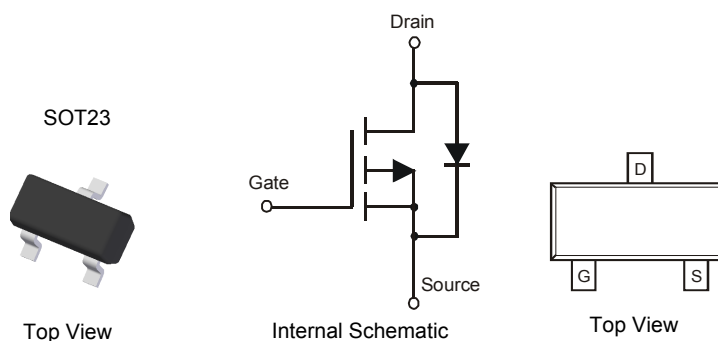


## Features

- Low  $R_{DS(ON)}$ :
  - 75 m $\Omega$  @  $V_{GS} = -4.5V$
  - 110 m $\Omega$  @  $V_{GS} = -2.7V$
  - 125 m $\Omega$  @  $V_{GS} = -2.5V$
- 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**

## Mechanical Data

- Case: SOT23
- Case Material - Molded Plastic, "Green" Molding Compound.  
UL Flammability 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 
- Terminal Connections: See Diagram Below
- Weight: 0.008 grams (approximate)

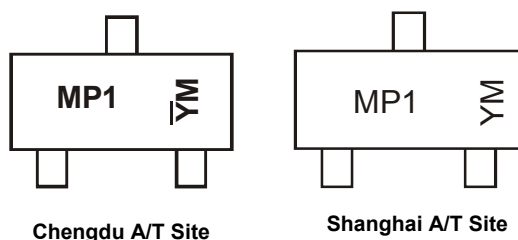


## Ordering Information (Note 4)

| Part Number | Case  | Packaging        |
|-------------|-------|------------------|
| DMP2130L-7  | SOT23 | 3000/Tape & Reel |

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



MP1 = Product Type Marking Code  
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)  
 Y or 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                          | Unit |
|----------------------------------------|------------------|--------------------------------|------|
| Drain-Source Voltage                   | V <sub>DSS</sub> | -20                            | V    |
| Gate-Source Voltage                    | V <sub>GSS</sub> | ±12                            | V    |
| Drain Current (Note 5) Continuous      | I <sub>D</sub>   | T <sub>A</sub> = +25°C<br>-3.0 | A    |
|                                        |                  | T <sub>A</sub> = +70°C<br>-2.4 |      |
| Pulsed Drain Current (Note 6)          | I <sub>DM</sub>  | -15                            | A    |
| Body-Diode Continuous Current (Note 5) | I <sub>S</sub>   | 2.0                            | A    |

**Thermal Characteristics**

| Characteristic                                                 | Symbol                            | Value       | Unit |
|----------------------------------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                               | P <sub>D</sub>                    | 1.4         | W    |
| Thermal Resistance, Junction to Ambient (Note 5); Steady-State | R <sub>θJA</sub>                  | 90          | °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>STATIC PARAMETERS</b>                       |                     |      |                |                  |      |                                                                                                                                                       |
| Drain-Source Breakdown Voltage                 | BV <sub>DSS</sub>   | -20  | —              | —                | V    | I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V                                                                                                         |
| Zero Gate Voltage Drain Current                | I <sub>DSS</sub>    | —    | —              | -1               | μA   | T <sub>J</sub> = 25°C, V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V                                                                                   |
| Gate-Body Leakage Current                      | I <sub>GSS</sub>    | —    | —              | ±100             | nA   | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±12V                                                                                                          |
| Gate Threshold Voltage                         | V <sub>GS(th)</sub> | -0.6 | —              | -1.25            | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                                                                           |
| On State Drain Current (Note 7)                | I <sub>D(ON)</sub>  | -15  | —              | —                | A    | V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -5V                                                                                                        |
| Static Drain-Source On-Resistance (Note 7)     | R <sub>DS(ON)</sub> | —    | 51<br>87<br>99 | 75<br>110<br>125 | mΩ   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.5A<br>V <sub>GS</sub> = -2.7V, I <sub>D</sub> = -3.0A<br>V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.6A |
| Forward Transconductance (Note 7)              | g <sub>FS</sub>     | —    | 7.3            | —                | S    | V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A                                                                                                        |
| Diode Forward Voltage (Note 7)                 | V <sub>SD</sub>     | —    | 0.79           | -1.26            | V    | I <sub>S</sub> = -1.7A, V <sub>GS</sub> = 0V                                                                                                          |
| Maximum Body-Diode Continuous Current (Note 5) | I <sub>S</sub>      | —    | —              | 1.7              | A    | —                                                                                                                                                     |
| <b>DYNAMIC PARAMETERS (Note 8)</b>             |                     |      |                |                  |      |                                                                                                                                                       |
| Total Gate Charge                              | Q <sub>g</sub>      | —    | 7.3            | —                | nC   | V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A                                                                               |
| Gate-Source Charge                             | Q <sub>gs</sub>     | —    | 2.0            | —                | nC   | V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A                                                                               |
| Gate-Drain Charge                              | Q <sub>gd</sub>     | —    | 1.9            | —                | nC   | V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A                                                                               |
| Turn-On Delay Time                             | t <sub>D(on)</sub>  | —    | 12             | —                | ns   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V,<br>R <sub>L</sub> = 10Ω, R <sub>G</sub> = 6Ω                                                         |
| Turn-On Rise Time                              | t <sub>r</sub>      | —    | 20             | —                | ns   |                                                                                                                                                       |
| Turn-Off Delay Time                            | t <sub>D(off)</sub> | —    | 38             | —                | ns   |                                                                                                                                                       |
| Turn-Off Fall Time                             | t <sub>f</sub>      | —    | 41             | —                | ns   |                                                                                                                                                       |
| Input Capacitance                              | C <sub>iss</sub>    | —    | 443            | —                | pF   | V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                                                            |
| Output Capacitance                             | C <sub>oss</sub>    | —    | 128            | —                | pF   |                                                                                                                                                       |
| Reverse Transfer Capacitance                   | C <sub>rss</sub>    | —    | 101            | —                | pF   |                                                                                                                                                       |

- Notes:
5. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width t ≤ 10s.
  6. Repetitive Rating, pulse width limited by junction temperature.
  7. Test pulse width t = 300μs.
  8. Guaranteed by design. Not subject to production testing.

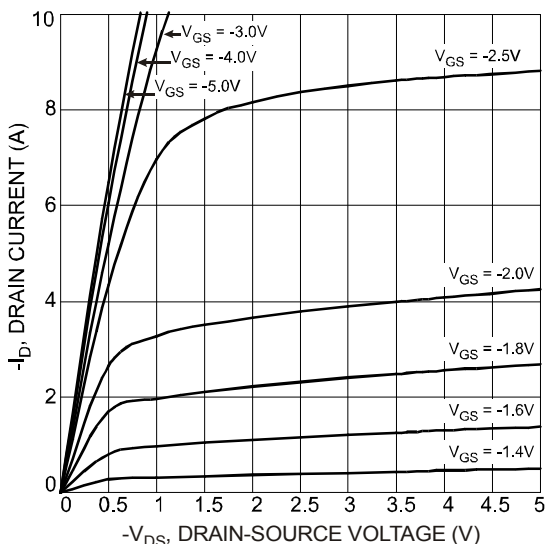


Fig. 1 Typical Output Characteristics

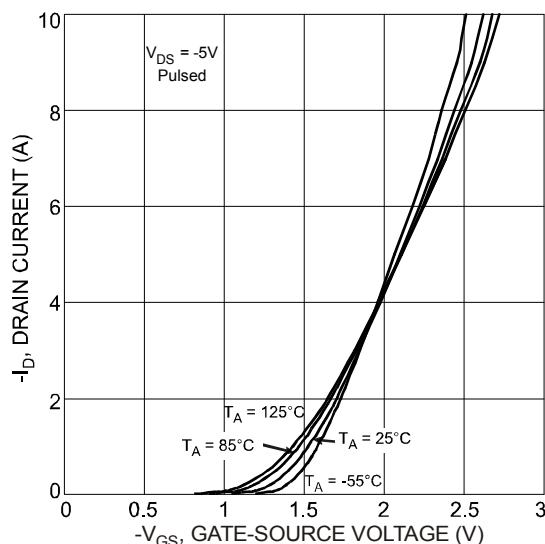


Fig. 2 Typical Transfer Characteristics

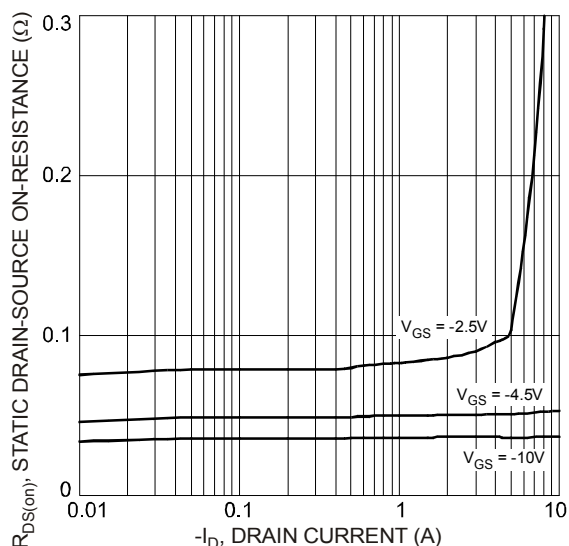


Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

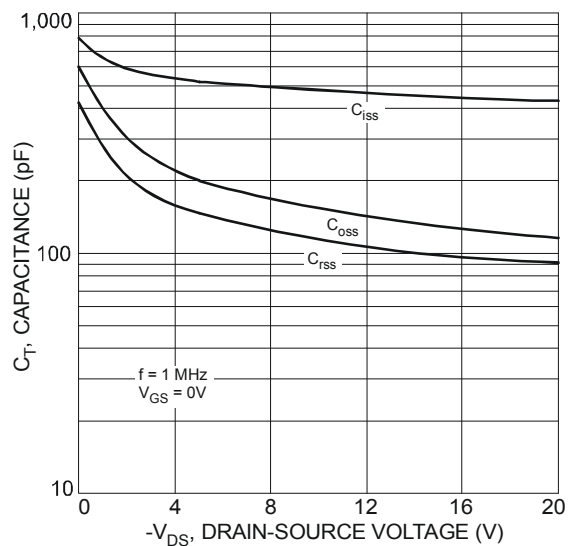


Fig. 4 Typical Total Capacitance

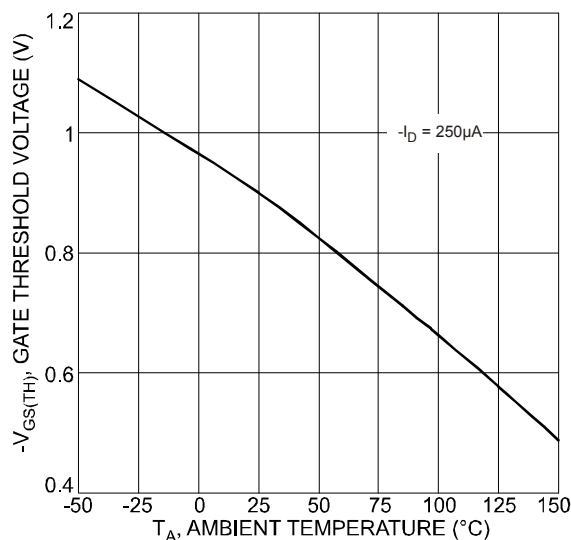


Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

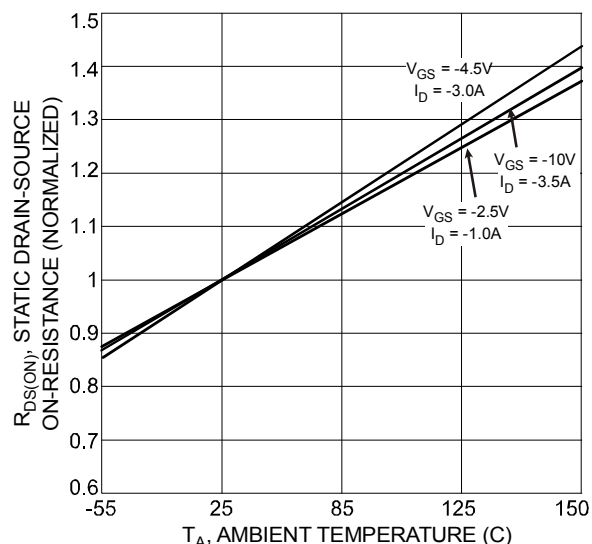


Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

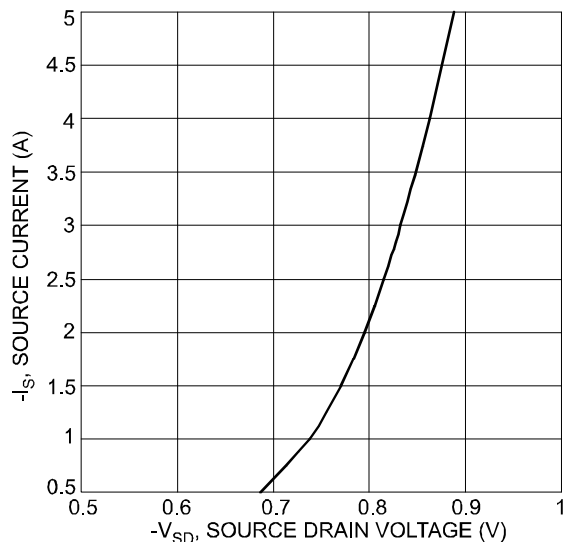


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

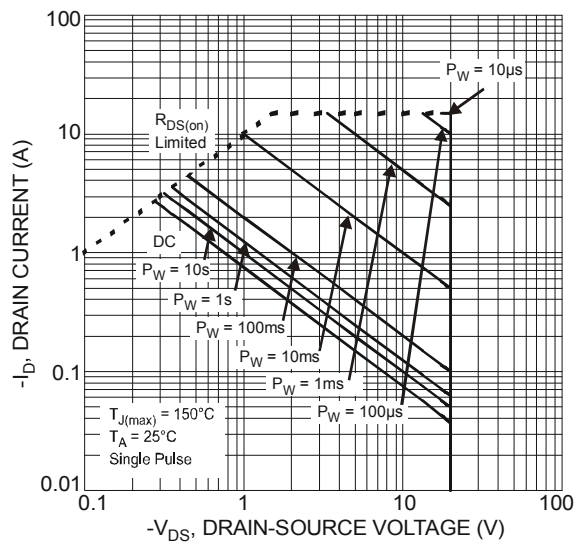
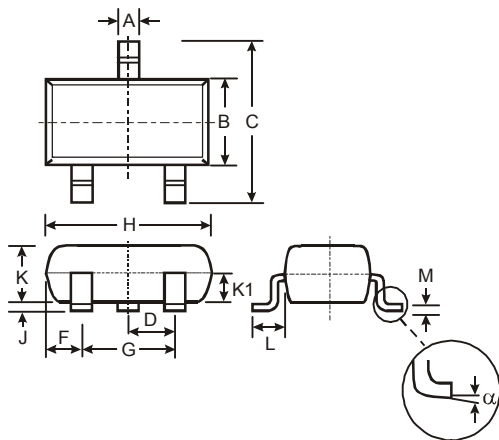


Fig. 8 SOA, Safe Operation Area

## Package Outline Dimensions

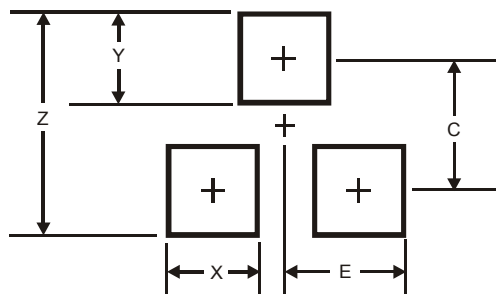
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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                    | 0.903 | 1.10 | 1.00  |
| K1                   | -     | -    | 0.400 |
| L                    | 0.45  | 0.61 | 0.55  |
| M                    | 0.085 | 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 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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