

P11208 Mid-Range RF II Module

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Team Leader

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Team member

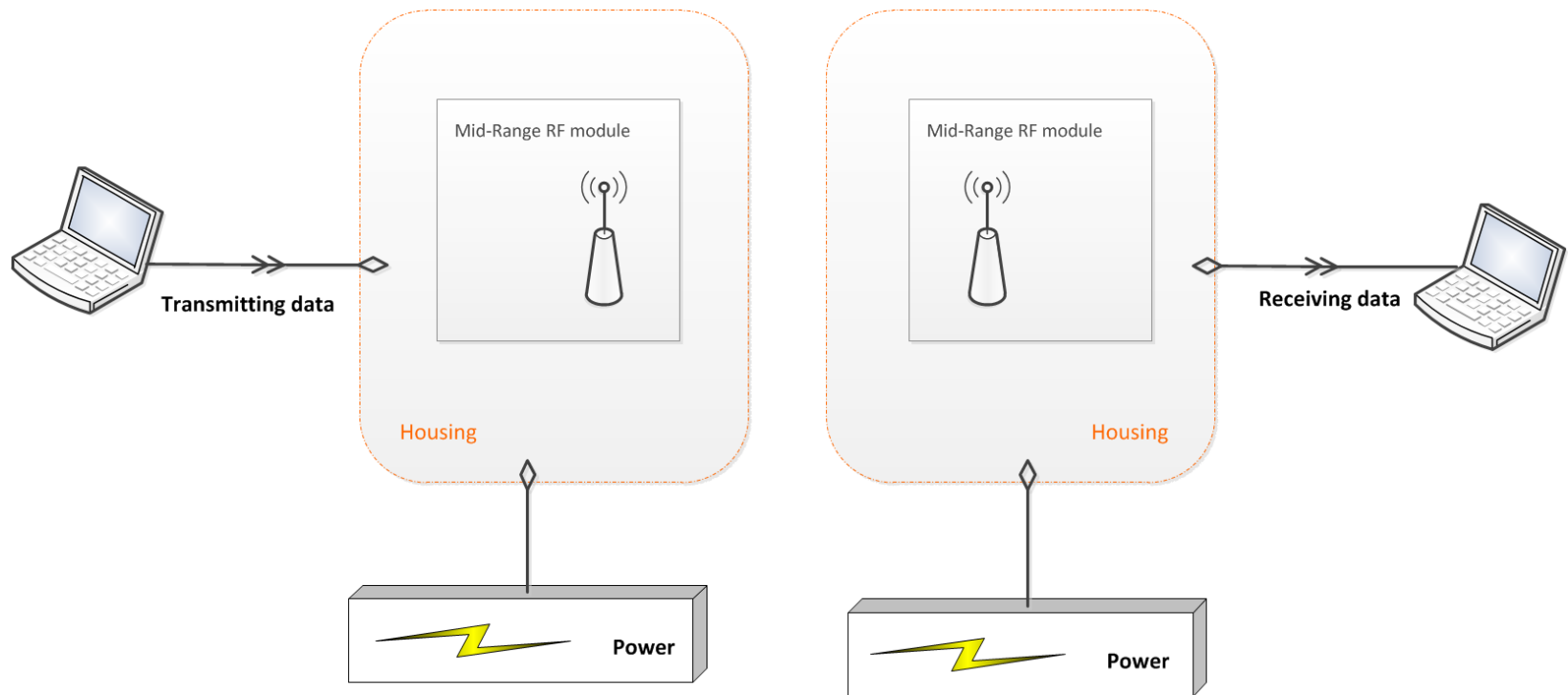
Team member



Sponsor: Harris Corporation

Project Description

- ▶ To create a wireless data transmission channel over a distance of at least 100m

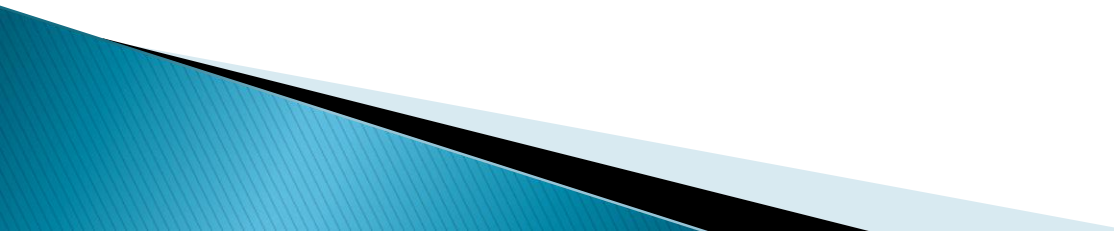


Customer Needs/ Engineering Specifications

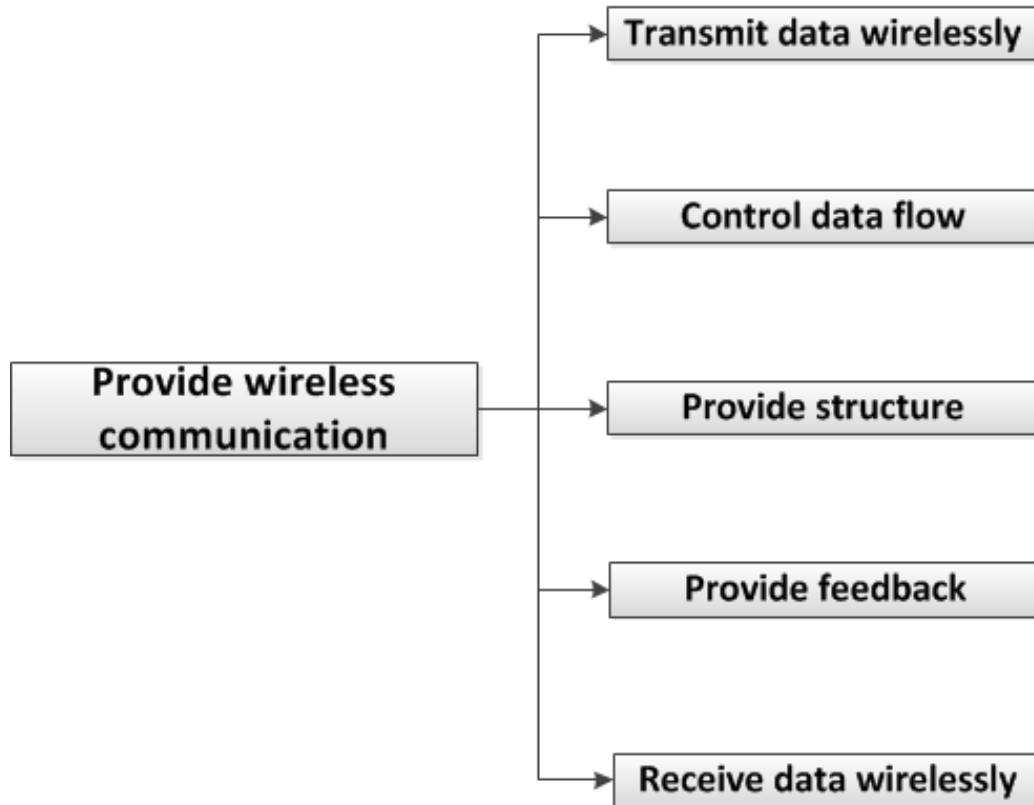
High Level Customer Needs

- ▶ Wireless
- ▶ Addressability
- ▶ Reliable Connection

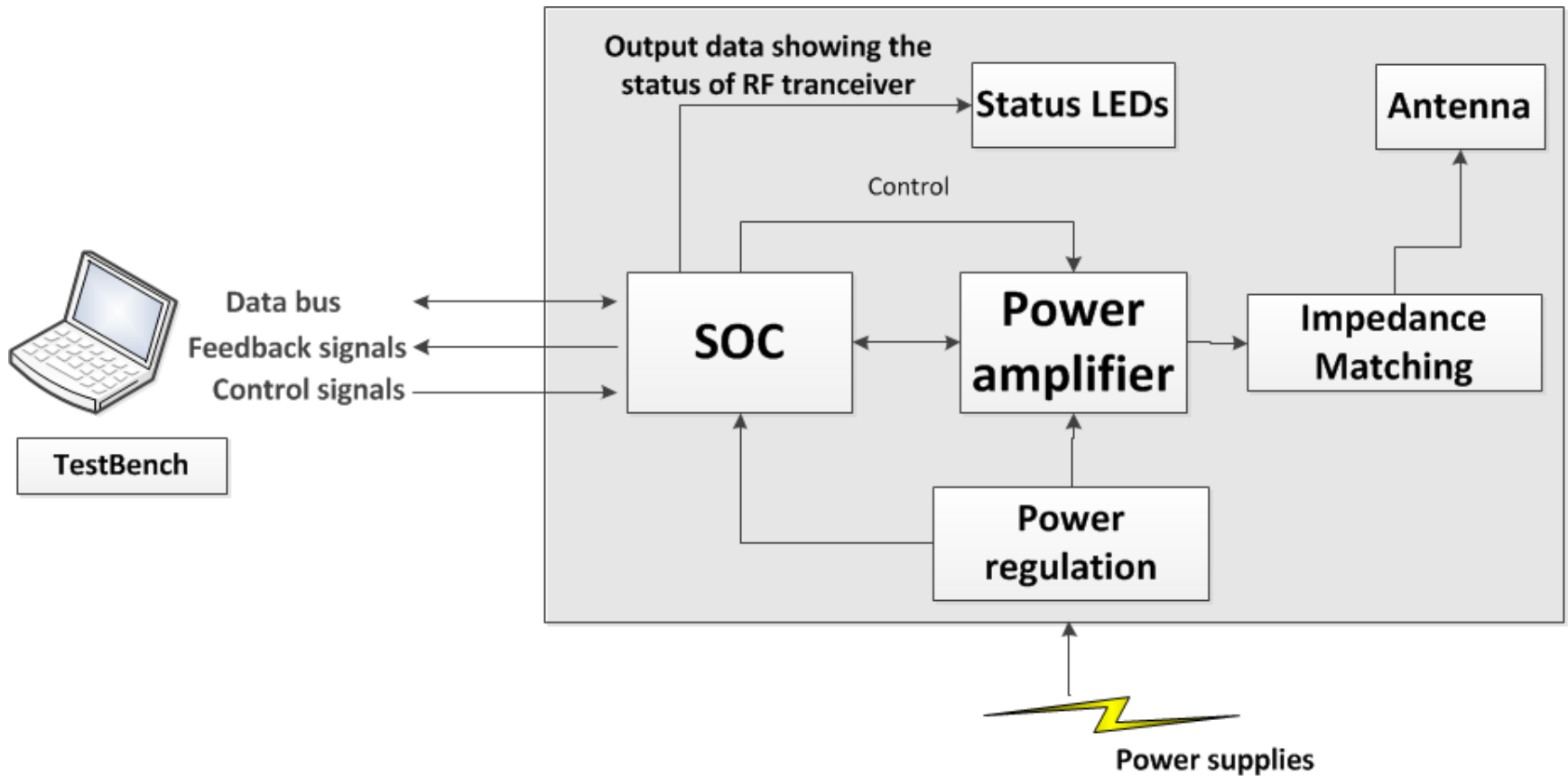
Corresponding Engineering Specifications

- ▶ Regulated Transmit/Receive Frequency
 - ▶ Number of Available Channels
 - ▶ Data Rate
 - ▶ Range
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Functional Decomposition

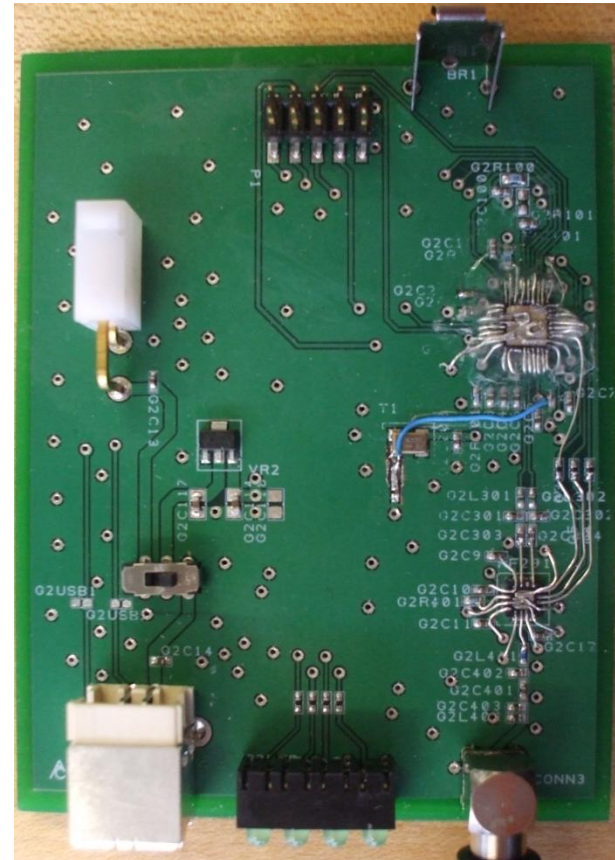
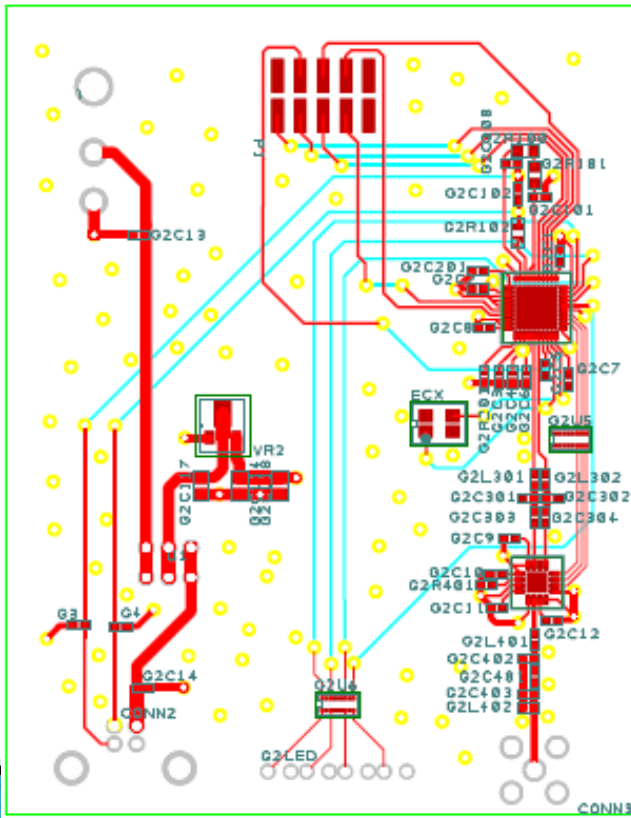


Functional Block Diagram



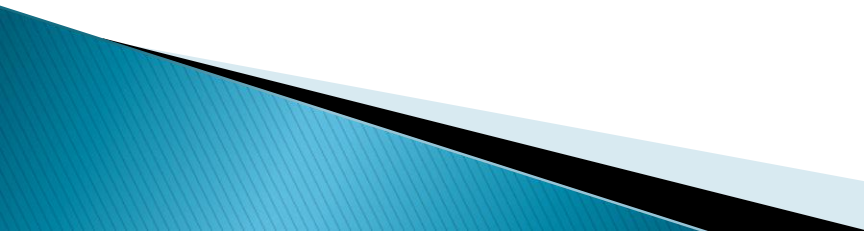
Final Design Review

- ▶ Mirrored chips during PCB layout
- ▶ Reworked PCB to provide a proof of concept



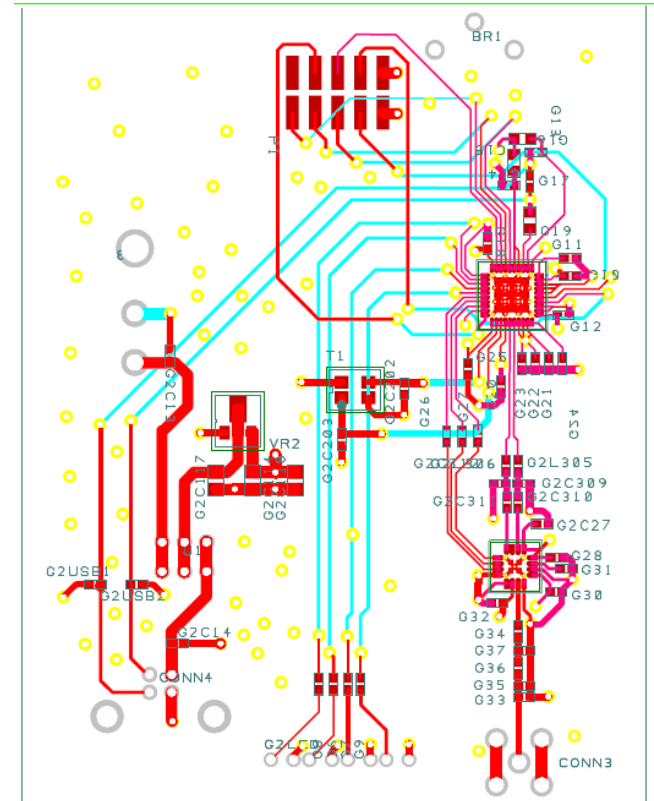
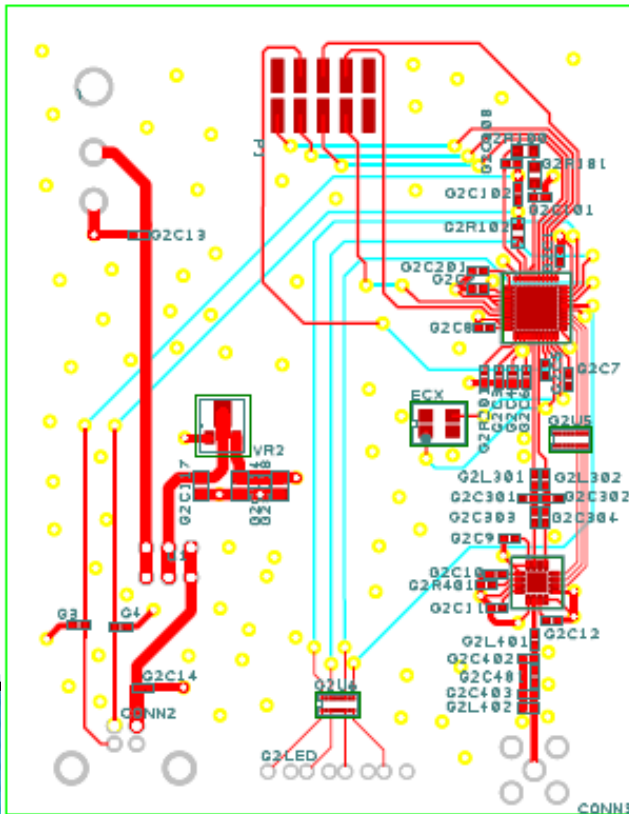
Final Design Review

Test Results

- ▶ Accomplished transmission at 1 meter between two reworked boards
 - ▶ Accomplished transmission at 100 meters between a reworked and purchased TI board
 - ▶ Measured data rate at 40.5 kbps with a bit error rate of zero
 - ▶ Successful transmission on 16 available channels
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Final Design Review

- ▶ Met all the specifications except the range
- ▶ Delivered only one working board
- ▶ Updated design to correct errors



Future Improvements

- ▶ Implement Zigbee Protocol
 - Use mesh networking instead of point to point protocol
- ▶ Decrease board size
- ▶ Use PCB antenna
 - Need housing modification

Acknowledgements

- ▶ Harris Corporation
 - ▶ Texas Instruments
 - ▶ Dr. Leo Farnand
 - ▶ Philip Bryan
 - ▶ Vincent Burolla
 - ▶ Jeff Lonneville
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