ANALOG DEVICES
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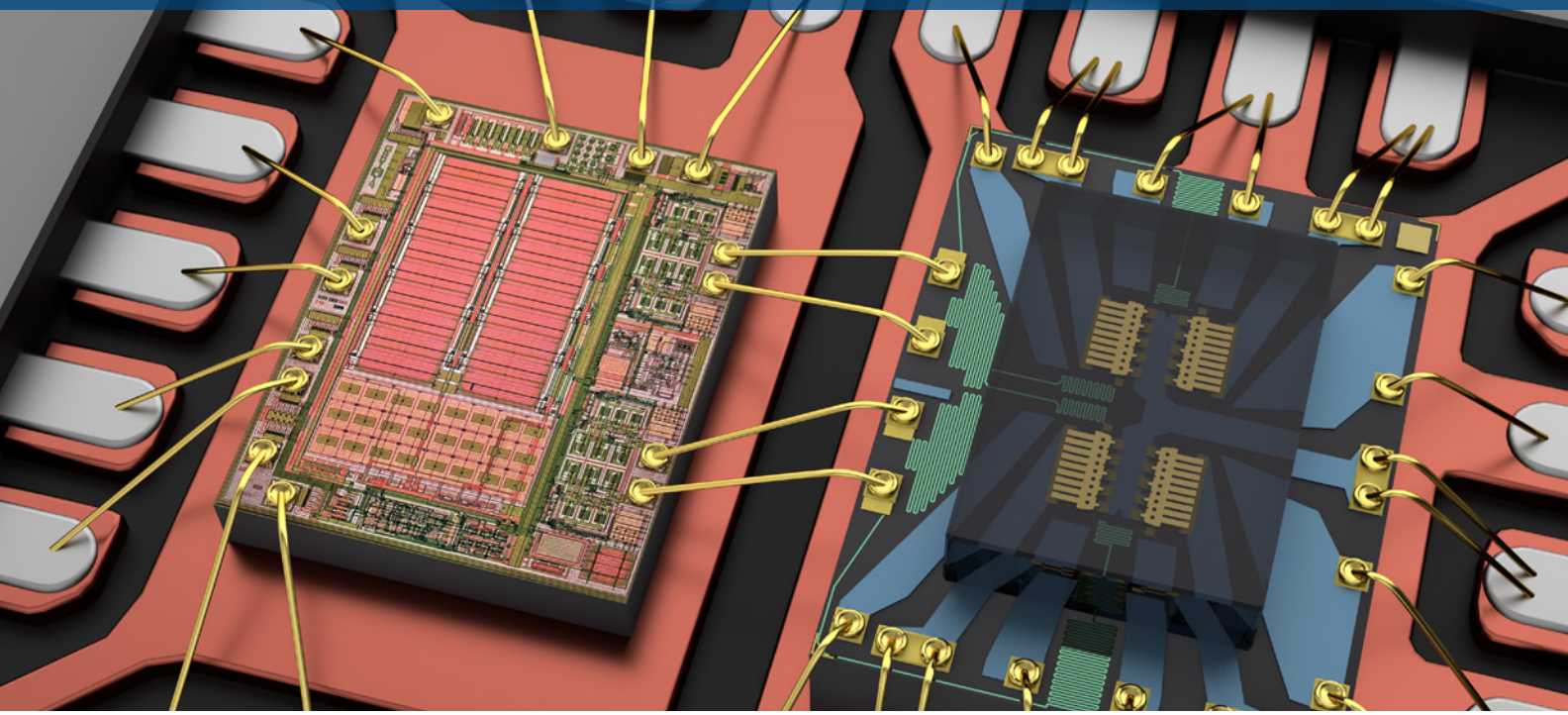
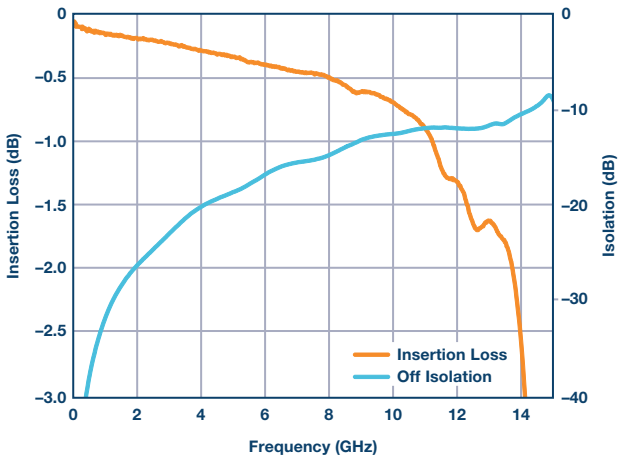
ANALOG DEVICES MAKES MEMS SWITCH TECHNOLOGY A COMMERCIAL REALITY



Product Overview

- The ADGM1304 and ADGM1004 are single-pole, four-throw (SP4T) switches fabricated using Analog Devices internal microelectromechanical systems (MEMS) switch technology.
- This state-of-the-art technology enables a vastly smaller, more reliable, power-saving, lighter, faster switching, and wider bandwidth relay replacement solution.
- The ADGM1304 and ADGM1004 are highly linear, low insertion loss switches that are fully operational from 0 Hz/dc up to 14 GHz and 13 GHz, respectively. The ADGM1004 is further optimized with a 2.5 kV HBM ESD rating.
- A copackaged, low voltage, standard logic compatible driver IC generates the high voltage necessary to internally electrostatically actuate the switch. All four switches are also independently controlled for maximum flexibility.

ADGM1304 Insertion Loss and Off Isolation



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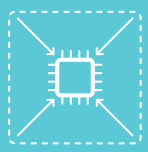
ADGM1304/ADGM1004
Highlights to Remember

Gold cantilever type designs

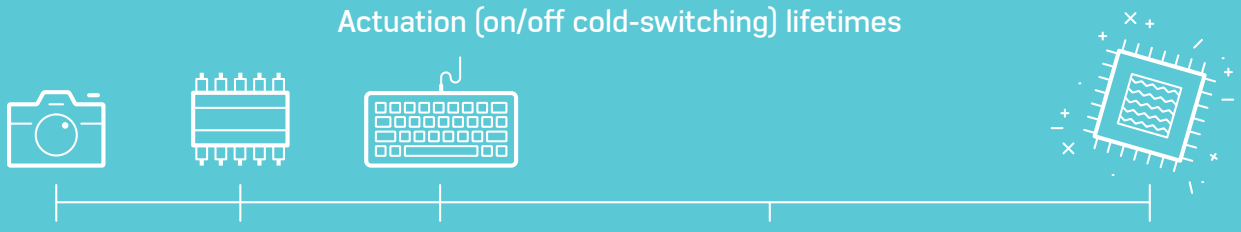


20× smaller than typical EM relays

>10× reduction in power usage

>20× lighter than typical EM relays

Actuation (on/off cold-switching) lifetimes



30× faster switch turn on time (with no sound)

EMR
1000 µsec

MEMS switch
30 µsec

MEMS contact gap (over 100× less than hair width)

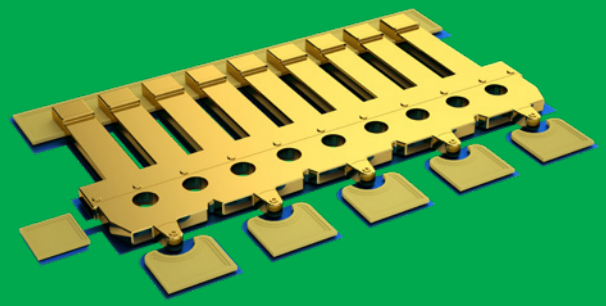
50,000 nm wide

MEMS switch
300 nm
contact gap

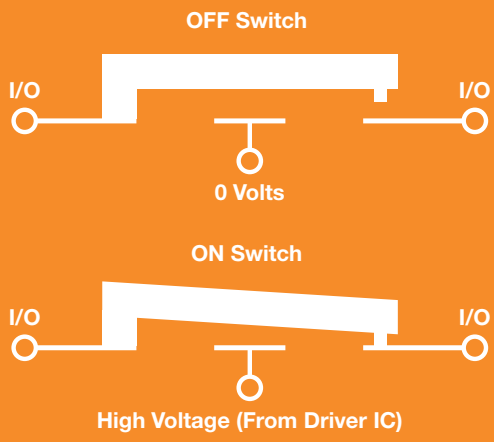
Maximum usable bandwidth
0 Hz/dc to 14 GHz+

dc

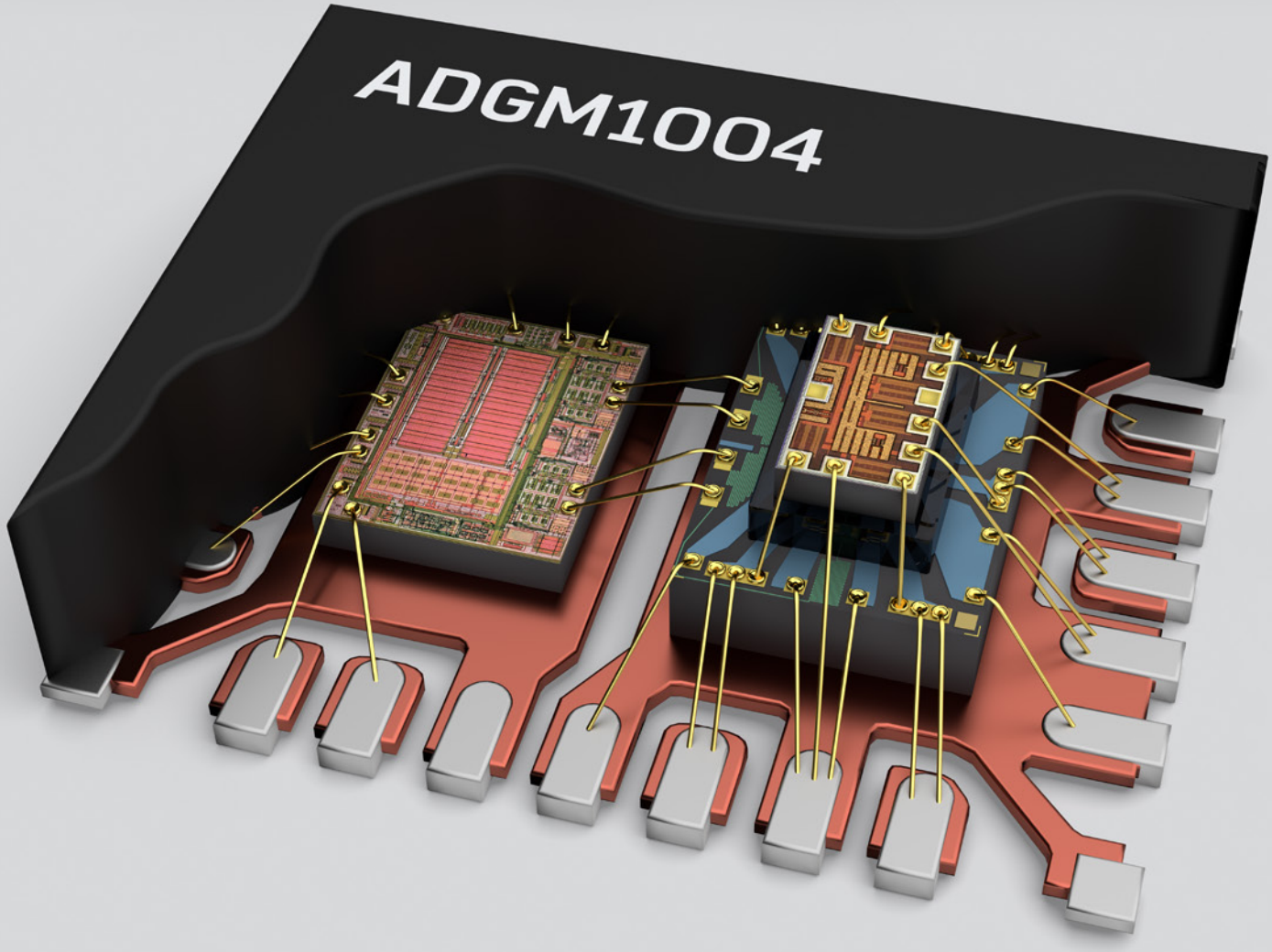
mmW



MEMS Switch Cantilever Structure



MEMS Switch Cantiliver
Actuation Mechanism



ADGM1004 MEMS switch showing inbuilt, low voltage/low power driver on left, MEMS switch on right (SP4T) with mounted, solid-state, 5 kV HBM ESD protection die on RF pins.

ADGM1004 MEMS switch on top of a typical EMR, with up to 95% volume saving.

Introducing a revolutionary 0 Hz/dc to GHz switching solution. Innovative thinking and a proprietary approach offer a superior alternative to conventional relay approaches. Discover what MEMS switch technology can do for you in instrumentation, aerospace and defense, healthcare, communications, and other key markets.

Visit *analog.com/MEMSswitch*

User Guides

UG-644: Evaluating the ADGM1304 0 Hz/DC to 14 GHz, Single-Pole, Four-Throw MEMS Switch with Integrated Driver (Rev. A)

Technical Articles

The Fundamentals of Analog Devices' Revolutionary MEMS Switch Technology

Groundbreaking 5 kV ESD MEMS Switch Technology

Circuit Notes

CN-0377: DC to 2.5 GHz Switchable RF Attenuator Implemented with RF MEMS Switches (Rev. A)

Press Release

Analog Devices Makes MEMS Switch Technology a Commercial Reality

ADGM1304/ADGM1004:
5 mm × 4 mm × 0.95 mm/1.45 mm LFCSP.

Part Number	Device Configuration	Switch R_{ON} (Typ)(Ω)	Leakage Switch Off (Typ) (pA)	Frequency Response (Min) (Hz)	Frequency Response (Max) (GHz)	Insertion Loss (Typ) (dB)	Off Isolation (Typ) (dB)	IIP3 (Typ) (dBm)	Input Power (Max) (dBm)	Specified at Frequency (GHz)	Price 1000 to 4999 ($U.S.)
ADGM1004	(4:1) × 1	1.8	500	0	13	0.45	24	67	32	2.5	39.34
ADGM1304	(4:1) × 1	1.6	500	0	14	0.26	24	69	36	2.5	36.58

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