Abstracts

Direct multilevel carrier modulation using millimeter-wave balanced vector modulators

A.E. Ashtiani, Sueng-Il Nam, A. d'Espona, S. Lucyszyn and I.D. Robertson. "Direct multilevel carrier modulation using millimeter-wave balanced vector modulators." 1998 Transactions on Microwave Theory and Techniques 46.12 (Dec. 1998, Part II [T-MTT] (1998 Symposium Issue)): 2611-2619.

The importance of being able to design affordable, high-performance, millimeter-wave transmitters for digital communications and radar applications is increasing. To this end, two monolithic millimeter-wave vector modulators have been realized at 38 and 60 GHz for use in direct multilevel carrier modulation. It is shown that, by employing balanced biphase amplitude modulator elements, accurate constellations are achieved with broad-band operation from 20 to 40 GHz and 55 to 65 GHz. Modulations of 16- and 256-QAM have been demonstrated, both at 38 and 60 GHz, using this technique. Each balanced biphase amplitude modulator uses a pair of reflection-type attenuators operated in push-pull mode. This study investigates the suitability of this topology for use as a full biphase amplitude modulator for multilevel digital modulation schemes. It is found that the technique is very robust and the resulting analog vector modulator can be a very important component for many future millimeter-wave applications.

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