.45			
All Dimensions in mm						

Suggested Pad Layout



Dimensions	Value (in mm)		
Z	2.59		
G	0.11		
X1	2.49		
X2	0.65		
Y	0.39		
С	0.65		



IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
 - 1. are intended to implant into the body, or
 - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2012, Diodes Incorporated

www.diodes.com