Abstracts

Miniaturized millimeter-wave masterslice 3-D MMIC amplifier and mixer

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Masterslice three-dimensional MMIC (3-D MMIC) technology has (even in the millimeter-wave region) the advantages of high integration levels, simple design procedures, short turnaround time, and low fabrication cost. This paper clarifies the advantages of the thin-film microstrip line by drawing comparisons to the characteristics of other transmission lines. The simple design procedures of the masterslice 3-D MMIC are elucidated by referring to fabricated MMICs. A V-band amplifier and an image rejection mixer fabricated by using the same master array are demonstrated. The V-band amplifier offers an 8-dB gain and a 5.3-dB noise figure in the area of just 0.27 mm/sup 2/. The image rejection mixer achieves a conversion gain of /spl sim/10 db and an image rejection ratio of 20 db. The performance of the millimeter-wave 3-D MMIC's is competitive with those of the conventional planar-formed MMIC's.

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