



**THE DATASHEET OF  
DMP2066LSS-13**



**SINGLE P-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> Max        | I <sub>D</sub> Max<br>T <sub>A</sub> = +25°C |
|-------------------|--------------------------------|----------------------------------------------|
| -20V              | 40mΩ @ V <sub>GS</sub> = -4.5V | -6.5A                                        |
|                   | 70mΩ @ V <sub>GS</sub> = -2.5V | -5.0A                                        |

**Description and Applications**

This MOSFET has been designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

**Description and Applications**

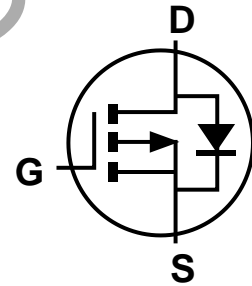
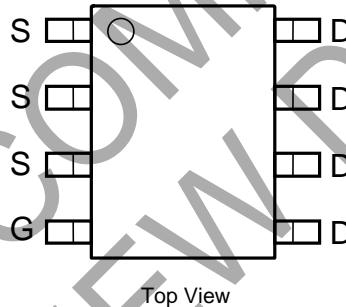
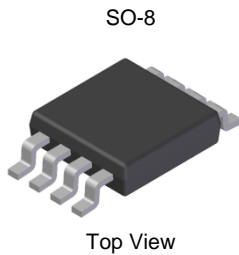
- Backlighting
- Power Management Functions
- DC-DC Converters

**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 (e3)
- Weight: 0.074g (Approximate)

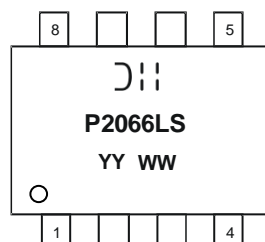


**Ordering Information** (Note 4)

| Part Number   | Case | Packaging        |
|---------------|------|------------------|
| DMP2066LSS-13 | SO-8 | 2500/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**



D; = Manufacturer's Marking  
P2066LS = Product Type Marking Code  
YYWW = Date Code Marking  
YY or YY = Year (ex: 18 = 2018)  
WW = Week (01 to 53)

### 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> | ±12   | V    |
| Drain Current (Note 5)                             | Steady State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | -6.5  | A    |
|                                                    |              | T <sub>A</sub> = +70°C |                  | -5.2  |      |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) |              |                        | I <sub>DM</sub>  | -26   | 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                                                                                                      |
|-----------------------------------------|---------------------|------|-------|------|------|---------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 6)</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 6)</b>      |                     |      |       |      |      |                                                                                                                     |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | -0.6 | —     | -1.2 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA                                                         |
| Static Drain-Source On-Resistance       | R <sub>DS(ON)</sub> | —    | —     | 40   | mΩ   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5.8A                                                                     |
|                                         |                     | —    | —     | 70   |      | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -3.8A                                                                     |
| Forward Transconductance                | g <sub>fs</sub>     | —    | 9     | —    | S    | V <sub>DS</sub> = -10V, I <sub>D</sub> = -4.6A                                                                      |
| Diode Forward Voltage                   | V <sub>SD</sub>     | -0.5 | -0.72 | -1.4 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.1A                                                                        |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b> |                     |      |       |      |      |                                                                                                                     |
| Input Capacitance                       | C <sub>ISS</sub>    | —    | 820   | —    | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                          |
| Output Capacitance                      | C <sub>OSS</sub>    | —    | 200   | —    | pF   |                                                                                                                     |
| Reverse Transfer Capacitance            | C <sub>RSS</sub>    | —    | 160   | —    | pF   |                                                                                                                     |
| Gate Resistance                         | R <sub>g</sub>      | —    | 10.4  | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                                           |
| Total Gate Charge                       | Q <sub>g</sub>      | —    | 14.4  | —    | nC   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V<br>I <sub>D</sub> = -4.5A                                           |
| Gate-Source Charge                      | Q <sub>gs</sub>     | —    | 2.6   | —    |      |                                                                                                                     |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | —    | 2.7   | —    |      |                                                                                                                     |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —    | 13.7  | —    | ns   | V <sub>DD</sub> = -10V, V <sub>GS</sub> = -4.5V,<br>R <sub>G</sub> = 6Ω, R <sub>L</sub> = 10Ω, I <sub>D</sub> = -1A |
| Turn-On Rise Time                       | t <sub>r</sub>      | —    | 14.0  | —    |      |                                                                                                                     |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —    | 79.1  | —    |      |                                                                                                                     |
| Turn-Off Fall Time                      | t <sub>f</sub>      | —    | 35.5  | —    |      |                                                                                                                     |

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

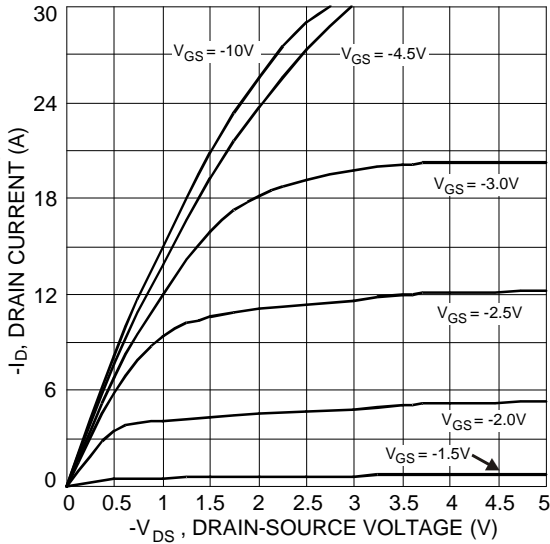


Fig. 1 Typical Output Characteristic

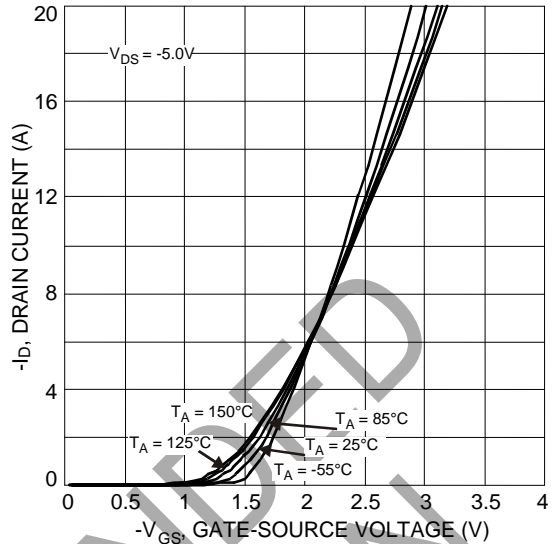


Fig. 2 Typical Transfer Characteristic

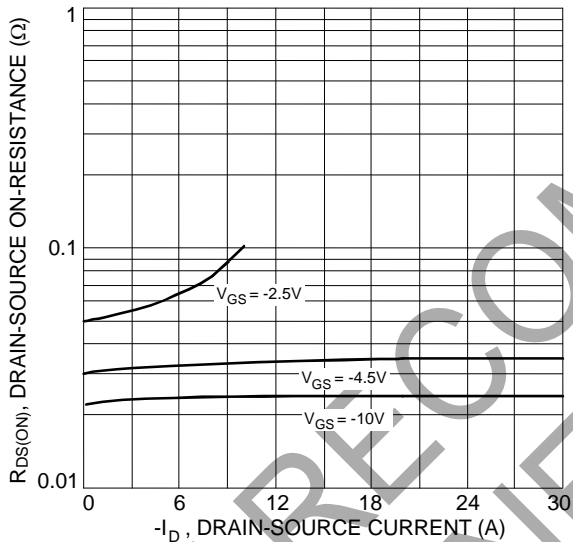


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

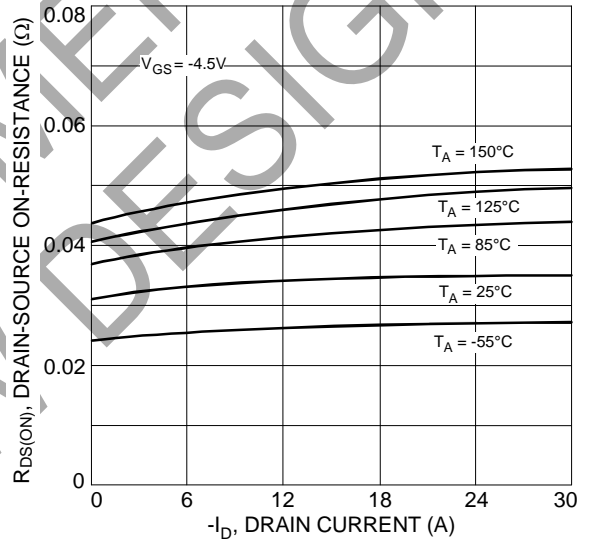


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

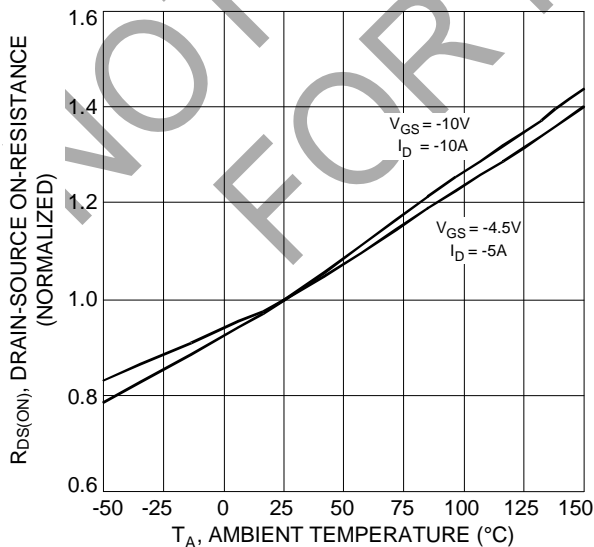


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

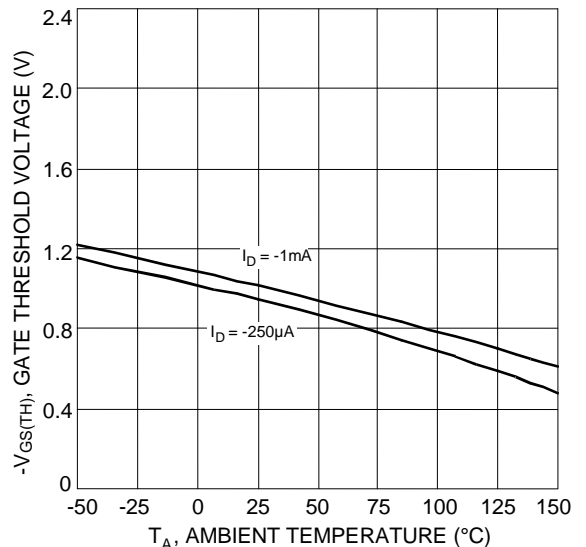


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

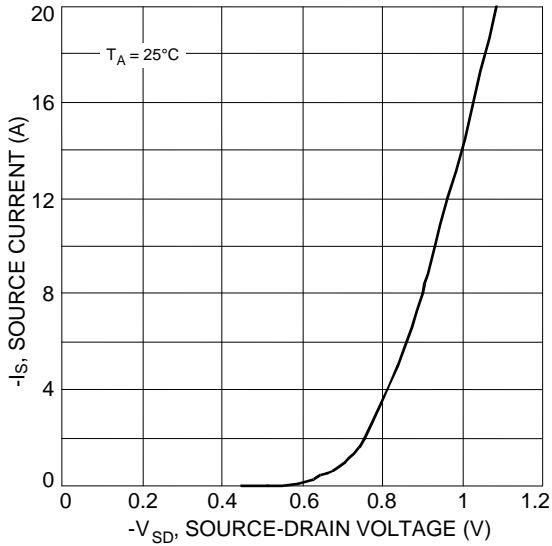


Fig. 7 Diode Forward Voltage vs. Current

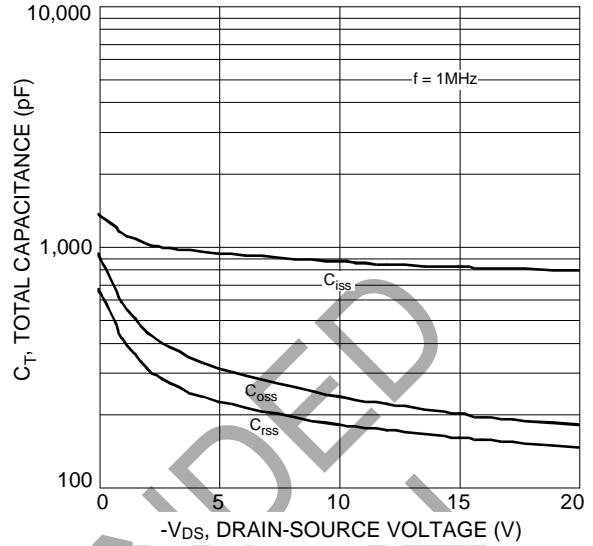


Fig. 8 Typical Total Capacitance

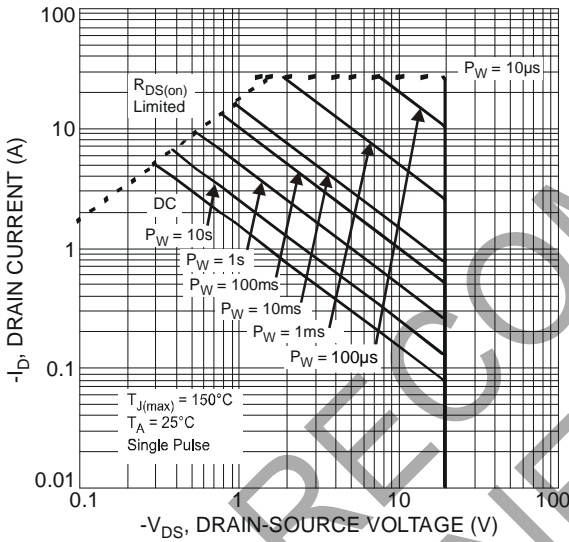


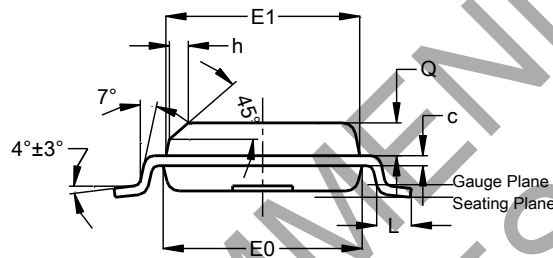
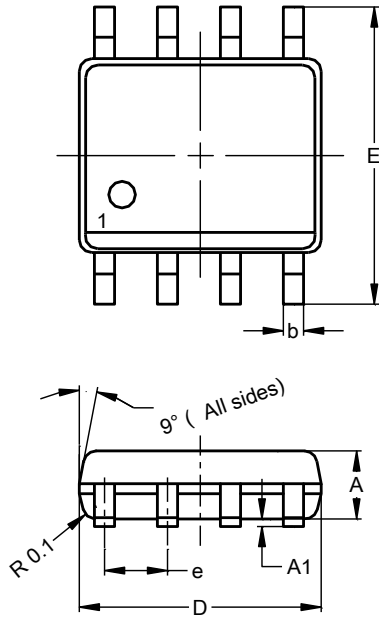
Fig. 9 SOA, Safe Operation Area

NOT RECOMMENDED FOR NEW DESIGN

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SO-8

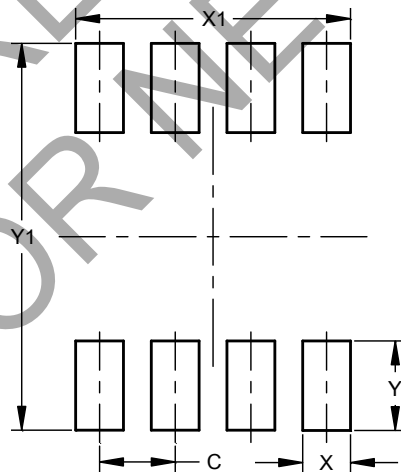


| SO-8                 |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 1.40 | 1.50 | 1.45 |
| A1                   | 0.10 | 0.20 | 0.15 |
| b                    | 0.30 | 0.50 | 0.40 |
| c                    | 0.15 | 0.25 | 0.20 |
| D                    | 4.85 | 4.95 | 4.90 |
| E                    | 5.90 | 6.10 | 6.00 |
| E1                   | 3.80 | 3.90 | 3.85 |
| E0                   | 3.85 | 3.95 | 3.90 |
| e                    | --   | --   | 1.27 |
| h                    | -    | --   | 0.35 |
| L                    | 0.62 | 0.82 | 0.72 |
| Q                    | 0.60 | 0.70 | 0.65 |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SO-8



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.27          |
| X          | 0.802         |
| X1         | 4.612         |
| Y          | 1.505         |
| Y1         | 6.50          |

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