

Towards a THz Sideband Separating Subharmonic Schottky Mixer

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Today GaAs Schottky mixers with state of the art planar submicron diodes are used for THz-detection up to 3 THz [1]. GaAs Schottky diodes can operate in room temperature which makes them good candidates for space applications and an interesting low cost alternative to low noise cryogenic SIS and HEB technologies.

To our knowledge this is the first time a sideband separation mixer [2] using subharmonic Schottky mixers is presented. We will present the current status of the development of a novel sideband separating subharmonic receiver topology operating at 340 GHz, see Fig1. The design of a subharmonic mixer and the LO and RF waveguide hybrids will be presented followed by an account of measured S-parameters and mixer noise temperature.

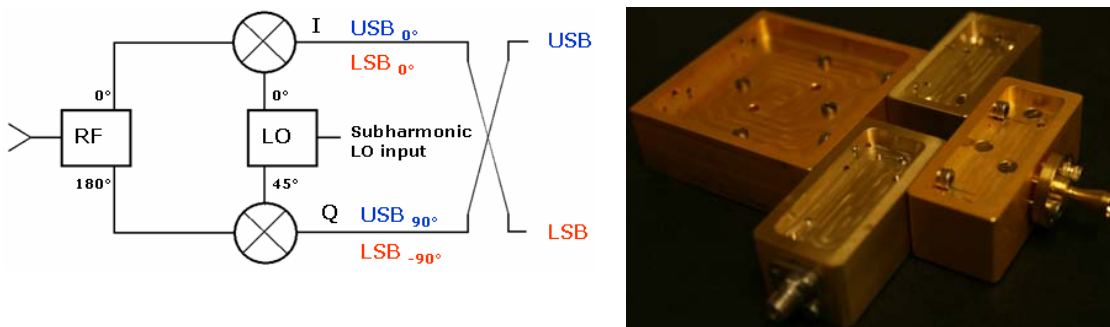


Fig1. Schematic of the sideband separation mixer (left) and modular assembly (right).

[1] L. Hesler, T.W. Crowe, W.L. Bishop, R.M. Weikle, R.F. Bradley and Pan Shing-Kuo, "The development of planar Schottky diode waveguide mixers at submillimeter wavelengths", IEEE MTT-S International Microwave Symposium Digest, vol 2, pp. 953-6, 1997.

[2] Risacher, V. Vassilev, V. Belitsky, A. Pavolotsky, "Design of a 345 GHz Sideband Separation SIS Mixer", Proceedings of 3rd ESA Workshop on Millimeter Wave Technology and Applications: Circuits, Systems and Measurement Techniques, 21-23 May 2003, Espoo, Finland