# THE DATASHEET OF

# DMP2066LDM-7

NOT RECOMMENDED FOR NEW DESIGN
USE DMP2040UVT

Lead-free Green

# DMP2066LDM

## P-CHANNEL ENHANCEMENT MODE MOSFET

## Features

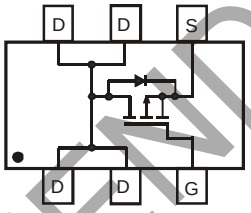
- Low $R_{DS(ON)}$:
  40mΩ @$V_{GS}$ = -4.5V
  70mΩ @$V_{GS}$ = -2.5V
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: SOT26
- Case Material – Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

SOT26

Top View




Top View
Internal Schematic

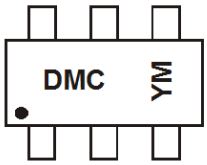


## Ordering Information (Note 5)

| Part Number | Case | Packaging |
|---|---|---|
| DMP2066LDM-7 | SOT26 | 3000/Tape & Reel |
| DMP2066LDMQ-7 | SOT26 | 3000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to https://www.diodes.com/quality/.
5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information




DMC = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: F = 2018)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2008 | 2009 | 2010 | 2011 | ~ | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Code | V | W | X | Y | ~ | F | G | H |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

## 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 6) Continuous | $T_A$ = +25°C<br>$T_A$ = +70°C | $I_D$ | -4.6<br>-3.7 | A |
| Pulsed Drain Current (Note 7) | | $I_{DM}$ | -18 | A |
| Body-Diode Continuous Current (Note 6) | | $I_S$ | 2.0 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Total Power Dissipation (Note 6) | $P_D$ | 1.25 | W |
| Thermal Resistance, Junction to Ambient (Note 6); Steady-State | $R_{\theta JA}$ | 100 | °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 |
|---|---|---|---|---|---|---|---|
| **STATIC PARAMETERS** | | | | | | | |
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | -20 | — | — | V | $I_D$ = -250μA, $V_{GS}$ = 0V |
| Zero Gate Voltage Drain Current | $T_J$ = +25°C | $I_{DSS}$ | — | — | -1 | μA | $V_{DS}$ = -20V, $V_{GS}$ = 0V |
| Gate-Body Leakage Current | | $I_{GSS}$ | — | — | ±100 | nA | $V_{DS}$ = 0V, $V_{GS}$ = ±12V |
| Gate Threshold Voltage | | $V_{GS(TH)}$ | -0.6 | -0.96 | -1.2 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -250μA |
| On State Drain Current (Note 8) | | $I_{D(ON)}$ | -15 | — | — | A | $V_{GS}$ = -4.5V, $V_{DS}$ = -5V |
| Static Drain-Source On-Resistance (Note 8) | | $R_{DS(ON)}$ | — | 29<br>55 | 40<br>70 | mΩ | $V_{GS}$ = -4.5V, $I_D$ = -4.6A<br>$V_{GS}$ = -2.5V, $I_D$ = -3.8A |
| Forward Transconductance (Note 8) | | $g_{FS}$ | — | 9 | — | S | $V_{DS}$ = -10V, $I_D$ = -4.6A |
| Diode Forward Voltage (Note 8) | | $V_{SD}$ | -0.5 | -0.72 | -1.4 | V | $I_S$ = -2.1A, $V_{GS}$ = 0V |
| Maximum Body-Diode Continuous Current (Note 6) | | $I_S$ | — | — | -1.7 | A | — |
| **DYNAMIC PARAMETERS (Note 9)** | | | | | | | |
| Input Capacitance | | $C_{iss}$ | — | 820 | — | pF | $V_{DS}$ = -15V, $V_{GS}$ = 0V<br>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<br>f = 1.0MHz |
| **SWITCHING CHARACTERISTICS** | | | | | | | |
| Total Gate Charge | | $Q_G$ | — | 10.1 | — | nC | $V_{DS}$ = -10V, $V_{GS}$ = -4.5V,<br>$I_D$ = -4.5A |
| 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,<br>$I_D$ = -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:
6. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width t ≤10s.
7. Repetitive Rating, pulse width limited by junction temperature.
8. Test pulse width t = 300μs.
9. Guaranteed by design. Not subject to production testing.

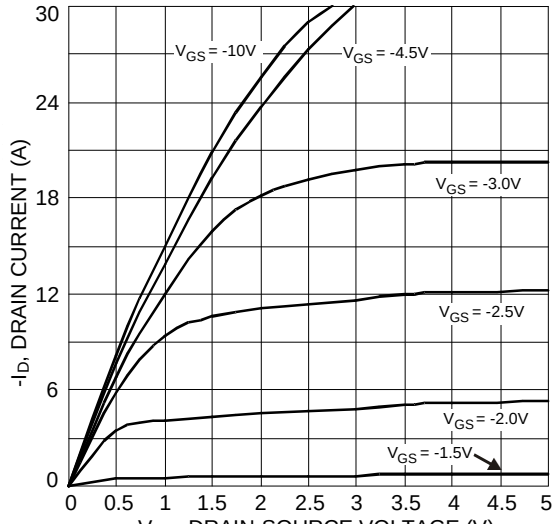



Fig. 1 Typical Output Characteristic

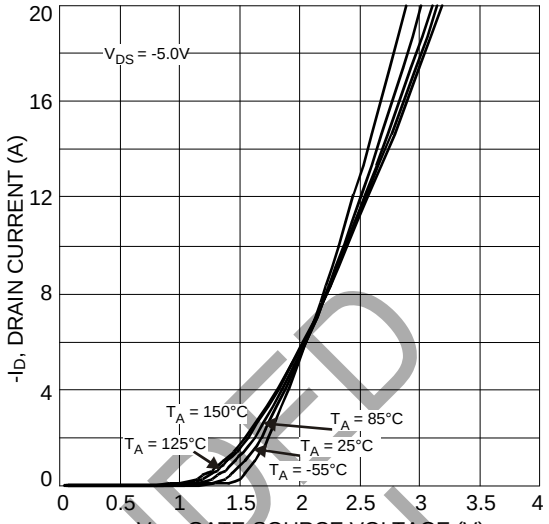



Fig. 2 Typical Transfer Characteristic

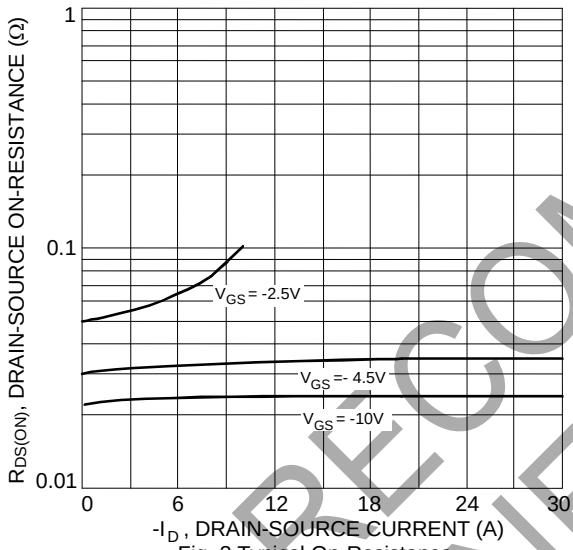



Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

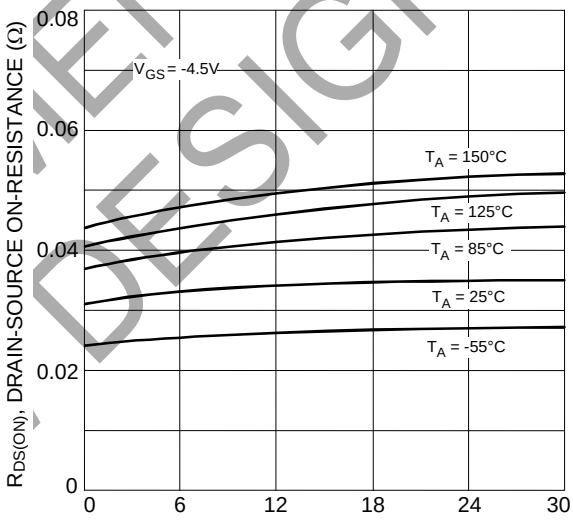



Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

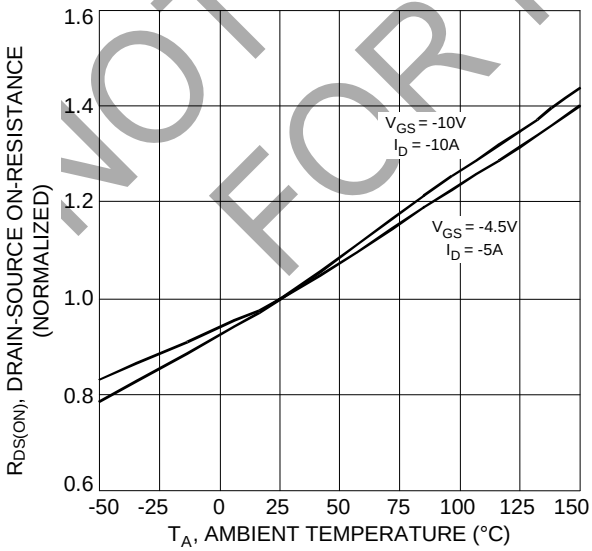



Fig. 5 Normalized On-Resistance vs. Ambient Temperature

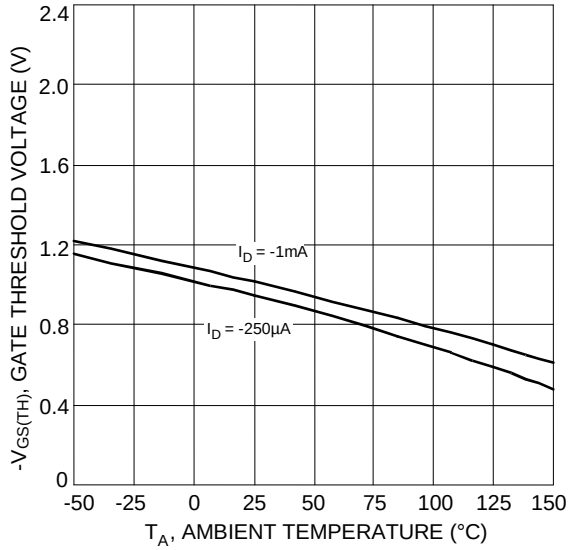



Fig. 6 Gate Threshold Variation vs. Ambient Temperature

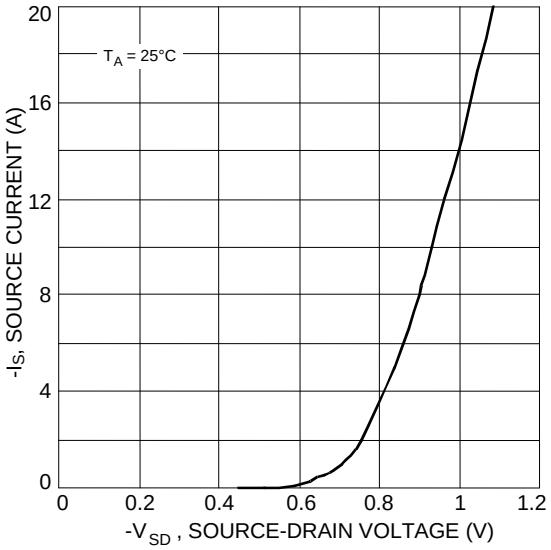



Fig. 7 Diode Forward Voltage vs. Current

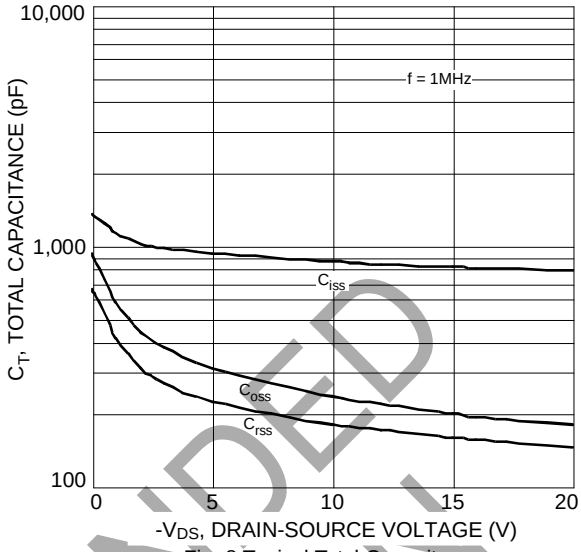



Fig. 8 Typical Total Capacitance

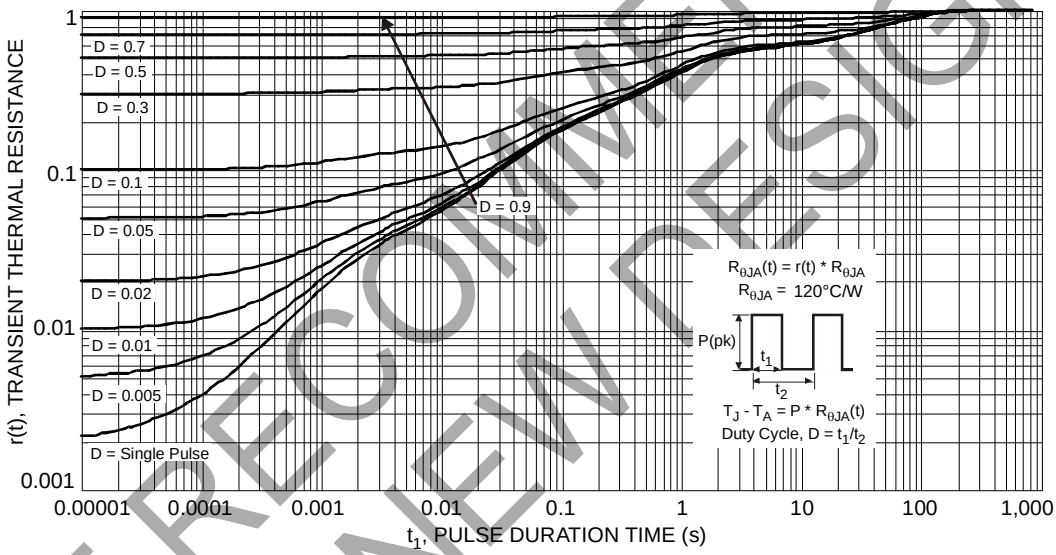
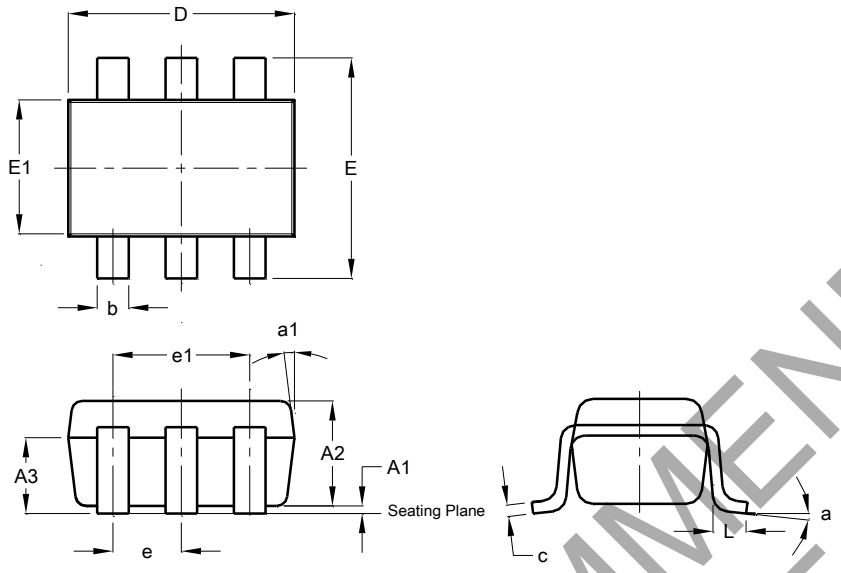



Fig. 9 Transient Thermal Response

## Package Outline Dimensions

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

**SOT26**

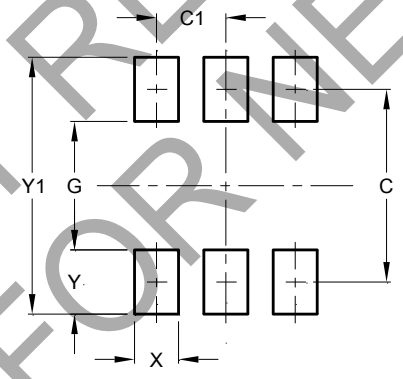



| SOT26 | | | |
|---|---|---|---|
| Dim | Min | Max | Typ |
| A1 | 0.013 | 0.10 | 0.05 |
| A2 | 1.00 | 1.30 | 1.10 |
| A3 | 0.70 | 0.80 | 0.75 |
| b | 0.35 | 0.50 | 0.38 |
| c | 0.10 | 0.20 | 0.15 |
| D | 2.90 | 3.10 | 3.00 |
| e | - | - | 0.95 |
| e1 | - | - | 1.90 |
| E | 2.70 | 3.00 | 2.80 |
| E1 | 1.50 | 1.70 | 1.60 |
| L | 0.35 | 0.55 | 0.40 |
| a | - | - | 8° |
| a1 | - | - | 7° |
| All Dimensions in mm | | | |

## Suggested Pad Layout

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

**SOT26**




| Dimensions | Value (in mm) |
|---|---|
| C | 2.40 |
| C1 | 0.95 |
| G | 1.60 |
| X | 0.55 |
| Y | 0.80 |
| Y1 | 3.20 |

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