



**THE DATASHEET OF  
DMN62D1SFB-7B**



## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ Max	$I_D$ Max @ $T_A = +25^\circ C$
60V	1.4Ω @ $V_{GS} = 10V$	0.41A
	1.6Ω @ $V_{GS} = 4.5V$	0.38A

## 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

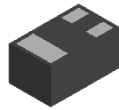
## Features and Benefits

- Footprint of just 0.6mm<sup>2</sup> – thirteen times smaller than SOT23
- Low On-Resistance
- Low Gate Threshold Voltage
- Fast Switching Speed
- Ultra-Small Surface Mount Package
- ESD Protected Gate 200V
- **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**

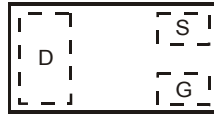
## Mechanical Data

- Case: X1-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<sup>(4)</sup>
- Weight: 0.001 grams (approximate)

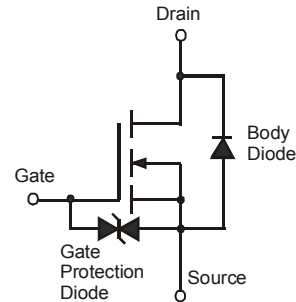
X1-DFN1006-3



Bottom View



Top View  
Internal Schematic



Equivalent Circuit

## Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN62D1SFB-7B	NH	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/quality/lead\\_free.html](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

DMN62D1SFB-7B



Top View  
Bar Denotes Gate and Source Side

NH = Product Type Marking Code

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5)	V <sub>GS</sub> = 10V	T <sub>A</sub> = +25°C	I <sub>D</sub>	0.41	A
		T <sub>A</sub> = +85°C		0.30	
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	2.64	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Power Dissipation (Note 5)			P <sub>D</sub>	0.47	W
Thermal Resistance, Junction to Ambient		@T <sub>A</sub> = +25°C	R <sub>θJA</sub>	258	°C/W
Operating and Storage Temperature Range			T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	100	nA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
				1		V <sub>GS</sub> = ±5V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.3	1.6	2.3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	1.40	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 40mA
				1.60		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 35mA
Forward Transfer Admittance	Y <sub>fs</sub>	100	—	—	mS	V <sub>DS</sub> = 5V, I <sub>D</sub> = 40mA
Diode Forward Voltage	V <sub>SD</sub>	—	0.7	1.1	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 300mA
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	40	80	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	3.5	7	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	2.8	5.6	pF	
Gate Resistance	R <sub>g</sub>	—	81.3	200	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	0.73	1.5	nC	V <sub>GS</sub> = 4.5V
Total Gate Charge	Q <sub>g</sub>	—	1.39	2.8	nC	V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	—	0.2	0.4	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.23	0.5	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	—	3.89	10	ns	V <sub>DS</sub> = 50V, I <sub>D</sub> = 1A V <sub>GS</sub> = 10V, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>r</sub>	—	4.93	10	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	—	18.80	40	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	11.96	25	ns	

- Notes:
5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
  6. Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to production testing.

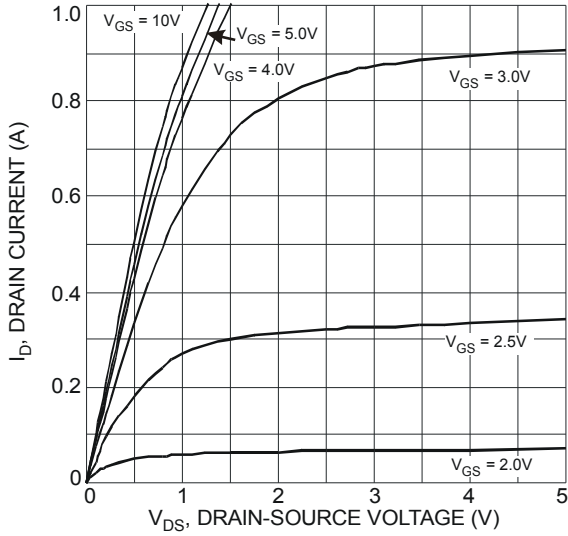


Fig. 1 Typical Output Characteristic

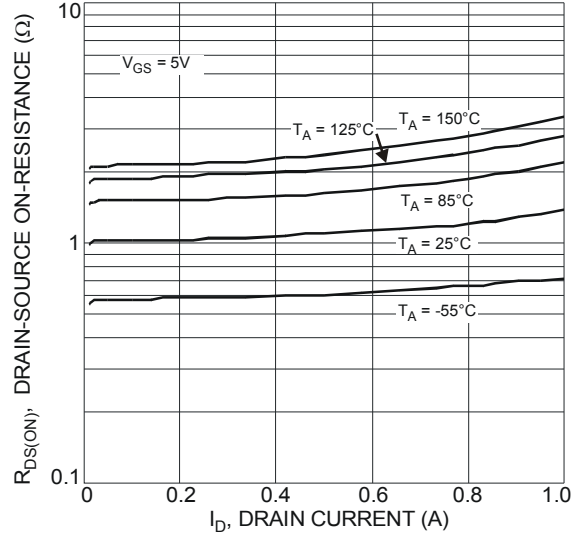


Fig. 2 Typical On-Resistance vs. Drain Current and Temperature

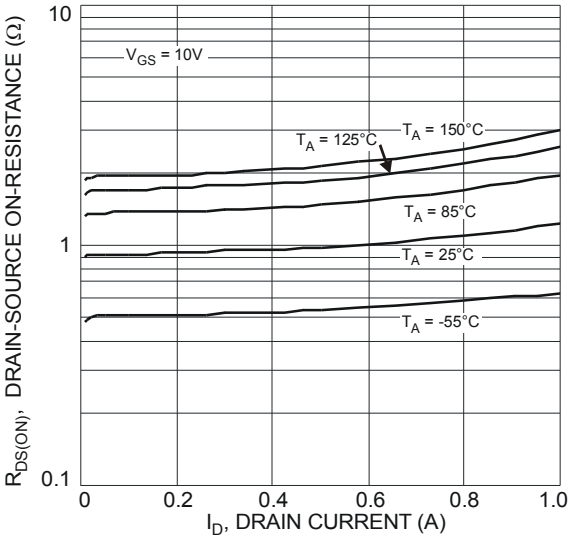


Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

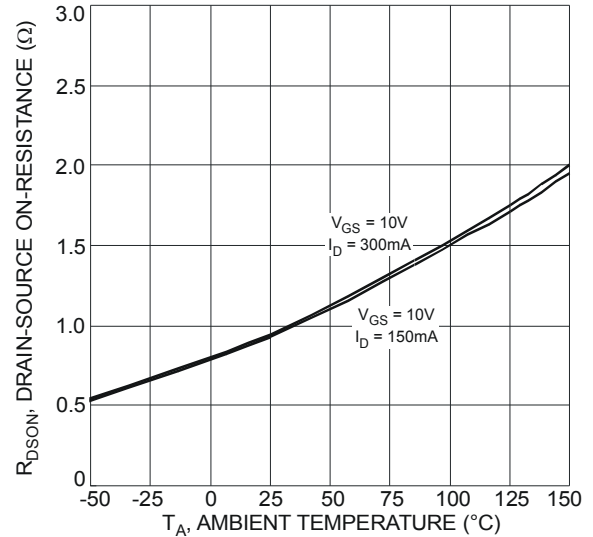


Fig. 4 On-Resistance Variation with Temperature

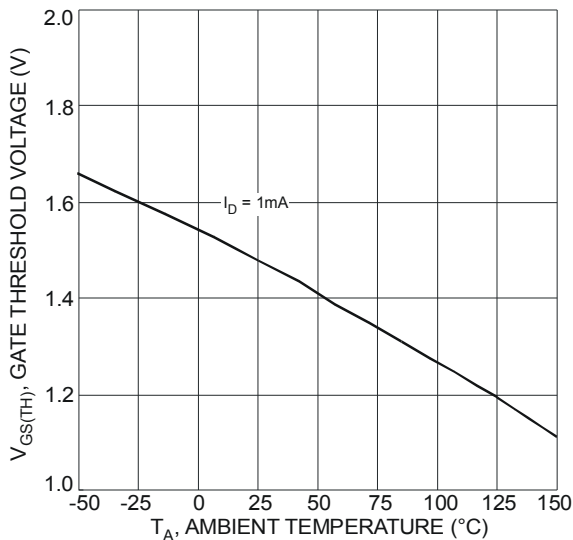


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

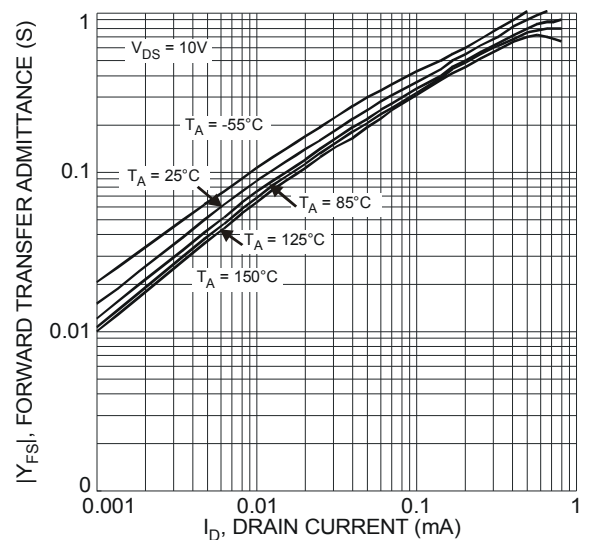


Fig. 6 Forward Transfer Admittance vs. Drain Current

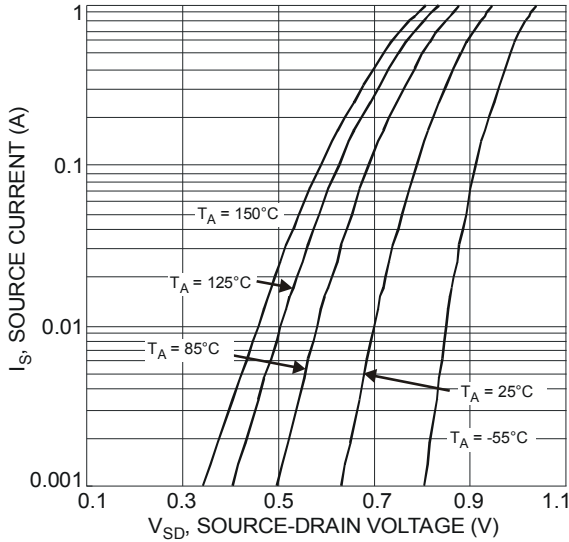


Fig. 7 Diode Forward Voltage vs. Current

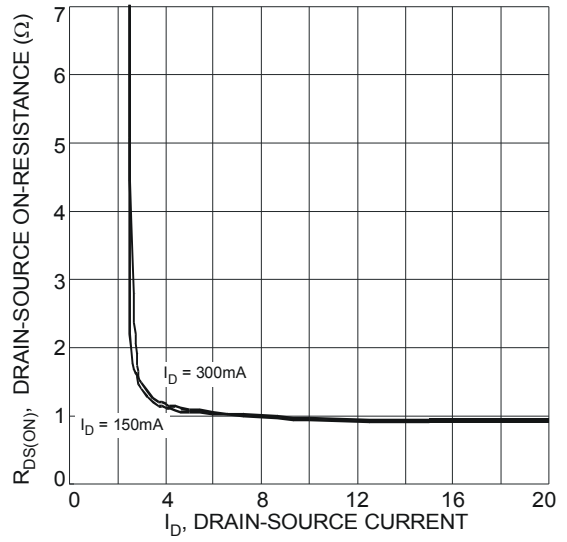


Fig. 8 On-Resistance vs. Drain-Source Current

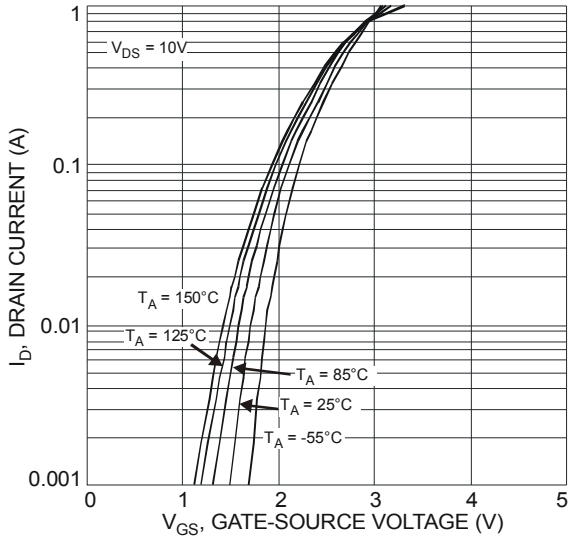


Fig. 9 Typical Transfer Characteristic

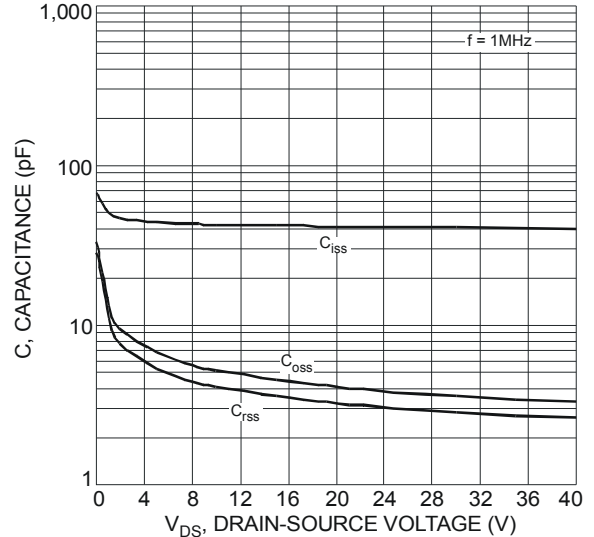


Fig. 10 Typical Total Capacitance

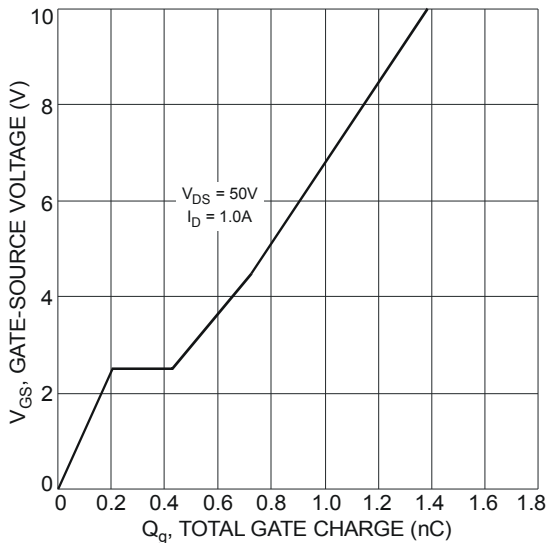


Fig. 11 Gate-Charge Characteristics

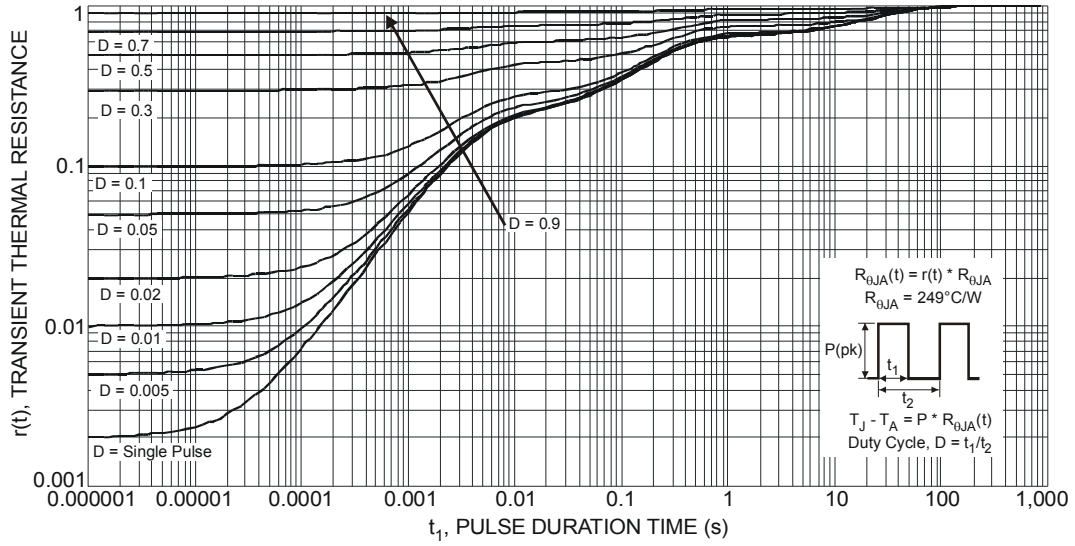
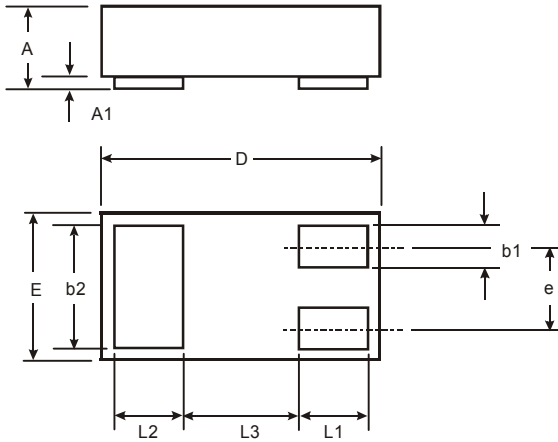


Fig. 12 Transient Thermal Response

**Package Outline Dimensions**

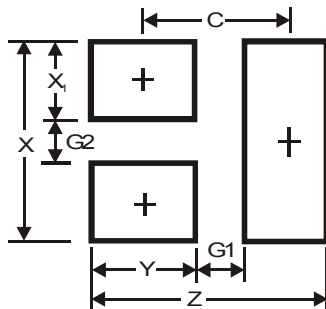
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



X1-DFN1006-3			
Dim	Min	Max	Typ
A	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
E	0.55	0.675	0.60
e	—	—	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**

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



Dimensions	Value (in mm)
Z	1.1
G1	0.3
G2	0.2
X	0.7
X1	0.25
Y	0.4
C	0.7

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