Abstracts

FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers

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We describe the design and construction of planar FET-based quasi-optical sources and transceivers. The circuits are quite simple in construction and exhibit isotropic conversion gain. Both single-device and balanced transmitter and transceiver circuits are described. Balanced sources are reported which may be operated in push-pull mode for power combining or in push-push mode for frequency doubling. A single-FET quasi-optical oscillator circuit using a microstrip patch linear array is reported with an effective radiated power of 31.6 dBm at 10 GHz. A dual-FET frequency-doubling oscillator circuit using a coupled rampart line antenna is reported with an effective radiated power of 21.6 dBm at 19.7 GHz. Quasi-optical transceiver elements are reported which use the FET's as both signal sources and self-oscillating mixers for down-conversion of the received signal. The application of these transceiver elements to Doppler motion detection is reported.

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