

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)} \text{ Max}$               | $I_D \text{ Max}$<br>$T_A = +25^\circ\text{C}$ |
|---------------|----------------------------------------|------------------------------------------------|
| -30V          | 11m $\Omega$ @ $V_{GS} = -10\text{V}$  | -13A                                           |
|               | 17m $\Omega$ @ $V_{GS} = -4.5\text{V}$ | -9.9A                                          |

## 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

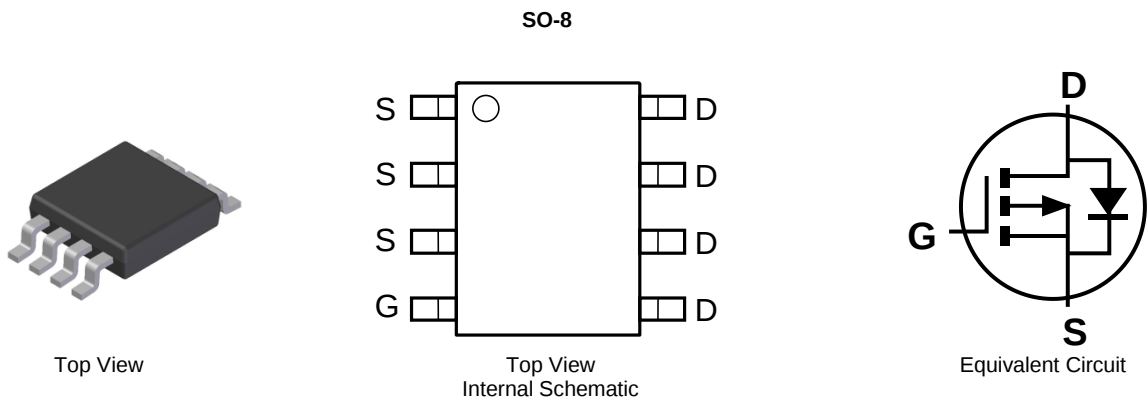
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208 
- Weight: 0.074g (Approximate)

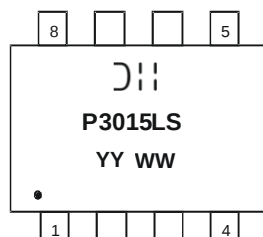


## Ordering Information (Note 5)

| Part Number    | Case | Packaging         |
|----------------|------|-------------------|
| DMP3015LSSQ-13 | SO-8 | 2,500/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DII = Manufacturer's Marking  
 P3015LS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 13 = 2013)  
 WW = Week (01 - 53)

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

| Characteristic                |              |                        | Symbol           | Value | Units |
|-------------------------------|--------------|------------------------|------------------|-------|-------|
| Drain-Source Voltage          |              |                        | V <sub>DSS</sub> | -30   | V     |
| Gate-Source Voltage           |              |                        | V <sub>GSS</sub> | ±20   | V     |
| Drain Current (Note 6)        | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | -13   | A     |
|                               |              | T <sub>A</sub> = +70°C |                  | -9.75 |       |
| Pulsed Drain Current (Note 7) |              |                        | I <sub>DM</sub>  | -45   | A     |

## Thermal Characteristics

| Characteristic                          | Symbol                            | Value       | Unit |
|-----------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 6)        | P <sub>D</sub>                    | 2.5         | W    |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 50          | °C/W |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

Notes: 6. Device mounted on 2 oz. Copper pads on FR-4 PCB with R<sub>θJA</sub> = +50°C/W.  
 7. Pulse width ≤10μs, Duty Cycle ≤1%.

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

| Characteristic                            | Symbol              | Min  | Typ          | Max      | Unit | Test Condition                                                                                                                                  |
|-------------------------------------------|---------------------|------|--------------|----------|------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS</b> (Note 8)       |                     |      |              |          |      |                                                                                                                                                 |
| Drain-Source Breakdown Voltage            | BV <sub>DSS</sub>   | -30  | —            | —        | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                                                                   |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | —    | —            | -1       | μA   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V                                                                                                    |
| Gate-Source Leakage                       | I <sub>GSS</sub>    | —    | —            | ±100     | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                                                                    |
| <b>ON CHARACTERISTICS</b> (Note 8)        |                     |      |              |          |      |                                                                                                                                                 |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub> | -1   | —            | -2       | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                                                                     |
| Static Drain-Source On-Resistance         | R <sub>DS(on)</sub> | —    | 9<br>14      | 11<br>17 | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A<br>V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A                                                 |
| Forward Transconductance                  | g <sub>fs</sub>     | —    | 15           | —        | S    | V <sub>DS</sub> = -15V, I <sub>D</sub> = -8A                                                                                                    |
| Diode Forward Voltage (Note 8)            | V <sub>SD</sub>     | -0.5 | —            | -1.1     | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.1A                                                                                                    |
| <b>DYNAMIC CHARACTERISTICS</b> (Note 9)   |                     |      |              |          |      |                                                                                                                                                 |
| Input Capacitance                         | C <sub>iss</sub>    | —    | 2,748        | —        | pF   | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                                                      |
| Output Capacitance                        | C <sub>oss</sub>    | —    | 357          | —        | pF   |                                                                                                                                                 |
| Reverse Transfer Capacitance              | C <sub>rss</sub>    | —    | 356          | —        | pF   |                                                                                                                                                 |
| Gate Resistance                           | R <sub>G</sub>      | —    | 2.0          | —        | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                                                        |
| <b>SWITCHING CHARACTERISTICS</b> (Note 9) |                     |      |              |          |      |                                                                                                                                                 |
| Total Gate Charge                         | Q <sub>g</sub>      | —    | 30.0<br>60.4 | —        | nC   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -13A<br>V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A |
| Gate-Source Charge                        | Q <sub>gs</sub>     | —    | 7.2          | —        |      | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A                                                                           |
| Gate-Drain Charge                         | Q <sub>gd</sub>     | —    | 16.4         | —        |      | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A                                                                           |
| Turn-On Delay Time                        | t <sub>d(on)</sub>  | —    | 11.2         | —        | nS   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V,<br>I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω                                                  |
| Rise Time                                 | t <sub>r</sub>      | —    | 12.4         | —        |      |                                                                                                                                                 |
| Turn-Off Delay Time                       | t <sub>d(off)</sub> | —    | 104.9        | —        |      |                                                                                                                                                 |
| Fall Time                                 | t <sub>f</sub>      | —    | 61.7         | —        |      |                                                                                                                                                 |

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

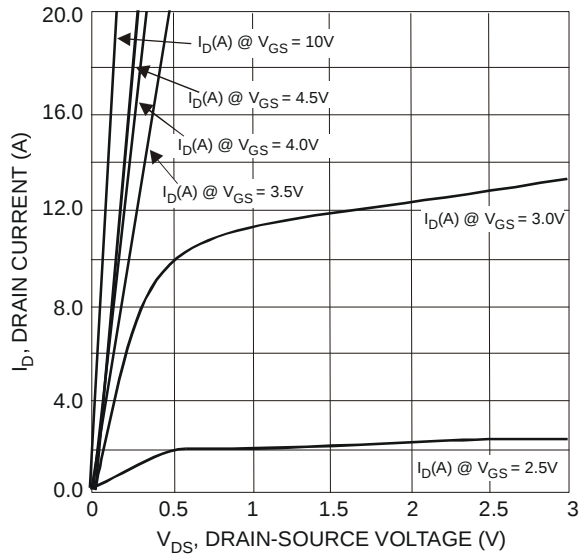


Fig.1 Typical Output Characteristics

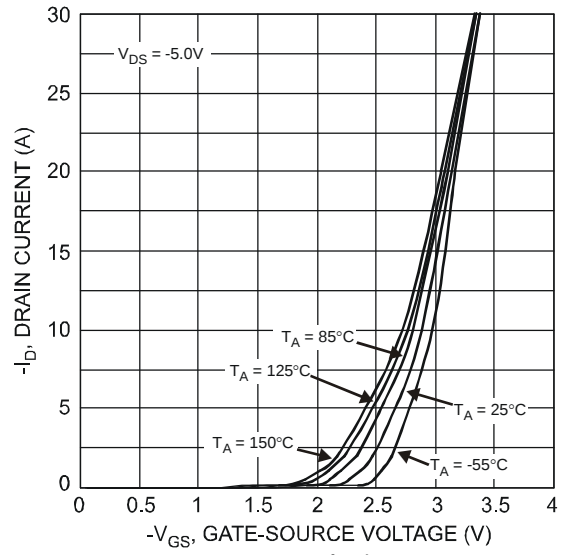


Fig. 2 Typical Transfer Characteristics

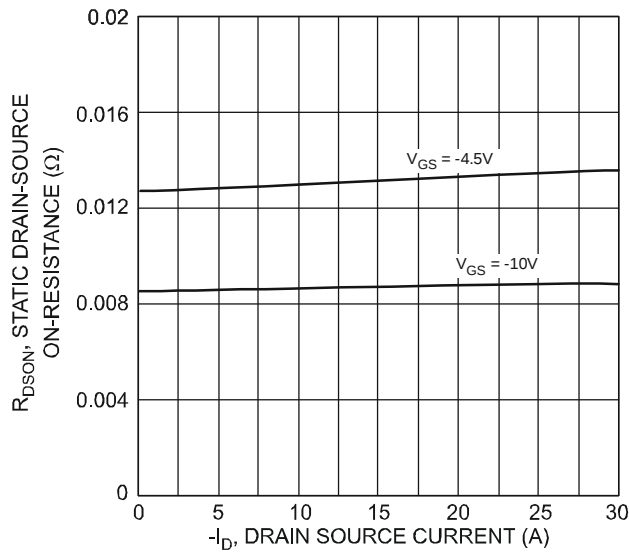


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

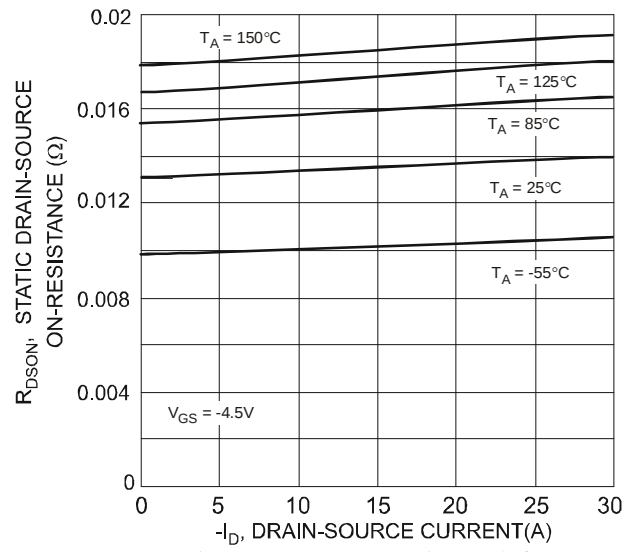


Fig. 4 On-Resistance vs. Drain Current & Gate Voltage

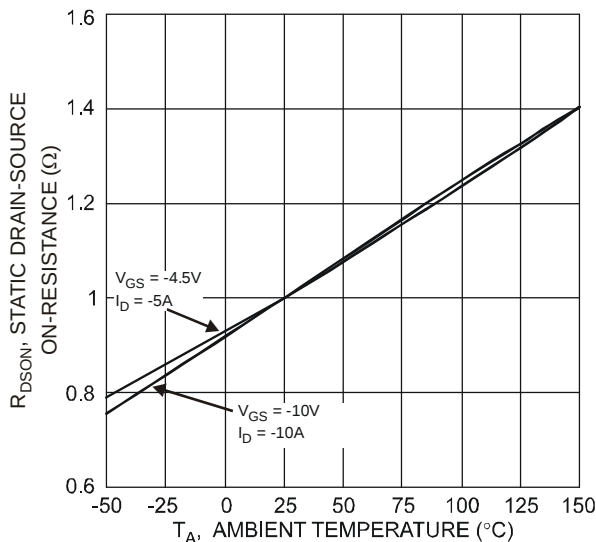


Fig. 5 Static Drain-Source On-Resistance vs. Ambient Temperature

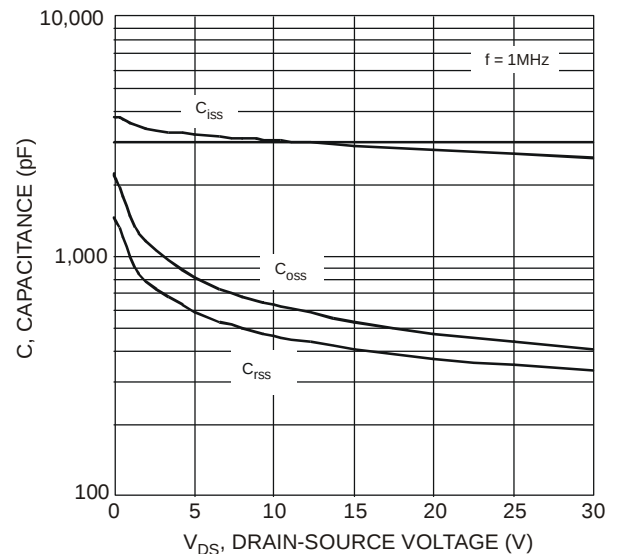


Fig. 6 Typical Total Capacitance

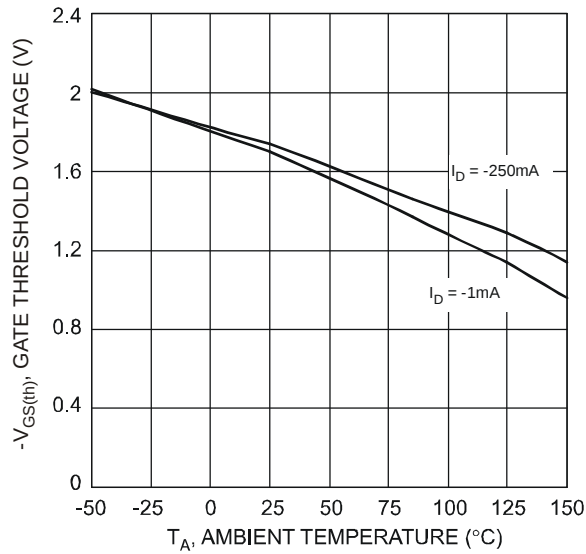


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

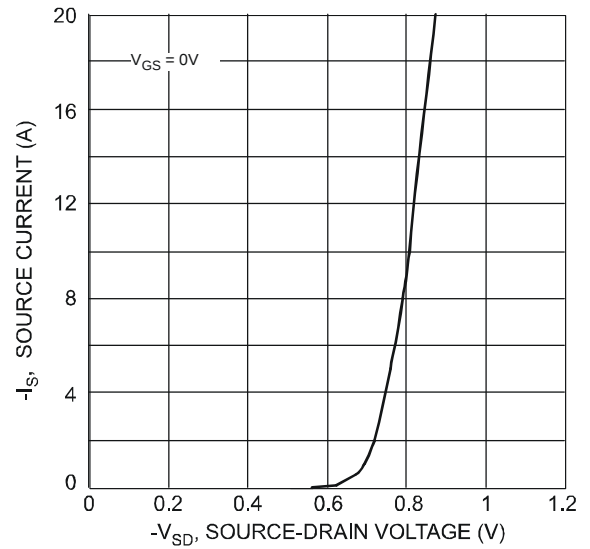


Fig. 8 Forward Drain Current vs. Source-Drain Voltage

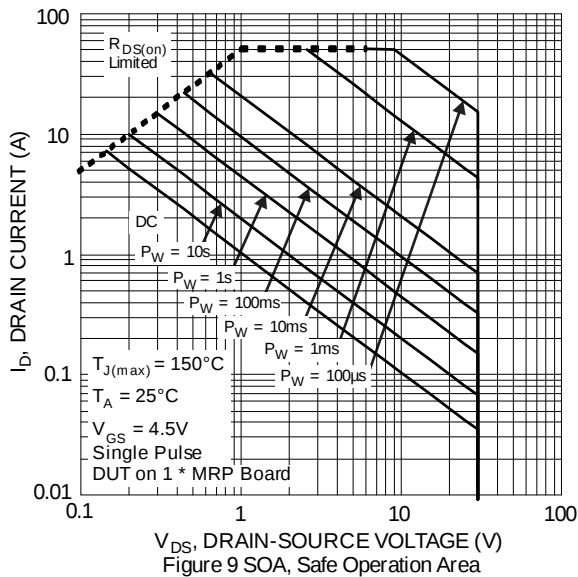


Figure 9 SOA, Safe Operation Area

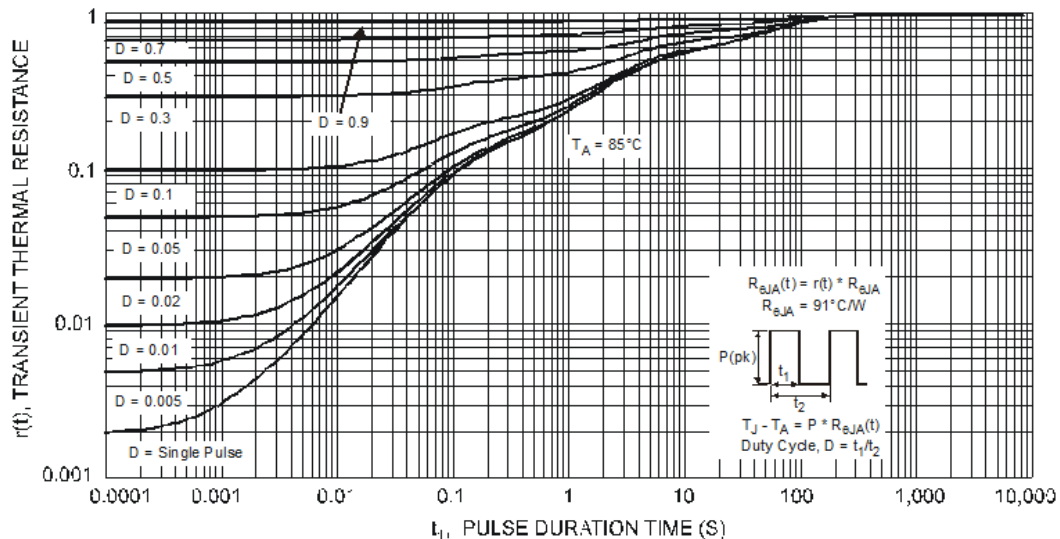
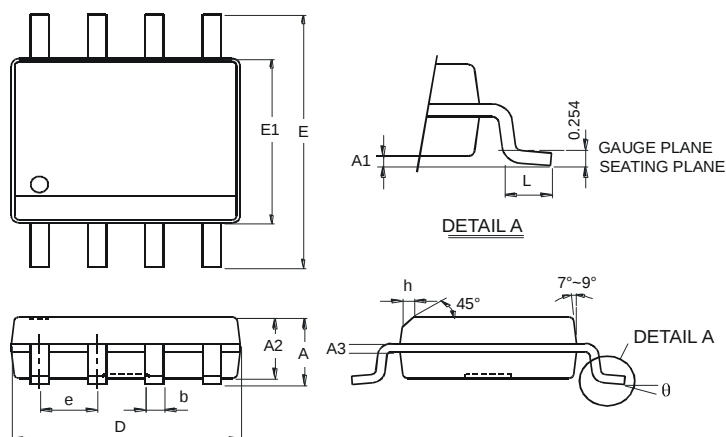


Fig. 10 Transient Thermal Resistance

## Package Outline Dimensions

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

### SO-8

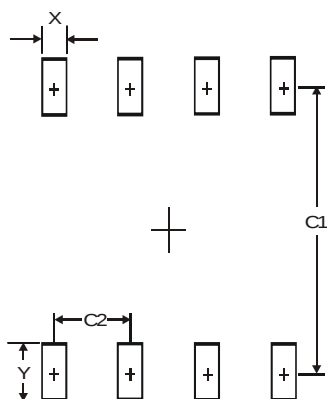


| SO-8                 |           |      |
|----------------------|-----------|------|
| Dim                  | Min       | Max  |
| A                    | —         | 1.75 |
| A1                   | 0.08      | 0.25 |
| A2                   | 1.30      | 1.50 |
| A3                   | 0.20 Typ. |      |
| b                    | 0.3       | 0.5  |
| D                    | 4.80      | 5.30 |
| E                    | 5.79      | 6.20 |
| E1                   | 3.70      | 4.10 |
| e                    | 1.27 Typ. |      |
| h                    | —         | 0.35 |
| L                    | 0.38      | 1.27 |
| θ                    | 0°        | 8°   |
| All Dimensions in mm |           |      |

## Suggested Pad Layout

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

### SO-8



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.60          |
| Y          | 1.55          |
| C1         | 5.4           |
| C2         | 1.27          |

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