

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
-20V	1.0Ω @ V _{GS} = -4.5V	-0.58A
	1.5Ω @ V _{GS} = -2.5V	-0.48A
	2.0Ω @ V _{GS} = -1.8V	-0.41A

Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

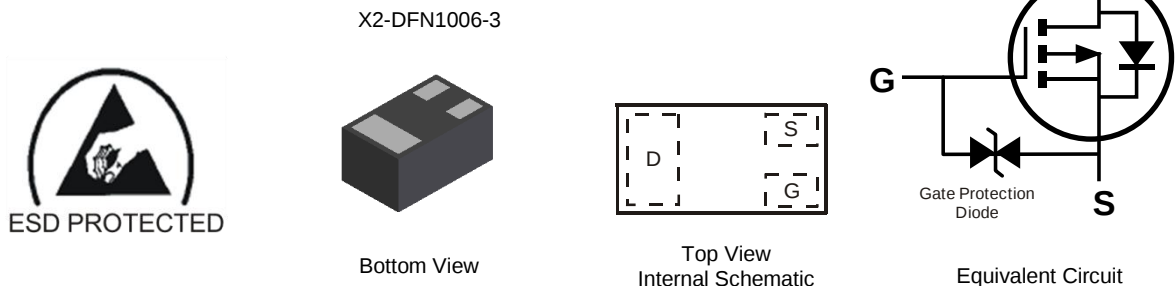
- Portable Electronics

Features and Benefits

- Footprint of just 0.6mm² – 13 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 ^(e4)
- Weight: 0.001 grams (Approximate)

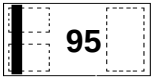
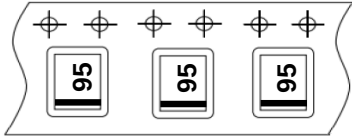


Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Tape Pitch (mm)	Quantity per Reel
DMP21D6UFB4-7B	95	7	8	2	10,000

- 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

DMP21D6UFB4-7B	 95 = Part Marking Code Top View Bar Denotes Gate and Source Side
	

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}	±8	V
Continuous Drain Current V _{GS} = -4.5V	Steady State	T _A = +25°C (Note 5)	I _D	-0.58	A
		T _A = +70°C (Note 5)		-0.47	
		T _A = +25°C (Note 6)		-0.81	
Maximum Body Diode Forward Current (Note 6)			I _s	-0.8	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	-5.0	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	0.51	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	240	°C/W
Power Dissipation (Note 6)	P _D	0.98	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	128	°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}	—	—	-1	μA	V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.5	—	-1.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	0.67	1.0	Ω	V _{GS} = -4.5V, I _D = -100mA
			0.85	1.5		V _{GS} = -2.5V, I _D = -80mA
			1.0	2.0		V _{GS} = -1.8V, I _D = -40mA
Diode Forward Voltage	V _{SD}	—	-1.0	-1.2	V	V _{GS} = 0V, I _S = -300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	46.1	—	pF	V _{DS} = -10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	7.2	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	4.9	—	pF	
Gate Resistance	R _G	—	350	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _G	—	0.5	—	nC	V _{DS} = -10V, I _D = -250mA
Total Gate Charge (V _{GS} = -8V)	Q _G	—	0.8	—	nC	
Gate-Source Charge	Q _{GS}	—	0.1	—	nC	
Gate-Drain Charge	Q _{GD}	—	0.1	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	8.5	—	ns	V _{DD} = -3V, V _{GS} = -2.5V, R _L = 300Ω, R _G = 25Ω, I _D = -100mA
Turn-On Rise Time	t _R	—	4.3	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	20.2	—	ns	
Turn-Off Fall Time	t _F	—	19.2	—	ns	

- Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

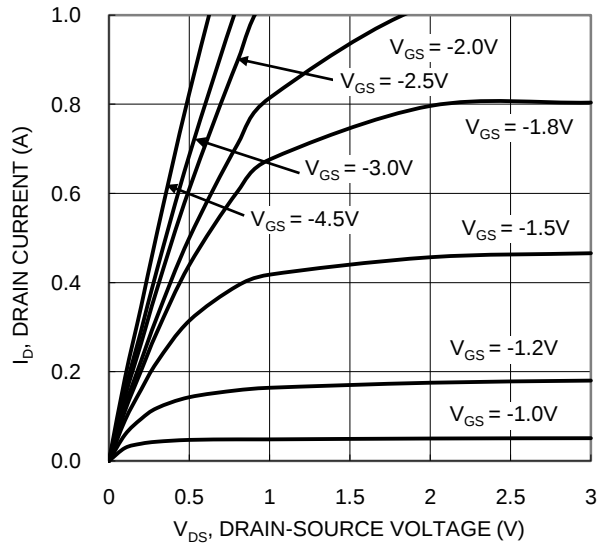


Figure 1. Typical Output Characteristic

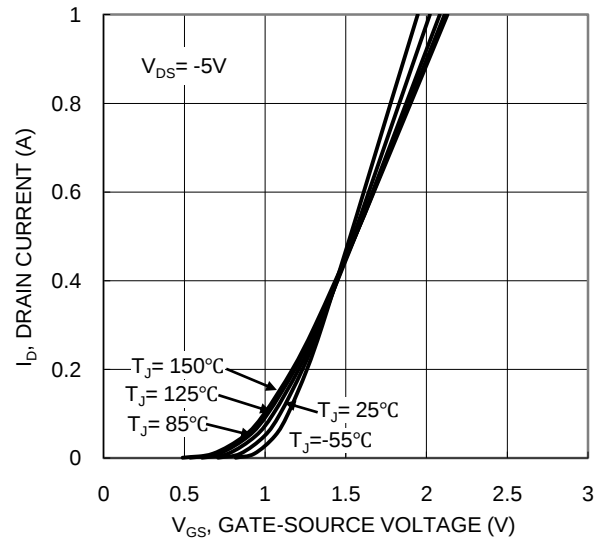


Figure 2. Typical Transfer Characteristic

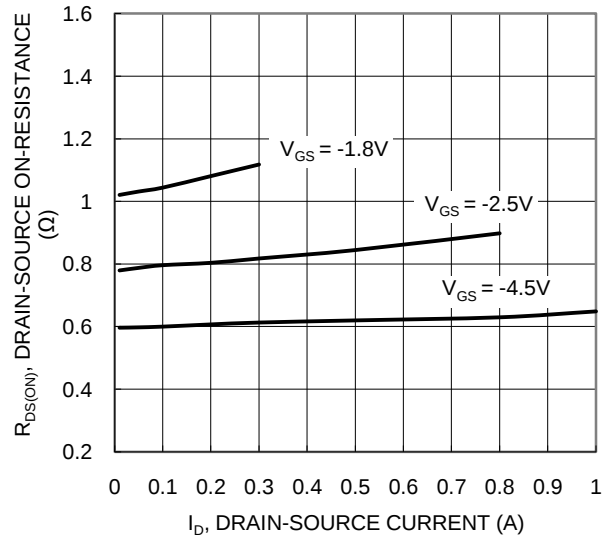


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

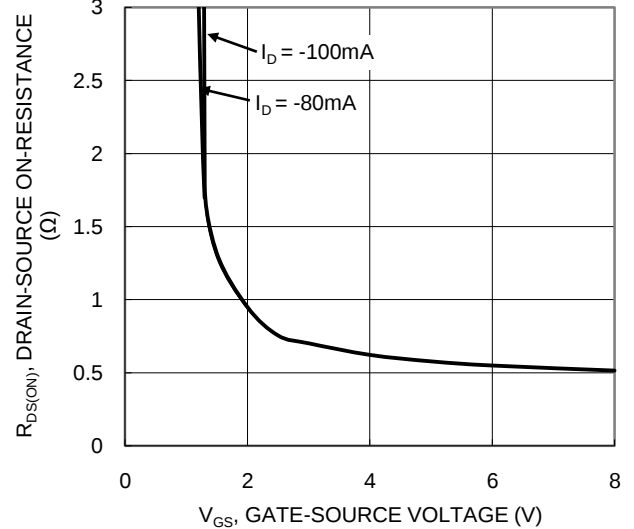


Figure 4. Typical Transfer Characteristic

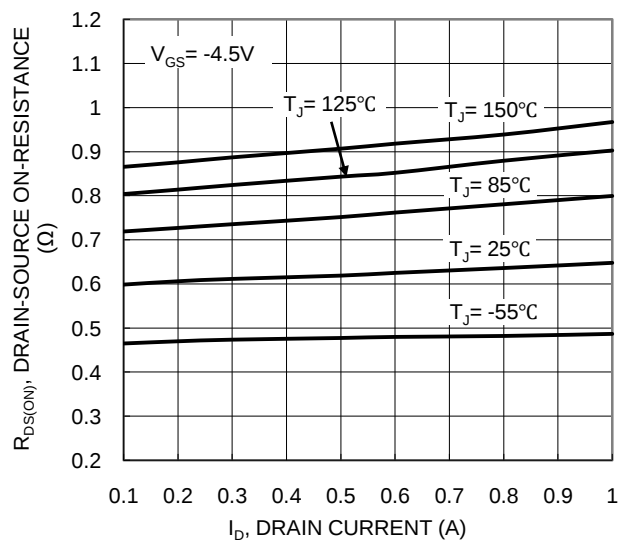


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

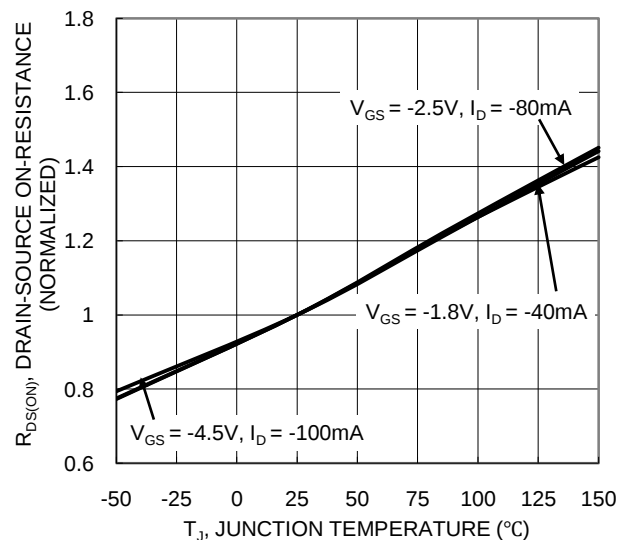
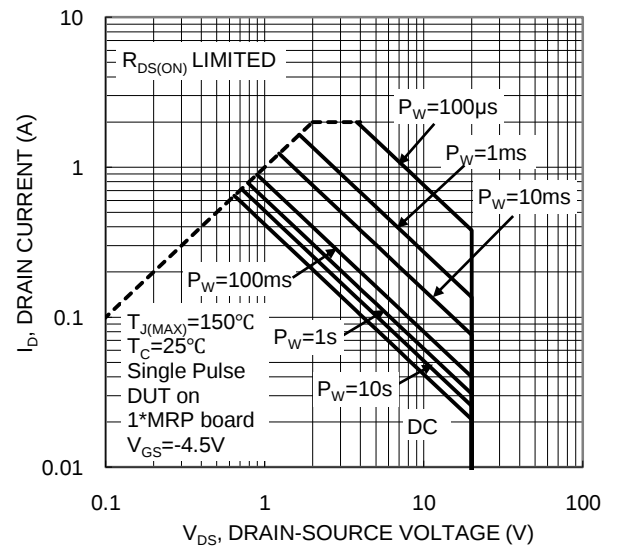
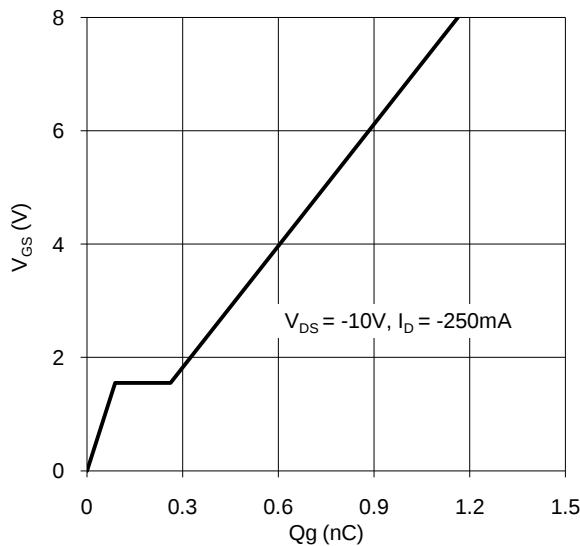
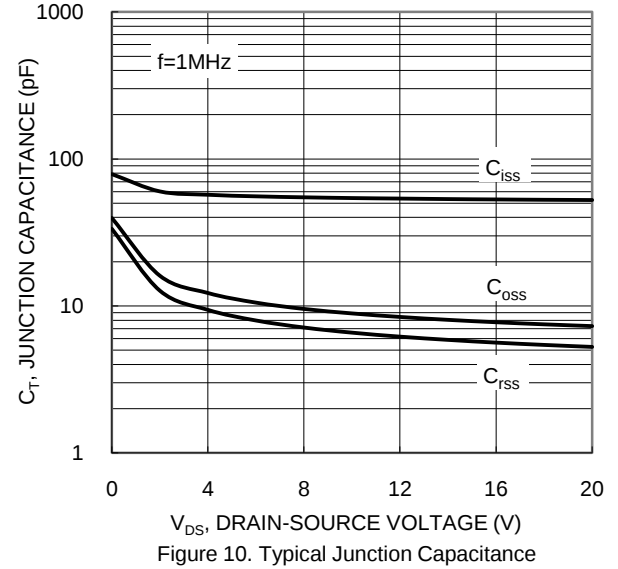
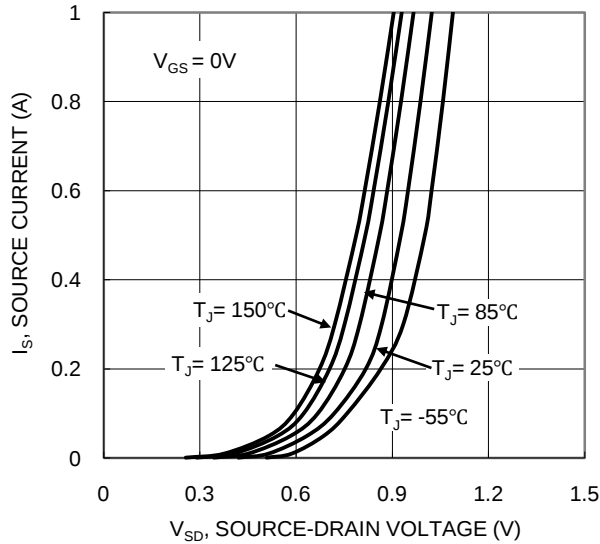
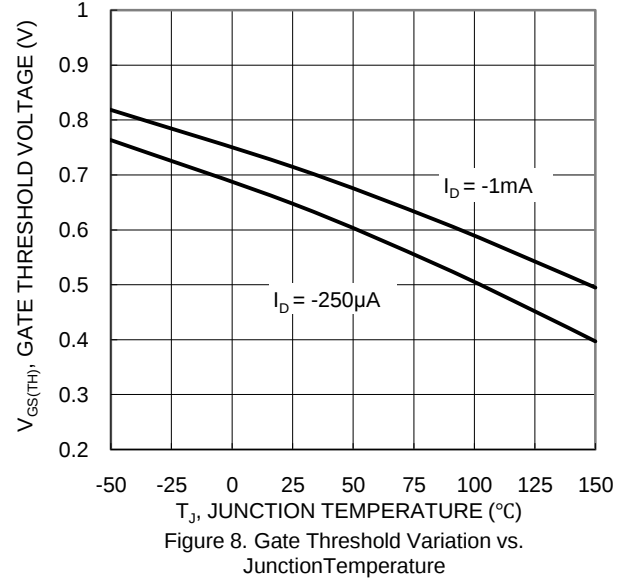
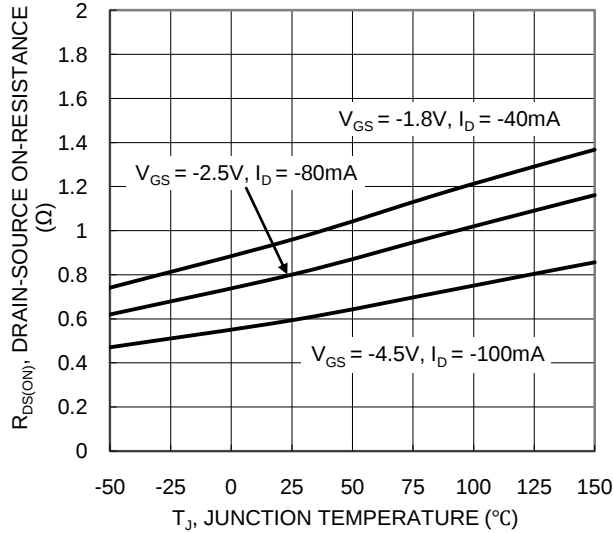


Figure 6. On-Resistance Variation with Temperature



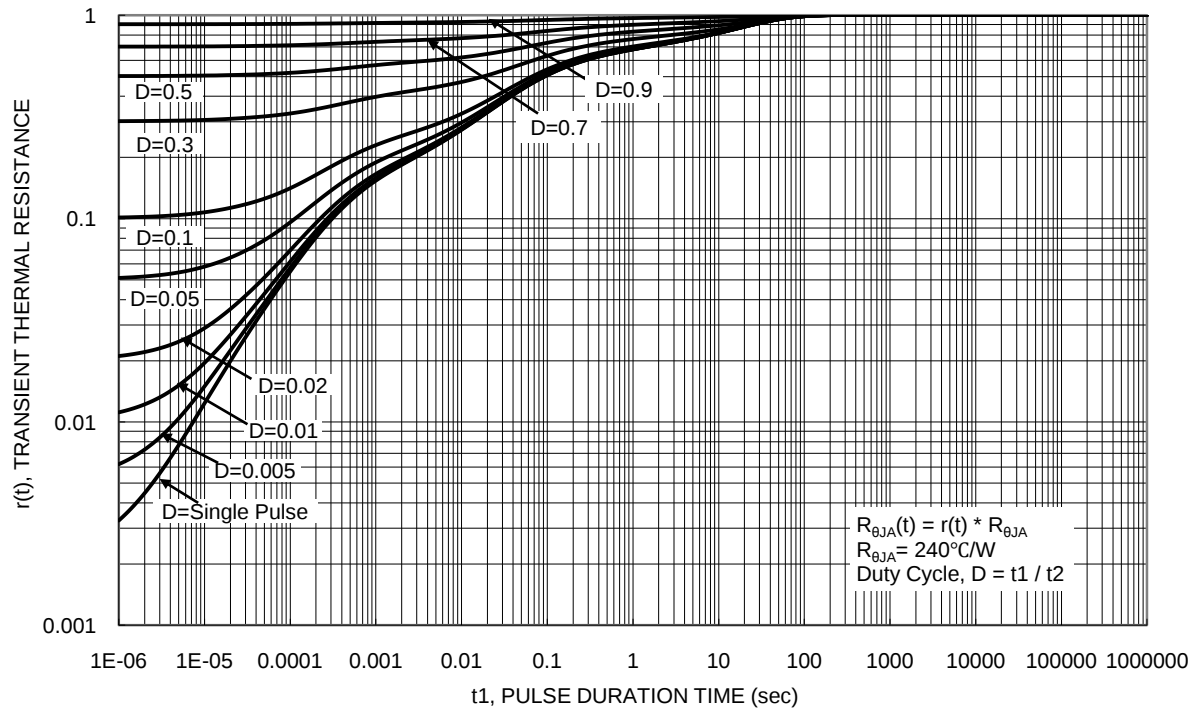
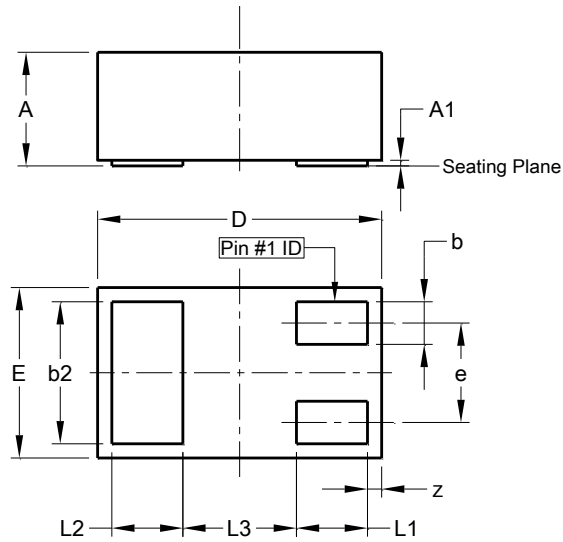


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X2-DFN1006-3

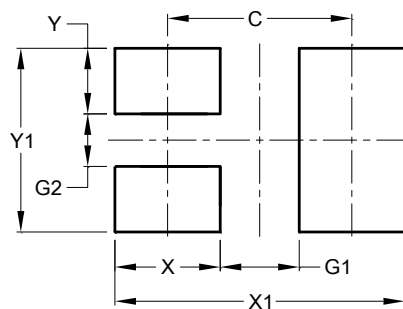


X2-DFN1006-3			
Dim	Min	Max	Typ
A	—	0.40	—
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	-	-	0.40
z	0.02	0.08	0.05
All Dimensions in mm			

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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