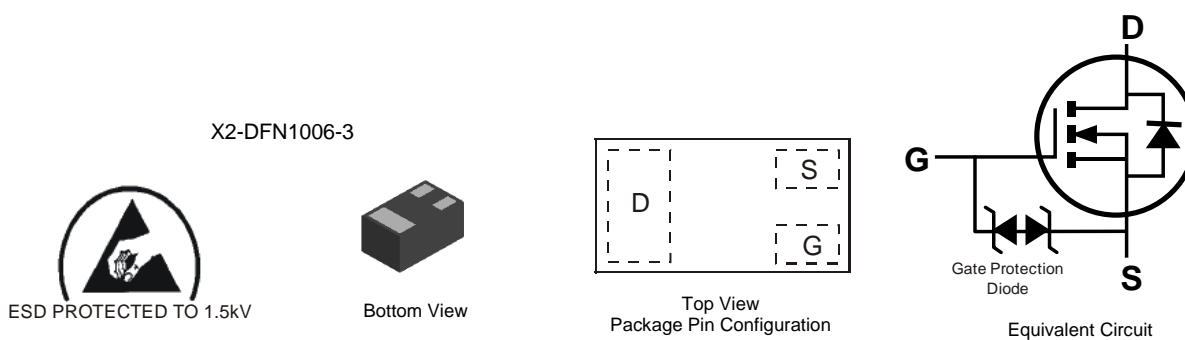


## Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- Ultra-Low Package Profile, 0.4mm Maximum Package Height
- ESD Protected up to 1.5kV
- **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: 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 
- Weight: 0.001 grams (Approximate)



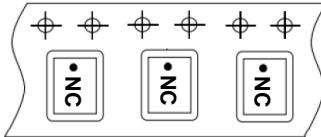
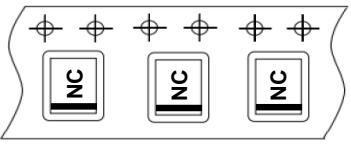
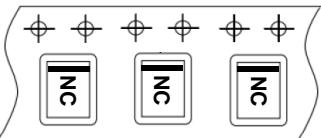
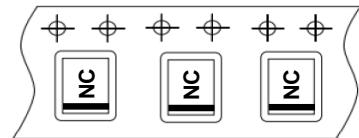
## Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Tape Pitch (mm)	Quantity per Reel
DMN2400UFB4-7	NC	7	8	4	3,000
DMN2400UFB4-7R	NC	7	8	4	3,000
DMN2400UFB4-7B	NC	7	8	2	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](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

DMN2400UFB4-7	<p>From date code 1527 (YYWW), this changes to:</p> <p>Top View Dot Denotes Drain Side</p>  <p>Top View Bar Denotes Gate and Source Side</p>   
DMN2400UFB4-7R	<p>Top View Bar Denotes Gate and Source Side</p>  <p>NC = Part Marking Code</p> 
DMN2400UFB4-7B	<p>Top View Bar Denotes Gate and Source Side</p>  <p>NC = Part Marking Code</p> 

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 12$	V
Continuous Drain Current (Note 5) $V_{GS} = 4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	$I_D$	0.75	A
		$T_A = +85^\circ\text{C}$		0.55	
Pulsed Drain Current (Notes 5 & 6)			$I_{DM}$	3	A

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

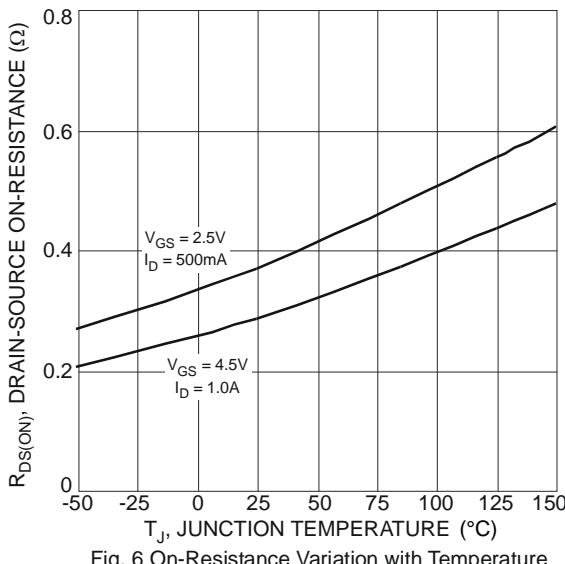
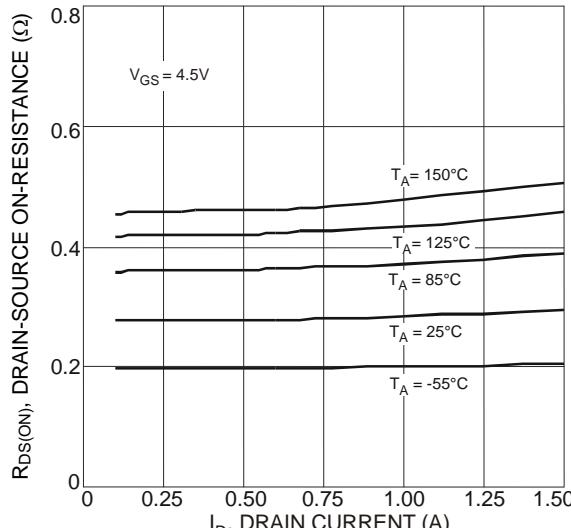
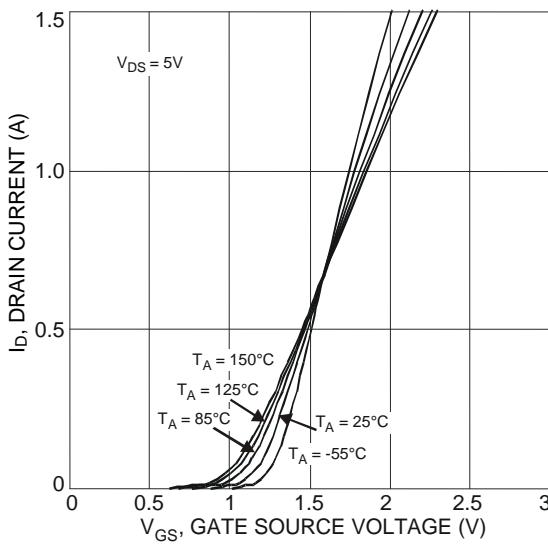
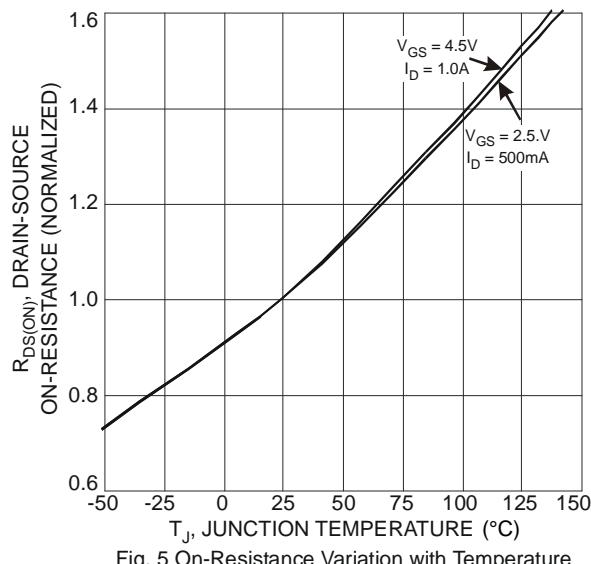
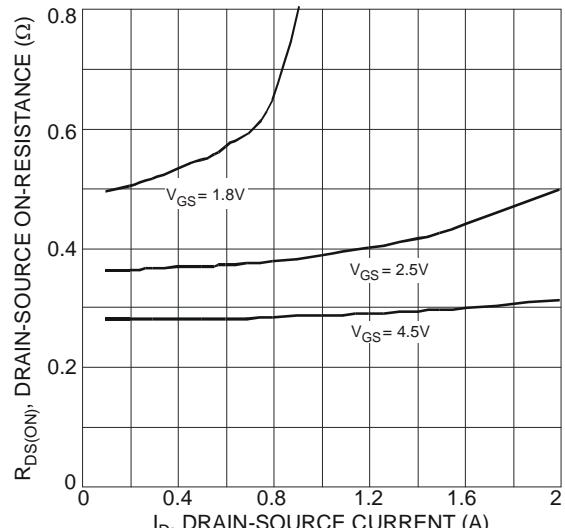
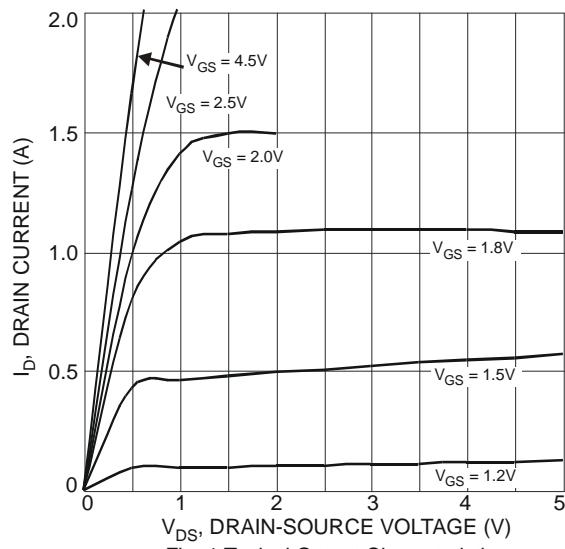
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	0.47	mW
Thermal Resistance, Junction to Ambient	$R_{QJA}$	258	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.  
 6. Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	20	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	$I_{DSS}$	—	—	100 50	nA	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$ $V_{DS} = 5\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 3\text{V}, V_{DS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 1.0$	μA	$V_{GS} = \pm 4.5\text{V}, V_{DS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 50$	μA	$V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	—	0.9	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	0.55	Ω	$V_{GS} = 4.5\text{V}, I_D = 600\text{mA}$
		—	—	0.75		$V_{GS} = 2.5\text{V}, I_D = 500\text{mA}$
		—	—	0.9		$V_{GS} = 1.8\text{V}, I_D = 350\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	—	1.0	—	S	$V_{DS} = 10\text{V}, I_D = 400\text{mA}$
Diode Forward Voltage	$V_{SD}$	—	0.7	1.2	V	$V_{GS} = 0\text{V}, I_S = 150\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	36.0	—	pF	$V_{DS} = 16\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	5.7	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	4.2	—	pF	
Total Gate Charge	$Q_g$	—	0.5	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 250\text{mA}$
Gate-Source Charge	$Q_{gs}$	—	0.07	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	0.1	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.11	—	ns	$V_{DD} = 10\text{V}, V_{GS} = 4.5\text{V}, R_L = 47\Omega, R_g = 10\Omega, I_D = 200\text{mA}$
Turn-On Rise Time	$t_r$	—	3.82	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	14.8	—	ns	
Turn-Off Fall Time	$t_f$	—	9.6	—	ns	

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



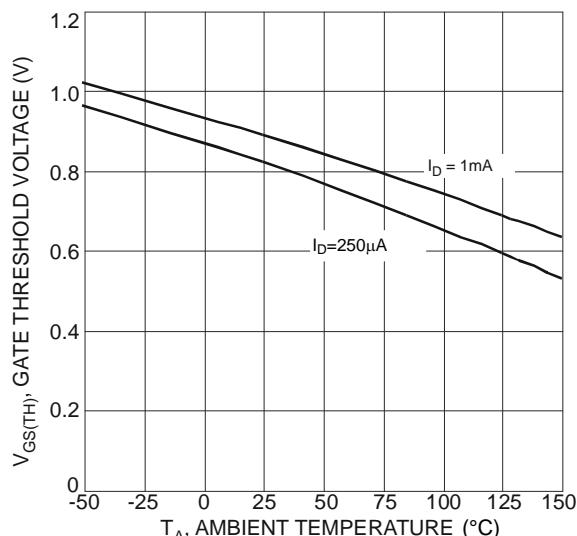


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

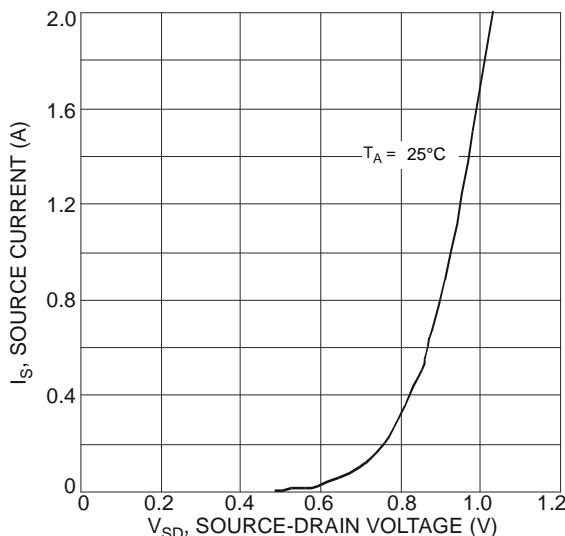


Fig. 8 Diode Forward Voltage vs. Current

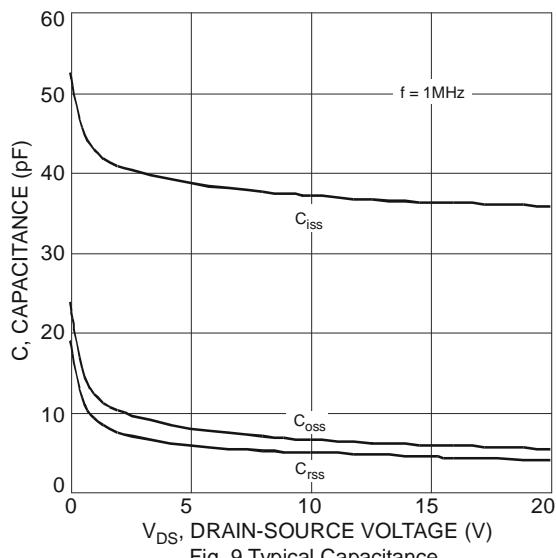


Fig. 9 Typical Capacitance

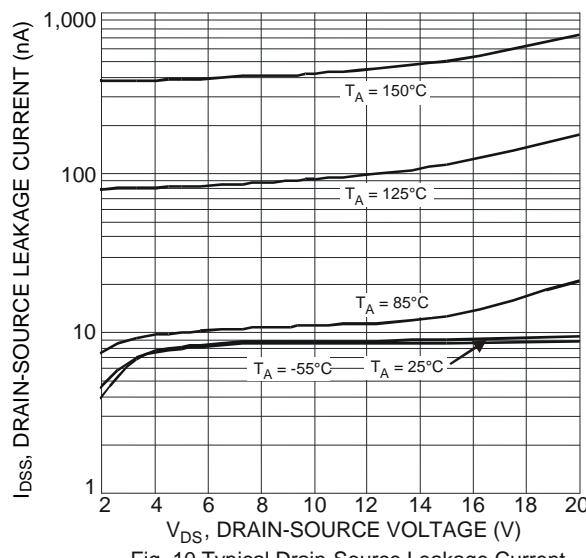


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

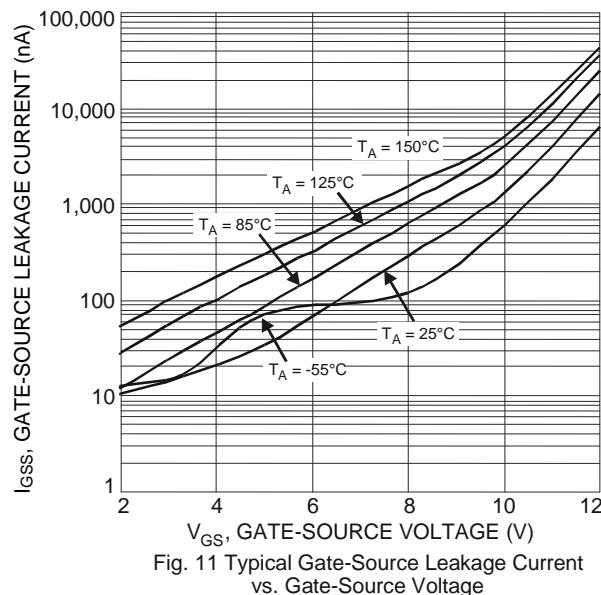


Fig. 11 Typical Gate-Source Leakage Current vs. Gate-Source Voltage

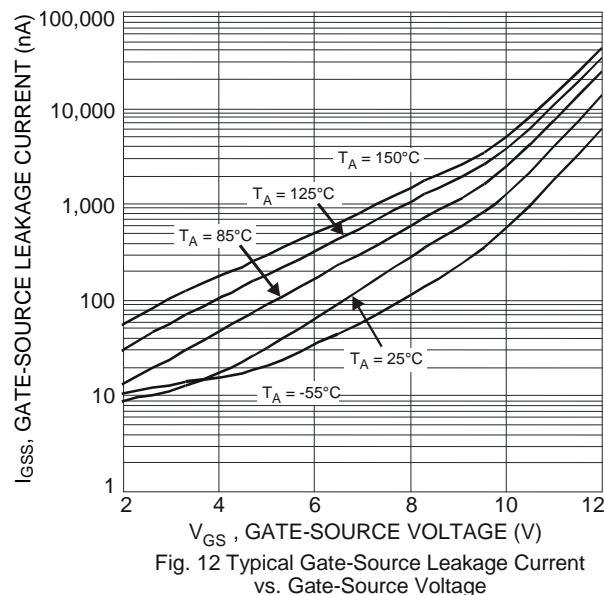


Fig. 12 Typical Gate-Source Leakage Current vs. Gate-Source Voltage

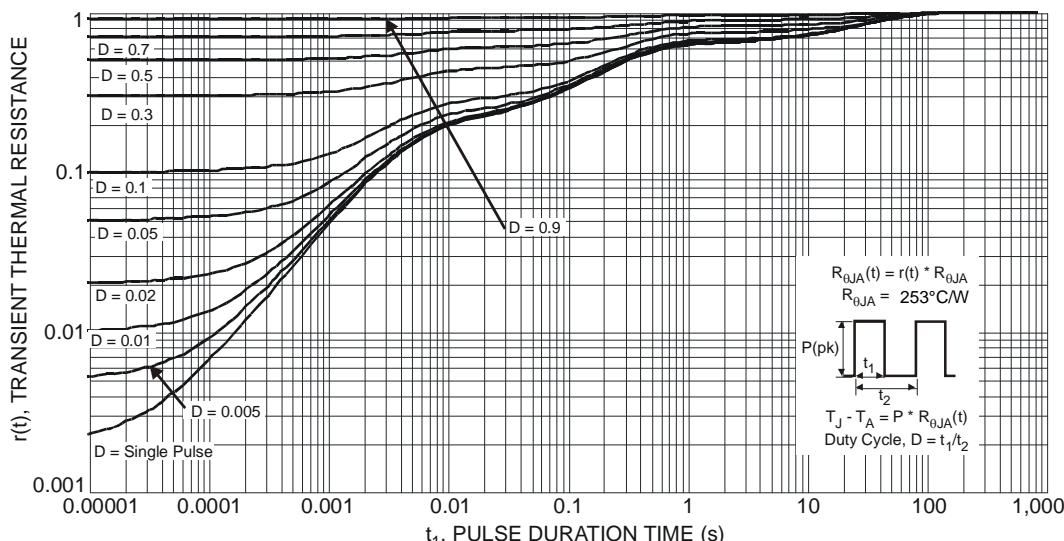
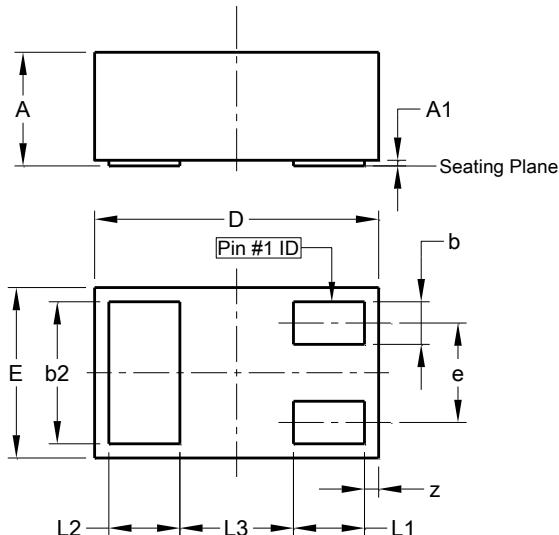


Fig. 13 Transient Thermal Response

## Package Outline Dimensions

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

X2-DFN1006-3



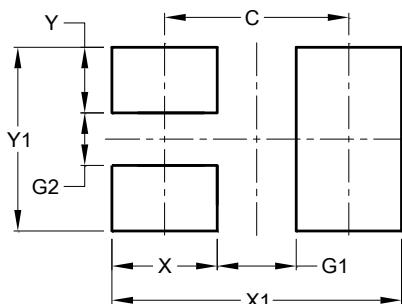
X2-DFN1006-3			
Dim	Min	Max	Typ
<b>A</b>	—	0.40	—
<b>A1</b>	0.00	0.05	0.03
<b>b</b>	0.10	0.20	0.15
<b>b2</b>	0.45	0.55	0.50
<b>D</b>	0.95	1.05	1.00
<b>E</b>	0.55	0.65	0.60
<b>e</b>	-	-	0.35
<b>L1</b>	0.20	0.30	0.25
<b>L2</b>	0.20	0.30	0.25
<b>L3</b>	-	-	0.40
<b>z</b>	0.02	0.08	0.05

All Dimensions in mm

## Suggested Pad Layout

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

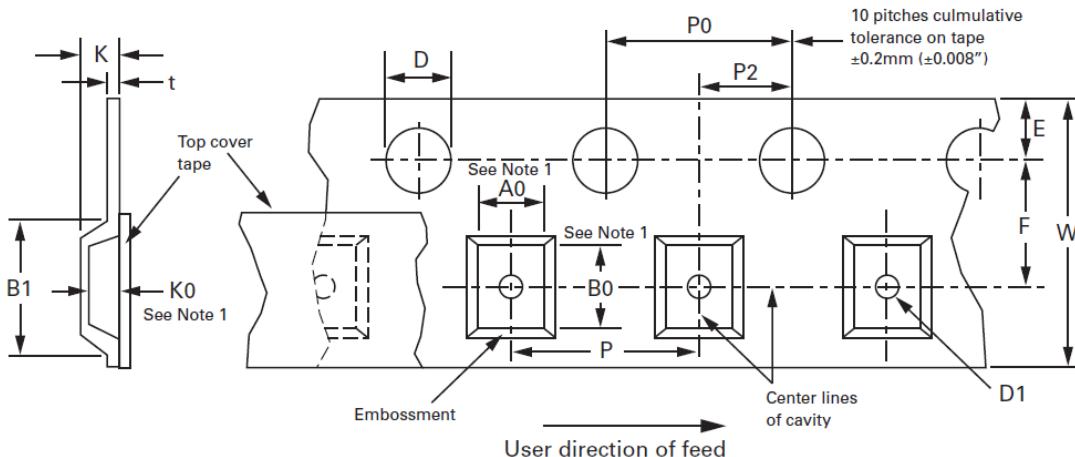
X2-DFN1006-3



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

## Tape Information

## EMBOSSED CARRIER TAPE SPECIFICATIONS



8, 12, 16, 24mm EMBOSSED TAPE DIMENSIONS IN mm						
Tape Size	D	E	P <sub>0</sub>	tmax	A <sub>o</sub> B <sub>o</sub> K <sub>o</sub>	
8mm	1.50 $\pm 0.10$ -0.0	1.75 $\pm 0.10$	4.0 $\pm 0.10$	0.400	See Note 9	Constant Dimensions

Tape Size	B <sub>1</sub> max	D <sub>1</sub> min	F	K max	P <sub>2</sub>	R min	W	Package Type
8mm	4.5	0.35	3.5 $\pm 0.05$	2.4	2.0 $\pm 0.05$	25	8.0 $\pm 0.30$	Refer to 8mm Device Tape Orientation Table

Note: 9. Ao Bo Ko are determined by component size.

P						
Tape Size	2.0 $\pm 0.05$	4.0 $\pm 0.10$	8.0 $\pm 0.10$	12.0 $\pm 0.10$	16.0 $\pm 0.10$	
8mm	DFN1006 (-7B)	DFN1006 (-7) DFN1006 (-7R)	—	—	—	

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