Abstracts

Integrated X-Band Sweeping Superheterodyne Receiver

P.J. Meier, H.C. Okean and E.W. Sard. "Integrated X-Band Sweeping Superheterodyne Receiver." 1971 Transactions on Microwave Theory and Techniques 19.7 (Jul. 1971 [T-MTT] (Special Issue on Microwave Integrated Circuits)): 600-609.

The development of an integrated low-noise sweeping superheterodyne receiver is described. Based upon a receiver performance tradeoff study, a group of components were designed and integrated within a single housing occupying 5.9 in, less connectors. The integrated receiver weighs 6.4 oz, including magnets, and contains the following components: a wide-band low-noise tunnel-diode amplifer (TDA), an image-rejection balanced mixer, a varactor-tuned Gunn oscillator, a four-stage IF amplifier, and a quasi-complementary IF output filter. The housing also contains an interstage ferrite isolator, a bias distribution network with subminiature potentiometers, and a branch-line coupler. This coupler permits the injection of an external oscillator and allows the system to be evaluated outside the band covered by the internal Gunn oscillator. This receiver is the first kind to integrate within a minimum volume all the components necessary for a wide-band low-noise rapid-scan X-band imageless superheterodyne receiver. Varactor tuning permitted the entire receiver to be integrated in a package having about one fifth the weight and two fifths the volume of other similar receiver designs (e.g., a receiver utilizing a YIG-tuned oscillator).

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