Abstracts

A broadband and miniaturized V-band PHEMT frequency doubler

B. Piernas, H. Hayashi, K. Nishikawa, K. Kamogawa and T. Nakagawa. "A broadband and miniaturized V-band PHEMT frequency doubler." 2000 Microwave and Guided Wave Letters 10.7 (Jul. 2000 [MGWL]): 276-278.

In this work, we present the design and measured performances of a V-band frequency doubler fabricated using 0.15 /spl mu/m GaAs pseudomorphic HEMTs and the three-dimensional (3-D) MMIC technology. Thank to the use of an improved 180/spl deg/ rat-race hybrid, the frequency doubler exhibits high spectral purity over a large bandwidth. Isolation better than 30 dB is achieved on a frequency range from 31.736 GHz and fundamental frequency rejection better than 35 dB is achieved between 31.5 GHz and 37.5 GHz. Conversion loss measured at 32.5 GHz is 8.5 dB for an input power of 14 dBm. Both the broadband spectral purity and the small size of 1 mm/sup 2/ make it suitable for the realization of high-quality and widely tunable V-band frequency sources. For the future developments of millimeter-wave wireless communication systems, it offers good perspectives toward the fabrication of single-chip V-band transceiver including the frequency source.

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