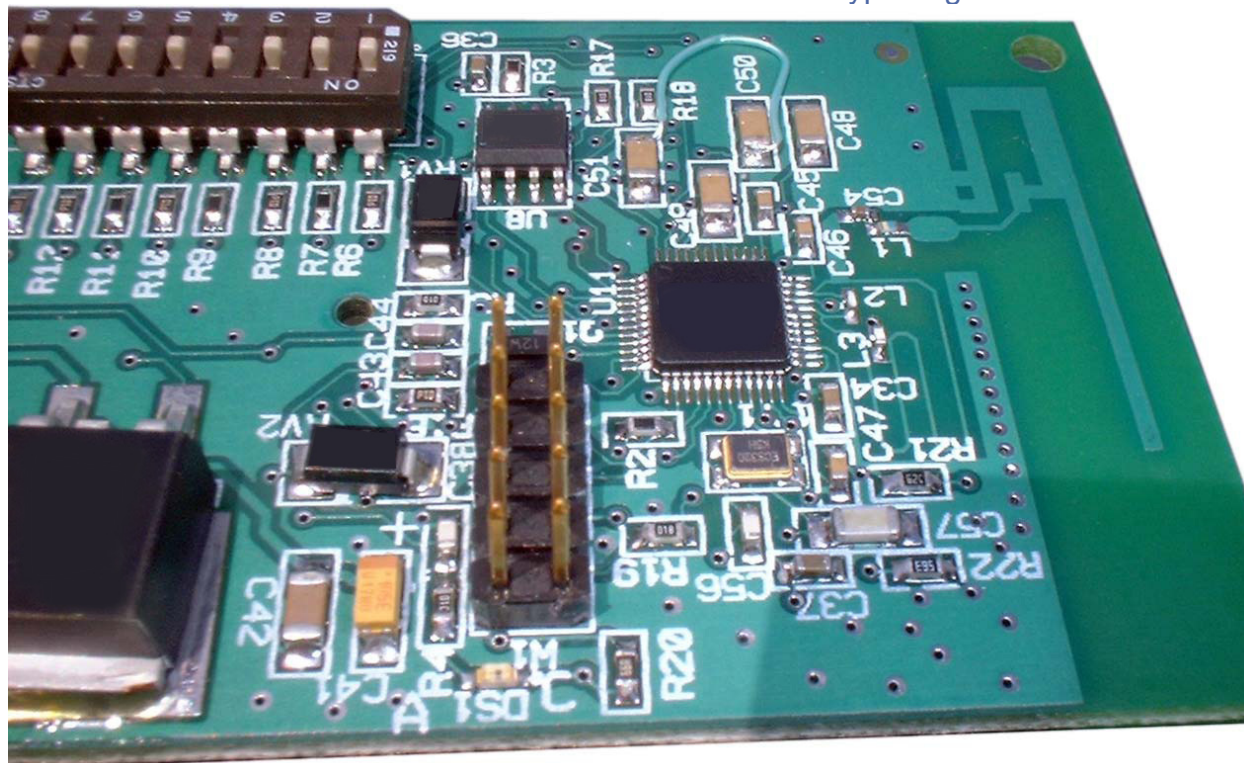


2007

Introduction:

360°RF has been retained to test and optimize supplied ZigBee antenna samples to maximize field-strength and transmitter matching.

Type: ZigBee Antenna



TEST FINDINGS AND NOTES:

The board appears to have undergone a number of layout changes. In the current iteration, the antenna again is low in frequency. This fact was verified by installing components and driving the circuit with a Network Analyzer, as well as by using the populated board as a Radar Target and looking at the peak response.

- Option 1: Shorten the antenna 6.0mm.
- Option 2: Reduce the value of C54.

Since the antenna tuning network is also impedance matching a non-50 Ohm transmitter, the tuning is not straight forward. **Can the supplied board be energized and supply a test signal?**

By measuring the field strength of an energized board, the value of C54 can be adjusted for max field strength. Alternatively, different values for C54 in the 1 to 3 pF range can be substituted and a digital control range test performed.

Later in 2007

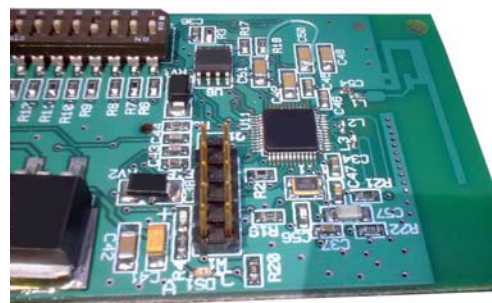
Introduction:

360°RF has been retained to test and optimize a supplied ZigBee antenna sample set to continually broadcast on channel 18 — to allow maximizing field-strength and transmitter matching.

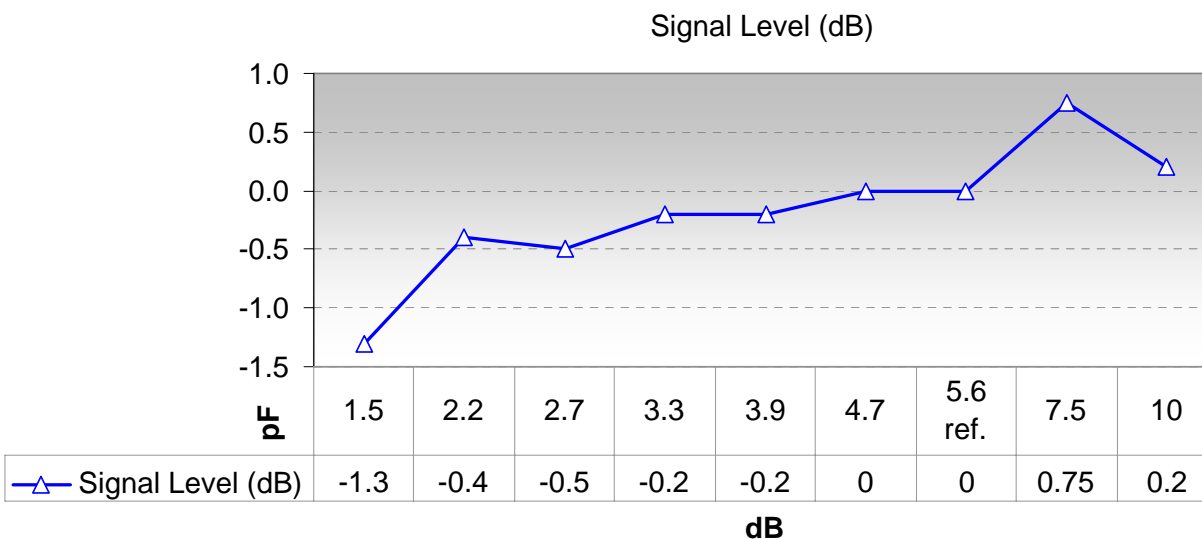
Type: ZigBee Antenna

TEST FINDINGS AND NOTES:

When the supplied sample was first powered, the unit was barely detectable on test equipment. A USB 802.11 wireless dongle in the lab, about 30-Meters away, was showing a stronger signal on our test equipment than the DUT at 1-Meter.



Inspection of the assembly under a microscope showed numerous poor solder joints and solder bridges. Several of these solder bridges were wicked-up and many joints touched-up, especially the unsoldered joints on C54 and L3—the main problem area. After touching-up, signal strength improved 28 dB.



Thus, we observe a 0.75 dB improvement with a 7.5 pF capacitor used at C54.^{1,2}

Next, the antenna tuning was revisited. At this point, antenna length looks very good. There was perhaps a 0.03 - 0.05 dB improvement with a slight shortening of the antenna tip, but this nominal improvement is not worth changing the PCB Gerber files, and the noted increment falls within measurement uncertainty.

¹ Voltages above 4-volts had no effect on signal strength; thus, all testing was done at 4.5 VDC.

² Various coupling capacitors between 1.5 and 10 pF were used in the C54 position.