Research Consortium in Speckled Computing

Compact 10 GHz Transceiver for WSN Applications

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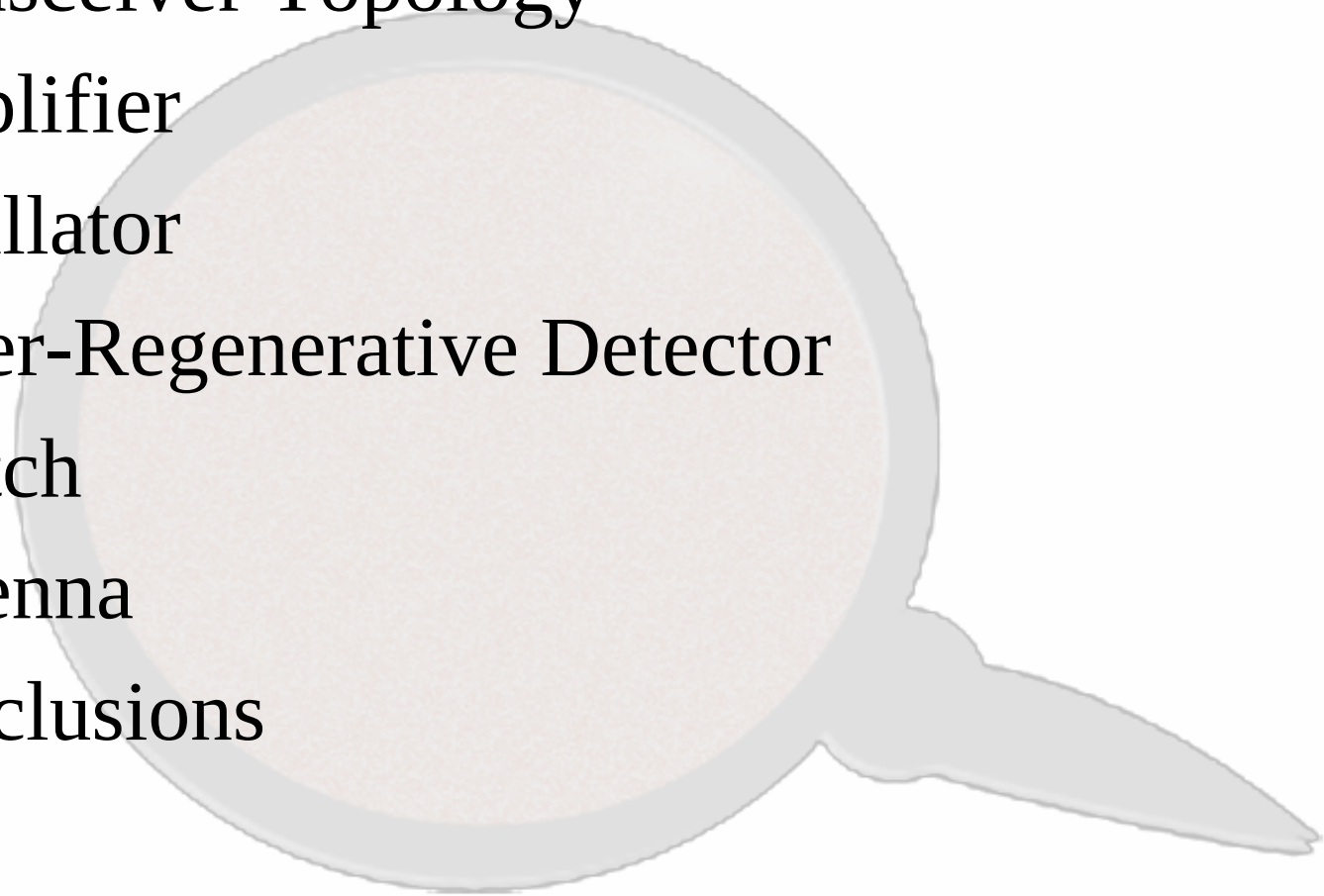
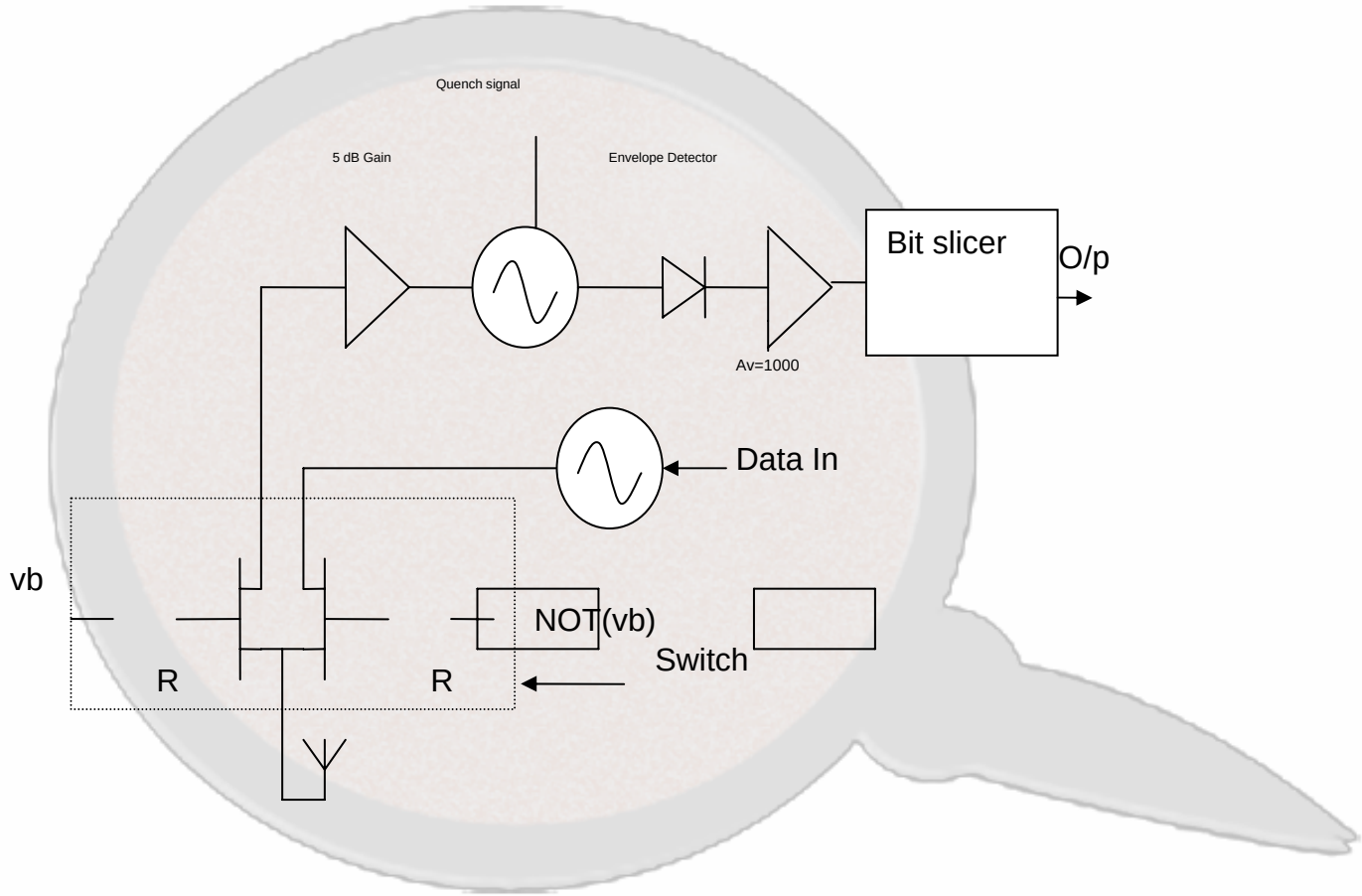
Outline of Talk

- Transceiver Topology
- Amplifier
- Oscillator
- Super-Regenerative Detector
- Switch
- Antenna
- Conclusions

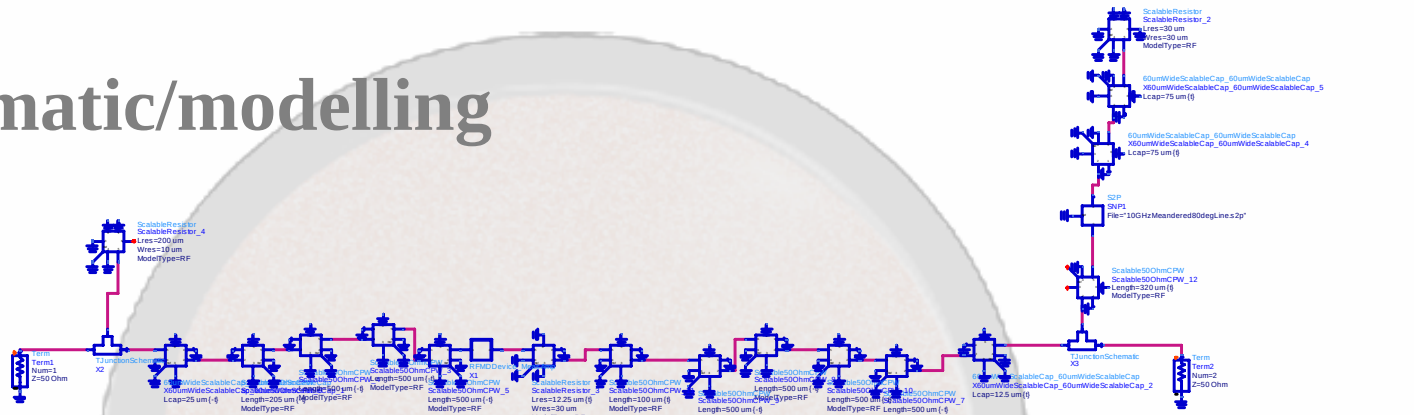


Super-Regenerative Transceiver Topology

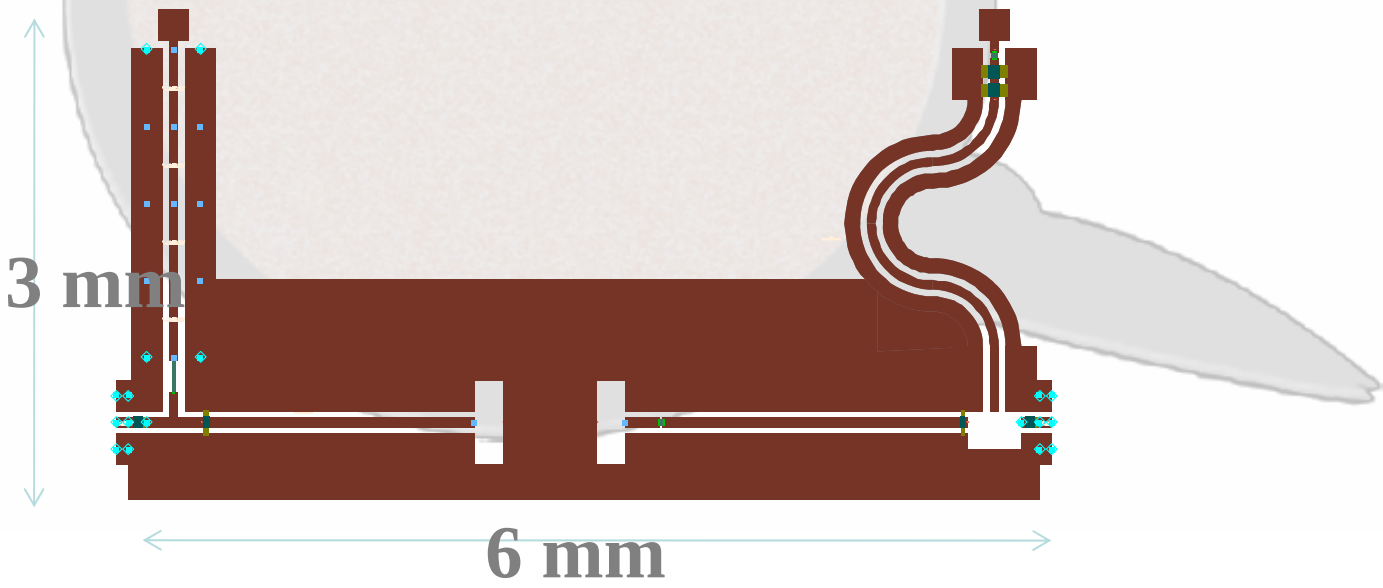


10 GHz Amplifier

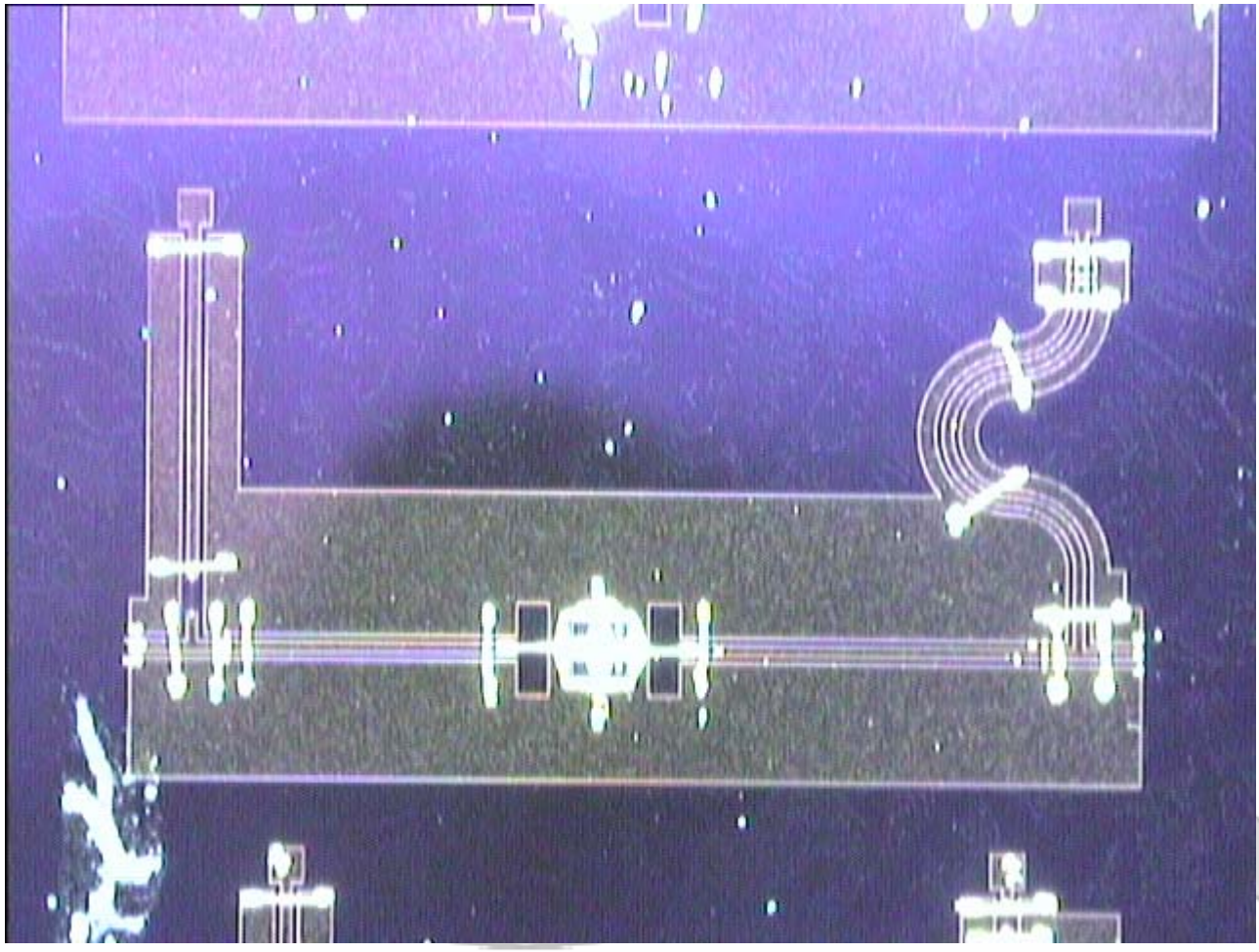
Schematic/modelling



Layout

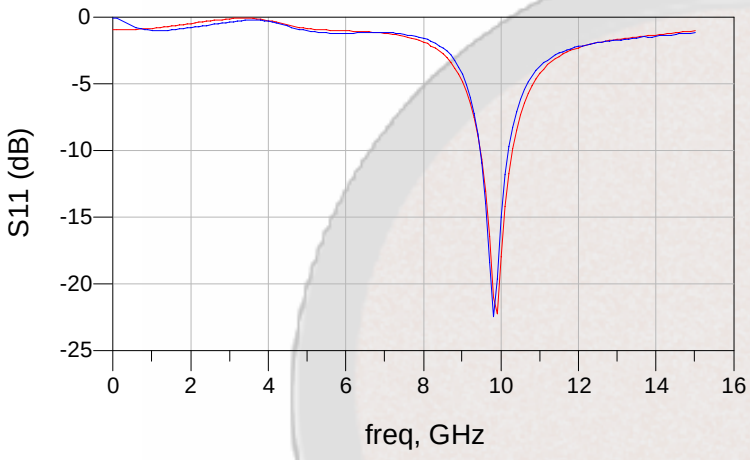


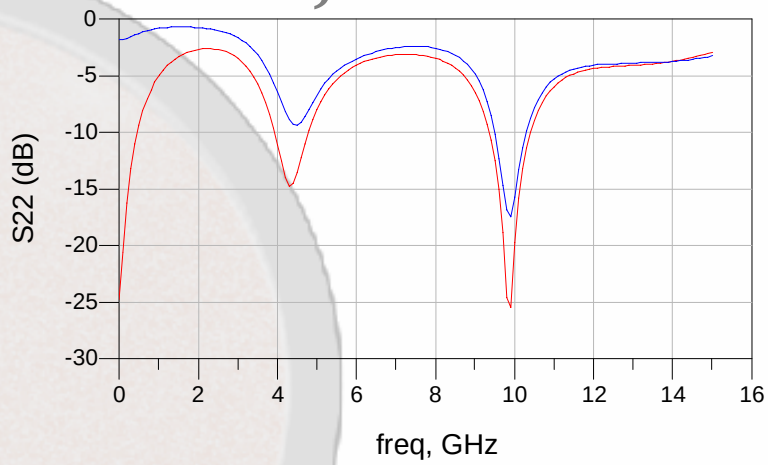
Amplifier Picture

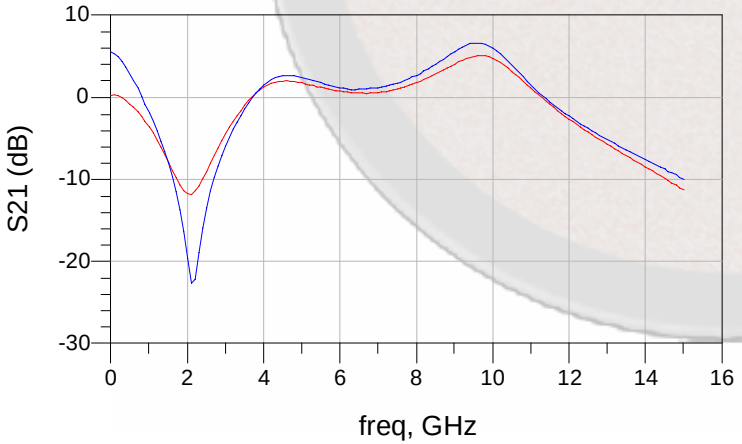


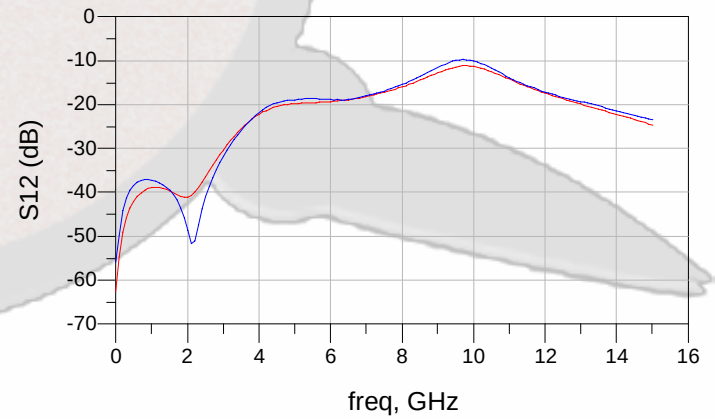
Amp: Simulated and Measured data

Blue=measured, red=modelled

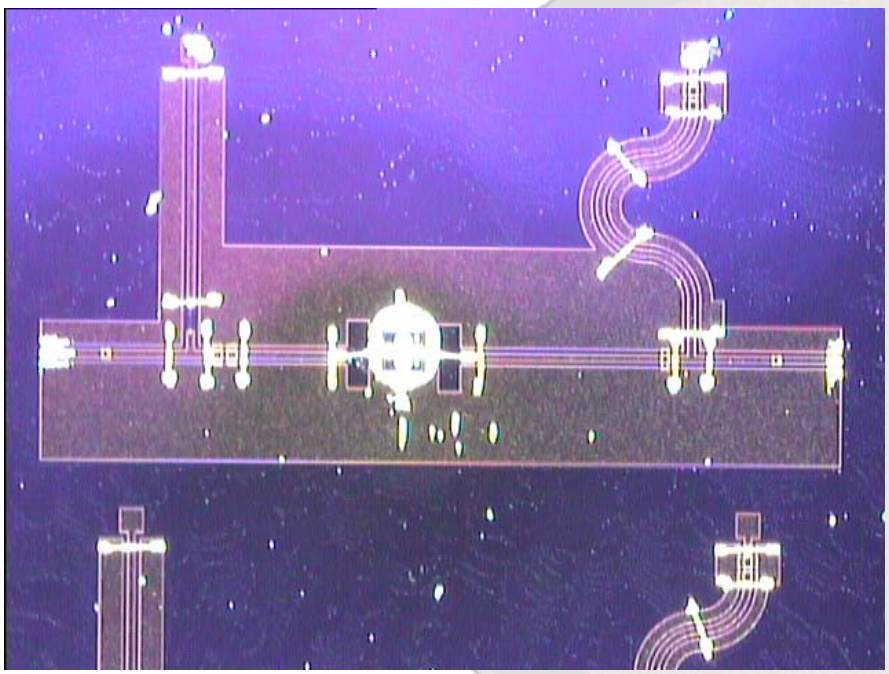


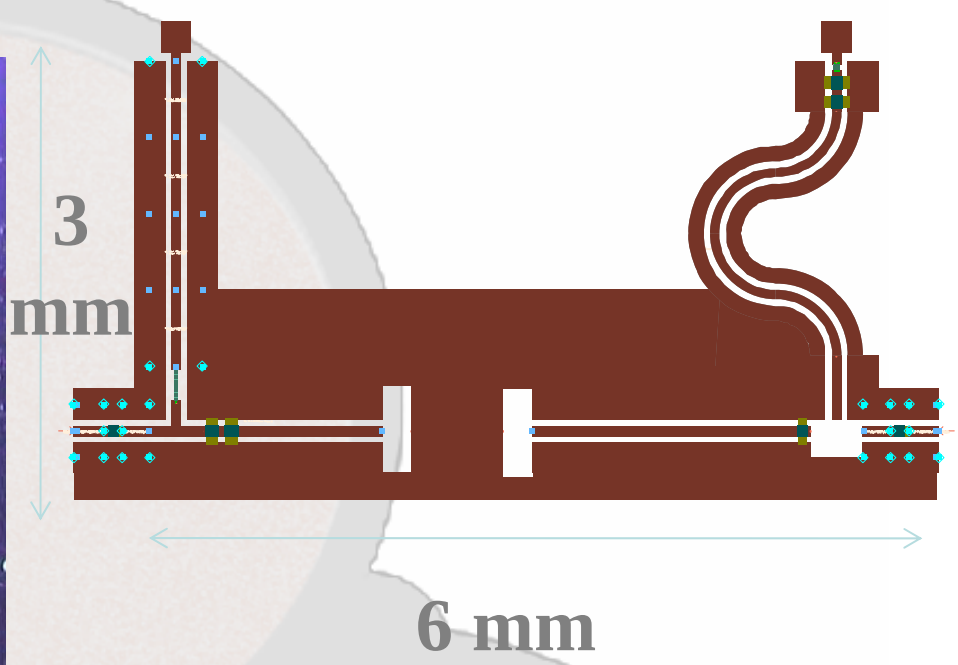




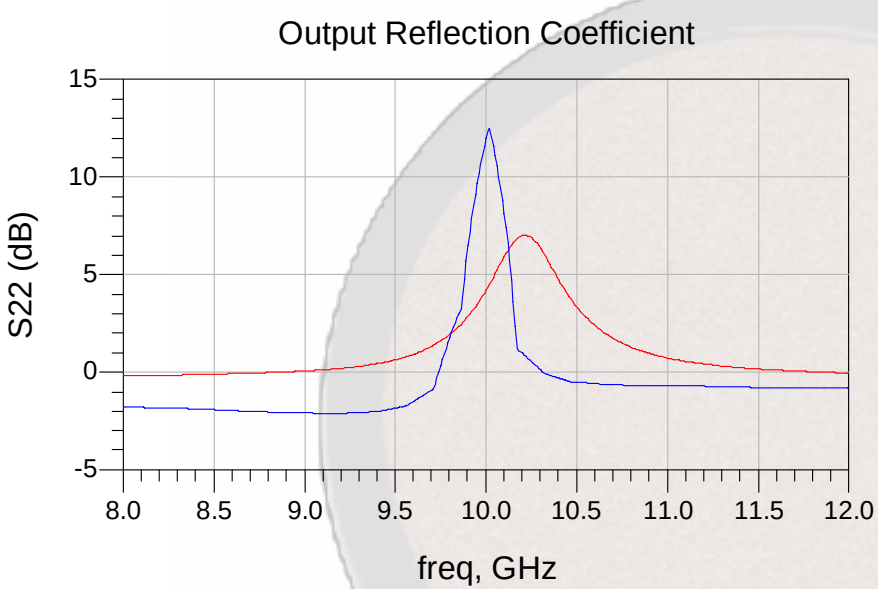


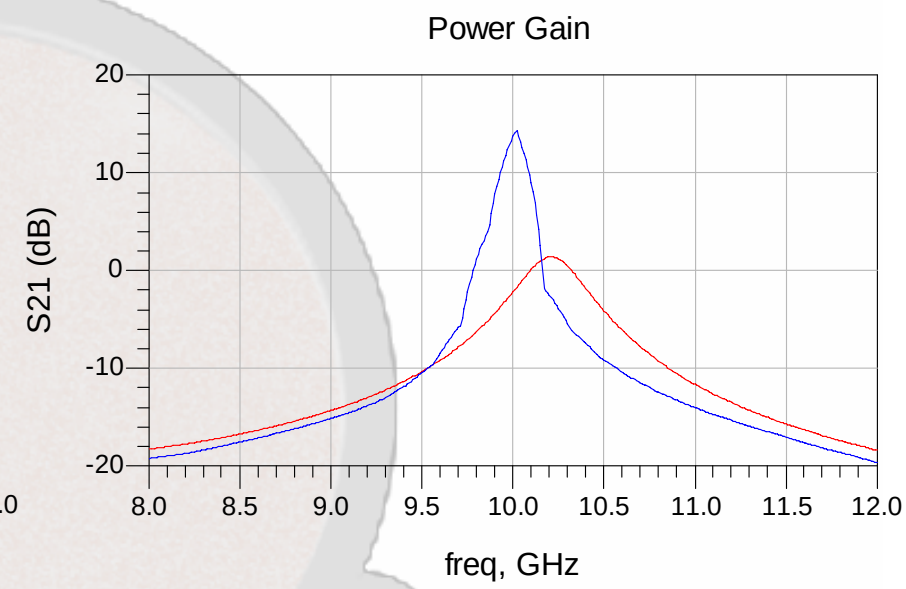
Oscillator



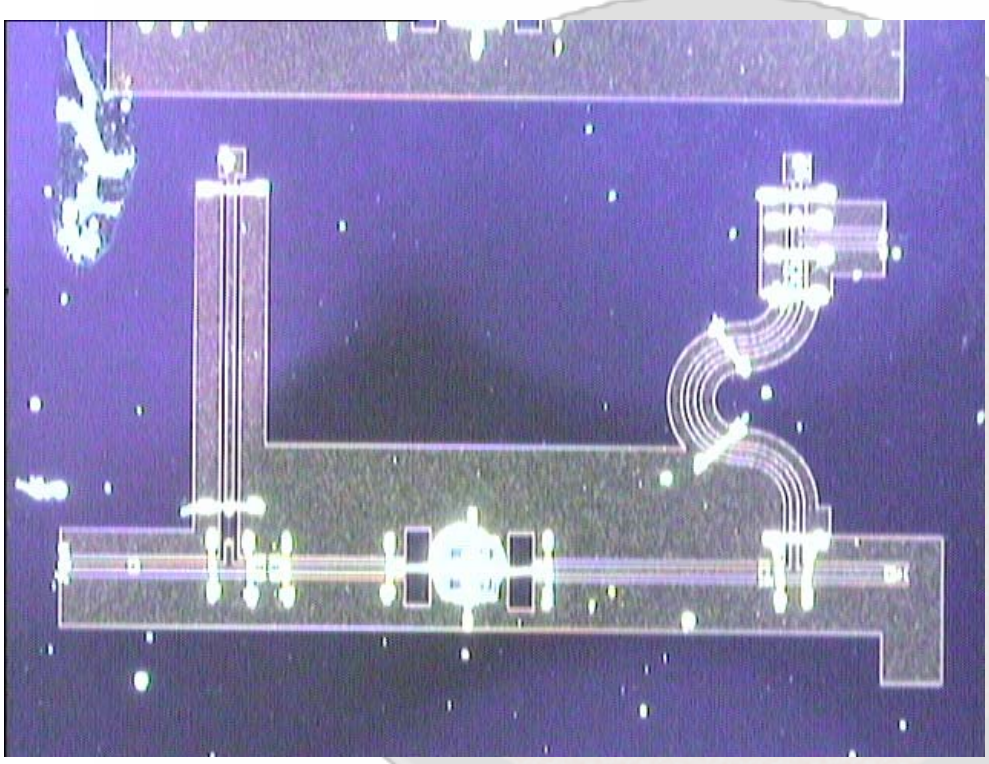


Oscillator: Sim. and Meas. data



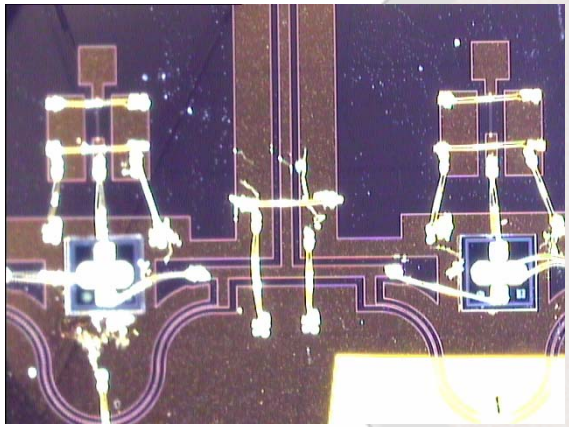


Super-Regenerative Detector

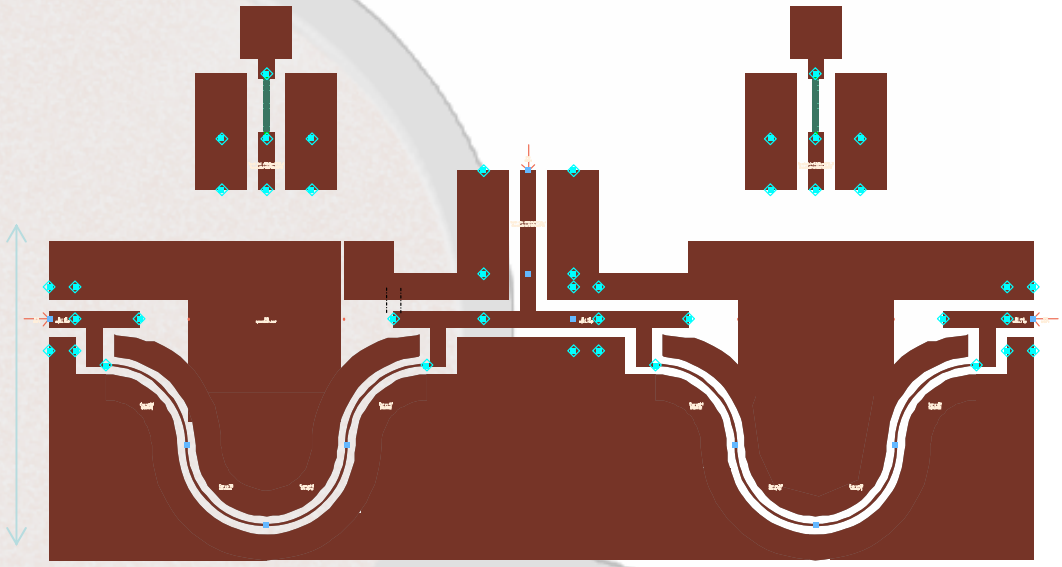


- Oscillates at 10 GHz
- Demodulates
- No data on Sensitivity yet

Switch



2 mm

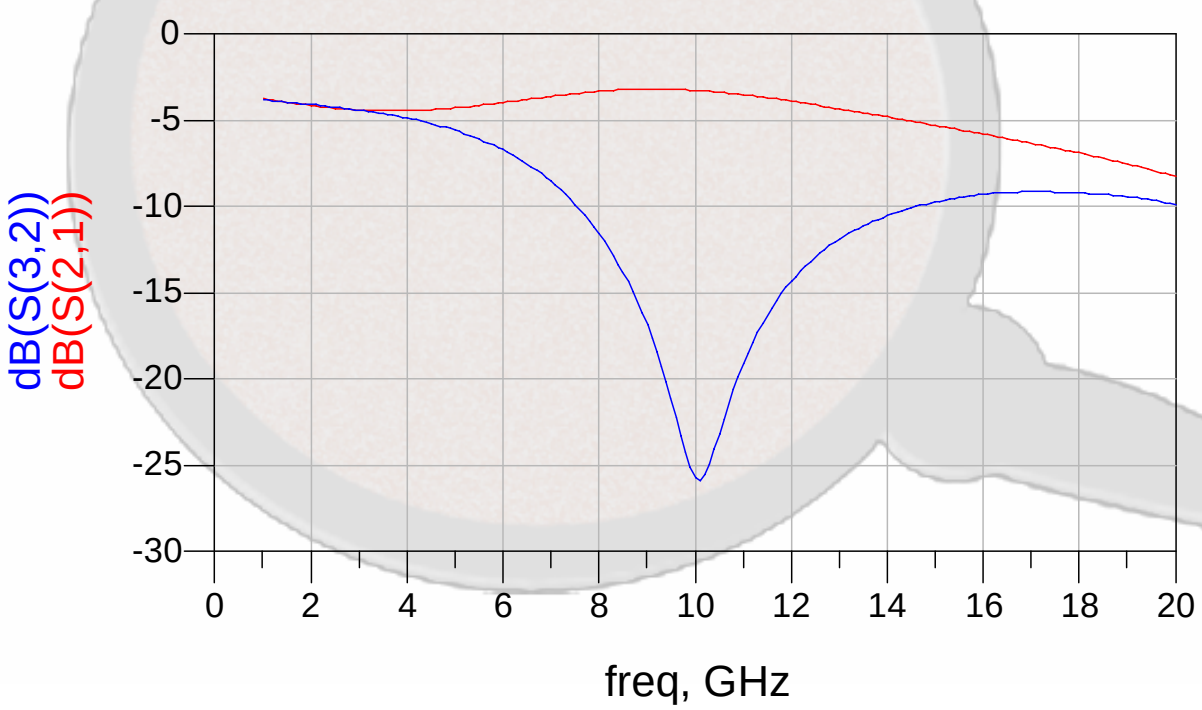


4 mm

Switch Data

Simulated:

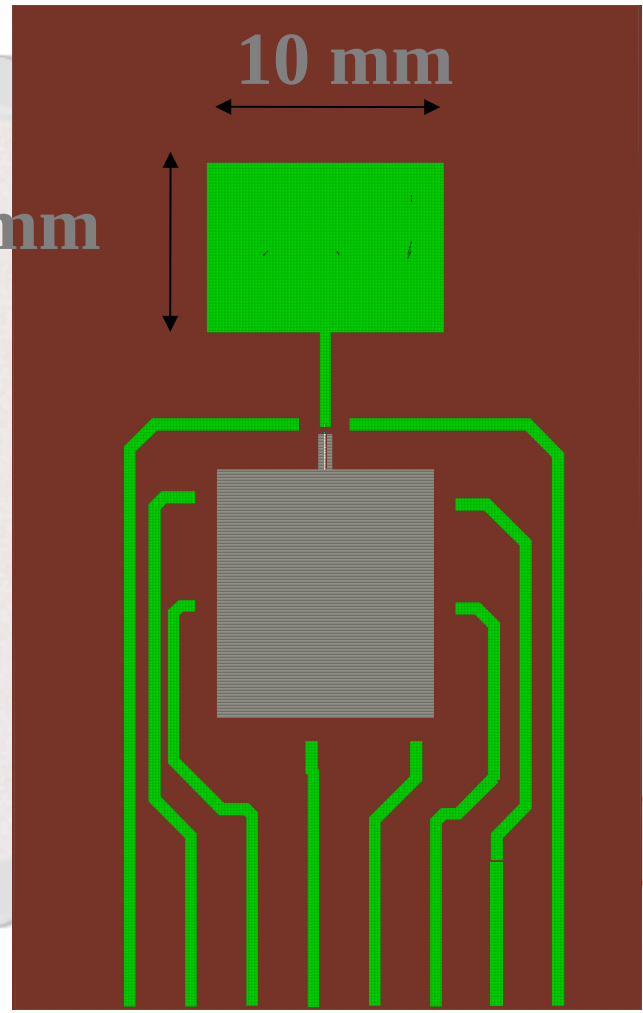
Practical difficulty with measurement
However, low insertion loss and excellent match has been measured



Antenna

Patch on Low dielectric Substrate

Gain approx 4 dB



Cocnlusions

- Amplifier works
- Switch Works
- Oscillator works
- Rx oscillator/detector work
- Transceiver ready to be diced and placed in carrier board with antenna before complete system measurement
- With Thanks to Chi Jeon and Lai Bun Lok (bonding etc), Richard Oxland (fabrication) and Griogair Whyte (antenna)