

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

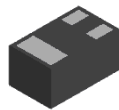
Features and Benefits

- Footprint of just 0.6mm² – 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**

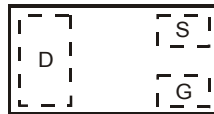
Mechanical Data

- 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⁽⁴⁾
- Weight: 0.001 grams (approximate)

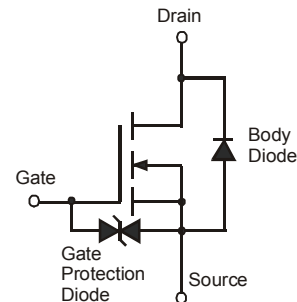
X1-DFN1006-3



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 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5)	$V_{GS} = 10\text{V}$	$T_A = +25^\circ\text{C}$	I_D	0.41	A
		$T_A = +85^\circ\text{C}$		0.30	
Pulsed Drain Current (Note 6)			I_{DM}	2.64	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Power Dissipation (Note 5)			P_D	0.47	W
Thermal Resistance, Junction to Ambient		@ $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	258	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range			T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	100	nA	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	10	μA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
				1		$V_{GS} = \pm 5\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1.3	1.6	2.3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	1.40	Ω	$V_{GS} = 10\text{V}, I_D = 40\text{mA}$
				1.60		$V_{GS} = 4.5\text{V}, I_D = 35\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	100	—	—	mS	$V_{DS} = 5\text{V}, I_D = 40\text{mA}$
Diode Forward Voltage	V_{SD}	—	0.7	1.1	V	$V_{GS} = 0\text{V}, I_S = 300\text{mA}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	40	80	pF	$V_{DS} = 40\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	3.5	7	pF	
Reverse Transfer Capacitance	C_{riss}	—	2.8	5.6	pF	
Gate Resistance	R_g	—	81.3	200	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	Q_g	—	0.73	1.5	nC	$V_{GS} = 4.5\text{V}$
Total Gate Charge	Q_g	—	1.39	2.8	nC	$V_{GS} = 10\text{V}$
Gate-Source Charge	Q_{gs}	—	0.2	0.4	nC	
Gate-Drain Charge	Q_{gd}	—	0.23	0.5	nC	
Turn-On Delay Time	$t_{D(on)}$	—	3.89	10	ns	$V_{DS} = 50\text{V}, I_D = 1\text{A}$
Turn-On Rise Time	t_r	—	4.93	10	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	18.80	40	ns	
Turn-Off Fall Time	t_f	—	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, 10 μs pulse duty cycle = 1%.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.

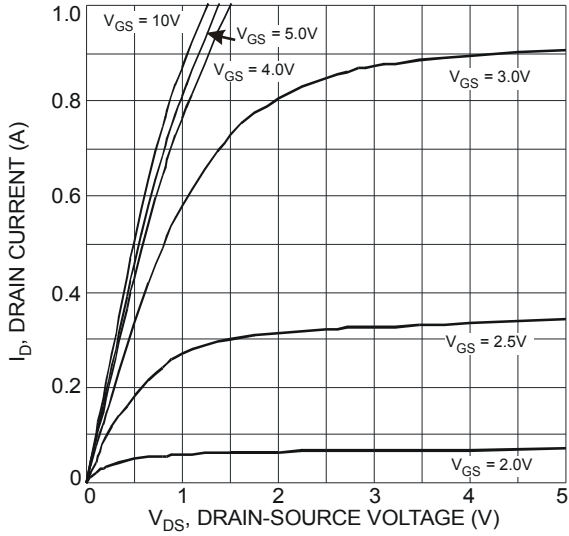


Fig. 1 Typical Output Characteristic

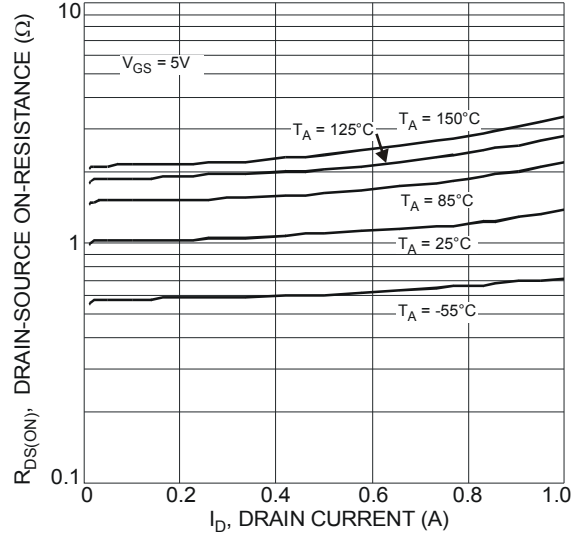


Fig. 2 Typical On-Resistance vs. Drain Current and Temperature

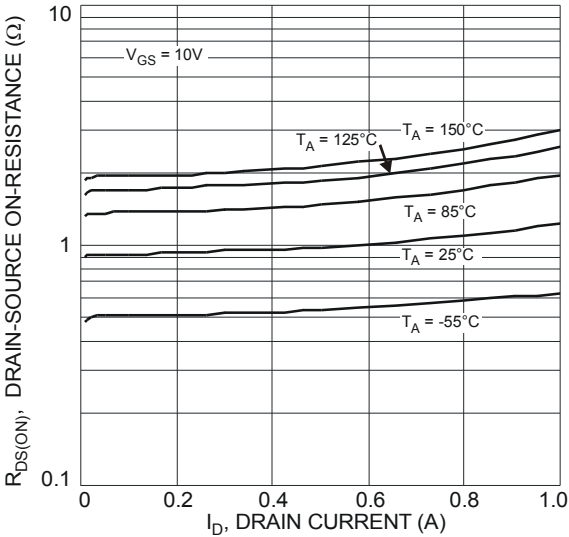


Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

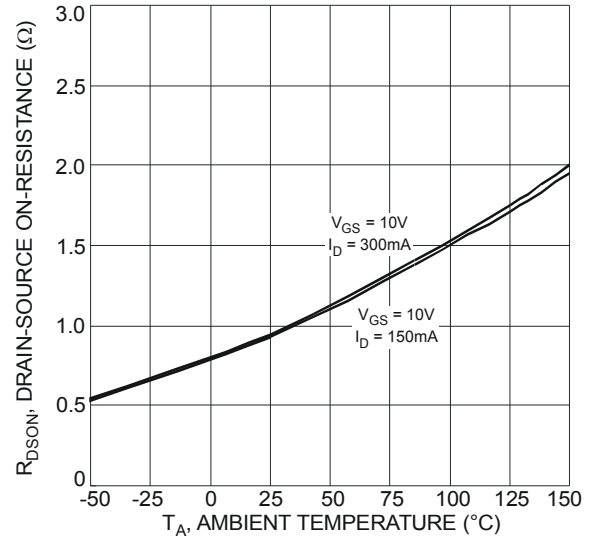


Fig. 4 On-Resistance Variation with Temperature

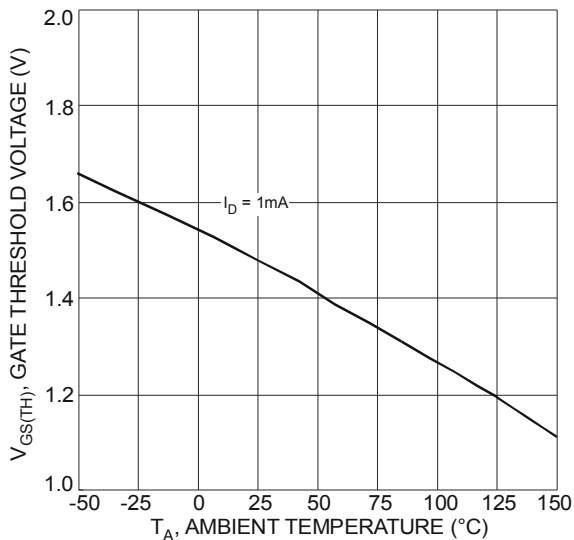


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

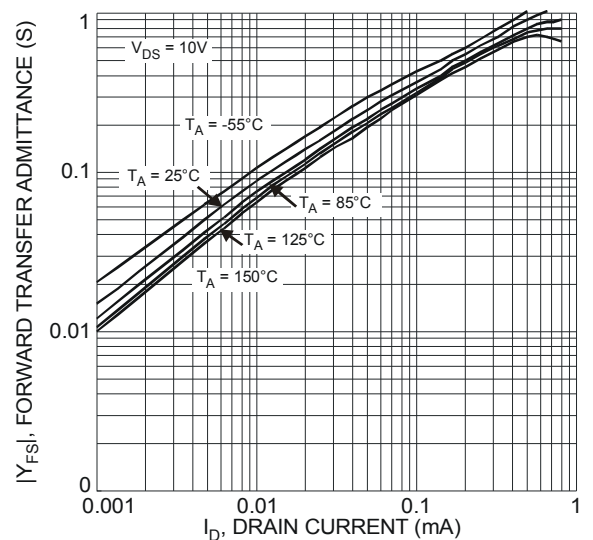


Fig. 6 Forward Transfer Admittance vs. Drain Current

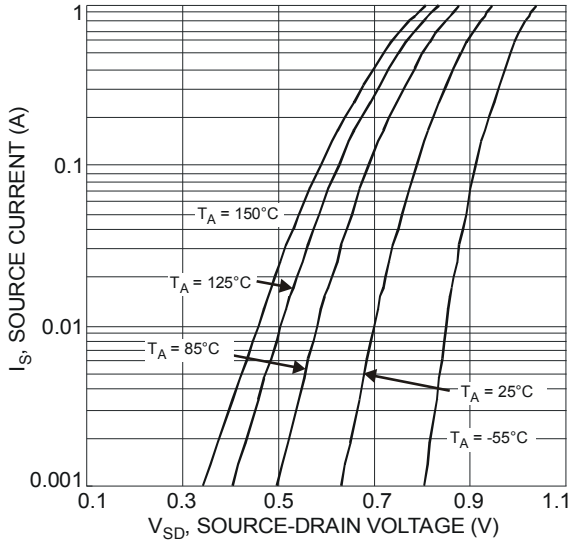


Fig. 7 Diode Forward Voltage vs. Current

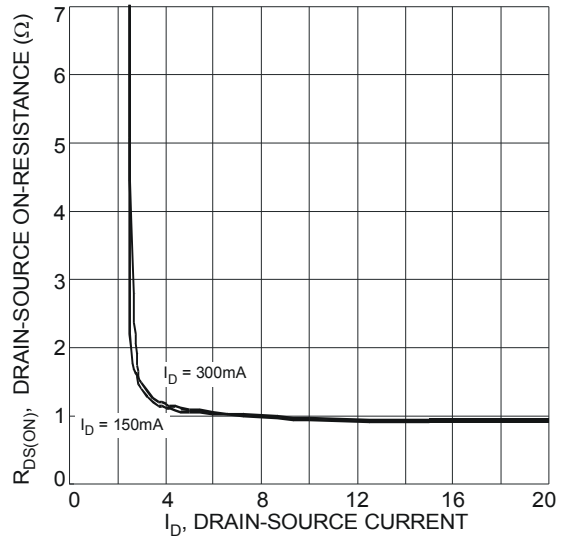


Fig. 8 On-Resistance vs. Drain-Source Current

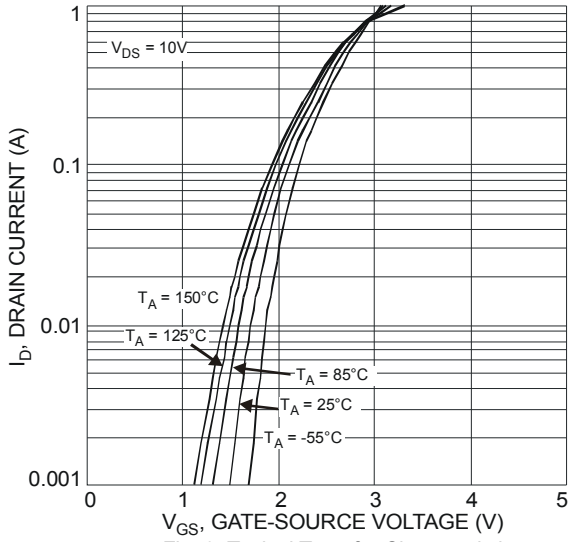


Fig. 9 Typical Transfer Characteristic

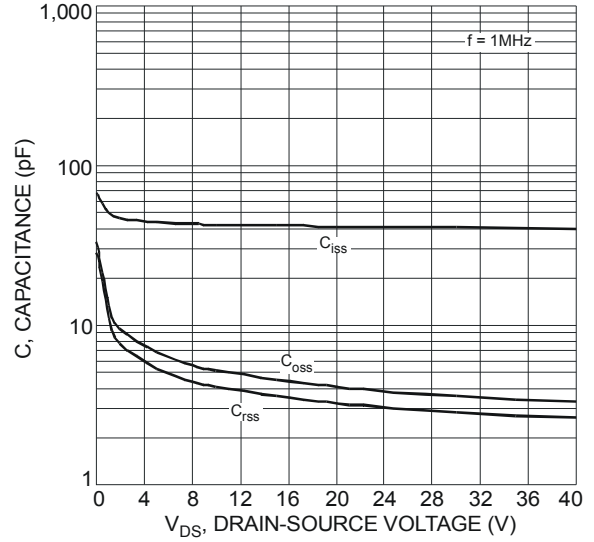


Fig. 10 Typical Total Capacitance

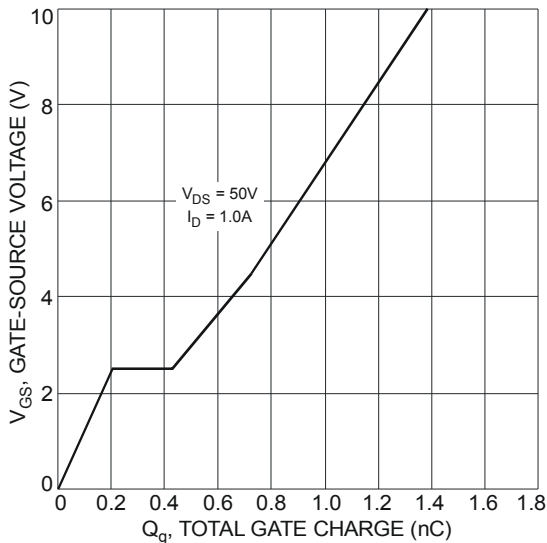


Fig. 11 Gate-Charge Characteristics

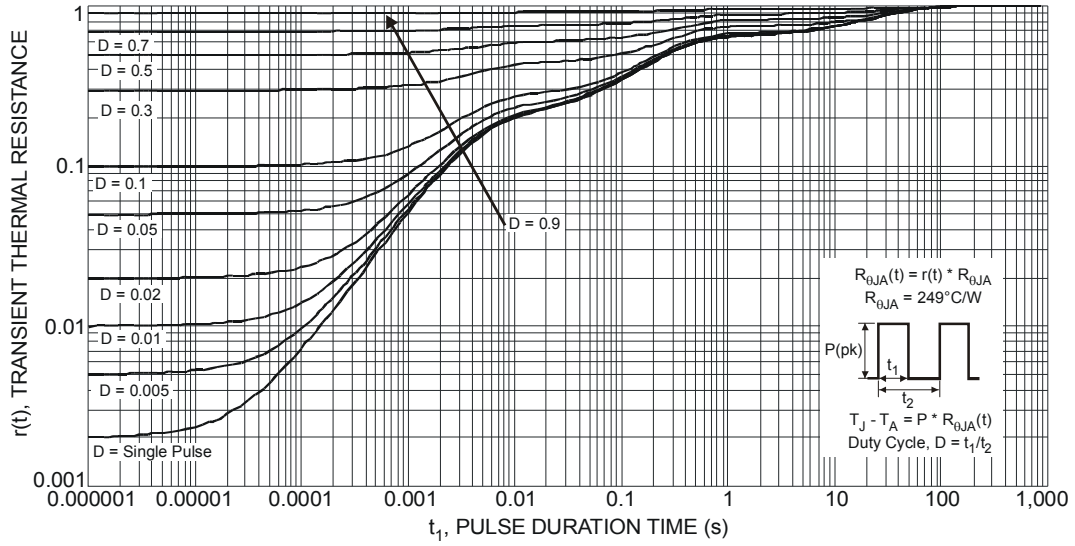
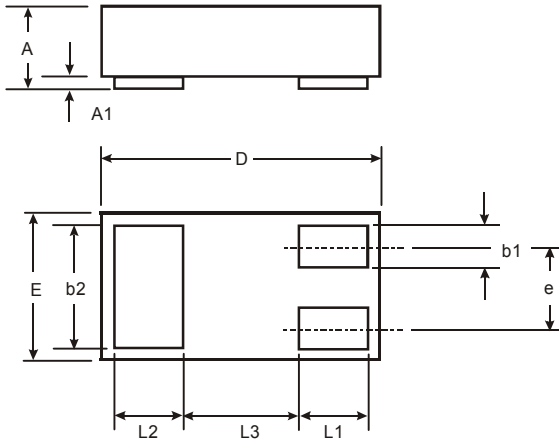


Fig. 12 Transient Thermal Response

Package Outline Dimensions

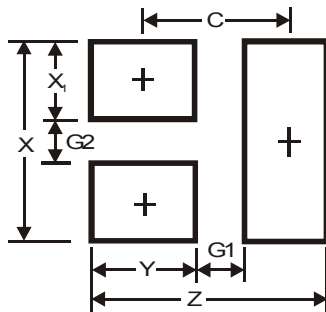
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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