

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
-20V	5Ω @ V <sub>GS</sub> = -4.5V	-200mA
	7Ω @ V <sub>GS</sub> = -2.5V	-170mA
	10Ω @ V <sub>GS</sub> = -1.8V	-140mA
	15Ω @ V <sub>GS</sub> = -1.5V	-50mA

## Description

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

## Applications

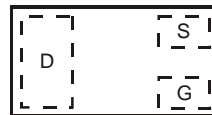
- DC-DC converters
- Power management functions

## Features and Benefits

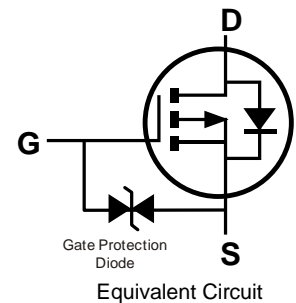
- P-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage V<sub>GS(TH)</sub>
- Low Input Capacitance
- Fast Switching Speed
- Ultra-Small Surfaced Mount Package
- Ultra-Low Package Profile, 0.4mm Maximum Package Height
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Package: X2-DFN1006-3
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208④
- Weight: 0.001 grams (Approximate)



Top View  
Internal Schematic



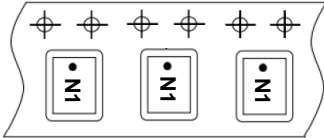
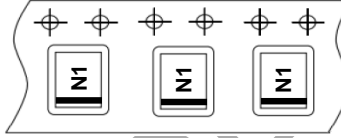

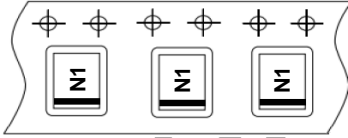


## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMP210DUFB4-7	X2-DFN1006-3	3,000	Tape & Reel
DMP210DUFB4-7B	X2-DFN1006-3	10,000	Tape & Reel

- 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**

<p><b>DMP210DUFB4-7</b></p>	<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: 20px;">   </div>
<p><b>DMP210DUFB4-7B</b></p>	<div style="text-align: center;">  <p>Top View Bar Denotes Gate and Source Side</p> </div> <div style="text-align: center; margin-top: 20px;">  </div> <p style="text-align: right; margin-top: 10px;">N1 = Part Marking Code</p>

NOT RECOMMENDED FOR NEW DESIGN

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-20	V
Gate-Source Voltage			V <sub>GSS</sub>	±10	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-200	mA
		T <sub>A</sub> = +70°C		-160	
Continuous Drain Current (Note 5) V <sub>GS</sub> = -1.8V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-140	mA
		T <sub>A</sub> = +70°C		-110	
Pulsed Drain Current			I <sub>DM</sub>	-600	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	350	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	357	°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</b> (Note 6)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-100	nA	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V	
		—	—	-50	nA	V <sub>DS</sub> = -5.0V, V <sub>GS</sub> = 0V	
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±5.0V, V <sub>DS</sub> = 0V	
		—	—	±1	μA	V <sub>GS</sub> = ±8.0V, V <sub>DS</sub> = 0V	
		—	—	±10	μA	V <sub>GS</sub> = ±10.0V, V <sub>DS</sub> = 0V	
<b>ON CHARACTERISTICS</b> (Note 6)							
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.5	—	-1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	
Gate Threshold Voltage (Note 7)	V <sub>GS(TH)</sub>	@T <sub>J</sub> = +25°C	-0.55	—	-1.05	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
		@T <sub>J</sub> = 0°C	-0.40	—	-0.90		
		@T <sub>J</sub> = +85°C	-0.35	—	-0.85		
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	5	Ω	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -100mA	
		—	—	7		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -50mA	
		—	—	10		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -20mA	
		—	—	15		V <sub>GS</sub> = -1.5V, I <sub>D</sub> = -10mA	
		—	—	20		V <sub>GS</sub> = -1.2V, I <sub>D</sub> = -1mA	
Forward Transfer Admittance	Y <sub>FS</sub>	—	200	—	mS	V <sub>DS</sub> = -10V, I <sub>D</sub> = -200mA	
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	-0.5	—	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -115mA	
<b>DYNAMIC CHARACTERISTICS</b> (Note 7)							
Input Capacitance	C <sub>iss</sub>	—	13.72	175	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V f = 1.0MHz	
Output Capacitance	C <sub>oss</sub>	—	4.01	30	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	2.34	20	pF		
<b>SWITCHING CHARACTERISTICS</b> (Note 7)							
Turn-On Delay Time	t <sub>D(ON)</sub>	—	7.7	—	ns	V <sub>GS</sub> = -4.5V, V <sub>DD</sub> = -15V I <sub>D</sub> = -180mA, R <sub>G</sub> = 2.0Ω	
Rise Time	t <sub>R</sub>	—	19.3	—			
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	25.9	—			
Fall Time	t <sub>F</sub>	—	31.5	—			

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

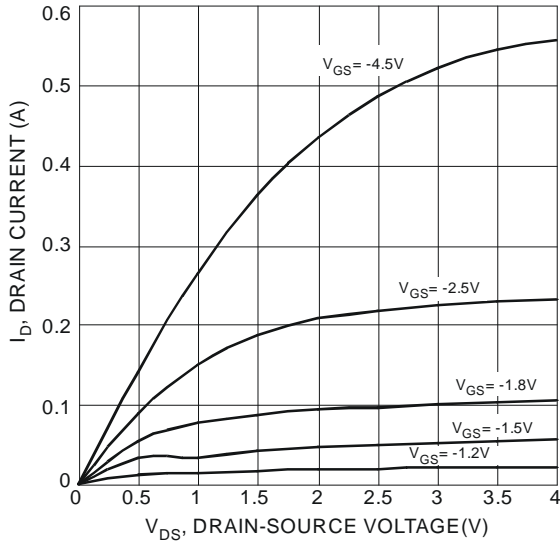


Fig. 1 Typical Output Characteristics

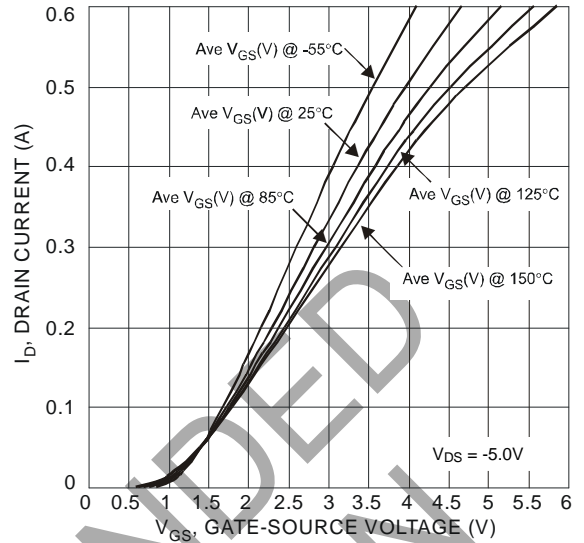


Fig. 2 Typical Transfer Characteristics

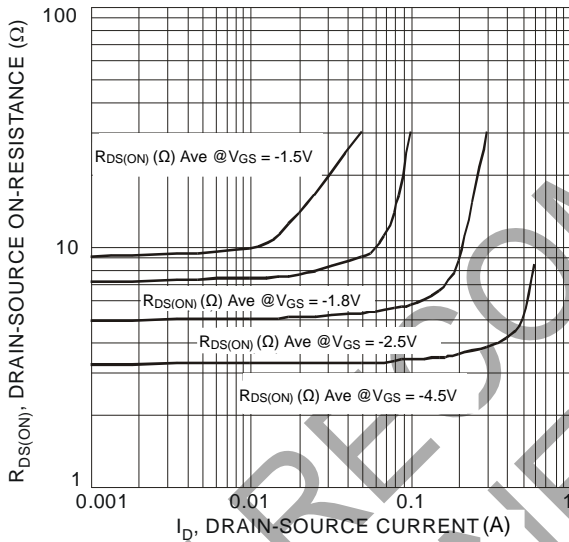


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

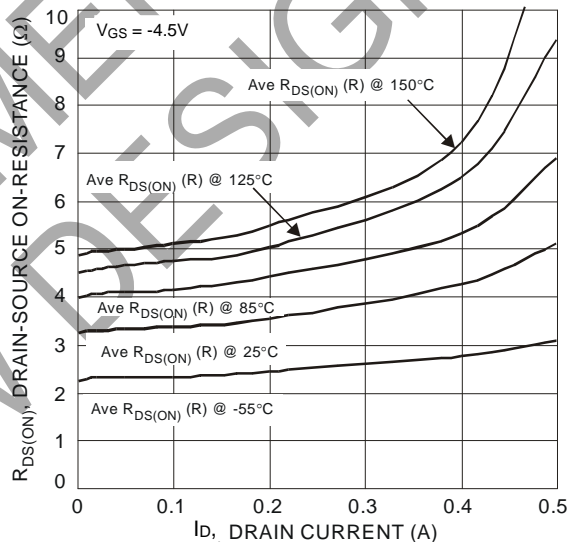


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

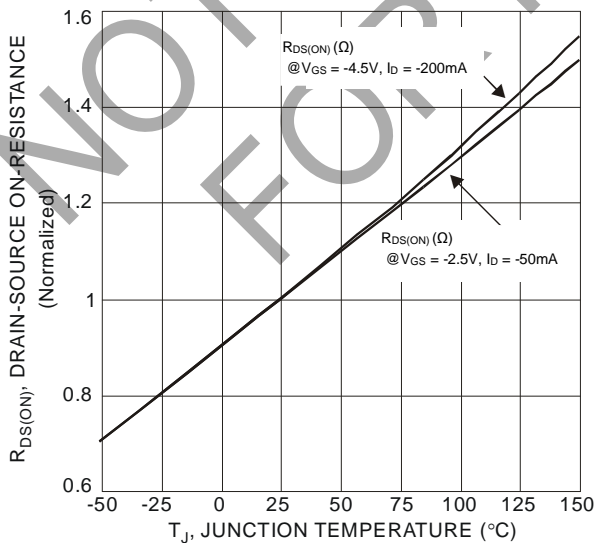


Fig. 5 On-Resistance Variation with Temperature

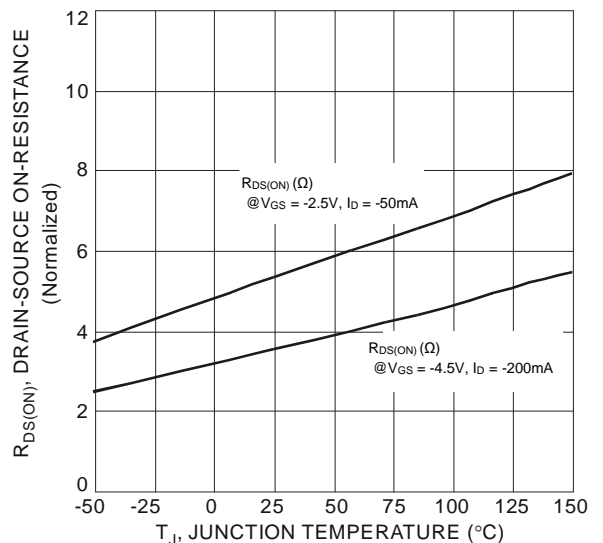


Fig. 6 On-Resistance vs. Temperature

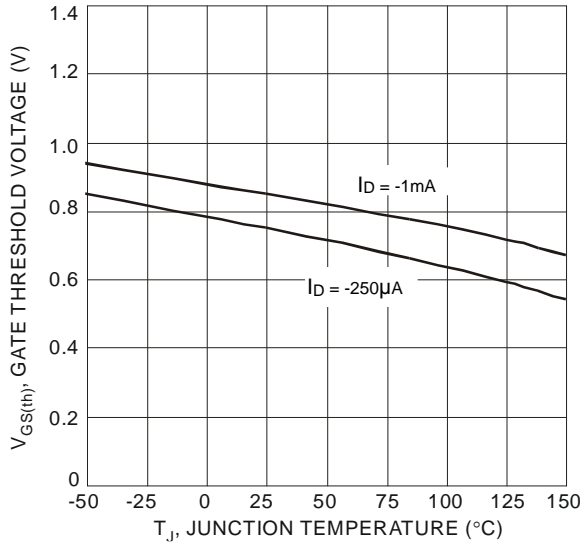


Fig. 7 Gate Threshold Variation vs. Junction Temperature

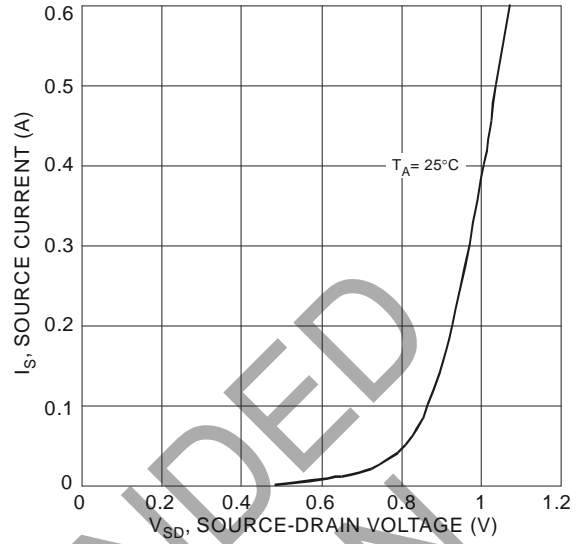


Fig. 8 Diode Forward Voltage vs. Current

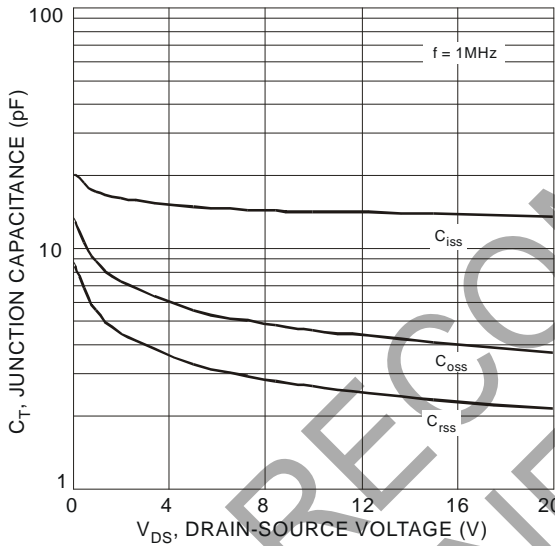


Fig. 9 Typical Junction Capacitance

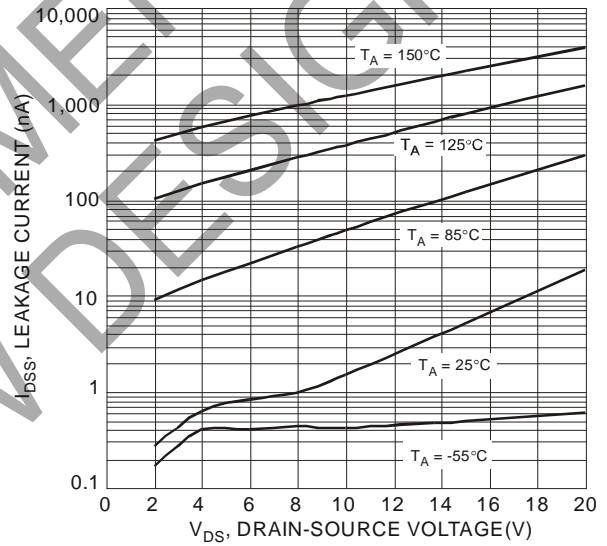


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

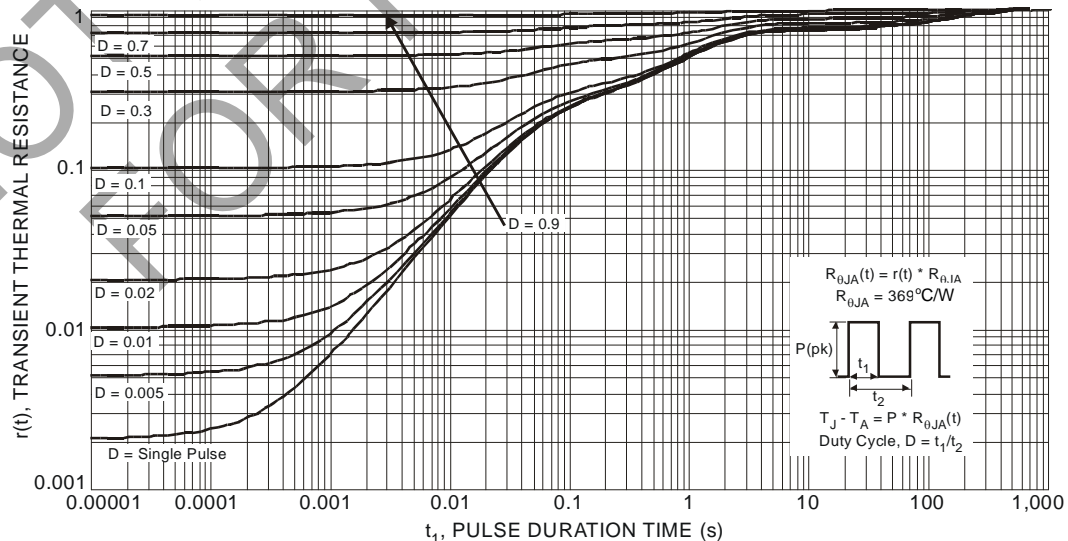
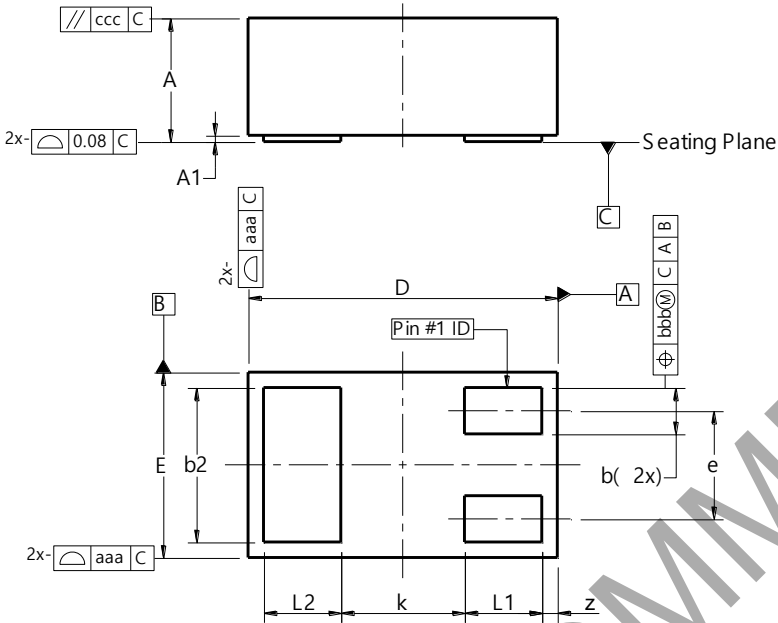


Fig. 11 Transient Thermal Response

**Package Outline Dimensions**

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

**X2-DFN1006-3**

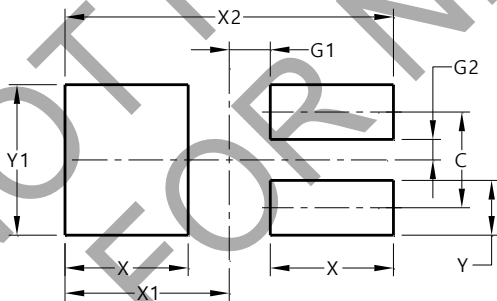


X2-DFN1006-3			
Dim	Min	Max	Typ
A	—	0.40	—
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
k	-	-	0.40
z	0.02	0.08	0.05
aaa	-	0.15	-
bbb	-	0.05	-
ccc	-	0.05	-
All Dimensions in mm			

**Suggested Pad Layout**

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

**X2-DFN1006-3**



Dimensions	Value (in mm)
C	0.350
G1	0.150
G2	0.075
X	0.450
X1	0.600
X2	1.200
Y	0.200
Y1	0.550

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