30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
30V	460mΩ @ V_{GS} = 4.5V	1.3A
	560mΩ @ V_{GS} = 2.5V	1.2A

Description

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.

Applications

- Load switches
- Portable applications
- Power-management functions

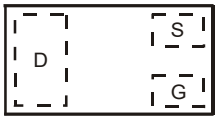
Features and Benefits

- 0.4mm Ultra-Low Profile Package for Thin Application
- 0.6mm² Package Footprint, 10 Times Smaller than SOT23
- Low $V_{GS(TH)}$, Can Be Driven Directly from A Battery
- Low $R_{DS(ON)}$
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN3732UFB4Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

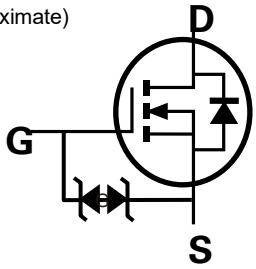
Mechanical Data

- 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
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.001 grams (Approximate)

ESD Protected



Equivalent Circuit



X2-DFN1006-3

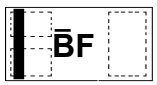
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (Inches)	Tape Width (mm)	Tape Pitch (mm)	Packing	
						Qty.	Carrier
DMN3732UFB4Q-7B	X2-DFN1006-3	BF	7	8	2	10,000	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/.

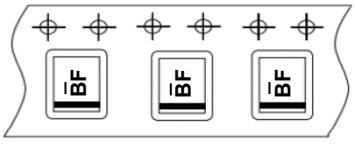
Marking Information

DMN3732UFB4Q-7B



Top View
Bar Denotes Gate and Source Side

$\overline{BF}$ = Part Marking Code



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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±8	
Continuous Drain Current (Note 6) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	1.3 1.1	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	1.1	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	3.3	A

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	0.49	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	253	°C/W
Total Power Dissipation (Note 6)		P_D	1.12	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	112	°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}	30	—	—	V	V_{GS} = 0, I_D = 10µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 30V, V_{GS} = 0
Gate-Source Leakage	I_{GSS}	—	—	±3	µA	V_{GS} = ±8V, V_{DS} = 0
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.45	—	0.95	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	230	460	mΩ	V_{GS} = 4.5V, I_D = 200mA
		—	250	560		V_{GS} = 2.5V, I_D = 100mA
		—	278	730		V_{GS} = 1.8V, I_D = 75mA
		—	—	2600		V_{GS} = 1.2V, I_D = 25mA
Diode Forward Voltage	V_{SD}	—	0.7	1.2	V	V_{GS} = 0, I_S = 300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	40.8	—	pF	V_{DS} = 25V, V_{GS} = 0, f = 1.0MHz
Output Capacitance	C_{oss}	—	7.6	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	4.6	—	pF	
Total Gate Charge	Q_g	—	0.9	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 1A
Gate-Source Charge	Q_{gs}	—	0.05	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.3	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	1.1	—	ns	V_{DS} = 10V, I_D = 1A, V_{GS} = 10V, R_G = 6Ω
Turn-On Rise Time	t_R	—	15.9	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	20.7	—	ns	
Turn-Off Fall Time	t_F	—	20.0	—	ns	
Reverse-Recovery Time	t_{RR}	—	59	—	ns	I_F = 1A, di/dt = 100A/µs
Reverse-Recovery Charge	Q_{RR}	—	25	—	nC	I_F = 1A, di/dt = 100A/µs

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 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

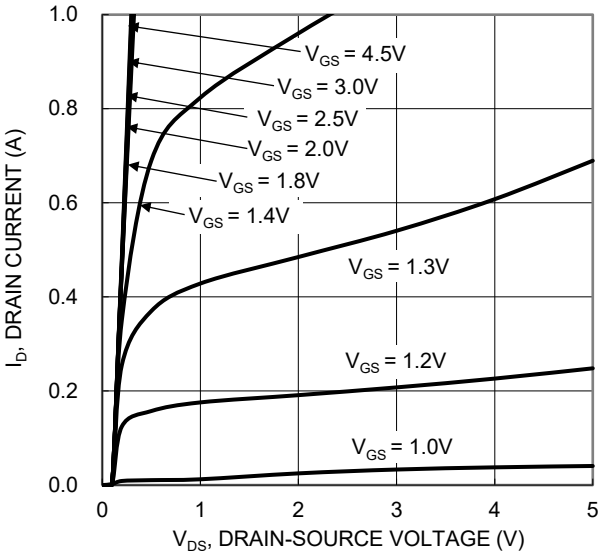


Figure 1. Typical Output Characteristic

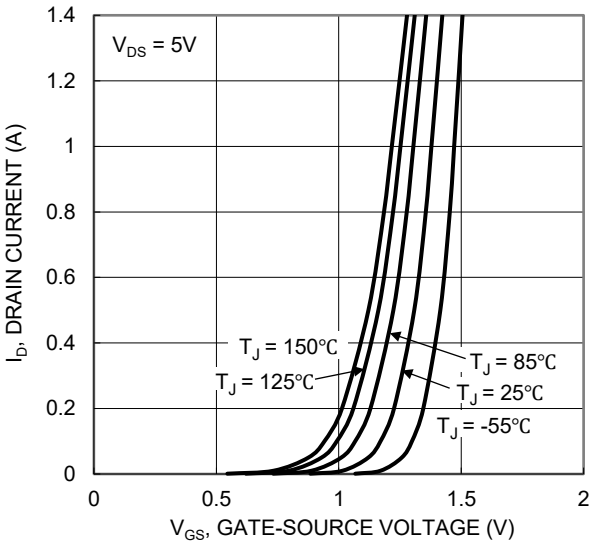


Figure 2. Typical Transfer Characteristic

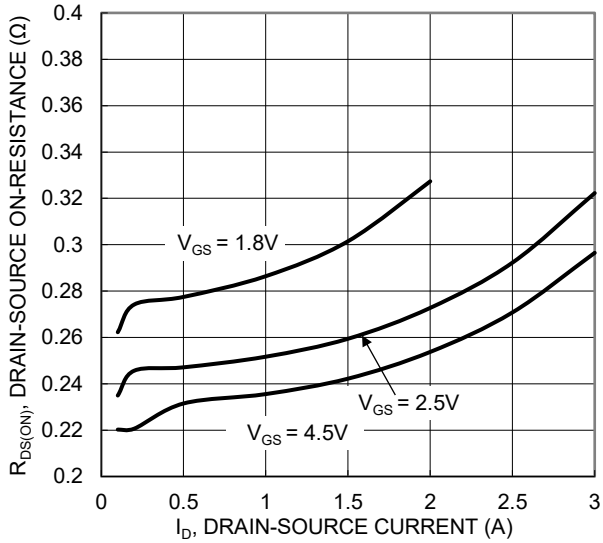


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

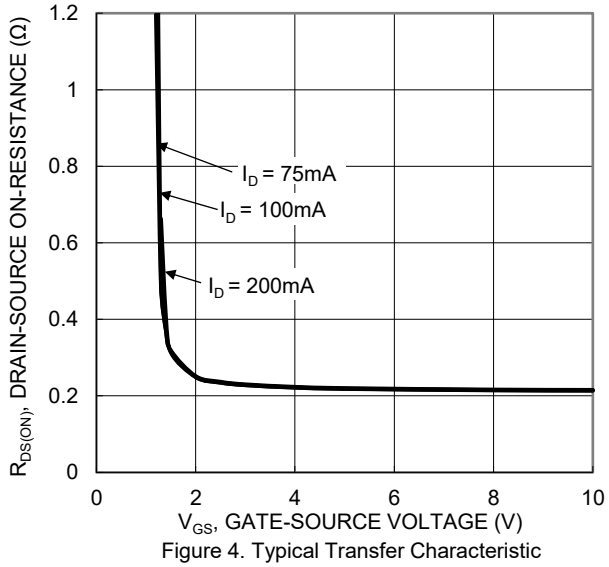


Figure 4. Typical Transfer Characteristic

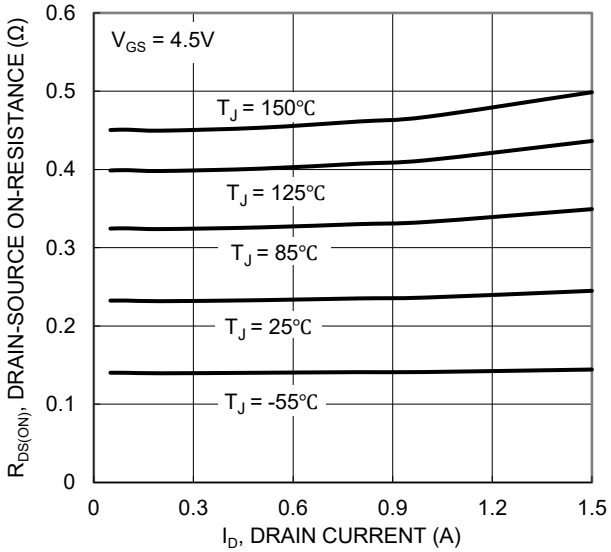


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

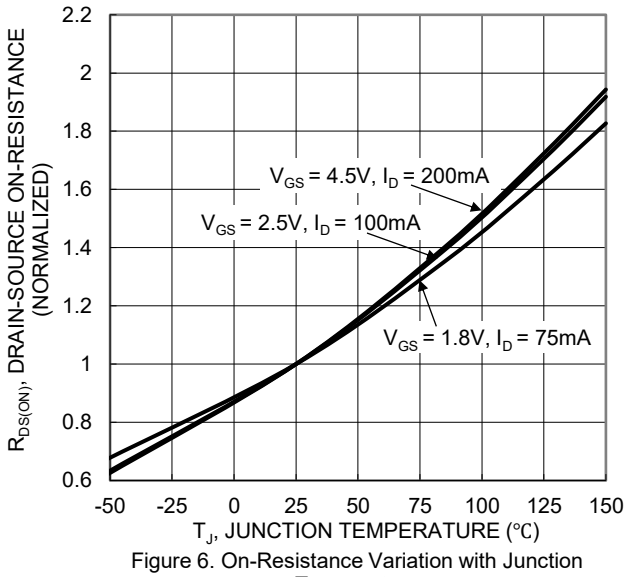


Figure 6. On-Resistance Variation with Junction Temperature

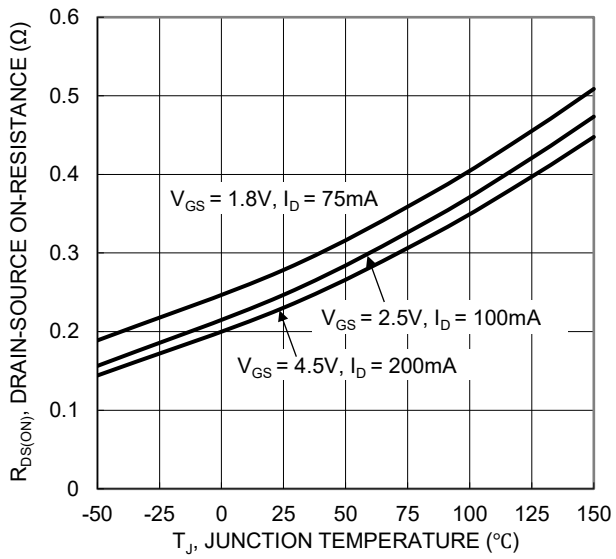


Figure 7. On-Resistance Variation with Junction Temperature

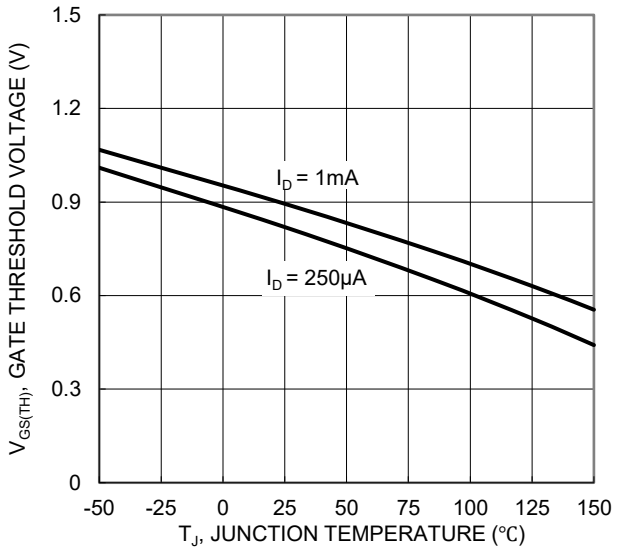


Figure 8. Gate Threshold Variation vs. Junction Temperature

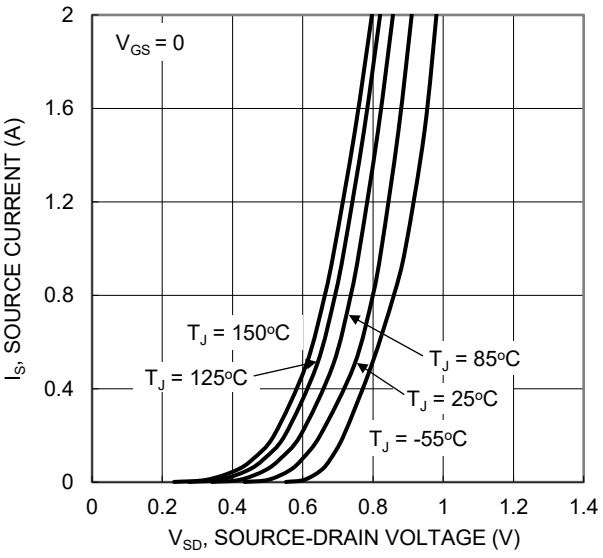


Figure 9. Diode Forward Voltage vs. Current

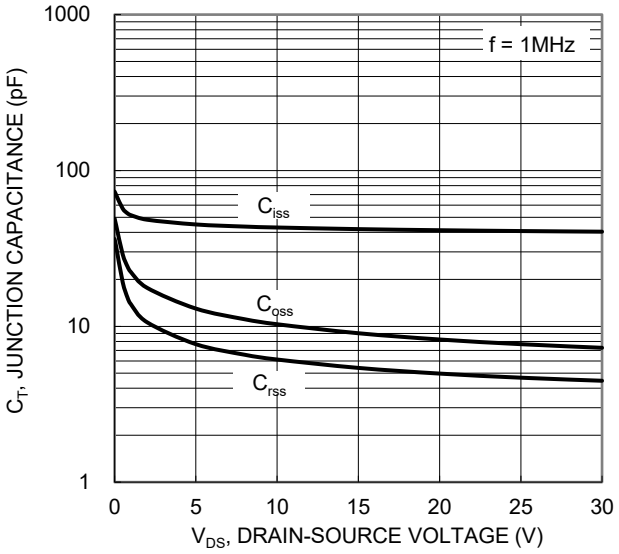


Figure 10. Typical Junction Capacitance

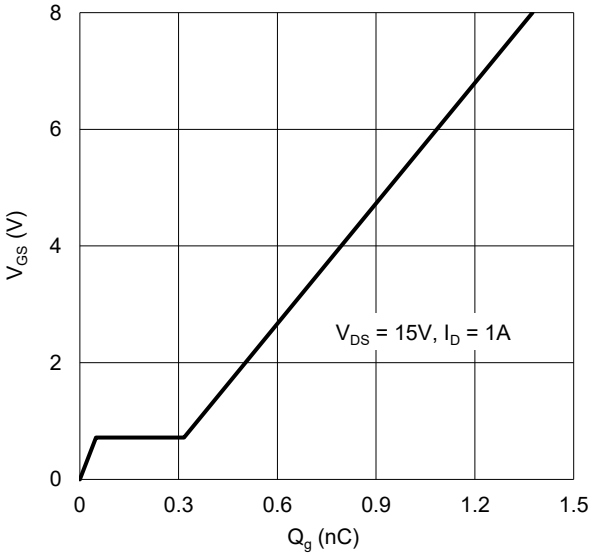


Figure 11. Gate Charge

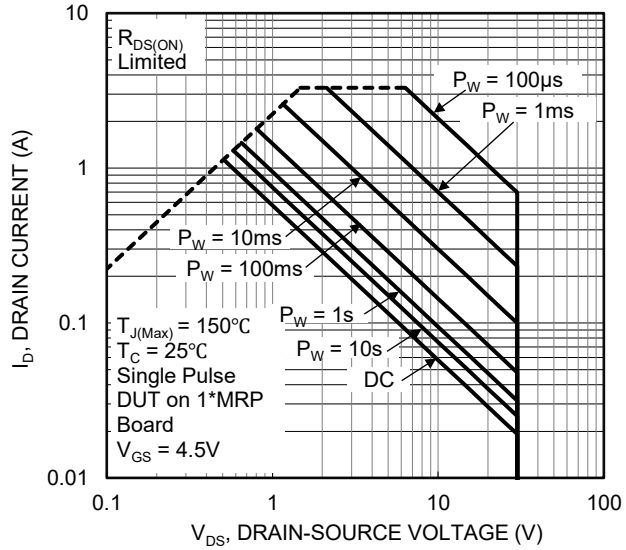


Figure 12. SOA, Safe Operation Area

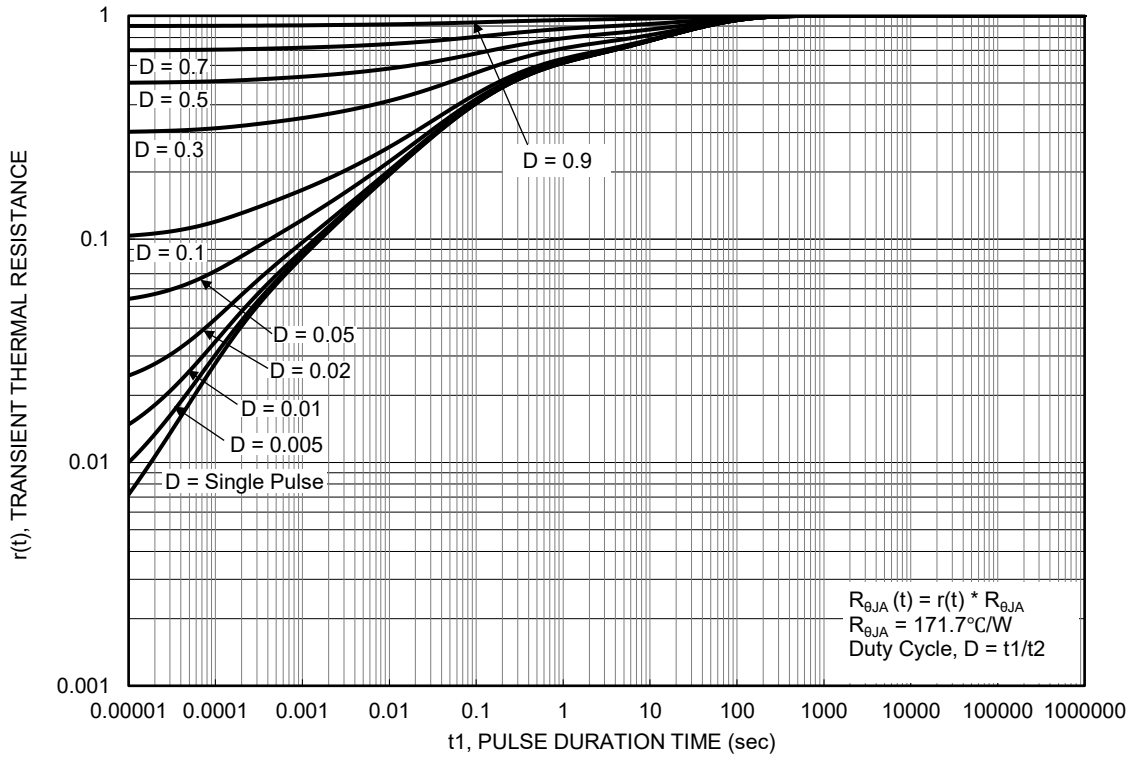
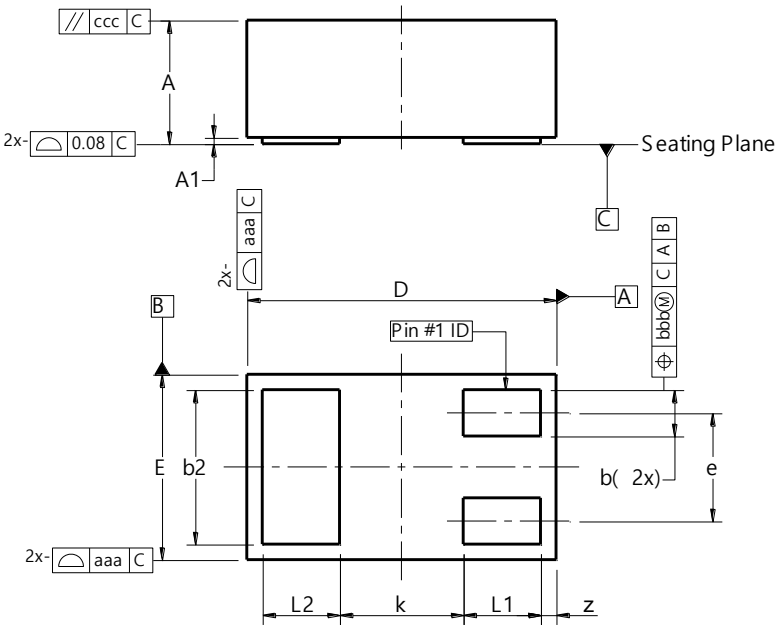


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X2-DFN1006-3

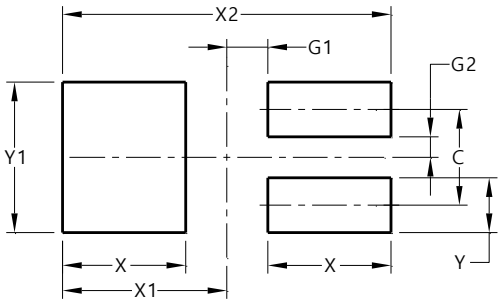


X2-DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	—	0.40	—
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
k	-	-	0.40
z	0.02	0.08	0.05
aaa	0.15		
bbb	0.05		
ccc	0.05		
All Dimensions in mm			

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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