

**N-CHANNEL ENHANCEMENT MODE MOSFET**

### Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
60V	2Ω @ V <sub>GS</sub> = 4V	320mA
	2.5Ω @ V <sub>GS</sub> = 2.5V	50mA

### Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- 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**

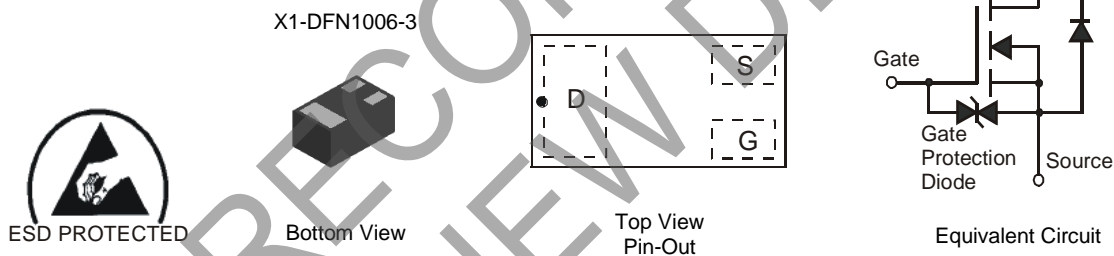
### Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

### 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)



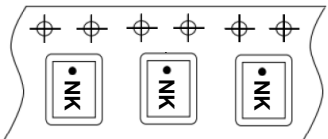
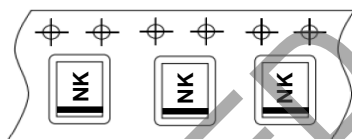

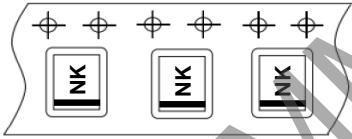


### Ordering Information (Note 4)

Product	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DMN62D0LFB-7	NK	7	8	3,000
DMN62D0LFB-7B	NK	7	8	10,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

DMN62D0LFB-7	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Top View Dot Denotes Drain Side</p> </div> <div style="text-align: center;"> <p>From date code 1527 (YYWW), this changes to:</p>  <p>Top View Bar Denotes Gate and Source Side</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div>
DMN62D0LFB-7B	<div style="text-align: center;">  <p>Top View Bar Denotes Gate and Source Side</p> </div> <p style="text-align: center; margin-top: 10px;">NK = Part Marking Code</p> <div style="text-align: center; margin-top: 10px;">  </div>

## 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> = 4.0V	I <sub>D</sub>	Steady State	T <sub>A</sub> = +25°C
		T <sub>A</sub> = +70°C	320 75
Pulsed Drain Current (Note 6)	I <sub>DM</sub>	1	A

## Thermal Characteristics

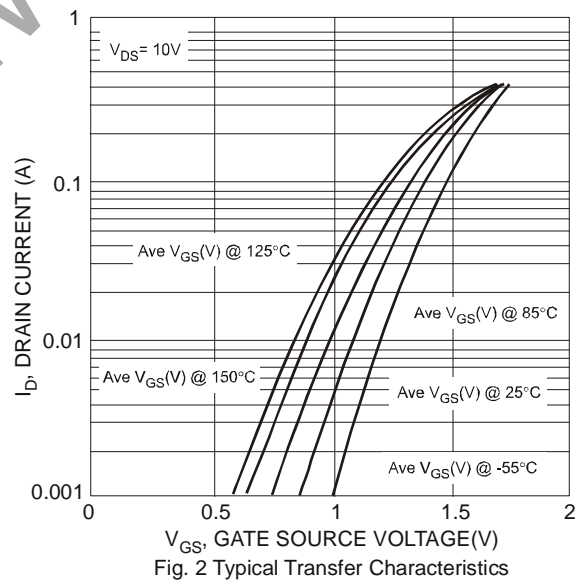
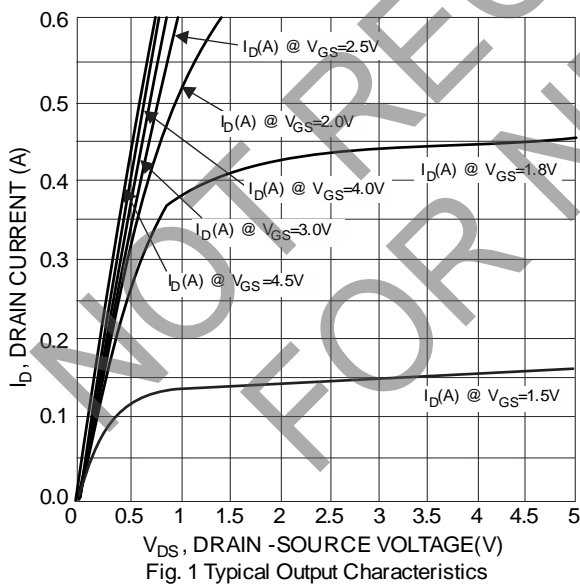
Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	0.5	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	258	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.  
6. Repetitive rating, pulse width limited by junction temperature.

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

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>	-	-	1.0	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±5V, V <sub>DS</sub> = 0V
		-	-	±500	nA	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V
		-	-	±2.0	μA	V <sub>GS</sub> = ±15V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.6	-	1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	1.3	2	Ω	V <sub>GS</sub> = 4V, I <sub>D</sub> = 100mA
		-	1.5	2.5		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 50mA
		-	1.9	3		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 50mA
		-	2.6	-		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 10mA
Forward Transfer Admittance	Y <sub>fs</sub>	-	0.8	-	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 200mA
Diode Forward Voltage	V <sub>SD</sub>	-	0.9	1.3	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	-	32	64	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	4.4	9		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	2.9	6		
Gate Resistance	R <sub>g</sub>	-	126	250	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	-	0.45	0.9	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 250mA
Gate-Source Charge	Q <sub>gs</sub>	-	0.08	0.2		
Gate-Drain Charge	Q <sub>gd</sub>	-	0.08	0.2		
Turn-On Delay Time	t <sub>D(ON)</sub>	-	3.4	10	ns	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 30V, R <sub>L</sub> = 150Ω, R <sub>g</sub> = 25Ω, I <sub>D</sub> = 200mA
Turn-On Rise Time	t <sub>R</sub>	-	3.4	10	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	-	26.4	45	ns	
Turn-Off Fall Time	t <sub>F</sub>	-	16.3	30	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to production testing.



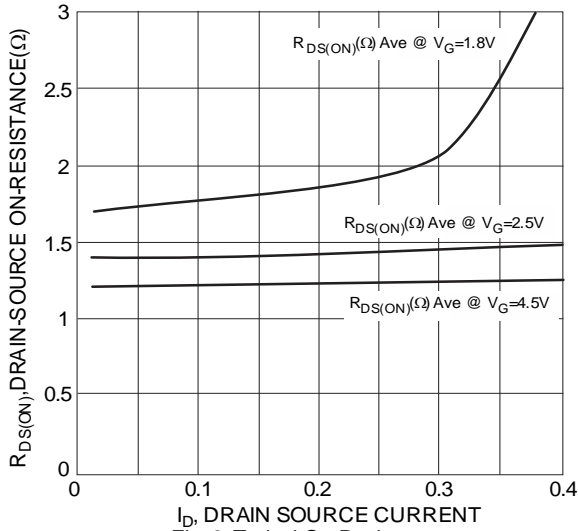


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

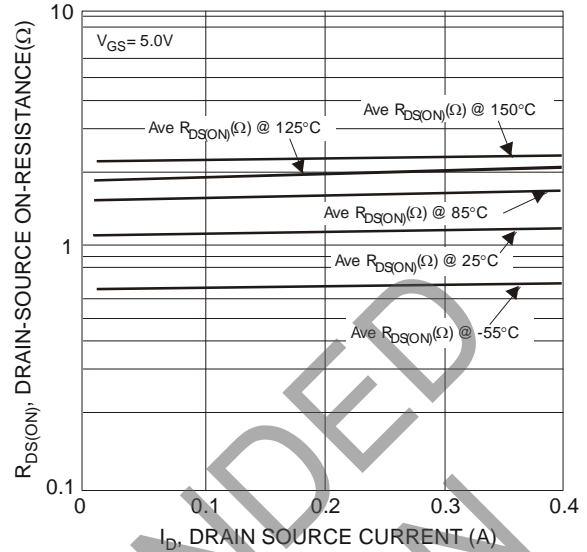


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

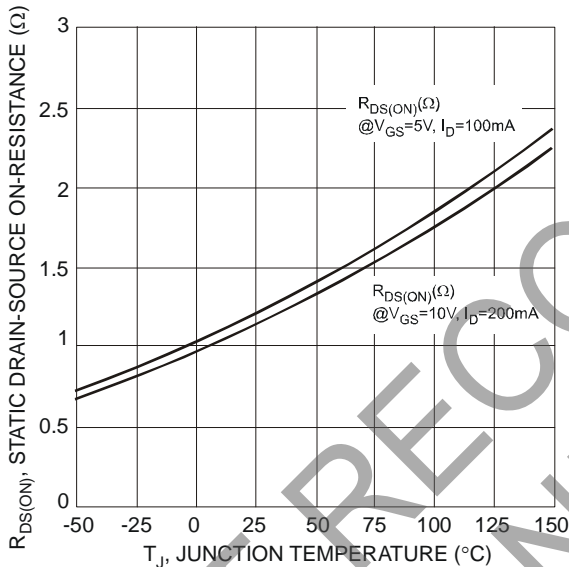


Fig. 5 On-Resistance Variation with Temperature

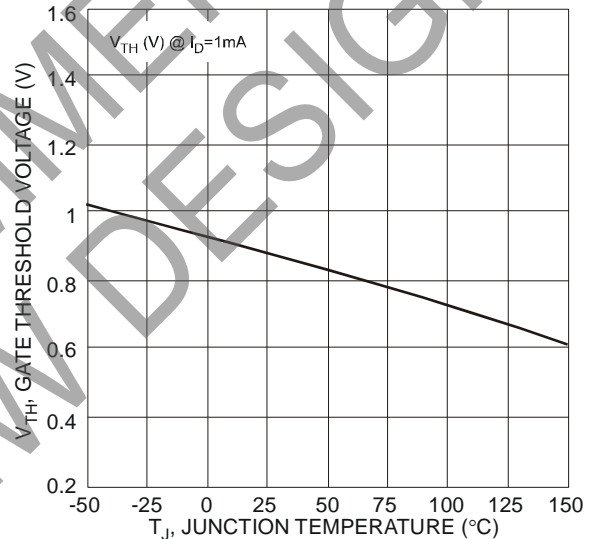


Fig. 6 Gate Threshold Variation vs. Junction Temperature

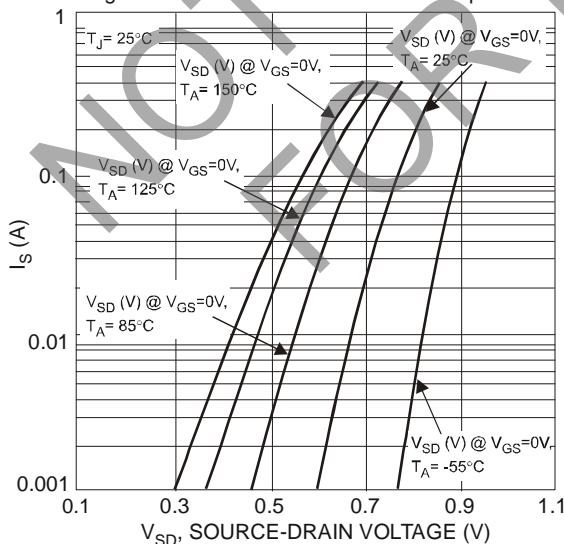


Fig. 7 Diodes Forward Voltage vs. Current

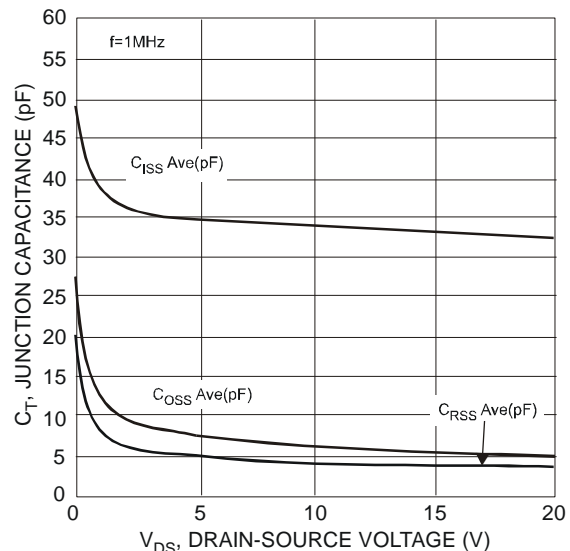


Fig. 8 Typical Junction Capacitance

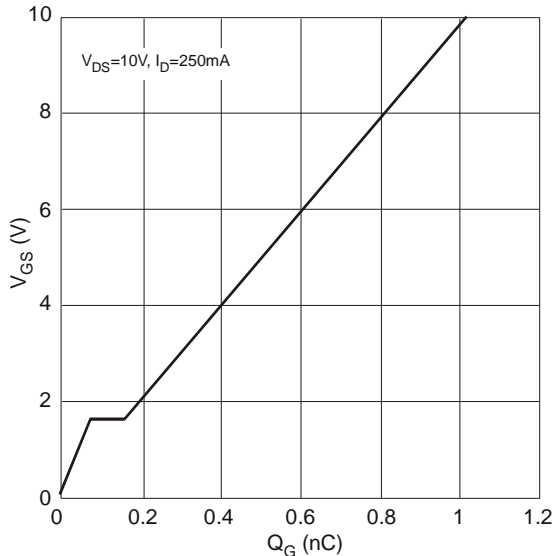


Fig. 9 Gate Charge Characteristics

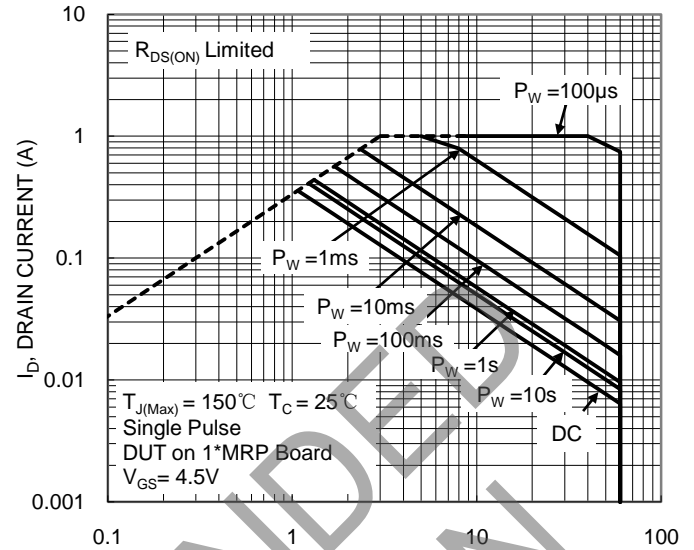


Fig. 10 SOA, Safe Operation Area

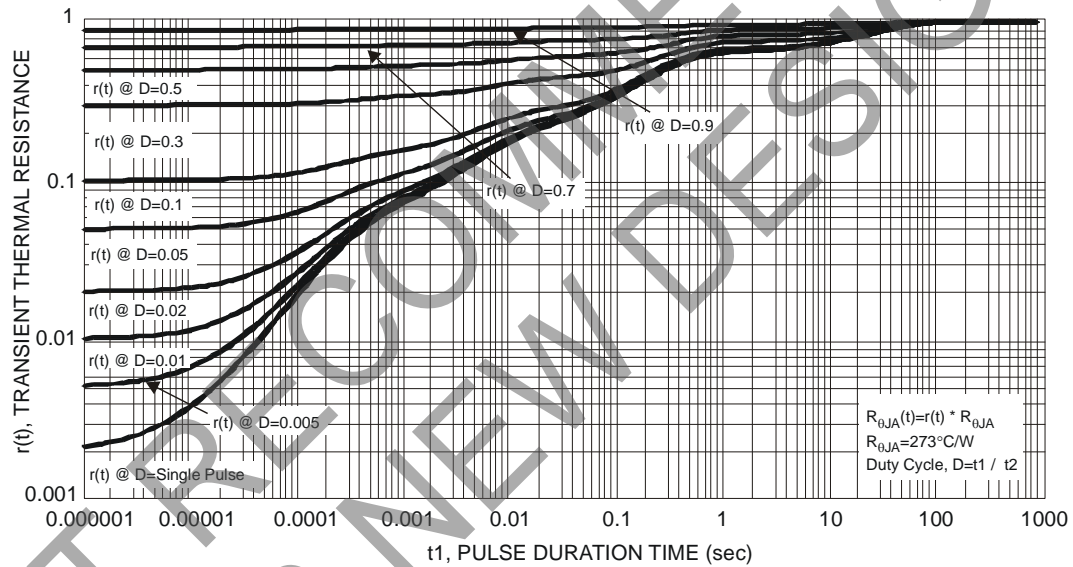
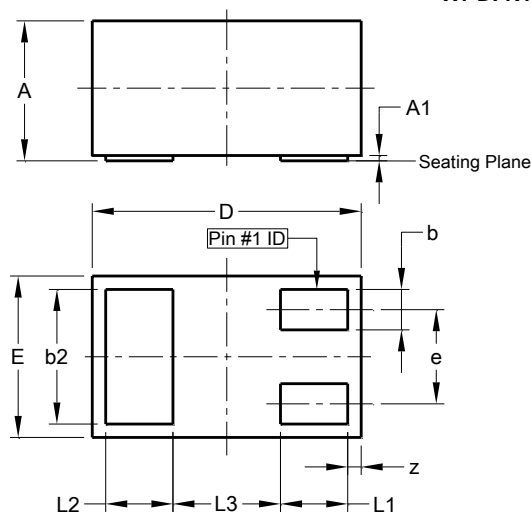


Fig. 11 Transient Thermal Resistance

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

X1-DFN1006-3

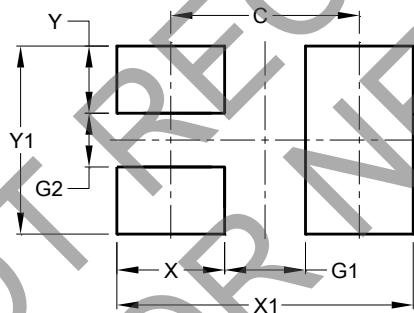


X1-DFN1006-3			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	-	-	0.40
z	0.02	0.08	0.05
All Dimensions in mm			

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

X1-DFN1006-3



Dimensions	Value (in mm)
C	0.70
G1	0.30
G2	0.20
X	0.40
X1	1.10
Y	0.25
Y1	0.70

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