Abstracts

Performance of Three-Millimeter Harmonic Generators and Crystal Detectors

J.M. Richardson and R.B. Riley. "Performance of Three-Millimeter Harmonic Generators and Crystal Detectors." 1957 Transactions on Microwave Theory and Techniques 5.2 (Apr. 1957 [T-MTT]): 131-135.

Because of growing applications of millimeter wave measurements, a fairly thorough investigation of what could be expected from sources and detectors in the 3 mm region was made. The sources consisted of fourth-harmonic generators from a 1.25 cm fundamental. A type of crystal holder for both harmonic generators and detectors in which a small crystal wafer is positioned in the broad wall of the millimeter waveguide, being contacted by a whisker passing across the waveguide (the open-guide type) was found to be superior in general to units using crystal cartridges or modifications thereof. Factors affecting the performance of these units have been investigated statistically. It was found that the short-circuit current sensitivity in microamperes per microwatt of a good crystal detector of the type described above is not greatly less than the value for crystals at lower microwave frequencies, so that the minimum detectable signal is about the same. As an additional result, evidence for art important effect in which the harmonic generation process degrades the signal-to-noise ratio of the source is presented and discussed.

❑ Return to main document.