

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ Max | I_D Max @ $T_A = +25^\circ\text{C}$ |
|---------------|--------------------------------------|--|
| -30V | 2.4Ω @ $V_{GS} = -10\text{V}$ | -400mA |
| | 4Ω @ $V_{GS} = -4.5\text{V}$ | -300mA |

Description

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.

Applications

- Load Switch
- Portable Applications
- Power Management Functions

Features

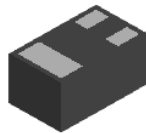
- Low On-Resistance
- Ultra-Small Surfaced Mount Package
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

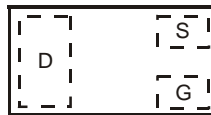
- Case: X1-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.001 grams (Approximate)



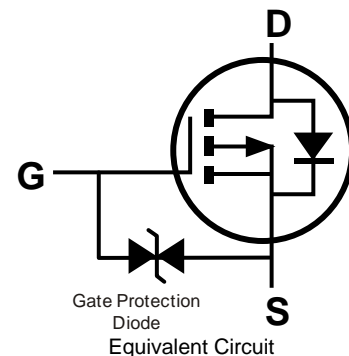
X1-DFN1006-3



Bottom View



Top View



Ordering Information (Note 4)

| Part Number | Reel Size (inches) | Quantity per Reel |
|---------------|--------------------|-------------------|
| DMP32D5SFB-7B | 7 | 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 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



Top View
Bar Denotes Gate and Source Side

XH = Product Type 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} | ±25 | V |
| Continuous Drain Current (Note 5) | V _{GS} = -10V | T _A = +25°C | I _D | -400 | mA |
| | | T _A = +70°C | | -300 | |
| Continuous Drain Current (Note 6) | V _{GS} = -10V | T _A = +25°C | I _D | -500 | mA |
| | | T _A = +70°C | | -400 | |
| Pulsed Drain Current (Note 5) | | | I _{DM} | -1 | A |
| Maximum Body Diode Continuous Current (Note 6) | | | I _S | -800 | mA |

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

| Characteristic | | Symbol | Value | Unit |
|---|----------|-----------------------------------|-------------|------|
| Total Power Dissipation | (Note 5) | P _D | 0.5 | W |
| | (Note 6) | | 1.2 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | R _{θJA} | 255 | °C/W |
| | (Note 6) | | 108 | |
| 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} = 0V, I _D = -1mA | |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | - | - | -1 | µA | V _{DS} = -30V, V _{GS} = 0V | |
| Gate-Source Leakage | I _{GSS} | - | - | ±10 | µA | V _{GS} = ±20V, V _{DS} = 0V | |
| ON CHARACTERISTICS (Note 7) | | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -1.3 | - | -2.3 | V | V _{DS} = V _{GS} , I _D = -250µA | |
| Static Drain-Source On-Resistance | R _{DS(ON)} | - | - | 2.4 | Ω | V _{GS} = -10V, I _D = -200mA | |
| | | | | 4 | | V _{GS} = -4.5V, I _D = -200mA | |
| Diode Forward Voltage | V _{SD} | - | 0.8 | 1.2 | V | V _{GS} = 0V, I _S = -300mA | |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | | |
| Input Capacitance | C _{ISS} | - | 51 | 100 | pF | V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz | |
| Output Capacitance | C _{OSS} | - | 11 | 20 | pF | | |
| Reverse Transfer Capacitance | C _{RSS} | - | 9 | 20 | pF | | |
| Total Gate Charge | Q _g | - | 0.62 | 2 | nC | V _{GS} = -4.5V | V _{DS} = -10V, I _D = -200mA |
| Total Gate Charge | Q _g | - | 1.25 | 4 | nC | V _{GS} = -10V | |
| Gate-Source Charge | Q _{gs} | - | 0.16 | 0.5 | nC | | |
| Gate-Drain Charge | Q _{gd} | - | 0.21 | 0.5 | nC | | |
| Turn-On Delay Time | t _{D(ON)} | - | 4.3 | 10 | ns | V _{DS} = -15V, I _D = -500mA V _{GS} = -10V, R _G = 1Ω | |
| Turn-On Rise Time | t _R | - | 7.7 | 15 | ns | | |
| Turn-Off Delay Time | t _{D(OFF)} | - | 31.9 | 60 | ns | | |
| Turn-Off Fall Time | t _F | - | 17.8 | 40 | ns | | |

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

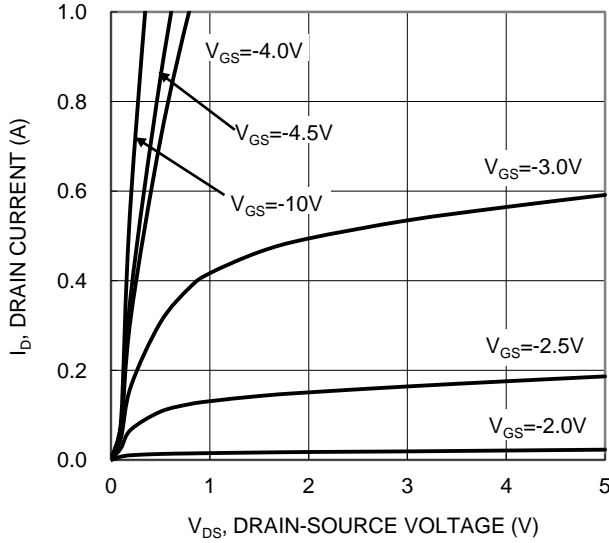


Figure 1. Typical Output Characteristic

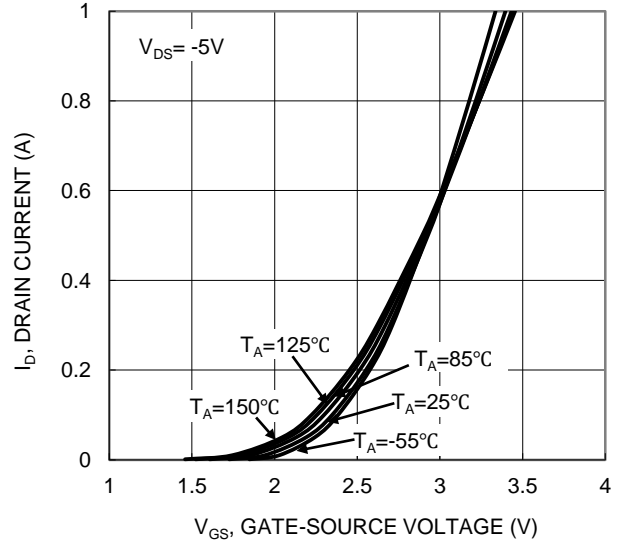


Figure 2. Typical Transfer Characteristic

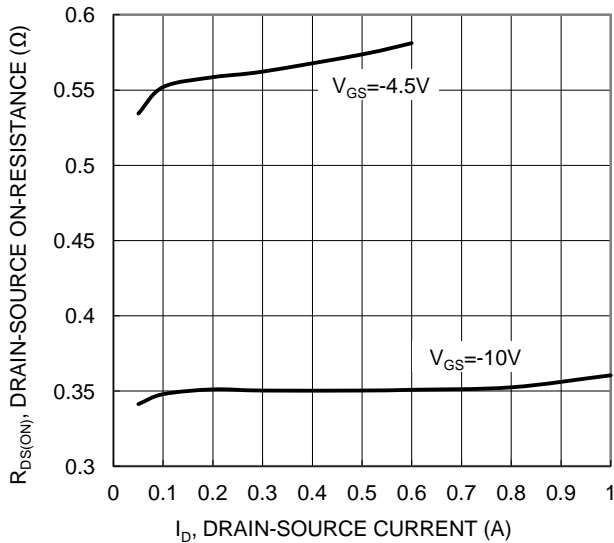


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

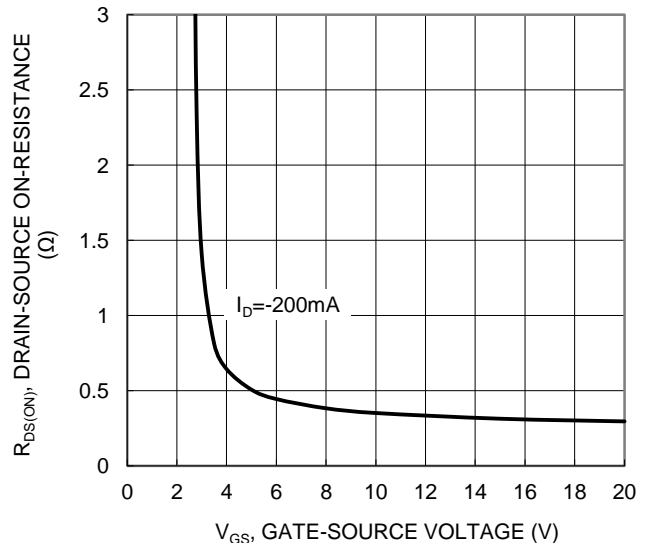


Figure 4. Typical Transfer Characteristic

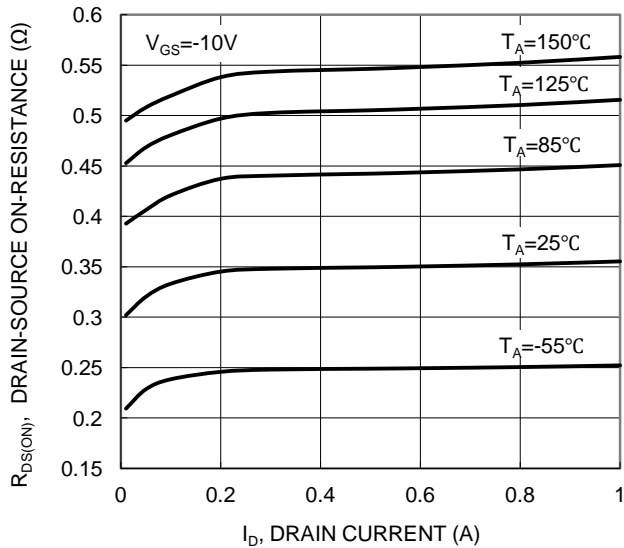


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

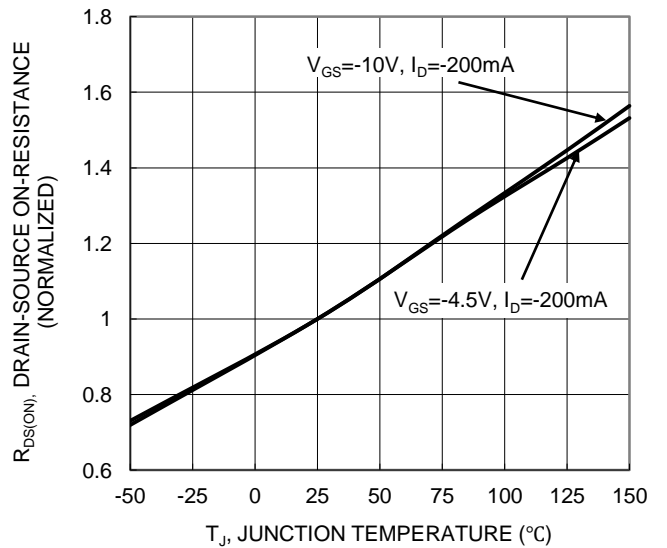
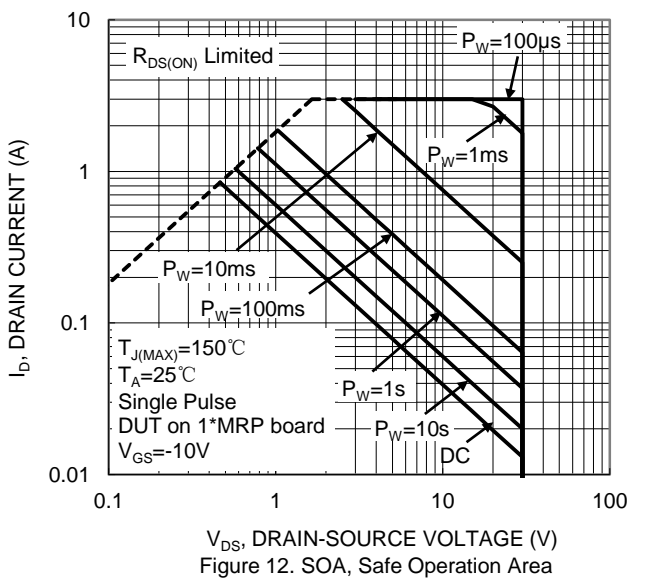
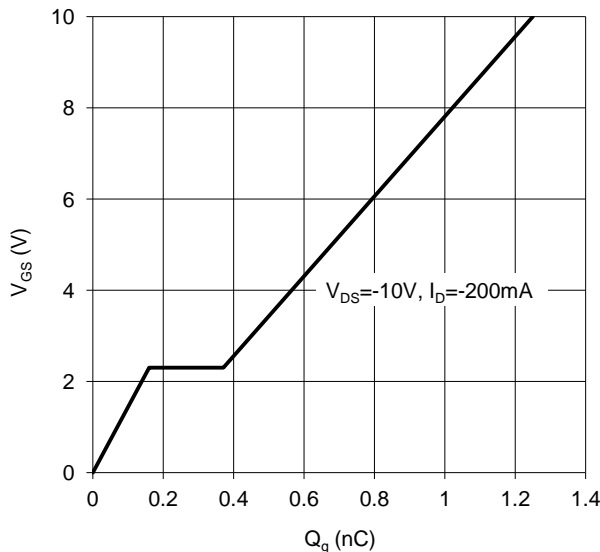
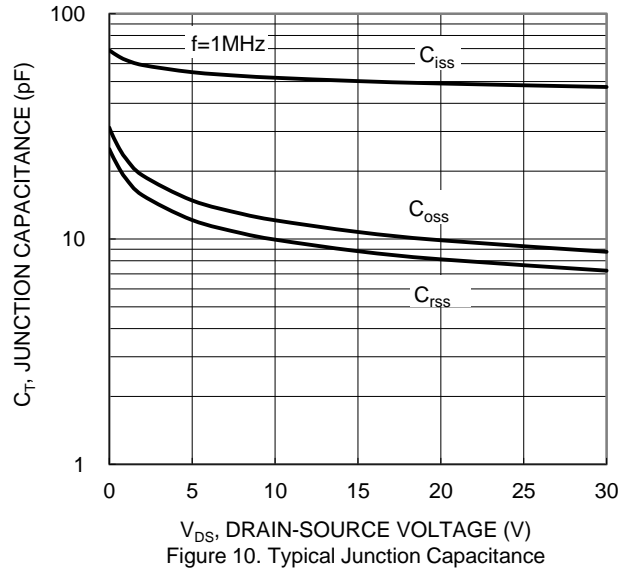
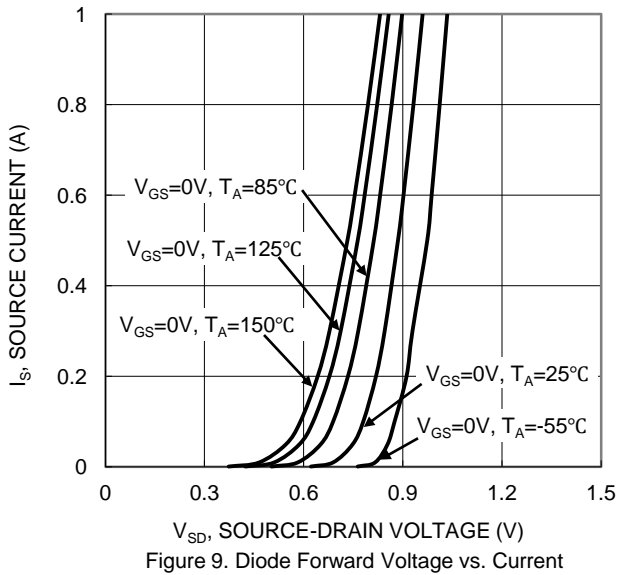
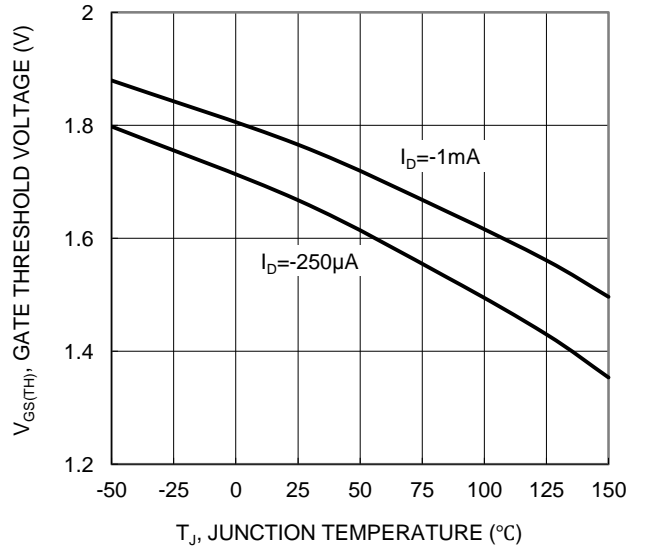
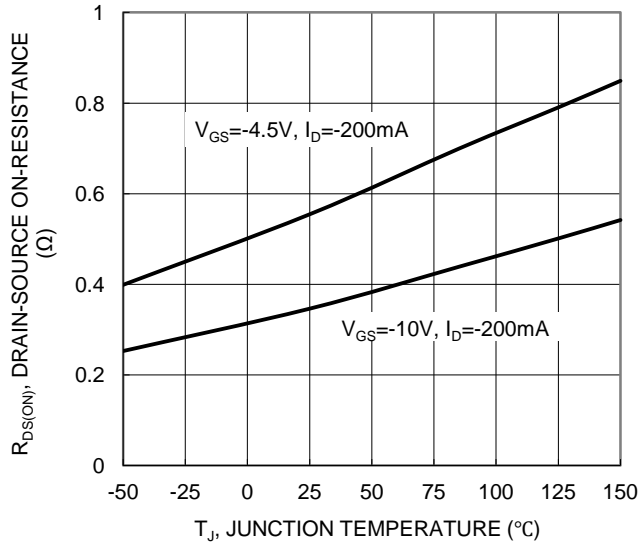


Figure 6. On-Resistance Variation with Temperature



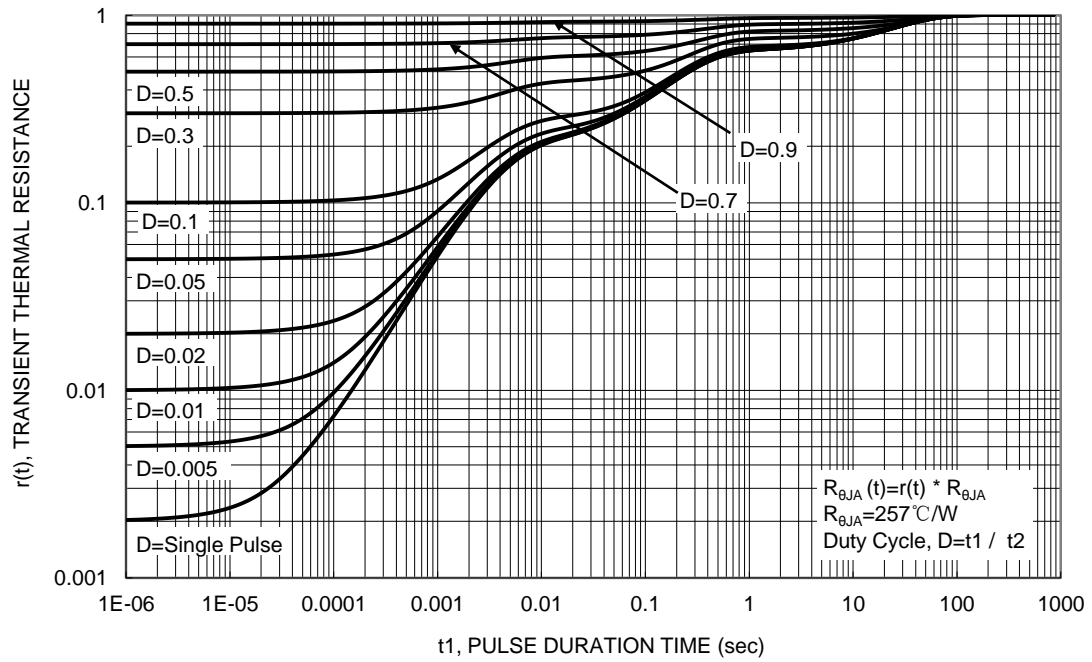
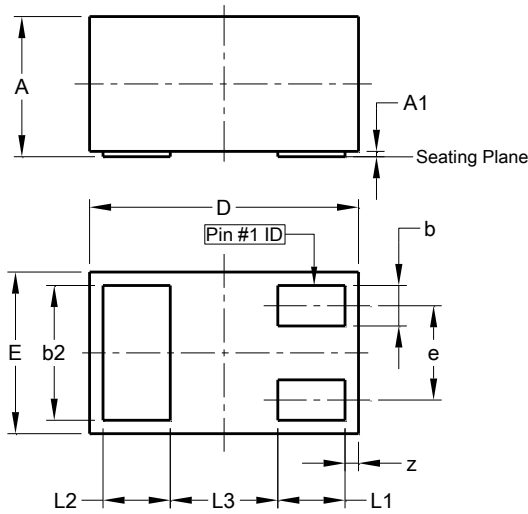


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

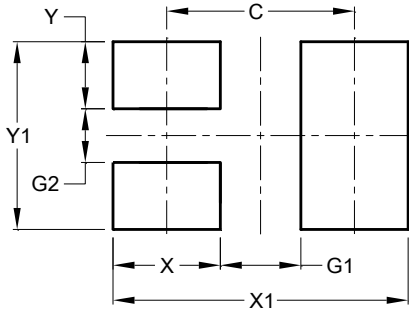
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| 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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