Abstracts

Uniplanar Monolithic Frequency Doublers

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GaAs monolithic frequency doublers in the 13 GHz band and 26 GHz band have been designed and fabricated. These doublers employ a newly developed uniplanar monolithic microwave IC (MMIC) structure. They are composed of coplanar waveguides, slotlines, and air bridges only on the upper side of the GaAs substrate. These uniplanar MMIC frequency doublers offer the advantages of smaller circuit size and simpler fabrication processes than microstrip-based MMIC's. The fabricated doublers have achieved a conversion gain of 2.9 dB at 12.4 GHz and a minimum conversion loss of 0.7 dB at 24.4 GHz. Furthermore, a 6.5 GHz to 26 GHz frequency quadruple has been made using a cascade connection of the doubler chips. It demonstrated stable operation without any adjustment and achieved a conversion loss of 10 dB.

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