



DMP31D7LDWQ

Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _A = +25°C |
|-------------------|-------------------------------|--|
| 001/ | 0.9Ω @V _{GS} = -10V | -0.55A |
| -30V | 1.7Ω @V _{GS} = -4.5V | -0.4A |

Description and Applications

This MOSFET is designed to minimize on-state resistance (RDS(ON)) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Motor controls
- Power management functions
- DC-DC converters

DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The DIODES™ DMP31D7LDWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

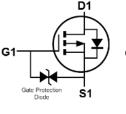
https://www.diodes.com/guality/product-definitions/

Mechanical Data

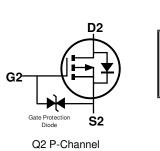
- Package: SOT363
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.027 grams (Approximate)

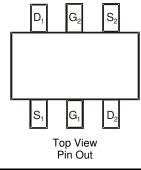


Top View



Q1 P-Channel





Ordering Information (Note 4)

| Part Number | Package | Packing | | |
|----------------|---------|---------|-------------|--|
| Part Number | Раскауе | Qty. | Carrier | |
| DMP31D7LDWQ-7 | SOT363 | 3,000 | Tape & Reel | |
| DMP31D7LDWQ-13 | SOT363 | 10,000 | Tape & Reel | |

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

Notes:

| Date Code Key | | | АN2 ИА | SNA 5MA 5MM | YM Y o | = Date Co r Y or <u>Y</u> = \ | t Type Mai de Marking (ear (ex: J k: 7 = July) | g = 2022) | | | | |
|---------------|------|------|-----------|-------------------|-----------|----------------------------------|---|--------------|------|------|------|-----------|
| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| Code | G | Н | I | J | K | L | М | Ν | 0 | Р | R | S |
| Month | Jan | Feb | Mar | Apr | Мау | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Ν | D |
| DMP31D7LDW | 0 | | | | 1 | of 7 | | | | | | Julv 2022 |

DMP31D7LDWQ Document number: DS42358 Rev. 3 - 2 $\label{eq:solution} \begin{array}{c} July \ 2022 \\ \ensuremath{\textcircled{O}}\ 2022 \ Copyright \ Diodes \ Incorporated. \ All \ Rights \ Reserved. \end{array}$



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

| Characteristic | Symbol | Value | Unit |
|--|------------------|----------------|------|
| Drain-Source Voltage | VDSS | -30 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 6) $V_{GS} = -10V$ | ID | -0.55 -0.44 | А |
| Maximum Continuous Body Diode Forward Current (Note 6) | ls | -0.38 | А |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | Ідм | -2.4 | А |

Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | |
|--|------------------|------------------|------|------|
| Total Power Dissipation (Note 5) | | PD | 0.29 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{ØJA} | 433 | °C/W | |
| Total Power Dissipation (Note 6) | PD | 0.4 | W | |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | R _{ØJA} | 301 | °C/W |
| Operating and Storage Temperature Range | TJ, TSTG | -55 to +150 | °C | |

Electrical Characteristics – P Channel (@TA = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Тур | Max | Unit | Test Condition | | | |
|---|---------------------|-----|------|------|------|---|--|--|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -30 | _ | _ | V | VGS = 0V, ID = -250µA | | | |
| Zero Gate Voltage Drain Current | IDSS | — | — | -1 | μA | $V_{DS} = -24V, V_{GS} = 0V$ | | | |
| Gate-Source Leakage | lgss | _ | _ | ±10 | μA | $V_{GS} = \pm 16V, V_{DS} = 0V$ | | | |
| ON CHARACTERISTICS (Note 7) | | | | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -1 | -2.2 | -2.6 | V | $V_{DS}=V_{GS},\ I_{D}=-250\mu A$ | | | |
| Static Drain-Source On-Resistance | Descent | — | 0.5 | 0.9 | Ω | $V_{GS} = -10V, I_D = -0.42A$ | | | |
| Static Drain-Source On-nesistance | RDS(ON) | — | 0.78 | 1.7 | 12 | $V_{GS} = -4.5V, I_D = -0.2A$ | | | |
| Diode Forward Voltage | Vsd | _ | -0.8 | -1.2 | V | VGS = 0V, IS = -0.23A | | | |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | | | | |
| Input Capacitance | Ciss | — | 19 | — | pF | | | | |
| Output Capacitance | Coss | — | 16 | — | pF | V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz | | | |
| Reverse Transfer Capacitance | Crss | — | 3 | — | pF | | | | |
| Gate Resistance | Rg | — | 729 | — | Ω | $V_{DS} = V_{GS} = 0V$, f = 1.0MHz | | | |
| Total Gate Charge (V _{GS} = -4.5V) | Qg | _ | 0.36 | — | nC | | | | |
| Total Gate Charge (V _{GS} = -10V) | Qg | _ | 0.8 | — | nC | V _{DS} = -10V. In = -0.24A | | | |
| Gate-Source Charge | Qgs | _ | 0.1 | — | nC | $V_{DS} = -10V, ID = -0.24A$ | | | |
| Gate-Drain Charge | Q _{gd} | — | 0.1 | — | nC | | | | |
| Turn-On Delay Time | tD(ON) | _ | 30 | _ | ns | | | | |
| Turn-On Rise Time | tR | _ | 74 | _ | ns | VGS = -10V, VDD = -15V, | | | |
| Turn-Off Delay Time | tD(OFF) | _ | 28 | _ | ns | $I_D = -0.5A, R_G = 1\Omega$ | | | |
| Turn-Off Fall Time | tF | _ | 31 | _ | ns | 7 | | | |

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

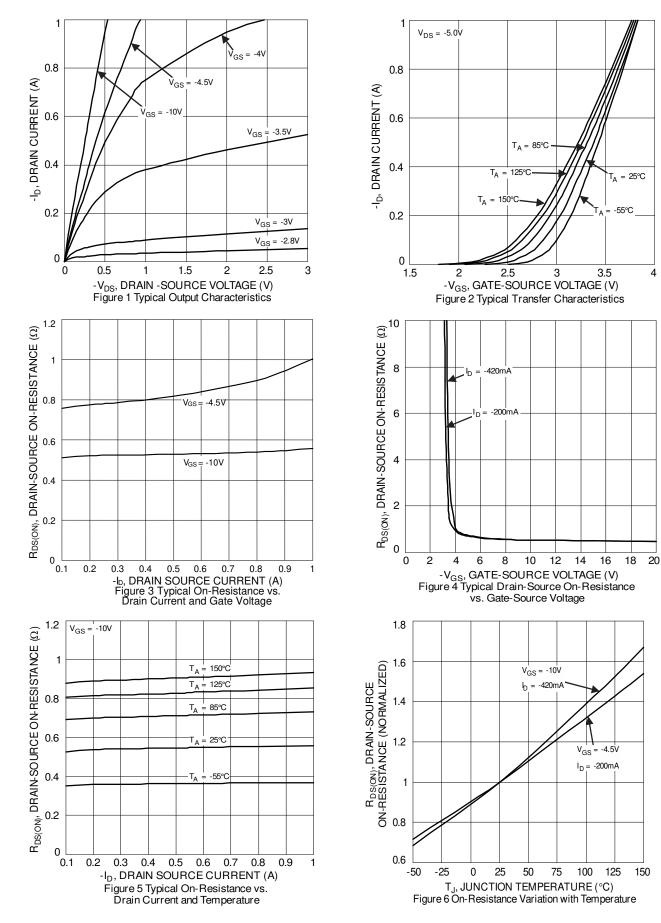
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1in square copper plate.

7. Short duration pulse test used to minimize self-heating effect.

8. Guaranteed by design. Not subject to product testing.

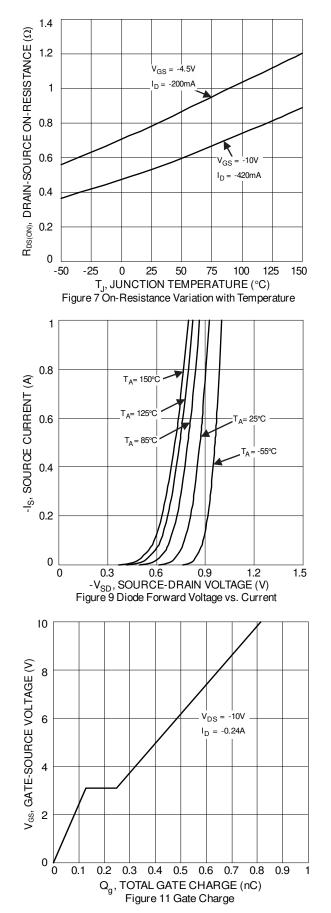


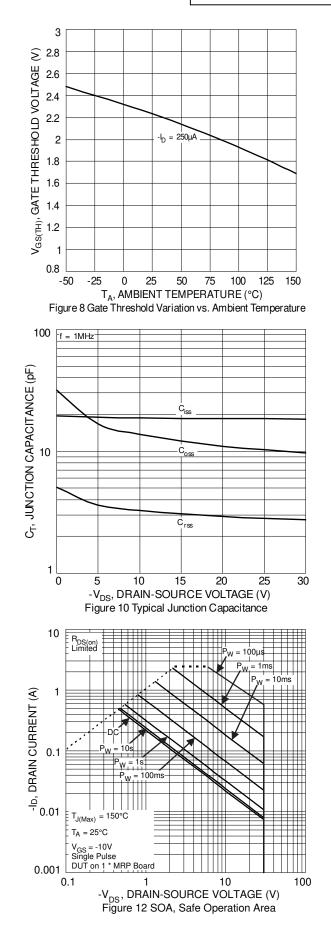
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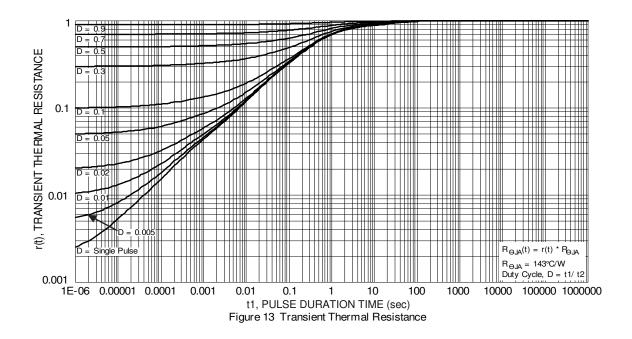






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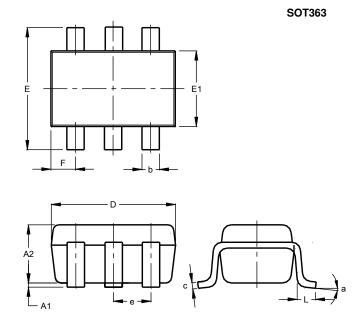






Package Outline Dimensions

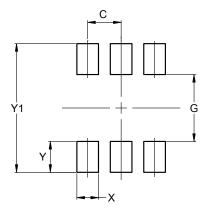
Please see http://www.diodes.com/package-outlines.html for the latest version.



| | SOT363 | | | | | | | | |
|-----|--------|---------|-------|--|--|--|--|--|--|
| Dim | Min | Max | Тур | | | | | | |
| A1 | 0.00 | 0.10 | 0.05 | | | | | | |
| A2 | 0.90 | 1.00 | 0.95 | | | | | | |
| b | 0.10 | 0.30 | 0.25 | | | | | | |
| С | 0.10 | 0.22 | 0.11 | | | | | | |
| D | 1.80 | 2.20 | 2.15 | | | | | | |
| Е | 2.00 | 2.20 | 2.10 | | | | | | |
| E1 | 1.15 | 1.35 | 1.30 | | | | | | |
| е | C |).650 E | SC | | | | | | |
| F | 0.40 | 0.45 | 0.425 | | | | | | |
| L | 0.25 | 0.40 | 0.30 | | | | | | |
| а | 0° | 8° | | | | | | | |
| | Dimen | sions | in mm | | | | | | |

Suggested Pad Layout

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



| Dimensions | Value (in mm) |
|------------|------------------|
| С | 0.650 |
| G | 1.300 |
| X | 0.420 |
| Y | 0.600 |
| Y1 | 2.500 |

SOT363



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