

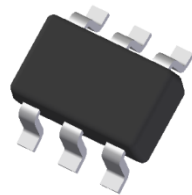
**NPN TRANSISTOR WITH DUAL SERIES SWITCHING DIODE**

**Features**

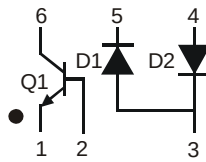
- Integrates one NPN Transistor (Q1) and two Switching Diodes (D1, D2) in a Single Compact Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

**Mechanical Data**

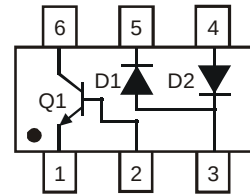
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 
- Terminal Connections: See Diagram
- Weight: 0.01 grams (Approximate)



Top View



Device Schematic



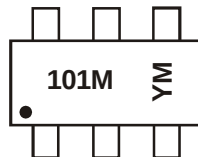
Top View  
Pin Configuration

**Ordering Information** (Note 4)

| Part Number | Case  | Packaging         |
|-------------|-------|-------------------|
| DSM80101M-7 | SOT26 | 3,000/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**



101M = Product Type Marking Code  
(See Electrical Characteristics Table)  
YM = Date Code Marking  
Y = Year (ex: B = 2014)  
M = Month (ex: 9 = September)

Date Code Key

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------|------|------|------|------|------|------|------|------|
| Code | B    | C    | D    | E    | F    | G    | H    | I    |

| 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 – Q1** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                                                                               | Symbol              | Value | Unit |
|------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|------|
| Collector-Base Voltage                                                                                                       | V <sub>CBO</sub>    | 80    | V    |
| Collector-Emitter Voltage                                                                                                    | V <sub>CEO</sub>    | 80    | V    |
| Emitter-Base Voltage                                                                                                         | V <sub>EBO</sub>    | 6.0   | V    |
| Continuous Collector Current                                                                                                 | I <sub>C(MAX)</sub> | 500   | mA   |
| Peak Pulse Collector Current @ DC Increment for I <sub>C</sub> ;<br>I <sub>B</sub> = 300mA; Test Duration >10s for each Step | I <sub>CM</sub>     | 0.8   | A    |
| Base Current                                                                                                                 | I <sub>B</sub>      | 200   | mA   |

**Maximum Ratings – D1, D2** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                        | Symbol              | Value | Unit |
|-------------------------------------------------------|---------------------|-------|------|
| Non-Repetitive Peak Reverse Voltage                   | V <sub>RM</sub>     | 100   | V    |
| Peak Repetitive Reverse Voltage                       | V <sub>RRM</sub>    | 75    | V    |
| Working Peak Reverse Voltage                          | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage                                   | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage                                   | V <sub>R(RMS)</sub> | 53    | V    |
| Forward Continuous Current (Note 5)                   | I <sub>FM</sub>     | 300   | mA   |
| Average Rectified Output Current (Note 5)             | I <sub>O</sub>      | 200   | mA   |
| Non-Repetitive Peak Forward Surge Current @ t = 1.0μs | I <sub>FSM</sub>    | 20    | A    |

**Thermal Characteristics**

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                           | P <sub>D</sub>                    | 600         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R <sub>θJA</sub>                  | 208         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics – Q1** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic (Note 6)              | Symbol               | Min | Typical | Max | Unit | Test Condition                                |
|--------------------------------------|----------------------|-----|---------|-----|------|-----------------------------------------------|
| Collector-Base Breakdown Voltage     | BV <sub>CBO</sub>    | 80  | —       | —   | V    | I <sub>C</sub> = 100μA, I <sub>E</sub> = 0    |
| Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>    | 80  | —       | —   | V    | I <sub>C</sub> = 1.0mA, I <sub>B</sub> = 0    |
| Emitter-Base Breakdown Voltage       | BV <sub>EBO</sub>    | 6.0 | —       | —   | V    | I <sub>E</sub> = 100μA, I <sub>C</sub> = 0    |
| Collector Cutoff Current             | I <sub>CBO</sub>     | —   | —       | 100 | nA   | V <sub>CB</sub> = 80V, I <sub>E</sub> = 0     |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub> | —   | —       | 0.3 | V    | I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA |
| DC Current Transfer Ratio            | h <sub>FE</sub>      | 120 | 180     | 350 | —    | I <sub>C</sub> = 10mA, V <sub>CE</sub> = 1.0V |

**Electrical Characteristics – D1, D2** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol             | Min | Max   | Unit | Test Condition                                                                                            |
|------------------------------------|--------------------|-----|-------|------|-----------------------------------------------------------------------------------------------------------|
| Reverse Breakdown Voltage (Note 6) | V <sub>(BR)R</sub> | 75  | —     | V    | I <sub>R</sub> = 100μA                                                                                    |
| Forward Voltage                    | V <sub>F</sub>     | —   | 0.715 | V    | I <sub>F</sub> = 5.0mA                                                                                    |
|                                    |                    | —   | 0.855 |      | I <sub>F</sub> = 10mA                                                                                     |
|                                    |                    | —   | 1.0   |      | I <sub>F</sub> = 50mA                                                                                     |
|                                    |                    | —   | 1.25  |      | I <sub>F</sub> = 150mA                                                                                    |
|                                    |                    | —   | —     |      | I <sub>F</sub> = 10mA, V <sub>R</sub> = 75V                                                               |
| Leakage Current (Note 6)           | I <sub>R</sub>     | —   | 0.1   | μA   | V <sub>R</sub> = 75V                                                                                      |
|                                    |                    | —   | 25    | nA   | V <sub>R</sub> = 20V                                                                                      |
| Total Capacitance                  | C <sub>T</sub>     | —   | 2.0   | pF   | V <sub>R</sub> = 0V, f = 1.0MHz                                                                           |
| Reverse Recovery Time              | t <sub>rr</sub>    | —   | 4     | ns   | I <sub>F</sub> = I <sub>R</sub> = 10mA,<br>I <sub>rr</sub> = 0.1 x I <sub>R</sub> , R <sub>L</sub> = 100Ω |

Notes: 5. Device mounted on FR-4 PC board with recommended pad layout, which can be found on our website at <http://www.diodes.com>.  
6. Short duration pulse test used to minimize self-heating effect.

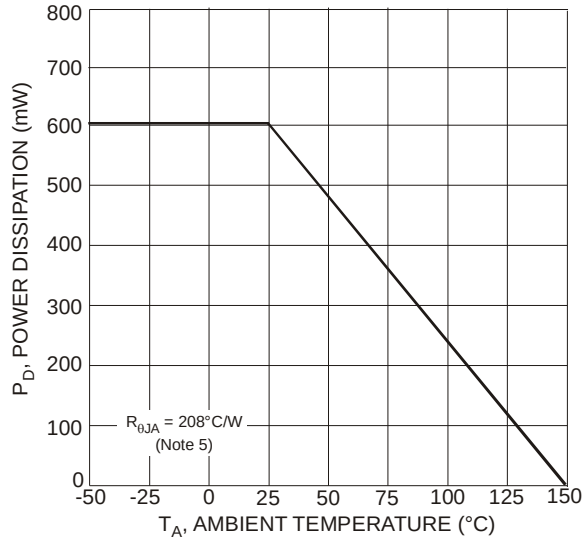


Fig. 1 Power Derating Curve

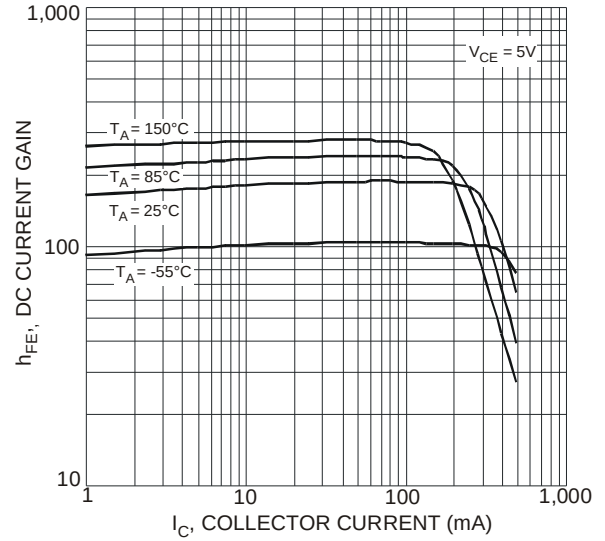


Fig. 2 Typical DC Current Gain vs. Collector Current

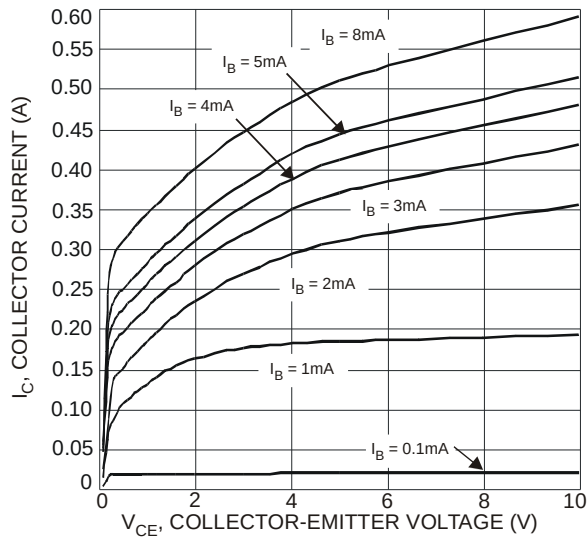


Fig. 3 Typical Collector Current vs. Collector-Emitter Voltage

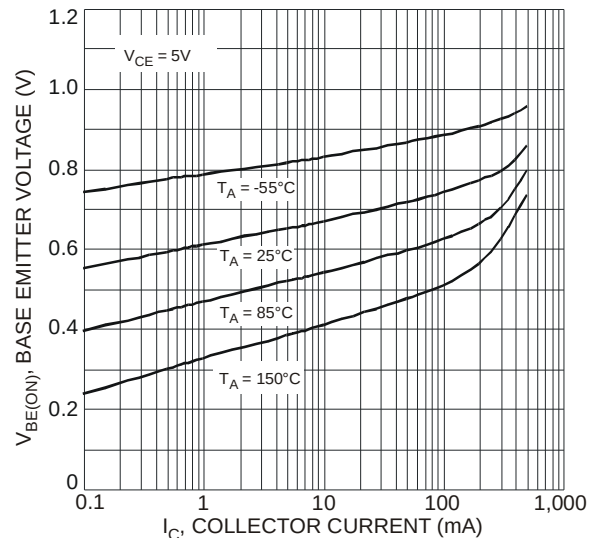


Fig. 4 Typical Base Emitter Voltage vs. Collector Current

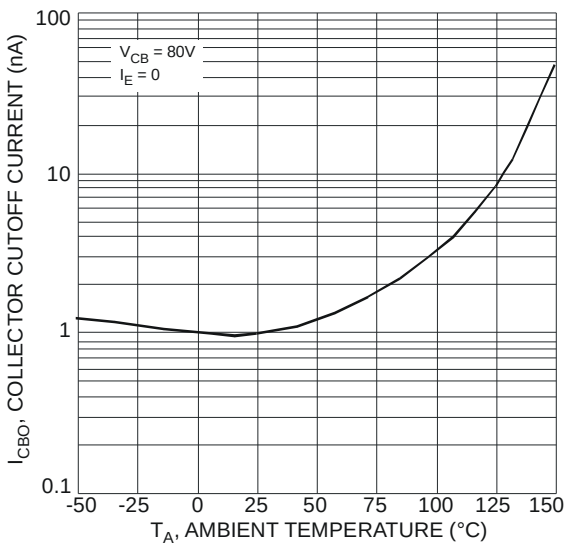


Fig. 5 Collector Cutoff Current vs. Ambient Temperature

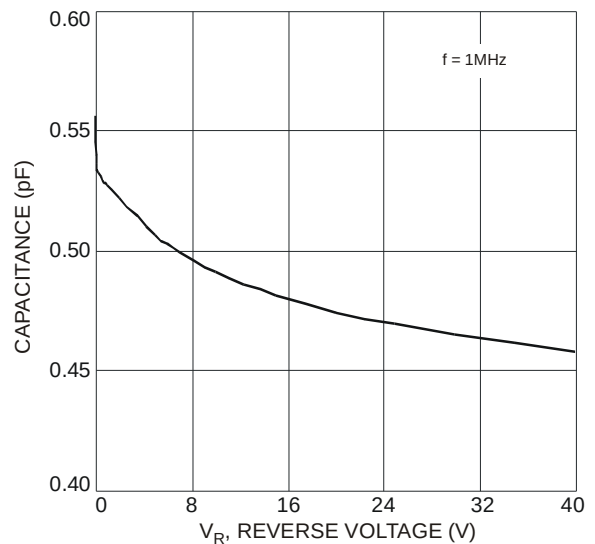
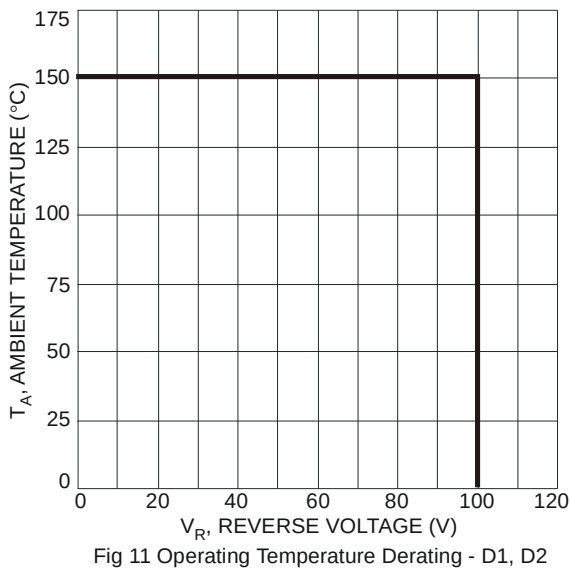
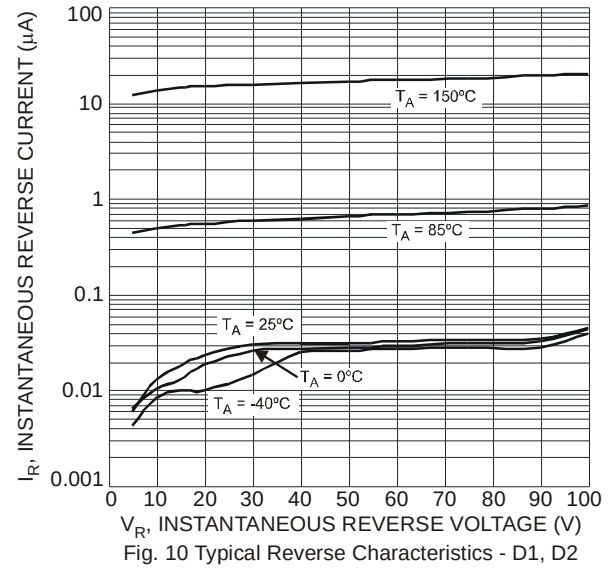
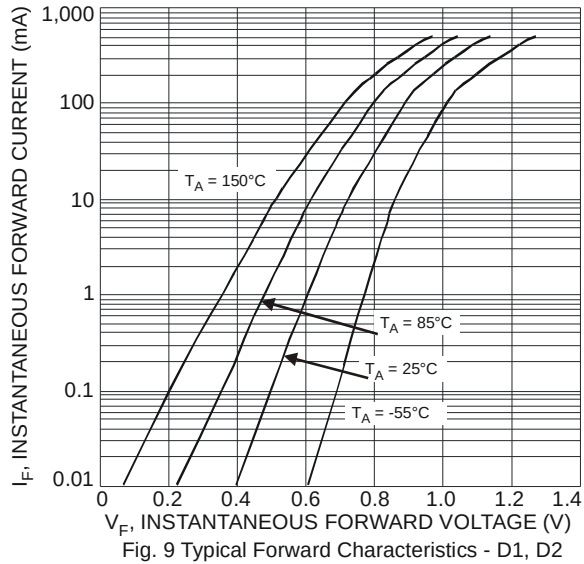
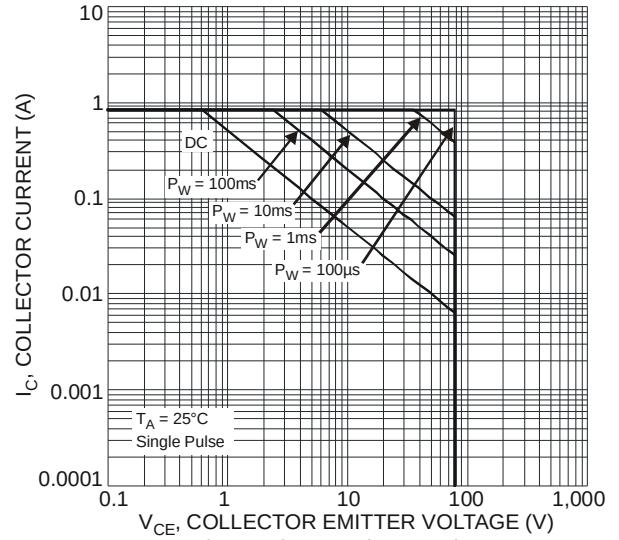
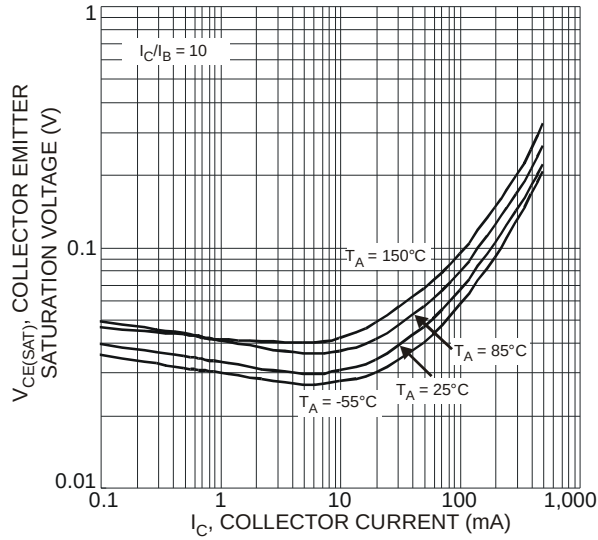
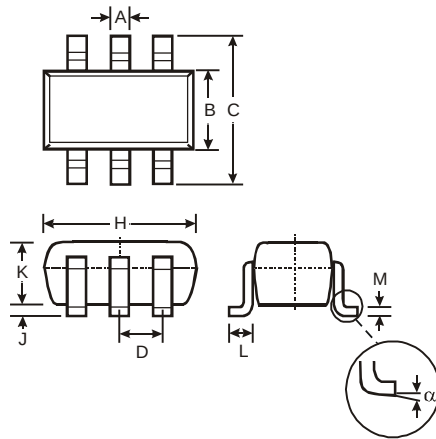


Fig. 6 Typical Capacitance Characteristics - D1, D2



## Package Outline Dimensions

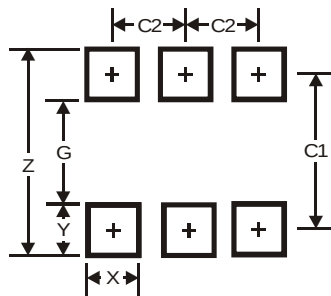
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT26                |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 0.35  | 0.50 | 0.38 |
| B                    | 1.50  | 1.70 | 1.60 |
| C                    | 2.70  | 3.00 | 2.80 |
| D                    | —     | —    | 0.95 |
| H                    | 2.90  | 3.10 | 3.00 |
| J                    | 0.013 | 0.10 | 0.05 |
| K                    | 1.00  | 1.30 | 1.10 |
| L                    | 0.35  | 0.55 | 0.40 |
| M                    | 0.10  | 0.20 | 0.15 |
| $\alpha$             | 0°    | 8°   | —    |
| All Dimensions in mm |       |      |      |

## Suggested Pad Layout

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



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 3.20          |
| G          | 1.60          |
| X          | 0.55          |
| Y          | 0.80          |
| C1         | 2.40          |
| C2         | 0.95          |

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