Abstracts

A Wide-Band Monolithic Quasi-Optical Power Meter for Millimeter- and Submillimeter-Wave Applications

C.C. Ling and G.M. Rebeiz. "A Wide-Band Monolithic Quasi-Optical Power Meter for Millimeter- and Submillimeter-Wave Applications." 1991 Transactions on Microwave Theory and Techniques 39.8 (Aug. 1991 [T-MTT]): 1257-1261.

A novel monolithic power meter has been developed for submillimeter-wave applications (100 GHz to 10 THz). The detector is a large-area bismuth bolometer integrated on a 1.2- µm-thick dielectric membrane. This approach results in a wide-band, high-responsivity detector. The power meter is simple to fabricate, inexpensive, and can be easily calibrated using a low-frequency network. Quasi-optical measurements at 90, 140, and 240 GHz show that the bolometer is polarization independent and could be modeled by a simple transmission-line model. Absolute power measurements at 90, 140, and 240 GHz show a ±5% accuracy and agree well with a calibrated Anritsu power meter at 90 GHz. Potential application areas are power calibration, antenna coupling efficiency measurements, and absolute power measurements from solid-state devices and far-infrared lasers at submillimeter wavelengths. Absolute output power measurements on a 220-280 GHz tripler using the quasi-optical power meter are presented as an application example.

❑ Return to main document.