

**N-CHANNEL ENHANCEMENT MODE MOSFET**
**Product Summary**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = 25^\circ C$
60V	$2\Omega @ V_{GS} = 4V$	100mA
	$2.5\Omega @ V_{GS} = 2.5V$	50mA

**Description and Applications**

This new generation 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.

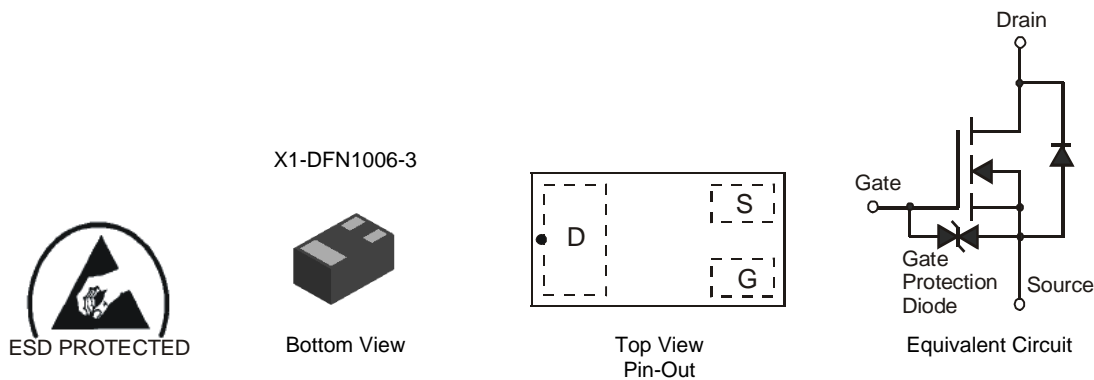
- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

**Features and Benefits**

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected**
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

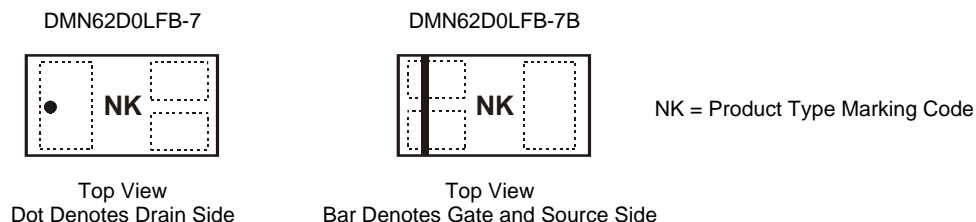
**Mechanical Data**

- 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
- Weight: 0.001 grams (approximate)


**Ordering Information (Note 3)**

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 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**


**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			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 4) $V_{GS} = 4.0\text{V}$	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	100	mA
		$T_A = 70^\circ\text{C}$		75	
Pulsed Drain Current (Note 5)			$I_{DM}$	200	mA

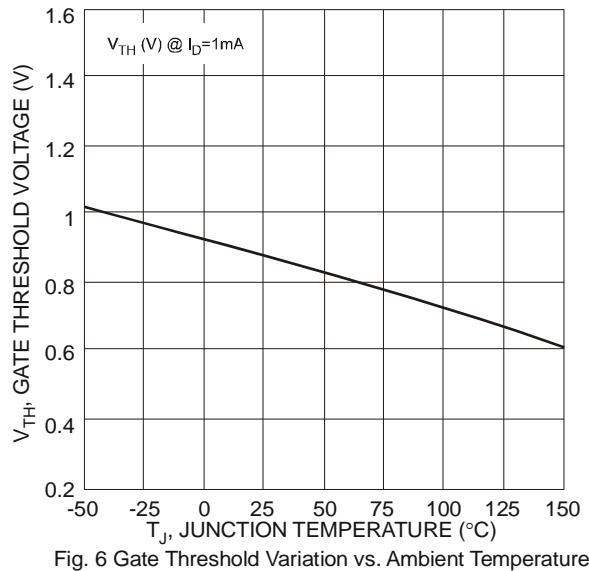
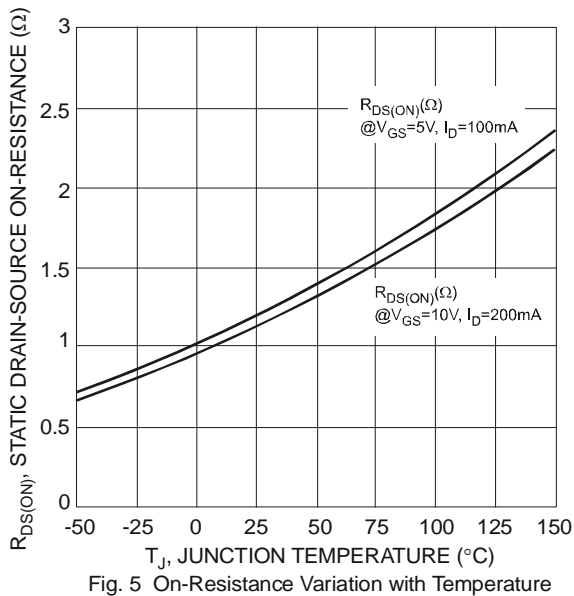
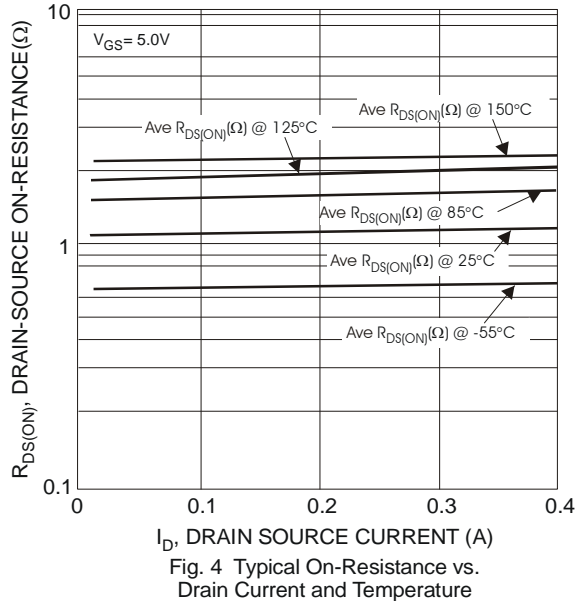
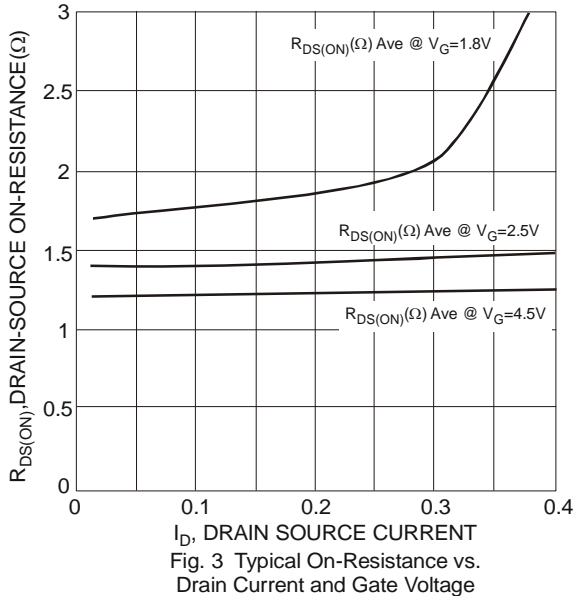
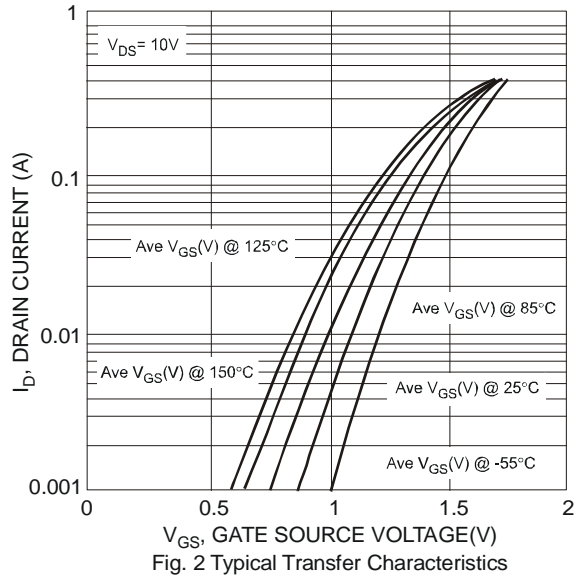
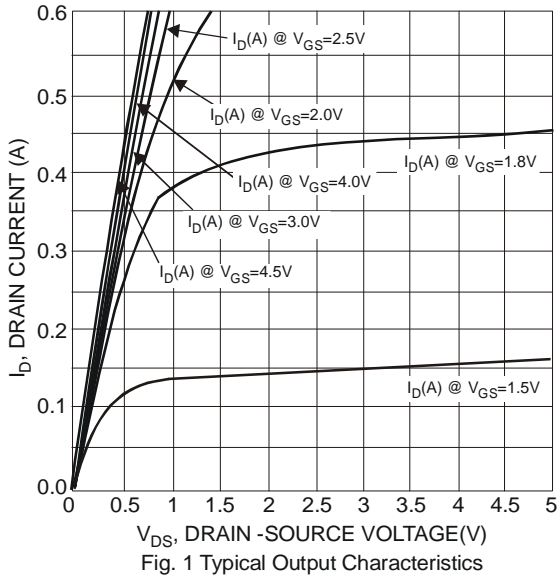
**Thermal Characteristics**

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 4)	$P_D$	0.47	W
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 4)	$R_{\theta JA}$	258	$^\circ\text{C/W}$
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 stated

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	-	-	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = 25^\circ\text{C}$	$I_{DSS}$	-	-	1.0	$\mu\text{A}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 5\text{V}, V_{DS} = 0\text{V}$
		-	-	$\pm 500$	nA	$V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$
		-	-	$\pm 2.0$	$\mu\text{A}$	$V_{GS} = \pm 15\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.6	-	1.0	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	1.3	2	$\Omega$	$V_{GS} = 4\text{V}, I_D = 100\text{mA}$
		-	1.5	2.5		$V_{GS} = 2.5\text{V}, I_D = 50\text{mA}$
		-	1.9	3		$V_{GS} = 1.8\text{V}, I_D = 50\text{mA}$
		-	2.6	-		$V_{GS} = 1.5\text{V}, I_D = 10\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	-	0.8	-	S	$V_{DS} = 10\text{V}, I_D = 200\text{mA}$
Diode Forward Voltage	$V_{SD}$	-	0.9	1.3	V	$V_{GS} = 0\text{V}, I_S = 115\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	$C_{iss}$	-	32	-	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	4.4	-		
Reverse Transfer Capacitance	$C_{rss}$	-	2.9	-		
Gate Resistance	$R_g$	-	126	-	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	$Q_g$	-	0.45	-	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 250\text{mA}$
Gate-Source Charge	$Q_{gs}$	-	0.08	-		
Gate-Drain Charge	$Q_{gd}$	-	0.08	-		
Turn-On Delay Time	$t_{D(on)}$	-	3.4	-	ns	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}, R_L = 150\Omega, R_G = 25\Omega, I_D = 200\text{mA}$
Turn-On Rise Time	$t_r$	-	3.4	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	26.4	-	ns	
Turn-Off Fall Time	$t_f$	-	16.3	-	ns	

- Notes:
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
  - Repetitive rating, pulse width limited by junction temperature.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.



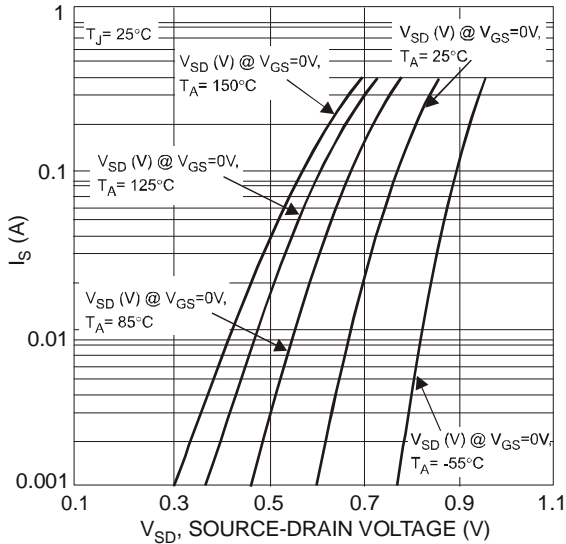


Fig. 7 Diodes Forward Voltage vs. Current

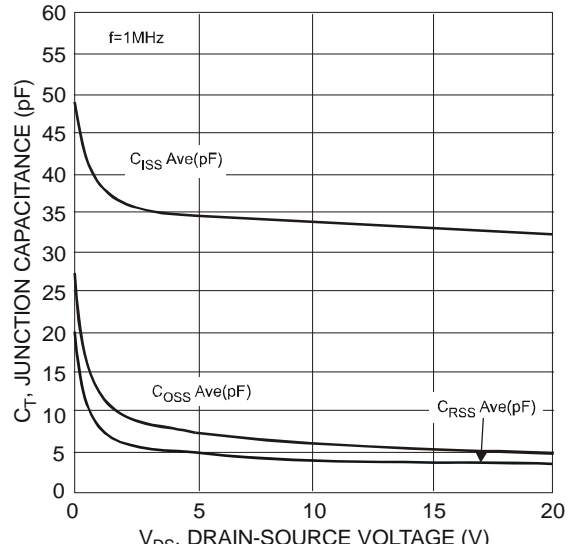


Fig. 8 Typical Junction Capacitance

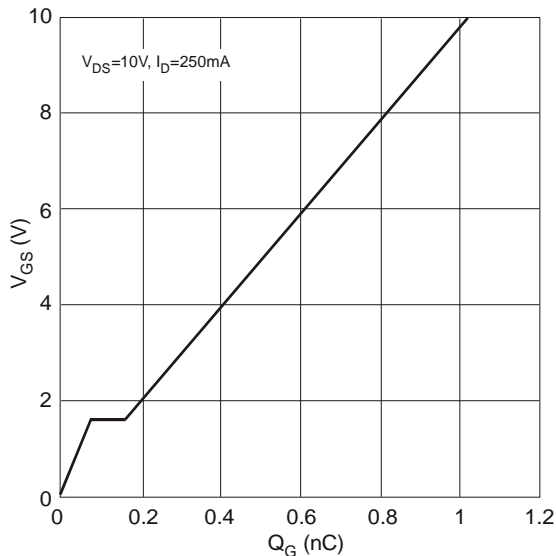


Fig. 9 Gate Charge Characteristics

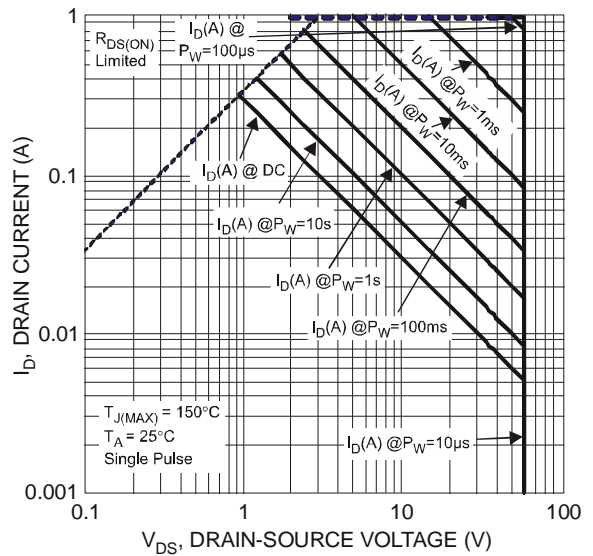


Fig. 10 SOA, Safe Operation Area

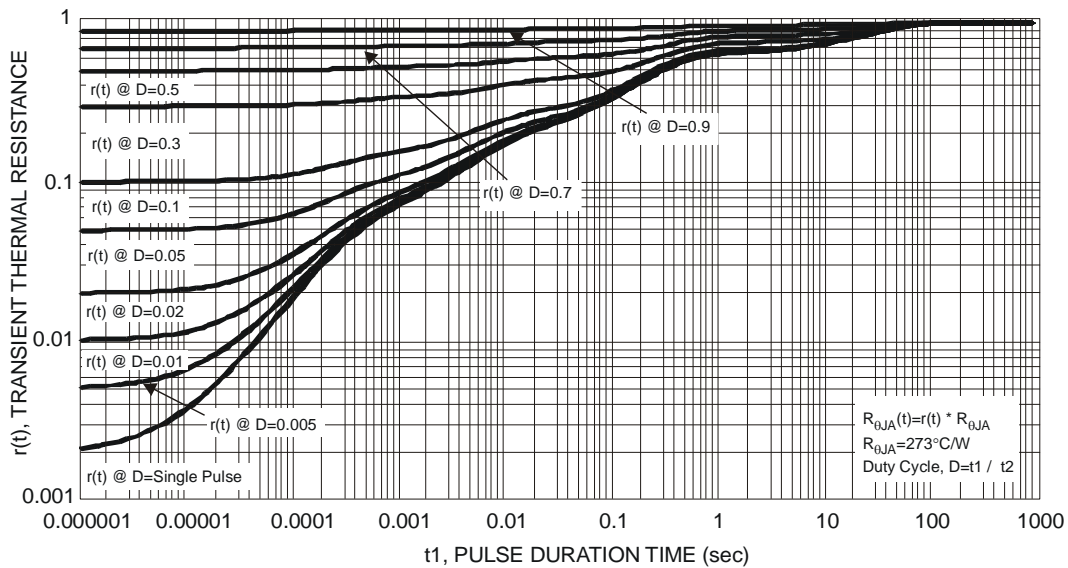
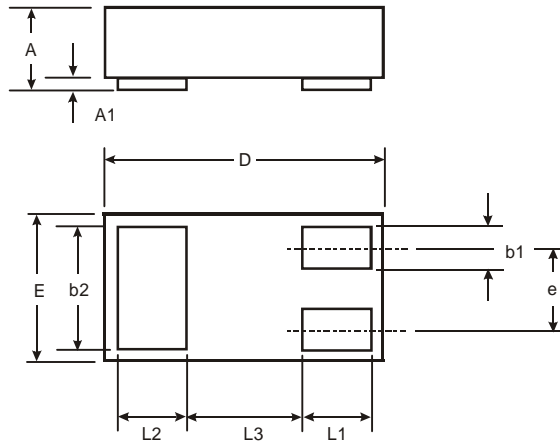


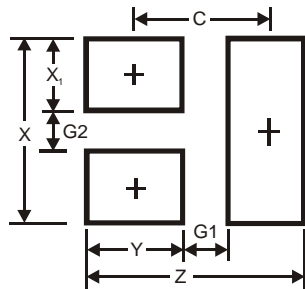
Fig. 11 Transient Thermal Resistance

**Package Outline Dimensions**



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**



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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