Abstracts

Micromachined Microwave Actuator (MIMAC) Technology - A New Tuning Approach for Microwave Integrated Circuits

L.E. Larson, R.H. Hackett, M.A. Melendes and R.F. Lohr. "Micromachined Microwave Actuator (MIMAC) Technology - A New Tuning Approach for Microwave Integrated Circuits." 1991 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 91.1 (1991 [MCS]): 27-30.

This paper describes a new approach for the realization of tunable/variable III-V planar microwave integrated circuits, which employs micromachined electrostatically controlled actuator technology. This technology is potentially compatible with conventional MMIC fabrication techniques, and allows precise positioning and re-positioning of metal conductors (tuning stubs, switches, capacitor plates, etc.) on an insulating substrate after fabrication is complete. A variety of structures have been fabricated, including electrostatic micro-motors, rotating microwave switches, and variable interdigitated capacitors. A rotating microwave transmission line switch exhibited less than 0.5 dB insertion loss and greater than 35 dB isolation from dc to 45 GHz. A variable interdigitated capacitor exhibited a variation from 35 fF to 100 fF. A number of aspects of the technology require further research, including improvement in starting voltages, repeatability of contacts, and microwave design.

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