Abstracts

Tunable microwave load based on biased photoinduced plasma in silicon

B. Boyer, J. Haidar, A. Vilcot and M. Bouthinon. "Tunable microwave load based on biased photoinduced plasma in silicon." 1997 Transactions on Microwave Theory and Techniques 45.8 (Aug. 1997, Part II [T-MTT]): 1362-1367.

The frequency tuning of a quarter-wave resonator using an optoelectronic control is reported. Sharp notch characteristics with a small decibel-insertion loss and tunable frequency with matching better than 45 dB are obtained by varying both the optical power and the DC bias. The measured frequency shift is more than 60% below the dark resonant frequency and is carried out without altering the shape of the response. The biased photoinduced plasma (BPP) loading the open terminated microstrip line is then analyzed by comparing microwave simulations and measurements. The deduced complex load equivalent to this biased photoinduced plasma is then confirmed by semiconductor simulations. Results show the great possibilities offered by this BPP load (BPPL), which can be easily and widely tuned by means of a simple optoelectronic control. The frequency bandwidth of tuning is limited by the geometrical parameters and may be extended to millimeter-wave operation.

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