Ambient Backscatter Communication Systems

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Overview

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Project Goals

1. Provide low power communication using WIFI
2. Provide stealth communication without using a battery

What is ABCS?

ABCS is a system that leverages radio frequency energy for power and communications.

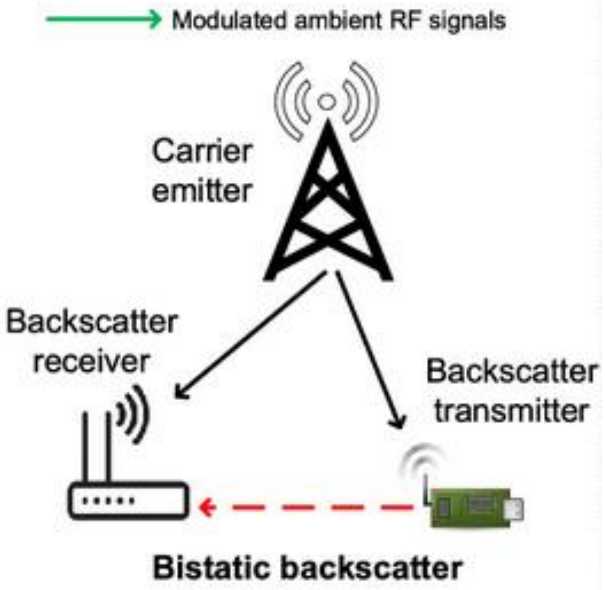
Achieved with very Low Power consumption

How Does it work?

RF source

Transmitter absorbs RF power

Data transmitted to receiving device



Design Requirements

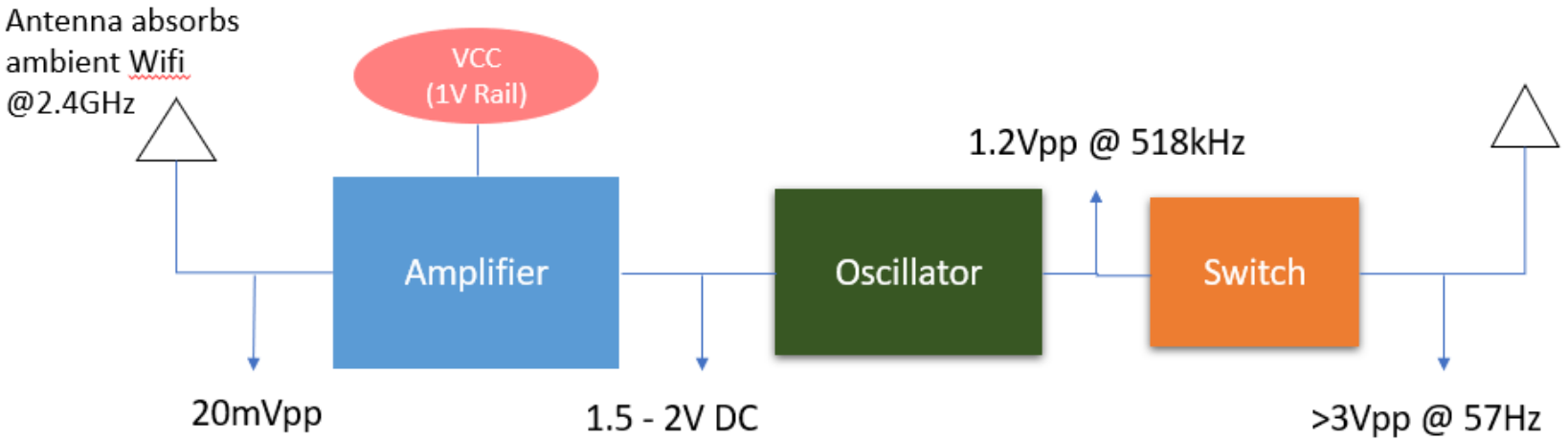
Amplifier must produce a 1V swing to power the oscillator

Produce an On and Off Keying (OOK) modulated signal

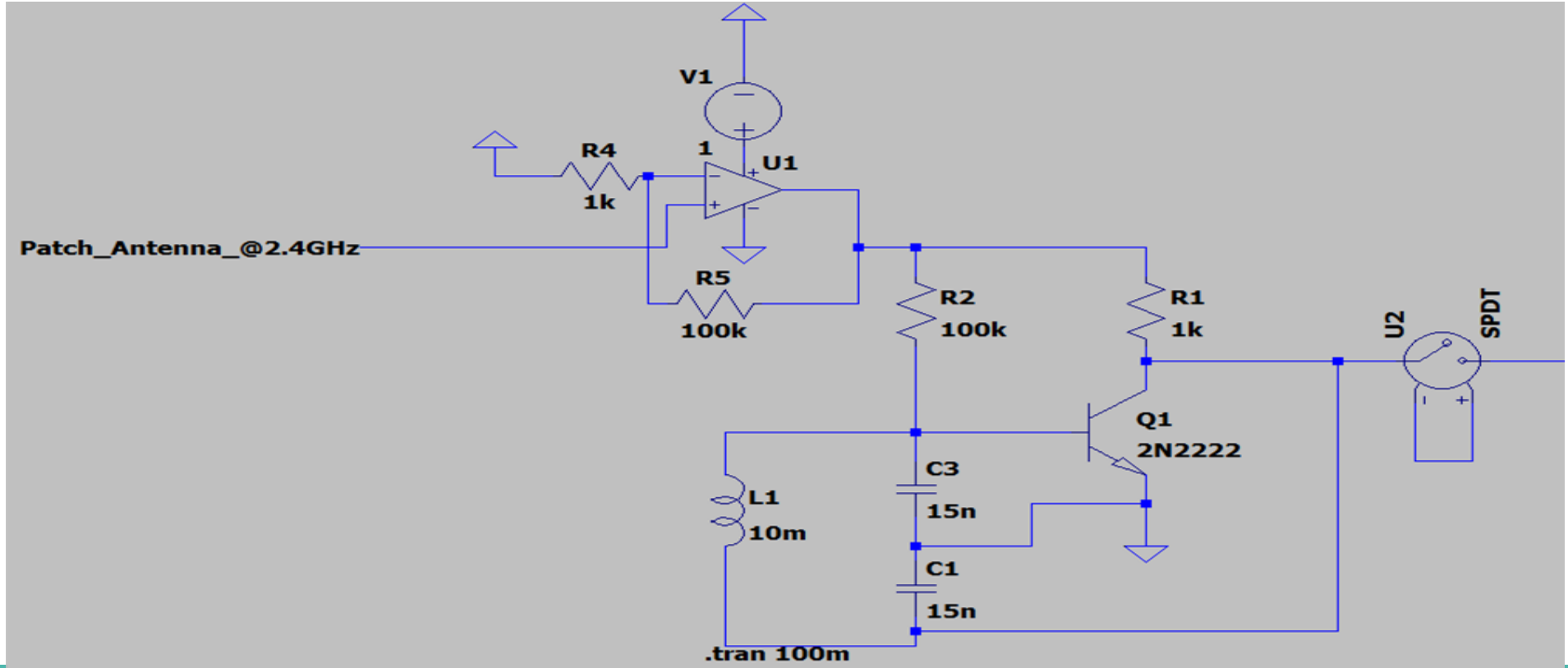
Strong Wifi signal

Access to a Faraday Cage

Transmitter Block Diagram



Circuit Schematic



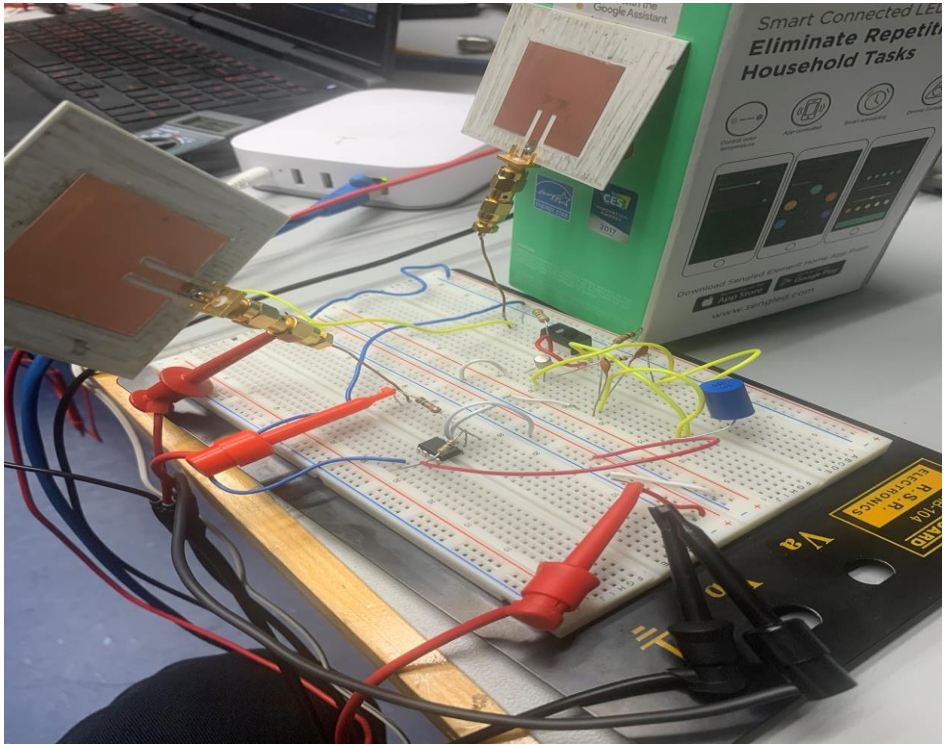
ABCS Implementation

2.4GHz Patch Antenna

High Gain Amplifier

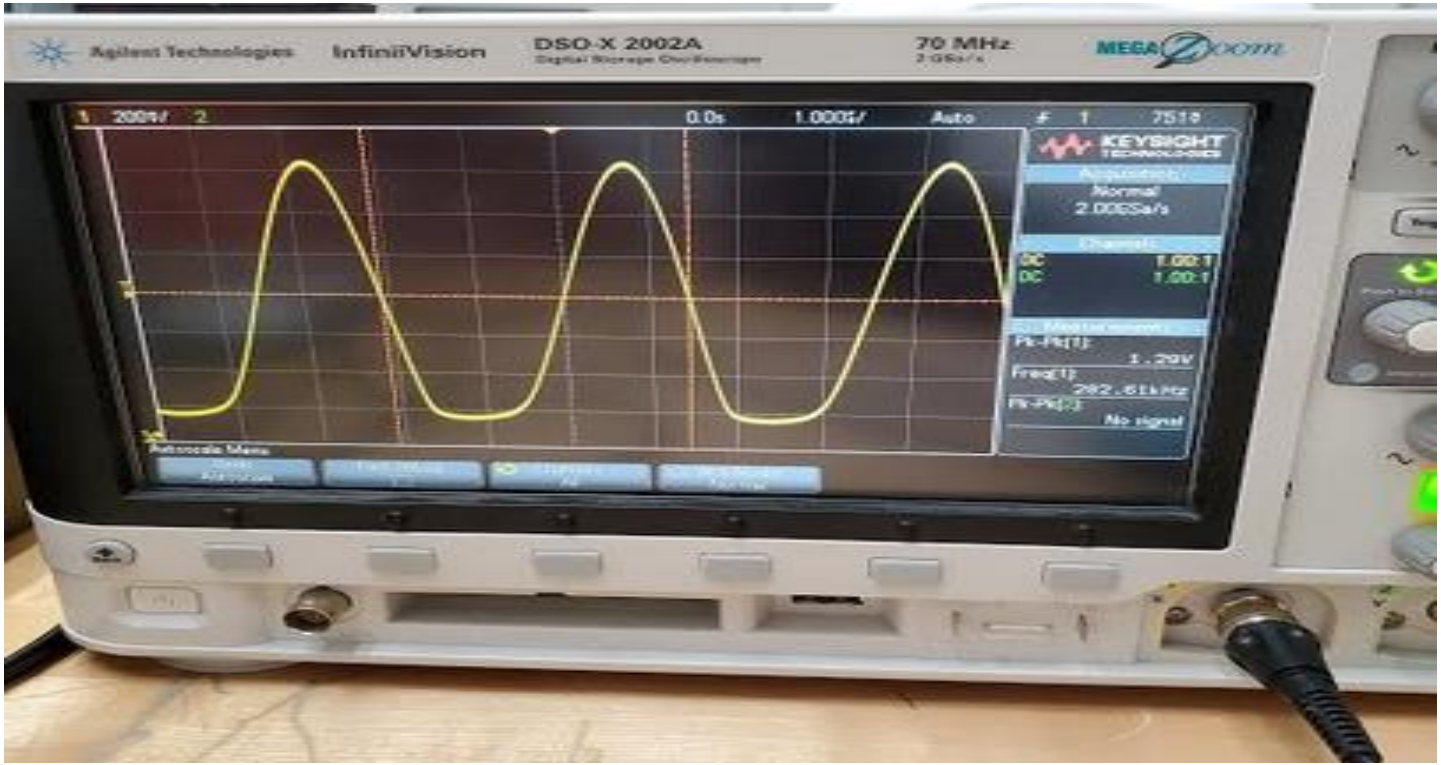
LC Oscillator

Switch

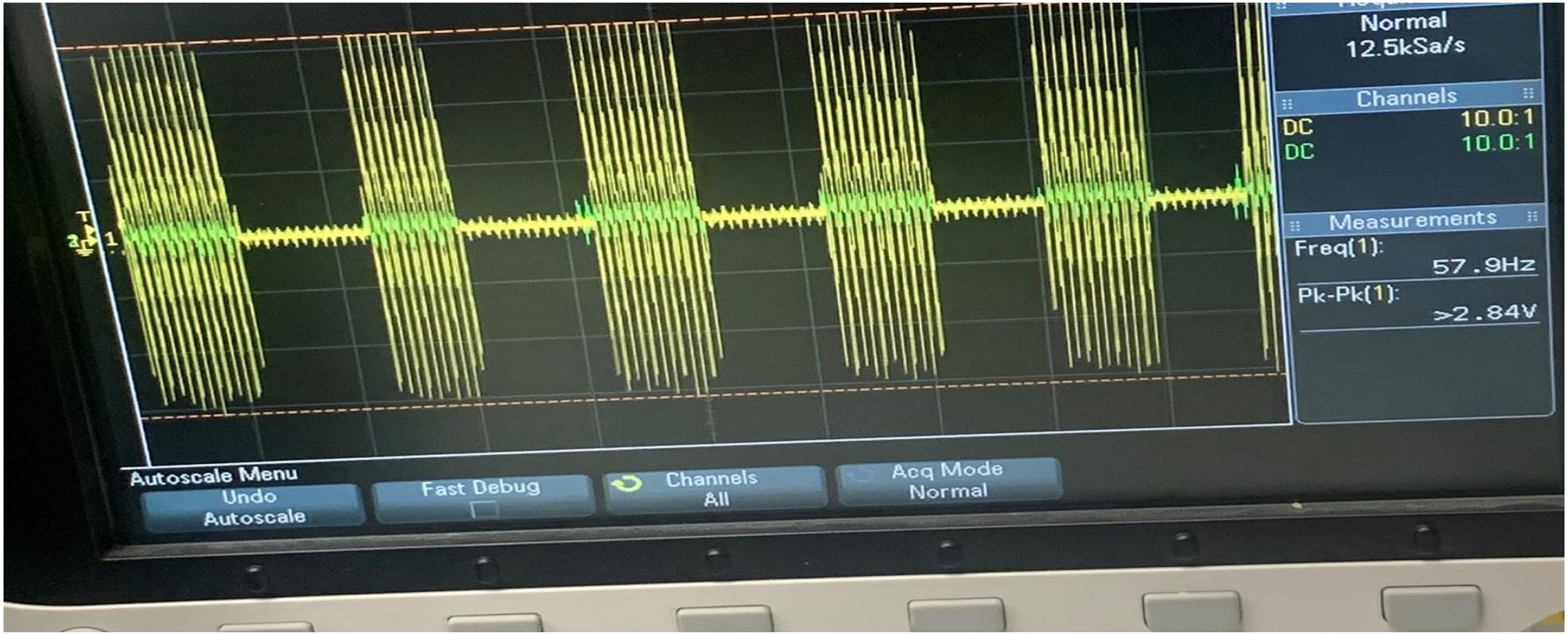


Patch Antenna Signal

BJT LC Oscillator Signal



OOK Transmission



Lessons Learned

- The basics of On and Off Keying modulation
- United States Frequency Spectrum Allocation Table
- How LC oscillators work
- Spectrum Analyzer

Acknowledgements

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References

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Questions