Abstracts

A 94 GHz Planar Monopulse Tracking Receiver

C.C. Ling and G.M. Rebeiz. "A 94 GHz Planar Monopulse Tracking Receiver." 1994 Transactions on Microwave Theory and Techniques 42.10 (Oct. 1994 [T-MTT]): 1863-1871.

This paper describes the design, fabrication and measurements of a 94 GHz integrated monopulse receiver with IF beam control. The receiver is integrated on a single chip, and is based on a 23 GHz local oscillator driving four separate phase-coherent 94 GHz subharmonic mixers. The resulting IF signals are takeoff-chip to a IF monopulse processor, which produces sum and difference monopulse patterns for the elevation and azimuth coordinates. Voltage-controlled phase-shifters in each of the IF channels allow the monopulse patterns to be electronically steered. All of the receiver circuits are realized using uniplanar coplanar-waveguide (CPW), slot lines and coplanar striplines (CPS). These features result in a compact, low-cost system suitable for tracking systems operating in poor visibility conditions, as well as in collision avoidance receivers for automotive applications. To our knowledge, this work represents the first demonstration of a fully integrated millimeter-wave subsystem to date.

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