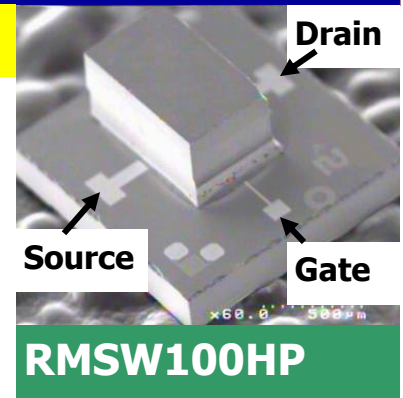




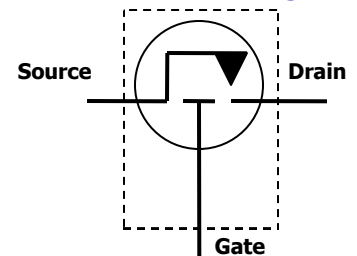
# SPST, High Power RF-MEMS Switch, DC to 12 GHz



## Features

- Long Life at High Power (typical >10 billion cycles @ 36 dBm cold-switched, >1 billion cycles @ 40 dBm cold-switched)
- Low Insertion Loss (0.16 dB typical @ 2.4 GHz)
- High Isolation (23 dB typical @ 2.4 GHz)
- Near Zero Harmonic Distortion
- No Quiescent Power Dissipation
- Hermetically sealed die designed for die-attach and wire-bond to board. Please contact us for other packaging options.

## Functional Block Diagram



## Description

The RMSW100HP 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, telecommunications, and broadband wireless access.

## Typical Device Specifications

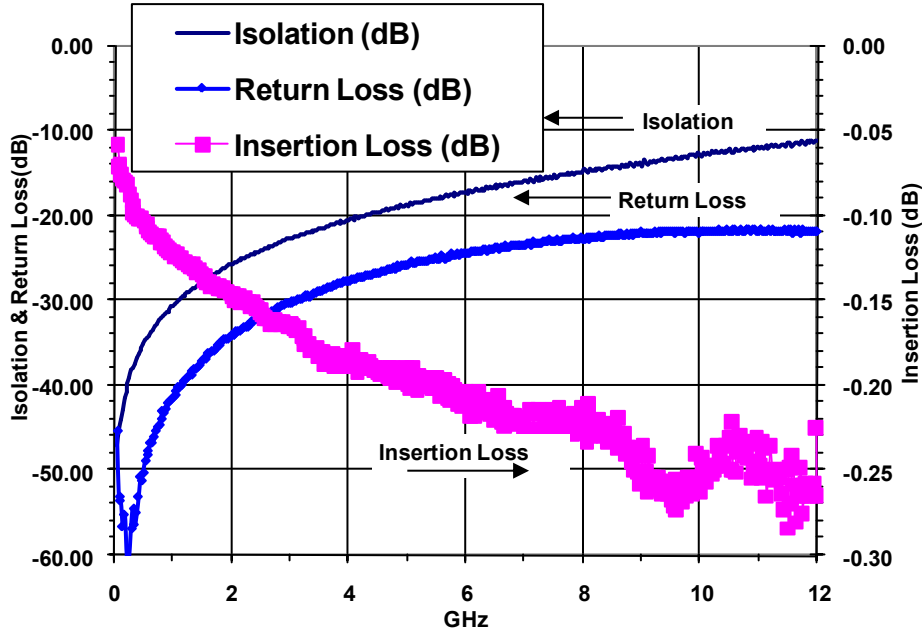
<b>Insertion Loss</b> DC 2 GHz 4 GHz 10 GHz	< 2 Ω < 0.17 dB < 0.20 dB < 0.28 dB	<b>Lifecycle</b> Cold-switched, 36dBm Cold-switched, 40 dBm Cold-switched, 42 dBm Hot-switched, -20 dBm Hot-switched, -10 dBm Hot-switched, 20 dBm	> 10 <sup>11</sup> cycles > 10 <sup>9</sup> cycles > 10 <sup>3</sup> cycles > 10 <sup>11</sup> cycles > 10 <sup>9</sup> cycles > 10 <sup>3</sup> cycles
<b>Isolation</b> DC 2 GHz 4 GHz 10 GHz	> 1 GΩ > 23 dB > 20 dB > 11 dB	<b>Control</b> Gate-Source Voltage (on) Gate-Source Voltage (off) Control Power, steady-state Control Power, 1 KHz cycle rate	+/- 90 V 0 V < 1 nW < 2 μW
<b>Return Loss</b> 2 GHz 4 GHz 10 GHz	< -30 dB < -24 dB < -20 dB	<b>Switching speed</b> On Off	< 10 μs < 2 μs
<b>Input IP3</b> (Two-tone inputs 900 MHz and 901 MHz up to +5 dBm)	> 65 dBm	<b>Operating temperature</b> Maximum Minimum	85 °C -40 °C
		<b>Storage temperature</b> Maximum Minimum	150 °C -55 °C

### Notes:

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

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Typical Performance

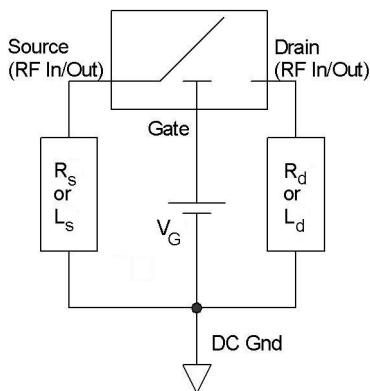


\* Measurement results include bond wires

Absolute Maximum Ratings

Maximum Temperature (10 seconds)	290 °C
(120 seconds)	250 °C
Maximum Voltage, Gate-Source	+/- 110 V
Maximum Voltage, Drain-Source	+/- 100 V

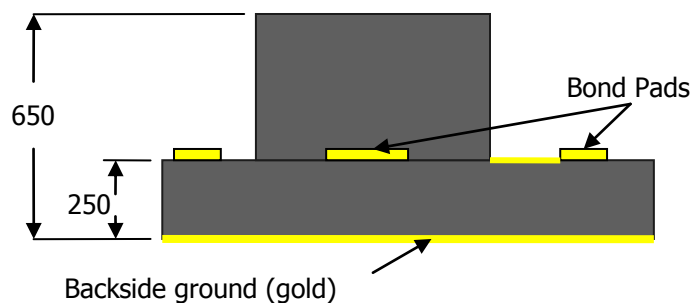
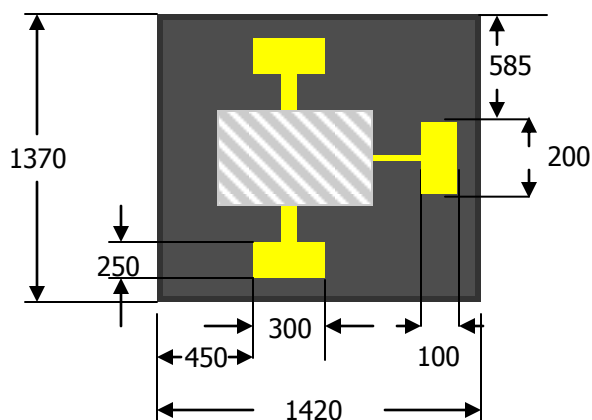
Recommended Application



1. Resistors  $R_S$  and  $R_D$  (40 k $\Omega$ -100 k $\Omega$ ) or inductors  $L_S$  and  $L_D$  should be used to provide a path to DC Ground from Source and Drain.
2.  $V_G$  may be of either polarity.
3.  $V_G$  rise-time should be at least 10  $\mu$ s for optimal lifetime.
4. Please refer to the application note entitled "Test and Handling of SPST RF-MEMS Switches" for more information. Contact us for driver solutions.

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## 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 the application note entitled "Test and Handling of SPST RF-MEMS Switches" for more information.

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