Sub-mm Wave Schottky Mixer Pumped with 170µW Optically Generated Local Oscillator Power

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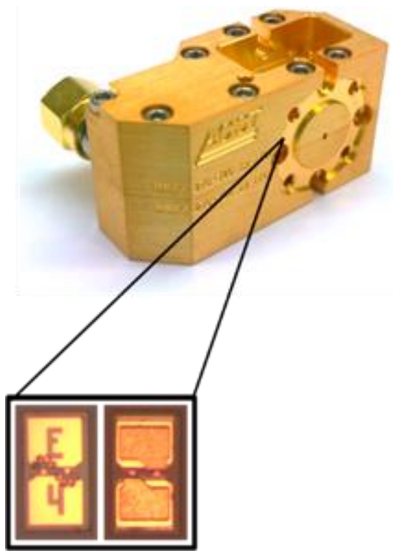
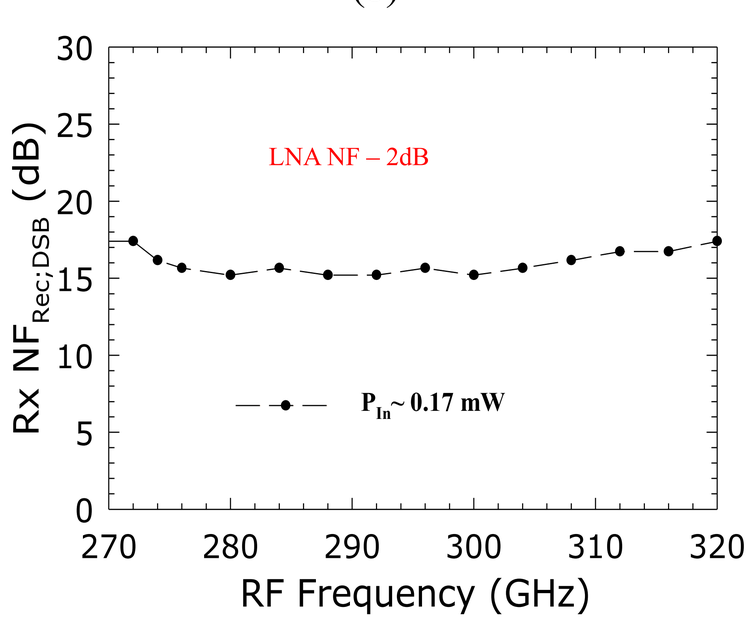
Introduction: A 270-320 GHz Low Barrier Schottky Mixer pumped with 0.17 mW input LO power is reported here. The mixer has been fully designed and developed by ACST GmbH. The reduction of barrier height on these didoes permit the use of this mixer in optical communication systems, which usually can provide less power than electrical approaches. High-Power UTC-PD designed in University Duisburg Essen has been used as LO source, able to provide enough power for such a purpose.

Low Barrier Schottky Mixer



(a)

(b)



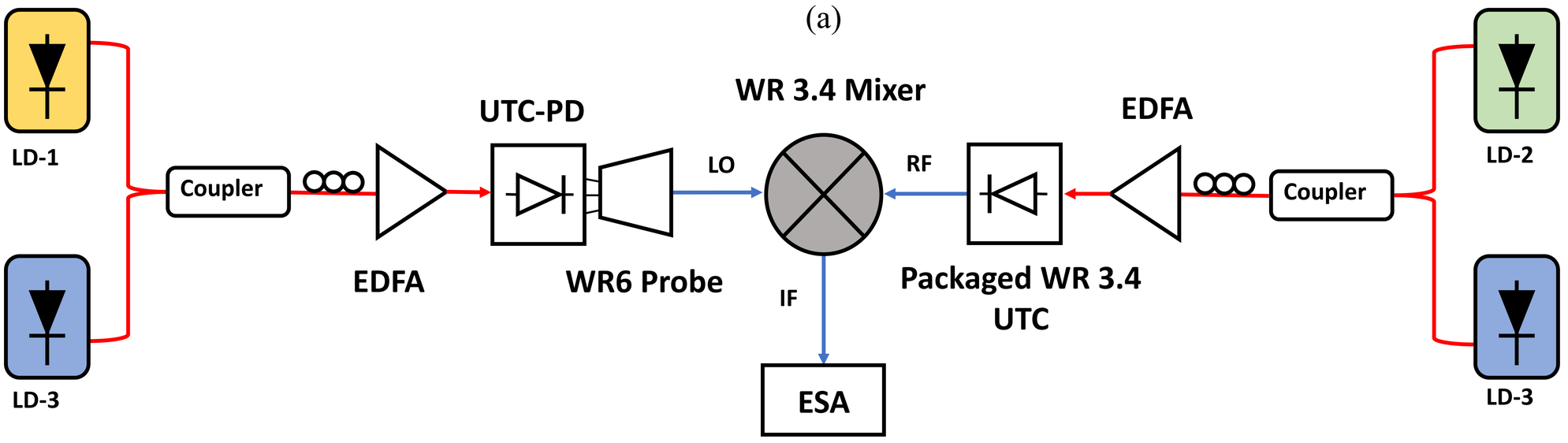
Mixer main features:

- LO Frequency: 135-160GHz
- LO Input Power: -7.5 dBm
- IF Frequency: 0-18 GHz

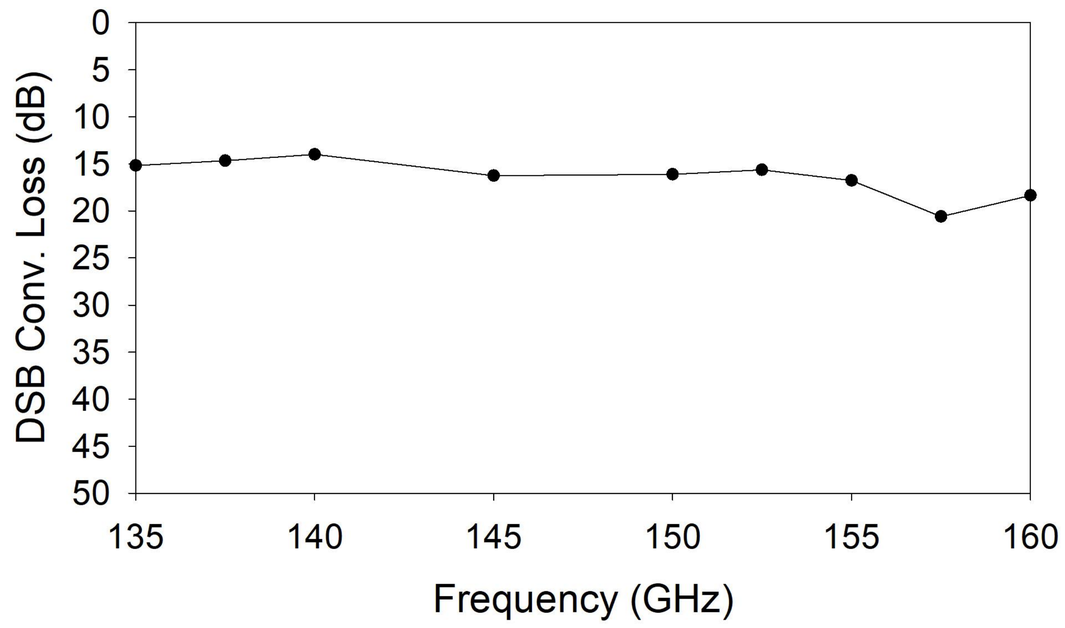
Figure 1:
(a) Mechanical block and diodes of the Low Barrier Schottky Diode Mixer (b) Noise Figure of the Mixer obtained using the Y-factor measurements with electrical pumping.

Experimental Performances

(a)



(b)



(c)

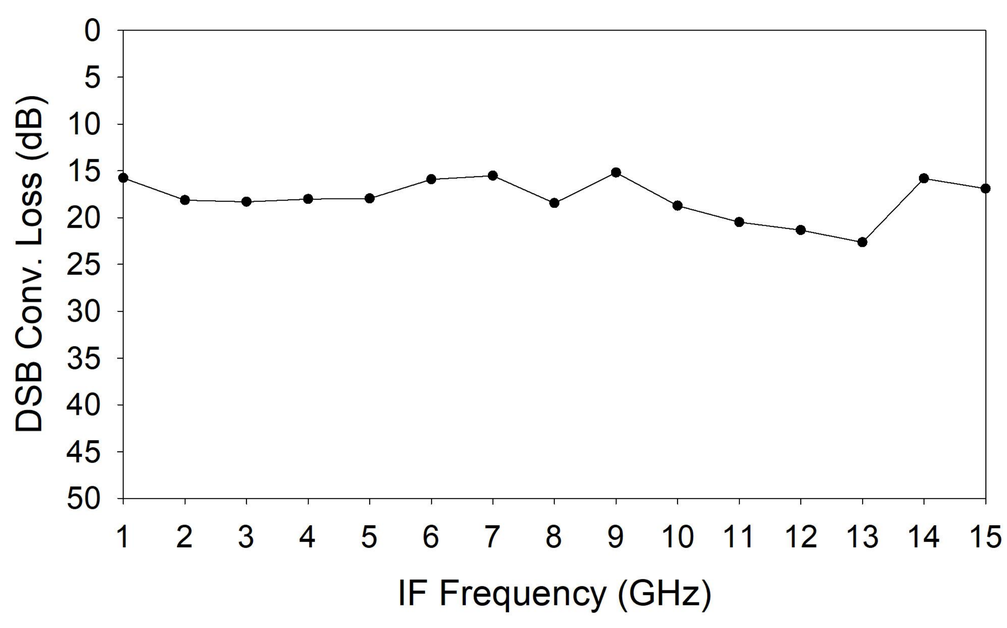


Figure 2: (a) Schematic of the measurement setup (b) Measured DSB Conversion Loss with a fixed IF at 1GHz (c) Measured DSB Conversion Loss at 150 GHz sweeping the IF frequency.

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