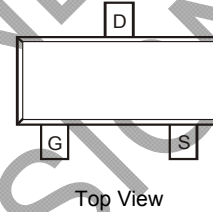
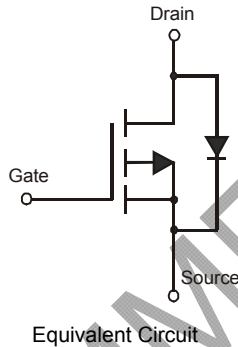


### Features

- Low On-Resistance:  
 $R_{DS(ON)} < 120m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 240m\Omega @ V_{GS} = -2.5V$
- 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**

### Mechanical Data

- Case: SOT-23
- 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
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

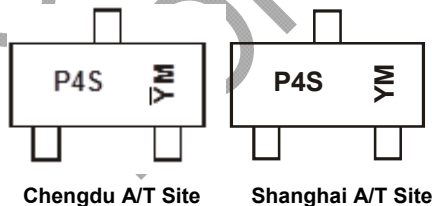


### Ordering Information (Note 4)

| Part Number | Case   | Packaging        |
|-------------|--------|------------------|
| DMP3120L-7  | SOT-23 | 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



P4S = Product Type Marking Code  
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 ȲM = Date Code Marking for CAT (Chengdu Assembly/ Test site)  
 Y or Ȳ = Year (ex: A = 2013)  
 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   |

### Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                         | Symbol           | Value                  | Unit |
|--|------------------|------------------------|------|
| Drain Source Voltage                   | V <sub>DSS</sub> | -30                    | V    |
| Gate-Source Voltage                    | V <sub>GSS</sub> | ±12                    | V    |
| Drain Current (Note 5)                 | I <sub>D</sub>   | T <sub>A</sub> = +25°C | -2.8 |
|  |                  | T <sub>A</sub> = +70°C | -2.2 |
| Drain Current (Note 5)                 | I <sub>DM</sub>  | -9                     | 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 @T <sub>A</sub> = 25°C (Note 5) | R <sub>θJA</sub>                  | 90          | °C/W |
| Operating and Storage Temperature Range                                 | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

Notes: 5. Device mounted on FR-4 PCB. t ≤ 5 sec.

### 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>   | -30  | —    | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA   |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | —    | —    | -1   | μA   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V  |
| Gate-Body Leakage                         | I <sub>GSS</sub>    | —    | —    | ±100 | nA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 6)</b>        |                     |      |      |      |      |   |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub> | -0.6 | —    | -1.4 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                     |
| Static Drain-Source On-Resistance         | R <sub>DS(on)</sub> | —    | —    | 120  | mΩ   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.8A   |
|   |                     | —    | —    | 240  |      | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -1.8A   |
| Forward Transconductance                  | g <sub>fs</sub>     | —    | 5    | —    | S    | V <sub>DS</sub> = -5V, I <sub>D</sub> = -2.8A   |
| Source-Drain Diode Forward Voltage        | V <sub>SD</sub>     | —    | —    | -1.1 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.0A  |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b>   |                     |      |      |      |      |   |
| Input Capacitance                         | C <sub>iss</sub>    | —    | 285  | —    | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                      |
| Output Capacitance                        | C <sub>oss</sub>    | —    | 56   | —    | pF   |   |
| Reverse Transfer Capacitance              | C <sub>rss</sub>    | —    | 40   | —    | pF   |   |
| Gate Resistance                           | R <sub>G</sub>      | —    | 13   | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V<br>f = 1.0MHz  |
| <b>SWITCHING CHARACTERISTICS (Note 7)</b> |                     |      |      |      |      |   |
| Turn-On Delay Time                        | t <sub>d(on)</sub>  | —    | 5.6  | —    | ns   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V,<br>I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω |
| Rise Time                                 | t <sub>r</sub>      | —    | 6.8  | —    |      |   |
| Turn-Off Delay Time                       | t <sub>d(off)</sub> | —    | 35.3 | —    |      |   |
| Fall Time                                 | t <sub>f</sub>      | —    | 19.2 | —    |      |   |
| Total Gate Charge                         | Q <sub>G</sub>      | —    | 6.7  | —    | nC   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1.0A                          |
| Gate-Source Charge                        | Q <sub>GS</sub>     | —    | 3.0  | —    |      | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.0A                         |
| Gate-Drain Charge                         | Q <sub>GD</sub>     | —    | 0.8  | —    |      |   |

Notes: 6. Short duration pulse test used to minimize self-heating effect.  
7. Guaranteed by design. Not subject to production testing.

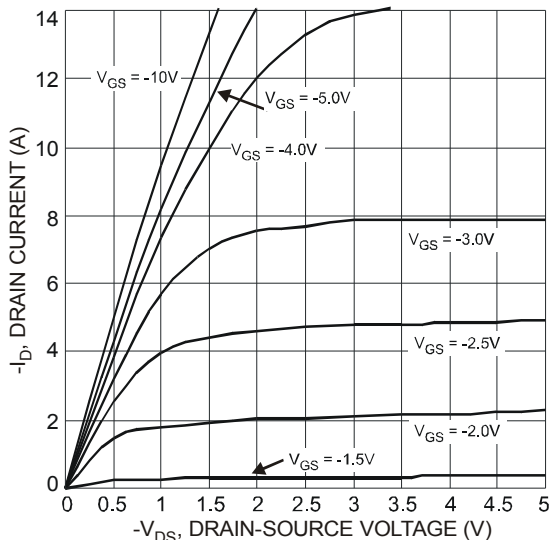


Fig. 1 Typical Output Characteristics

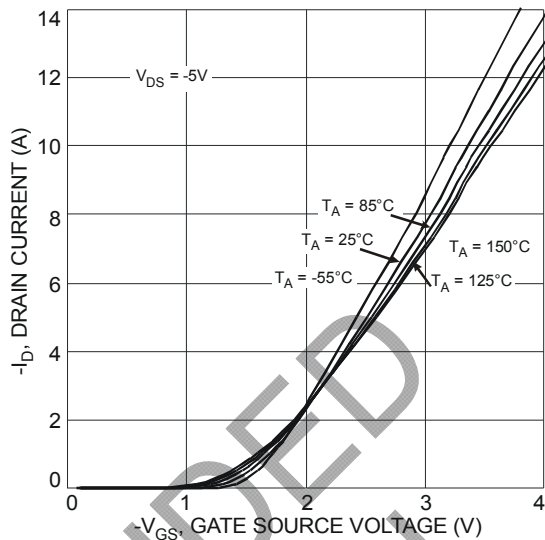


Fig. 2 Typical Transfer Characteristics

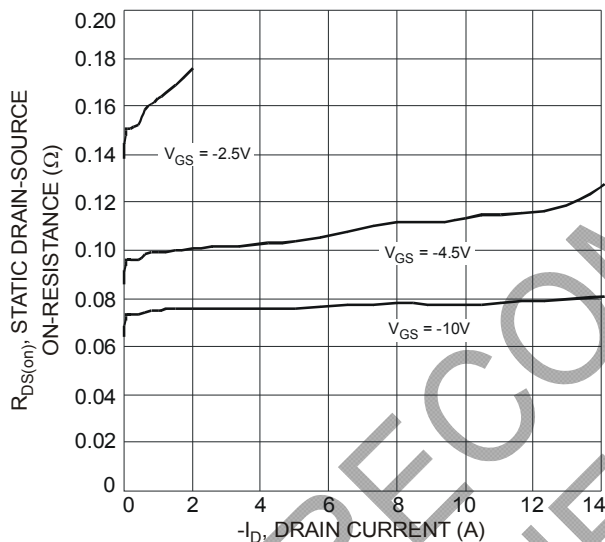


Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

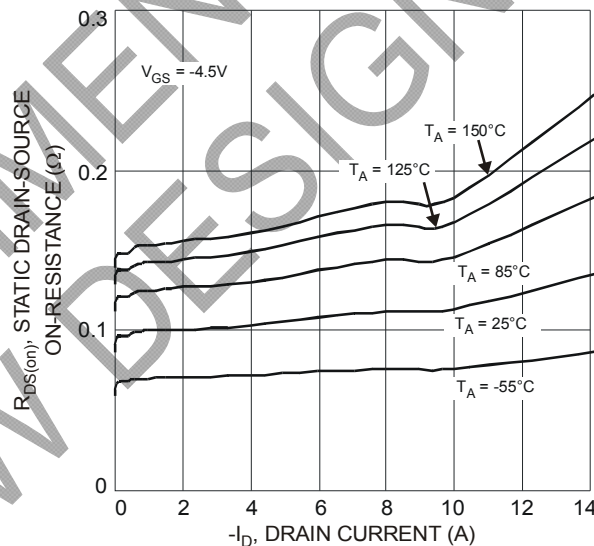


Fig. 4 On-Resistance vs. Drain Current and Temperature

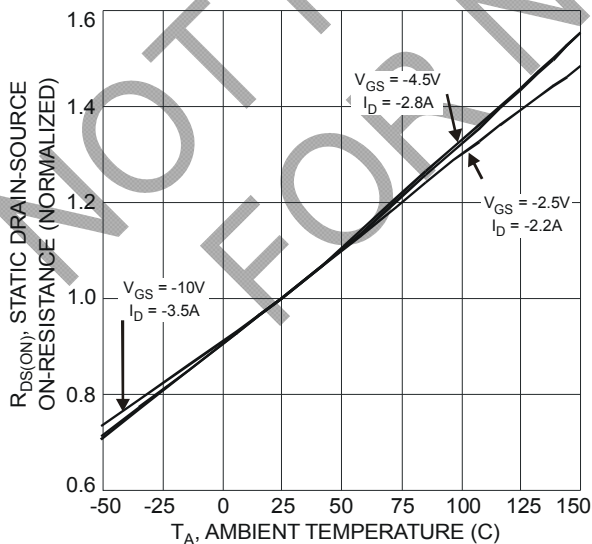


Fig. 5 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

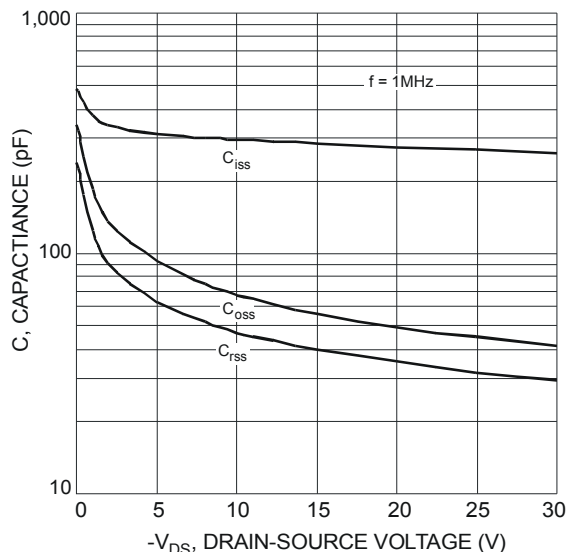


Fig. 6 Typical Capacitance

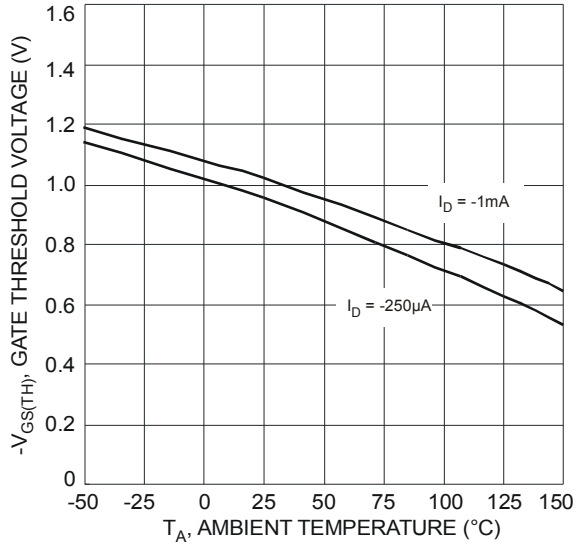


Fig. 7 Gate Threshold Voltage vs. Ambient Temperature

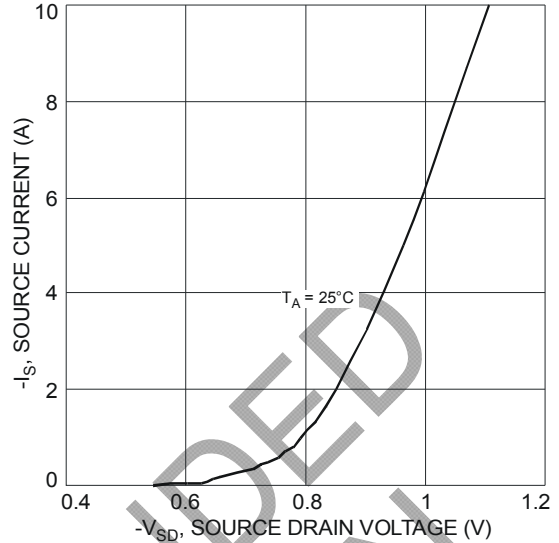
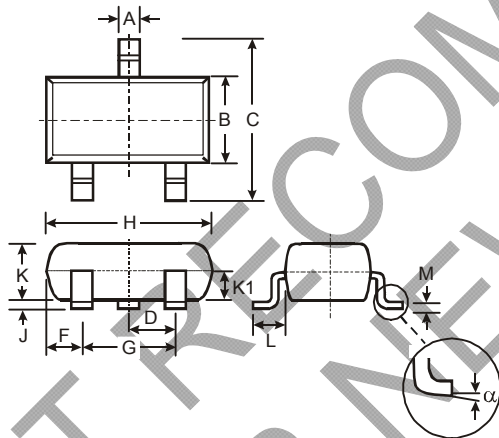


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

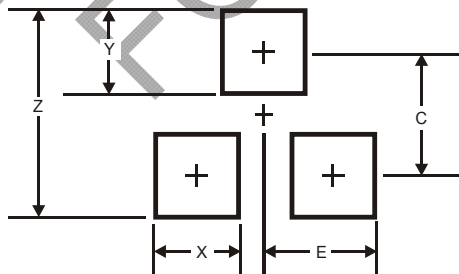
**Package Outline Dimensions**



| SOT-23 |       |      |       |
|--------|-------|------|-------|
| 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**



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

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