

DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

| BV _{DSS} | R _{DS(ON)} max | I _D T _A = +25°C |
|-------------------|--------------------------------|--|
| -20V | 40mΩ @ V _{GS} = -4.5V | -5.8A |
| | 70mΩ @ V _{GS} = -2.5V | -4.4A |

Description

This new generation MOSFET is 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.

Applications

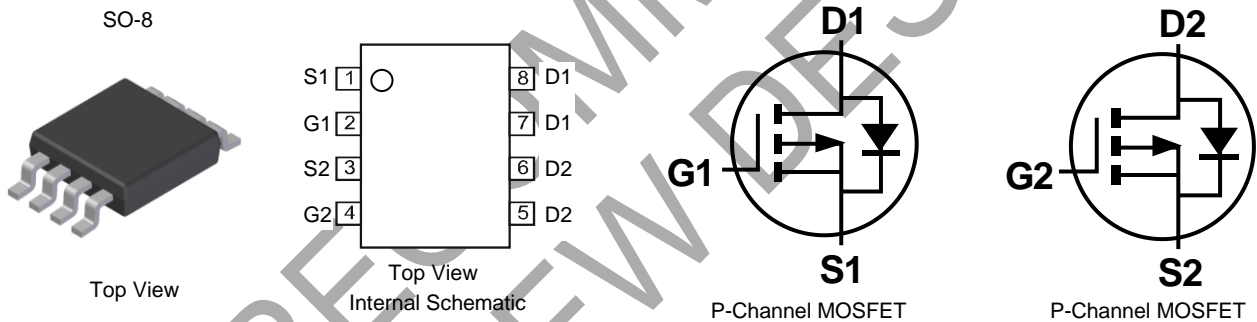
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

- Dual P-Channel MOSFET
- 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 Indicator: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 Ⓔ
- Weight: 0.072 grams (Approximate)

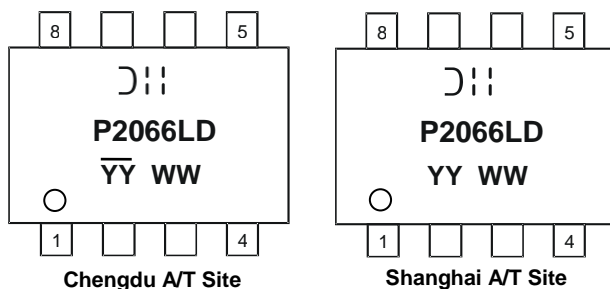


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|------|------------------|
| DMP2066LSD-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



- ⓁⓂⓂ = Manufacturer's Marking
- P2066LD = Product Type Marking Code
- YYWW = Date Code Marking
- YY or YY = Year (ex: 18 = 2018)
- WW = Week (01 to 53)
- YY = Date Code Marking for SAT (Shanghai Assembly/ Test Site)
- YY = Date Code Marking for CAT (Chengdu Assembly/ Test Site)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|-------------------------------|--------------|------------------------|------------------|-------|------|
| Drain-Source Voltage | | | V _{DSS} | -20 | V |
| Gate-Source Voltage | | | V _{GSS} | ±12 | V |
| Drain Current (Note 5) | Steady State | T _A = +25°C | I _D | -5.8 | A |
| | | T _A = +70°C | | -4.6 | |
| Pulsed Drain Current (Note 6) | | | I _{DM} | -20 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) | P _D | 2.0 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 62.5 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------------------|---------------------|------|-------|------|------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -20 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | μA | V _{DS} = -20V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±12V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -0.6 | -0.94 | -1.2 | V | V _{DS} = V _{GS} , I _D = -250μA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 29 | 40 | mΩ | V _{GS} = -4.5V, I _D = -4.6A V _{GS} = -2.5V, I _D = -3.8A |
| | | — | 55 | 70 | | |
| Forward Transconductance | g _{fs} | — | 9 | — | S | V _{DS} = -10V, I _D = -4.6A |
| Diode Forward Voltage (Note 7) | V _{SD} | -0.5 | -0.72 | -1.4 | V | V _{GS} = 0V, I _S = -2.1A |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C _{iss} | — | 820 | — | pF | V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 200 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 160 | — | pF | |
| Gate Resistance | R _G | — | 2.5 | — | Ω | V _{DS} = 0V, V _{GS} = 0V f = 1.0MHz |
| SWITCHING CHARACTERISTICS | | | | | | |
| Total Gate Charge | Q _G | — | 10.1 | — | nC | V _{DS} = -10V, V _{GS} = -4.5V, I _D = -5.9A |
| Gate-Source Charge | Q _{GS} | — | 1.5 | — | | |
| Gate-Drain Charge | Q _{GD} | — | 4.3 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 4.4 | — | ns | V _{DS} = -10V, V _{GS} = -4.5V, I _D = -1A, R _G = 6.0Ω |
| Rise Time | t _R | — | 9.9 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 28.0 | — | | |
| Fall Time | t _F | — | 23.4 | — | | |

- Notes: 5. Device mounted on 2 oz. 1" x 1" Copper pads on 2" x 2" FR-4 PCB.
6. Pulse width ≤10μs, Duty Cycle ≤1%.
7. Short duration pulse test used to minimize self-heating effect.

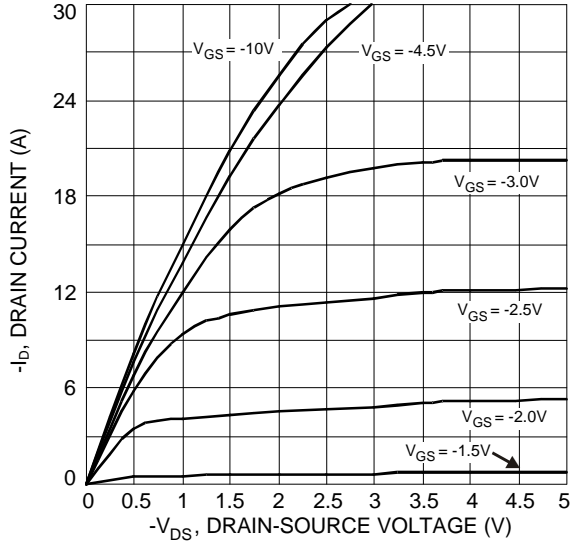


Fig. 1 Typical Output Characteristic

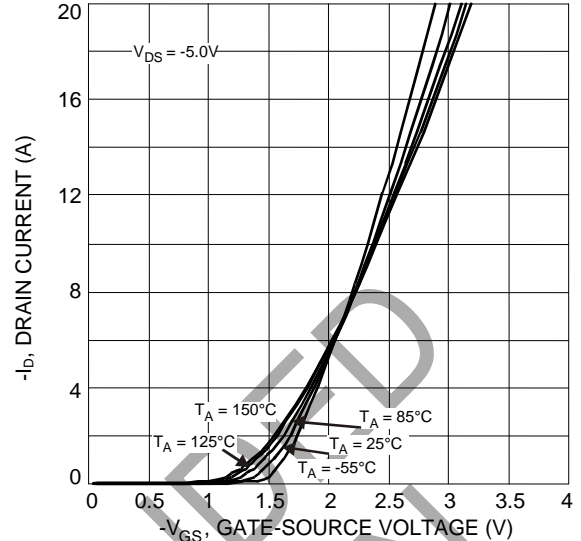


Fig. 2 Typical Transfer Characteristic

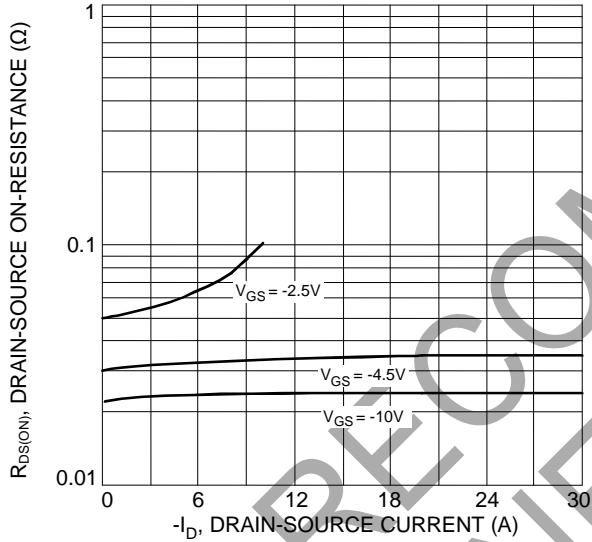


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

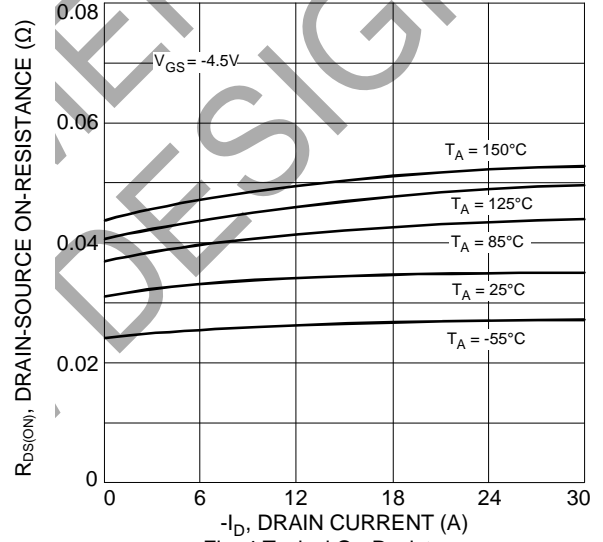


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

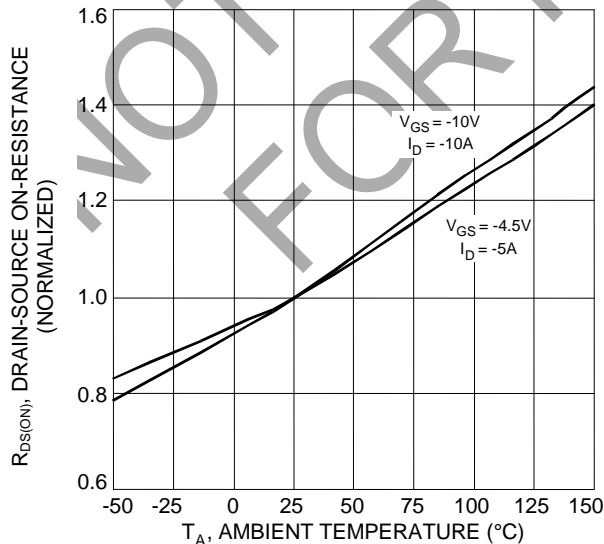


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

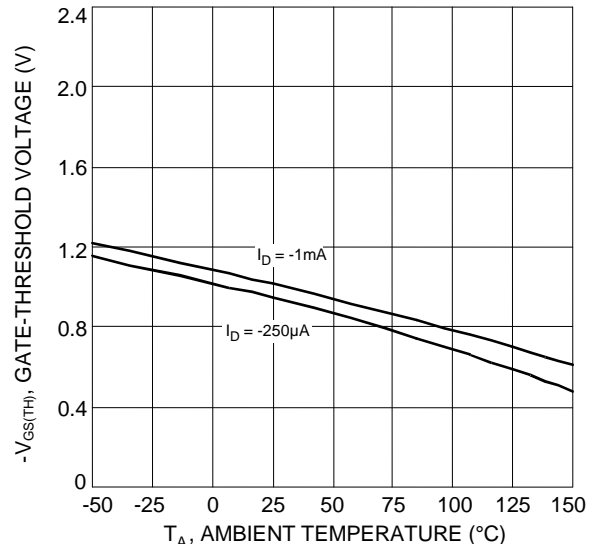


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

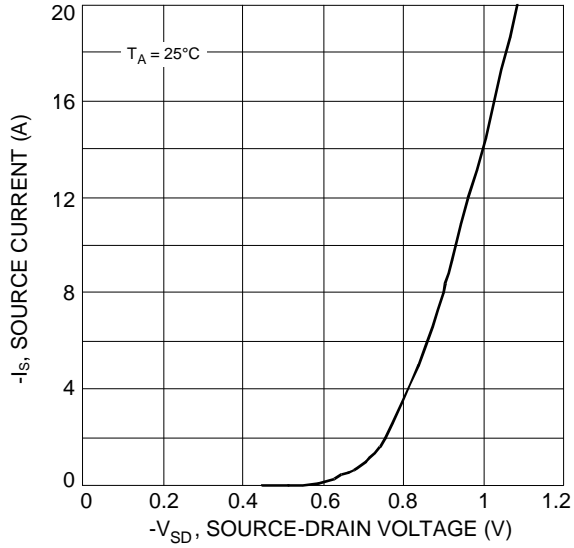


Fig. 7 Diode Forward Voltage vs. Current

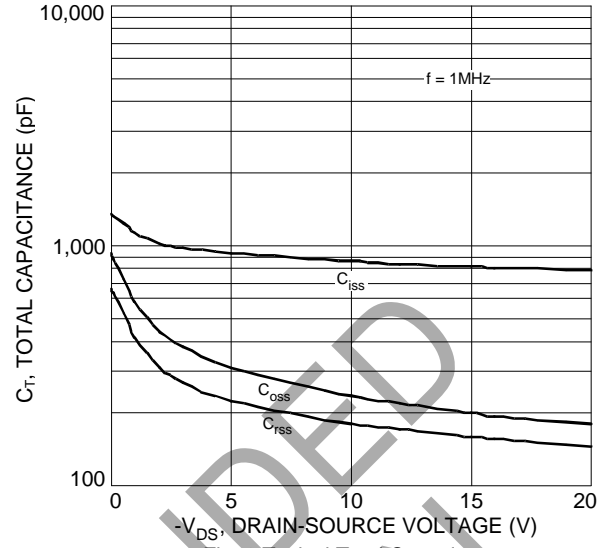


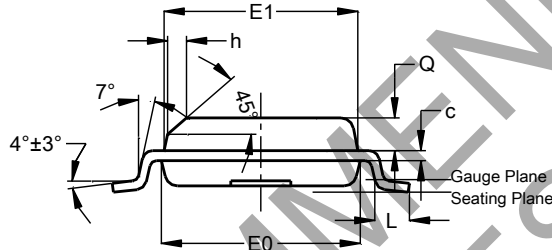
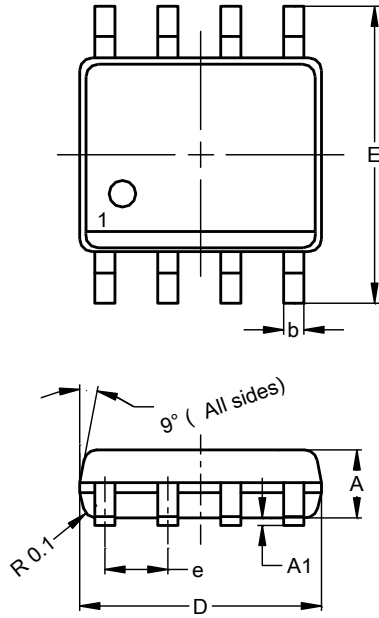
Fig. 8 Typical Total Capacitance

NOT RECOMMENDED FOR NEW DESIGN

Package Outline Dimensions

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

SO-8

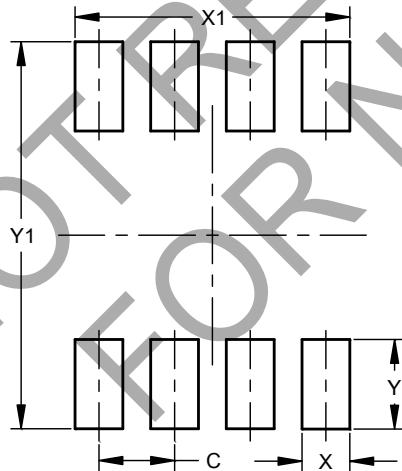


| SO-8 | | | |
|-----------------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 1.40 | 1.50 | 1.45 |
| A1 | 0.10 | 0.20 | 0.15 |
| b | 0.30 | 0.50 | 0.40 |
| c | 0.15 | 0.25 | 0.20 |
| D | 4.85 | 4.95 | 4.90 |
| E | 5.90 | 6.10 | 6.00 |
| E1 | 3.80 | 3.90 | 3.85 |
| E0 | 3.85 | 3.95 | 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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