

## Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 3)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

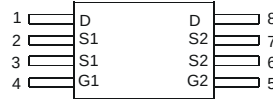
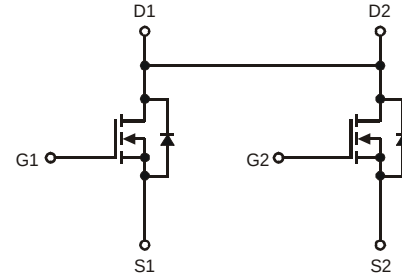
- Case: TSSOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram Below
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.039 grams (approximate)



TOP VIEW



BOTTOM VIEW


Top View  
Pin Configuration


Internal Schematic

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                    |              |                       | Symbol           | Value | Unit |
|-----------------------------------|--------------|-----------------------|------------------|-------|------|
| Drain-Source Voltage              |              |                       | V <sub>DSS</sub> | 20    | V    |
| Gate-Source Voltage               |              |                       | V <sub>GSS</sub> | ±8    | V    |
| Continuous Drain Current (Note 1) | Steady State | T <sub>A</sub> = 25°C | I <sub>D</sub>   | 4.9   | A    |
|                                   |              | T <sub>A</sub> = 70°C |                  | 3.9   |      |
| Pulsed Drain Current (Note 2)     |              |                       | I <sub>DM</sub>  | 31    | A    |

## Thermal Characteristics

| Characteristic                                                 | Symbol                            | Value       | Unit |
|----------------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 1)                                     | P <sub>D</sub>                    | 0.87        | W    |
| Thermal Resistance, Junction to Ambient @T <sub>A</sub> = 25°C | R <sub>θJA</sub>                  | 143         | °C/W |
| Operating and Storage Temperature Range                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

- Notes:
1. Device mounted on FR-4 PCB with minimum recommended pad layout.
  2. Repetitive rating, pulse width limited by junction temperature.
  3. No purposefully added lead.
  4. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).

# Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                          | Symbol              | Min | Typ  | Max  | Unit | Test Condition                                                                              |
|-----------------------------------------|---------------------|-----|------|------|------|---------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 5)</b>     |                     |     |      |      |      |                                                                                             |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | 20  | -    | -    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | -   | -    | 1.0  | μA   | V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V                                                 |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | -   | -    | ±100 | nA   | V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V                                                 |
| <b>ON CHARACTERISTICS (Note 5)</b>      |                     |     |      |      |      |                                                                                             |
| Gate Threshold Voltage                  | V <sub>GS(th)</sub> | 0.5 | -    | 0.9  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                  |
| Static Drain-Source On-Resistance       | R <sub>DS(on)</sub> | -   | 19   | 25   | mΩ   | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.2A                                               |
|                                         |                     |     | 22   | 29   |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 3.3A                                               |
|                                         |                     |     | 28   | 37   |      | V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 2.0A                                               |
|                                         |                     |     |      |      |      |                                                                                             |
| Forward Transfer Admittance             | Y <sub>fs</sub>     | -   | 7    | -    | S    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 4A                                                  |
| Diodes Forward Voltage                  | V <sub>SD</sub>     | -   | 0.7  | 0.9  | V    | I <sub>S</sub> = 2.25A, V <sub>GS</sub> = 0V                                                |
| <b>DYNAMIC CHARACTERISTICS (Note 6)</b> |                     |     |      |      |      |                                                                                             |
| Input Capacitance                       | C <sub>iss</sub>    | -   | 841  | -    | pF   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                  |
| Output Capacitance                      | C <sub>oss</sub>    | -   | 88   | -    | pF   |                                                                                             |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    | -   | 81   | -    | pF   |                                                                                             |
| Gate Resistance                         | R <sub>g</sub>      | -   | 1.24 | -    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                        |
| <b>SWITCHING CHARACTERISTICS</b>        |                     |     |      |      |      |                                                                                             |
| Total Gate Charge                       | Q <sub>g</sub>      | -   | 9.6  | -    | nC   | V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V,<br>I <sub>D</sub> = 8.2A                     |
| Gate-Source Charge                      | Q <sub>gs</sub>     | -   | 1.4  | -    | nC   |                                                                                             |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | -   | 2.1  | -    | nC   |                                                                                             |
| Turn-On Delay Time                      | t <sub>D(on)</sub>  | -   | 7.8  | -    | ns   | V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V,<br>R <sub>L</sub> = 10Ω, R <sub>G</sub> = 6Ω |
| Turn-On Rise Time                       | t <sub>r</sub>      | -   | 21.1 | -    | ns   |                                                                                             |
| Turn-Off Delay Time                     | t <sub>D(off)</sub> | -   | 38.6 | -    | ns   |                                                                                             |
| Turn-Off Fall Time                      | t <sub>f</sub>      | -   | 10.1 | -    | ns   |                                                                                             |

Notes: 5. Short duration pulse test used to minimize self-heating effects.  
6. Guaranteed by design. Not subject to production testing.

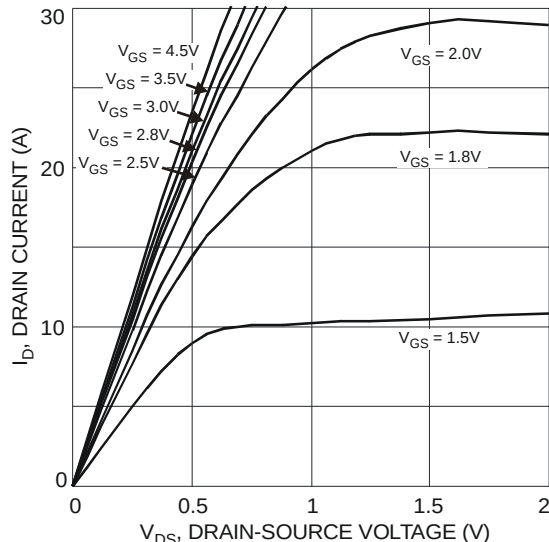


Fig. 1 Typical Output Characteristics

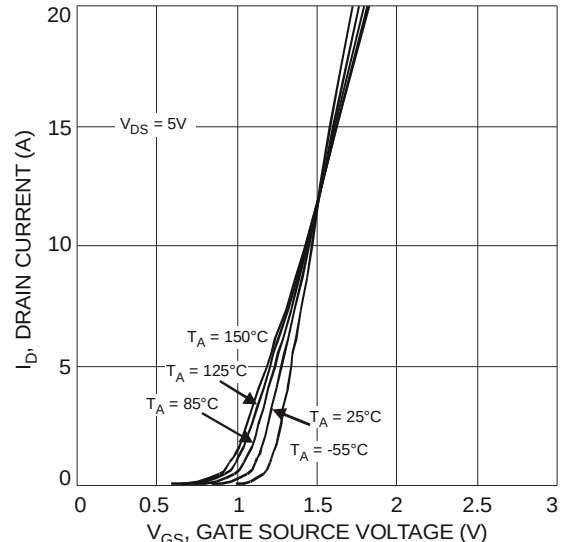


Fig. 2 Typical Transfer Characteristics

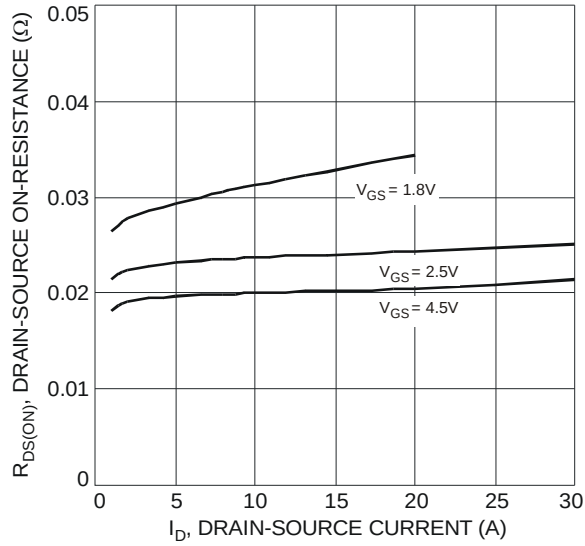


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

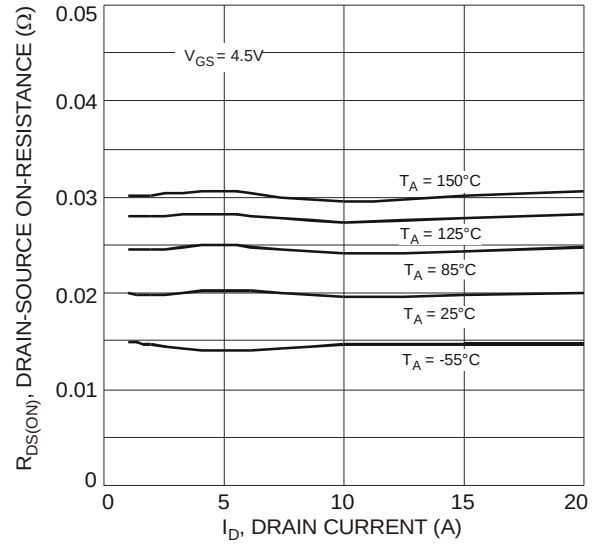


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

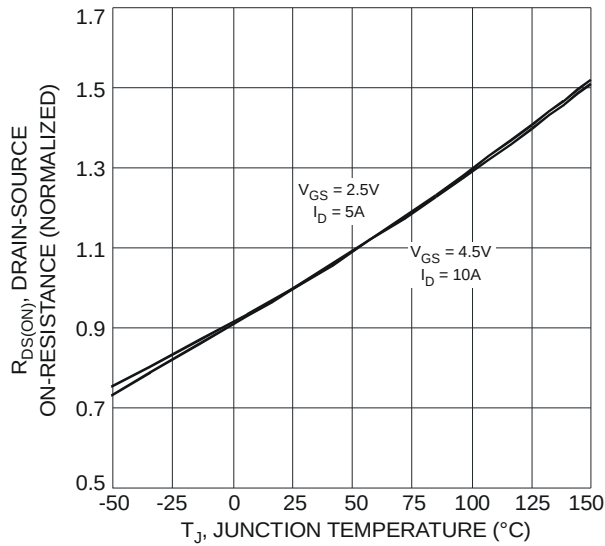


Fig. 5 On-Resistance Variation with Temperature

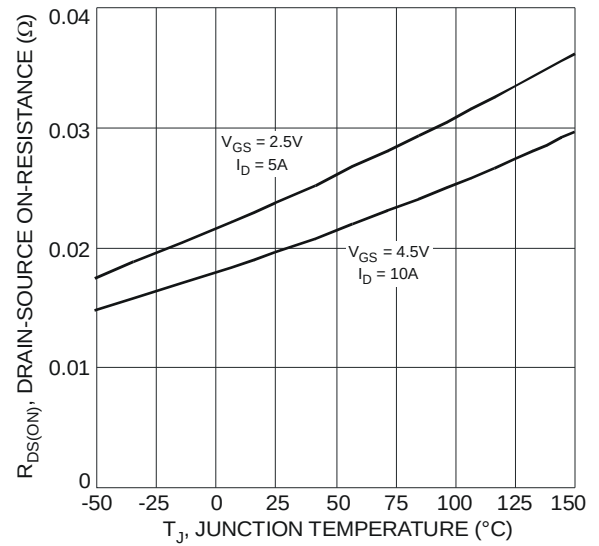


Fig. 6 On-Resistance Variation with Temperature

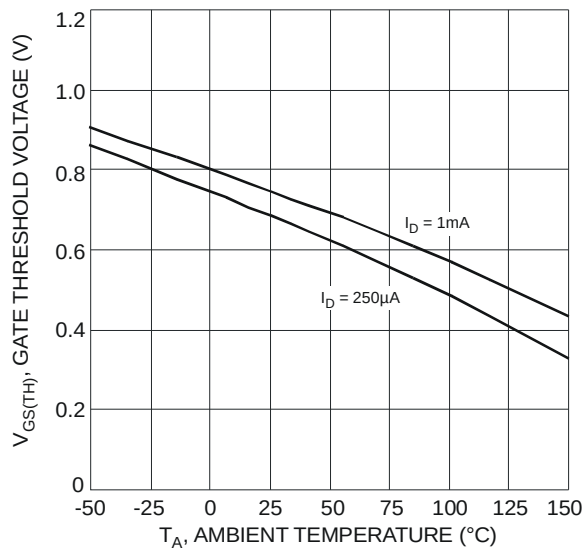


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

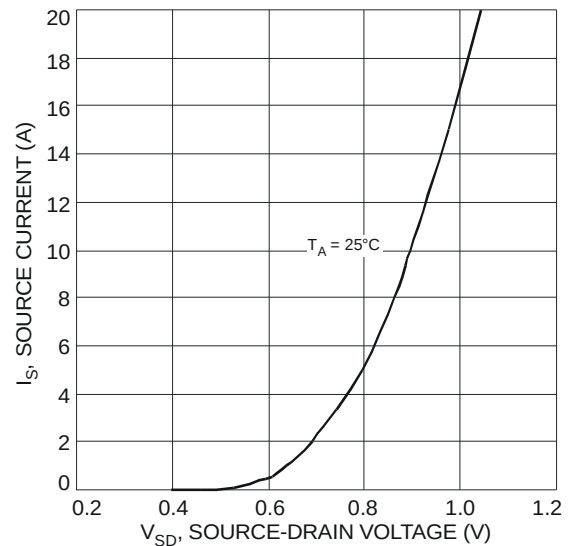


Fig. 8 Diode Forward Voltage vs. Current

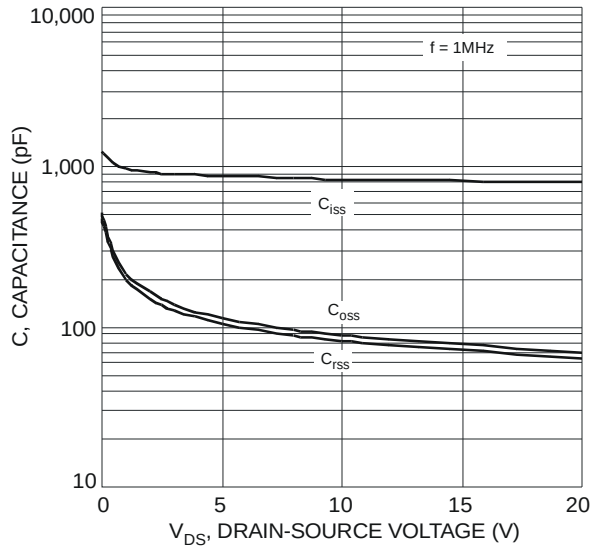


Fig. 9 Typical Capacitance

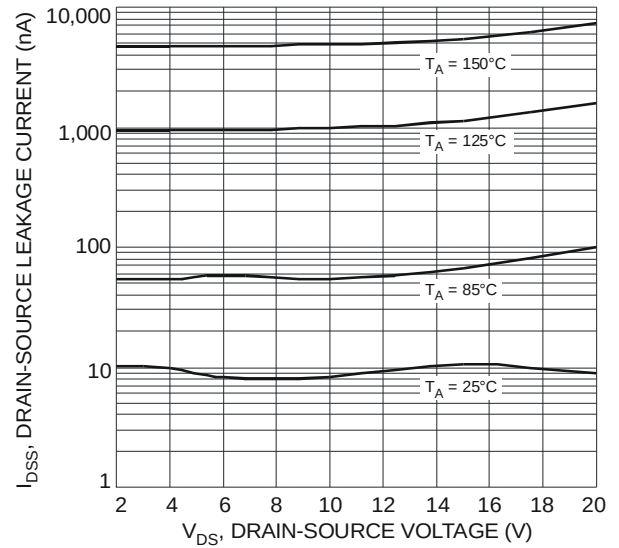


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

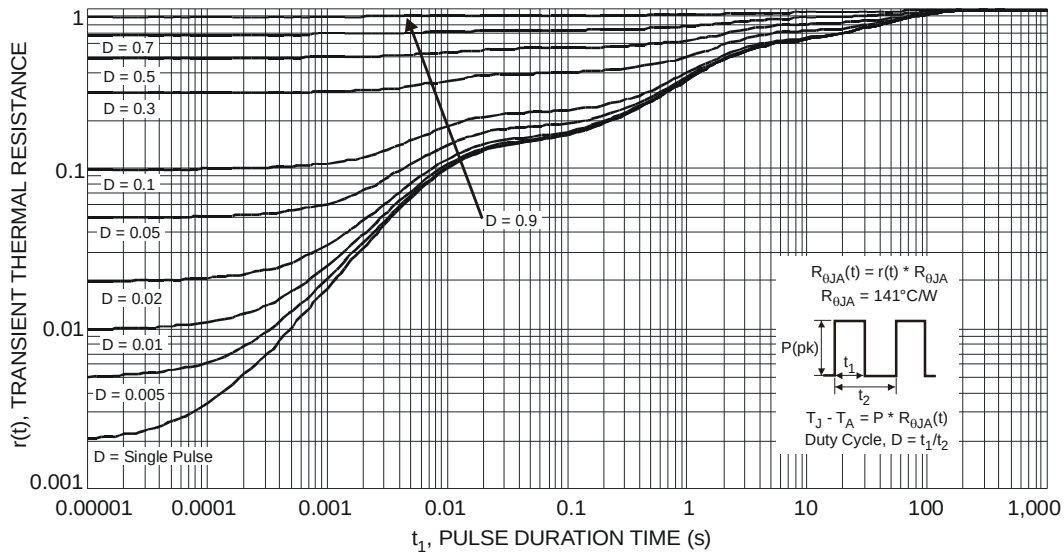


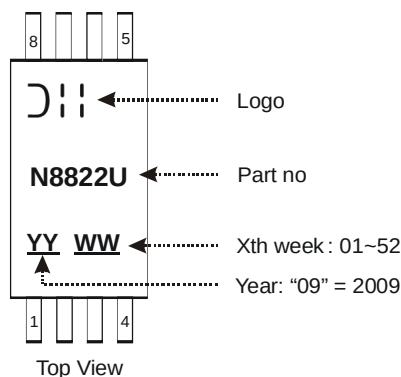
Fig. 11 Transient Thermal Response

## Ordering Information (Note 7)

| Part Number   | Case     | Packaging          |
|---------------|----------|--------------------|
| DMG8822UTS-13 | TSSOP-8L | 2500 / Tape & Reel |

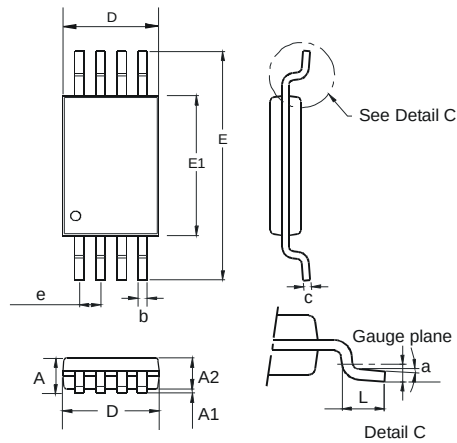
Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



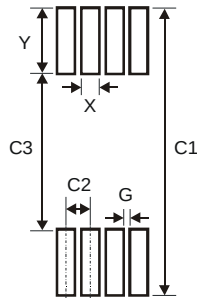
Top View

## Package Outline Dimensions



| TSSOP-8L             |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| a                    | 0.09  | —     | —     |
| A                    | —     | 1.20  | —     |
| A1                   | 0.05  | 0.15  | —     |
| A2                   | 0.825 | 1.025 | 0.925 |
| b                    | 0.19  | 0.30  | —     |
| c                    | 0.09  | 0.20  | —     |
| D                    | 2.90  | 3.10  | 3.025 |
| e                    | —     | —     | 0.65  |
| E                    | —     | —     | 6.40  |
| E1                   | 4.30  | 4.50  | 4.425 |
| L                    | 0.45  | 0.75  | 0.60  |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.45          |
| Y          | 1.78          |
| C1         | 7.72          |
| C2         | 0.65          |
| C3         | 4.16          |
| G          | 0.20          |

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**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331