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# Antenna Test Report

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**Equipment: Bald Eagle PVT(US)**

**Author: FIELDTHEORY**

**Issue Date: 2022.08.29**

## 1 Test Sample

Refer to Antenna Test Setup Photos.

## 2 Test Condition

Test Conductor	Nicholas Pirok
Test Conducted	TRP
DUT	Contact Sensor DSN: US Version: G7Q1XC0123240099 FCC ID: 2AB2Q5F55E9
	Rail Test SW: generic-railtest-zw700_dev (Motion, PB) 20220415.hex
Equipment Used	3-meter fully anechoic antenna chamber equipped with: (1) ETS-Lindgren 3164-10 Open Boundary Quad-Ridged Horn receive antenna (2) EL-AZ positioner that was programed to index at 15° on both axis (3) Laser positioner (4) Keysight N9000B Signal Analyzer (Used for TRP and TxSweep) Tektronix RSA306B Spectrum Analyzer (Used for conducted power measurements) ; Tag-Connect Cable; Silicon Labs PCB4001 REV3;
Purpose	Gather data reflecting the contact sensor, including a defined match, with and without magnet for US regions

## 3 Test Methods

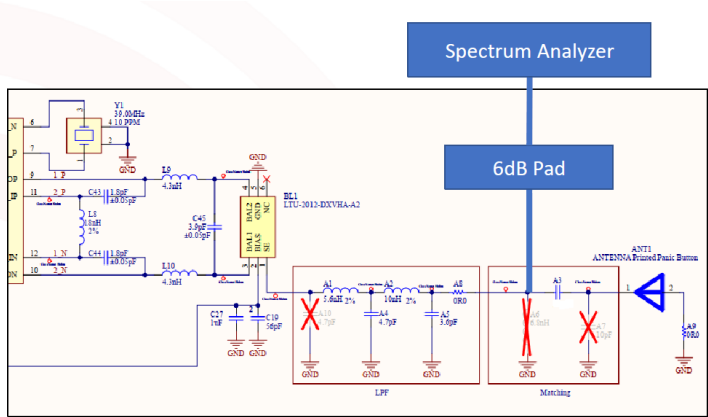
### 3.1 Program Setup

- Ring Program Jig used for test to avoid adding additional wires to unit
- The following commands were sent to the unit to put it into transmit mode via PUTTY
  - RX 0
  - SETDEBUGMODE 1
  - FREQOVERRIDE (FREQUENCY IN HZ)
  - SETPOWER 100 RAW
  - SETTX TONE 1
- The following commands were sent to the unit to put it into Sweep Mode via PUTTY
  - RX 0
  - TXSWEEP 830000000 930000000 500000 5 30000
- **Railtest version provided by RING:**
  - generic-railtest-zw700\_dev (Motion, PB) 20220415.hex

Program Jig photo

Note: Refer to Antenna Test Setup Photos

### 3.2 Conducted Power Setup



A3 is removed and a very short semi-ridged SMA coax is soldered to the A3 pad that shares a node with A6 and A8. The 6dB pad is added to present a 50 ohm termination close to the tap point. The Spectrum Analyzer is set to Max Hold and the commands from slide 8 are issued to the DUT to gather the measurement.

#### 4 Antenna Spec

Parameter	Value
Frequency Range	902-928 MHz
Antenna Peak Gain	1.4 dBi
Antenna Type	IFA Antenna

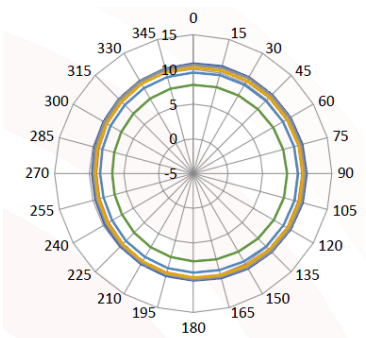
#### 5 Test Result

##### 5.1 System Performance

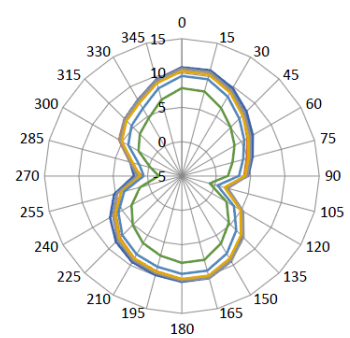
Region	Frequency	Power Level	Peak Gain	TRP	Conducted Power	RF System Efficiency
			(dBi)	(dBm)	(dBm)	(%)
US	902	100 RAW	0.4	8.6	10.3	67.6%
	908.4	100 RAW	1.4	9.2	9.9	85.1%
	912	100 RAW	1.2	8.9	9.9	79.4%
	916	100 RAW	1.2	8.6	9.6	79.4%
	920	100 RAW	0.8	7.9	9.3	72.4%
	928	100 RAW	-0.3	6.1	8.8	53.7%

##### 5.2 Radiation Pattern

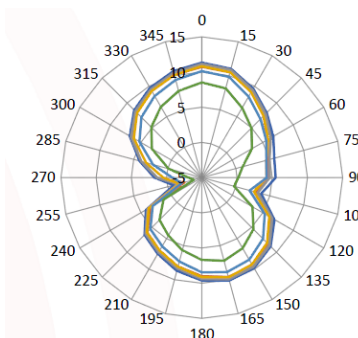
902-928 MHz



Theta 90



Phi 0



Phi 90

- 902 MHz
- 908.4 MHz
- 912 MHz
- 916 MHz
- 920 MHz
- 928 MHz