

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ max                | $I_D$<br>$T_A = +25^\circ\text{C}$ |
|---------------|---------------------------------|------------------------------------|
| -30V          | 70mΩ @ $V_{GS} = -10\text{V}$   | -3.8A                              |
|               | 120mΩ @ $V_{GS} = -4.5\text{V}$ | -3.0A                              |

## Description and Applications

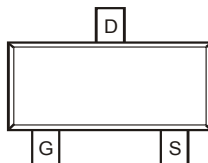
This new generation MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Power Management Functions
- Analog Switch
- Load Switch
- Boost Switch

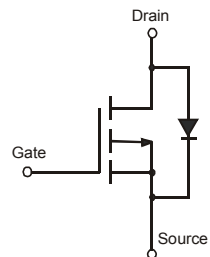
SOT23



Top View



Pin Configuration



Equivalent Circuit

## 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**
- **PPAP Capable (Note 4)**

## Mechanical Data

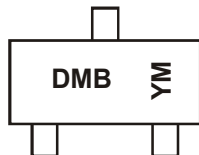
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper Leadframe  
Solderable per MIL-STD-202, Method 208 (63)
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

## Ordering Information (Note 5)

| Part Number | Case  | Packaging         |
|-------------|-------|-------------------|
| DMP3098LQ-7 | SOT23 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DMB = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: A = 2013)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|------|
| Code | Z    | A    | B    | C    | D    | E    | F    | G    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                |                 |                        | Symbol           | Value | Units |
|-----------------------------------------------|-----------------|------------------------|------------------|-------|-------|
| Drain-Source Voltage                          |                 |                        | V <sub>DSS</sub> | -30   | V     |
| Gate-Source Voltage                           |                 |                        | V <sub>GSS</sub> | ±20   | V     |
| Drain Current (Note 6) V <sub>GS</sub> = -10V | Steady<br>State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | -3.8  | A     |
|                                               |                 | T <sub>A</sub> = +70°C |                  | -2.9  |       |
| Pulsed Drain Current (Note 7)                 |                 |                        | I <sub>DM</sub>  | -11   | A     |

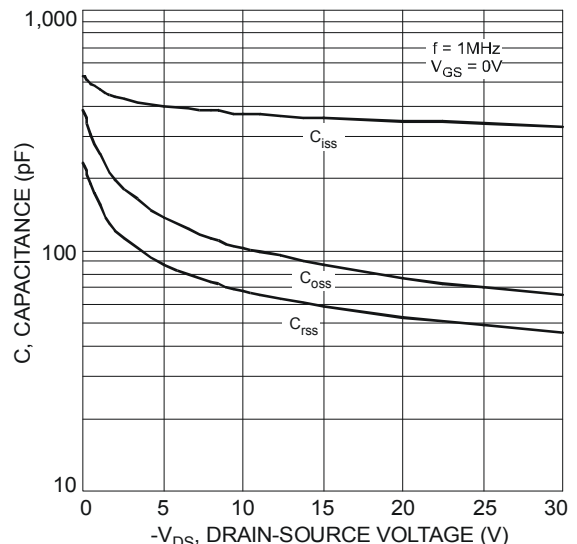
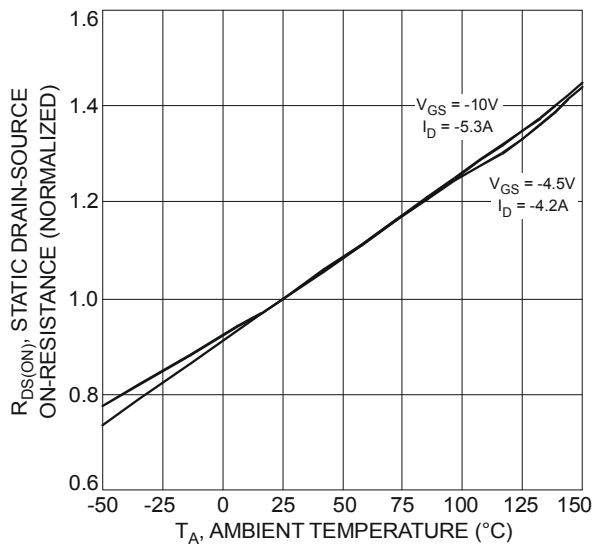
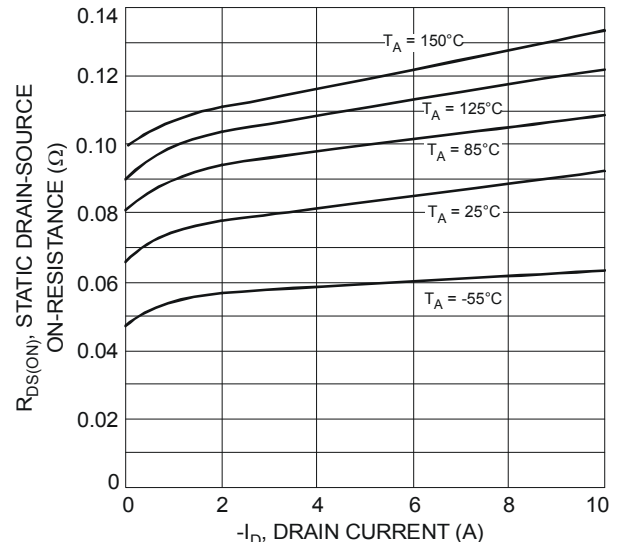
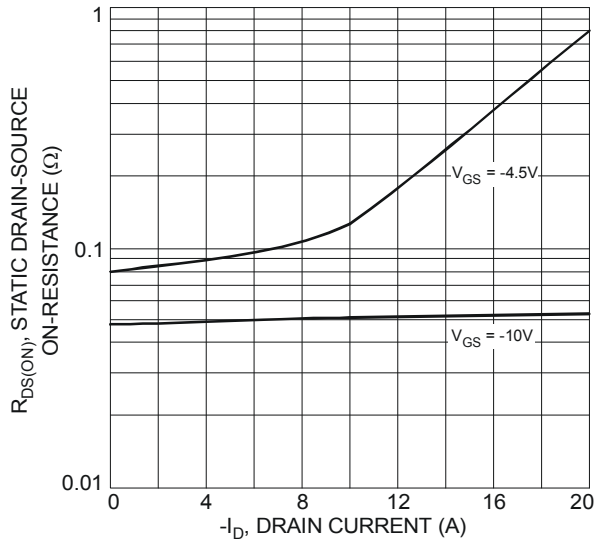
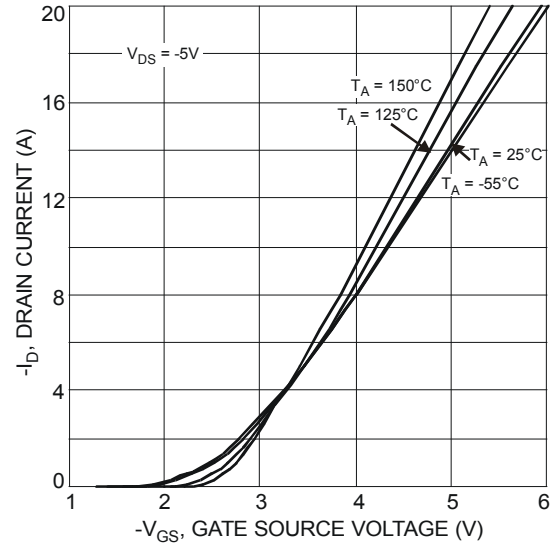
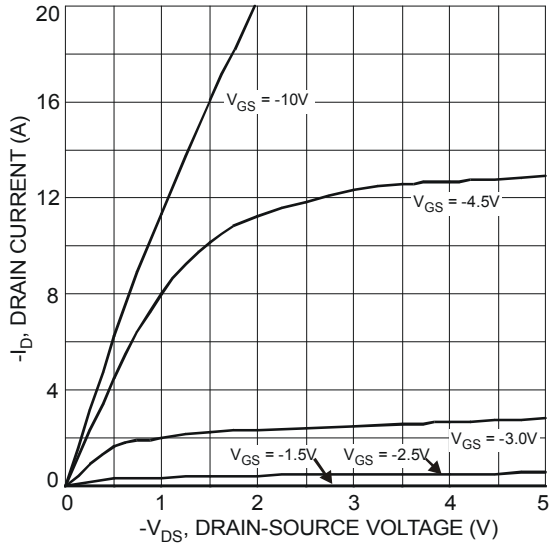
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                           | Symbol                            | Value       | Units |
|--------------------------------------------------------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 6)                                         | P <sub>D</sub>                    | 1.08        | W     |
| Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 6) | R <sub>θJA</sub>                  | 115         | °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 8)</b>       |                     |      |      |       |      |                                                                                             |
| Drain-Source Breakdown Voltage            | BV <sub>DSS</sub>   | -30  | —    | —     | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                               |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | —    | —    | -800  | nA   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V                                                |
| Gate-Source Leakage                       | I <sub>GSS</sub>    | —    | —    | ±100  | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                |
| <b>ON CHARACTERISTICS (Note 8)</b>        |                     |      |      |       |      |                                                                                             |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub> | -1.0 | -1.8 | -2.1  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                 |
| Static Drain-Source On-Resistance         | R <sub>DS(on)</sub> | —    | 56   | 70    | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -3.8A                                              |
|                                           |                     |      | 98   | 120   |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.0A                                             |
| Forward Transfer Admittance               | Y <sub>fs</sub>     | —    | 3.6  | —     | S    | V <sub>DS</sub> = -5V, I <sub>D</sub> = -2.7A                                               |
| Diode Forward Voltage (Note 7)            | V <sub>SD</sub>     | —    | —    | -1.26 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.7A                                                |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>   |                     |      |      |       |      |                                                                                             |
| Input Capacitance                         | C <sub>iss</sub>    | —    | 336  | 1008  | pF   | V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V, f = 1.0MHz                                    |
| Output Capacitance                        | C <sub>oss</sub>    | —    | 70   | 210   | pF   |                                                                                             |
| Reverse Transfer Capacitance              | C <sub>rss</sub>    | —    | 49   | 147   | pF   |                                                                                             |
| Gate Resistance                           | R <sub>G</sub>      | —    | 4.6  | —     | Ω    | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz                                        |
| <b>SWITCHING CHARACTERISTICS (Note 9)</b> |                     |      |      |       |      |                                                                                             |
| Total Gate Charge                         | Q <sub>g</sub>      | —    | 4.0  | 8.0   | nC   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.8A                     |
|                                           |                     | —    | 7.8  | —     |      | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -3.8A                      |
| Gate-Source Charge                        | Q <sub>gs</sub>     | —    | 1.0  | —     |      |                                                                                             |
| Gate-Drain Charge                         | Q <sub>gd</sub>     | —    | 2.5  | —     | ns   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω |
| Turn-On Delay Time                        | t <sub>d(on)</sub>  | —    | 6.0  | 12.0  |      |                                                                                             |
| Rise Time                                 | t <sub>r</sub>      | —    | 5.0  | 10.0  |      |                                                                                             |
| Turn-Off Delay Time                       | t <sub>d(off)</sub> | —    | 17.6 | 35.2  |      |                                                                                             |
| Fall Time                                 | t <sub>f</sub>      | —    | 9.5  | 19.0  |      |                                                                                             |

Notes: 6. Device mounted on FR-4 PCB on 2 oz., 0.5 in.<sup>2</sup> copper pads and t ≤ 5 sec.  
7. Pulse width ≤ 10μs, Duty Cycle ≤ 1%.  
8. Short duration pulse test used to minimize self-heating effect.  
9. Guaranteed by design. Not subject to production testing.



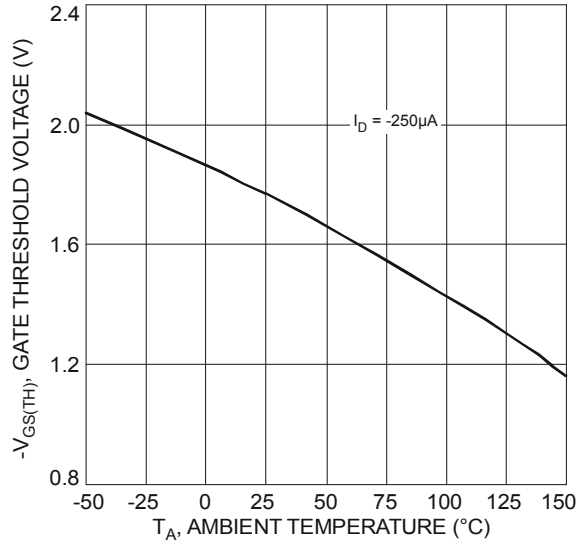


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

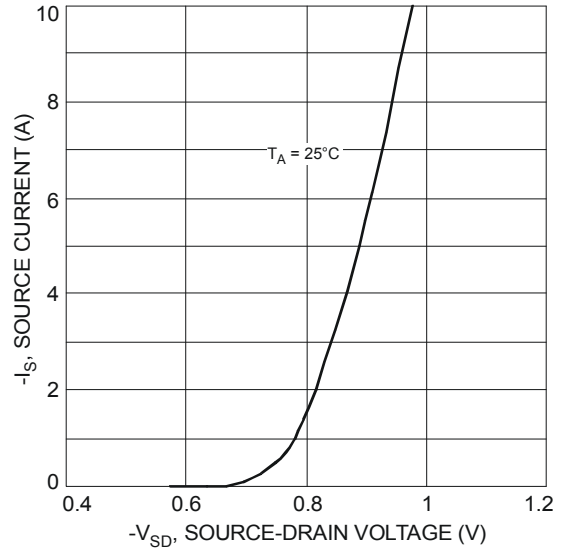


Fig. 8 Diode Forward Voltage vs. Current

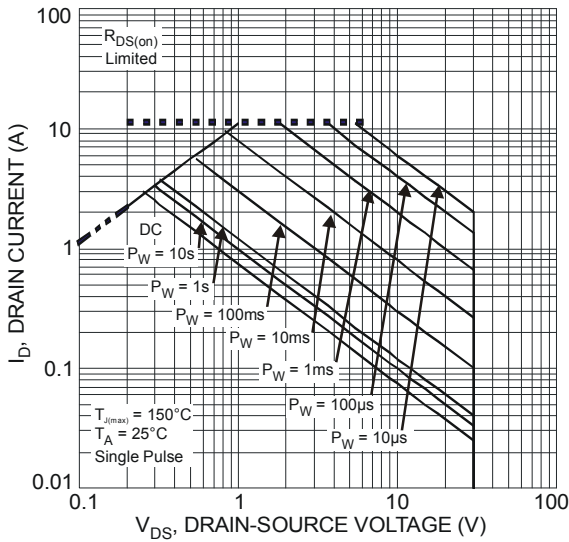
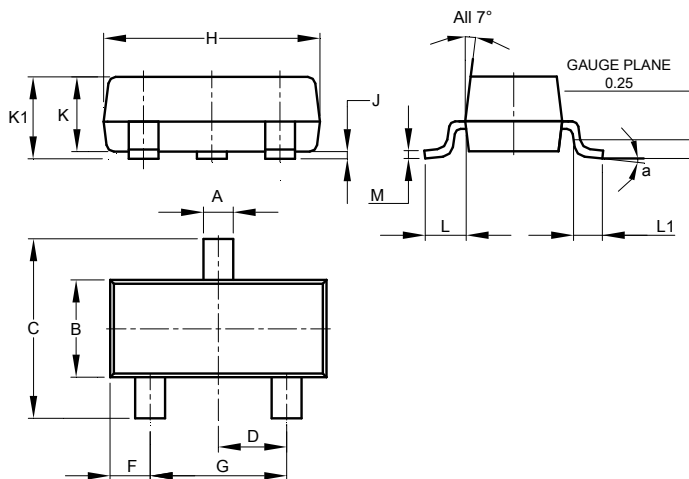


Fig. 9 Safe Operation Area

## Package Outline Dimensions

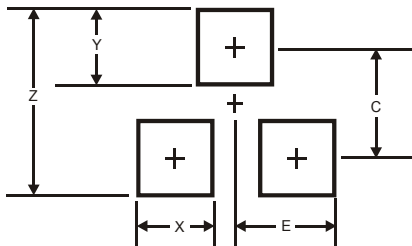
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| α                    | 8°    |       |       |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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