DC to mmWave MEMS Switch with Integrated Driver

Where Capability Means Productivity

Product Details

ADI recognizes the ever-increasing demands for switch functionality and performance in the electronics test and measurement world. Using our proprietary MEMS and CMOS technology, a breakthrough micro relay product has been developed to deliver compelling advantages over traditional relays.

The ADGM1001 is a DC to 34 GHz SPDT switch with low voltage integrated driver circuitry.

ATE System-Level Benefits

- Higher IC test throughput due to greater ATE test system channel density driven from the small SMT form factor of the MEMS switch
- Simplified test system architectures due to the switches' DC and high speed performance characteristics coupled with improved reliability compared to relays, reducing time to market
- Enabling full IC test coverage from a single test insertion on an ATE load or probe board with increased productivity from a simplified test

Features

- Size: 5 mm × 4 mm × 0.9 mm, making it 20× smaller than the smallest electromechanical relays
- Performance: DC (±6 V) to 34 GHz, 64 Gbps digital bandwidths, 33 dBm RF power handling and excellent linearity; integrated low voltage 3.3 V/10 mW driver
- Reliability: 20× improvement in cycle lifetime over typical electromechanical relays

Application

- ATE load and probe PCBs
- RF instrumentation
- Military/aerospace

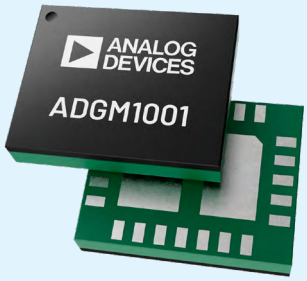

Figure 1. The ADGM1001 MEMS switch in a 5 mm × 4 mm × 0.9 LGA.

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Application

The ADGM1001 SPDT MEMS switch provides class-leading performance from DC (±6 V) to 34 GHz, as illustrated in Figure 2. The switch has minimal impact on digital signals up to 64 Gbps and offers minimal channel skew, jitter, and propagation delay to enable high fidelity data transmission.

This performance is ideally suited for relay replacement applications on ATE load and probe boards. Figure 3 shows how the MEMS switch enables a single insertion test solution for both high speed loop back digital routing and parametric DC testing. No other switching technology on the market today can provide such an efficient solution for both high speed and DC signals. In addition, this solution enables not only DC signals from the tester, but higher speed signals that can be used if needed.

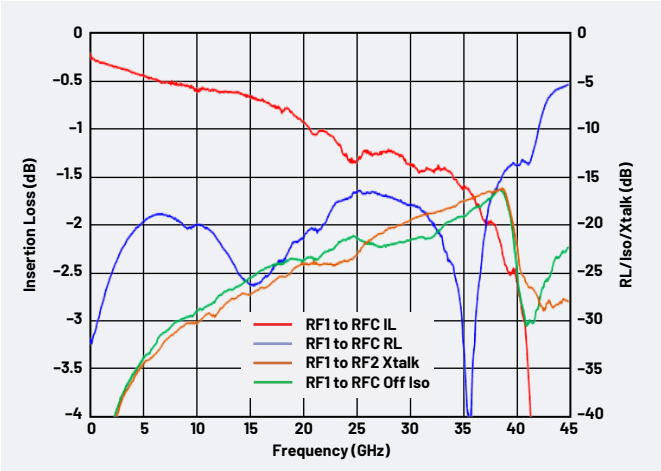

Figure 2. ADGM1001 RF performance.

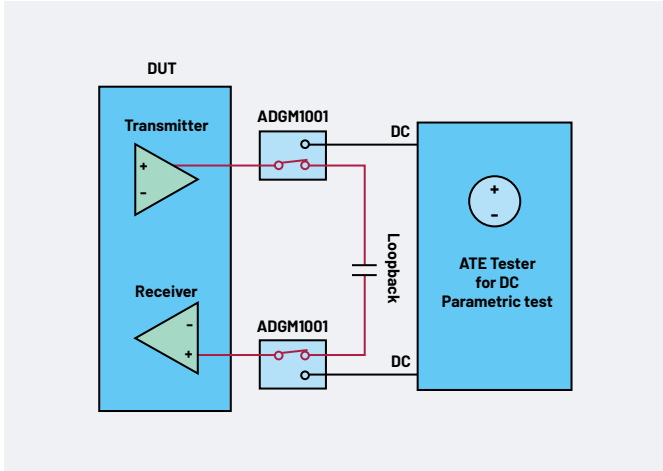

Figure 3. ATE loop back application enabling high speed digital and DC testing (highlighting P channel only).

Part Number	Device Configuration	Switch R_{on} (Typ) (Ω)	Frequency Response (GHz)	Digital Bandwidth (Gpbs)	Insertion Loss at Max Frequency (Typ) (dB)	Input Power (dBm)	Bleed Resistor (MΩ)	Logic Control (3.3 V)	Supply Voltage (V)/ Current (mA)	Package
ADGM1001	SPDT	3.4	0 to 34	64	1.5	33	11.5	Parallel/SPI	3.3/2.5	5 mm × 4 mm × 0.9 mm LGA
ADGM1002	SPDT	3.4	0 to 20	40	0.9	30	11.5	Parallel/SPI	3.3/2.5	5 mm × 4 mm × 0.9 mm LGA
ADGM1003	SPDT	3.4	0 to 16	32	0.7	27	11.5	Parallel/SPI	3.3/2.5	5 mm × 4 mm × 0.9 mm LGA

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