Abstracts

A highly integrated multi-functional chip set for low cost Ka-band transceiver (1998 [RFIC])

D.L. Ingram, L. Sjogren, J. Kraus, M. Nishimoto, M. Siddiqui, S. Sing, K. Cha, M. Huang and R. Lai. "A highly integrated multi-functional chip set for low cost Ka-band transceiver (1998 [RFIC])." 1998 Radio Frequency Integrated Circuits (RFIC) Symposium 98. (1998 [RFIC]): 227-230.

This paper presents the development of a highly integrated multi-functional chip set for low-cost Ka-band transceiver. The transmitter portion consists of a 17.5-to-35 GHz doubler macrocell which delivers >20 dBm of output power, a Ka-band SPDT polarization switch macrocell with >45 dB of isolation and a >10-W high power module. The receiver portion consists of a Ka-band doubler macrocell, an InGaAs/lnAlAs/InP HEMT Ka-band balanced LNA with 1.9 dB noise figure and 19 dB gain and a Ka-band image rejection mixer with >32 dB image rejection and 5.5 dB conversion loss. The high power module consists of two power modules; each can deliver 6-W with 24% PAE and an associated power gain of 21.5 dB. The power module consists of a driver amplifier and two power amplifier chips. These MMIC amplifiers were fabricated with a 2-mil thick substrate using 0.15-/spl mu/m InGaAs/AlGaAs/GaAs HEMT technology. The total GaAs real estate required for implementation of a typical pulsed-FM transceiver is <150 mm/sup 2/. This highly integrated chip set will also reduce the assembly cost substantially.

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