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CERTIFICATION TEST REPORT

Manufacturing Address:	**Beijing Jia An Electronics Technology Co., Ltd. No. 19 Gu Cheng West Street, Shi Jing Shan District, Beijing 100043, China**
Applicant:	**BEA Incorporated RIDC Park West, 100 Enterprise Drive Pittsburgh, Pennsylvania 15275 United States of America**
Product:	**RF 900 MHz Transceivers for Pedestrian Automatic Door Industry**
Models:	**10TD900HH, 10TD900HH2, 10TD900HH3, 10TD900HH4**
FCC ID:	**2ABWS-10TD900HH4**
Testing Commenced:	**June 26, 2014**
Testing Ended:	**June 26, 2014**
Summary of Test Results:	**Page 5**

Standards:

- **FEDERAL REGISTER CFR 47, PART 15 – RADIO FREQUENCY DEVICES**
  - **Part 15 Subpart C, Section 15.231 - Periodic operation in the band 40.66–40.70 MHz and above 70 MHz**
  - **Part 15 Subpart C, Section 15.209 - Radiated emissions limits; general requirements**
- **ANSI C63.4 2009 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz**

Evaluation Conducted by:

Joe Knepper, EMC Proj. Eng.

Ken Littell, EMC Tech. Mgr.

Report Reviewed by:

Wendy Fuster, President

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD**.**

1.2 Measurement Procedure:

All measurements were performed according to the 2009 version of ANSI C63.4 and recommended FCC procedure of measurement for Intermittent Transmitters and Receivers operating under Section 15.231. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

Radiated Emission

- Combined Uncertainty (+ or -) 2.67 dB
- Expanded Uncertainty (+ or -) 5.35 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.4 Document History

Document Number	Description	Issue Date	Approved By
F2LQ5979A-07E	First Issue	June 30, 2014	W. Fuster

2 SUMMARY OF TEST RESULTS

Standard(s)	Results
CFR 47 Part 15.231(b) / Part 15.209	Complies

Note: Requirements of 15.31(e) were met by using new batteries.

Modifications Made to the Equipment
Reduced power of EUT to -7.4dBm
Refer to APPENDIX - UE259 Engineering Change Requests (Hardware) 20140603

3 ENGINEERING STATEMENT

This report has been prepared on behalf of BEA Incorporated, to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.231 of the FCC Rules, using ANSI C63.4 2009 standards, with the modifications noted in Section 2 of this Test report. The test results found in this test report relate only to the items tested.

4 EUT INFORMATION AND DATA

4.1 Equipment Under Test:

Product: RF 900 MHz Transceivers for Pedestrian Automatic Door Industry
Model: 10TD900HH4
Serial No.: None Spec.
FCC ID: 2ABWS-10TD900HH4

4.2 Trade Name: BEA Incorporated

4.3 Power Supply:

Battery Powered, (new batteries were used)

4.4 Applicable Rules:

CFR 47, Part 15.231, subpart C

4.5 Equipment Category:

Intermittent Transceiver

4.6 Antenna:

0dBi Internal

4.7 Accessories:

N/A

4.8 Test Item Condition:

The equipment to be tested was received in good condition.

4.9 Testing Algorithm:

The EUT was configured to permit frequency changes from low-mid-upper transmission channel. For all tests, in a semi-anechoic chamber and on the OATS, the EUT was equipped with a 0dBi Omni antenna.

5 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shield Room	0175	Ray Proof	N/A	11645	Aug. 7, 2014
Temp/Hum. Recorder	CL119	Extech	RH520	H005869	Jan. 8, 2015
OATS-3m	CL017	Compliance Labs	N/A	001	Dec. 13, 2014
Spectrum Analyzer	CL147	Agilent	E7402A	MY45101241	Oct. 24, 2014
Spectrum Analyzer	CL138	Agilent Technologies	E4407B	US41192779	Oct. 29, 2014
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Oct. 30, 2014
Antenna 1-Chamber	0142	ETS/EMCO	3142B	9811-1330	Verified
Antenna 2-OATS	0105	Sunol Sciences	JB1	A101101	May 7, 2015
Pre-Amplifier	CL153	Agilent	83006-69007	MY39500900	Jan. 9, 2015
Amplifier w/Monopole & 18” Loop	CL163	A.H. Systems, Inc.	EHA-52B	100	Apr. 24, 2015
Antenna, Horn	CL098	Emco	3115	9809-5580	Dec. 3, 2015
Cable: 0.3m Low Loss	CL116	A.H. Systems, Inc.	SAC-26G-0.3	206	Apr. 29, 2015
Cable: 0.3m Low Loss	CL117	A.H. Systems, Inc.	SAC-26G-3	207	Jan. 16, 2015
Cable, High Frequency	CL154	Pasternack	p/n PE350-240	N/A	Jan. 16, 2015

6 FCC PART 15.231(b)

6.1 Requirements:

Field strength of emissions, fundamental and spurious using average detector and a peak limit of 20dB was added above the average limit per 15.35(b).

Limit for fundamental frequency above 470 MHz is: 12,500 μV/m.

Limits for spurious emissions were those specified in 15.209.

The EUT was initially placed in a semi-anechoic chamber, and rotated in all three orthogonal positions to maximize the emissions. Characterization measurements were then performed to determine at which frequencies significant emissions occurred. These graphs are shown below.

The EUT was then positioned on the OATS and while the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength. The tables of measured results can be found below.

The equipment was fully exercised with all cabling attached to the EUT and was positioned for maximum emissions. The EUT was positioned flat against the plastic tabletop and it was verified, by placing a foam support between the table and the antenna, that the table had no effect on the emissions at these frequency ranges.

Some of the frequencies did not change with the EUT on or off. At those frequencies, the test distance was shortened to 1 meter and still no emissions from the EUT were visible or over the ambient or limit.

In the following plots, the black line indicates ambient noise and the red line indicates the measurement with the EUT on. Emissions to be found by the EUT were measured and listed in tables. In the frequency range of 9kHz-30MHz, the plots are for reference only and the limit lines are not actual limit lines but merely a guide. The plots are to show that there are no measureable emissions above the ambient signal.

The formula used was: DCCF $= 20\log\left(\frac{30.0ms}{100ms}\right) =$- 10.45

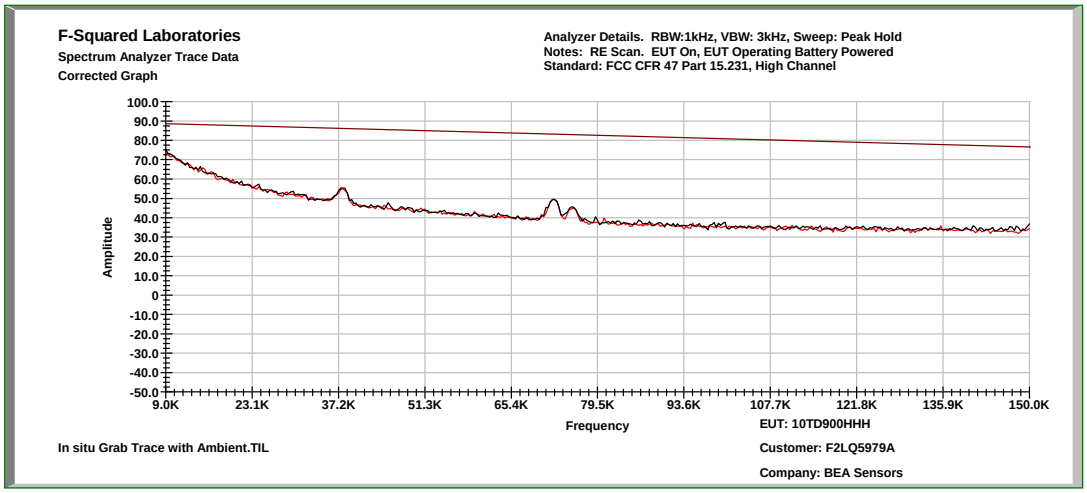
6.2 Test Data

Test Date:	June 26, 2014	**Test Engineers:**	J. Knepper; K. Littell
Standards:	CFR 47 Part 15.231(b); 15.209; C63.4:2009, Section 13.7	**Air Temperature:**	36.5ºC
		Relative Humidity:	60%

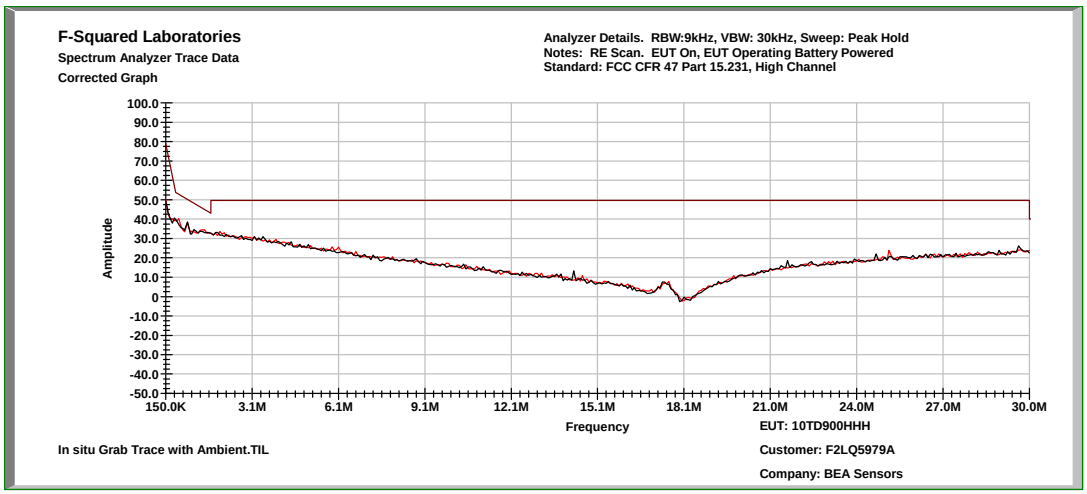
High Channel

Frequency (MHz)	Polarity	Corr. (dB)	MaxPeak (dBµV/m)	MaxPeak (dBµV/m) Limit	MaxPeak Margin	Average (dBµV/m)	Average (dBµV/m) w/DCCF	Average (dBµV/m) Limit	Average Margin	Bandwidth (kHz)
902.000000	V	28.9	42.6	81.9	-39.3	30.3	19.85	61.9	-31.6	120.000
902.000000	V	28.9	42.1	81.9	-39.8	30.3	19.85	61.9	-31.6	120.000
902.000000	H	28.0	42.2	81.9	-39.7	29.9	19.45	61.9	-32.0	120.000
918.000000	V	28.9	69.5	101.9	-32.4	65	54.55	81.9	-16.9	120.000
918.000000	H	28.2	81.1	101.9	-20.8	76.8	66.35	81.9	-5.1	120.000
928.000000	H	28.4	43.1	81.9	-38.8	29.9	19.45	61.9	-32.0	120.000
928.000000	V	29.2	43.2	81.9	-38.7	30.7	20.25	61.9	-31.2	120.000
5508.000000	V	38.1	42.3	81.9	-39.6	40.2	29.75	61.9	-32.2	1000.000
5508.000000	H	38.8	43.7	81.9	-38.2	41.8	31.35	61.9	-30.6	1000.000

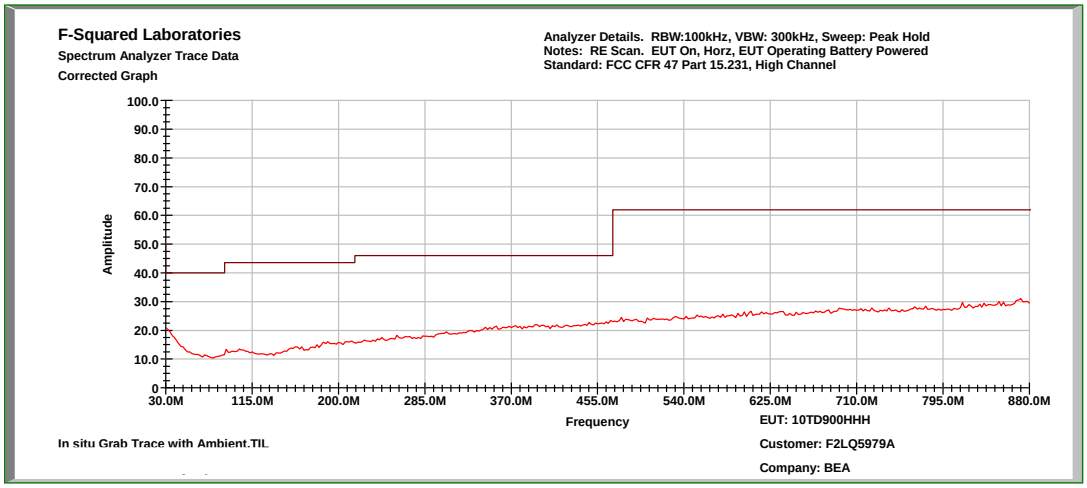
Characterization Scan, High Channel: 9kHz to 150kHz



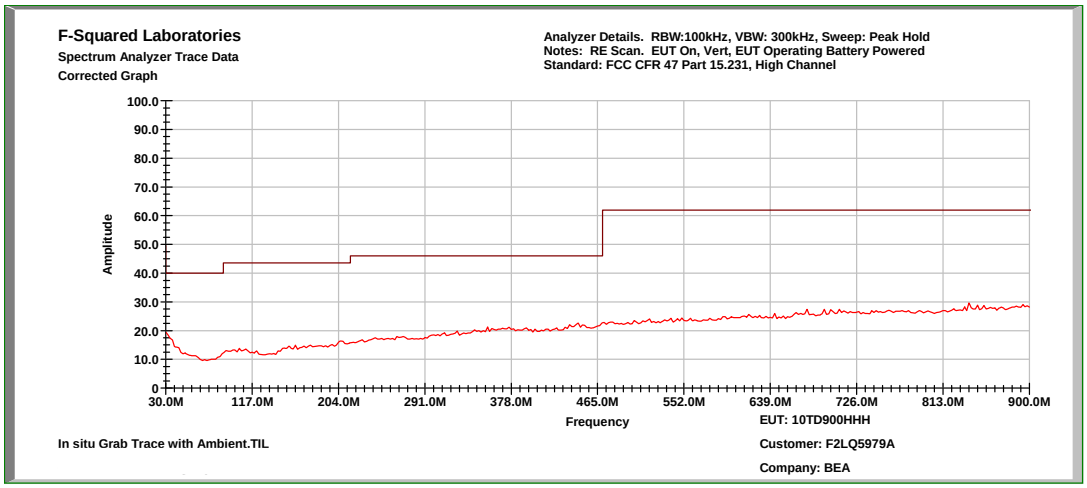
Characterization Scan, High Channel: 150kHz to 30 MHz



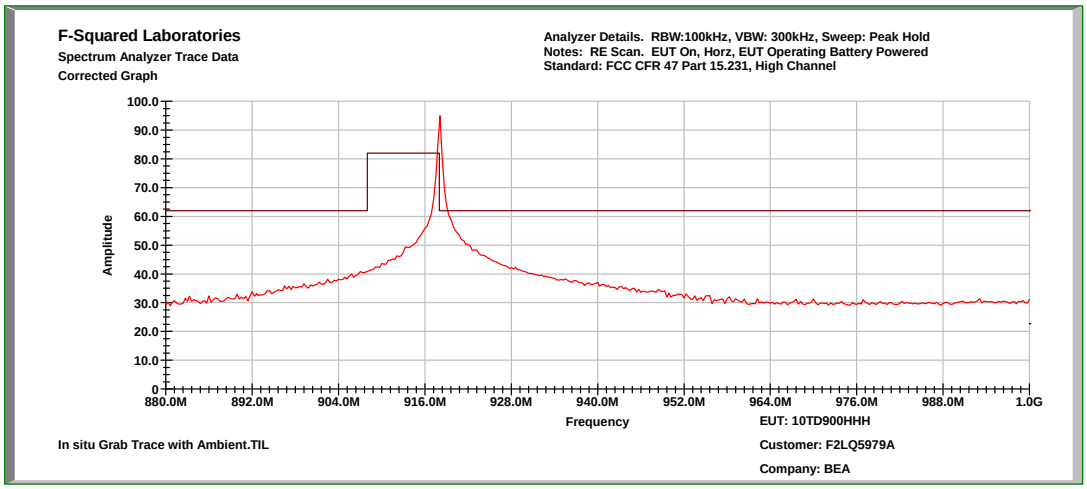
Characterization Scan, High Channel: 30 MHz to 880 MHz, Horizontal



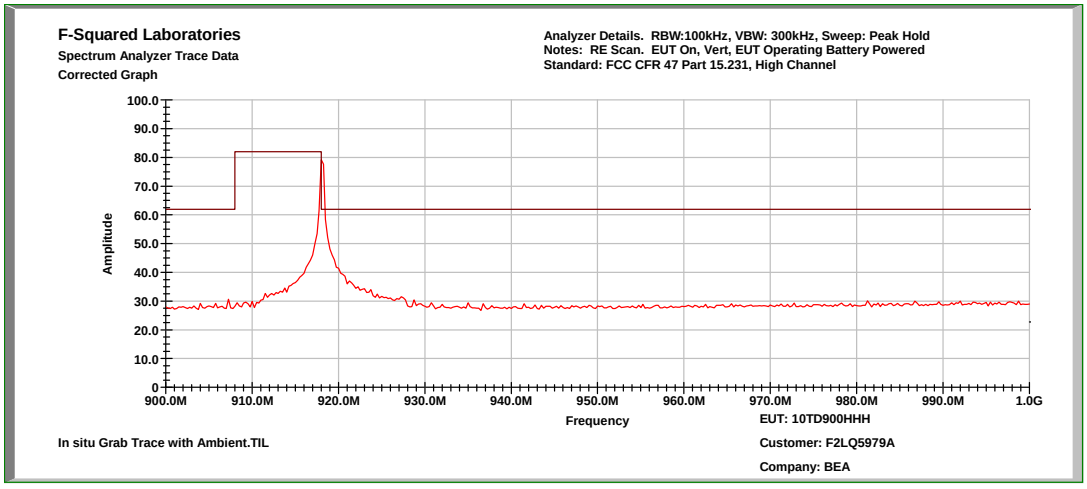
Characterization Scan, High Channel: 30 MHz to 900 MHz, Vertical



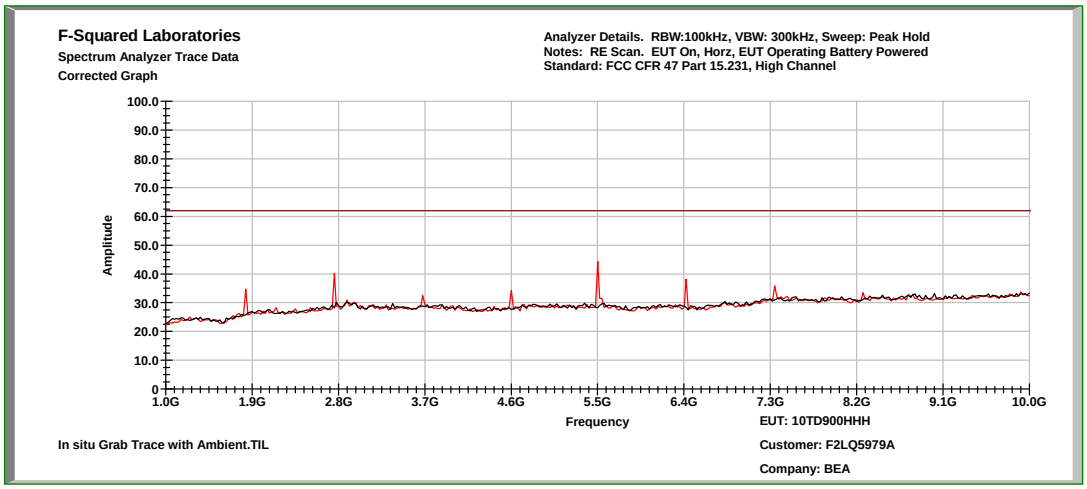
Characterization Scan, High Channel: 880 MHz to 1 GHz, Horizontal



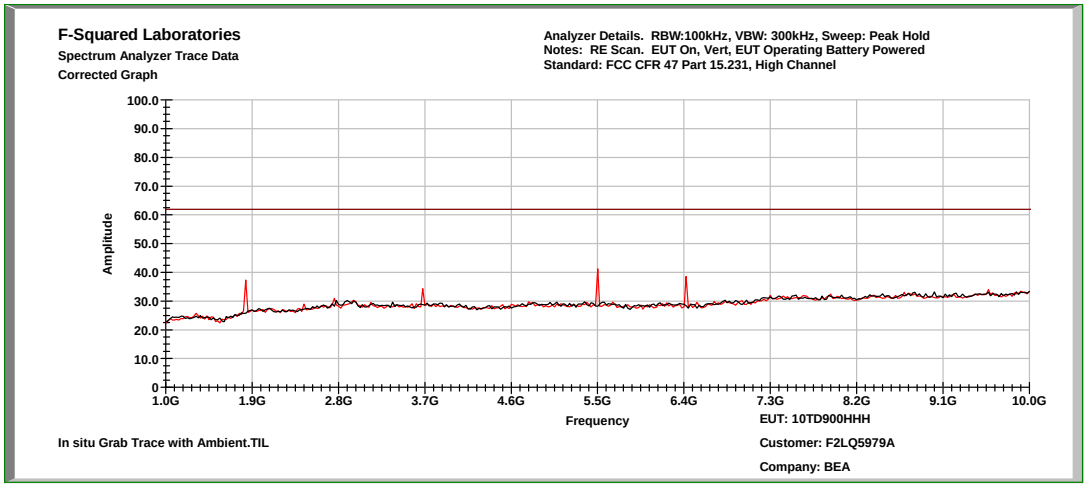
Characterization Scan, High Channel: 900 MHz to 1 GHz, Vertical



Characterization Scan, High Channel: 1 GHz to 10 GHz, Horizontal



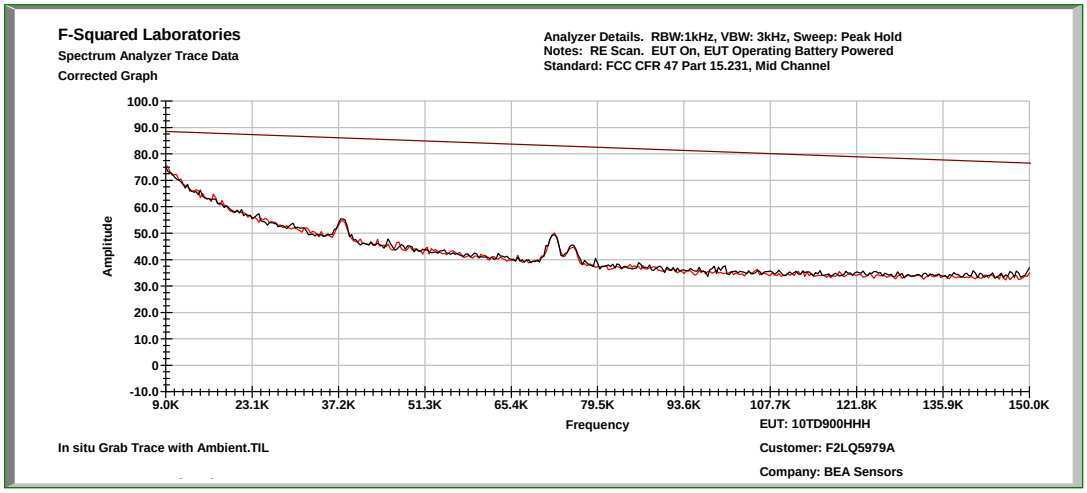
Characterization Scan, High Channel: 1 GHz to 10 GHz, Vertical



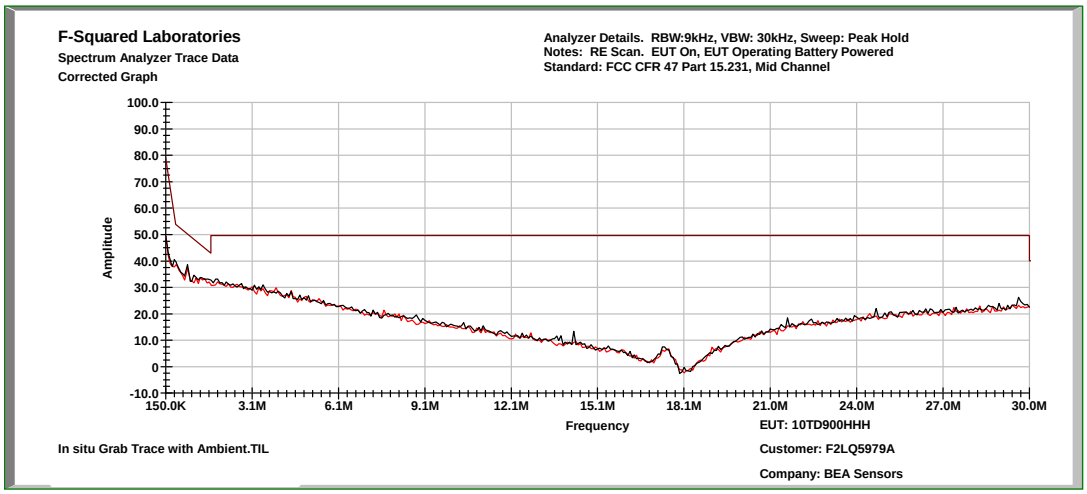
Mid Channel

	Polarity	Corr. (dB)	MaxPeak (dBµV/m)	MaxPeak (dBµV/m) Limit	MaxPeak Margin	Average (dBµV/m)	Average (dBµV/m) w/DCCF	Average (dBµV/m) Limit	Average Margin
902.000000	H	28.5	42.7	81.9	-39.2	29.9	19.45	61.9	-32.0
902.000000	V	28.9	42.7	81.9	-39.2	30.3	19.85	61.9	-31.6
913.000000	H	28.2	80.1	101.9	-21.8	75.9	65.45	81.9	-6.0
913.000000	V	28.9	71.8	101.9	-30.1	67.4	56.95	81.9	-14.5
928.000000	V	29.2	44.4	81.9	-37.5	30.7	20.25	61.9	-31.2
928.000000	H	28.4	42.2	81.9	-39.7	29.9	19.45	61.9	-32.0
5478.000000	V	38.3	42.3	81.9	-39.6	39.4	28.95	61.9	-32.95
5478.000000	H	39.1	43.8	81.9	-38.1	40.5	30.05	61.9	-31.85

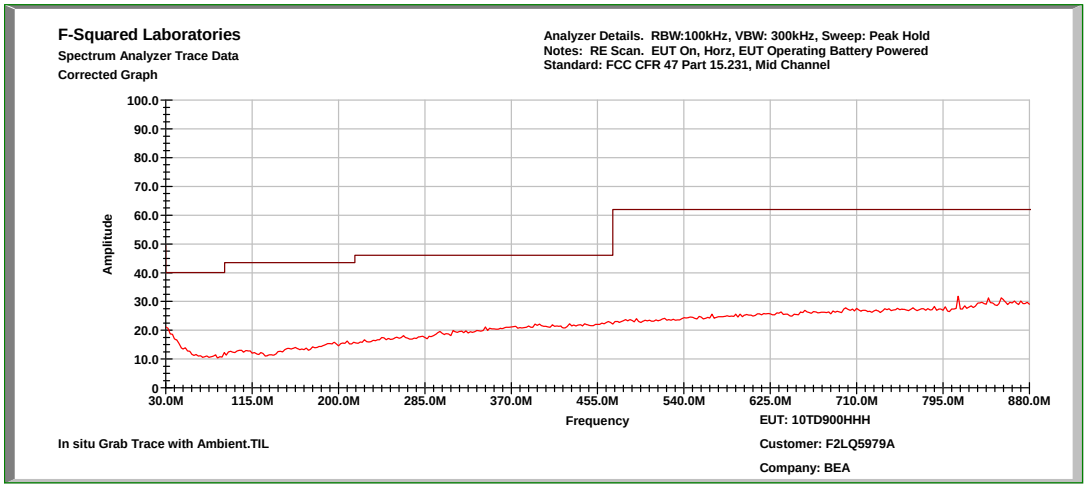
Characterization Scan, Mid Channel: 9kHz to 150 kHz



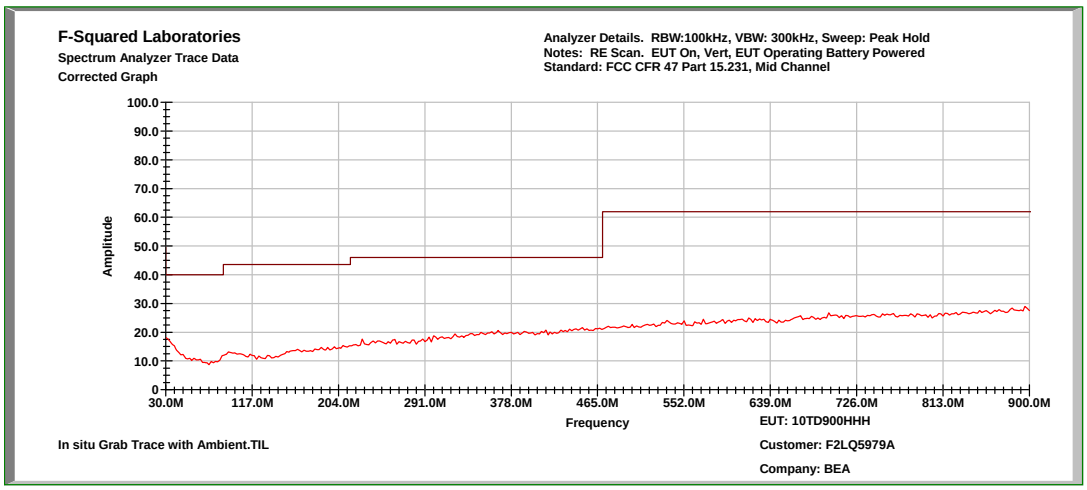
Characterization Scan, Mid Channel: 150kHz to 30 MHz



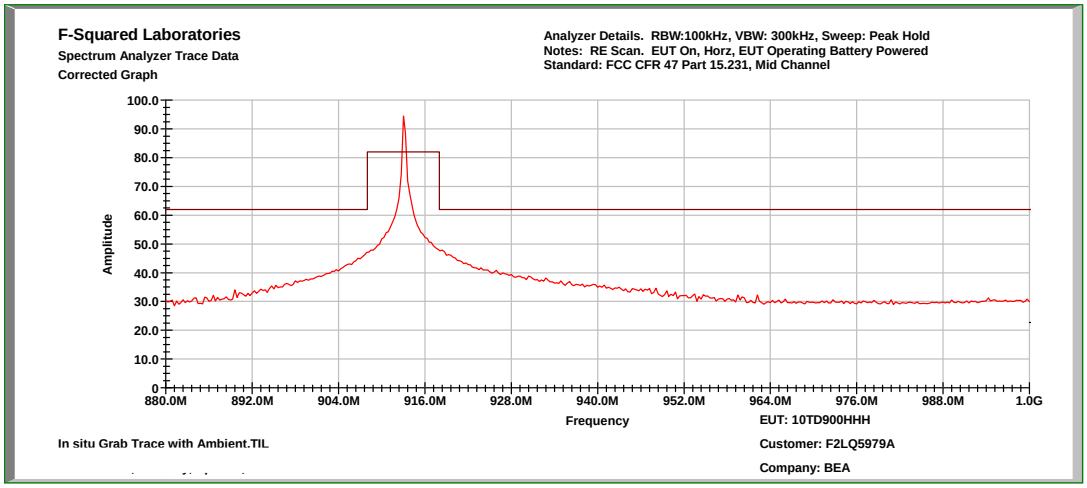
Characterization Scan, Mid Channel: 30 MHz to 880 MHz, Horizontal



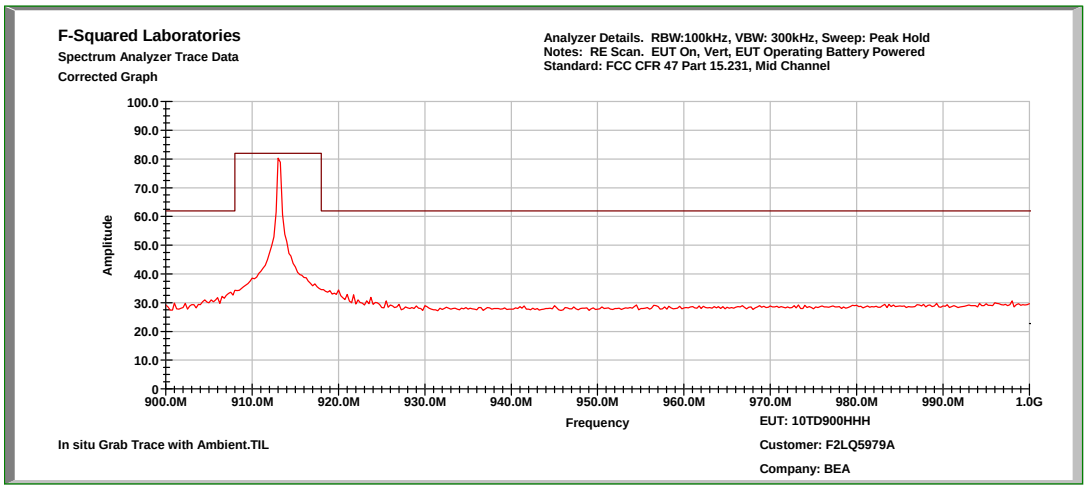
Characterization Scan, Mid Channel: 30 MHz to 900 MHz, Vertical



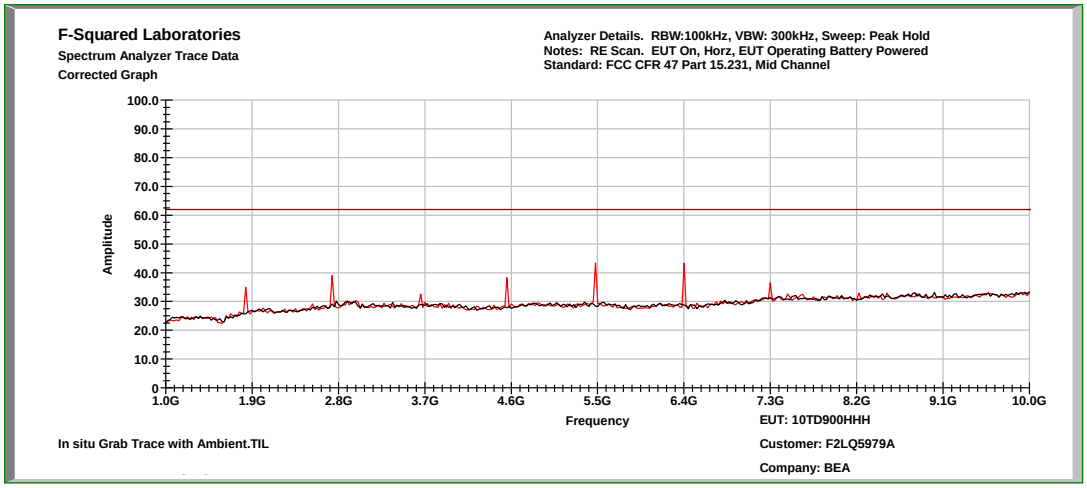
Characterization Scan, Mid Channel: 880 MHz to 1 GHz, Horizontal



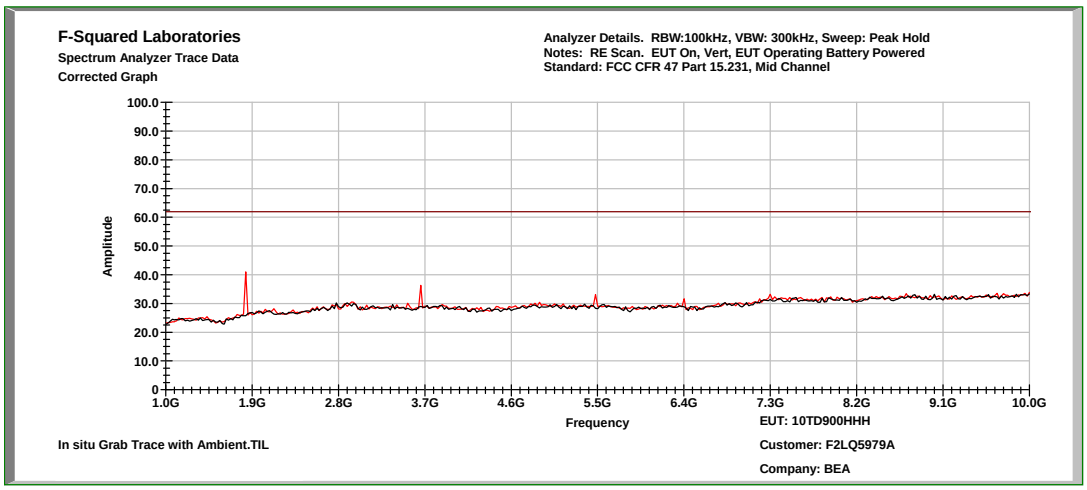
Characterization Scan, Mid Channel: 900 MHz to 1 GHz, Vertical



Characterization Scan, Mid Channel: 1 GHz to 10 GHz, Horizontal



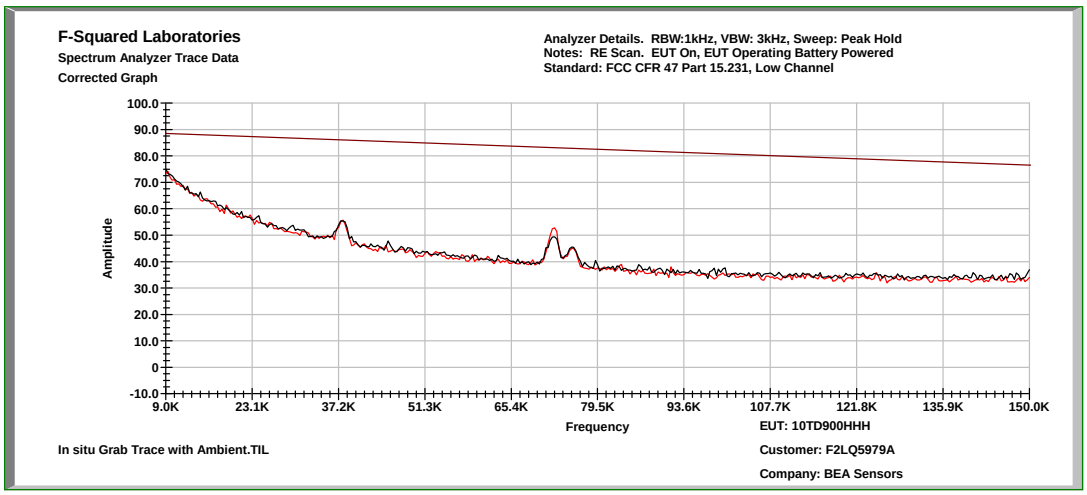
Characterization Scan, Mid Channel: 1 GHz to 10 GHz, Vertical



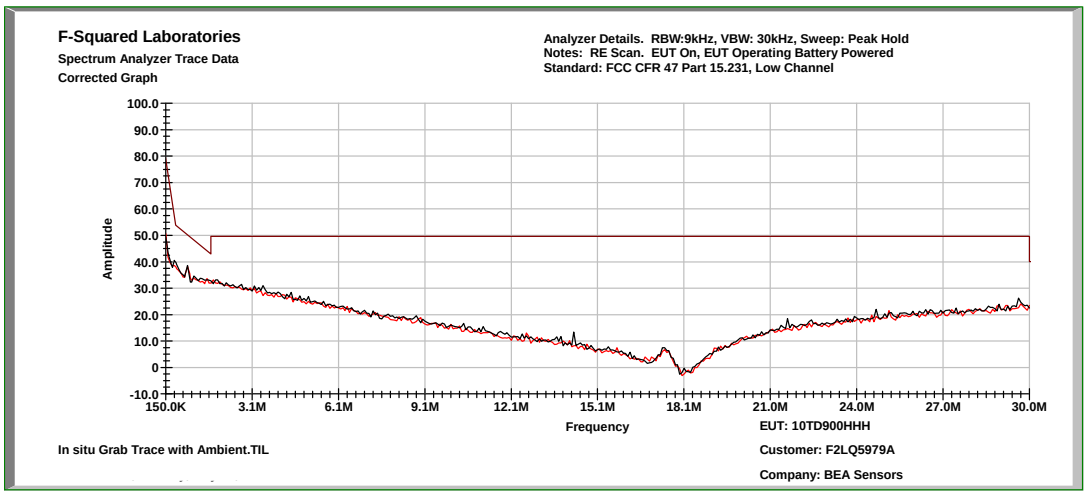
Low Channel

Frequency (MHz)	Polarity	Corr. (dB)	MaxPeak (dBµV/m)	MaxPeak (dBµV/m) Limit	MaxPeak Margin	Average (dBµV/m)	Average (dBµV/m) w/DCCF	Average (dBµV/m) Limit	Average Margin	Bandwidth (kHz)
902.000000	V	28.9	43.0	81.9	-38.9	30.3	19.85	61.9	-31.6	120.000
902.000000	H	28.5	40.5	81.9	-41.4	29.9	19.45	61.9	-32.0	120.000
908.020000	V	28.9	71.4	101.9	-30.5	66.9	56.45	81.9	-15.0	120.000
908.020000	H	28.3	80.5	101.9	-21.4	75.5	65.05	81.9	-6.4	120.000
928.000000	H	28.4	42.4	81.9	-39.5	29.9	19.45	61.9	-32.0	120.000
928.000000	V	29.2	43.7	81.9	-38.2	30.7	20.25	61.9	-31.2	120.000
5448.000000	V	38.9	42.3	81.9	-39.6	40.5	30.05	61.9	-31.85	1000.000
5448.000000	H	39.2	40.8	81.9	-41.1	41.8	31.35	61.9	-30.55	1000.000

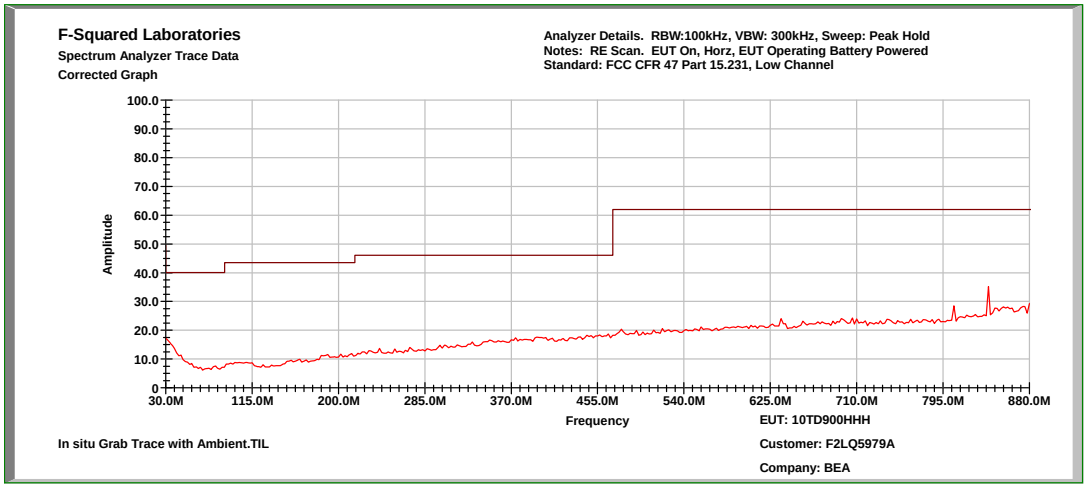
Characterization Scan, Low Channel: 9 kHz to 150 kHz



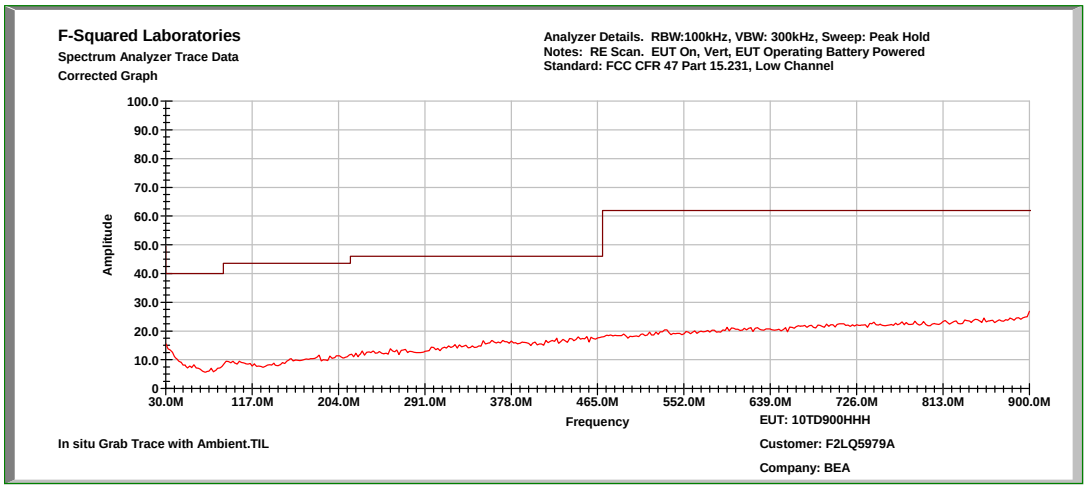
Characterization Scan, Low Channel: 150kHz to 30 MHz



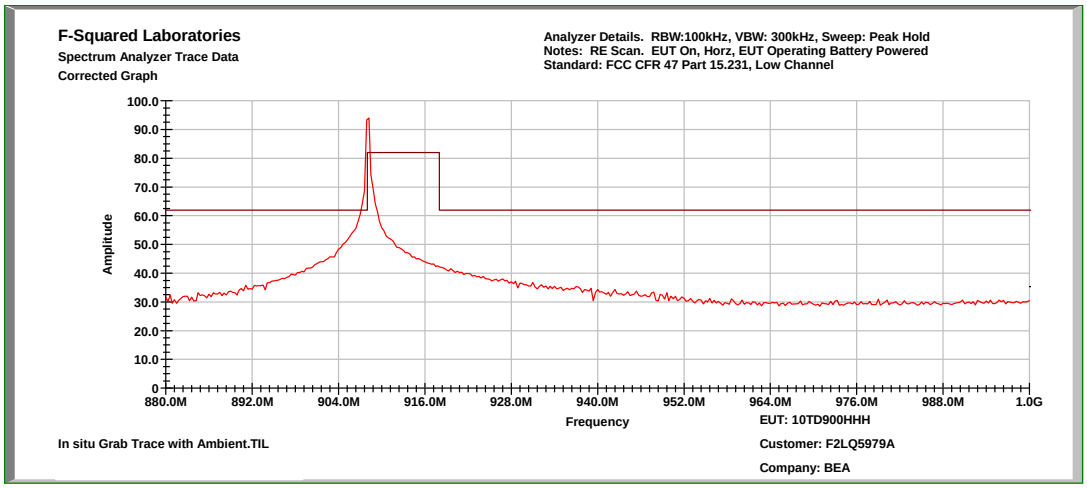
Characterization Scan, Low Channel: 30 MHz to 880 MHz, Horizontal



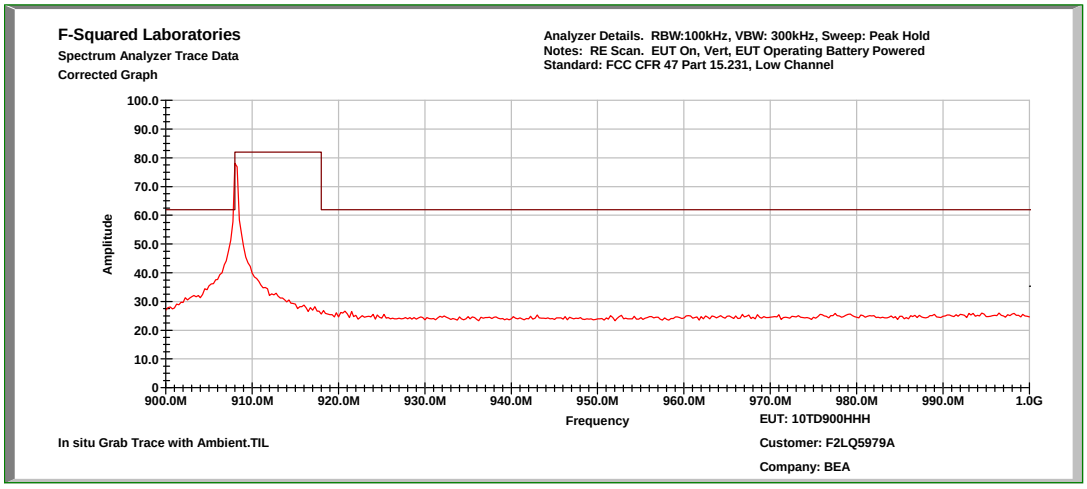
Characterization Scan, Low Channel: 30 MHz to 900 MHz, Vertical



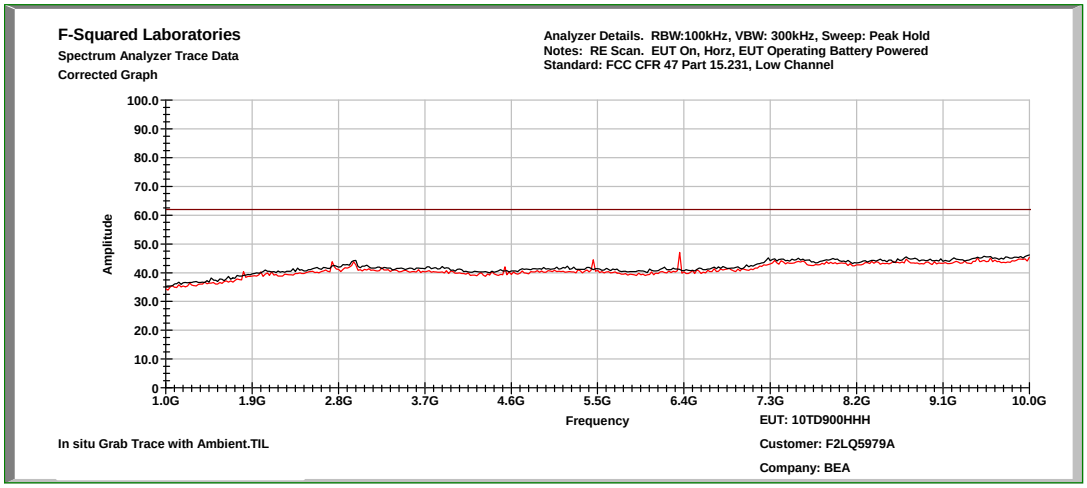
Characterization Scan, Low Channel: 880 MHz to 1 GHz, Horizontal



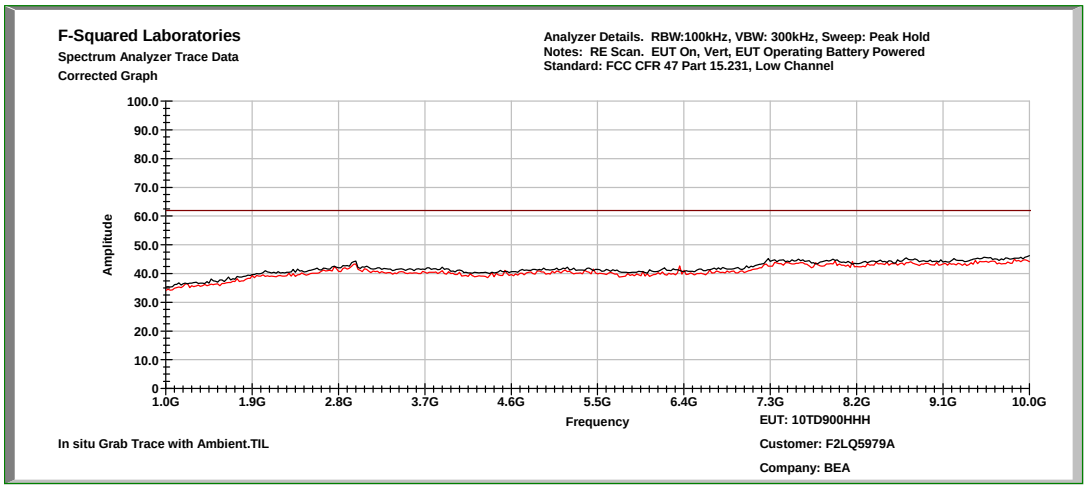
Characterization Scan, Low Channel: 900 MHz to 1 GHz, Vertical



Characterization Scan, Low Channel: 1 GHz to 10 GHz, Horizontal



Characterization Scan, Low Channel: 1 GHz to 10 GHz, Vertical



7 PHOTOGRAPH(S)

Radiated Spurious Emissions

APPENDIX

REPORTING FORM

EU259
Project

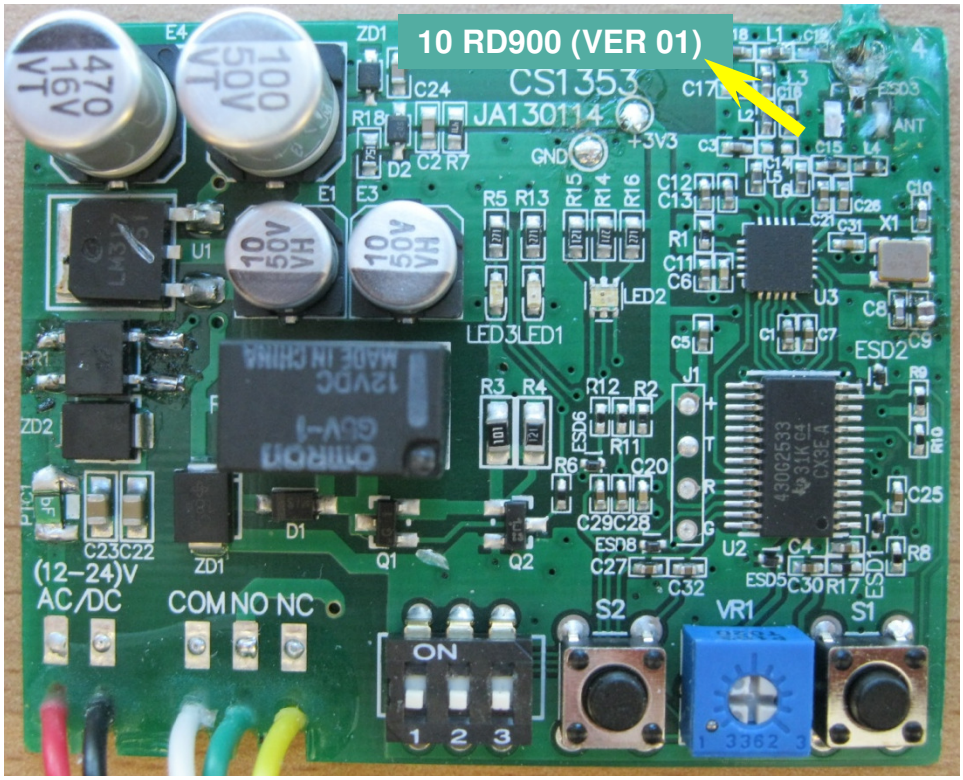
Name: A Gianettino
Date: 6/3/2014

UE259 BEA 900Mhz TxRx
Engineering Change Requests (Hardware)

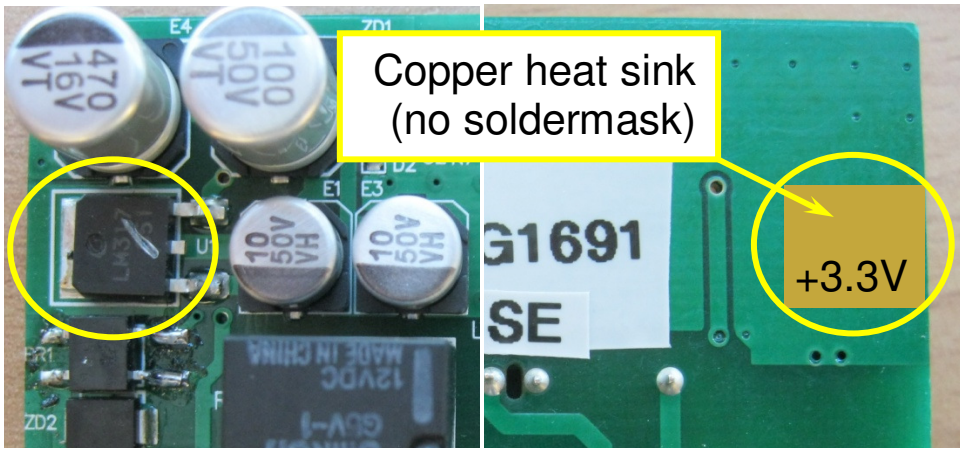
The purpose of this report is to provide a description of the final hardware changes (pertaining to assemblies 10.1256 / 10.1257 / 10.1258 / 10.1262 / 10.1263 / 10.1264). All changes must be implemented for first production parts.

Changes

- **10RD900** (10.1256)
  - Change tolerance of resistors (R7, R18) to ±1%.
  - On silkscreen layer add "(VER 01)" next to the assembly number "10RD900".

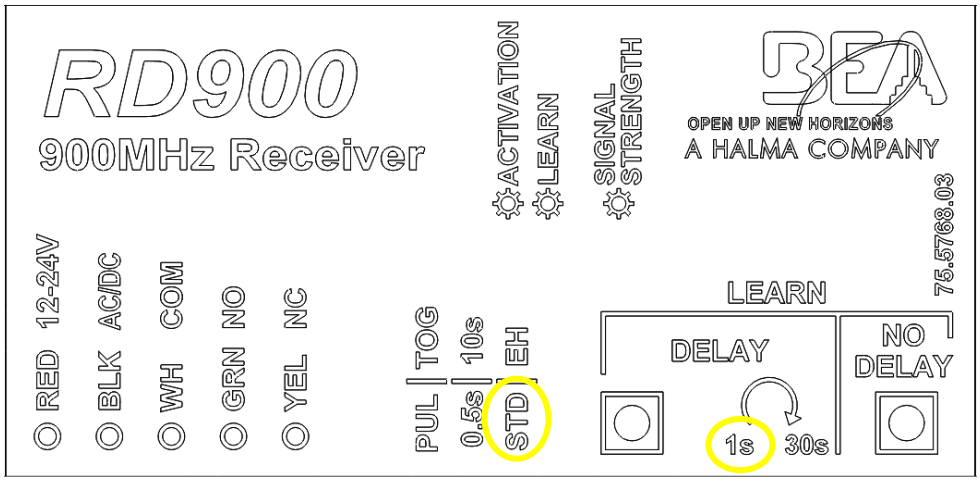


- Add copper heat sink for voltage regulator (U1) on bottom side of PCB



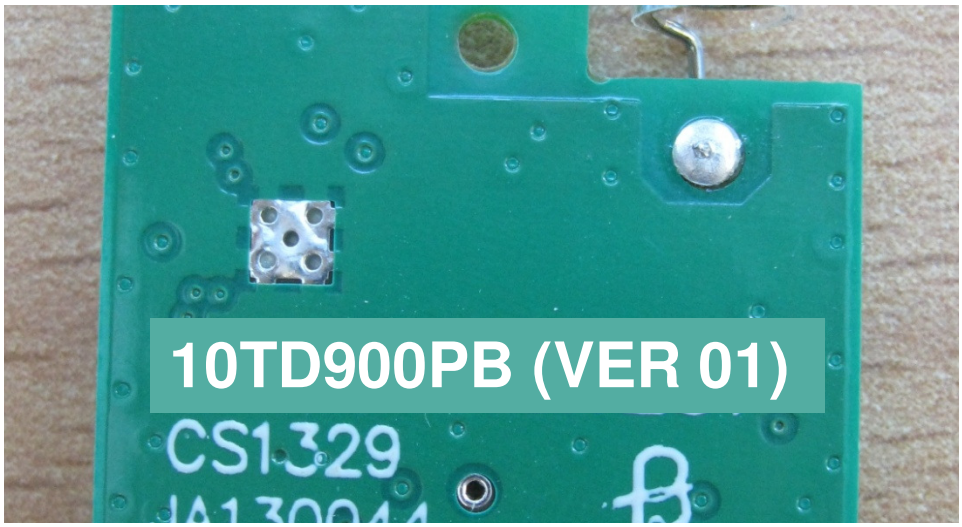
- Change fuse F1 to MFR PN 0ZCA0020FF2E

- Silkscreen cover label
  - Change label for dip switch 3 from "REG" to "STD"
  - Change minimum delay from "0s" to "1s"

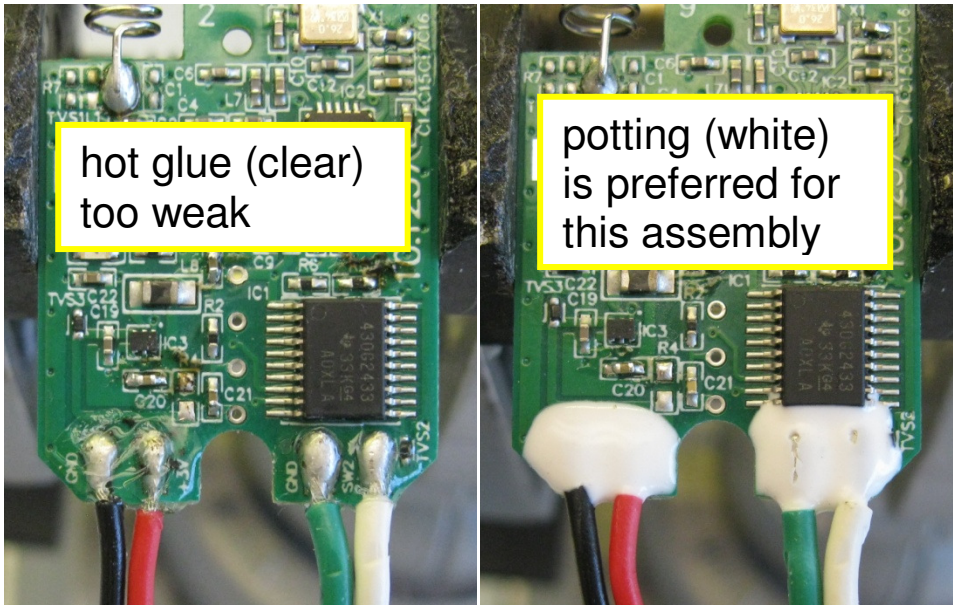


- ZD3 (as labeled on the schematic) is incorrectly called ZD1 on the BOM. Correct BOM.

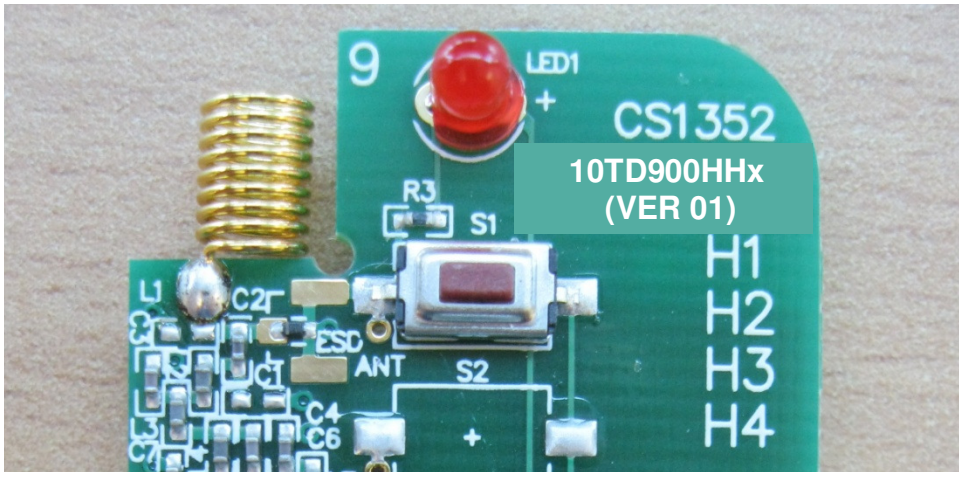
- **10TD900PB** (10.1257)
    - On silkscreen layer add "(VER 01)" next to the assembly number "10TD900PB".



    - On this assembly, use white potting for better strength.



- **10TD900HHx** (10.1258 / 10.1262 / 10.1263 / 10.1264)
    - On silkscreen layer add "(VER 01)" next to the assembly number "10TD900HHx".



    - Add through hole pads for external activation leads (same as TD433HHx)