

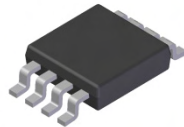
## Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Low Gate Resistance
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

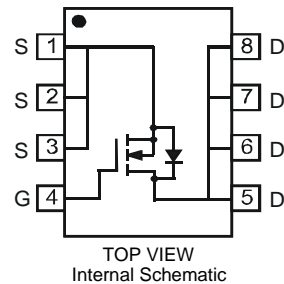
## Mechanical Data

- 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
- Marking Information: See Page 5
- Ordering Information: See Page 5
- Weight: 0.072 grams (approximate)

SO-8



TOP VIEW


 TOP VIEW  
Internal Schematic

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic   |              |                          | Symbol    | Value    | Unit |
|--|--------------|--------------------------|-----------|----------|------|
| Drain-Source Voltage   |              |                          | $V_{DSS}$ | 30       | V    |
| Gate-Source Voltage  |              |                          | $V_{GSS}$ | $\pm 25$ | V    |
| Continuous Drain Current (Note 3)                            | Steady State | $T_A = 25^\circ\text{C}$ | $I_D$     | 10       | A    |
|  |              | $T_A = 85^\circ\text{C}$ |           | 6        |      |
| Pulsed Drain Current (Note 4)                                |              |                          | $I_{DM}$  | 60       | A    |
| Avalanche Current (Notes 4 & 5)                              |              |                          | $I_{AR}$  | 16       | A    |
| Repetitive Avalanche Energy (Notes 4 & 5) $L = 0.1\text{mH}$ |              |                          | $E_{AR}$  | 12.8     | mJ   |

## Thermal Characteristics

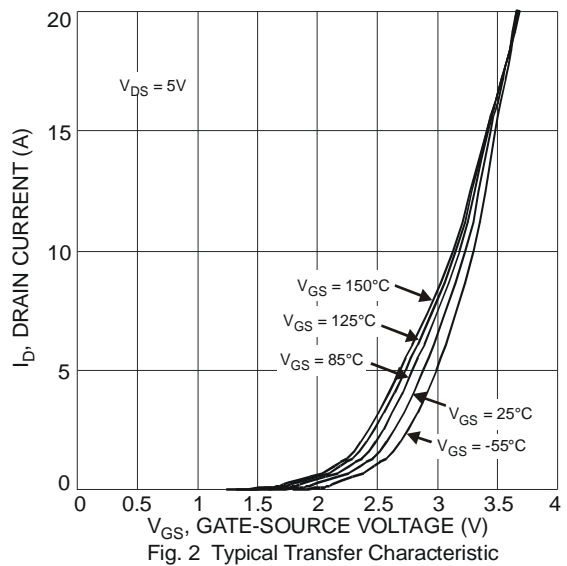
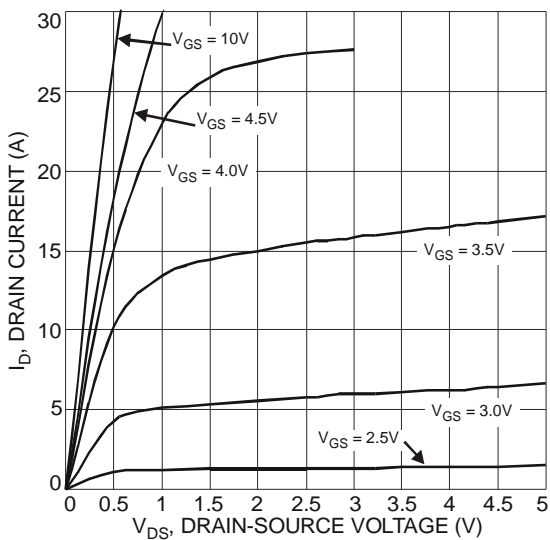
| Characteristic  |  |  | Symbol          | Value       | Unit               |
|---|--|--|-----------------|-------------|--------------------|
| Power Dissipation (Note 3)  |  |  | $P_D$           | 1.42        | W                  |
| Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 3) |  |  | $R_{\theta JA}$ | 88.4        | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                                     |  |  | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. Device mounted on FR-4 substrate PC board with minimum recommended pad layout in a still air environment @  $T_A = 25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.
  4. Repetitive rating, pulse width limited by junction temperature.
  5.  $I_{AR}$  and  $E_{AR}$  rating are based on low frequency and duty cycles to keep  $T_J = 25^\circ\text{C}$

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

| Characteristic                             | Symbol              | Min | Typ   | Max  | Unit | Test Condition  |
|--|---------------------|-----|-------|------|------|---|
| <b>OFF CHARACTERISTICS (Note 6)</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>    | -   | -     | 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> = ±25V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 6)</b>         |                     |     |       |      |      |   |
| Gate Threshold Voltage                     | V <sub>GS(th)</sub> | 1.0 | 1.45  | 2.4  | 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    | 23   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A   |
|  |                     | -   | 25    | 33   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7.5A   |
| Forward Transfer Admittance                | Y <sub>fs</sub>     | -   | 2.5   | -    | S    | V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A  |
| Diode Forward Voltage                      | V <sub>SD</sub>     | -   | 0.69  | 1    | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A   |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b>    |                     |     |       |      |      |   |
| Input Capacitance                          | C <sub>iss</sub>    | -   | 478.9 | -    | pF   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                  |
| Output Capacitance                         | C <sub>oss</sub>    | -   | 96.7  | -    | pF   |   |
| Reverse Transfer Capacitance               | C <sub>rss</sub>    | -   | 61.4  | -    | pF   |   |
| Gate Resistance                            | R <sub>g</sub>      | 0.4 | 1.1   | 1.6  | 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>      | -   | 5.0   | 8    | nC   | V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A                          |
| Total Gate Charge (V <sub>GS</sub> = 10V)  | Q <sub>g</sub>      | -   | 10.5  | 17   |      |   |
| Gate-Source Charge                         | Q <sub>gs</sub>     | -   | 1.8   | -    |      |   |
| Gate-Drain Charge                          | Q <sub>gd</sub>     | -   | 1.6   | -    |      |   |
| Turn-On Delay Time                         | t <sub>D(on)</sub>  | -   | 2.9   | -    | ns   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V,<br>R <sub>G</sub> = 3Ω, R <sub>L</sub> = 1.5Ω |
| Turn-On Rise Time                          | t <sub>r</sub>      | -   | 7.9   | -    | ns   |   |
| Turn-Off Delay Time                        | t <sub>D(off)</sub> | -   | 14.6  | -    | ns   |   |
| Turn-Off Fall Time                         | t <sub>f</sub>      | -   | 3.1   | -    | ns   |   |

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



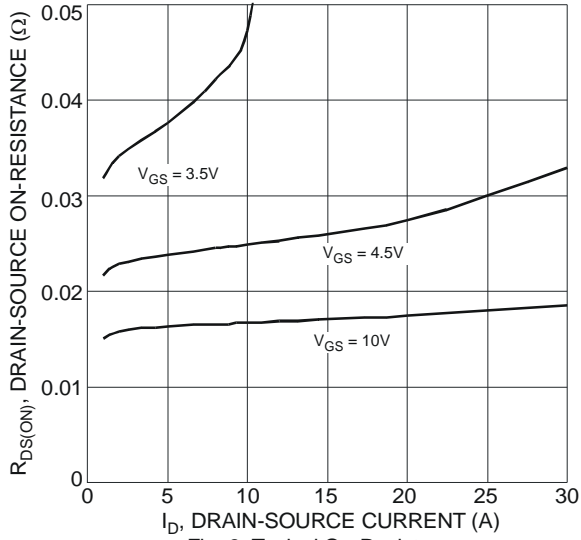


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

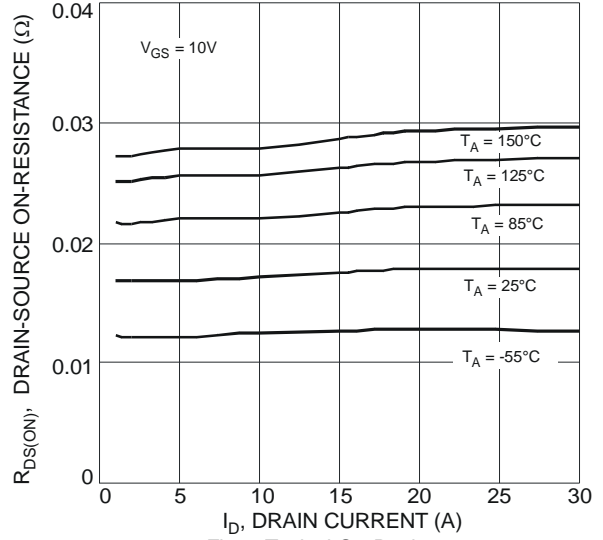


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

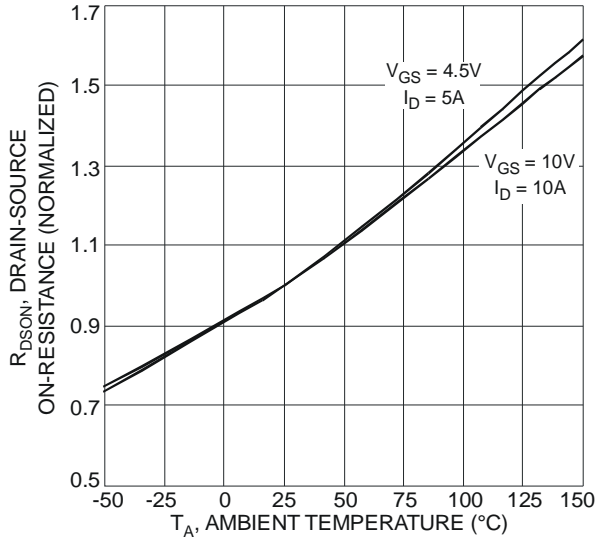


Fig. 5 On-Resistance Variation with Temperature

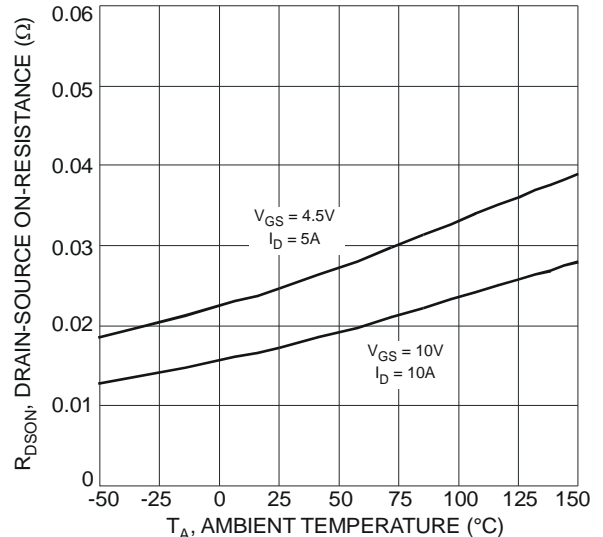


Fig. 6 On-Resistance Variation with Temperature

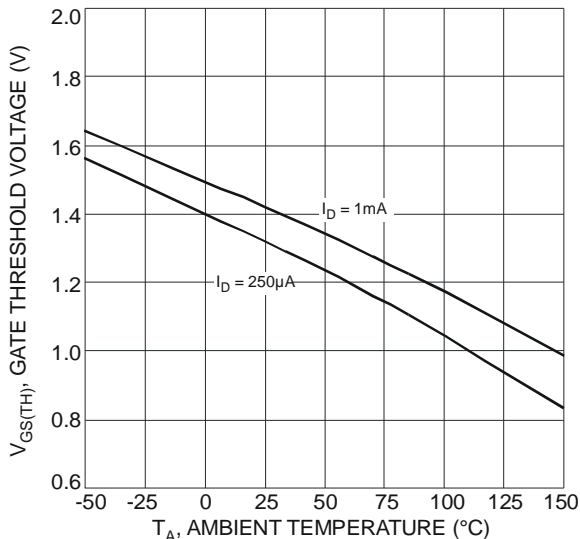


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

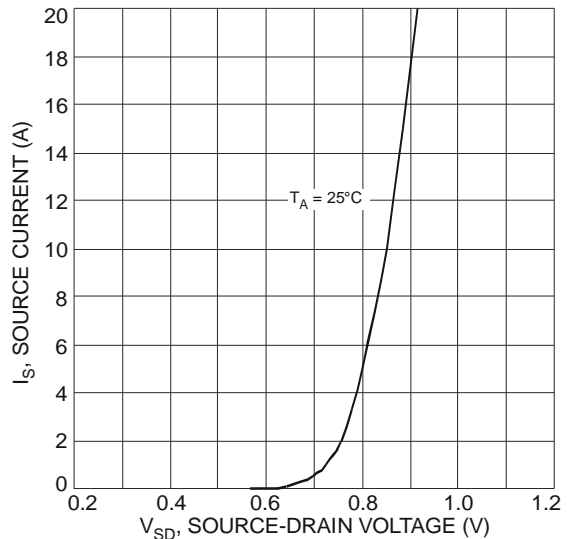


Fig. 8 Diode Forward Voltage vs. Current

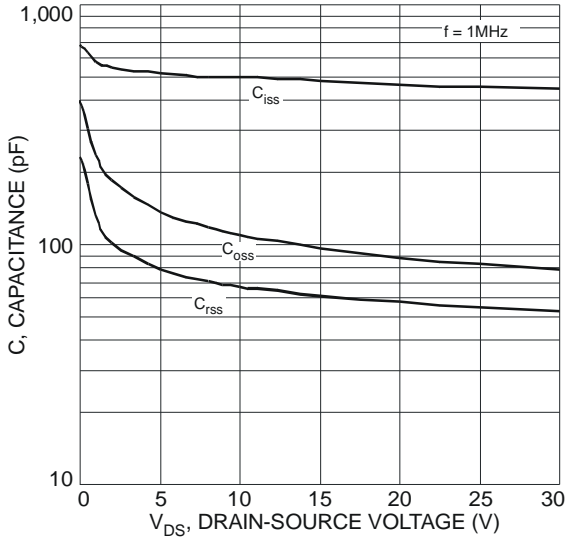


Fig. 9 Typical Total Capacitance

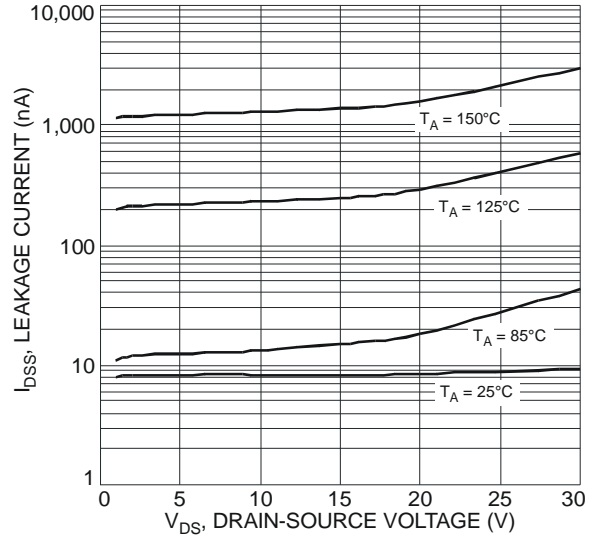


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

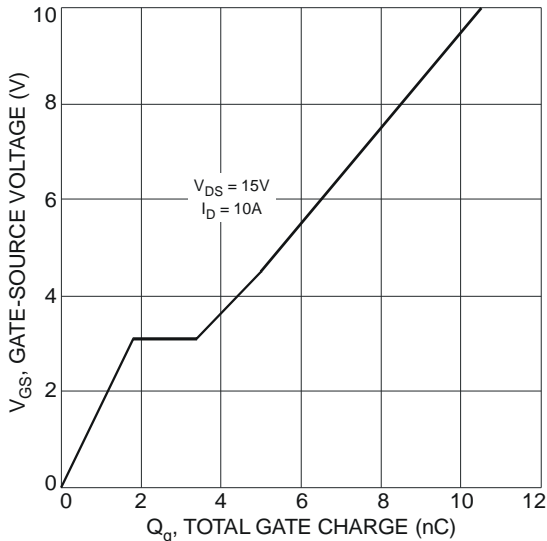


Fig. 11 Gate-Charge Characteristics

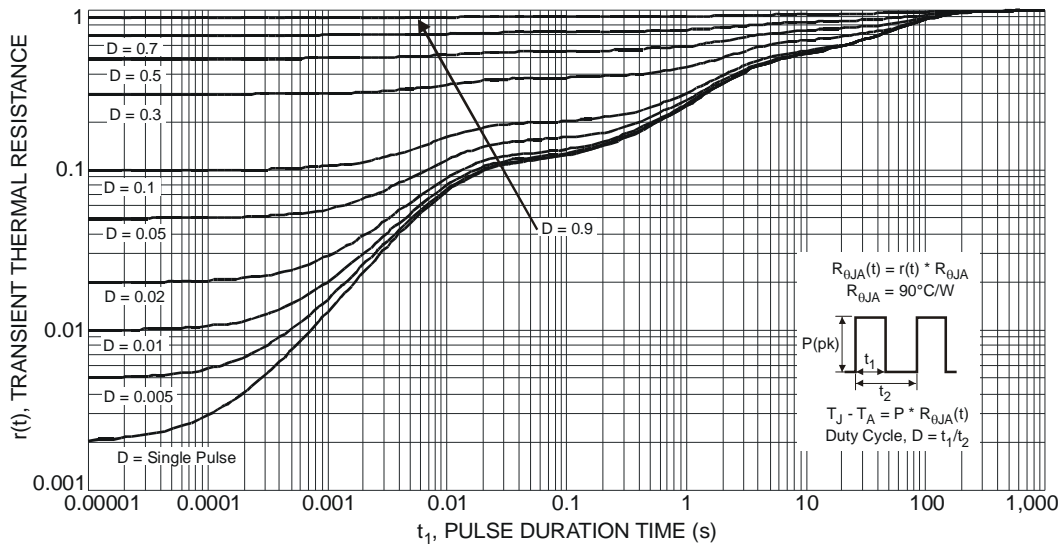


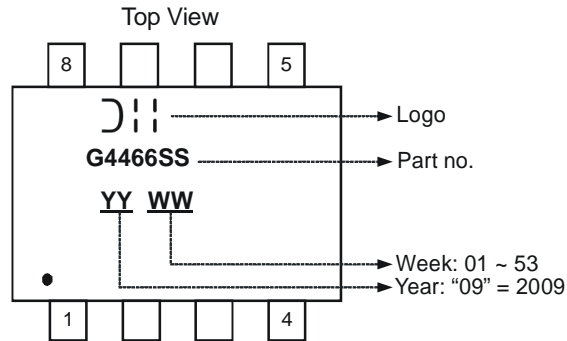
Fig. 12 Transient Thermal Response

**Ordering Information** (Note 8)

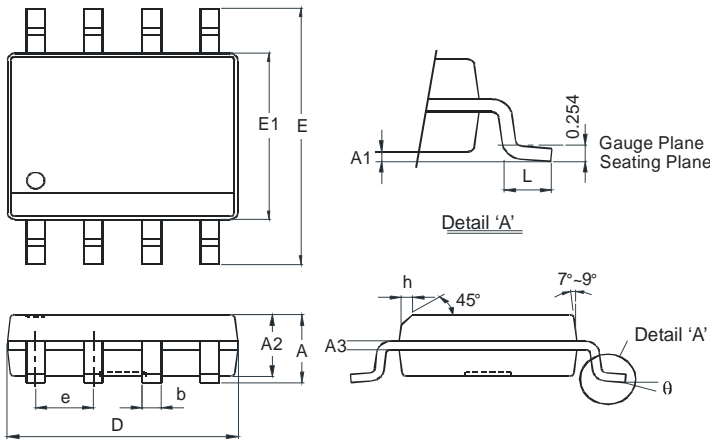
| Part Number   | Case | Packaging          |
|---------------|------|--------------------|
| DMG4466SSS-13 | SO-8 | 2500 / Tape & Reel |

Notes: 8. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**

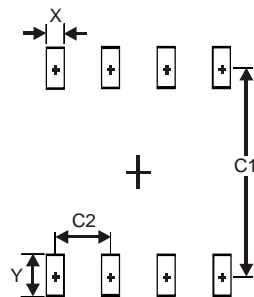


**Package Outline Dimensions**



| 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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