
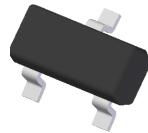


## Features

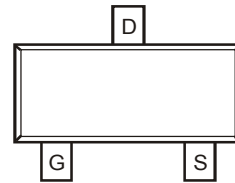
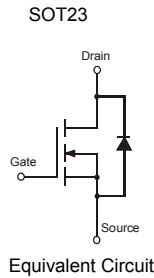
- Low On-Resistance
  - 29mΩ @V<sub>GS</sub> = 4.5V
  - 50mΩ @V<sub>GS</sub> = 2.5V
  - 100mΩ @V<sub>GS</sub> = 2.0V
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

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



Top View



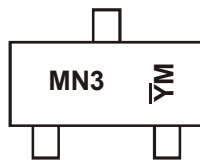
Top View

## Ordering Information (Note 4)

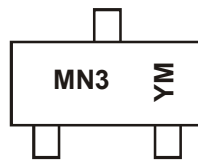
| Part Number | Case  | Packaging        |
|-------------|-------|------------------|
| DMN2050L-7  | SOT23 | 3000/Tape & Reel |

- 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

MN3 = Marking Code  
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 Y̅M = Date Code Marking for CAT (Chengdu Assembly/ Test site)  
 Y or Y̅ = 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 | Units |
|-------------------------------|------------------|-------|-------|
| Drain-Source Voltage          | V <sub>DSS</sub> | 20    | V     |
| Gate-Source Voltage           | V <sub>GSS</sub> | ±12   | V     |
| Drain Current (Note 5)        | I <sub>D</sub>   | 5.9   | A     |
| Pulsed Drain Current (Note 6) | I <sub>DM</sub>  | 21    | A     |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Units |
|--|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | 1.4         | W     |
| Thermal Resistance, Junction to Ambient (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    |

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

| Characteristic                            | Symbol              | Min  | Typ | Max  | Unit | Test Condition   |
|---|---------------------|------|-----|------|------|--|
| <b>OFF CHARACTERISTICS (Note 7)</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    | μA   | 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 7)</b>        |                     |      |     |      |      |  |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub> | 0.45 | —   | 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> | —    | 24  | 29   | mΩ   | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A                        |
|   |                     |      | 42  | 50   |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 3.1A                        |
|   |                     |      | 68  | 100  |      | V <sub>GS</sub> = 2.0V, I <sub>D</sub> = 1.5A                        |
| Forward Transfer Admittance               | Y <sub>fs</sub>     | —    | 8   | —    | S    | V <sub>DS</sub> = 5V, I <sub>D</sub> = 2.1A                          |
| Diode Forward Voltage (Note 7)            | V <sub>SD</sub>     | —    | 0.9 | 1.4  | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.0A                          |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>   |                     |      |     |      |      |  |
| Input Capacitance                         | C <sub>iss</sub>    | —    | 532 | —    | pF   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V<br>f = 1.0MHz            |
| Output Capacitance                        | C <sub>oss</sub>    | —    | 144 | —    | pF   |  |
| Reverse Transfer Capacitance              | C <sub>rss</sub>    | —    | 117 | —    | pF   |  |
| Gate Resistance                           | R <sub>G</sub>      | —    | 1.3 | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz               |
| <b>SWITCHING CHARACTERISTICS (Note 8)</b> |                     |      |     |      |      |  |
| Total Gate Charge                         | Q <sub>g</sub>      | —    | 6.7 | —    | nC   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A |
| Gate-Source Charge                        | Q <sub>gs</sub>     | —    | 0.8 | —    |      | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A |
| Gate-Drain Charge                         | Q <sub>gd</sub>     | —    | 3.0 | —    |      | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A |

- Notes:
5. Device mounted on FR-4 PCB, on 2oz Copper pad layout with R<sub>θJA</sub> = 90°C/W.
  6. Repetitive rating, pulse width limited by junction temperature.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to production testing.

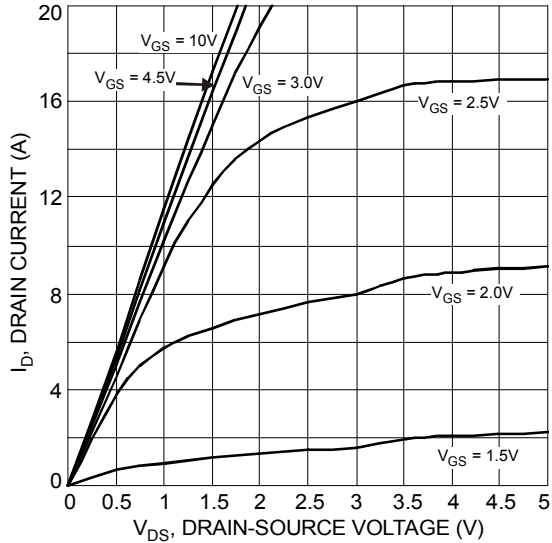


Fig. 1 Typical Output Characteristic

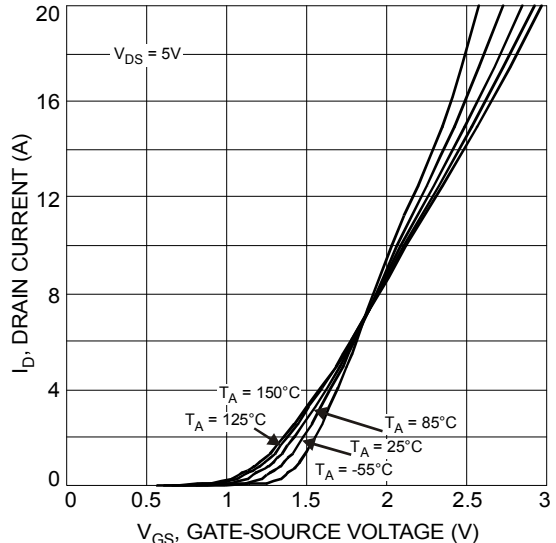


Fig. 2 Typical Transfer Characteristic

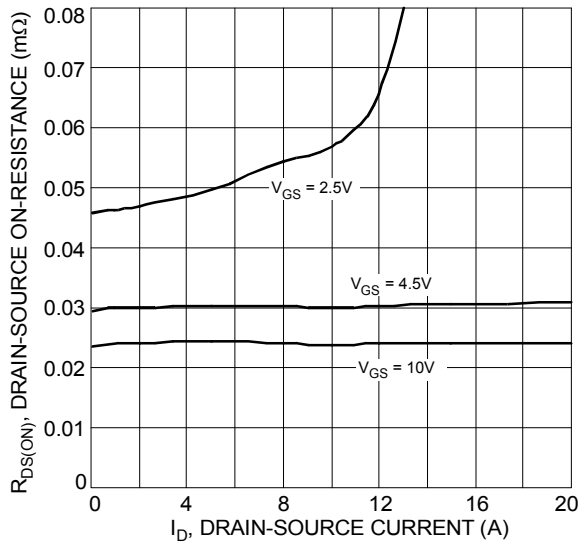


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

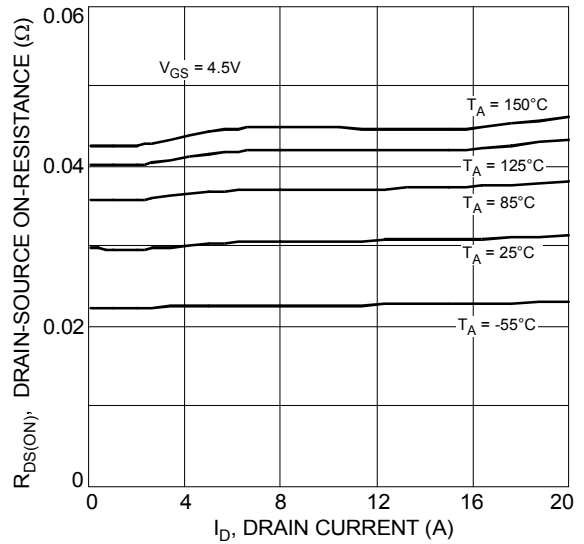


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

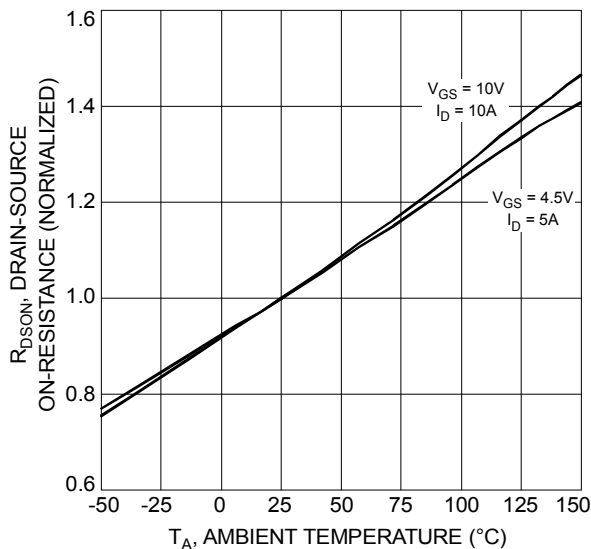


Fig. 5 On-Resistance Variation with Temperature

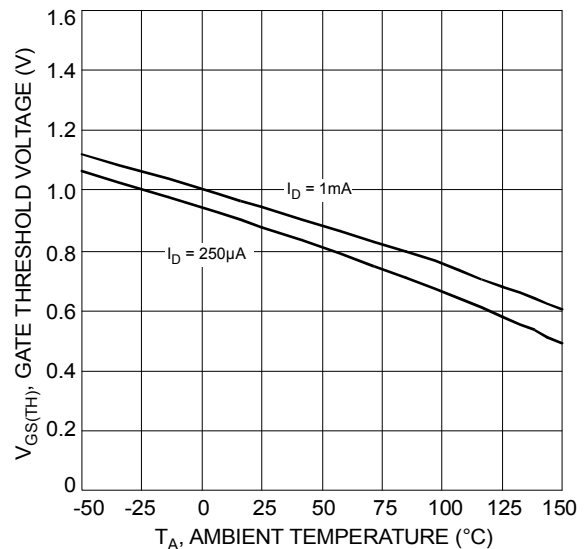


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

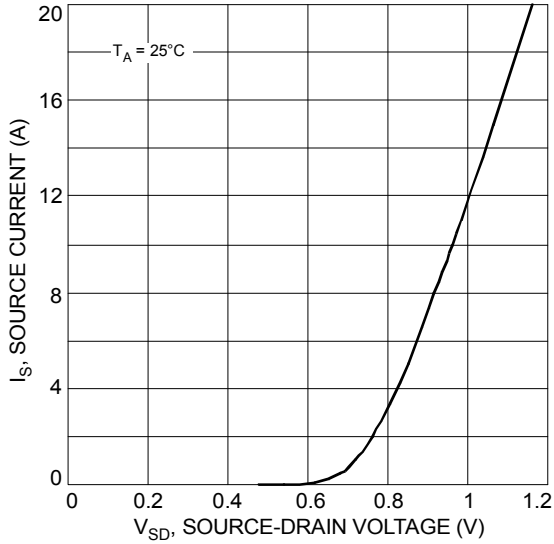


Fig. 7 Diode Forward Voltage vs. Current

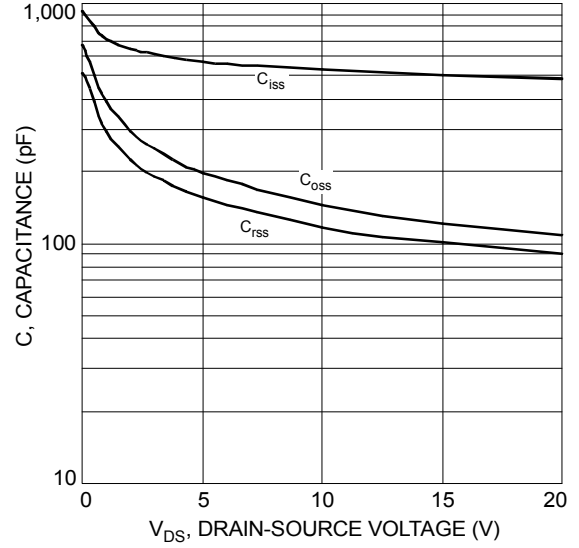


Fig. 8 Typical Total Capacitance

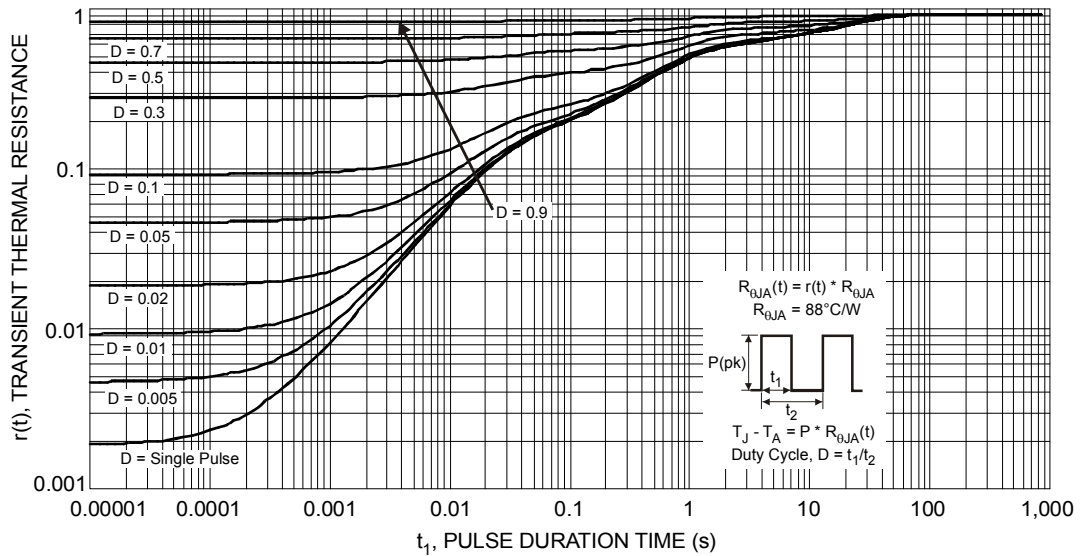
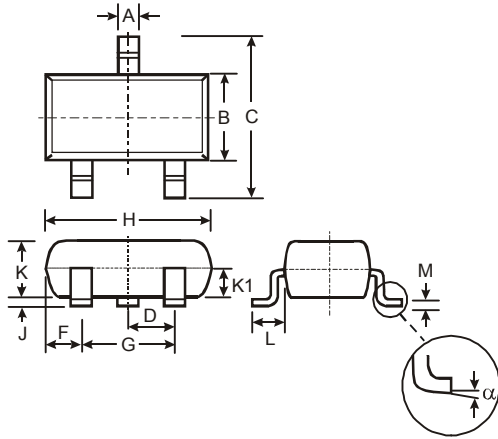


Fig. 9 Transient Thermal Response

**Package Outline Dimensions**

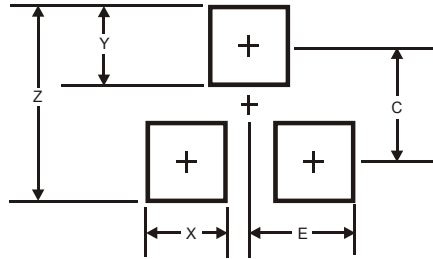
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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[BZT52C15SQ-7-F](#) [BZT52C6V2-13-F](#) [BZT52C24-13-F](#) [BC807-25](#) [BC807-40](#) [BC847BS-13-F](#) [BSS123Q-7](#)