

N-CHANNEL ENHANCEMENT MODE MOSFET WITH SCHOTTKY DIODE

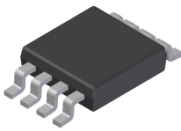
**Features**

- High Density UMOS with Schottky Barrier Diode
- Low Leakage Current at High Temp.
- High Conversion Efficiency
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Utilizes Diodes Incorporated's Monolithic SiMFET Technology to Increase Conversion Efficiency
- 100% UIS and R<sub>g</sub> Tested
- **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**

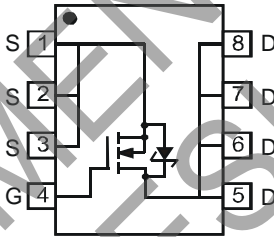
**Mechanical Data**

- Case: SO-8
- 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 Below
- Weight: 0.072 grams (Approximate)

SiMFET  
Schottky Integrated MOSFET



Top View



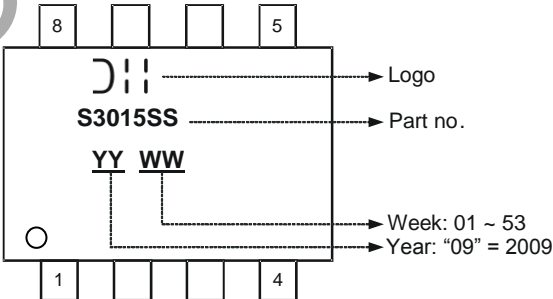
Top View  
Internal Schematic

**Ordering Information** (Note 4)

| Part Number   | Case | Packaging          |
|---------------|------|--------------------|
| DMS3015SSS-13 | SO-8 | 2500 / 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**



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

| Characteristic  |              |                        | Symbol           | Value | Unit |
|---|--------------|------------------------|------------------|-------|------|
| Drain-Source Voltage                                    |              |                        | V <sub>DSS</sub> | 30    | V    |
| Gate-Source Voltage                                     |              |                        | V <sub>GSS</sub> | ±20   | V    |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 11    | A    |
|   |              | T <sub>A</sub> = +85°C |                  | 6.6   |      |
| Pulsed Drain Current (Note 6)                           |              |                        | I <sub>DM</sub>  | 80    | A    |
| Avalanche Current (Notes 6 & 7)                         |              |                        | I <sub>AR</sub>  | 17    | A    |
| Repetitive Avalanche Energy (Notes 6 & 7) L = 0.3mH     |              |                        | E <sub>AR</sub>  | 43    | mJ   |

### Thermal Characteristics

| Characteristic   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)   | P <sub>D</sub>                    | 1.55        | W    |
| Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5) | R <sub>θJA</sub>                  | 81.3        | °C/W |
| Operating and Storage Temperature Range                                  | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

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

| Characteristic                             | Symbol              | Min | Typ  | Max  | Unit | Test Condition   |
|--|---------------------|-----|------|------|------|--|
| <b>OFF CHARACTERISTICS (Note 8)</b>        |                     |     |      |      |      |  |
| 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>    | -   | -    | 0.1  | mA   | 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 (Note 8)</b>         |                     |     |      |      |      |  |
| Gate Threshold Voltage                     | V <sub>GS(TH)</sub> | 1.0 | 1.5  | 2.5  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                     |
| Static Drain-Source On-Resistance          | R <sub>DS(ON)</sub> | -   | 8.5  | 11.9 | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 11A  |
|  |                     | -   | 9.5  | 14.9 |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.8A  |
| Forward Transfer Admittance                | Y <sub>fs</sub>     | -   | 18   | -    | S    | V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A   |
| Diode Forward Voltage                      | V <sub>SD</sub>     | -   | 0.45 | 1    | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A  |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>    |                     |     |      |      |      |  |
| Input Capacitance                          | C <sub>iss</sub>    | -   | 1276 | -    | pF   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                     |
| Output Capacitance                         | C <sub>oss</sub>    | -   | 160  | -    | pF   |  |
| Reverse Transfer Capacitance               | C <sub>rss</sub>    | -   | 136  | -    | pF   |  |
| Gate Resistance                            | R <sub>g</sub>      | -   | 1.48 | 2.7  | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz   |
| Total Gate Charge (V <sub>GS</sub> = 4.5V) | Q <sub>g</sub>      | -   | 14.3 | -    | nC   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.8A                           |
| Total Gate Charge (V <sub>GS</sub> = 10V)  | Q <sub>g</sub>      | -   | 30.6 | -    | nC   |  |
| Gate-Source Charge                         | Q <sub>gs</sub>     | -   | 3.4  | -    | nC   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 8.8A                            |
| Gate-Drain Charge                          | Q <sub>gd</sub>     | -   | 4.3  | -    | nC   |  |
| Turn-On Delay Time                         | t <sub>D(ON)</sub>  | -   | 15.8 | -    | ns   | V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V,<br>R <sub>G</sub> = 1.8Ω, I <sub>D</sub> = 8.8A |
| Turn-On Rise Time                          | t <sub>R</sub>      | -   | 27.8 | -    | ns   |  |
| Turn-Off Delay Time                        | t <sub>D(OFF)</sub> | -   | 29.7 | -    | ns   |  |
| Turn-Off Fall Time                         | t <sub>F</sub>      | -   | 13.6 | -    | ns   |  |

- Notes:
5. Device mounted on 1in \* 1in FR-4 PCB with 2oz. Copper. The value in any given application depends on the user's specific board design.
  6. Repetitive rating, pulse width limited by junction temperature.
  7. I<sub>AR</sub> and E<sub>AR</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Guaranteed by design. Not subject to production testing.

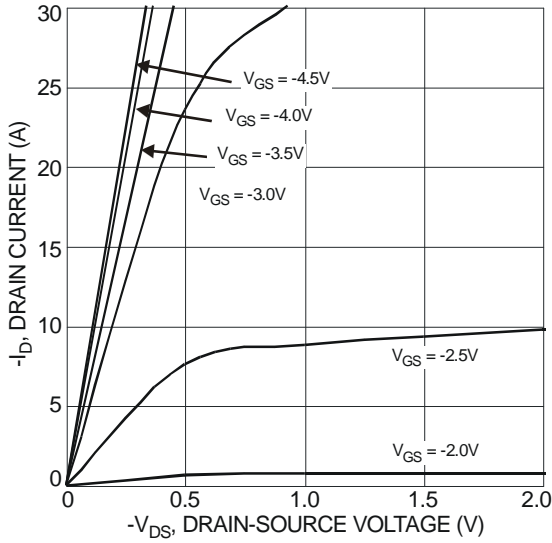


Fig. 1 Typical Output Characteristics

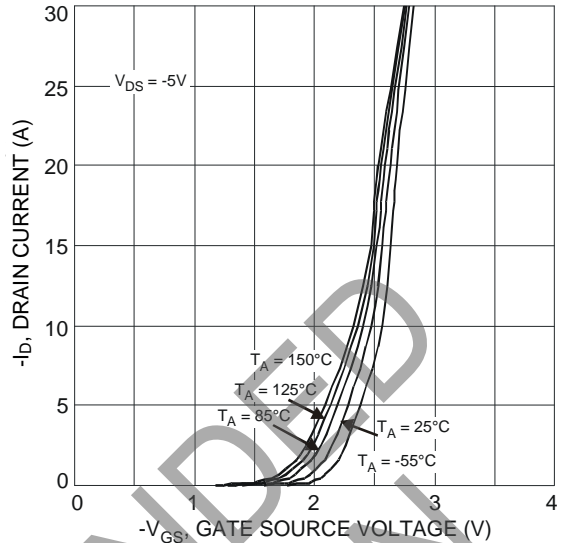


Fig. 2 Typical Transfer Characteristics

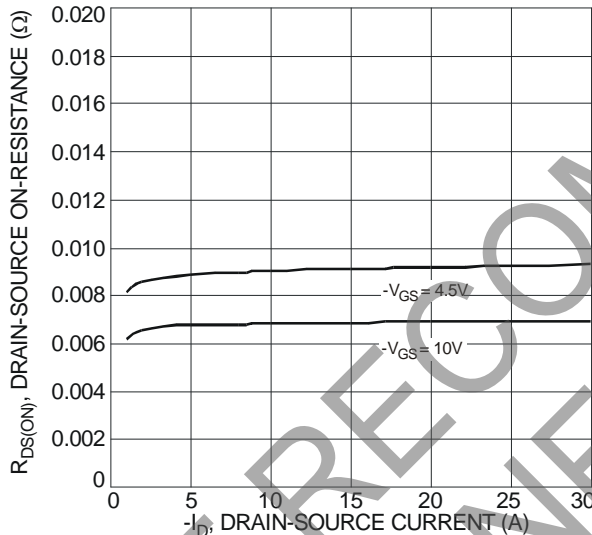


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

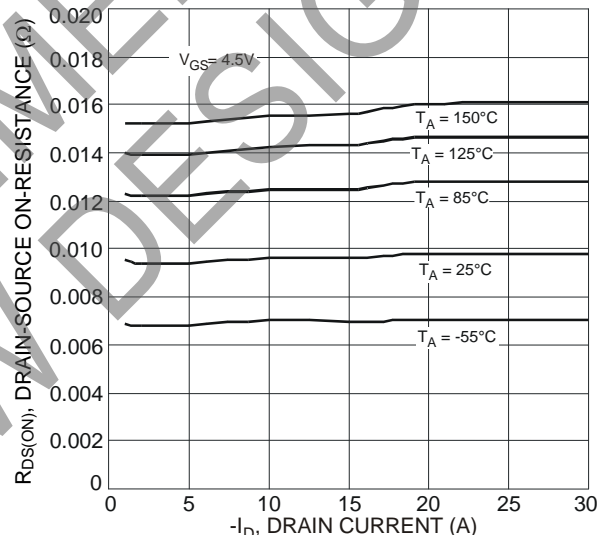


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

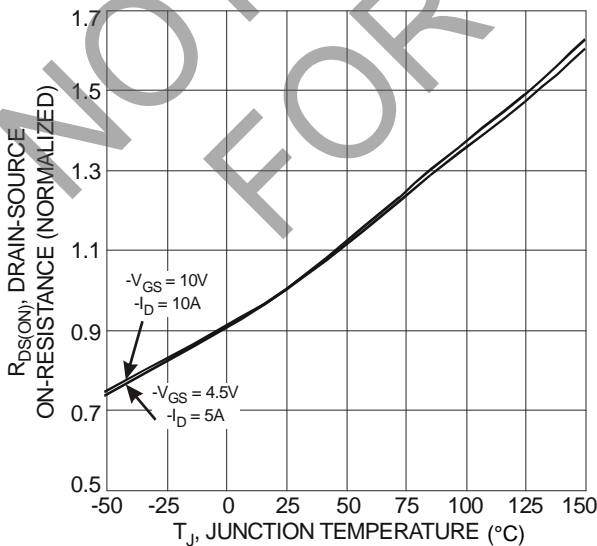


Fig. 5 On-Resistance Variation with Temperature

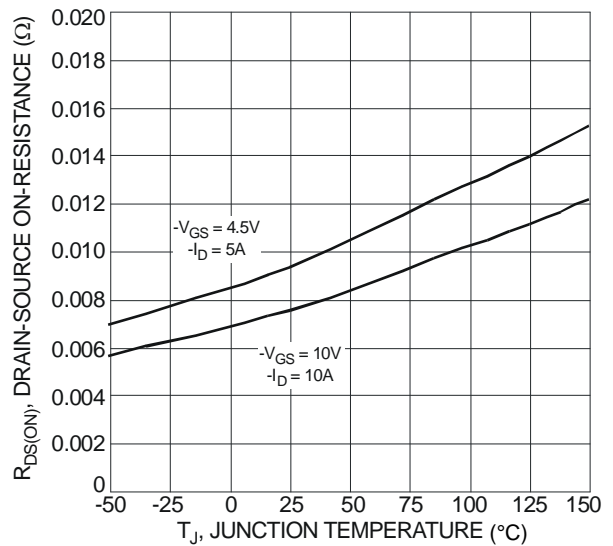


Fig. 6 On-Resistance Variation with Temperature

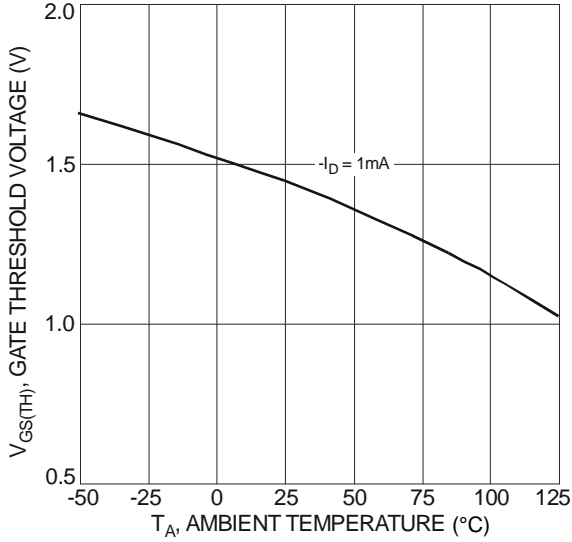


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

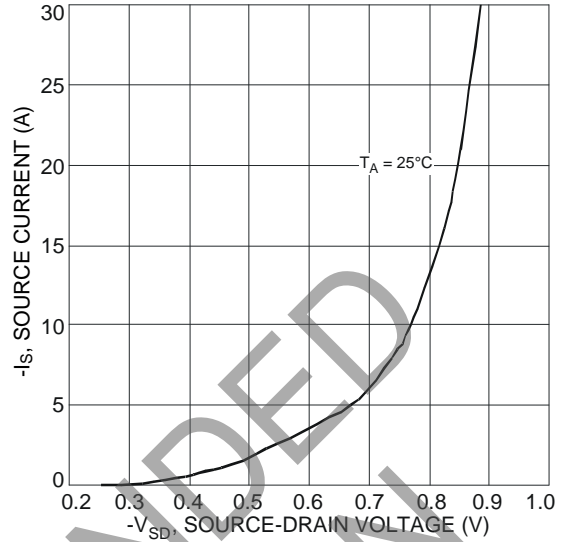


Fig. 8 Diode Forward Voltage vs. Current

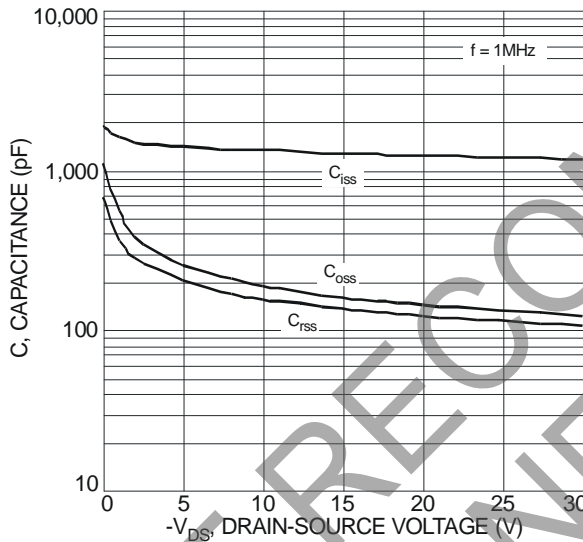


Fig. 9 Typical Capacitance

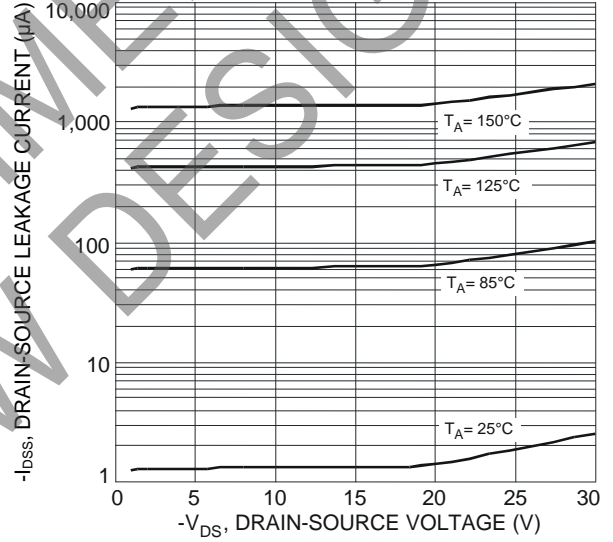


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

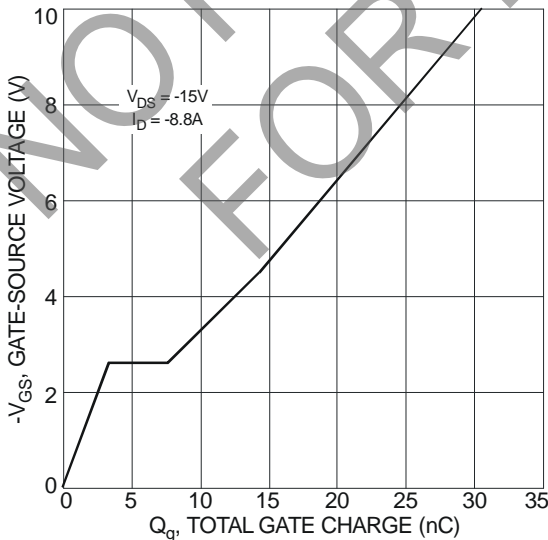


Fig. 11 Gate-Source Voltage vs. Total Gate Charge

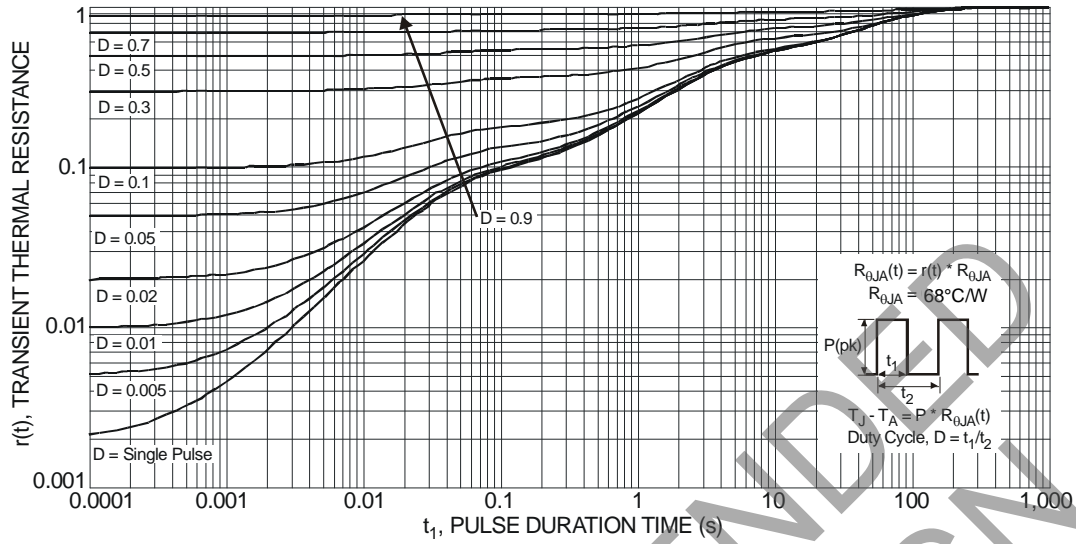


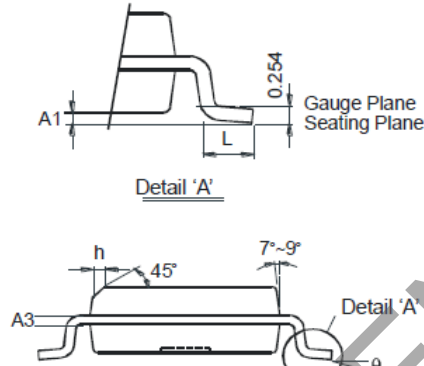
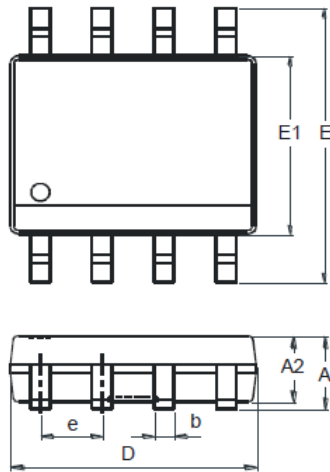
Fig. 12 Transient Thermal Response

NOT RECOMMENDED FOR NEW DESIGN

**Package Outline Dimensions**

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

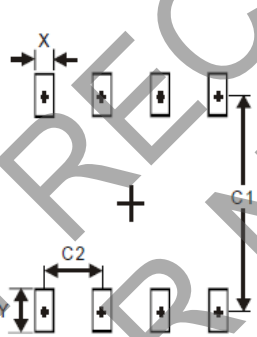
SO-8



| SO-8                 |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | -        | 1.75 |
| A1                   | 0.10     | 0.20 |
| A2                   | 1.30     | 1.50 |
| A3                   | 0.15     | 0.25 |
| b                    | 0.3      | 0.5  |
| D                    | 4.85     | 4.95 |
| E                    | 5.90     | 6.10 |
| E1                   | 3.85     | 3.95 |
| e                    | 1.27 Typ |      |
| h                    | -        | 0.35 |
| L                    | 0.62     | 0.82 |
| theta                | 0°       | 8°   |
| All Dimensions in mm |          |      |

**Suggested Pad Layout**

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



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

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