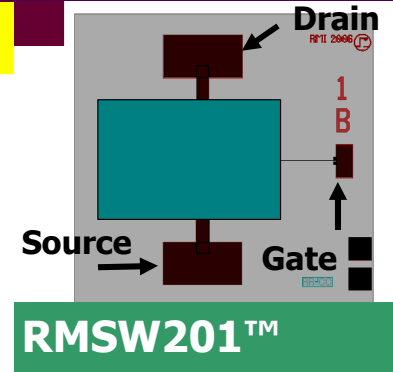




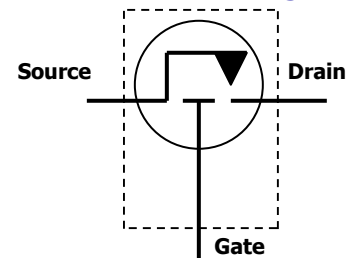
# SPST, High-Isolation, RF-MEMS Switch DC to 20 GHz

## Features

- High Isolation (20 dB typical @ 10 GHz)
- Low Insertion Loss (<0.5 dB typical @ 10 GHz)
- Near Zero Harmonic Distortion
- No Quiescent Power Dissipation
- Long Life (typical lifetime >100 billion cycles @ 27 dBm, >1 billion cycles @ 30 dBm)
- Hermetically sealed die designed for die-attach and wire-bond to board. Please contact us for other packaging options.



Functional Block Diagram



## Description

The RMSW201™ is a Single Pole Single Throw (SPST) Reflective RF Switch utilizing Radant's break-through MEMS technology that delivers high linearity, high isolation and low insertion loss in a chip-scale package configuration.

This device is ideally suited for use in many applications such as RF and microwave multi-throw switching, radar beam steering antennas, phase shifters, RF test instrumentation, ATE, cellular, and broadband wireless access.

## Typical Device Specifications

|  |  |   |  |
|--|--|---|--|
| <b>Insertion Loss</b><br>DC<br>2 GHz<br>10 GHz<br>18 GHz                     | < 4 Ω<br>< 0.30 dB<br>< 0.45 dB<br>< 0.60 dB | <b>Lifecycle</b><br>Cold-switched, 27 dBm<br>Cold-switched, 30 dBm<br>Cold-switched, 33 dBm<br>Hot-switched, -20 dBm<br>Hot-switched, -10 dBm<br>Hot-switched, 20 dBm | > 10 <sup>11</sup> cycles<br>> 10 <sup>9</sup> cycles<br>> 10 <sup>3</sup> cycles<br>> 10 <sup>11</sup> cycles<br>> 10 <sup>9</sup> cycles<br>> 10 <sup>3</sup> cycles |
| <b>Isolation</b><br>DC<br>2 GHz<br>10 GHz<br>18 GHz                          | > 1 GΩ<br>> 35 dB<br>> 21 dB<br>> 18 dB      | <b>Control</b><br>Gate-Source Voltage (on)<br>Gate-Source Voltage (off)<br>Control Power, steady-state<br>Control Power, 1 KHz cycle rate                             | +/- 100 V<br>0 V<br>< 1 nW<br>< 2 μW   |
| <b>Return Loss</b><br>2 GHz<br>10 GHz<br>18 GHz                              | < -27 dB<br>< -22 dB<br>< -20 dB             | <b>Switching speed</b><br>On<br>Off   | < 10 μs<br>< 2 μs  |
| <b>Input IP3</b><br>(Two-tone inputs<br>900 MHz and<br>901 MHz up to +5 dBm) | > 65 dBm                                     | <b>Operating temperature</b><br>Maximum<br>Minimum  | 85 °C<br>-40 °C  |
|  |  | <b>Storage temperature</b><br>Maximum<br>Minimum  | 150 °C<br>-55 °C   |

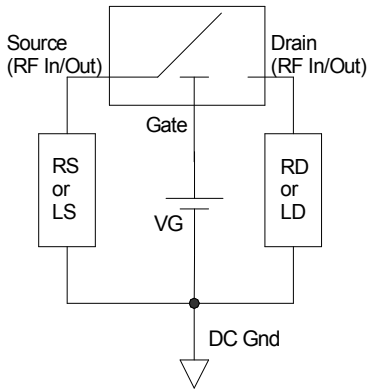
### Notes:

1. All RF measurements were made in a 50 Ω system.
2. Measurements include bond-wires from die to test-board.

**Absolute Maximum Ratings**

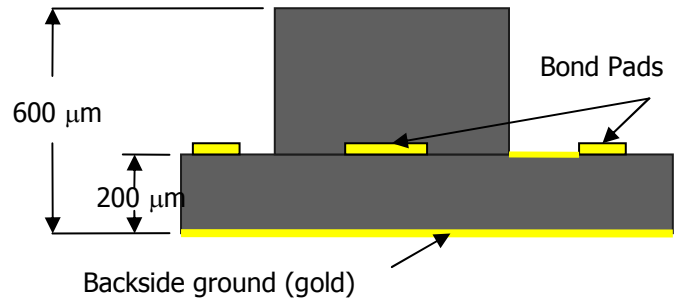
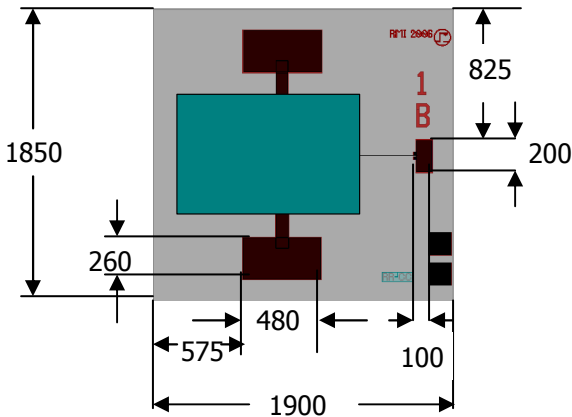
|                                     |           |
|-------------------------------------|-----------|
| Maximum Temperature<br>(10 seconds) | 290 °C    |
| (120 seconds)                       | 250 °C    |
| Maximum Voltage, Gate-Source        | +/- 130 V |
| Maximum Voltage, Drain-Source       | +/- 100 V |

**Recommended Application**



1. Resistors RS and RD (40 KΩ-100 KΩ) or inductors LS and LD should be used to provide a path to DC Ground from Source and Drain.
2. VG may be of either polarity.
3. VG rise-time should be at least 10 μs for optimal lifetime.
4. Please refer to "Application Note for Test and Handling of SPST RF-MEMS Switches" for more information. Contact us for driver solutions.

**Nominal Device Dimensions**



Dimensions are in micrometers.  
Please contact us for a footprint in .gds or .dxf format.

**Static sensitivity**

This device has an ESD (HBM) sensitivity of 100 V. Use proper ESD precautions when handling. Please refer to "Application Note for Test and Handling of SPST RF-MEMS Switches" for more information.

**Die Assembly**

The gold backside-metallization on the die is designed to be mounted with electrically conductive silver epoxy, or with a lower temperature solder which does not consume gold. Bond pads on the die are made of gold. Ball-bonds should be utilized to attach gold or Aluminum 1 mil wires. Please refer to "Application Note for Test and Handling of SPST RF-MEMS Switches" for more information.