Abstracts

A direct Ku-band linear subharmonically pumped BPSK and I/Q vector modulator in multi-layer thin-film MCM-D (2001 [RFIC])

G. Carchon, D. Schreurs, W. De Raedt, P. Van Loock and B. Nauwelaers. "A direct Ku-band linear subharmonically pumped BPSK and I/Q vector modulator in multi-layer thin-film MCM-D (2001 [RFIC])." 2001 Radio Frequency Integrated Circuits (RFIC) Symposium 01. (2001 [RFIC]): 295-298.

A direct Ku-band linear subharmonically pumped BPSK and I/Q vector modulator has been developed using multi-layer thin-film MCM-D technology. All passives are integrated in the low cost MCM-D substrate. The subharmonic mixing is performed using a beam-lead anti-parallel diode pair, mounted onto the MCM using thermocompression. No tuning has been performed on the circuits. The BPSK modulator has a very flat mixer conversion due to an optimal harmonic loading of the third harmonic of the LO: measurements show a +/-0.25 dB variation on the conversion loss for an LO-frequency varying between 6.8-7.6 GHz. The LO and RF return loss are below -14 dB and -12.5 dB respectively. The I/Q vector modulator consists of a Wilkinson power divider, a CPW Lange coupler and 2 BPSK modulators. The LO and RF return loss are better than -13 dB and -18 dB respectively. The QPSK-modulator has a measured image rejection better than -27 dB over the RF-range of 13.4-15.2 GHz band (corresponding to a vector phase and amplitude error lower than 2/spl deg/ and 1%). The image rejection is even better than -32 dB over the VSAT band (RF: 14-14.5 GHz).

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