Abstracts

A Low Cost DBS Low Noise Block Downconverter with a DR Stabilized MESFET Self-Oscillating Mixer

G.-W. Wang, T.-J. Lin, W.-C. Liu and S.-Y. Yang. "A Low Cost DBS Low Noise Block Downconverter with a DR Stabilized MESFET Self-Oscillating Mixer." 1994 MTT-S International Microwave Symposium Digest 94.3 (1994 Vol. III [MWSYM]): 1447-1450.

We have developed a new X-band low noise block downconverter with a DR stabilized MESFET self-oscillating mixer (SOM) for DBS application. The SOM oscillation frequency is 9.75 GHz with a temperature stability of 1.8 ppm/°C from -40°C to 70 °C. The phase noise is measured to be -106 dBc/Hz at 100 KHz away from the carrier. The SOM provides a min. conversion gain of 4 dB and a max. SSB noise figure of 3.3 dB for RF signal from 10.7 GHz to 11.8 GHz. The downconverter, which consists of two stages of HEMT RF amplifier, bandpass filter, SOM, and IF amplifier, provides a max. noise figure of 1.2 dB and a min. conversion gain of 53 dB across the same RF frequency. This simple downconverter structure reduces component count and leads to lower cost and better yield.

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