

Product Summary

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

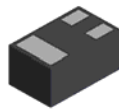
Features and Benefits

- 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**

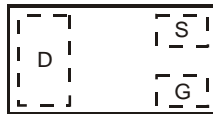
Mechanical Data

- 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)

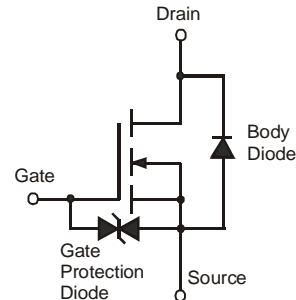
X1-DFN1006-3



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°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} = 10V	T _A = +25°C T _A = +85°C	I _D	0.41 0.30	A
Pulsed Drain Current (Note 6)			I _{DM}	2.64	A

Thermal Characteristics (@T_A = +25°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°C	R _{θJA}	258	°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	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	100	nA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	10	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	1.3	1.6	2.3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(on)}	—	—	1.40	Ω	V _{GS} = 10V, I _D = 40mA
				1.60		V _{GS} = 4.5V, I _D = 35mA
Forward Transfer Admittance	Y _{fs}	100	—	—	mS	V _{DS} = 5V, I _D = 40mA
Diode Forward Voltage	V _{SD}	—	0.7	1.1	V	V _{GS} = 0V, I _S = 300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	40	80	pF	V _{DS} = 40V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	3.5	7	pF	
Reverse Transfer Capacitance	C _{rss}	—	2.8	5.6	pF	
Gate Resistance	R _g	—	81.3	200	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	0.73	1.5	nC	V _{GS} = 4.5V, V _{DS} = 50V, I _D = 1A
Total Gate Charge	Q _g	—	1.39	2.8	nC	
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} = 50V, I _D = 1A V _{GS} = 10V, R _G = 6Ω
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:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
 - Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

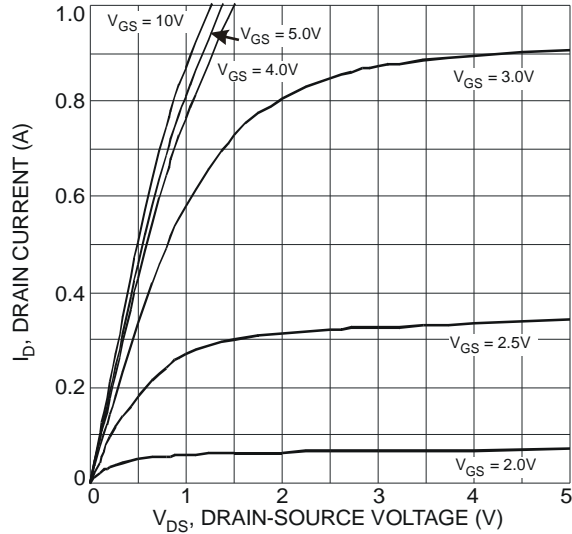


Fig. 1 Typical Output Characteristic

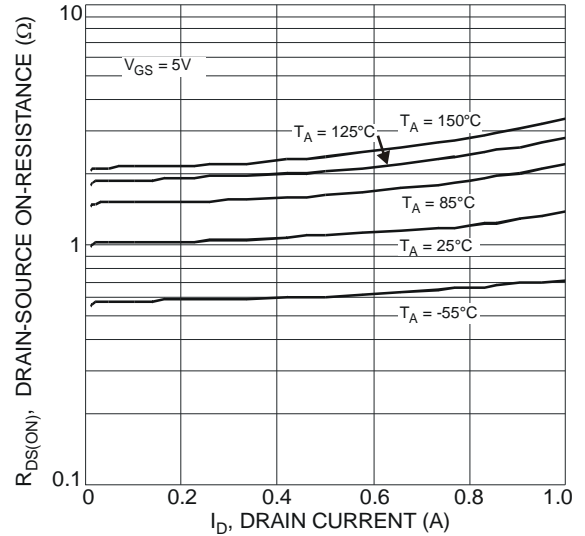


Fig. 2 Typical On-Resistance vs. Drain Current and Temperature

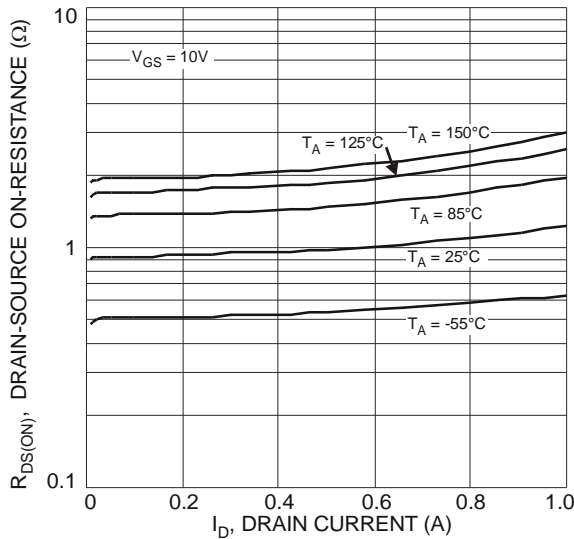


Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

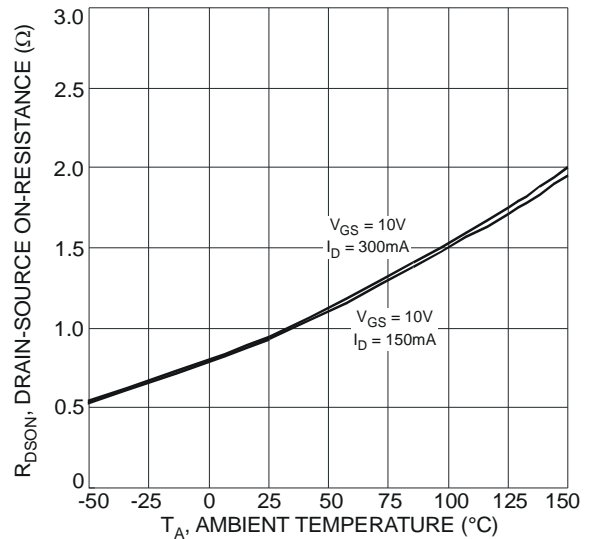


Fig. 4 On-Resistance Variation with Temperature

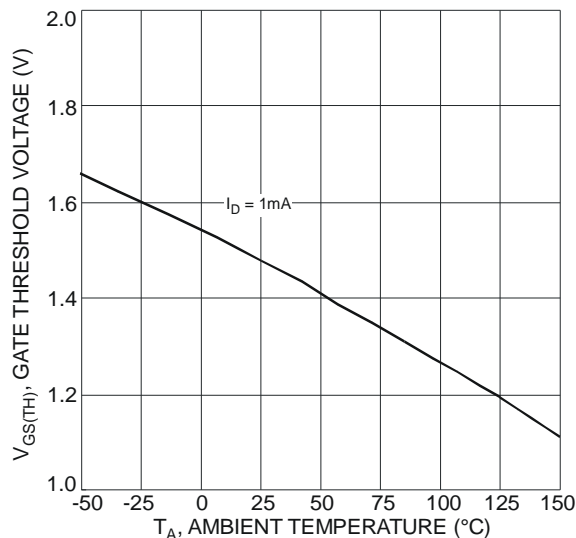


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

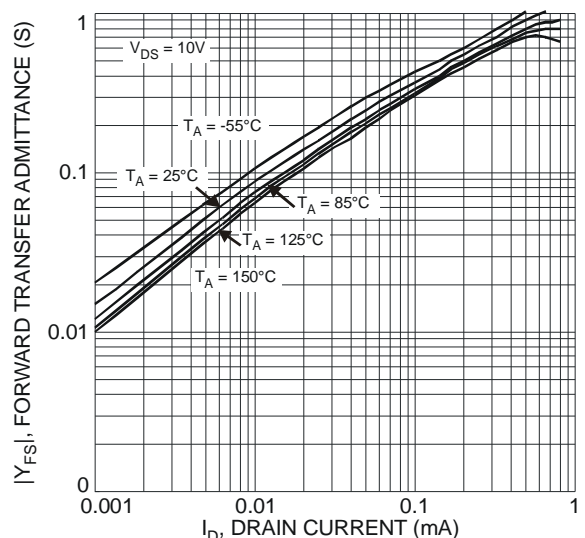


Fig. 6 Forward Transfer Admittance vs. Drain Current

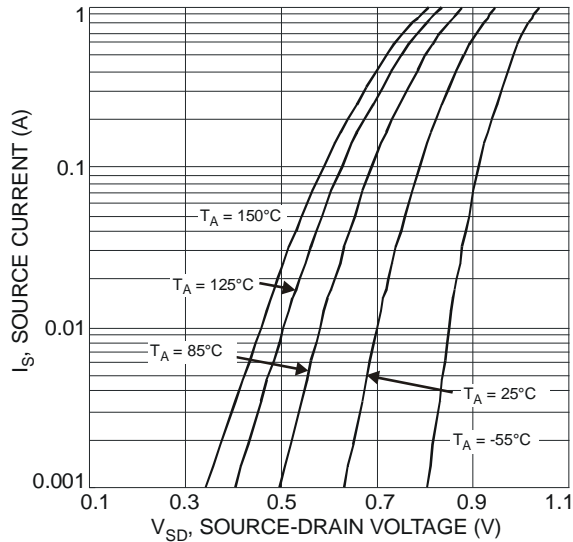


Fig. 7 Diode Forward Voltage vs. Current

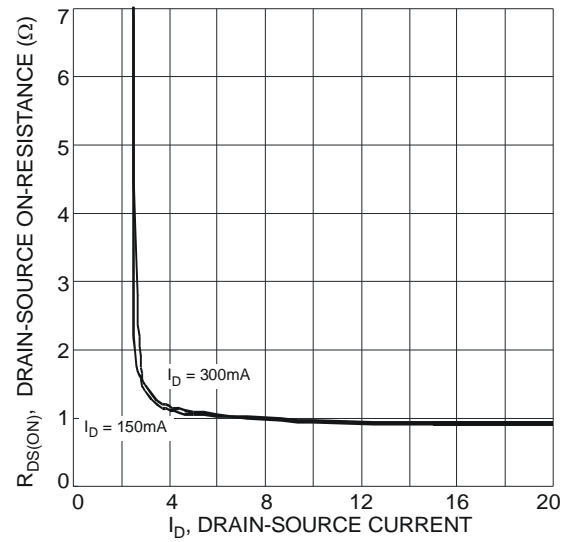


Fig. 8 On-Resistance vs. Drain-Source Current

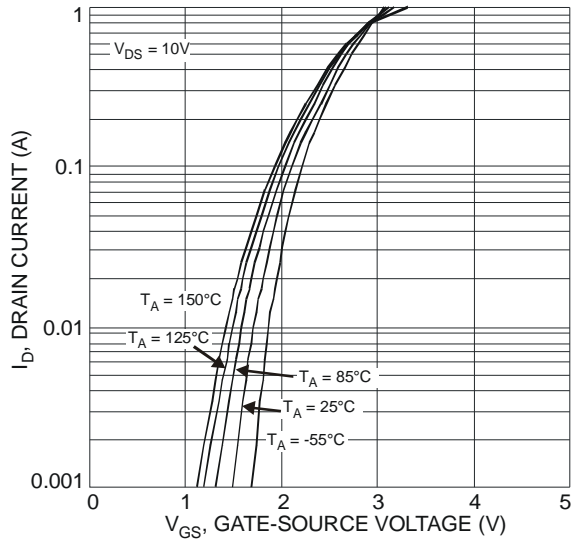


Fig. 9 Typical Transfer Characteristic

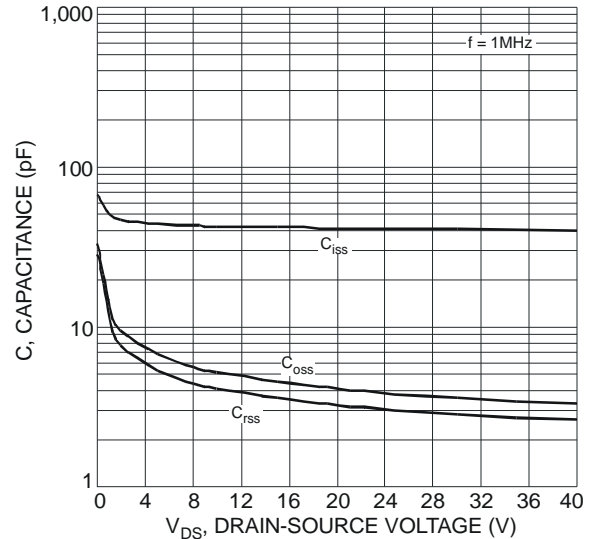


Fig. 10 Typical Total Capacitance

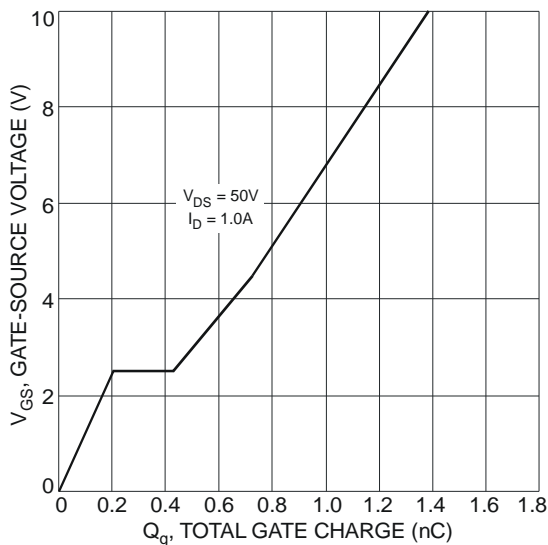
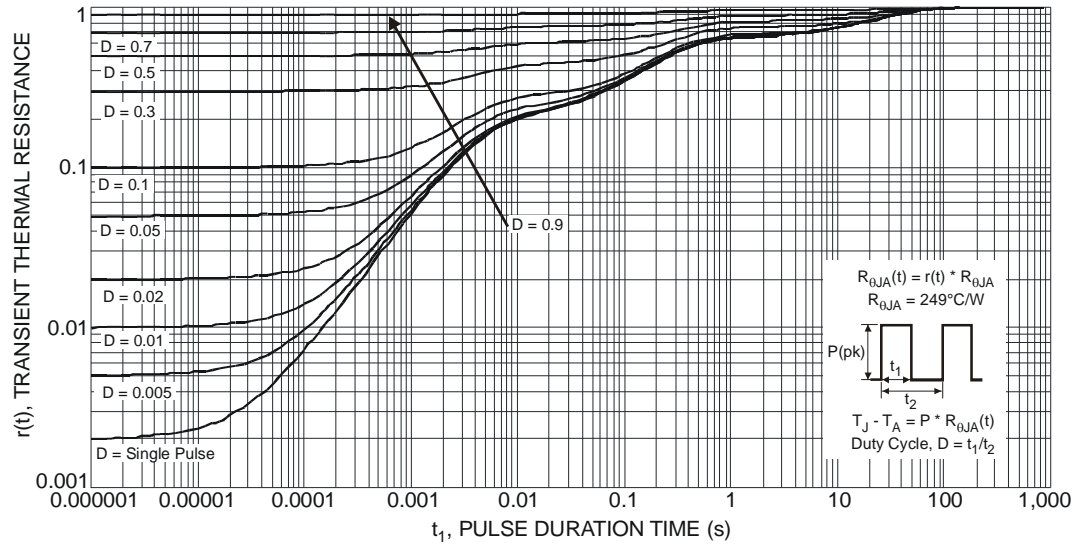
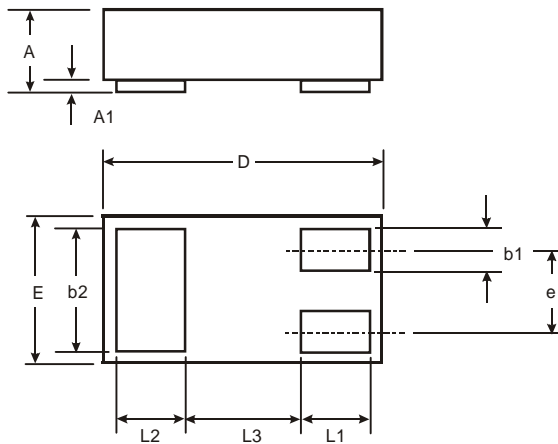


Fig. 11 Gate-Charge Characteristics



Package Outline Dimensions

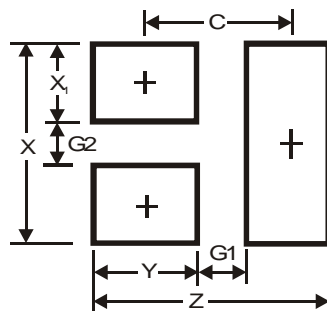
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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