Abstracts

Miniaturized Reverse Modulation Loop of a CQPSK 120-Mbit/s Modem for Spacecraft Applications

K.H.R. Kirmse, R.K. Gupta, F.T. Assal and R.T. Kroll. "Miniaturized Reverse Modulation Loop of a CQPSK 120-Mbit/s Modem for Spacecraft Applications." 1992 Transactions on Microwave Theory and Techniques 40.6 (Jun. 1992 [T-MTT] (Special Issue on Microwaves in Space)): 1165-1170.

The design and performance of a miniaturized reverse modulation loop (RML) for a 120-Mbit/s coherent quadrature phase shift keying (CQPSK) modern for on-board satellite applications are presented. Analysis of time delays within the RML circuit indicates that any differential time-delay errors can adversely affect the associated BER and should be minimized. The RML circuit, consisting of a modulator, demodulator, and comparator circuit, has been fabricated using quasi-monolithic techniques with dimensions of 1.65 x 4 cm. The relative phase for all four states of the modulator is in close agreement with design values of 90° ±1°over a 200-MHz bandwidth at 3.95 GHz. The demodulator and comparator circuits of the RML have successfully recovered a 120-Mbit/s bit stream. The RML circuit is capable of recovering higher bit rates because of relatively uniform amplitude and phase performance over the 3.7- to 4.2-GHz communications satellite band.

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