

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)max}$ | $I_D max$ $T_A = +25^{\circ}C$ |
|---------------|--------------------------------|-----------------------------------|
| 30V | 20m Ω @ $V_{GS} = 10V$ | 7.2A |
| | 31m Ω @ $V_{GS} = 4.5V$ | 5.8A |

Description

This MOSFET has been 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

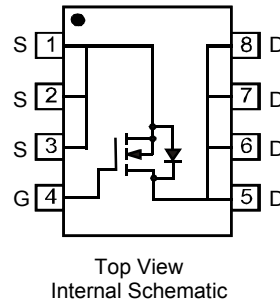
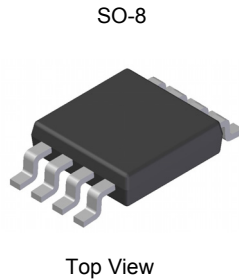
- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **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 Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 **e3**
- Weight: 0.008 grams (approximate)

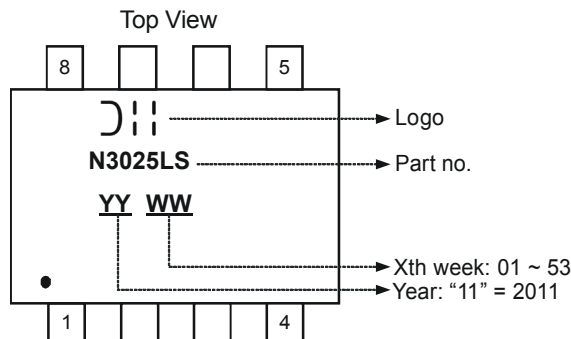


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|------|------------------|
| DMN3025LSS-13 | SO-8 | 2500/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> 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>.

Marking Information



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

| Characteristic | Symbol | Value | Units |
|--|-----------|---------------------------|-------|
| Drain-Source Voltage | V_{DSS} | 30 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$ | I_D | $T_A = +25^\circ\text{C}$ | 7.2 |
| | | $T_A = +70^\circ\text{C}$ | 5.7 |
| | I_D | $T_A = +25^\circ\text{C}$ | 9.6 |
| | | $T_A = +70^\circ\text{C}$ | 7.7 |
| Maximum Continuous Body Diode Forward Current (Note 6) | I_S | 3 | A |
| Pulsed Drain Current (10 μs pulse, duty cycle = 1%) | I_{DM} | 40 | A |
| Avalanche Current (L = 0.1mH) | I_{AS} | 14.5 | A |
| Repetitive Avalanche Energy (L = 0.1mH) | E_{AS} | 10.5 | mJ |

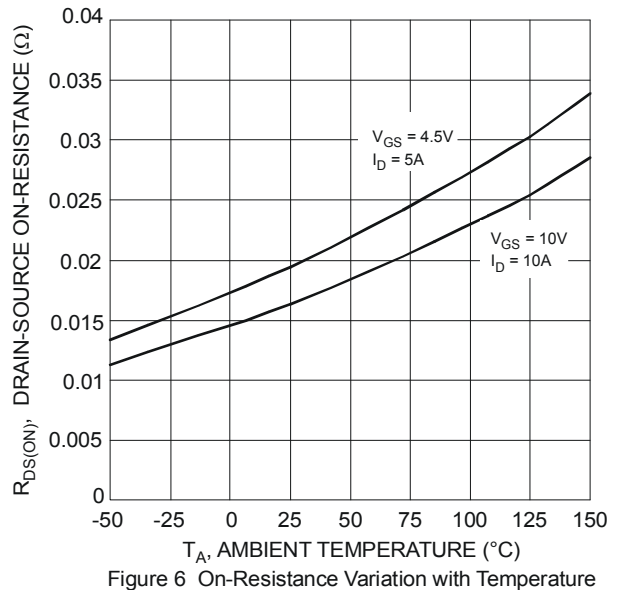
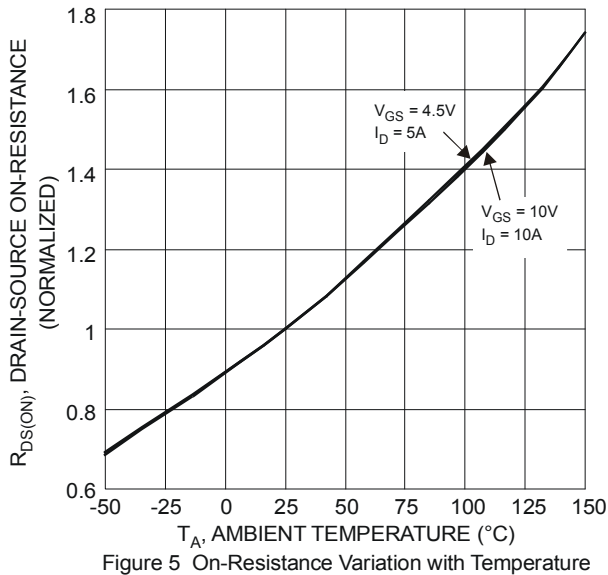
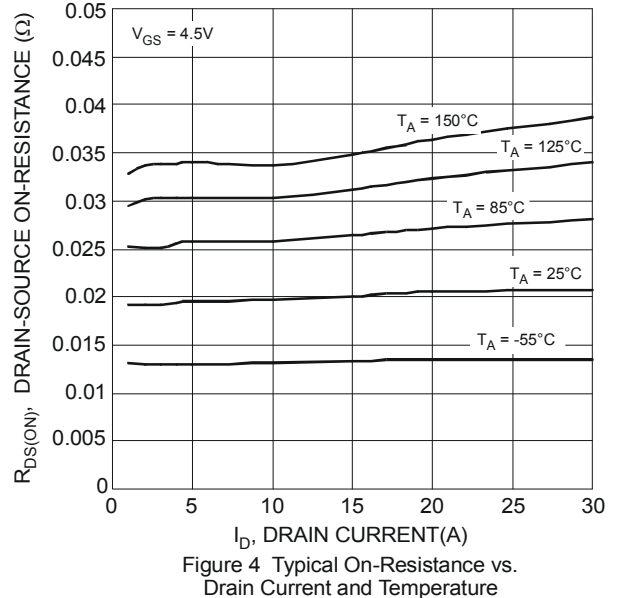
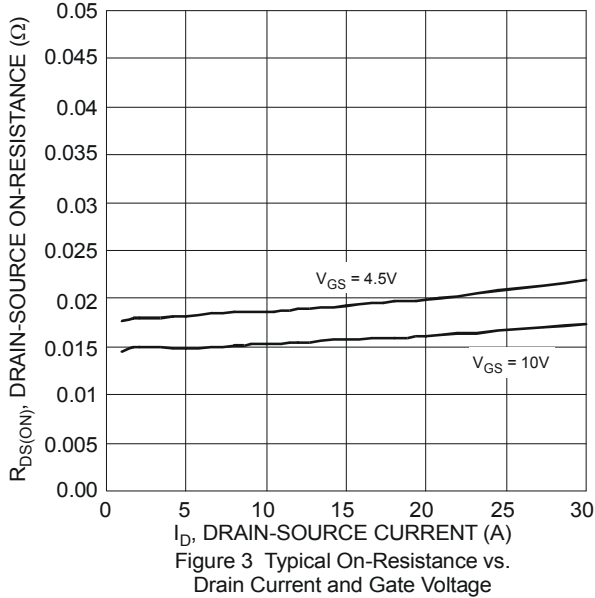
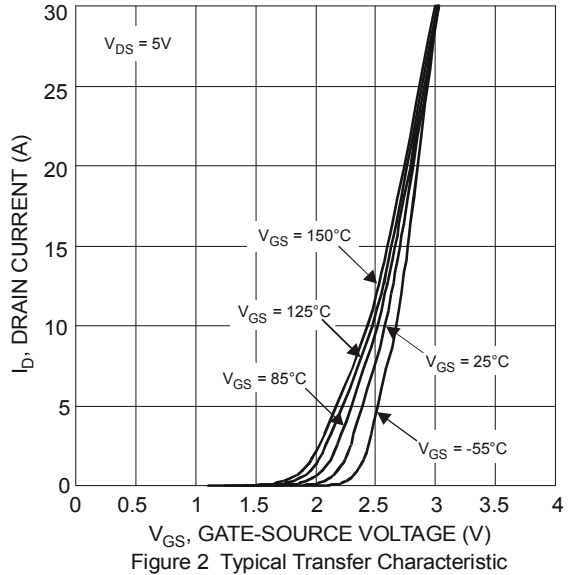
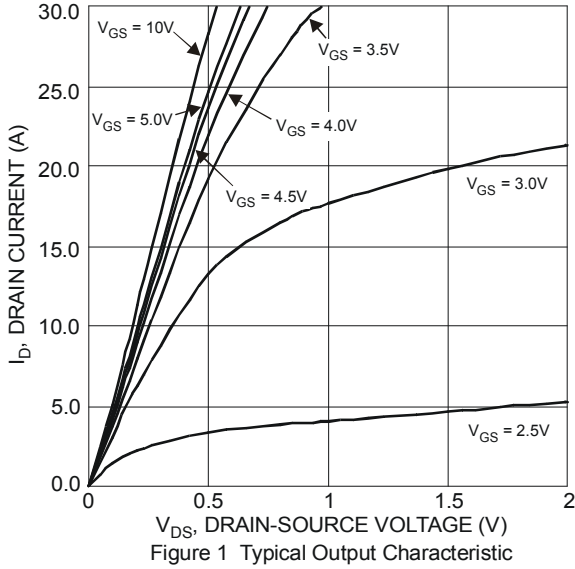
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Units |
|--|-----------------|---------------------------|------------------|
| Total Power Dissipation (Note 5) | P_D | $T_A = +25^\circ\text{C}$ | 1.4 |
| | | $T_A = +70^\circ\text{C}$ | 0.9 |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | Steady State | 87 |
| | | t<10s | 44 |
| Total Power Dissipation (Note 6) | P_D | $T_A = +25^\circ\text{C}$ | 1.7 |
| | | $T_A = +70^\circ\text{C}$ | 1.1 |
| Thermal Resistance, Junction to Ambient (Note 6) | $R_{\theta JA}$ | Steady State | 73 |
| | | t<10s | 37 |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|--------------|-----|------|---------|---------------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 30 | — | — | V | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 1 | μA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 0.8 | - | 2.0 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | — | 14 | 20 | m Ω | $V_{GS} = 10\text{V}, I_D = 10\text{A}$ |
| | | — | 23 | 31 | | $V_{GS} = 4.5\text{V}, I_D = 7.5\text{A}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | — | 11 | - | S | $V_{DS} = 5\text{V}, I_D = 10\text{A}$ |
| Diode Forward Voltage | V_{SD} | — | 0.70 | 1.0 | V | $V_{GS} = 0\text{V}, I_S = 1\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | — | 641 | — | pF | $V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 66 | — | | |
| Reverse Transfer Capacitance | C_{rss} | — | 50 | — | | |
| Gate resistance | R_g | — | 2.2 | — | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Total Gate Charge ($V_{GS} = 4.5\text{V}$) | Q_g | — | 6 | — | nC | $V_{DS} = 15\text{V}, I_D = 10\text{A}$ |
| Total Gate Charge ($V_{GS} = 10\text{V}$) | Q_g | — | 13.2 | — | | |
| Gate-Source Charge | Q_{gs} | — | 1.7 | — | | |
| Gate-Drain Charge | Q_{gd} | — | 2.2 | — | | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 3.3 | — | ns | $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_G = 6\Omega, I_D = 1\text{A}$ |
| Turn-On Rise Time | t_r | — | 4.4 | — | | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 22.3 | — | | |
| Turn-Off Fall Time | t_f | — | 5.3 | — | | |

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



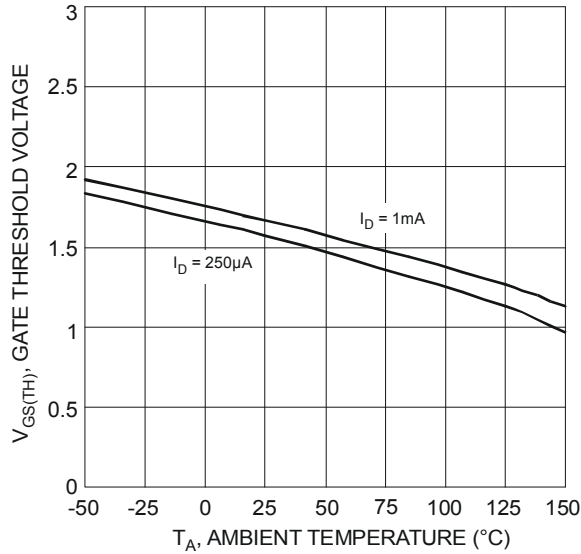


Figure 7 Gate Threshold Variation vs. Ambient Temperature

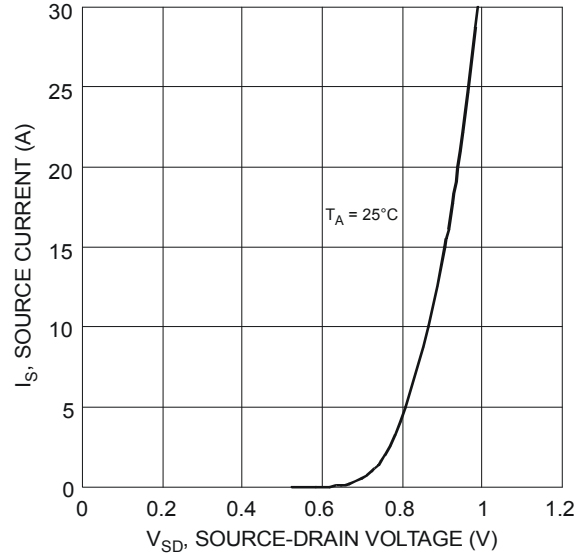


Figure 8 Diode Forward Voltage vs. Current

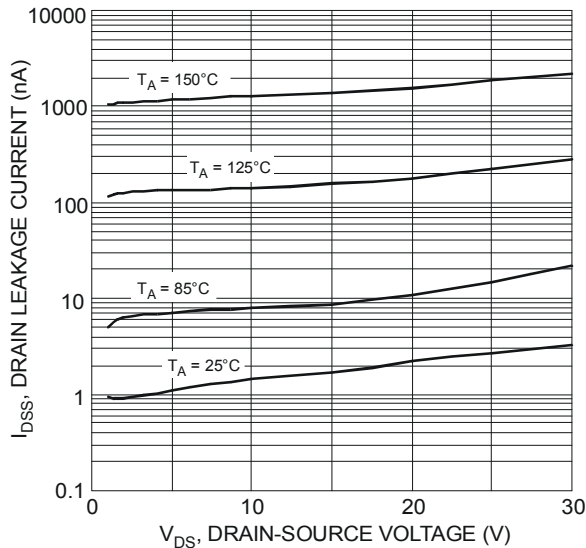


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

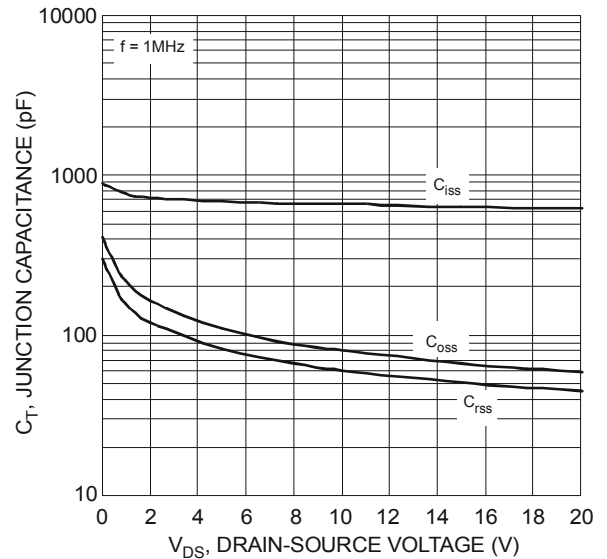


Figure 10 Typical Junction Capacitance

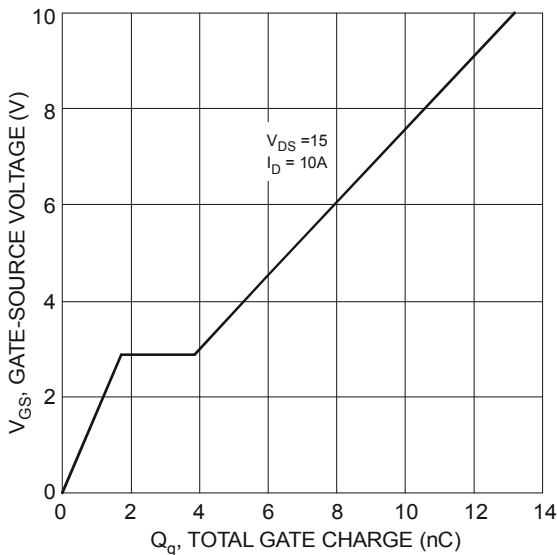


Figure 11 Gate-Source Voltage vs. Total Gate Charge

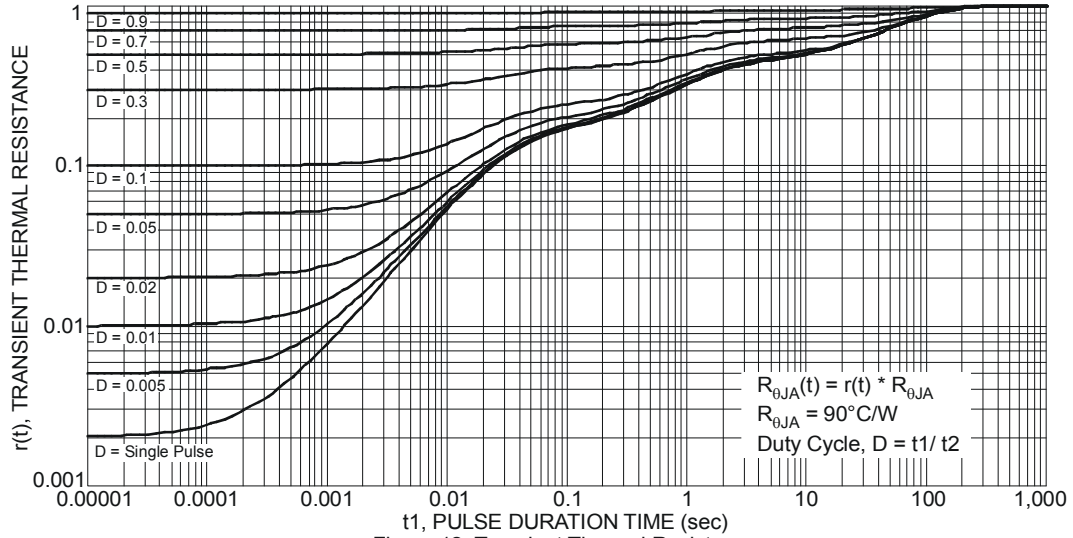
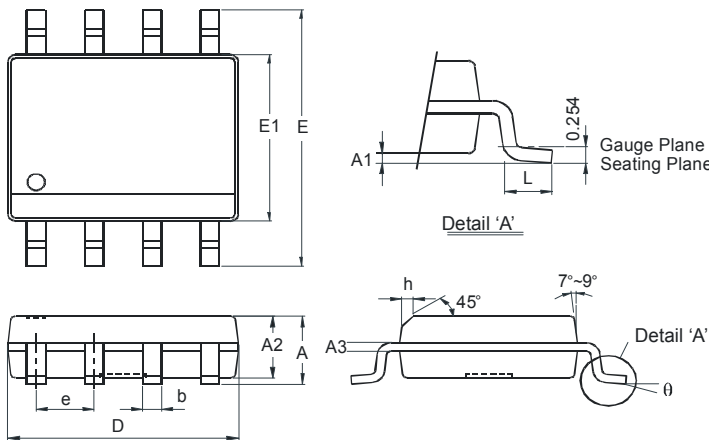


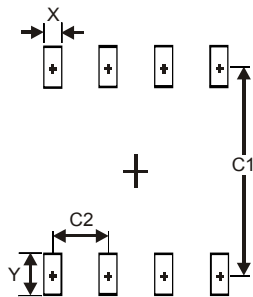
Figure 12 Transient Thermal Resistance

Package Outline Dimensions



| 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



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

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