Abstracts

Megalithic microwave signal processing for phased-array beamforming and steering

T. Ohira, Y. Suzuki, H. Ogawa and H. Kamitsuna. "Megalithic microwave signal processing for phased-array beamforming and steering." 1997 Transactions on Microwave Theory and Techniques 45.12 (Dec. 1997, Part II [T-MTT] (1997 Symposium Issue)): 2324-2332.

A microwave signal processing (MSP) architecture is presented for active phased array beam forming and steering. A large scale network, comprising 63 power dividers and 32 pairs of vector-synthetic phase/amplitude controllers, has been successfully developed in an 11 mm/spl times/13 mm GaAs monolithic microwave integrated circuit (MMIC). It has a huge integration level of 128 metal-semiconductor field effect transmitters (MESFETs), 448 spiral inductors, 527 metal-insulator-metal (MIM) capacitors, and 357 ion-implanted resistors. The expected 360/spl deg/ phase is successfully obtained at all the output ports. Vector error standard deviations exhibited are within 0.38-dB root-mean square (rms) and 2.8/spl deg/ r.m.s. over the bandwidth of 20 MHz at 2.5 GHz. This megalithic chip could mark an epoch in phased array systems.

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