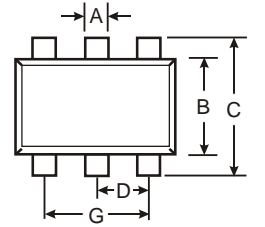


### Features

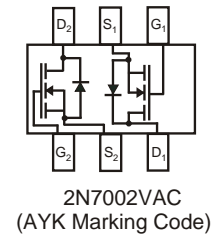
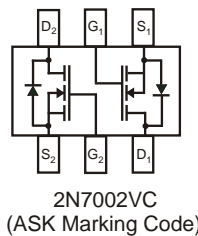
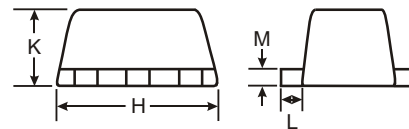
- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **Lead Free By Design/RoHS Compliant (Note 3)**
- **"Green Device" (Note 4)**

### 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-020C
- Terminal Connections: See Diagram (Note 1)
- Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking: See Page 2
- Ordering & Date Code Information: See Page 2
- Weight: 0.003 grams (approximate)



| SOT-563              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.25 |
| 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                    | 0.56 | 0.60 | 0.60 |
| L                    | 0.10 | 0.30 | 0.20 |
| M                    | 0.10 | 0.18 |      |
| All Dimensions in mm |      |      |      |



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

| Characteristic                          | Symbol                            | Value       | Units |
|---|-----------------------------------|-------------|-------|
| Drain-Source Voltage                    | V <sub>DSS</sub>                  | 60          | V     |
| Drain-Gate Voltage R <sub>GS</sub> 1.0M | V <sub>DGR</sub>                  | 60          | V     |
| Gate-Source Voltage (Note 2)            | V <sub>GSS</sub>                  | ±20         | V     |
| Continuous Pulsed                       |                                   | ±40         |       |
| Drain Current (Note 2)                  | I <sub>D</sub>                    | 280         | mA    |
| Continuous Pulsed                       |                                   | 1.5         |       |
| Total Power Dissipation                 | P <sub>d</sub>                    | 150         | mW    |
| Thermal Resistance, Junction to Ambient | R <sub>JA</sub>                   | 833         | °C/W  |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

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

**Electrical Characteristics** @ T<sub>A</sub> = 25°C unless otherwise specified

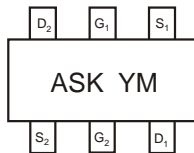
| Characteristic                      | Symbol              | Min | Typ | Max         | Unit | Test Condition  |
|-------------------------------------|---------------------|-----|-----|-------------|------|---|
| <b>OFF CHARACTERISTICS (Note 5)</b> |                     |     |     |             |      |   |
| Drain-Source Breakdown Voltage      | B <sub>V</sub> DSS  | 60  | 70  |             | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 10μA   |
| Zero Gate Voltage Drain Current     | I <sub>DSS</sub>    |     |     | 1.0<br>500  | μA   | @ T <sub>C</sub> = 25°C<br>@ T <sub>C</sub> = 125°C<br>V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V                          |
| Gate-Body Leakage                   | I <sub>GSS</sub>    |     |     | ±100        | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V  |
| <b>ON CHARACTERISTICS (Note 5)</b>  |                     |     |     |             |      |   |
| Gate Threshold Voltage              | V <sub>GS(th)</sub> | 1.0 |     | 2.5         | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA  |
| Static Drain-Source On-Resistance   | R <sub>DS(on)</sub> |     |     | 7.5<br>13.5 |      | V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.05A,<br>V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A, T <sub>j</sub> = 125°C       |
| On-State Drain Current              | I <sub>D(ON)</sub>  | 0.5 | 1.0 |             | A    | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 7.5V   |
| Forward Transconductance            | g <sub>FS</sub>     | 80  |     |             | mS   | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.2A  |
| <b>DYNAMIC CHARACTERISTICS</b>      |                     |     |     |             |      |   |
| Input Capacitance                   | C <sub>iss</sub>    |     |     | 50          | pF   | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V<br>f = 1.0MHz   |
| Output Capacitance                  | C <sub>oss</sub>    |     |     | 25          | pF   |   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>    |     |     | 5.0         | pF   |   |
| <b>SWITCHING CHARACTERISTICS</b>    |                     |     |     |             |      |   |
| Turn-On Delay Time                  | t <sub>D(ON)</sub>  |     |     | 20          | ns   | V <sub>DD</sub> = 30V, I <sub>D</sub> = 0.2A,<br>R <sub>L</sub> = 150 Ω, V <sub>GEN</sub> = 10V,<br>R <sub>GEN</sub> = 25 Ω |
| Turn-Off Delay Time                 | t <sub>D(OFF)</sub> |     |     | 20          | ns   |   |

**Ordering Information** (Note 6)

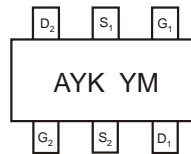
| Device      | Packaging | Shipping         |
|-------------|-----------|------------------|
| 2N7002VC-7  | SOT-563   | 3000/Tape & Reel |
| 2N7002VAC-7 | SOT-563   | 3000/Tape & Reel |

- Notes: 5. Short duration test pulse used to minimize self-heating effect.  
6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



ASK = 2N7002VC Product Type Marking Code (See Note 1)  
YM = Date Code Marking  
Y = Year ex: R = 2004  
M = Month ex: 9 = September



AYK = 2N7002VAC Product Type Marking Code (See Note 1)  
YM = Date Code Marking  
Y = Year ex: R = 2004  
M = Month ex: 9 = September

Date Code Key

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------|------|------|------|------|------|------|
| Code | R    | S    | T    | U    | V    | W    |

| Month | Jan | Feb | March | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3     | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

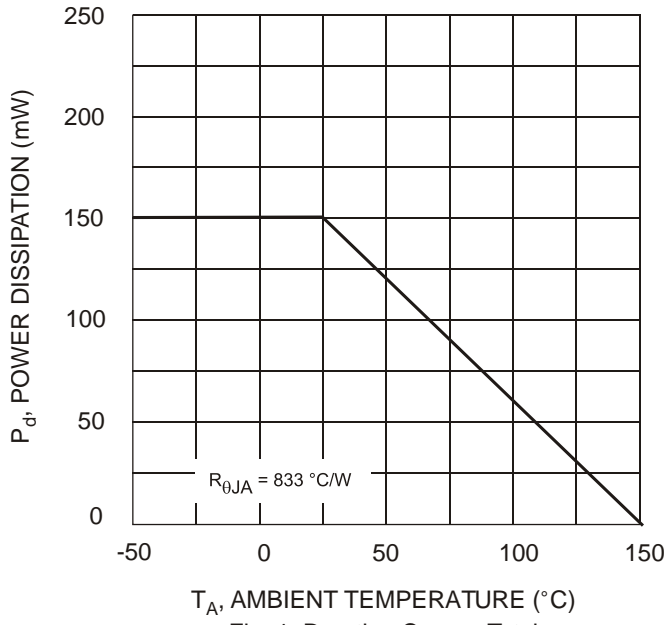


Fig. 1, Derating Curve - Total