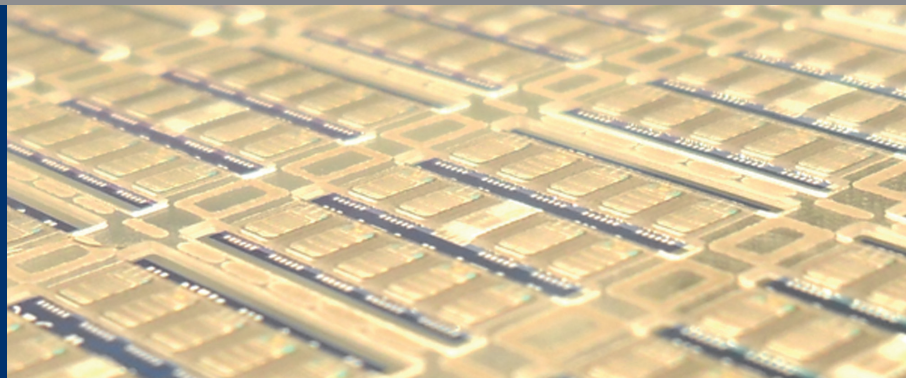
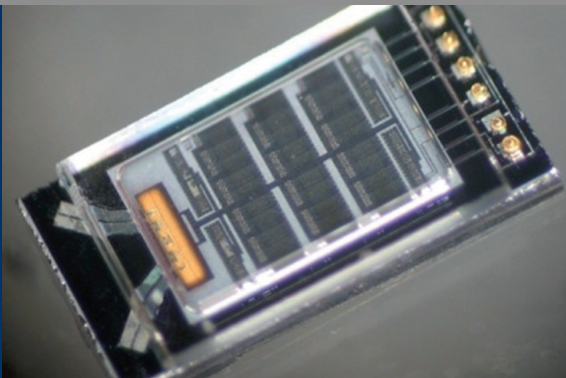




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ENAS

FRAUNHOFER INSTITUTE FOR ELECTRONIC NANO SYSTEMS ENAS



LOW ACTUATION VOLTAGE RF MEMS SWITCH FOR DC TO 30 (70) GHz

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**Forschungsfabrik
Mikroelektronik**
Deutschland

Fraunhofer Institute for Electronic Nano Systems ENAS

Technologie-Campus 3
09126 Chemnitz | Germany

Contact person

Dr. Steffen Kurth
Phone +49 371 45001-255
steffen.kurth@enas.fraunhofer.de

www.enas.fraunhofer.de

General Description

ENAS-SPST 70 TG is an electrostatically actuated Ohmic SPST MEMS switch with lateral motion of the actuation electrodes and of the contacts. Two contact pairs are connected in series for high isolation within a broad frequency range. The device is hermetically sealed by wafer level packaging. It is operated by 5 Volt actuation voltage because of its very large actuation electrode area that is achieved by a deep reactive ion etching. High contact force and high force for contact separation ensure a good contact resistance repeatability and reliability. Since no dielectric material is used in the actuation system, no charging occurs. The switch consists of a silicon substrate that contains the active MEMS part, the wiring, the contacts and the RF lines and of a glass cap or Si cap in case of the 70 GHz type. The cap is attached by die glass bonding at wafer level during the wafer fabrication.

Features

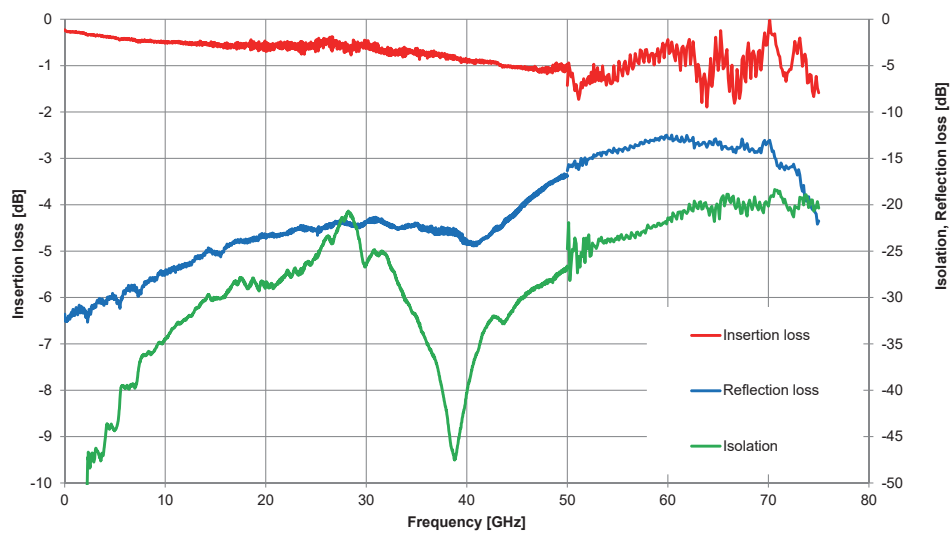
- Very low actuation voltage (5 V typical)
- Extremely low quiescent current (< 10 nA)
- High isolation (typ. -30 dB @ 10 GHz, 20 dB @ 70 GHz)
- Low insertion loss (typ. -0.5 dB @ 10 GHz, 1 dB @ 70 GHz)
- Coplanar waveguide mm-wave ports (70 GHz type only)
- High linearity
- Hermetically sealed
- ESD protection

Applications

- Automated test equipment
- Antenna reconfiguration
- Antenna beam steering
- Controllable phase shifter
- Phase arrays

In cooperation with





Insertion loss and isolation.

Specifications

Spezification	Value	Remark
Insertion loss	0.35 dB	3 GHz
	0.6 dB	20 GHz
	1 dB	70 GHz
Isolation	-45 dB	3 GHz
	-28 dB	20 GHz
	-20 dB	70 GHz
DC on resistance	1.3 Ω	
Activation voltage/current	5 V, < 10 nA	
Actuation time delay	10 μ s	
Release time delay	6 μ s	
AC Crosstalk, actuation to signal	< -40 dB	50 Ohm termination
Max. RF power	36 dBm	Cold switching
0.25 dB compression point	> 36 dBm	94,40%
Dimensions	3.0 x 1.5 x 0.51 mm ³	
Life cycles	10 ⁹	Cold switching

Photo acknowledgments:

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All information contained in this datasheet is preliminary and subject to change. Furthermore, the described system is not a commercial product.