

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)} \text{ max}$      | $I_D \text{ max}$<br>$T_A = +25^\circ\text{C}$ |
|---------------|-------------------------------|--|
| 30V           | 18mΩ @ $V_{GS} = 10\text{V}$  | 9.0A   |
|               | 30mΩ @ $V_{GS} = 4.5\text{V}$ | 7.0A   |

## Description and Applications


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.

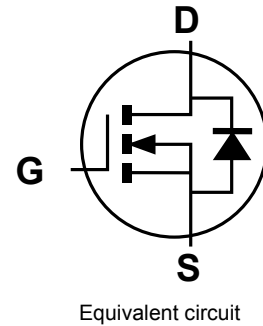
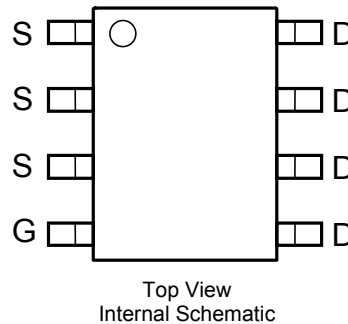
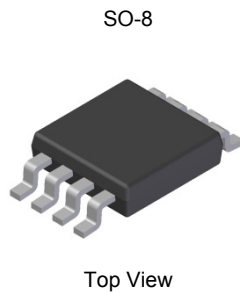
- Backlighting
- Power Management Functions
- DC-DC Converters
- 

## 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**

## 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 lead frame. Solderable per MIL-STD-202, Method 208 
- Weight: 0.074 grams (approximate)

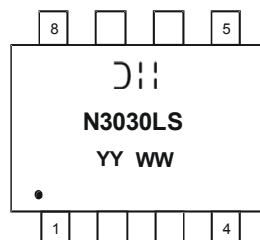
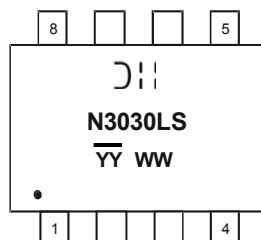



## Ordering Information (Note 4)

| Part Number   | Case | Packaging        |
|---------------|------|------------------|
| DMN3030LSS-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/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



 = Manufacturer's Marking  
 N3030LS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 13 = 2013)  
 WW = Week (01 - 53)  
 YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)

**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> | ±25   | V     |
| Drain Current (Note 5)        | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | 9.0   | A     |
|                               |              | T <sub>A</sub> = +70°C |                  | 6.75  |       |
| Pulsed Drain Current (Note 6) |              |                        | I <sub>DM</sub>  | 40    | A     |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | 2.5         | W    |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 50          | °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   |
|------------------------------------|----------------------|------|------|------|------|--|
| OFF CHARACTERISTICS (Note 7)       |                      |      |      |      |      |  |
| 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   |
|                                    |                      | —    | —    | ±1   | μA   | V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V   |
| ON CHARACTERISTICS (Note 7)        |                      |      |      |      |      |  |
| Gate Threshold Voltage             | V <sub>GS(th)</sub>  | 1    | —    | 2.1  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                 |
| Static Drain-Source On-Resistance  | R <sub>DS (ON)</sub> | —    | 15.7 | 18   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A   |
|                                    |                      |      | 26.4 | 30   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7A  |
| Forward Transconductance           | g <sub>fs</sub>      | —    | 5.8  | —    | S    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 9A   |
| Diode Forward Voltage              | V <sub>SD</sub>      | 0.5  | 0.7  | 1.2  | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.1A  |
| DYNAMIC CHARACTERISTICS (Note 8)   |                      |      |      |      |      |  |
| Input Capacitance                  | C <sub>iss</sub>     | —    | 741  | —    | pF   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                  |
| Output Capacitance                 | C <sub>oss</sub>     | —    | 124  | —    | pF   |  |
| Reverse Transfer Capacitance       | C <sub>rss</sub>     | —    | 95   | —    | pF   |  |
| Gate Resistance                    | R <sub>G</sub>       | 0.30 | 0.88 | 2.5  | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz                                     |
| SWITCHING CHARACTERISTICS (Note 8) |                      |      |      |      |      |  |
| Total Gate Charge                  | Q <sub>g</sub>       | —    | 7.6  | 12   | nC   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 9A                         |
|                                    |                      | —    | 16.7 | 25   |      |  |
| Gate-Source Charge                 | Q <sub>gs</sub>      | —    | 1.9  | —    |      | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A                          |
| Gate-Drain Charge                  | Q <sub>gd</sub>      | —    | 5.2  | —    |      |  |
| Turn-On Delay Time                 | t <sub>d(on)</sub>   | —    | 4.0  | —    | ns   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V,<br>R <sub>L</sub> = 15Ω, R <sub>G</sub> = 6Ω |
| Rise Time                          | t <sub>r</sub>       | —    | 4.4  | —    |      |  |
| Turn-Off Delay Time                | t <sub>d(off)</sub>  | —    | 23.0 | —    |      |  |
| Fall Time                          | t <sub>f</sub>       | —    | 9.4  | —    |      |  |

- Notes:
5. Device mounted on 2 oz copper pad layout with R<sub>θJA</sub> = 50°C/W.
  6. Pulse width ≤10μs, Duty Cycle ≤1%.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to product testing.

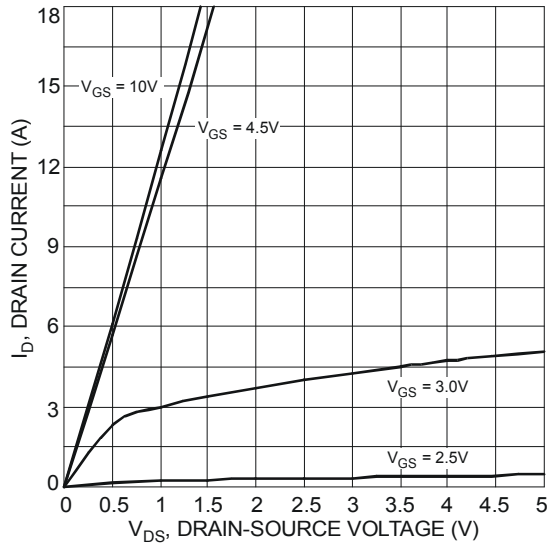


Fig. 1 Typical Output Characteristic

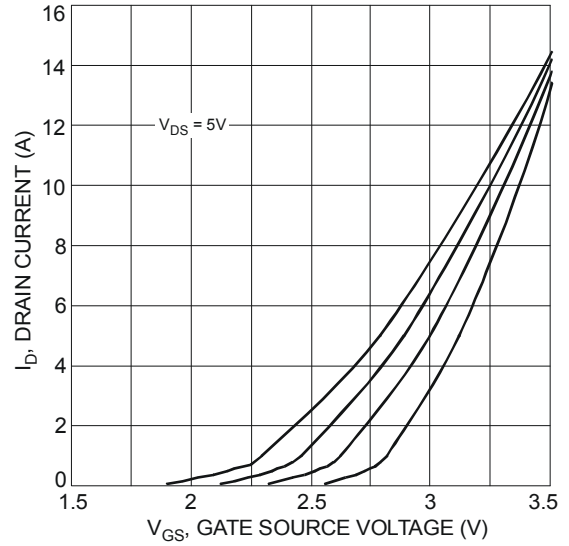


Fig. 2 Typical Transfer Characteristics

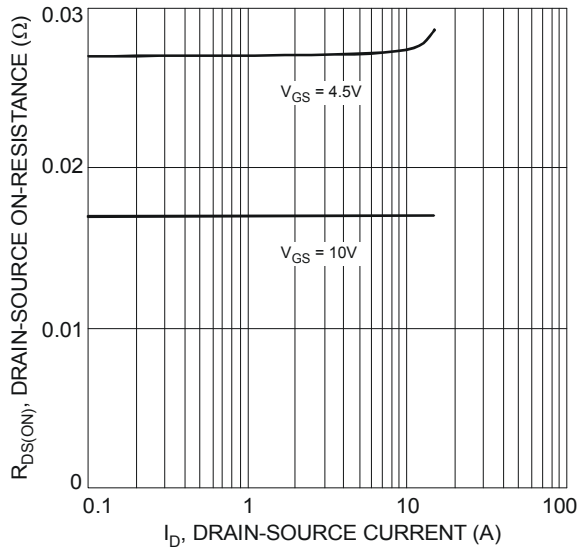


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

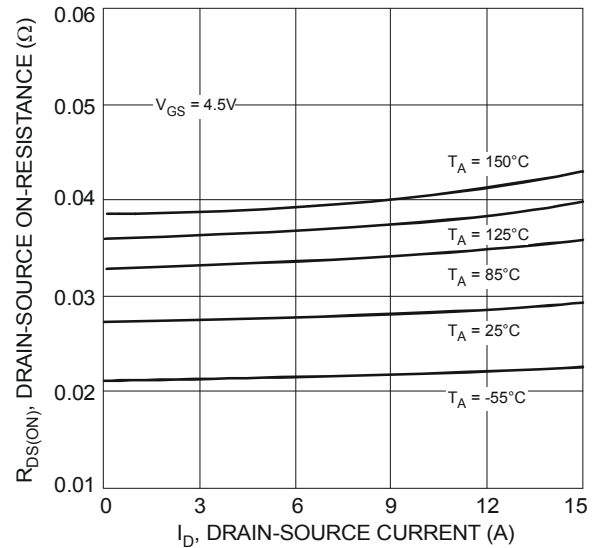


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

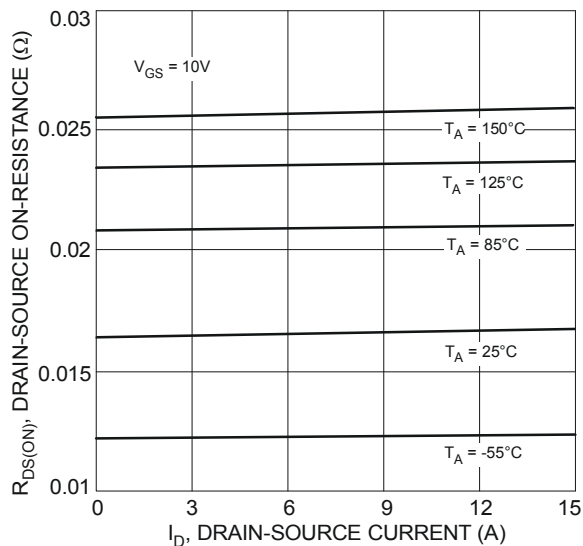


Fig. 5 Typical On-Resistance vs. Drain Current and Temperature

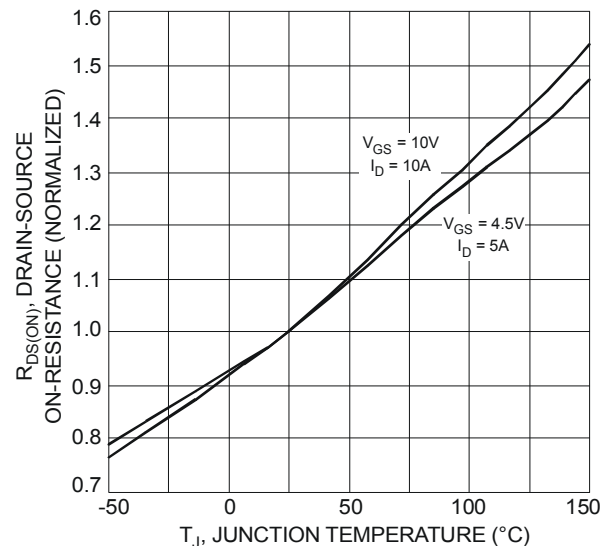


Fig. 6 On-Resistance Variation with Temperature

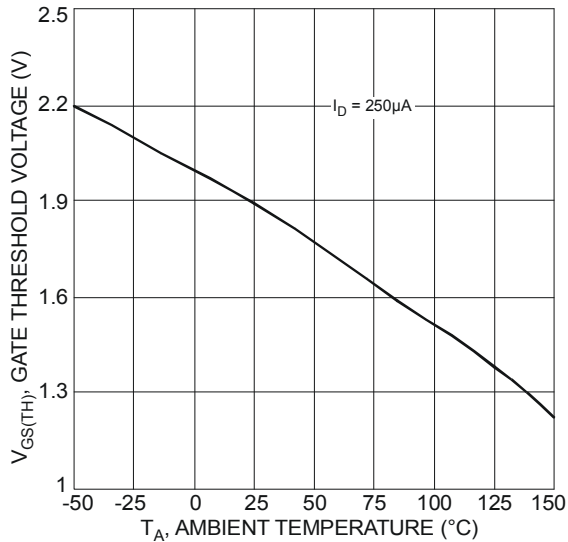


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

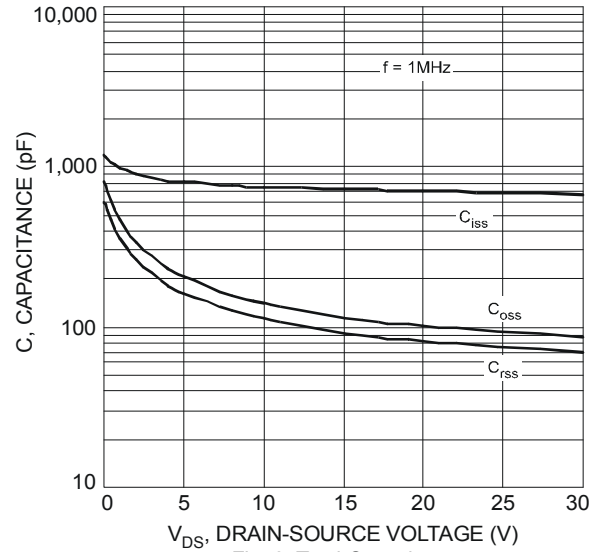


Fig. 8 Total Capacitance

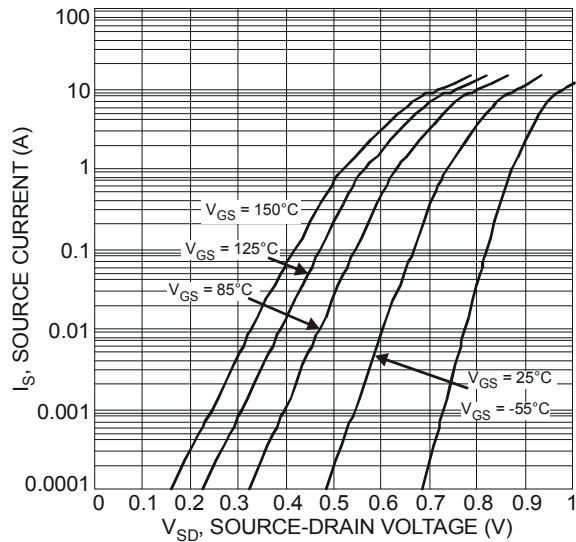


Fig. 9 Diode Forward Voltage vs. Current

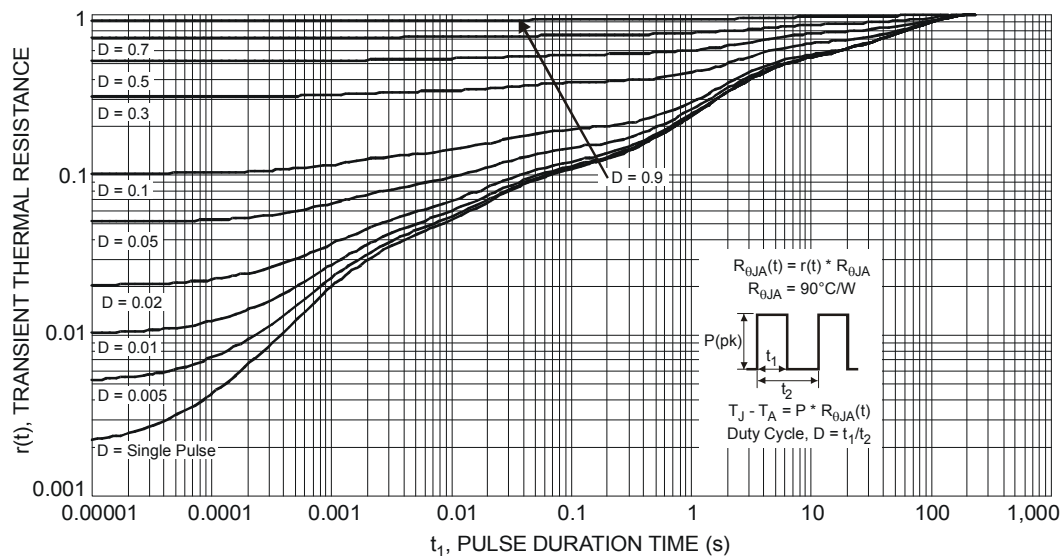
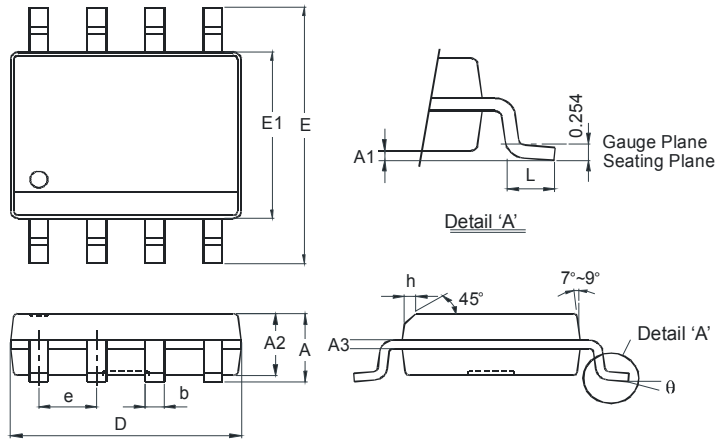


Fig. 10 Transient Thermal Response

## Package Outline Dimensions

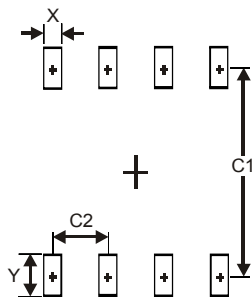
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 |
| 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.



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

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