Abstracts

38 GHz MMIC PHEMT-based tripler with low phase-noise properties

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Frequency translation circuits are key elements in communication systems. This paper presents a frequency tripler for 38 GHz short-range communication systems, designed using a pseudomorphic high electron-mobility transistor (PHEMT) technology. The successful first iteration MMIC achieved a state-of-the-art output power of 3.1 dBm and a minimum conversion loss of 3.4 dB. The multiplier exhibits a conversion efficiency of 11% and average phase noise degradation at 10 kHz and 100 kHz offset-frequency from carrier of 9/spl plusmn/1 dB. To our knowledge, this is the first reported Ka-band single-stage frequency tripler based on PHEMT technology that has been fully characterized for phase noise degradation.

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