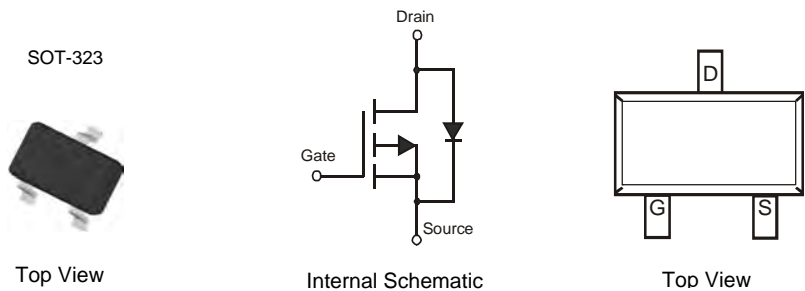


### Features

- P-Channel MOSFET
- Low On-Resistance
  - 150 mΩ @  $V_{GS} = -4.5V$
  - 200 mΩ @  $V_{GS} = -2.5V$
  - 240 mΩ @  $V_{GS} = -1.8V$
- Very Low Gate Threshold Voltage  $V_{GS(th)} \leq 1V$
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3)**
- **Qualified to AEC-Q101 standards for High Reliability**

### Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish — Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



### Maximum Ratings @ $T_A = 25^\circ C$ unless otherwise specified

| Characteristic         | Symbol    | Value              | Units |   |
|------------------------|-----------|--------------------|-------|---|
| Drain-Source Voltage   | $V_{DSS}$ | -20                | V     |   |
| Gate-Source Voltage    | $V_{GSS}$ | $\pm 12$           | V     |   |
| Drain Current (Note 1) |           | $T_A = 25^\circ C$ | -1.5  | A |
|                        |           | $T_A = 70^\circ C$ | -1.0  | A |
| Pulsed Drain Current   | $I_{DM}$  | -5                 | A     |   |

### Thermal Characteristics

| Characteristic                          | Symbol          | Value       | Units        |
|---|-----------------|-------------|--------------|
| Total Power Dissipation (Note 1)        | $P_D$           | 250         | mW           |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 500         | $^\circ C/W$ |
| Operating and Storage Temperature Range | $T_J, T_{STG}$  | -55 to +150 | $^\circ C$   |

- Notes:
1. Device mounted on FR-4 substrate PC board, 2oz. Copper, with minimum recommended pad layout.
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                      | Symbol              | Min   | Typ  | Max          | Unit | Test Condition  |
|-------------------------------------|---------------------|-------|------|--------------|------|---|
| <b>OFF CHARACTERISTICS (Note 4)</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<br>-5.0 | μA   | T <sub>J</sub> = 25°C<br>T <sub>J</sub> = 125°C<br>V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V   |
| Gate-Source Leakage                 | I <sub>GSS</sub>    | —     | —    | ±100         | nA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 4)</b>  |                     |       |      |              |      |   |
| Gate Threshold Voltage              | V <sub>GS(th)</sub> | -0.45 | —    | -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> | —     | 92   | 150          | mΩ   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.0A<br>V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -1.5A<br>V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -0.5A |
|                                     |                     |       | 134  | 200          |      |   |
|                                     |                     |       | 180  | 240          |      |   |
| Forward Transconductance            | g <sub>FS</sub>     | —     | 3.1  | —            | S    | V <sub>DS</sub> = -10V, I <sub>D</sub> = -810mA   |
| Diode Forward Voltage (Note 4)      | V <sub>SD</sub>     | —     | —    | -0.9         | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.5A  |
| <b>DYNAMIC CHARACTERISTICS</b>      |                     |       |      |              |      |   |
| Input Capacitance                   | C <sub>iss</sub>    | —     | 320  | —            | pF   | V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V<br>f = 1.0MHz  |
| Output Capacitance                  | C <sub>oss</sub>    | —     | 80   | —            | pF   |   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>    | —     | 60   | —            | pF   |   |
| Turn-On Delay Time                  | t <sub>D(on)</sub>  | —     | 12.5 | —            | ns   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V,<br>R <sub>L</sub> = 10Ω, R <sub>G</sub> = 1.0Ω   |
| Turn-On Rise Time                   | t <sub>r</sub>      | —     | 10.3 | —            | ns   |   |
| Turn-Off Delay Time                 | t <sub>D(off)</sub> | —     | 46.5 | —            | ns   |   |
| Turn-Off Fall Time                  | t <sub>f</sub>      | —     | 22.2 | —            | ns   |   |

Notes: 4. Short duration pulse test used to minimize self-heating effect.

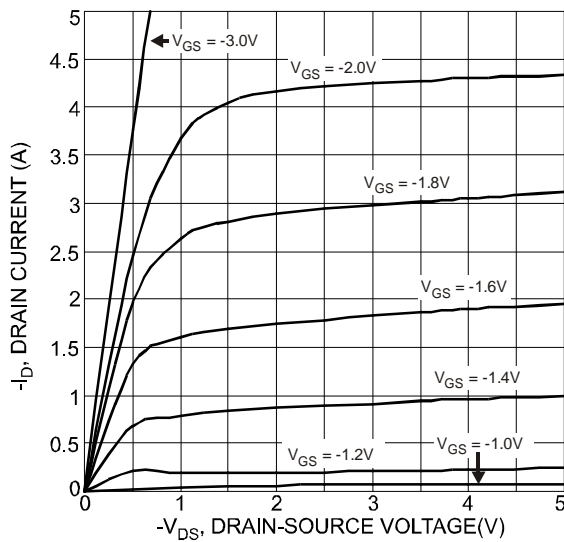


Fig. 1 Typical Output Characteristics

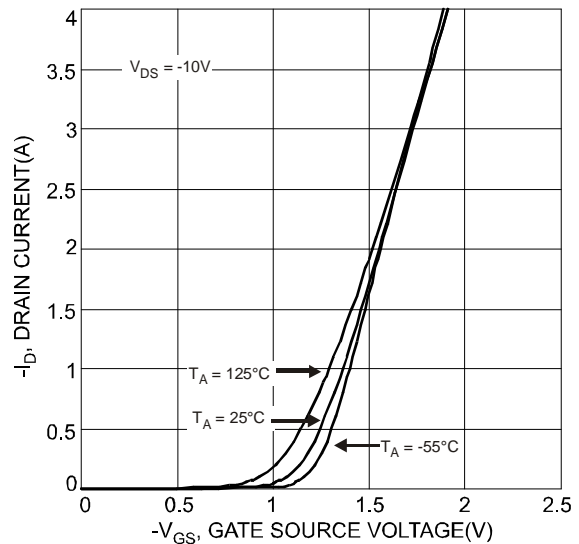


Fig. 2 Typical Transfer Characteristics

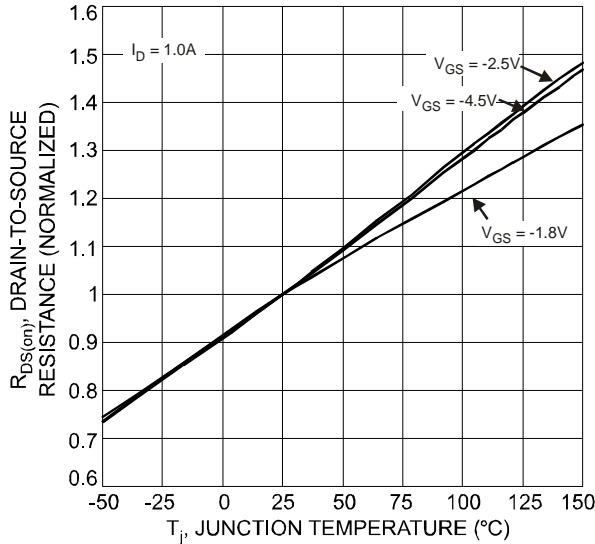


Fig. 3 On-Resistance Variation with Temperature

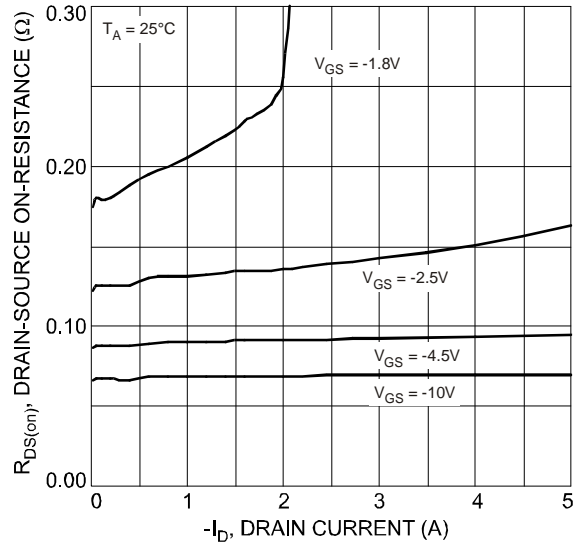


Fig. 4 On-Resistance vs Drain Current and Gate Voltage

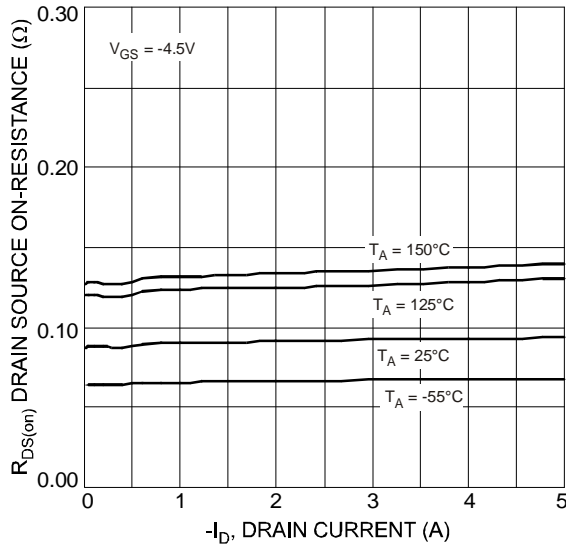


Fig. 5 Drain-Source On-Resistance Vs. Drain Current and Temperature

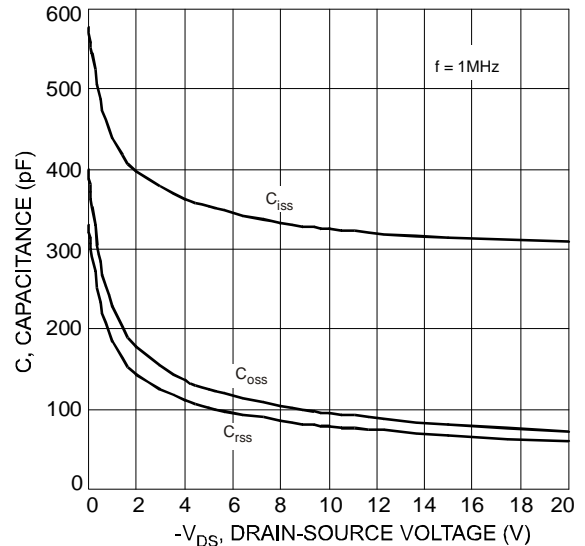


Fig. 6: Typical Capacitance

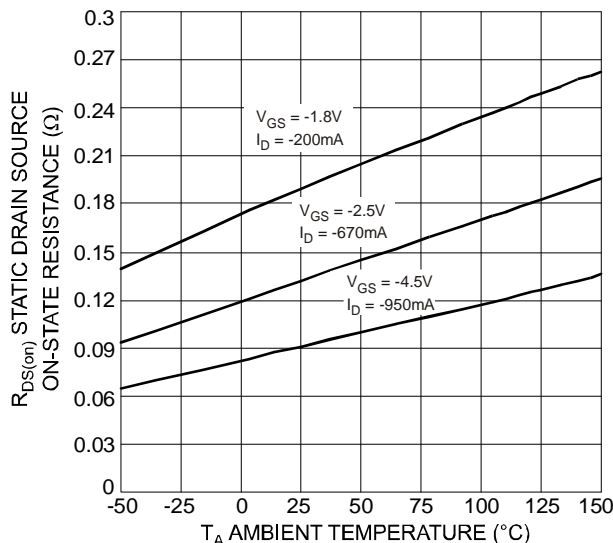


Fig. 7 Static Drain-Source On-State Resistance vs Ambient Temperature

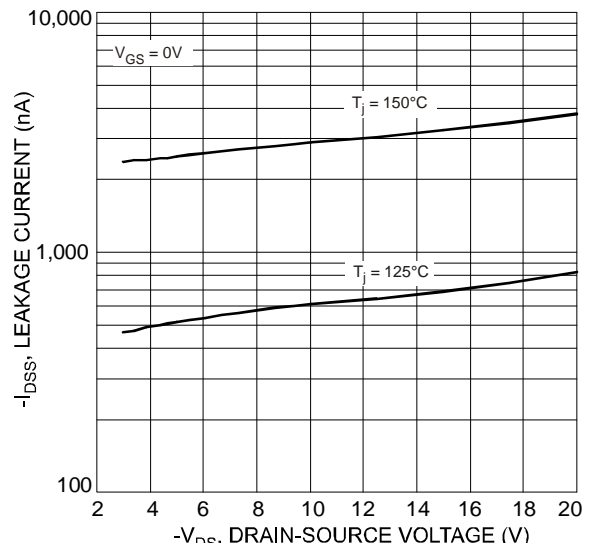


Fig. 8 Drain-Source Leakage Current vs Voltage

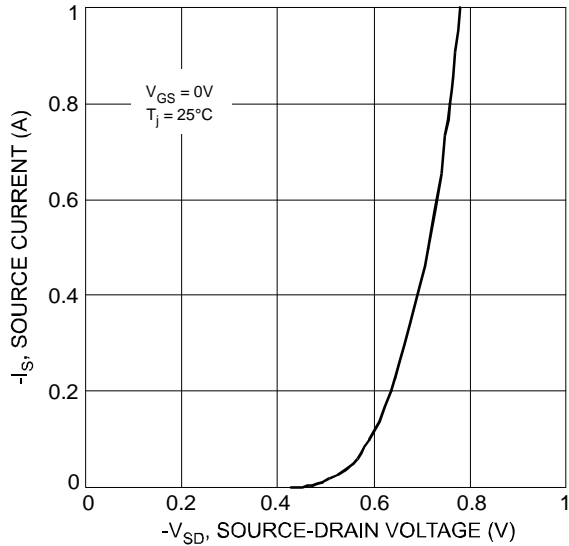


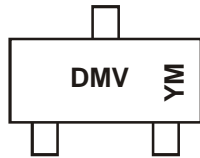
Fig. 9 Diode Forward Voltage vs. Current

**Ordering Information** (Note 5)

| Part Number | Case    | Packaging        |
|-------------|---------|------------------|
| DMP2240UW-7 | SOT-323 | 3000/Tape & Reel |

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



DMV = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: V = 2008)  
 M = Month (ex: 9 = September)

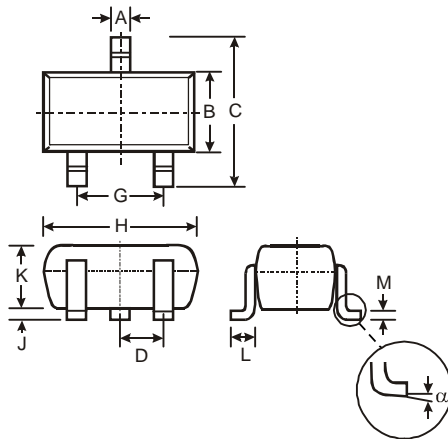
Date Code Key

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|
| Code | V    | W    | X    | Y    | Z    | A    | B    | C    |

| 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   |

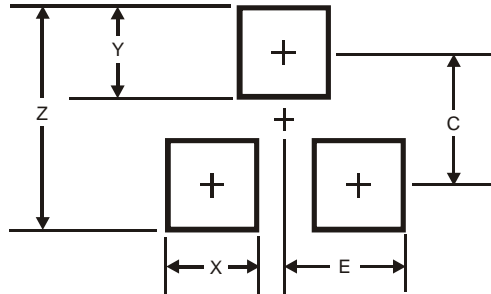
**Package Outline Dimensions**



| SOT-323 |      |      |      |
|---------|------|------|------|
| 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 | 1.00 |
| L       | 0.25 | 0.40 | 0.30 |
| M       | 0.10 | 0.18 | 0.11 |
| α       | 0°   | 8°   | -    |

All Dimensions in mm

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.8           |
| X          | 0.7           |
| Y          | 0.9           |
| C          | 1.9           |
| E          | 1.0           |

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