

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
20V	0.4Ω @ V _{GS} = 4.5V	1.0A
	0.5Ω @ V _{GS} = 2.5V	0.9A
	0.7Ω @ V _{GS} = 1.8V	0.8A

Description and Applications

This MOSFET is 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.

- Load Switch

Features and Benefits

- Footprint of just 0.6mm² – Thirteen Times Smaller than SOT23
- 0.4mm Profile – Ideal for Low Profile Applications
- Low Gate Threshold Voltage
- Fast Switching Speed
- ESD Protected Gate**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

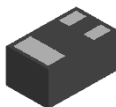
Mechanical Data

- Case: X2-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 (64)
- Weight: 0.001 grams (Approximate)

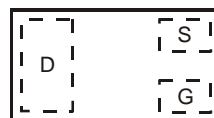


ESD Protected Gate

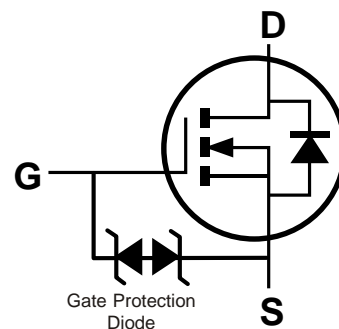
X2-DFN1006-3



Bottom View



Top View
Internal Schematic




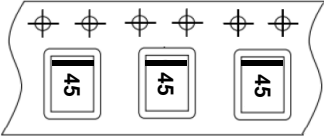

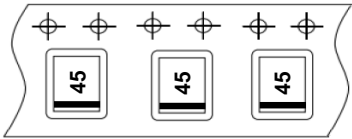
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Tape Pitch (mm)	Quantity per Reel
DMN2450UFB4-7B	45	7	8	2	10,000
DMN2450UFB4-7R	45	7	8	4	3,000

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

DMN2450UFB4-7R	 <p>Top View Bar Denotes Gate and Source Side</p> <p>45 = Part Marking Code</p> 
DMN2450UFB4-7B	 <p>Top View Bar Denotes Gate and Source Side</p> <p>45 = Part Marking Code</p> 

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	20	V
Gate-Source Voltage	V _{GSS}	±12	V
Continuous Drain Current (Note 6) V _{GS} = 4.5V	I _D	1.0	A
Steady State T _A = +25°C T _A = +70°C	I _D	0.8	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I _{DM}	3.0	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	0.5	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	225	°C/W
Total Power Dissipation (Note 6)	P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	129	°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}	20	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	100	nA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±1.0	μA	V _{GS} = ±4.5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	-	0.9	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	0.3	0.4	Ω	V _{GS} = 4.5V, I _D = 600mA
		-	0.4	0.5		V _{GS} = 2.5V, I _D = 500mA
		-	0.5	0.7		V _{GS} = 1.8V, I _D = 350mA
Diode Forward Voltage	V _{SD}	-	0.7	1.2	V	V _{GS} = 0V, I _S = 150mA,
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	-	56	-	pF	V _{DS} = 16V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	19	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	7.3	-	pF	
Gate Resistance	R _g	-	86	-	Ω	V _{DS} = 0V, V _{GS} = 0V,
Total Gate Charge (V _{GS} = 4.5V)	Q _g	-	0.6	-	nC	V _{DS} = 10V, I _D = 250mA
Total Gate Charge (V _{GS} = 10V)	Q _g	-	1.3	-	nC	
Gate-Source Charge	Q _{gs}	-	0.1	-	nC	
Gate-Drain Charge	Q _{gd}	-	0.16	-	nC	
Turn-On Delay Time	t _{d(ON)}	-	5.3	-	ns	V _{DD} = 10V, V _{GS} = 4.5V, R _L = 47Ω, R _g = 10Ω, I _D = 200mA
Turn-On Rise Time	t _R	-	2.6	-	ns	
Turn-Off Delay Time	t _{d(OFF)}	-	18.1	-	ns	
Turn-Off Fall Time	t _F	-	6.6	-	ns	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 25mm X 25mm square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

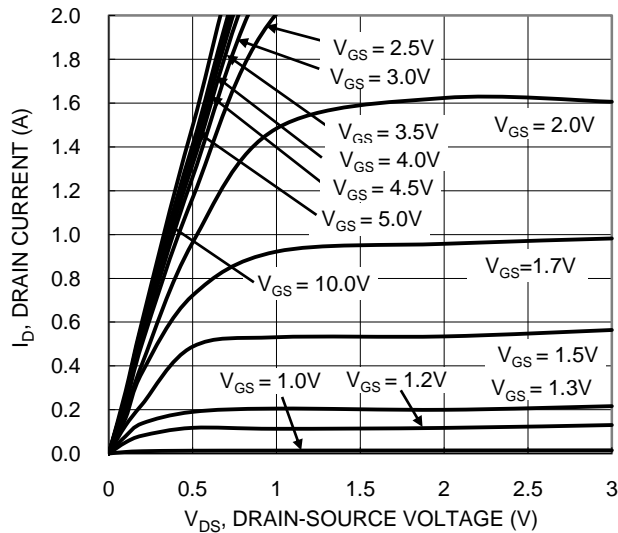


Figure 1. Typical Output Characteristic

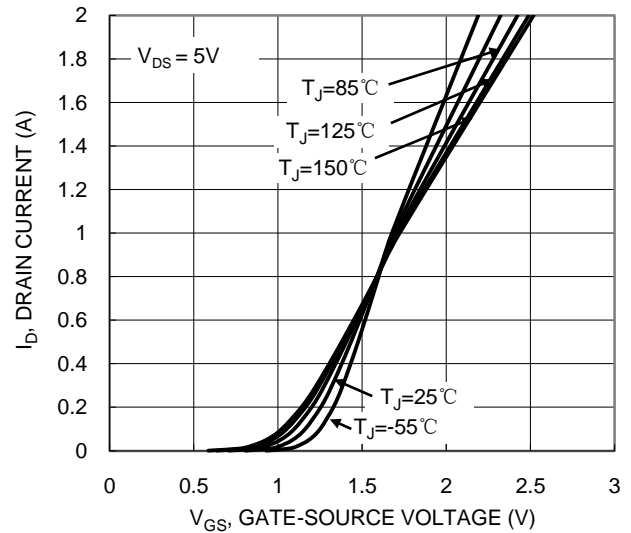


Figure 2. Typical Transfer Characteristic

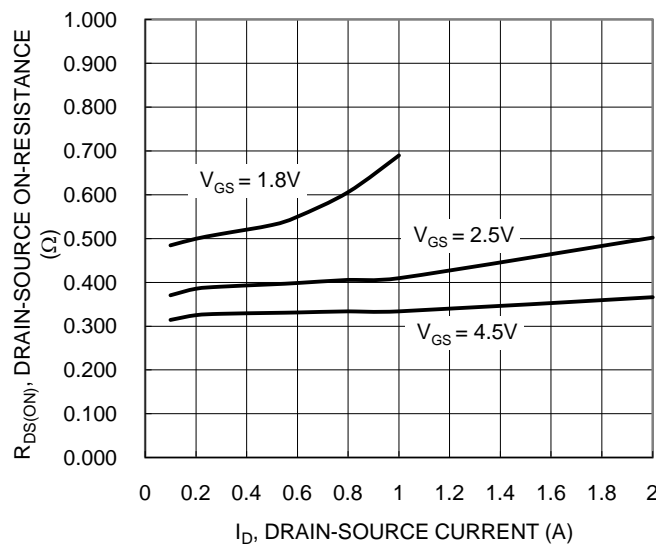


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

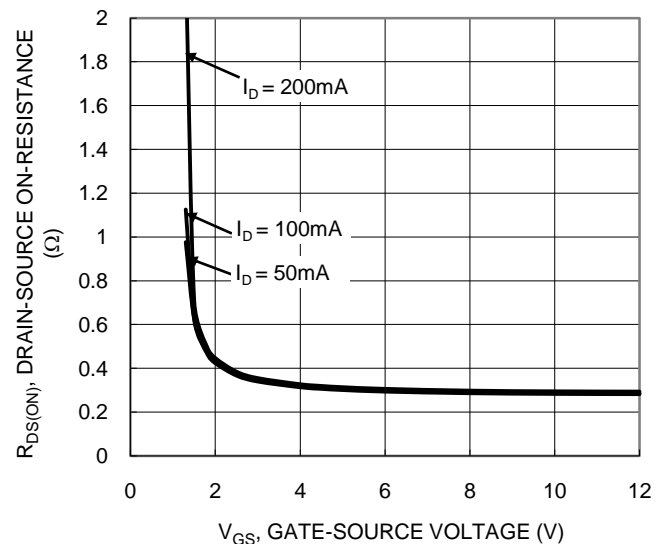


Figure 4. Typical Transfer Characteristic

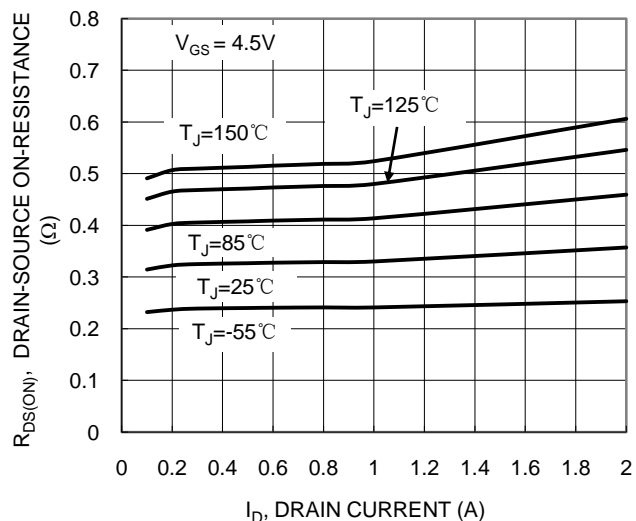


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

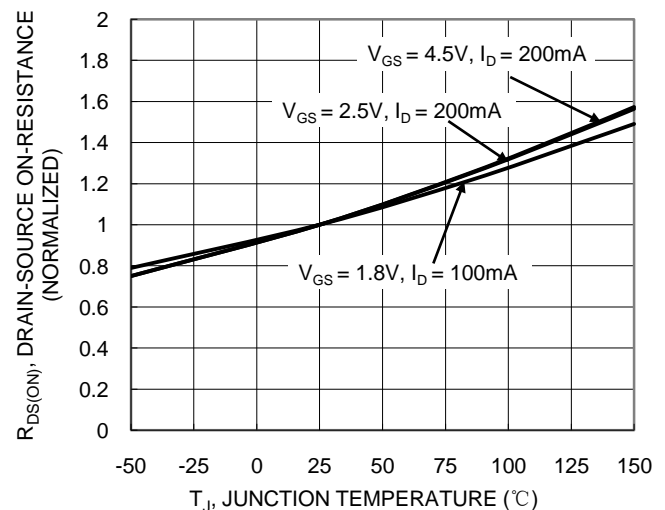
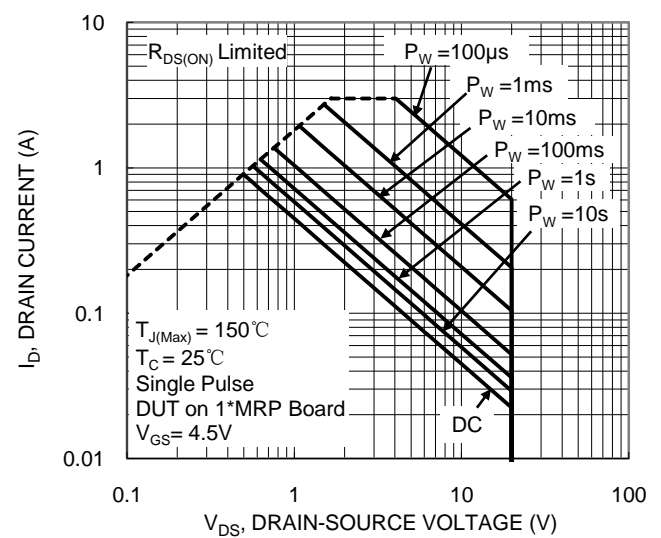
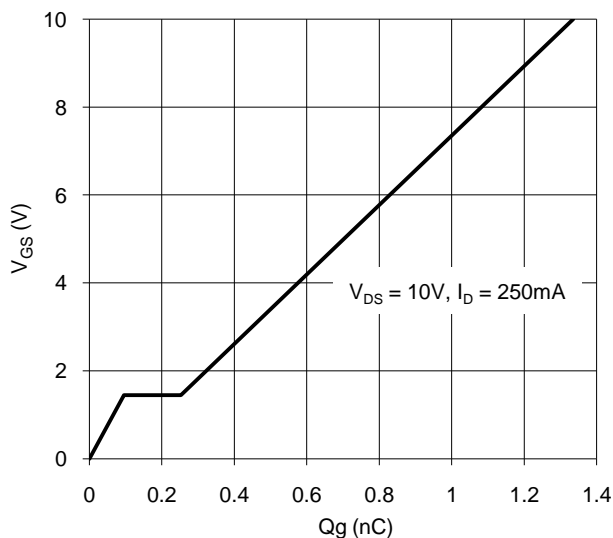
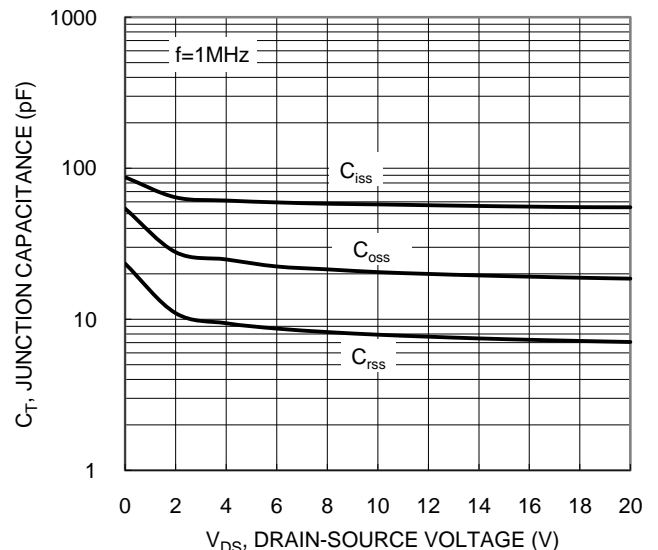
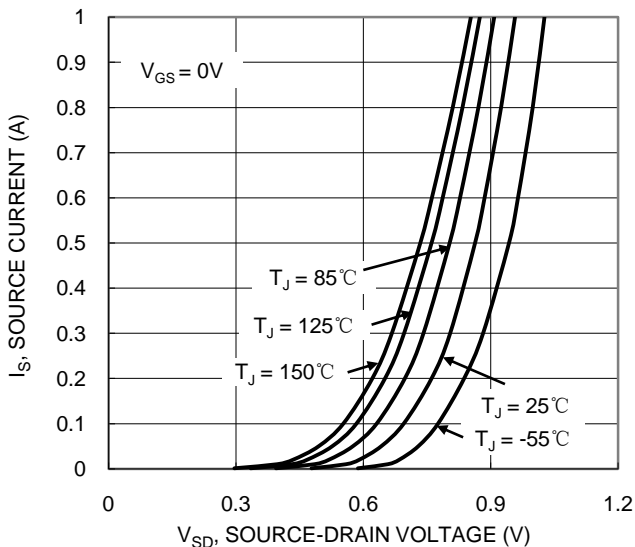
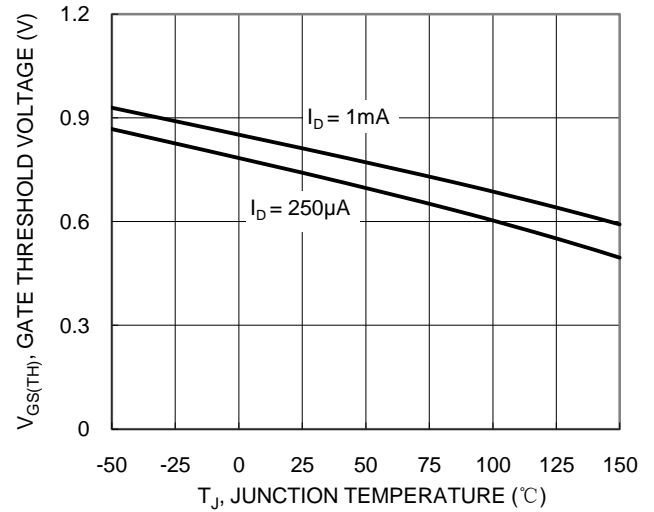
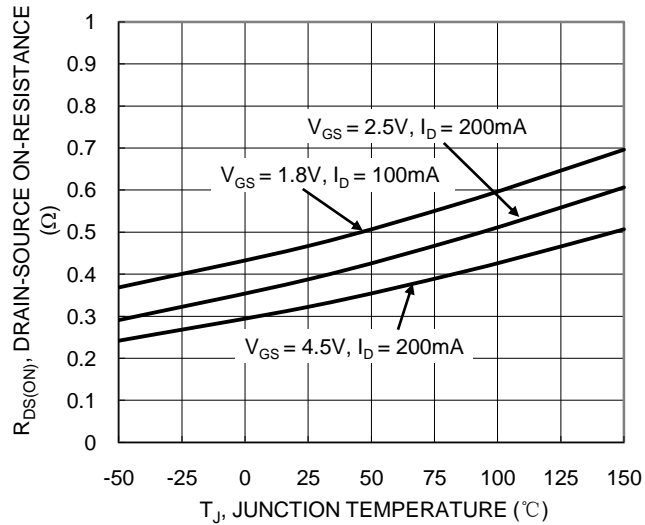


Figure 6. On-Resistance Variation with Temperature



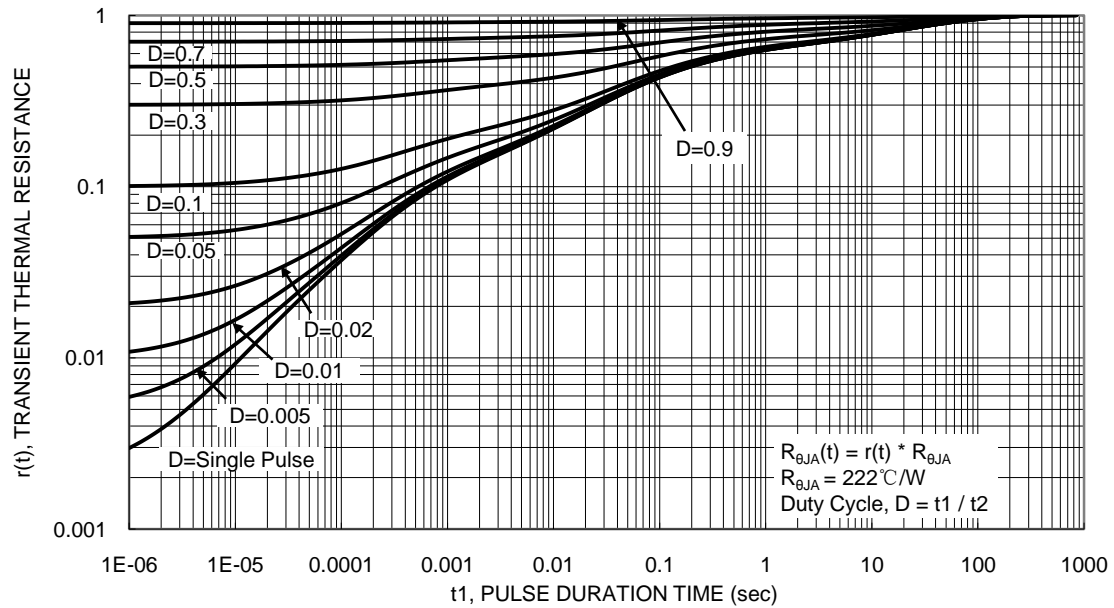
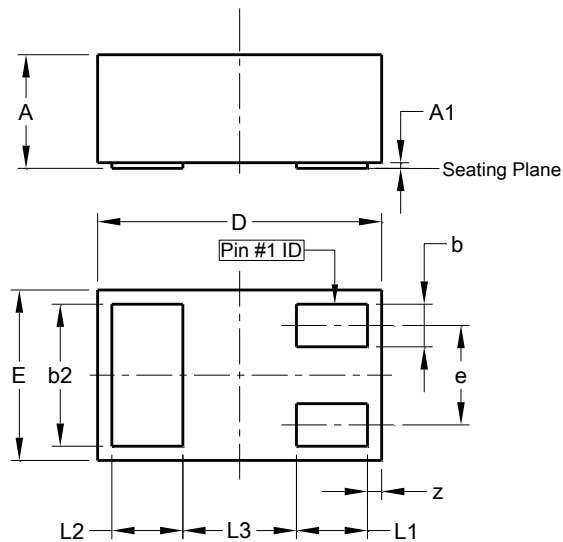


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X2-DFN1006-3

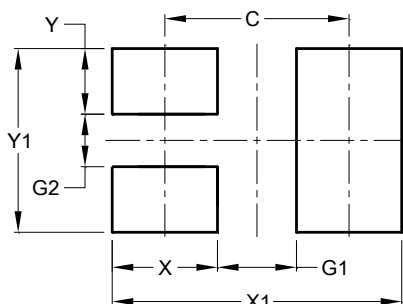


X2-DFN1006-3			
Dim	Min	Max	Typ
A	-	0.40	-
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	-	-	0.40
z	0.02	0.08	0.05
All Dimensions in mm			

Suggested Pad Layout

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

X2-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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