# DMN62D0LFB-7 Datasheet

https://www.DiGi-Electronics.com

| | |
|---|---|
| DiGi Electronics Part Number | DMN62D0LFB-7-DG |
| Manufacturer | Diodes Incorporated |
| Manufacturer Product Number | DMN62D0LFB-7 |
| Description | MOSFET N-CH 60V 100MA 3DFN |
| Detailed Description | N-Channel 60 V 100mA (Ta) 470mW (Ta) Surface Mount X1-DFN1006-3 |

## Purchase and inquiry

Manufacturer Product Number:
DMN62D0LFB-7

Manufacturer:
Diodes Incorporated

Series:
-

Product Status:
Active

FET Type:
N-Channel

Technology:
MOSFET (Metal Oxide)

Drain to Source Voltage (Vdss):
60 V

Current - Continuous Drain (Id) @ 25°C:
100mA (Ta)

Drive Voltage (Max Rds On, Min Rds On):
1.5V, 4V

Rds On (Max) @ Id, Vgs:
2Ohm @ 100mA, 4V

Vgs(th) (Max) @ Id:
1V @ 250µA

Gate Charge (Qg) (Max) @ Vgs:
0.45 nC @ 4.5 V

Vgs (Max):
±20V

Input Capacitance (Ciss) (Max) @ Vds:
32 pF @ 25 V

FET Feature:
-

Power Dissipation (Max):
470mW (Ta)

Operating Temperature:
-55°C ~ 150°C (TJ)

Mounting Type:
Surface Mount

Supplier Device Package:
X1-DFN1006-3

Package / Case:
3-UFDFN

Base Product Number:
DMN62

## Environmental & Export classification

RoHS Status:
ROHS3 Compliant

Moisture Sensitivity Level (MSL):
1 (Unlimited)

REACH Status:
REACH Unaffected

ECCN:
EAR99

HTSUS:
8541.21.0095

# DMN62D0LFB

## N-CHANNEL ENHANCEMENT MODE MOSFET

## Product Summary

| BV$_{DSS}$ | R$_{DS(ON)}$ Max | I$_D$ Max T$_A$ = +25°C |
|---|---|---|
| 60V | 2Ω @ V$_{GS}$ = 4V | 320mA |
| | 2.5Ω @ V$_{GS}$ = 2.5V | 50mA |

## Description and Applications

This new generation 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.

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

## Features and Benefits

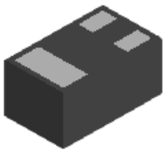
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, 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

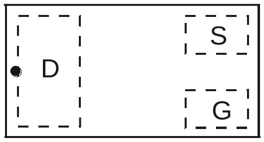
- Case: X1-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ⓔ4
- Weight: 0.001 grams (Approximate)

ESD PROTECTED

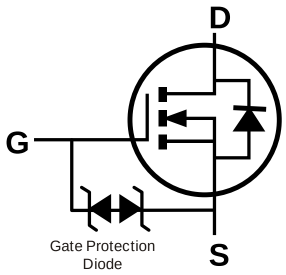
X1-DFN1006-3



Bottom View



Top View
Pin-Out



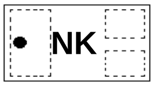
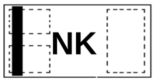
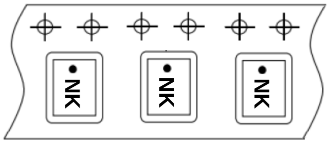
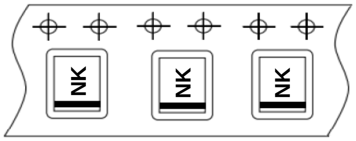
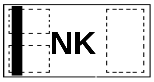
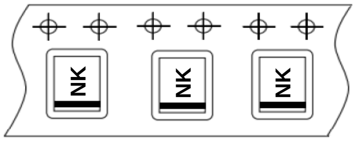
Equivalent Circuit

## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| DMN62D0LFB-7 | X1-DFN1006-3 | 3,000 /Tape & Reel |
| DMN62D0LFB-7B | X1-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

| | |
|---|---|
| DMN62D0LFB-7 |  <br>Top View<br>Dot Denotes Drain Side<br>From date code 1527 (YYWW),<br>this changes to:<br> <br>Top View<br>Bar Denotes Gate and Source Side<br> <br> |
| DMN62D0LFB-7B |  <br>Top View<br>Bar Denotes Gate and Source Side<br>NK = Part Marking Code<br> |

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

| Characteristic | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | 60 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current (Note 5)<br>$V_{GS}$ = 4.0V | Steady State | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | 320<br>75 | mA |
| Pulsed Drain Current (Note 6) | | | $I_{DM}$ | 1 | A |

## Thermal Characteristics

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Power Dissipation (Note 5) | $P_D$ | 0.5 | W |
| Thermal Resistance, Junction to Ambient @$T_A$ = +25°C (Note 5) | $R_{\theta JA}$ | 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. Repetitive rating, pulse width limited by junction temperature.

## Electrical Characteristics (@ $T_A$ = +25°C, unless otherwise stated.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 7)** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 60 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250μA |
| Zero Gate Voltage Drain Current $T_J$ = +25°C | $I_{DSS}$ | — | — | 1.0 | μA | $V_{DS}$ = 60V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±5V, $V_{DS}$ = 0V |
| | | — | — | ±500 | nA | $V_{GS}$ = ±10V, $V_{DS}$ = 0V |
| | | — | — | ±2.0 | μA | $V_{GS}$ = ±15V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 7)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 0.6 | — | 1.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 1.3 | 2 | Ω | $V_{GS}$ = 4V, $I_D$ = 100mA |
| | | — | 1.5 | 2.5 | | $V_{GS}$ = 2.5V, $I_D$ = 50mA |
| | | — | 1.9 | 3 | | $V_{GS}$ = 1.8V, $I_D$ = 50mA |
| | | — | 2.6 | — | | $V_{GS}$ = 1.5V, $I_D$ = 10mA |
| Forward Transfer Admittance | $\|Y_{fs}\|$ | — | 0.8 | — | S | $V_{DS}$ = 10V, $I_D$ = 200mA |
| Diode Forward Voltage | $V_{SD}$ | — | 0.9 | 1.3 | V | $V_{GS}$ = 0V, $I_S$ = 115mA |
| **DYNAMIC CHARACTERISTICS (Note 8)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 32 | 64 | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0V, f = 1.0MHz |
| Output Capacitance | $C_{oss}$ | — | 4.4 | 9 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 2.9 | 6 | | |
| Gate Resistance | $R_g$ | — | 126 | 250 | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz |
| Total Gate Charge | $Q_g$ | — | 0.45 | 0.9 | nC | $V_{GS}$ = 4.5V, $V_{DS}$ = 10V, $I_D$ = 250mA |
| Gate-Source Charge | $Q_{gs}$ | — | 0.08 | 0.2 | | |
| Gate-Drain Charge | $Q_{gd}$ | — | 0.08 | 0.2 | | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 3.4 | 10 | ns | $V_{GS}$ = 10V, $V_{DS}$ = 30V, $R_L$ = 150Ω, $R_g$ = 25Ω, $I_D$ = 200mA |
| Turn-On Rise Time | $t_R$ | — | 3.4 | 10 | ns | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 26.4 | 45 | ns | |
| Turn-Off Fall Time | $t_F$ | — | 16.3 | 30 | ns | |

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

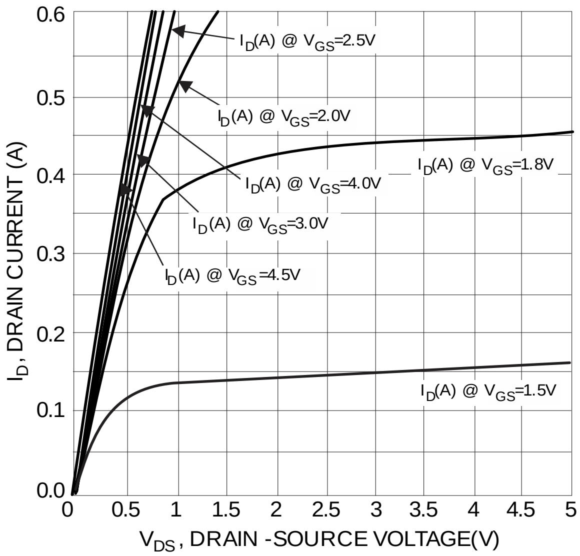


Fig. 1 Typical Output Characteristics

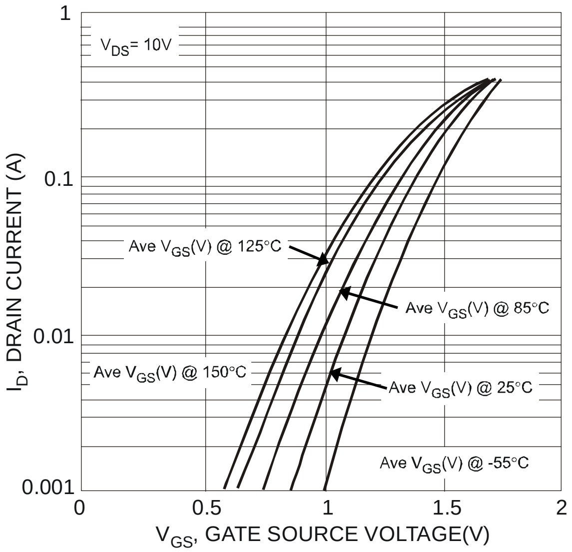


Fig. 2 Typical Transfer Characteristics

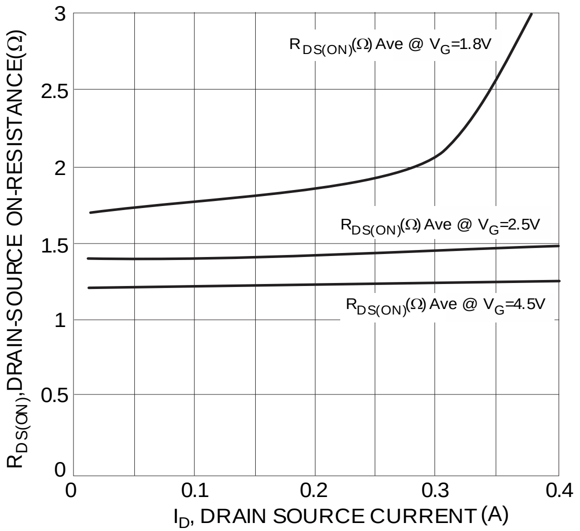


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

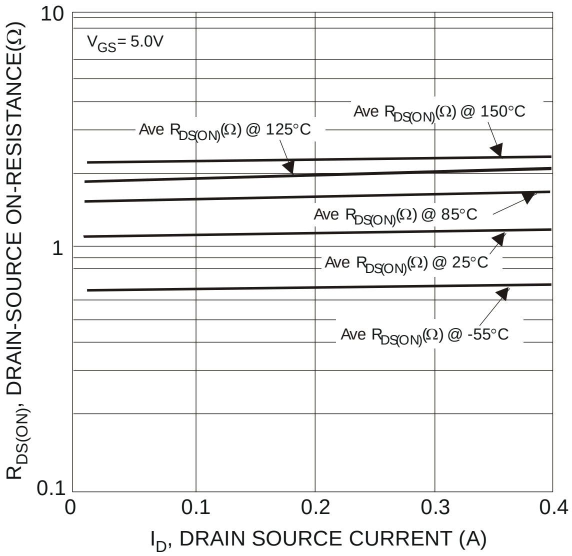


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

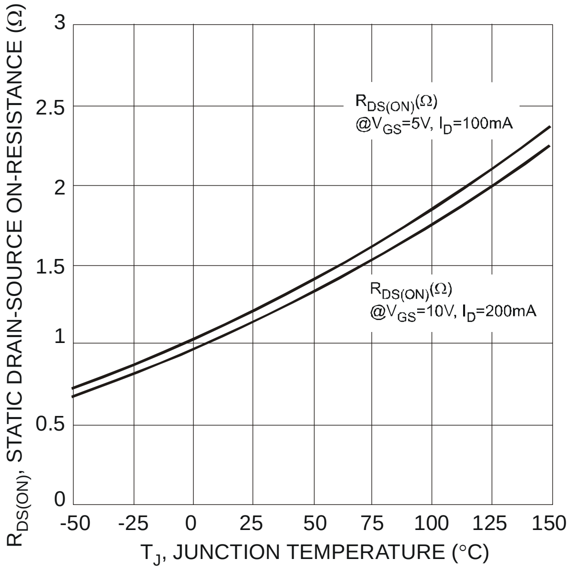


Fig. 5 On-Resistance Variation with Temperature

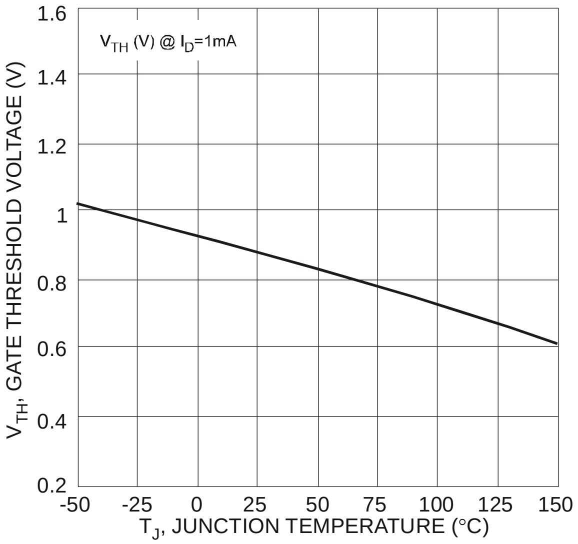


Fig. 6 Gate Threshold Variation vs. Junction Temperature

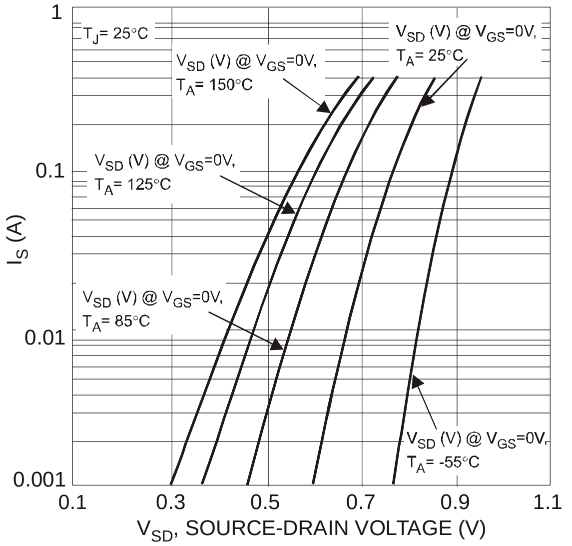


Fig. 7 Diodes Forward Voltage vs. Current

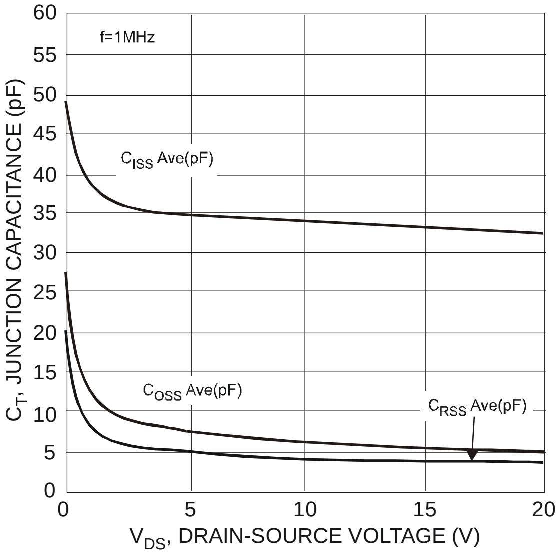


Fig. 8 Typical Junction Capacitance

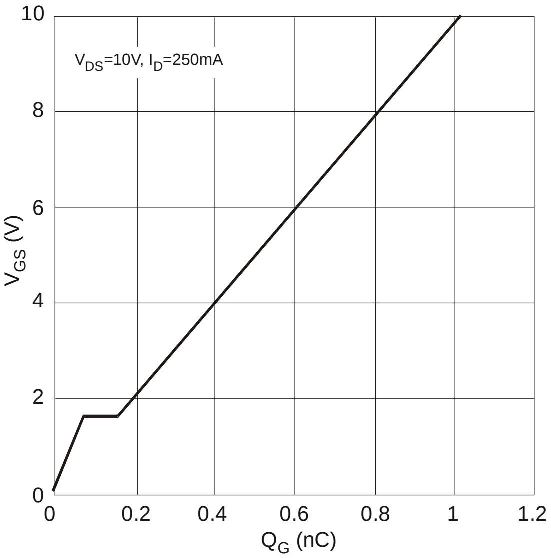


Fig. 9 Gate Charge Characteristics

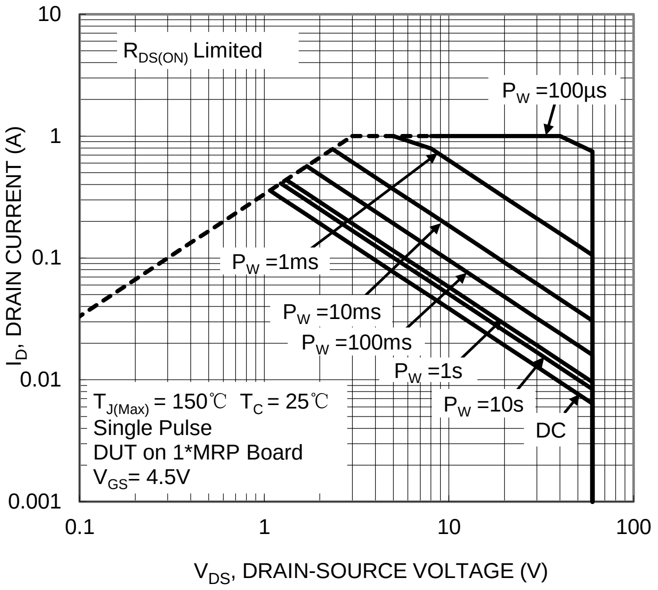


Fig.10 SOA, Safe Operation Area

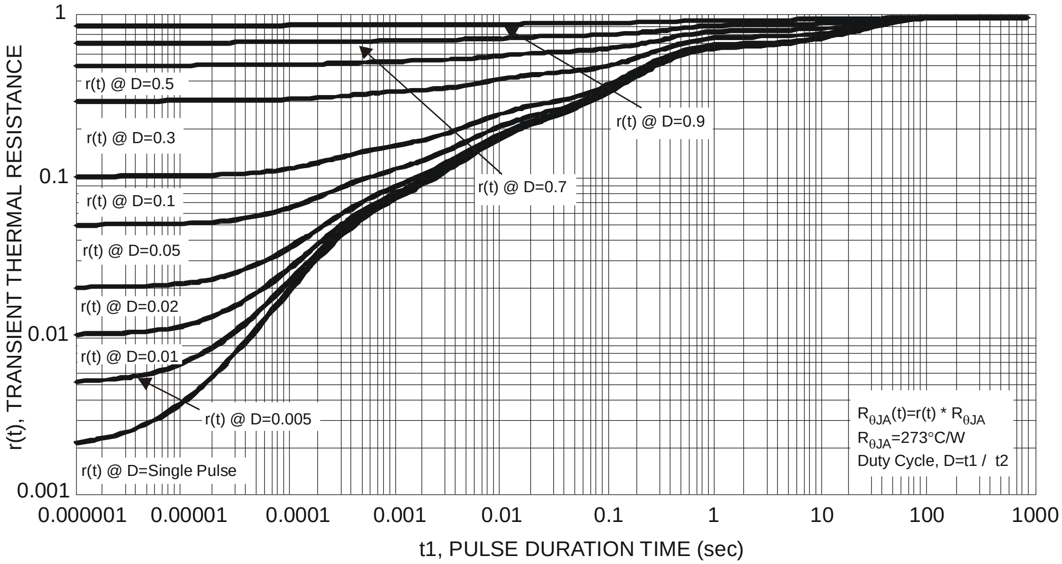
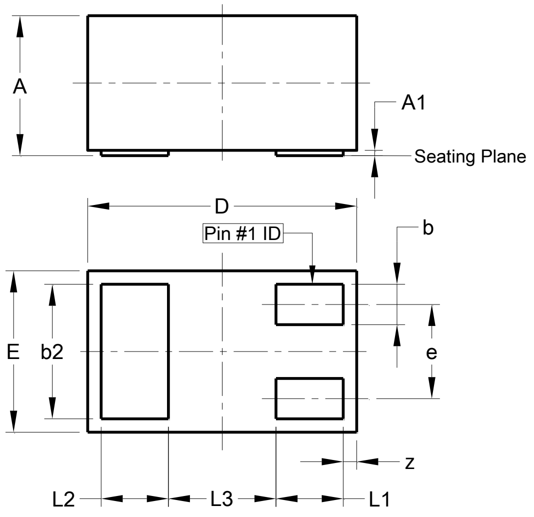


Fig. 11 Transient Thermal Resistance

## Package Outline Dimensions

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

**X1-DFN1006-3**

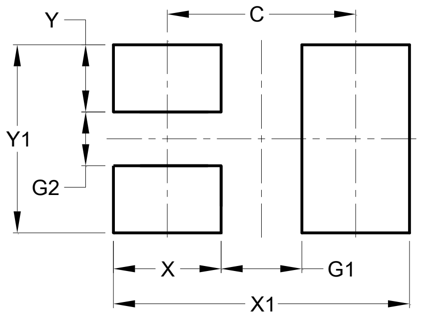


| X1-DFN1006-3 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.47 | 0.53 | 0.50 |
| **A1** | 0.00 | 0.05 | 0.03 |
| **b** | 0.10 | 0.20 | 0.15 |
| **b2** | 0.45 | 0.55 | 0.50 |
| **D** | 0.95 | 1.075 | 1.00 |
| **E** | 0.55 | 0.675 | 0.60 |
| **e** | - | - | 0.35 |
| **L1** | 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.

**X1-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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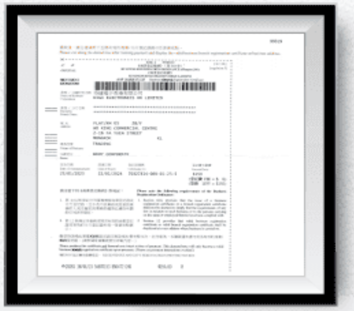

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