

## Features

- Low On-Resistance
- Very Low Gate Threshold Voltage  $V_{GS(th)} < 1V$
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected Gate**
- **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: SOT323
- 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 Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208 Ⓔ3
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)

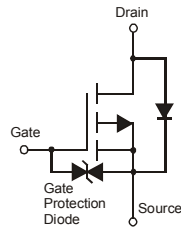


ESD PROTECTED

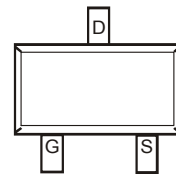
SOT323



Top View



Equivalent Circuit



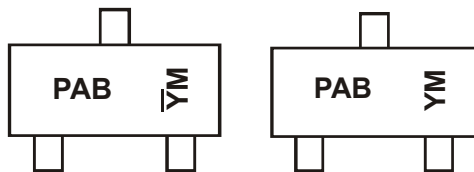
Top View

## Ordering Information (Note 4)

| Part Number | Case   | Packaging        |
|-------------|--------|------------------|
| DMP2004WK-7 | SOT323 | 3000/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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



Chengdu A/T Site

Shanghai A/T Site

PAB = Product Type Marking Code  
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 $\overline{Y}M$  = Date Code Marking for CAT (Chengdu Assembly/ Test site)  
 Y or  $\overline{Y}$  = Year (ex: A = 2013)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | U    | V    | W    | X    | Y    | Z    | A    | B    | C    | D    | E    |

| 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> | -20   | V     |
| Gate-Source Voltage    | V <sub>GSS</sub> | ±8    | V     |
| Drain Current (Note 5) | I <sub>D</sub>   | -400  | mA    |
| Pulsed Drain Current   | I <sub>DM</sub>  | -1.4  | A     |

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

| Characteristic                                   | Symbol                            | Value       | Units |
|--|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5)                 | P <sub>d</sub>                    | 250         | mW    |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 500         | °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>    | —    | —   | -1.0 | μA   | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V                |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | —    | —   | ±1.0 | μA   | V <sub>GS</sub> = ±4.5V, V <sub>DS</sub> = 0V               |
| <b>ON CHARACTERISTICS (Note 6)</b>      |                     |      |     |      |      |   |
| Gate Threshold Voltage                  | V <sub>GS(th)</sub> | -0.5 | —   | -1.0 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA |
| Static Drain-Source On-Resistance       | R <sub>DS(ON)</sub> | —    | 0.7 | 0.9  | Ω    | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -430mA            |
|   |                     |      | 1.1 | 1.4  |      | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -300mA            |
|   |                     |      | 1.7 | 2.0  |      | V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -150mA            |
| Forward Transfer Admittance             | Y <sub>fs</sub>     | 200  | —   | —    | mS   | V <sub>DS</sub> = 10V, I <sub>D</sub> = -0.2A               |
| Diode Forward Voltage (Note 6)          | V <sub>SD</sub>     | -0.5 | —   | -1.2 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -115mA               |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b> |                     |      |     |      |      |   |
| Input Capacitance                       | C <sub>iss</sub>    | —    | —   | 175  | pF   | V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V<br>f = 1.0MHz  |
| Output Capacitance                      | C <sub>oss</sub>    | —    | —   | 30   | pF   |   |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    | —    | —   | 20   | pF   |   |

- Notes:
5. Device mounted on FR-4 PCB.
  6. Short duration pulse test used to minimize self-heating effect.
  7. Guaranteed by design. Not subject to production testing.

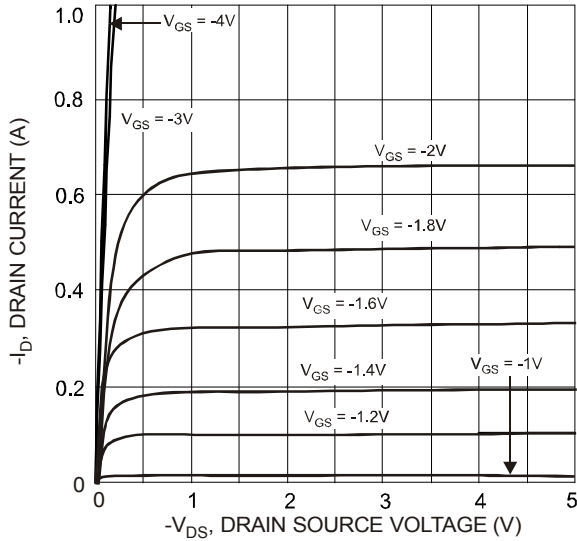


Fig. 1 Typical Output Characteristics

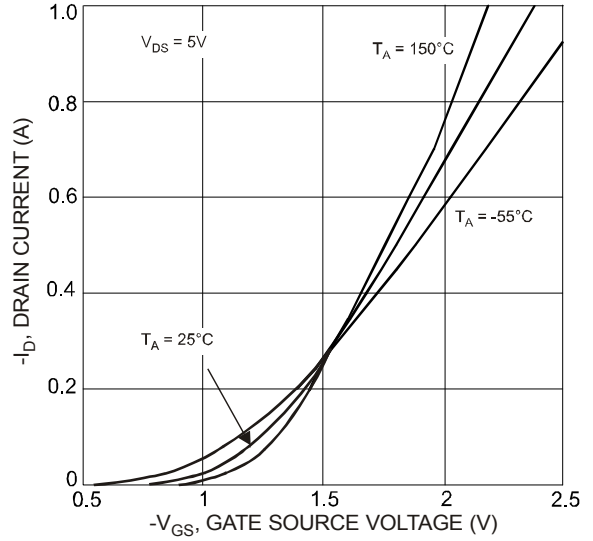


Fig. 2 Typical Transfer Characteristics

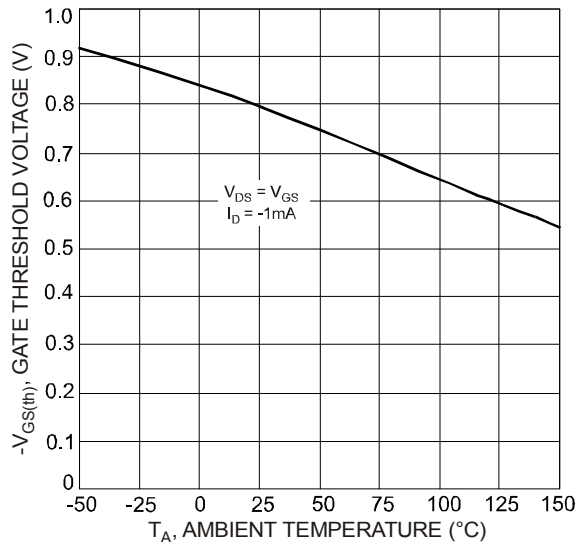


Fig. 3 Gate Threshold Voltage vs. Ambient Temperature

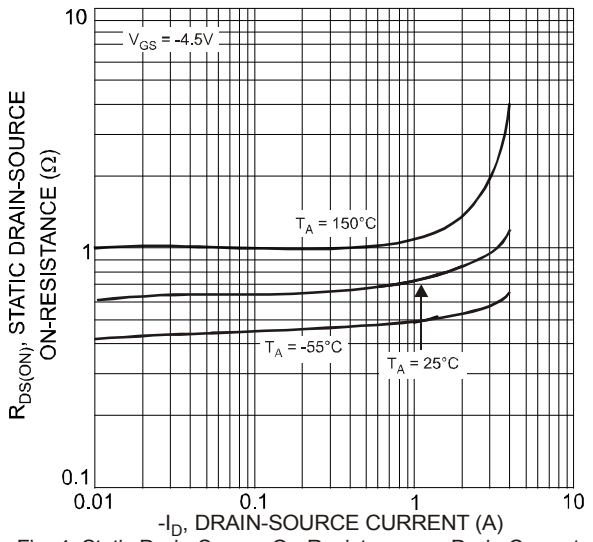


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

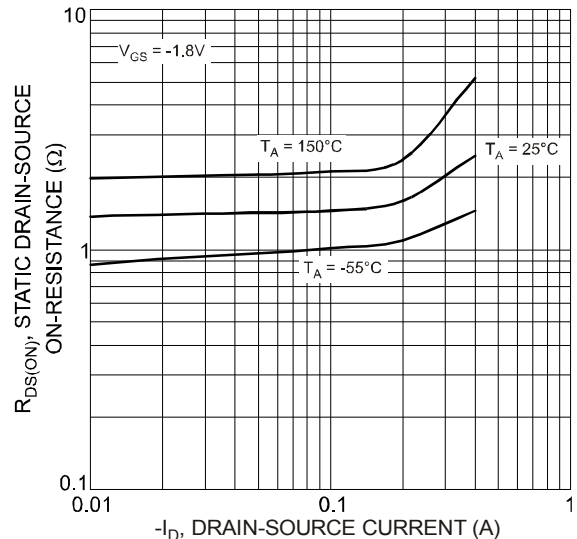


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

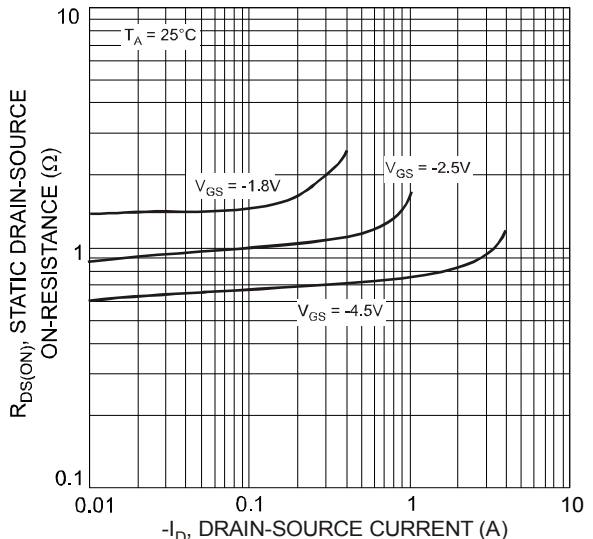


Fig. 6 Static Drain-Source On-Resistance vs. Drain-Source Current vs. Gate Source Voltage

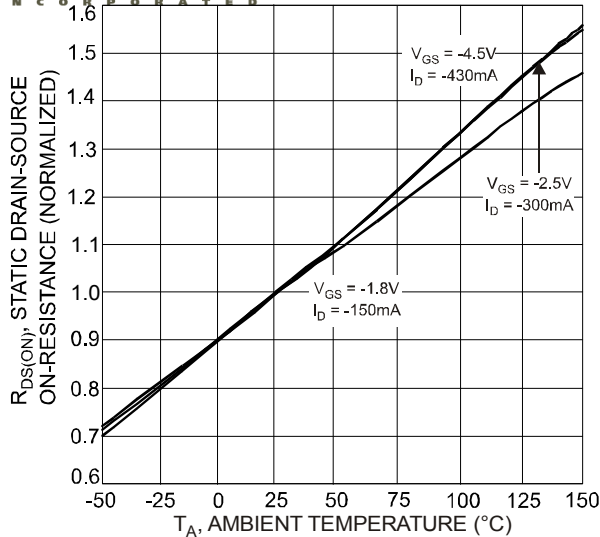


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

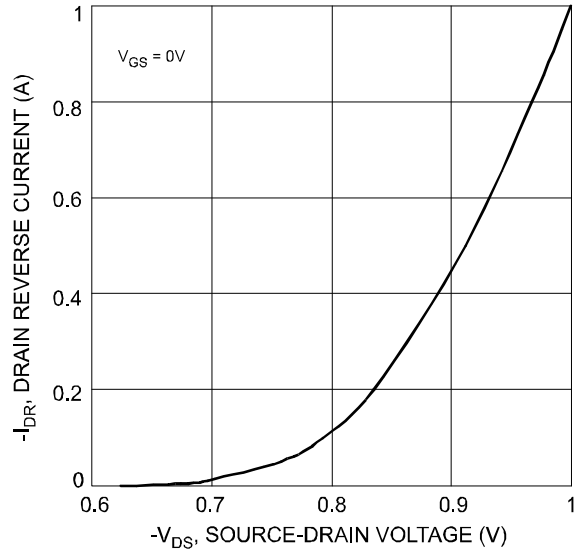


Fig. 8 Drain Reverse Current vs. Source-Drain Voltage

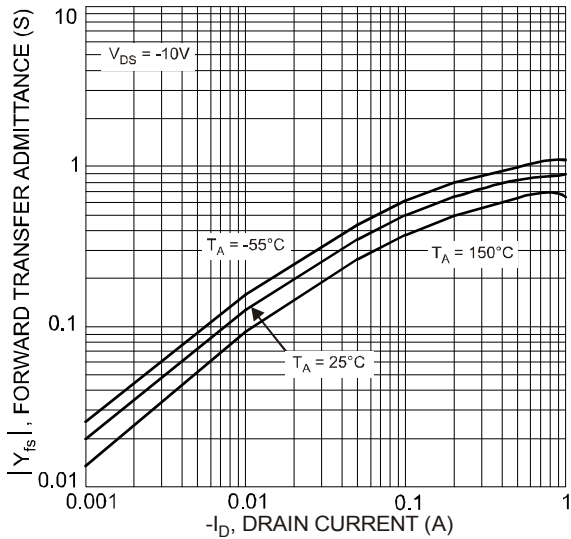


Fig. 9 Forward Transfer Admittance vs. Drain Current

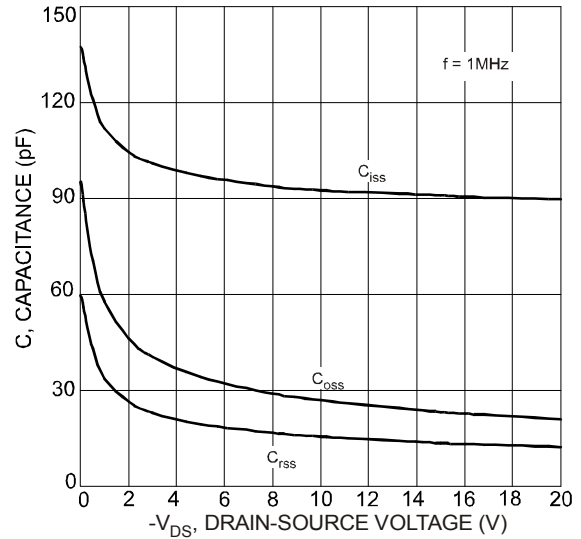
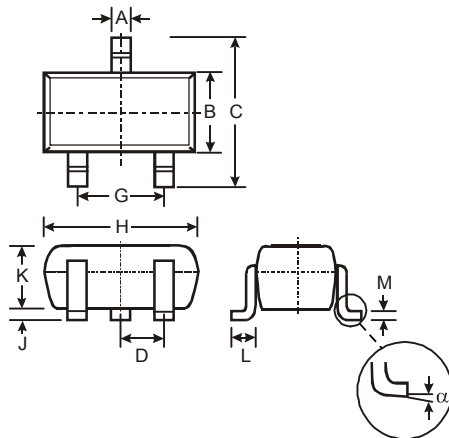


Fig. 10 Typical Capacitance

**Package Outline Dimensions**

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

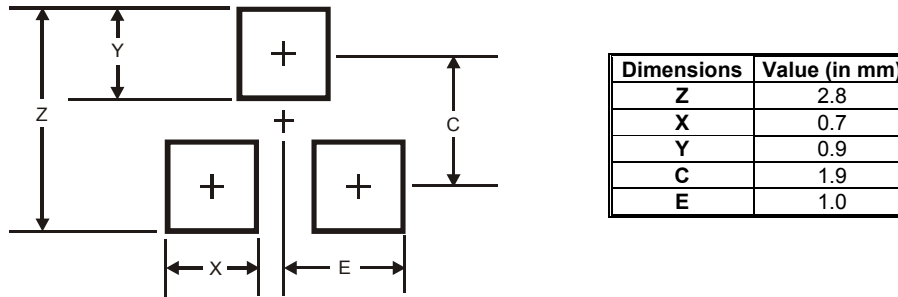


| SOT323 |      |      |      |
|--------|------|------|------|
| Dim    | Min  | Max  | Typ  |
| A      | 0.25 | 0.40 | 0.30 |
| B      | 1.15 | 1.35 | 1.30 |
| C      | 2.00 | 2.20 | 2.10 |
| D      | -    | -    | 0.65 |
| G      | 1.20 | 1.40 | 1.30 |
| H      | 1.80 | 2.20 | 2.15 |
| J      | 0.0  | 0.10 | 0.05 |
| K      | 0.90 | 1.00 | 0.95 |
| L      | 0.25 | 0.40 | 0.30 |
| M      | 0.10 | 0.18 | 0.11 |
| α      | 0°   | 8°   | -    |

**All Dimensions in mm**

## Suggested Pad Layout

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



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