





20V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on)}	I _D max T _A = 25°C (Note 4)
	175mΩ @ V_{GS} = 4.5 V	1.30A
20V	240m Ω @ V _{GS} = 2.5V	1.11A
	360 m Ω @ V _{GS} = 1.8 V	0.91A

Description and Applications

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.

Load switch

Features and Benefits

- Footprint of just 0.6mm² thirteen times smaller than SOT23
- 0.5mm profile ideal for low profile applications
- On resistance <200mΩ @ V_{GS} = 4.5V
- Low Gate Threshold Voltage
- Fast Switching Speed
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- ESD Protected Gate 2KV
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

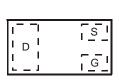
- Case: DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.001 grams (approximate)



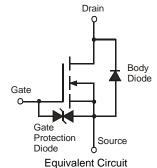




Bottom View



Top View Internal Schematic



Ordering Information (Note 3)

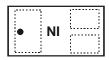
Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN2300UFB-7	NI	7	8	3,000
DMN2300UFB-7B	NI	7	8	10,000

Notes:

- 1. No purposefully added lead
- 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.

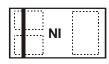
Marking Information

DMN2300UFB-7



Top View Dot Denotes Drain Side

DMN2300UFB-7B



Top View Bar Denotes Gate and Source Side

NI = Product Type Marking Code





Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V _{GSS}	±8	V
Continuous Drain Current $Steady State T_A = 25^{\circ}C \text{ (Note 4)} \\ T_A = 85^{\circ}C \text{ (Note 4)} \\ T_A = 25^{\circ}C \text{ (Note 5)}$		I _D	1.32 0.94 1.78	А	
Pulsed Drain Current (Note 6)			I_{DM}	8	А

Thermal Characteristics @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P _D	0.468	W
Power Dissipation (Note 5)	P _D	1.2	W
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	267	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	R _{0JA}	104	°C/W
Operating and Storage Temperature Range	T_{J}, T_{STG}	-55 to +150	°C

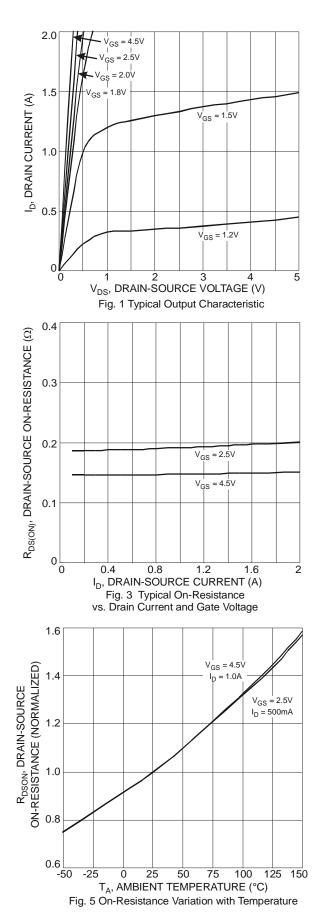
Electrical Characteristics @TA = 25°C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	20	1	-	V	$V_{GS} = 0V, I_D = 10\mu A$	
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	-	1	1	μΑ	$V_{DS} = 20V$, $V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	-	1	10	μΑ	$V_{GS} = \pm 8V$, $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)	ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.45	-	0.95	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
		-	-	175	mΩ	$V_{GS} = 4.5V, I_D = 300mA$	
Static Drain-Source On-Resistance	R _{DS} (ON)	-	-	240		$V_{GS} = 2.5V, I_D = 250mA$	
		-	1	360		$V_{GS} = 1.8V, I_D = 100mA$	
Forward Transfer Admittance	Y _{fs}	40	-	-	mS	$V_{DS} = 3V, I_{D} = 30mA$	
Diode Forward Voltage	V_{SD}	-	0.7	1.2	V	$V_{GS} = 0V, I_{S} = 300mA$	
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{iss}	-	67.62	-	pF	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Output Capacitance	Coss	-	9.74	-	pF	$V_{DS} = 20V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	Crss	-	7.58	-	pF		
Gate Resistance	R_{g}	-	68.51	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Q_{g}	-	0.89	-	nC	15// 10//	
Gate-Source Charge	Q _{gs}	-	0.14	-	nC	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_{D} = 1A$	
Gate-Drain Charge	Q _{qd}	-	0.16	-	nC		
Turn-On Delay Time	t _{D(on)}	-	4.92	-	ns		
Turn-On Rise Time	t _r	-	6.93	-	ns	$V_{DS} = 10V, I_{D} = 1A$	
Turn-Off Delay Time	t _{D(off)}	-	21.71	-	ns	$V_{GS} = 4.5V$, $R_G = 6\Omega$	
Turn-Off Fall Time	t _f	-	10.62	-	ns		

Notes:

- 4. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout
- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 25mm X 25mm square copper plate
- 6. Device mounted on minimum recommended pad layout test board, $10\mu s$ pulse duty cycle = 1%.
- 7. Short duration pulse test used to minimize self-heating effect.





2.0

V_{DS} = 5V

1.5

1.0

1.0

T_A = 150°C

T_A = 25°C

T_A = 25°C

T_A = 25°C

T_A = 55°C

O

0

0.5

1.5

V_{GS}, GATE-SOURCE VOLTAGE (V)

Fig. 2 Typical Transfer Characteristic

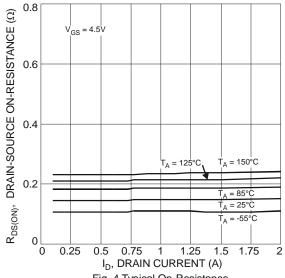


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

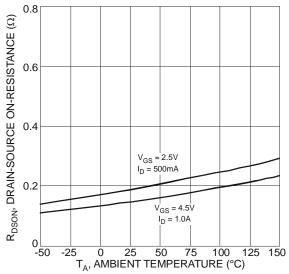


Fig. 6 On-Resistance Variation with Temperature



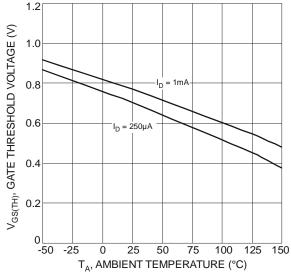
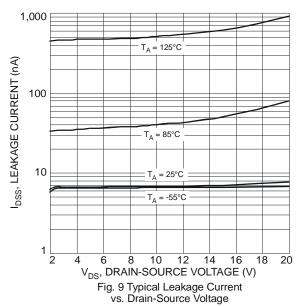


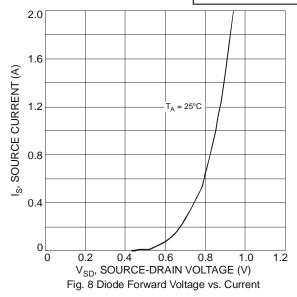
Fig. 7 Gate Threshold Variation vs. Ambient Temperature

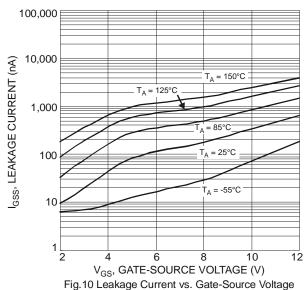


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VDS = 15V

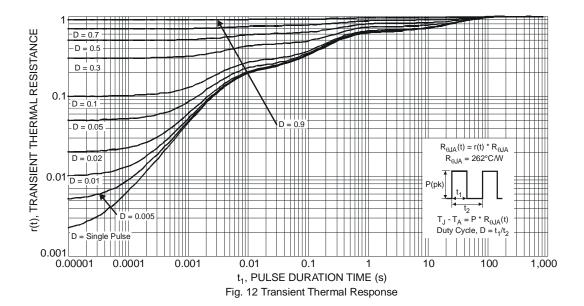
VDS = 15



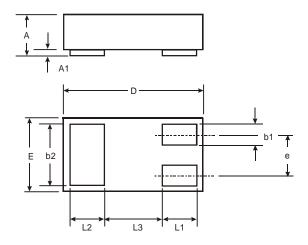


DMN2300UFB
Document number: DS35235 Rev. 1 - 2



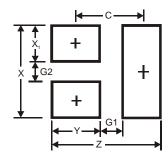


Package Outline Dimensions



DFN1006-3					
Dim	Min	Max	Тур		
Α	0.47	0.53	0.50		
A1	0	0.05	0.03		
b1	0.10	0.20	0.15		
b2	0.45	0.55	0.50		
D	0.95	1.075	1.00		
Е	0.55	0.675	0.60		
е	_	_	0.35		
L1	0.20	0.30	0.25		
L2	0.20	0.30	0.25		
L3	_	_	0.40		
All Dimensions in mm					

Suggested Pad Layout



Dimensions	Value (in mm)
Z	1.1
G1	0.3
G2	0.2
Х	0.7
X1	0.25
Υ	0.4
С	0.7





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