Abstracts

A low-loss Ka-band distributed MEMS 2-bit phase shifter using metal-air-metal capacitors

J.S. Hayden and G.M. Rebeiz. "A low-loss Ka-band distributed MEMS 2-bit phase shifter using metal-air-metal capacitors." 2002 MTT-S International Microwave Symposium Digest 02.1 (2002 Vol. I [MWSYM]): 337-340 vol.1.

A two-bit wideband distributed CPW phase shifter has been developed on a 500 /spl mu/m quartz substrate for Ka-band operation. The design utilizes MEMS switches in a DMTL (Distributed MEMS Transmission Line) periodically loaded by MEMS switches and high Q (>250 at 30 GHz) metal-air-metal capacitors. The MEMS switches are actuated by a low 20 volt P-P AC bias voltage via a high-resistance bias line. Estimated spring constant and switching time of the MEMS switch is 30 N/m and /spl sim/9 /spl mu/s, respectively. The two-bit design results in a reflection coefficient better than -11.5 dB, an average insertion loss of -1.5 dB, and phase shifts of 89/spl deg/, 180/spl deg/, and 270/spl deg/ at 37.7 GHz. This is currently the lowest less distributed phase shifter at Ka-band frequencies.

❑ Return to main document.