

## Features

- Low On-Resistance
- ESD Protected Gate to 500V
- Low Input Capacitance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 3)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q 101 Standards for High Reliability**

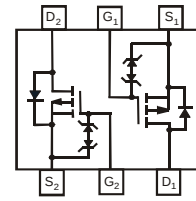
## Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe.  
Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.006 grams (approximate)

SOT-563



TOP VIEW



TOP VIEW  
Internal Schematic

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic              | Symbol           | Value | Units |
|-----------------------------|------------------|-------|-------|
| Drain-Source Voltage        | V <sub>DSS</sub> | -50   | V     |
| Drain-Gate Voltage (Note 1) | V <sub>DGR</sub> | -50   | V     |
| Gate-Source Voltage         | V <sub>GSS</sub> | ±20   | V     |
| Drain Current (Note 2)      | I <sub>D</sub>   | -160  | mA    |

## Thermal Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                                   | Symbol                            | Value       | Units |
|--------------------------------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 2)                 | P <sub>D</sub>                    | 400         | mW    |
| Thermal Resistance, Junction to Ambient (Note 2) | R <sub>θJA</sub>                  | 313         | °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 5)</b> |                     |      |     |      |      |                                                             |
| Drain-Source Breakdown Voltage      | BV <sub>DSS</sub>   | -50  | —   | —    | 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> = -50V, V <sub>GS</sub> = 0V                |
| Gate-Body Leakage                   | I <sub>GSS</sub>    | —    | —   | ±5   | μA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                |
| <b>ON CHARACTERISTICS (Note 5)</b>  |                     |      |     |      |      |                                                             |
| Gate Threshold Voltage              | V <sub>GS(th)</sub> | -0.8 | —   | -2.1 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA |
| Static Drain-Source On-Resistance   | R <sub>DS(ON)</sub> | —    | 6   | 8    | Ω    | V <sub>GS</sub> = -5V, I <sub>D</sub> = -0.100A             |
| Forward Transconductance            | g <sub>FS</sub>     | 0.05 | —   | —    | S    | V <sub>DS</sub> = -25V, I <sub>D</sub> = -0.1A              |
| <b>DYNAMIC CHARACTERISTICS</b>      |                     |      |     |      |      |                                                             |
| Input Capacitance                   | C <sub>iss</sub>    | —    | 27  | —    | pF   | V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V, f = 1.0MHz    |
| Output Capacitance                  | C <sub>oss</sub>    | —    | 4   | —    | pF   |                                                             |
| Reverse Transfer Capacitance        | C <sub>rss</sub>    | —    | 1.4 | —    | pF   |                                                             |

- Notes:
1. R<sub>GS</sub> ≤ 20KΩ.
  2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  3. No purposefully added lead.
  4. 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).
  5. Short duration pulse test used to minimize self-heating effect.

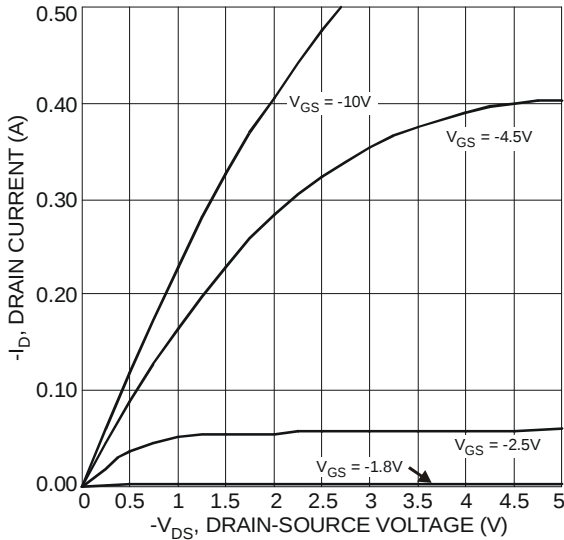


Fig. 1 Typical Output Characteristics

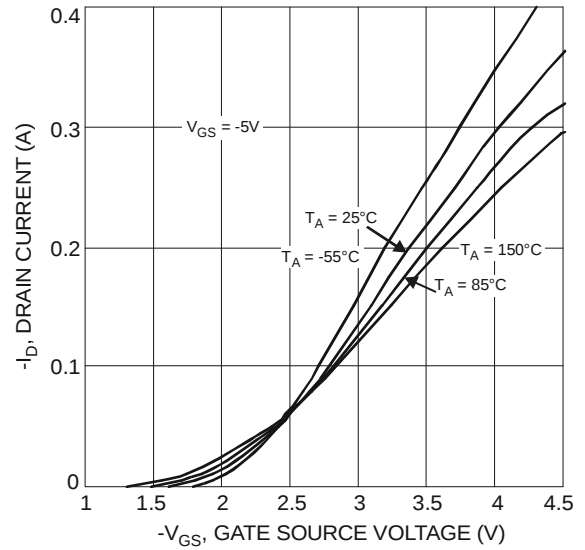


Fig. 2 Typical Transfer Characteristics

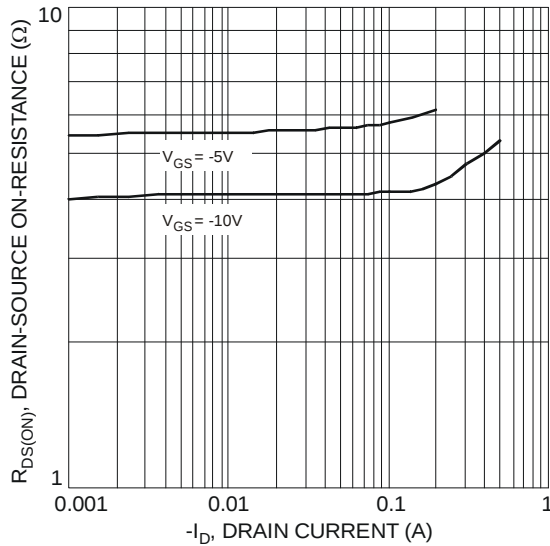


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

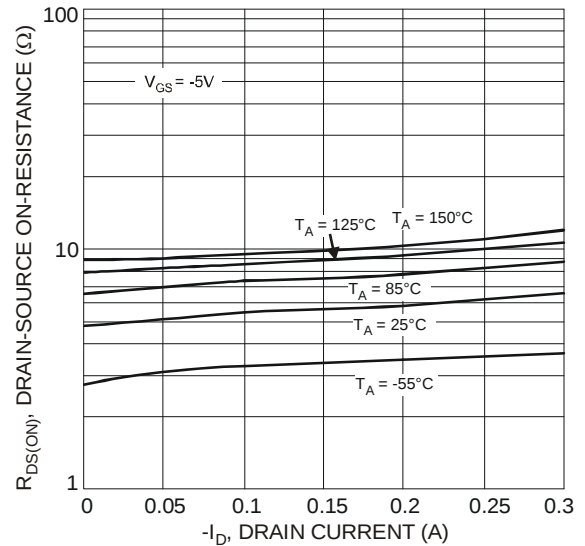


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

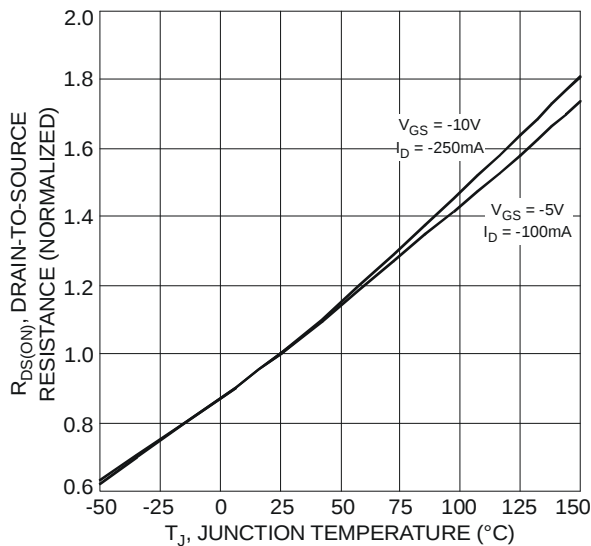


Fig. 5 On-Resistance Variation with Temperature

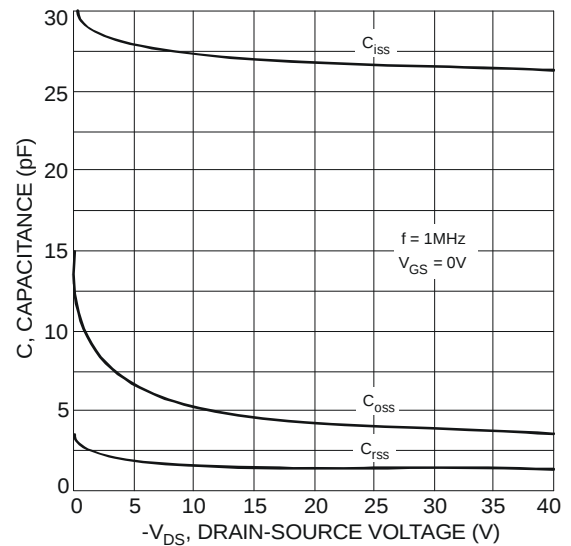


Fig. 6 Typical Capacitance

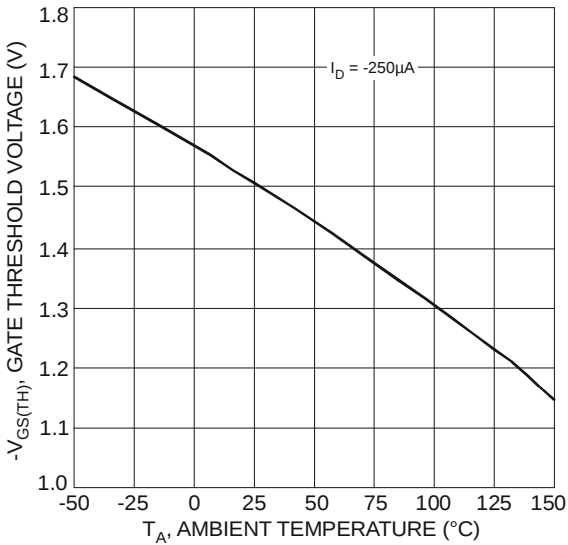


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

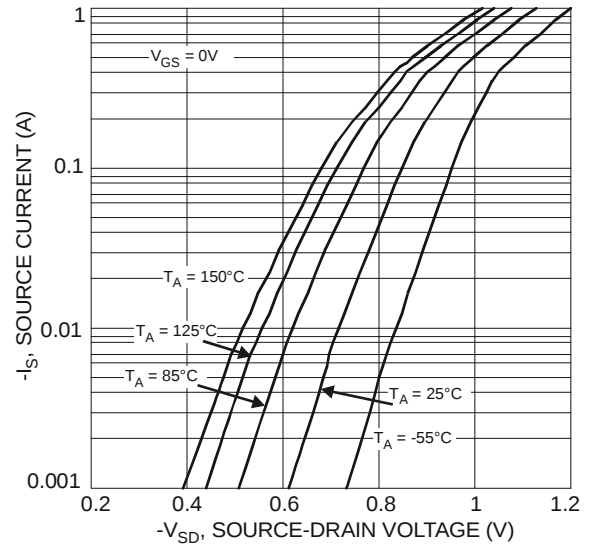


Fig. 8 Diode Forward Voltage vs. Current

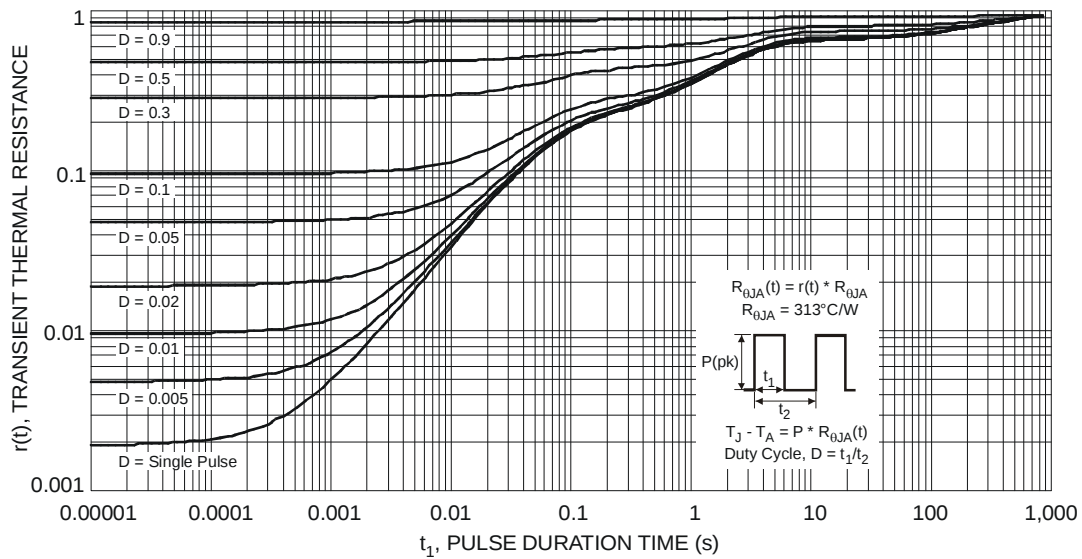


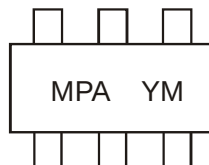
Fig. 9 Transient Thermal Response

## Ordering Information (Note 6)

| Part Number  | Case    | Packaging        |
|--------------|---------|------------------|
| DMP58D0SV -7 | SOT-563 | 3000/Tape & Reel |

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information (Note 7)



MPA = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: U = 2007)  
M = Month (ex: 9 = September)

### Date Code Key

Date Code Key

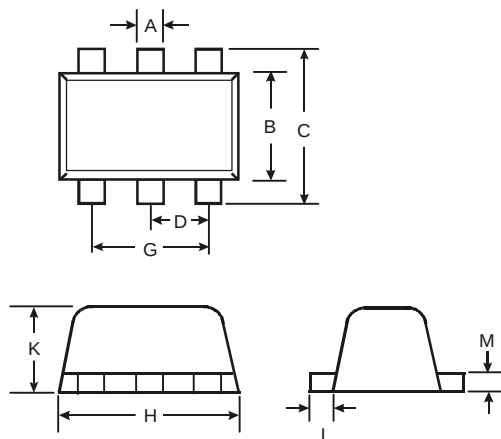
| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|------|
| Code | U    | V    | W    | X    | Y    | Z    | A    | B    | C    |

| 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   |

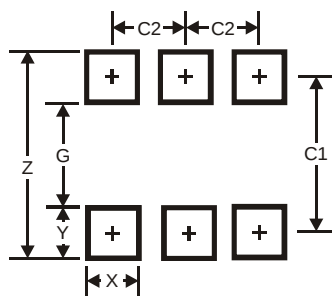
Notes: 7. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).

# Package Outline Dimensions



| SOT-563              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.20 |
| B                    | 1.10 | 1.25 | 1.20 |
| C                    | 1.55 | 1.70 | 1.60 |
| D                    | -    | -    | 0.50 |
| G                    | 0.90 | 1.10 | 1.00 |
| H                    | 1.50 | 1.70 | 1.60 |
| K                    | 0.55 | 0.60 | 0.60 |
| L                    | 0.10 | 0.30 | 0.20 |
| M                    | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm |      |      |      |

# Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.2           |
| G          | 1.2           |
| X          | 0.375         |
| Y          | 0.5           |
| C1         | 1.7           |
| C2         | 0.5           |

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