Abstracts

Cold tests and modeling of low-Q quasi-optical resonators

R.P. Fischer and A.W. Fliflet. "Cold tests and modeling of low-Q quasi-optical resonators." 2001 Transactions on Microwave Theory and Techniques 49.1 (Jan. 2001 [T-MTT] (Mini-Special Issue on 2000 Radio-Frequency Integrated Circuits (RFIC) Conference and Automatic Radio Frequency Techniques Group (ARFTG) Meeting)): 59-66.

Measurements are reported on low-Q open resonators at 85 GHz with a large centered coupling hole in each mirror. This is the first study of open resonators with large diffraction losses and efficient input coupling at millimeter wavelengths. The input resonator for a quasi-optical gyroklystron is described with quality factor Q=2000 and 13% round-trip losses where approximately 65% of the incident power in the waveguide is coupled to the fundamental TEM/sub 00/ mode. Two models have been developed to calculate the coupling from the rectangular waveguide through a circular aperture into the open resonator. Both models properly account for the increased diffraction loss of the resonator when coupling apertures are present. Measured results are in reasonably good agreement with values calculated using both scalar diffraction theory and an equivalent-circuit model.

❑ Return to main document.