Abstracts

A Fiber Optic/Millimeter-Wave Radio Transmission Link Using HBT as Direct Photodetector and an Optoelectronic Upconverter

E. Suematsu and N. Imai. "A Fiber Optic/Millimeter-Wave Radio Transmission Link Using HBT as Direct Photodetector and an Optoelectronic Upconverter." 1996 Transactions on Microwave Theory and Techniques 44.1 (Jan. 1996 [T-MTT]): 133-143.

The performance of a fiber optic subcarrier Iink using an HBT as a direct photodetector and an optoelectronic up-converter in 50 GHz band has been experimentally investigated at a wavelength of 0.83 µm. From comparison with the performances of links using other MMIC-compatible photodetectors and with that of a high speed PIN-photodetector, this paper shows that the HBT-photodetector is superior to the other MMIC compatible photodetectors (MSM and HEMT). It is also shown that HBT not only has a high photodetection ability in the millimeter-wave band but also provides low conversion loss between a microwave subcarrier modulated by an optical signal and a millimeter-wave carrier. Also demonstrated are video FM-subcarrier transmission and 140 Mbps QPSK digital radio transmission using an HBT optical/RF transducer. At transducer transmission power of around -20 dBm, the HBT optical/RF transducer allows 50 GHz band radio transmission over optical fiber to achieve a weighted SNR of more than 50 dB and a data rate of 140 Mbps in indoor application.

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