# 100V N-CHANNEL ENHANCEMENT MODE MOSFET

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)\ max}$ | $I_D$ $T_A$ = +25°C |
|---|---|---|
| 100V | 220mΩ @ $V_{GS}$ = 10V | 2.24A |
| | 250mΩ @ $V_{GS}$ = 4.5V | 2.10A |

## Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Description

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.

## Mechanical Data

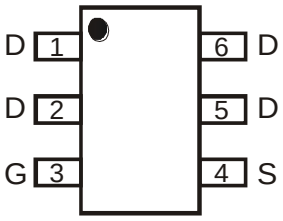
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (Approximate)

## Applications

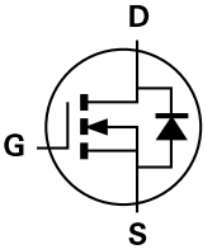
- DC-DC Converters
- Power Management Functions
- Backlighting

TSOT26

Top View




Top View
Pin Configuration



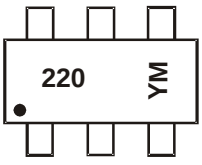

Equivalent Circuit

## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| DMN10H220LVT-7 | TSOT26 | 3,000/Tape & Reel |
| DMN10H220LVT-13 | TSOT26 | 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 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




220 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: C = 2015)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|
| Code | C | D | E | F | G | H | I | J |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

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

| Characteristic | | | Symbol | Value | Units |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | 100 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±16 | V |
| Continuous Drain Current (Note 5) $V_{GS}$ = 10V | (Note 6) | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | 2.24<br>1.79 | A |
| | (Note 5) | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | 1.87<br>1.50 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | $I_S$ | 1.50 | A |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | | $I_{DM}$ | 6.60 | A |

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

| Characteristic | | Symbol | Value | Units |
|---|---|---|---|---|
| Total Power Dissipation (Note 6) | $T_A$ = +25°C | $P_D$ | 1.67 | W |
| | $T_A$ = +70°C | | 1.07 | |
| Thermal Resistance, Junction to Ambient | (Note 6) | $R_{\theta JA}$ | 75 | °C/W |
| | (Note 5) | | 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 | $BV_{DSS}$ | 100 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250µA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | 1 | µA | $V_{DS}$ = 100V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±16V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS (Note 7)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 1 | 1.8 | 2.5 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250µA |
| Static Drain-Source On-Resistance | $R_{DS\ (ON)}$ | — | 172 | 220 | mΩ | $V_{GS}$ = 10V, $I_D$ = 1.6A |
| | | | 211 | 250 | | $V_{GS}$ = 4.5V, $I_D$ = 1.3A |
| Diode Forward Voltage | $V_{SD}$ | — | 0.77 | 1.2 | V | $V_{GS}$ = 0V, $I_S$ = 1.1A |
| **DYNAMIC CHARACTERISTICS (Note 8)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 401 | — | pF | $V_{DS}$ = 25V, $V_{GS}$ = 0V<br>f = 1MHz |
| Output Capacitance | $C_{oss}$ | — | 22 | — | | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 17 | — | | |
| Gate Resistance | $R_g$ | — | 2.1 | — | Ω | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz |
| Total Gate Charge ($V_{GS}$ = 4.5V) | $Q_g$ | — | 4.1 | — | nC | $V_{DS}$ = 50V, $I_D$ = 1.6A |
| Total Gate Charge ($V_{GS}$ = 10V) | $Q_g$ | — | 8.3 | — | | |
| Gate-Source Charge | $Q_{gs}$ | — | 1.5 | — | | |
| Gate-Drain Charge | $Q_{gd}$ | — | 2 | — | | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 6.8 | — | ns | $V_{DS}$ = 50V, $V_{GS}$ = 4.5V,<br>$R_G$ = 6.8Ω, $I_D$ = 1A |
| Turn-On Rise Time | $t_r$ | — | 8.2 | — | | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 7.9 | — | | |
| Turn-Off Fall Time | $t_f$ | — | 3.6 | — | | |
| Reverse Recovery Time | $t_{rr}$ | — | 17 | — | ns | $I_F$ = 1.1A, di/dt =100A/µs |
| Reverse Recovery Charge | $Q_{rr}$ | — | 9.8 | — | nC | |

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

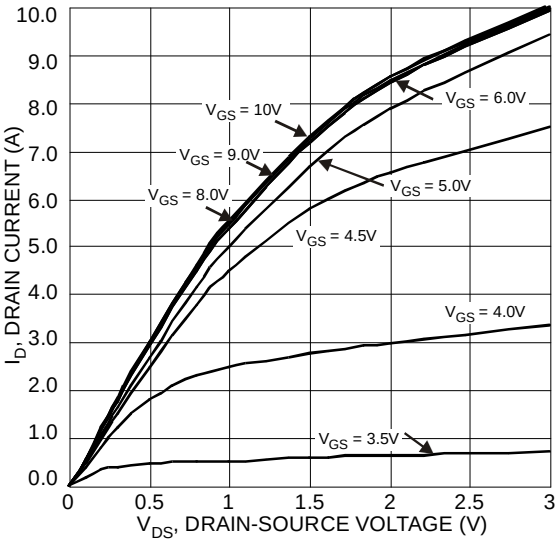



Figure 1 Typical Output Characteristic

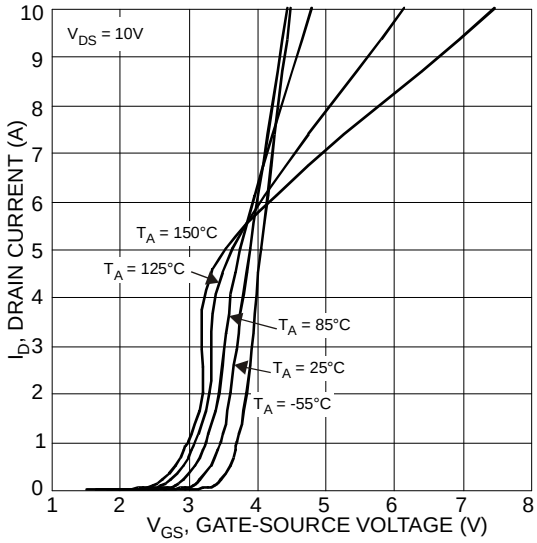



Figure 2 Typical Transfer Characteristics

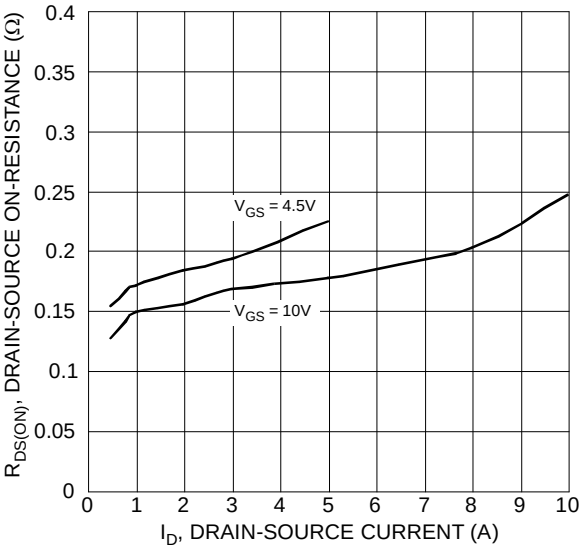



Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

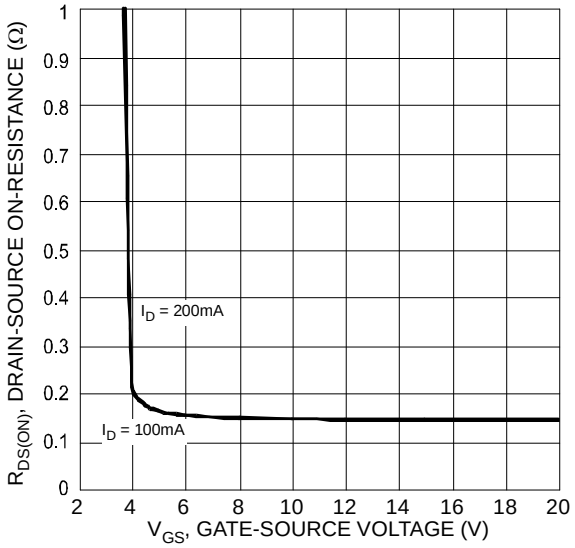



Figure 4 Typical Transfer Characteristic

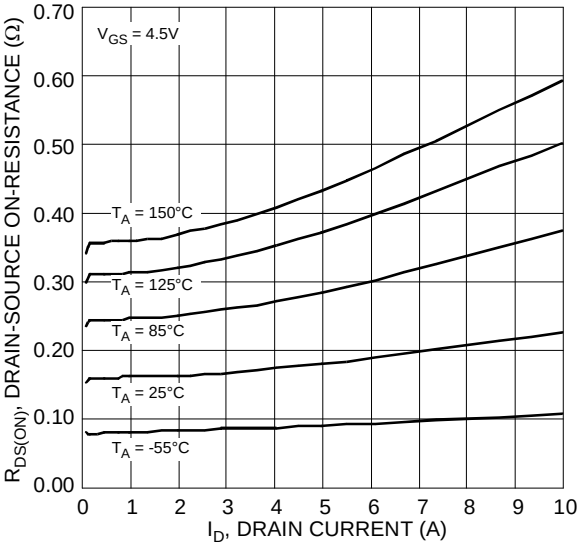



Figure 5 Typical On-Resistance vs. Drain Current and Temperature

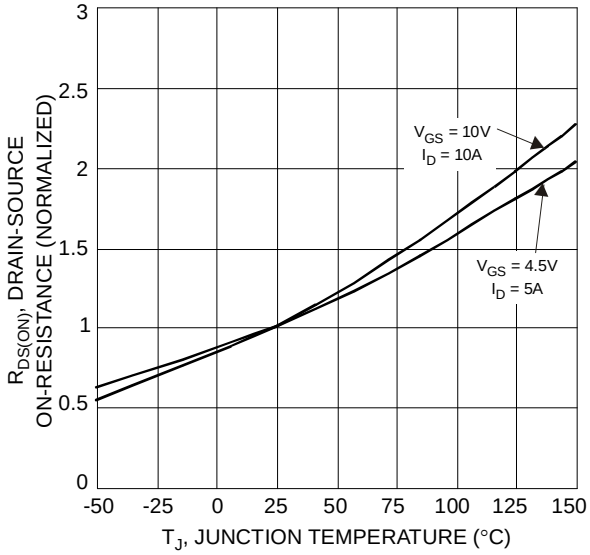



Figure 6 On-Resistance Variation with Temperature

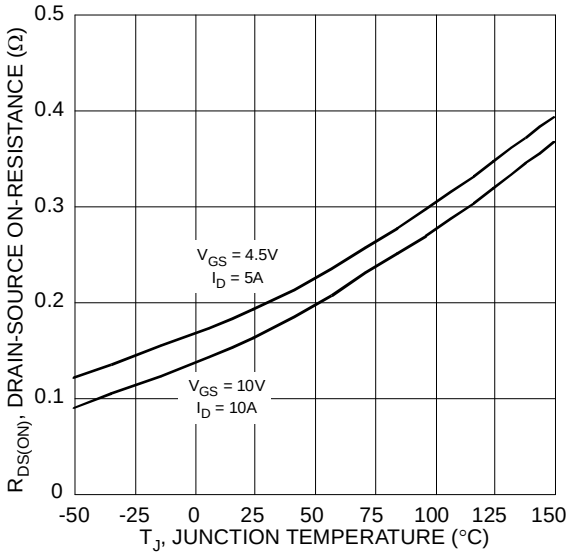



Figure 7 On-Resistance Variation with Temperature

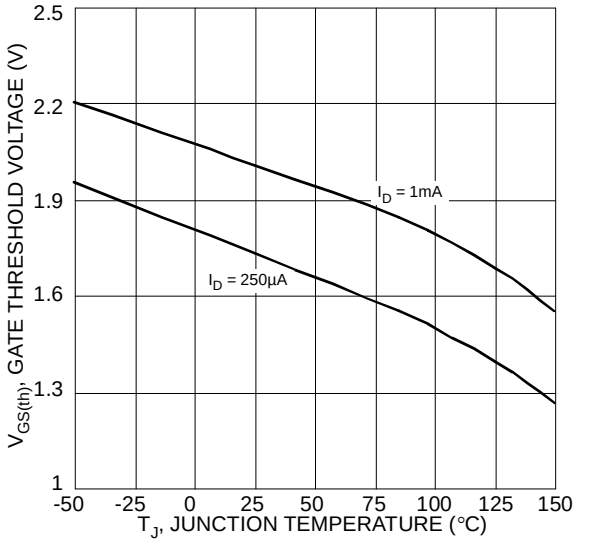



Figure 8 Gate Threshold Variation vs. Ambient Temperature

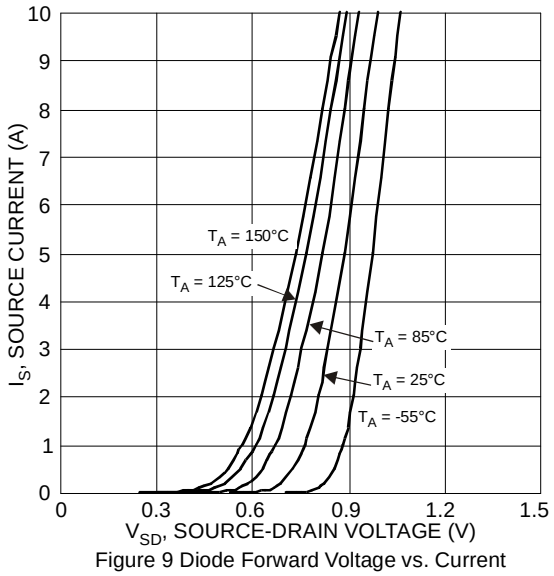



Figure 9 Diode Forward Voltage vs. Current

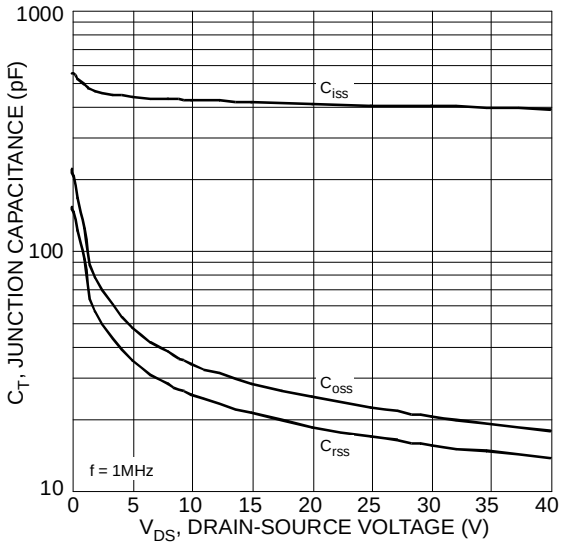



Figure 10 Typical Junction Capacitance

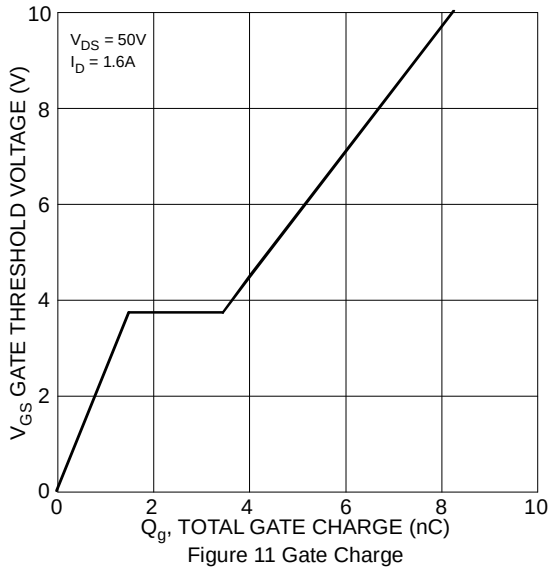



Figure 11 Gate Charge

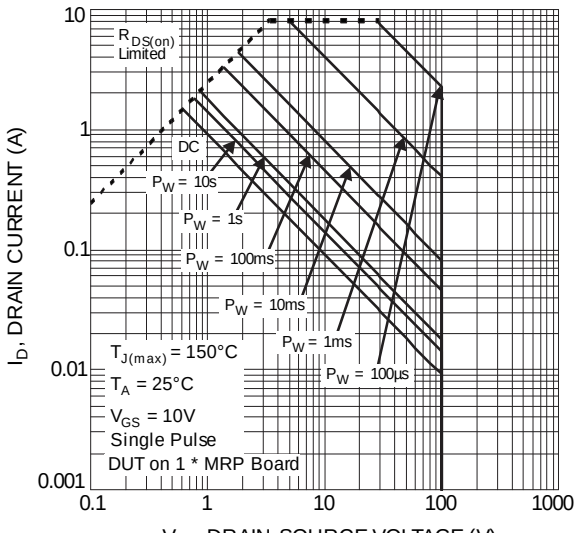



Figure 12 SOA, Safe Operation Area

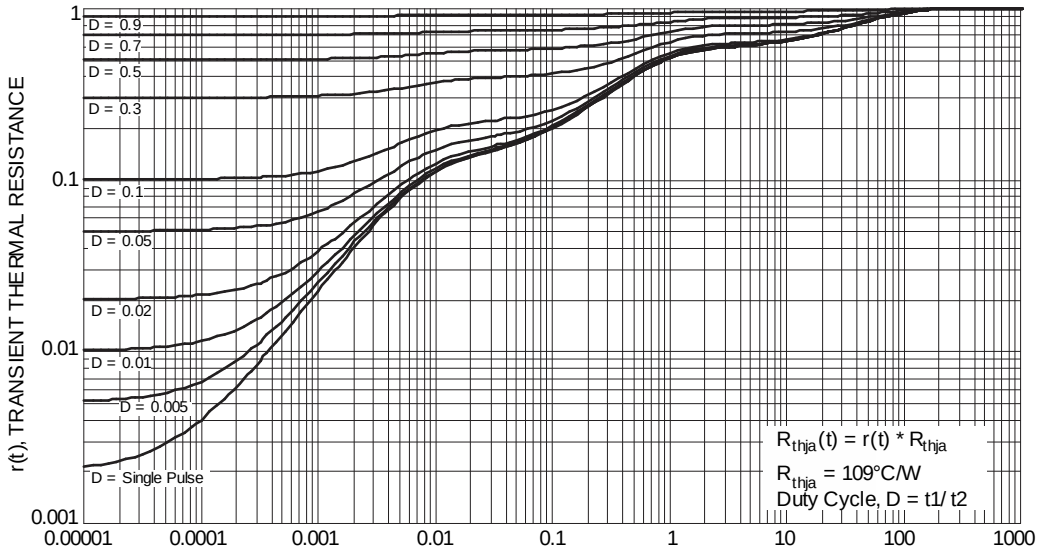
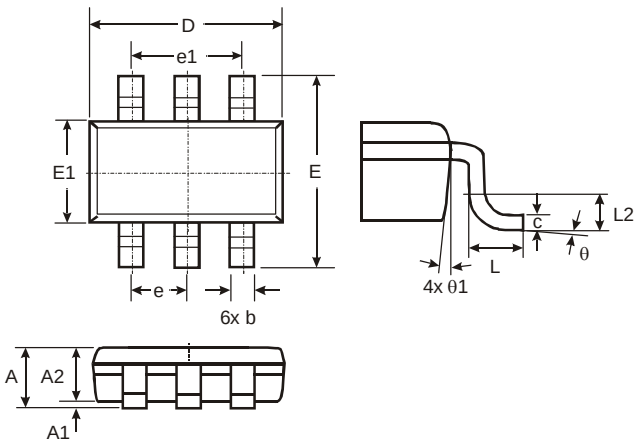



Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

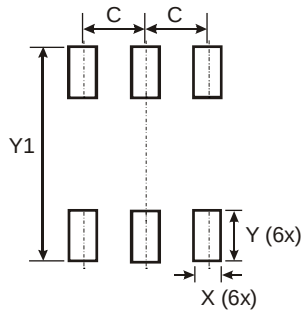
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.




| TSOT26 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | — | 1.00 | — |
| **A1** | 0.01 | 0.10 | — |
| **A2** | 0.84 | 0.90 | — |
| **D** | — | — | 2.90 |
| **E** | — | — | 2.80 |
| **E1** | — | — | 1.60 |
| **b** | 0.30 | 0.45 | — |
| **c** | 0.12 | 0.20 | — |
| **e** | — | — | 0.95 |
| **e1** | — | — | 1.90 |
| **L** | 0.30 | 0.50 | — |
| **L2** | — | — | 0.25 |
| **θ** | 0° | 8° | 4° |
| **θ1** | 4° | 12° | — |
| **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** | 0.950 |
| **X** | 0.700 |
| **Y** | 1.000 |
| **Y1** | 3.199 |

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- Техническая поддержка проекта;
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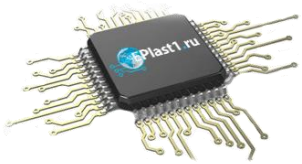


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