

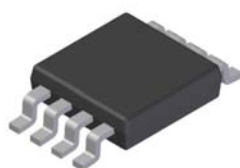
## Features

- Low On-Resistance
  - 13mΩ @  $V_{GS} = -10V$
  - 16mΩ @  $V_{GS} = -4.5V$
  - 22mΩ @  $V_{GS} = -2.5V$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead Free By Design/RoHS Compliant (Note 2)**
- "Green" Device (Note 4)**
- Qualified to AEC-Q101 Standards for High Reliability**

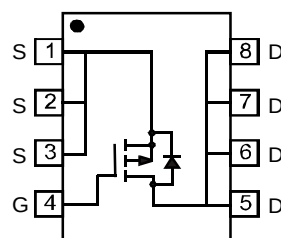
## Mechanical Data

- 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
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072g (approximate)

SO-8



TOP VIEW


 TOP VIEW  
 Internal Schematic

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

| Characteristic                |              |                     | Symbol    | Value    | Units |
|-------------------------------|--------------|---------------------|-----------|----------|-------|
| Drain-Source Voltage          |              |                     | $V_{DSS}$ | -20      | V     |
| Gate-Source Voltage           |              |                     | $V_{GSS}$ | $\pm 12$ | V     |
| Drain Current (Note 1)        | Steady State | $T_A = 25^{\circ}C$ | $I_D$     | -10      | A     |
|                               |              | $T_A = 70^{\circ}C$ |           | -8       |       |
| Pulsed Drain Current (Note 3) |              |                     | $I_{DM}$  | -35      | A     |

## Thermal Characteristics

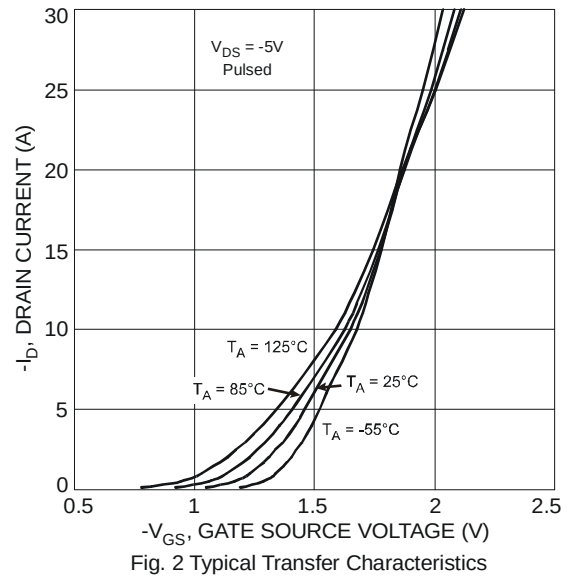
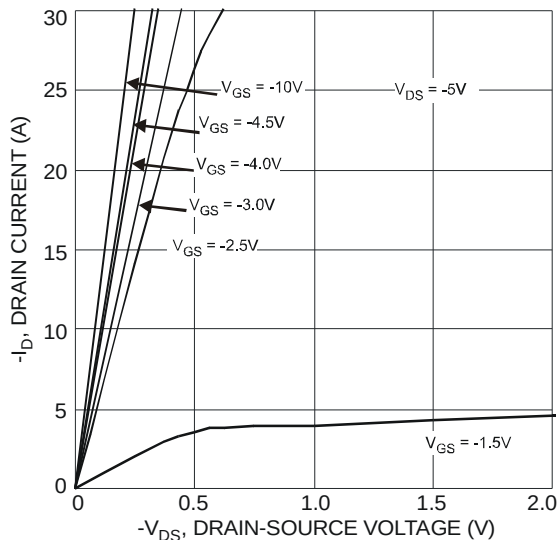
| Characteristic                          | Symbol          | Value       | Unit         |
|-----------------------------------------|-----------------|-------------|--------------|
| Total Power Dissipation (Note 1)        | $P_D$           | 2.5         | W            |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 50          | $^\circ C/W$ |
| Operating and Storage Temperature Range | $T_J, T_{STG}$  | -55 to +150 | $^\circ C$   |

- Notes:
- Device mounted on 2 oz. Copper pads on FR-4 PCB.
  - No purposefully added lead.
  - Pulse width  $\leq 10\mu s$ , Duty Cycle  $\leq 1\%$ .
  - 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   | μA   | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V                                                   |
| Gate-Source Leakage                       | I <sub>GSS</sub>    | —    | —            | ±100 | nA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V                                                   |
| <b>ON CHARACTERISTICS (Note 5)</b>        |                     |      |              |      |      |                                                                                                |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub> | -0.6 | 0.77         | -1.1 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                    |
| Static Drain-Source On-Resistance         | R <sub>DS(on)</sub> | —    | 8            | 13   | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A                                                  |
|                                           |                     | —    | 11           | 16   |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -9A                                                  |
|                                           |                     | —    | 17           | 22   |      | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -8A                                                  |
| Forward Transconductance                  | g <sub>fs</sub>     | —    | 28           | —    | S    | V <sub>DS</sub> = -10V, I <sub>D</sub> = -10A                                                  |
| Diode Forward Voltage (Note 5)            | V <sub>SD</sub>     | -0.5 | 0.68         | -1.2 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -3A                                                     |
| <b>DYNAMIC CHARACTERISTICS (Note 6)</b>   |                     |      |              |      |      |                                                                                                |
| Input Capacitance                         | C <sub>iss</sub>    | —    | 2444         | —    | pF   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                     |
| Output Capacitance                        | C <sub>oss</sub>    | —    | 594          | —    | pF   |                                                                                                |
| Reverse Transfer Capacitance              | C <sub>rss</sub>    | —    | 556          | —    | pF   |                                                                                                |
| Gate Resistance                           | R <sub>G</sub>      | —    | 2.0          | —    | Ω    | V <sub>GS</sub> = 0V V <sub>DS</sub> = 0V, f = 1MHz                                            |
| <b>SWITCHING CHARACTERISTICS (Note 6)</b> |                     |      |              |      |      |                                                                                                |
| Total Gate Charge                         | Q <sub>g</sub>      | —    | 28.1<br>56.9 | —    | nC   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A                         |
| Gate-Source Charge                        | Q <sub>gs</sub>     | —    | 3.4          | —    |      | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A                          |
| Gate-Drain Charge                         | Q <sub>gd</sub>     | —    | 11.9         | —    |      | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A                          |
| Turn-On Delay Time                        | t <sub>D(on)</sub>  | —    | 7.5          | 15   | ns   | V <sub>DD</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V,<br>R <sub>GEN</sub> = 6Ω |
| Turn-On Rise Time                         | t <sub>r</sub>      | —    | 9.9          | 20   |      |                                                                                                |
| Turn-Off Delay Time                       | t <sub>D(off)</sub> | —    | 108.0        | 216  |      |                                                                                                |
| Turn-Off Fall Time                        | t <sub>f</sub>      | —    | 76.5         | 153  |      |                                                                                                |

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



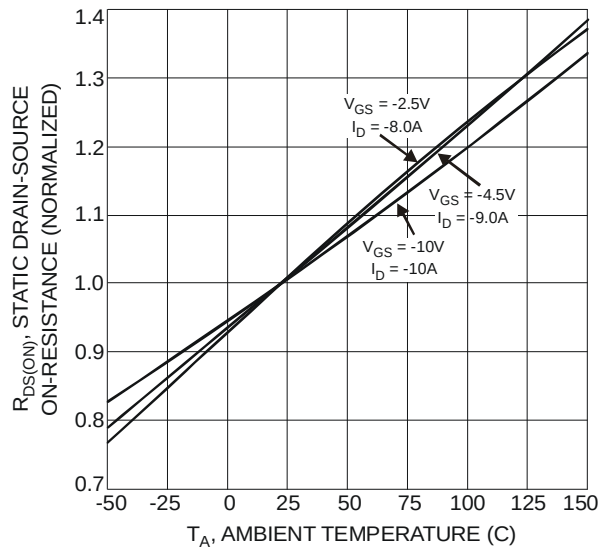


Fig. 3 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

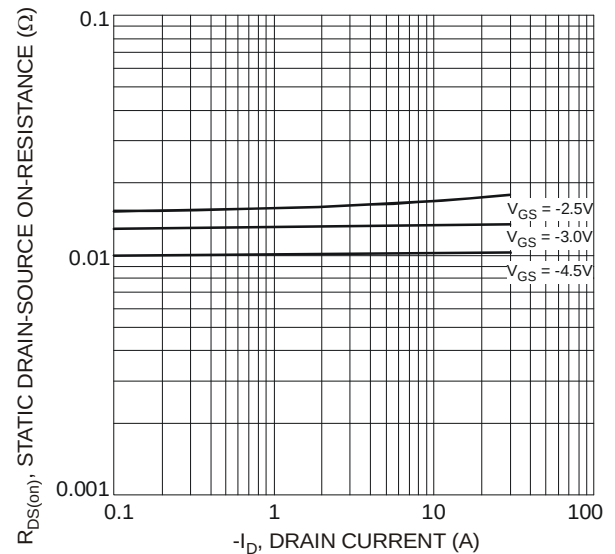


Fig. 4 On-Resistance vs. Drain Current and Gate Voltage

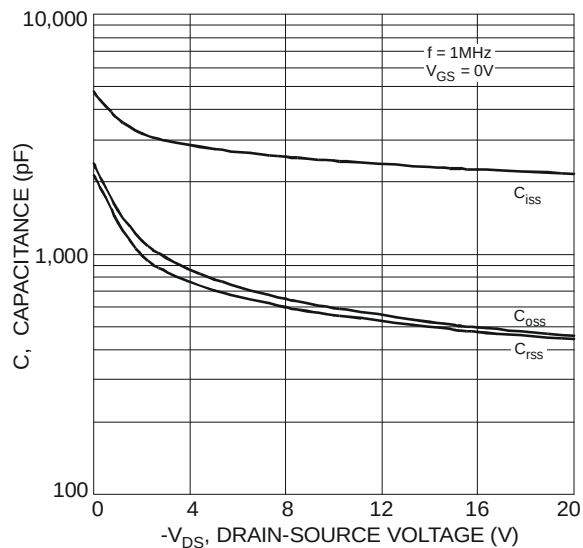


Fig. 5 Typical Total Capacitance

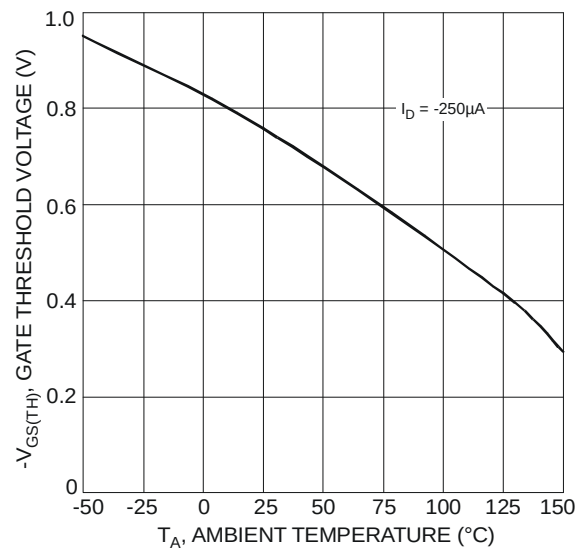


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

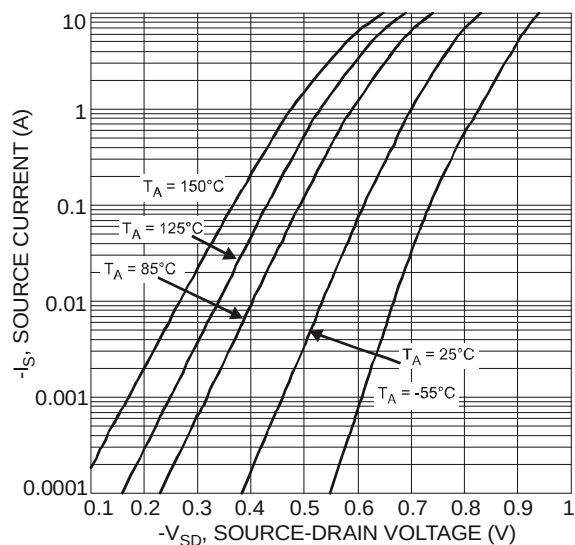


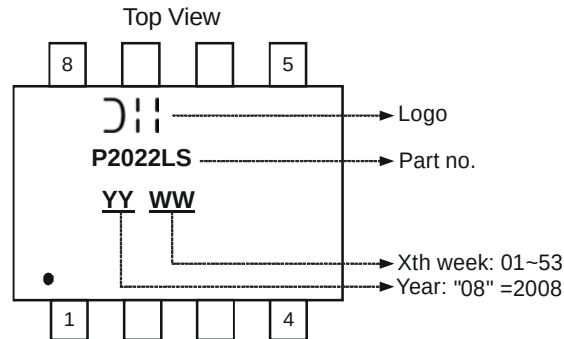
Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

## Ordering Information (Note 7)

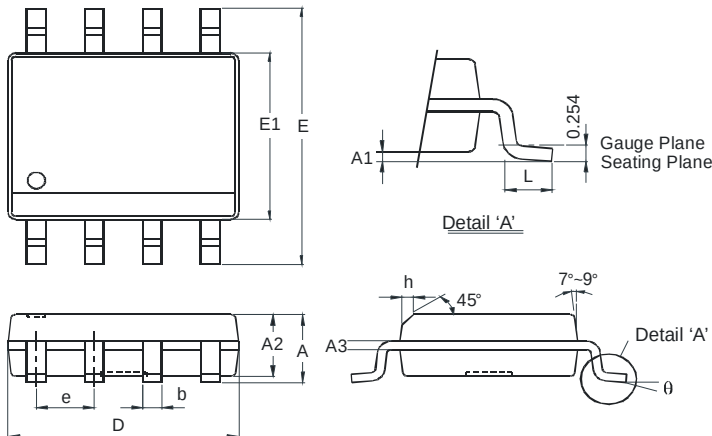
| Part Number   | Case | Packaging        |
|---------------|------|------------------|
| DMP2022LSS-13 | SO-8 | 2500/Tape & Reel |

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

## Marking Information

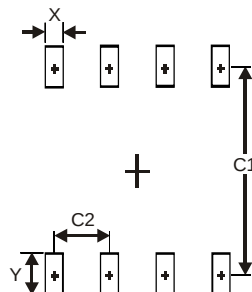


## Package Outline Dimensions



| 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 |
| θ                    | 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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