Abstracts

A highly integrated multi-functional chip set for low cost Ka-band transceiver (1998 Vol. I [MWSYM])

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 Vol. I [MWSYM])." 1998 MTT-S International Microwave Symposium Digest 98.1 (1998 Vol. I [MWSYM]): 301-304.

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-InAlAs-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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