

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(on)</sub>           | I <sub>D</sub><br>T <sub>A</sub> = +25°C |
|-------------------|-------------------------------|------------------------------------------|
| 20V               | 3.0Ω @ V <sub>GS</sub> = 4.5V | 240mA                                    |
|                   | 6.0Ω @ V <sub>GS</sub> = 1.8V | 180mA                                    |

## Description

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

## Applications

- DC-DC Converters
- Power Management Functions

## Features and Benefits

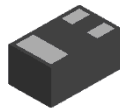
- N-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package, 0.4mm Maximum Package Height
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

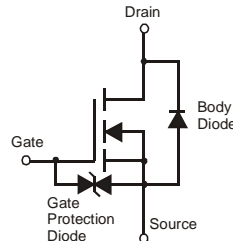
- Case: X2-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.001 grams (Approximate)



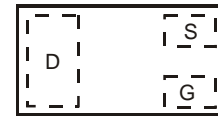
X2-DFN1006-3



Bottom View



Equivalent Circuit





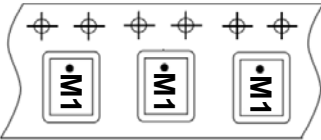
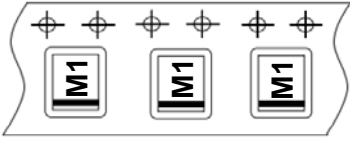
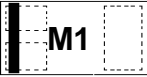
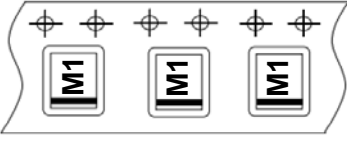
Top View

## Ordering Information (Note 4)

| Part Number    | Case         | Packaging          |
|----------------|--------------|--------------------|
| DMN26D0UFB4-7  | X2-DFN1006-3 | 3,000/Tape & Reel  |
| DMN26D0UFB4-7B | X2-DFN1006-3 | 10,000/Tape & Reel |

- 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**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>DMN26D0UFB4-7</b></p>  | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Top View<br/>Dot Denotes Drain Side</p> </div> <div style="text-align: center;"> <p>From date code 1527 (YYWW),<br/>this changes to:</p>  <p>Top View<br/>Bar Denotes Gate and Source Side</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;">   </div> |
| <p><b>DMN26D0UFB4-7B</b></p> | <div style="text-align: center;">  <p>Top View<br/>Bar Denotes Gate and Source Side</p> </div> <div style="text-align: center; margin-top: 20px;">  </div> <p style="text-align: right; margin-top: 20px;"><b>M1</b> = Part Marking Code</p>                                                                                                                                                                                                                                                                                                                              |

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                           |              |                        | Symbol           | Value | Unit |
|----------------------------------------------------------|--------------|------------------------|------------------|-------|------|
| Drain Source Voltage                                     |              |                        | V <sub>DSS</sub> | 20    | V    |
| Gate-Source Voltage                                      |              |                        | V <sub>GSS</sub> | ±10   | V    |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = 4.5V | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 240   | mA   |
|                                                          |              | T <sub>A</sub> = +70°C |                  | 190   |      |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = 1.8V | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 180   | mA   |
|                                                          |              | T <sub>A</sub> = +70°C |                  | 140   |      |
| Pulsed Drain Current - T <sub>P</sub> = 10μs             |              |                        | I <sub>DM</sub>  | 805   | mA   |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                           | Symbol                            | Value       | Unit |
|----------------------------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) @T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 350         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5)         | R <sub>θJA</sub>                  | 357         | °C/W |
| Operating and Storage Temperature Range                  | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

Note: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

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

| Characteristic                                              | Symbol       | Min | Typ                      | Max                       | Unit          | Test Condition                                                                                                            |
|-------------------------------------------------------------|--------------|-----|--------------------------|---------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 6)</b>                         |              |     |                          |                           |               |                                                                                                                           |
| Drain-Source Breakdown Voltage                              | $BV_{DSS}$   | 20  | —                        | —                         | V             | $V_{GS} = 0V, I_D = 100\mu A$                                                                                             |
| Zero Gate Voltage Drain Current @ $T_C = +25^\circ\text{C}$ | $I_{DSS}$    | —   | —                        | 500                       | nA            | $V_{DS} = 20V, V_{GS} = 0V$                                                                                               |
| Gate-Body Leakage                                           | $I_{GSS}$    | —   | —                        | $\pm 1$<br>$\pm 100$      | $\mu A$<br>nA | $V_{GS} = \pm 10V, V_{DS} = 0V$<br>$V_{GS} = \pm 5V, V_{DS} = 0V$                                                         |
| <b>ON CHARACTERISTICS (Note 6)</b>                          |              |     |                          |                           |               |                                                                                                                           |
| Gate Threshold Voltage                                      | $V_{GS(TH)}$ | 0.6 | —                        | 0.9                       | V             | $V_{DS} = V_{GS}, I_D = 250\mu A$                                                                                         |
| Static Drain-Source On-Resistance                           | $R_{DS(ON)}$ | —   | 1.8<br>2.5<br>3.4<br>4.7 | 3.0<br>4.0<br>6.0<br>10.0 | $\Omega$      | $V_{GS} = 4.5V, I_D = 100mA$<br>$V_{GS} = 2.5V, I_D = 50mA$<br>$V_{GS} = 1.8V, I_D = 20mA$<br>$V_{GS} = 1.5V, I_D = 10mA$ |
| Forward Transconductance                                    | $ Y_{fs} $   | 180 | 242                      | —                         | mS            | $V_{DS} = 10V, I_D = 0.1A$                                                                                                |
| Source-Drain Diode Forward Voltage                          | $V_{SD}$     | 0.5 | —                        | 1.4                       | V             | $V_{GS} = 0V, I_S = 115mA$                                                                                                |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b>                     |              |     |                          |                           |               |                                                                                                                           |
| Input Capacitance                                           | $C_{iss}$    | —   | 14.1                     | 28.2                      | pF            | $V_{DS} = 15V, V_{GS} = 0V$<br>$f = 1.0MHz$                                                                               |
| Output Capacitance                                          | $C_{oss}$    | —   | 2.9                      | 5.8                       | pF            |                                                                                                                           |
| Reverse Transfer Capacitance                                | $C_{rss}$    | —   | 1.6                      | 3.2                       | pF            |                                                                                                                           |
| <b>SWITCHING CHARACTERISTICS (Note 7)</b>                   |              |     |                          |                           |               |                                                                                                                           |
| Turn-On Delay Time                                          | $t_{D(ON)}$  | —   | 3.8                      | —                         | ns            | $V_{GS} = 4.5V, V_{DD} = 10V$<br>$I_D = 200mA, R_G = 2.0\Omega$                                                           |
| Rise Time                                                   | $t_R$        | —   | 7.9                      | —                         |               |                                                                                                                           |
| Turn-Off Delay Time                                         | $t_{D(OFF)}$ | —   | 13.4                     | —                         |               |                                                                                                                           |
| Fall Time                                                   | $t_F$        | —   | 15.2                     | —                         |               |                                                                                                                           |

Notes: 6. Short duration pulse test used to minimize self-heating effect.  
7. Guaranteed by design. Not subject to product testing.

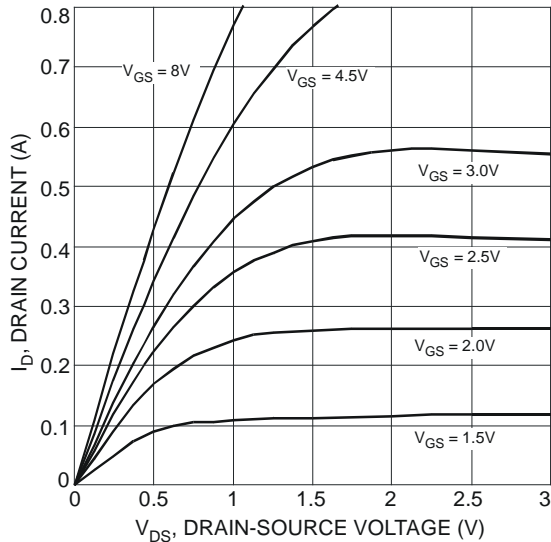


Fig. 1 Typical Output Characteristic

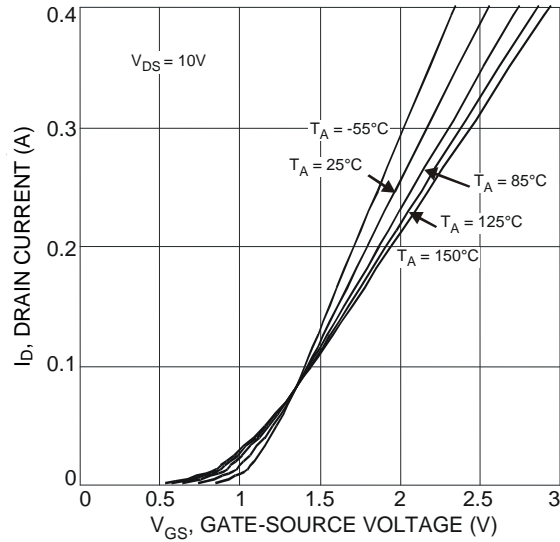


Fig. 2 Typical Transfer Characteristic

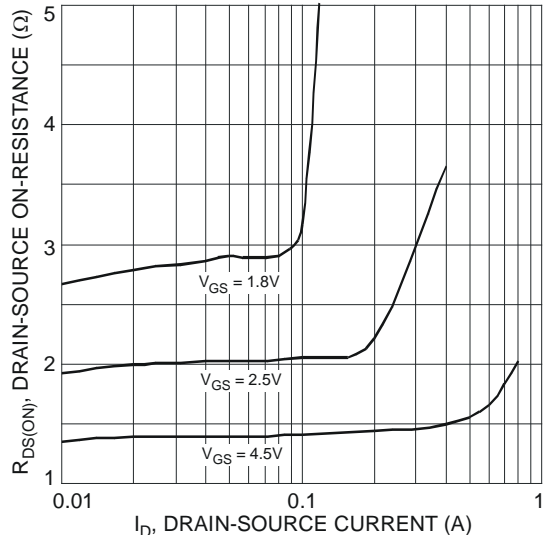


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

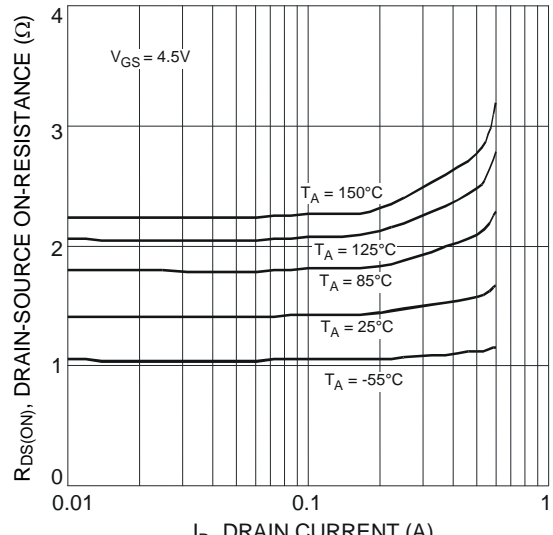


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

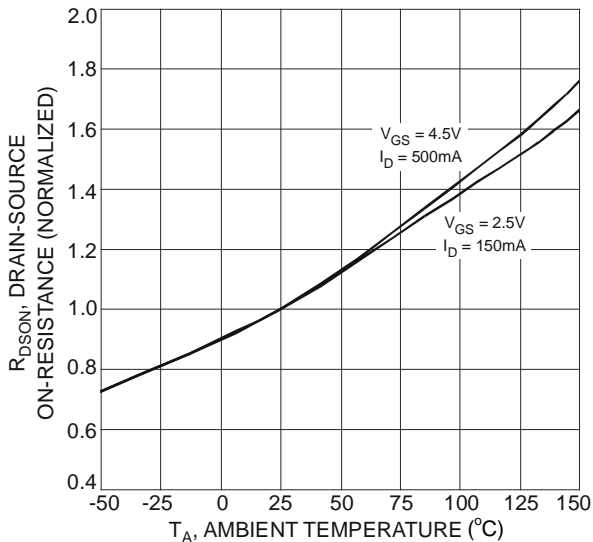


Fig. 5 On-Resistance Variation with Temperature

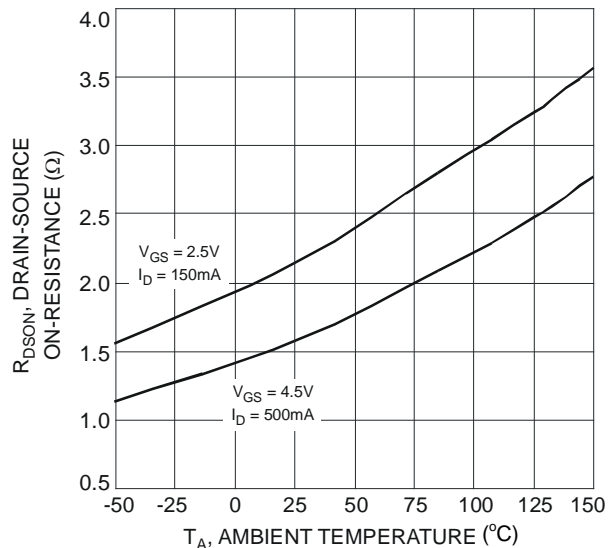


Fig. 6 On-Resistance Variation with Temperature

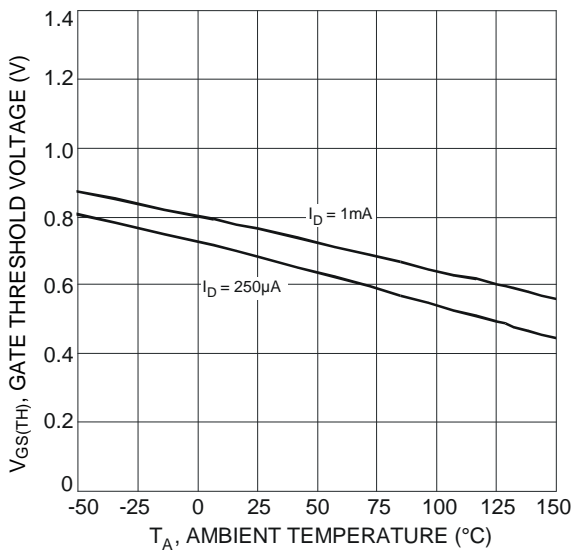


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

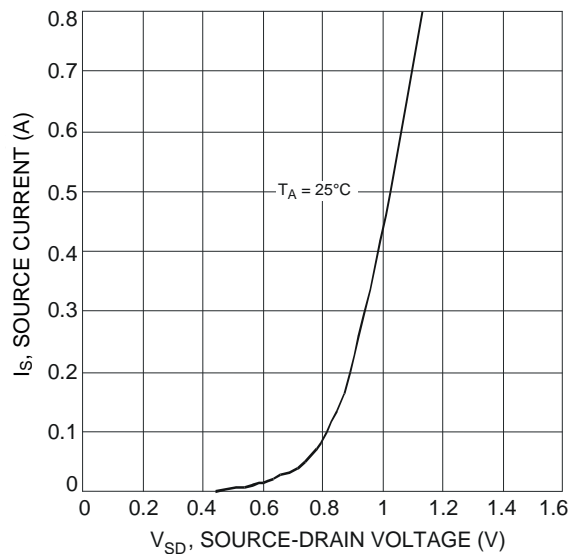


Fig. 8 Diode Forward Voltage vs. Current

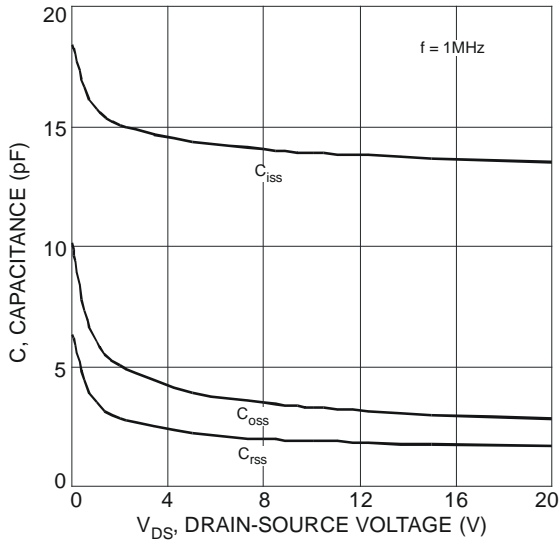


Fig. 9 Typical Total Capacitance

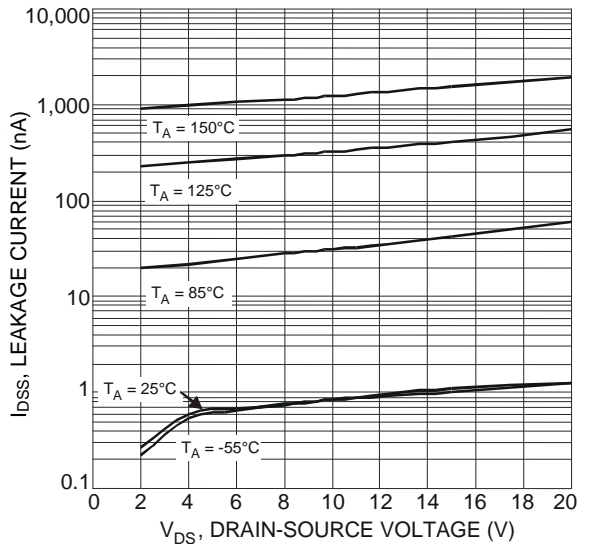


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

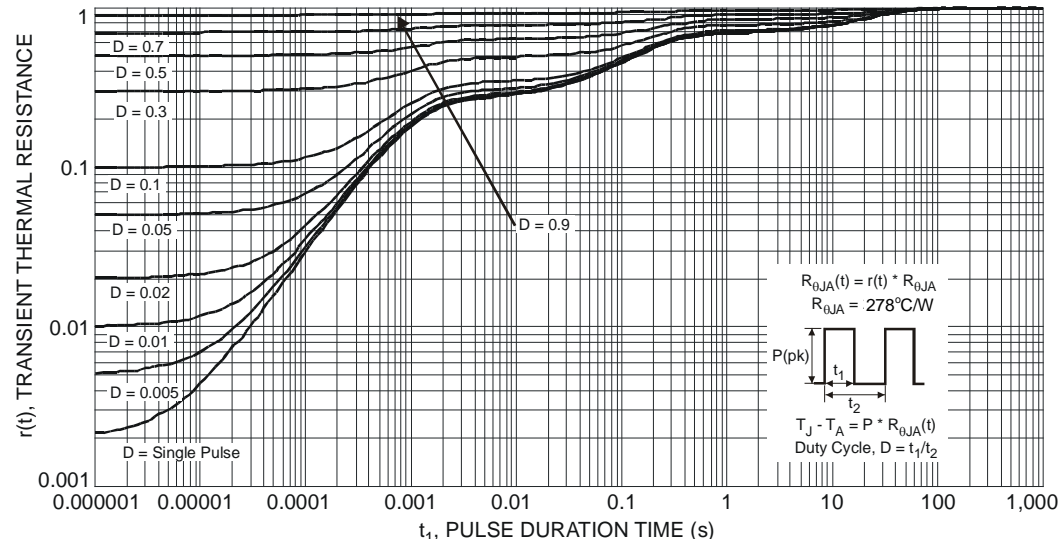
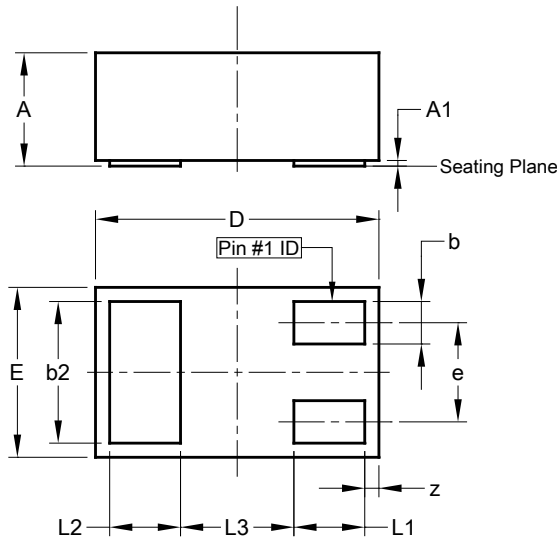


Fig. 11 Transient Thermal Response

**Package Outline Dimensions**

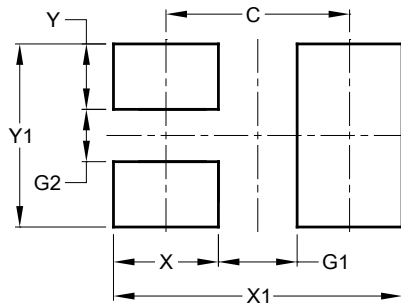
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



| 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.



| 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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