



30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on)}	I _D T _A = 25°C
30V	760mΩ @ V _{GS} = 4.5V	0.65A
	930mΩ @ V _{GS} = 2.5V	0.58A
	1500mΩ @ V _{GS} = 1.8V	0.45A

Description

This 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

- Load switch
- Portable applications
- Power Management Functions

Features

- 0.4mm ultra low profile package for thin application
- 0.48mm² package footprint, 16 times smaller than SOT23
- Low V_{GS(th)}, can be driven directly from a battery
- Low R_{DS(on)}
- ESD Protected
- 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

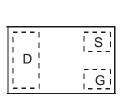
Mechanical Data

- Case: X2-DFN0806-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu over Copper leadframe. Solderable per MIL-STD-202. Method 208 [●]
- Weight: 0.00043 grams (approximate)

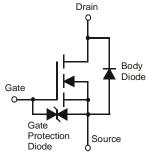












Equivalent Circuit

Ordering Information (Note 4)

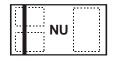
Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN3900UFA-7B	NU	7	8	10,000

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 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.

Marking Information

DMN3900UFA-7B



Top View Bar Denotes Gate and Source Side

NU = Product Type Marking Code



Characteristic			Symbol	Value	Unit	
Drain-Source Voltage			V_{DSS}	30	V	
Gate-Source Voltage			V _{GSS}	±8	1	
(No		(Note 6)	1	_	0.65	
Continuous Drain Current V _{GS} = 4.5V	$V_{GS} = 4.5V$	$T_A = +70^{\circ}C \text{ (Note 6)}$	ID	0.52	^	
		(Note 5)	I _D	0.55	A	
Pulsed Drain Current (Note 7)		(Note 7)	I _{DM}	2.5		

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

Characteristic	Symbol	Value	Unit		
Dawar Dissination	(Note 6)	0	490	mW	
Power Dissipation	(Note 5)	P _D	390		
Thermal Resistance, Junction to Ambient	(Note 6)	D	255	°C/W	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	327		
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C	

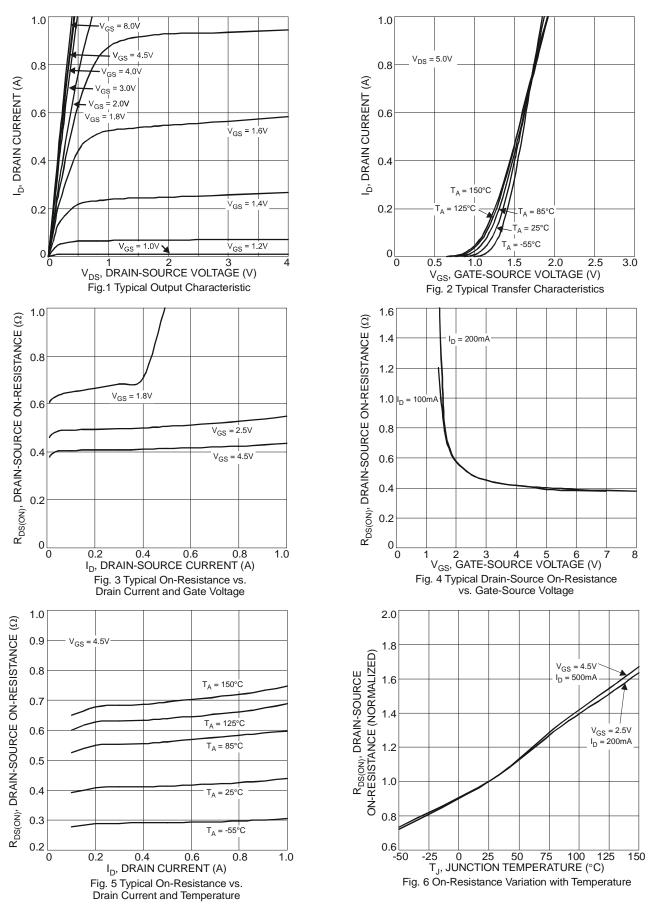
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	30	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	ı	1	1	μΑ	$V_{DS} = 30V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	-	-	3	μΑ	$V_{GS} = \pm 8V$, $V_{DS} = 0V$	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(th)}	0.45	-	0.95	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
				760		$V_{GS} = 4.5V, I_D = 200mA$	
Static Drain-Source On-Resistance (Note 8)	R _{DS(on)}	-	-	930	$m\Omega$	$V_{GS} = 2.5V, I_D = 100mA$	
				1500		$V_{GS} = 1.8V, I_D = 75mA$	
Forward Transfer Admittance	Y _{fs}	40	-	-	mS	$V_{DS} = 3V$, $I_D = 10mA$	
Diode Forward Voltage (Note 8)	V_{SD}	-	0.7	1.2	V	$V_{GS} = 0V, I_{S} = 300mA$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	-	42.2	-	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	
Output Capacitance	Coss		4.5	-	pF		
Reverse Transfer Capacitance	C _{rss}	-	3,4	-	pF		
Gate Resistance	R_g		468	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Qg	-	0.7	-	nC	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 200mA	
Gate-Source Charge	Q _{gs}	-	0.11	-	nC		
Gate-Drain Charge	Q_{gd}	-	0.15	-	nC		
Turn-On Delay Time	t _{D(on)}	-	10.5	-	ns	V _{DS} = 10V, I _D = 200mA	
Turn-On Rise Time	t _r	-	7.8	-	ns		
Turn-Off Delay Time	t _{D(off)}	-	80.6	-	ns	$V_{GS} = 4.5V$, $R_G = 6\Omega$	
Turn-Off Fall Time	t _f	·	23.4	-	ns		

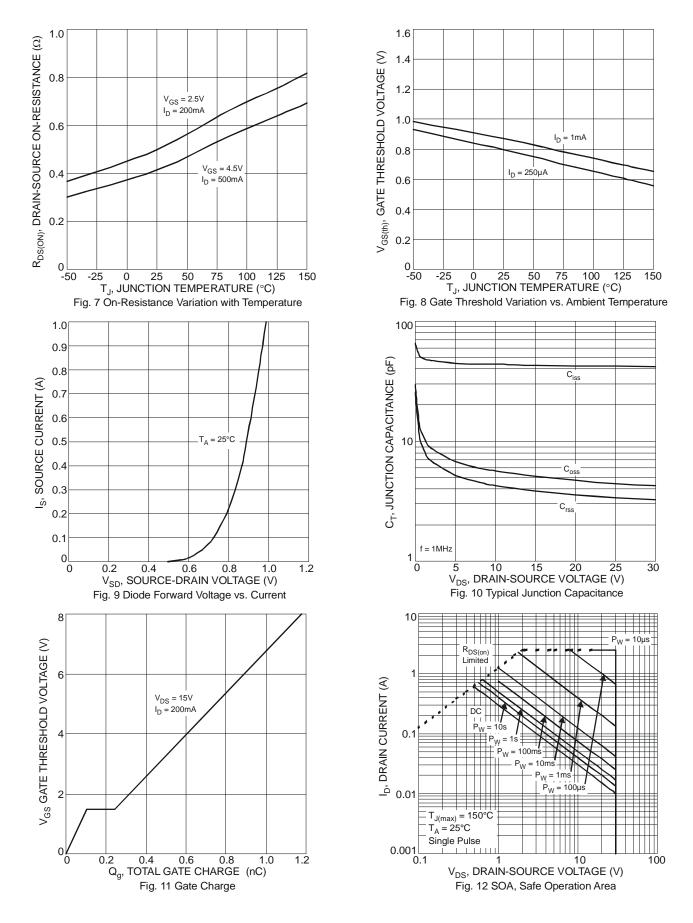
Notes:

- 5. For a device surface mounted on a minimum recommended pad layout of an FR4 PCB, in still air conditions; the device is measured when operating in steady-state condition.
- 6. Same as note 4, except the device measured at $t \le 10$ sec.
- 7. Same as note 4, except the device is pulsed at duty cycle of 1% for a pulse width of $10\mu s.$
- 8. Measured under pulsed conditions to minimize self-heating effect. Pulse width $\leq 300 \mu s$; duty cycle $\leq 2\%$
- 9. For design aid only, not subject to production testing.

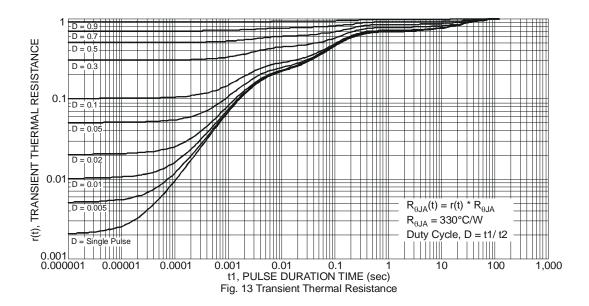






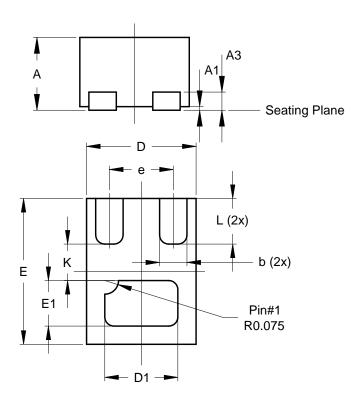






Package Outline Dimensions

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

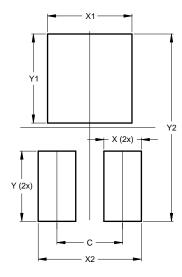


X2-DFN0806-3					
Dim	Min	Max	Тур		
Α	0.375	0.40	0.39		
A1	0	0.05	0.02		
А3	-	ı	0.10		
b	0.10	0.20	0.15		
D	0.55	0.65	0.60		
D1	0.35	0.45	0.40		
E	0.75	0.85	0.80		
E1	0.20	0.30	0.25		
е	-	ı	0.35		
K	-	-	0.20		
L	0.20	0.30	0.25		
All Dimensions in mm					



Suggested Pad Layout

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



Dimensions	Value (in mm)		
С	0.350		
Х	0.200		
X1	0.450		
X2	0.550		
Y	0.375		
Y1	0.475		
Y2	1.000		



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