Abstracts

A Q-Band Monolithic Balanced Diode Mixer Using AlGaAs/GaAs HEMT and CPW Hybrid

T.H. Chen, T.N. Ton, G.S. Dow, K. Nakano, L.C.T. Liu and J. Berenz. "A Q-Band Monolithic Balanced Diode Mixer Using AlGaAs/GaAs HEMT and CPW Hybrid." 1990 MTT-S International Microwave Symposium Digest 90.2 (1990 Vol. II [MWSYM]): 895-898.

A Q-band balanced diode mixer has been developed using AIGaAs/GaAs HEMTs, a CPW ratrace hybrid, and a lumped-element low-pass filter. The mixer can be easily intergrated with the RF, LO, and IF HEMT amplifiers on one chip because it uses HEMT as a mixer diode. Furthermore, the mixer does not require backside and via-hole process and has small size, 1.4 X 1.5 mm. Therefore, it has good RF circuit yield. The mixer downconverts the 41- 48 GHz RF to a 0.5 - 3.5 GHz IF. Without DC bias, it shows 9.4 dB conversion loss for RF at 42 GHz, with a LO drive of 11 dBm at 44.45 GHz. The presented mixer is the first monolithic CPW mixer for operation at Q-band frequencies.

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