# EMISSIONS TEST REPORT

**Report Number:** 100398565BOX-002d
**Project Number:** G100398565

**Report Issue Date:** 11/04/2011

**Product Designation:** ZOLL E Series Data Comm Card (Bluetooth Mode)

**Standards:** CFR47 FCC Part 15:2011 Subpart C Section 15.247,
CFR47 FCC Part 15:2011 Subpart B Class B,
Industry Canada RSS-210 Issue 8 December 2010,
Industry Canada ICES-003 Issue 4 February 2004,
Industry Canada RSS-Gen Issue 3 December 2010

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719

Client:
Zoll Medical Corporation
269 Mill Road
Chelmsford, MA 01824

Report prepared by Reviewer

Kouma Sinn / Senior Project Engineer

Report reviewed by

Michael F. Murphy / Staff Engineer, EMC

## 1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

## 2 Test Summary

| Section | Test full name | Result |
|---|---|---|
| 3 | Client Information | -- |
| 4 | Description of Equipment Under Test | -- |
| 5 | System Setup and Method | -- |
| 6 | Maximum Peak Output Power<br>FCC 15:2011 Subpart C, Section 15.247 (b) (1), (4)<br>RSS-210 Issue 8 December 2010, A8.4 (2) | Pass |
| 7 | Transmitter Radiated Spurious Emissions<br>FCC 15:2011 Subpart C Section 15.247 (d)<br>RSS-210 Issue 8 December 2010, A8.5 | Pass |
| 8 | Hopping Channel Separation<br>FCC 15:2011 Subpart C Section 15.247 (a)(1)<br>RSS-210 Issue 8 December 2010, A8.1 (b) | Pass |
| 9 | Number of Hopping Frequency<br>FCC 15:2011 Subpart C Section 15.247 (a)(1) (iii)<br>RSS-210 Issue 8 December 2010, A8.1 (d) | Pass |
| 10 | Hopping Channel Bandwidth<br>FCC 15:2011 Subpart C Section 15.247 (a)(1)<br>RSS-210 Issue 8 December 2010, A8.1 (b) | Pass |
| 11 | Hopping Dwell time<br>FCC 15:2011 Subpart C Section 15.247 (a)(1) (iii)<br>RSS-210 Issue 8 December 2010, A8.1 (d) | Pass |
| 12 | Band-edge Compliance<br>FCC 15:2011 Subpart C Section 15.247 (d)<br>RSS-210 Issue 8 December 2010, A8.5 | Pass |
| 13 | Receiver Radiated Spurious<br>FCC Part 15:2011 Subpart B Section 15.109 (a)<br>RSS-Gen Issue 3 December 2010, Section 6.1 (Table 2) | Pass |
| 14 | AC Mains Conducted Emissions<br>FCC Part 15:2011 Section 15.207 (a)<br>RSS-Gen Issue 3 December 2010, Section 7.2.4 (Table 4) | Pass |
| 15 | Revision History | -- |

## 3 Client Information

This EUT was tested at the request of:

**Company:** Zoll Medical Corporation
269 Mill Road
Chelmsford, MA 01824
**Contact:** Mr. Don Paradis
**Telephone:** 978-421-9608
**Fax:** Not Available
**Email:** DParadis@zoll.com

## 4 Description of Equipment Under Test

| Equipment Under Test | | | |
|---|---|---|---|
| Description | Manufacturer | Model Number | Serial Number |
| ZOLL E Series Data Comm Card | Zoll Medical | ZOLL E Series Data Comm Card | IN0411-00032 |
| | | | |

| | |
|---|---|
| Receive Date: | 08/15/2011 |
| Received Condition: | Good |
| Type: | Production |

| Description of Equipment Under Test (provided by client) |
|---|
| Bluetooth transmitter inside E-Series Defibrillator. It utilizes an integral antenna on an E-series board which has 1.5 dBi of gain as stated by Zoll Medical. Bluetooth utilizes 79 channels starting at 2402 MHz and extending to 2480 MHz. Channels 1 (2402 MHz), 40 (2441 MHz) and 79 (2480 MHz) were selected for testing. |

| Equipment Under Test Power Configuration | | | |
|---|---|---|---|
| Rated Voltage | Rated Current | Rated Frequency | Number of Phases |
| 100-120V | 220VA | 50/60 Hz | 1 |

| **Operating modes of the EUT:** | |
|---|---|
| No. | Descriptions of EUT Exercising |
| 1 | Transmit mode – hopping enabled (DH1, DH3, and DH5) or hopping disabled, modulated on a single channel |
| 2 | Receive mode |

## 5 System Setup and Method

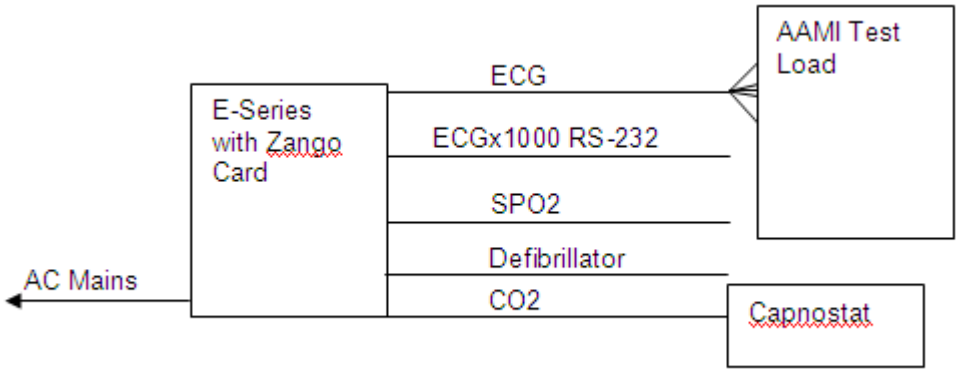
| Cables | | | | | |
|---|---|---|---|---|---|
| Qty | Description | Length (m) | Shielding | Ferrites | Termination |
| 1 | AC Mains Cable | 3.0m | None | None | EUT/AC |
| 1 | ECG Cable | 3.0m | Foil | None | EUT |
| 1 | ECGx1000 RS-232 Cable | 1.2 | Foil | None | EUT |
| 1 | SPO2 Cable | 3.0m | Braid | None | EUT |
| 1 | Defibrillator Cable | 2.2m | Braid | None | EUT |
| 1 | CO2 Cable | 3.0m | Braid | None | EUT |

| Support Equipment | | | |
|---|---|---|---|
| Description | Manufacturer | Model Number | Serial Number |
| E-Series Defibrillator | Zoll Medical | E Series | AB11B016129 |

### 5.1 Method:

Configuration as required by ANSI C 63.4:2003, FCC Part 15:2011 Subpart C Section 15.247, RSS-210 Issue 8 December 2010, RSS-Gen Issue 3 December 2010, and FCC Public Notice DA 00-705 Released March 30, 2000.

### 5.2 EUT Block Diagram:



# 6 Maximum Peak Output Power

## 6.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247, DA 00-705, ANSI C63.4, RSS-Gen, and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

**Measurement Uncertainty**

For radiated emissions, $U_{lab}$ (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < $U_{CISPR}$ (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

**Sample Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

**Example:**

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

## 6.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| 145108' | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESIB40 | 100209 | 04/28/2011 | 04/28/2012 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 08/27/10 |

## 6.3 Results:

The sample tested was found to comply.

FCC 15 Subpart C, Section 15.247 (b) (1) & RSS-210, A8.4 (2)

The maximum peak conducted output power of the intentional radiator shall not exceed 0.125 watts for systems with channel separation of 2/3 of the channel bandwidth.

The antenna conducted tests cannot be performed on this device, radiated tests to show compliance was performed using the following formula per DA 00-705 Released March 30, 2000.

$$P = \frac{(E*d)^2}{30G}$$

E is the measured maximum fundamental field strength in V/m.

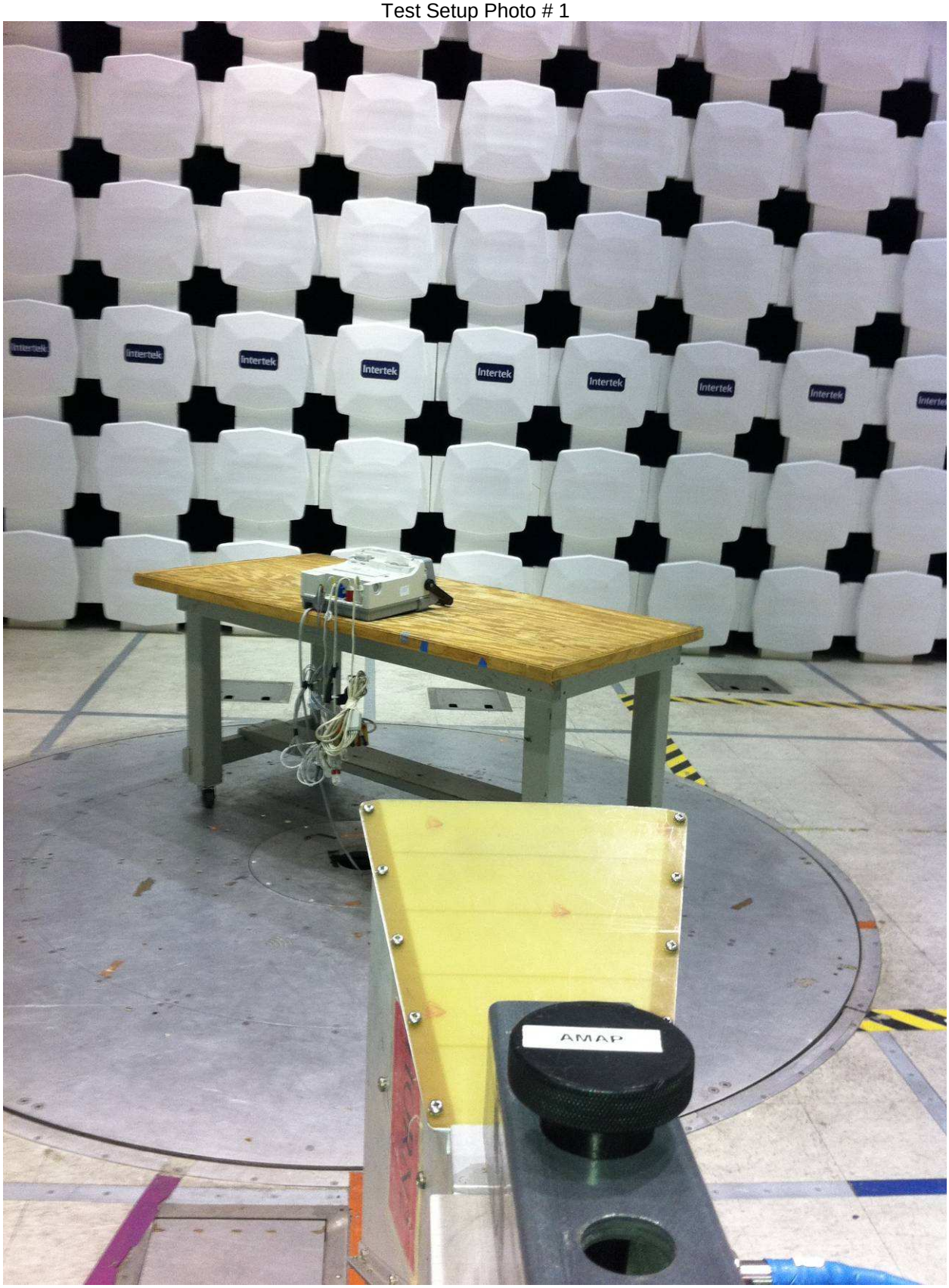
G is the numeric gain of the transmitting antenna with reference to an isotropic radiator.

d is the distance in meters from which the field strength was measured.

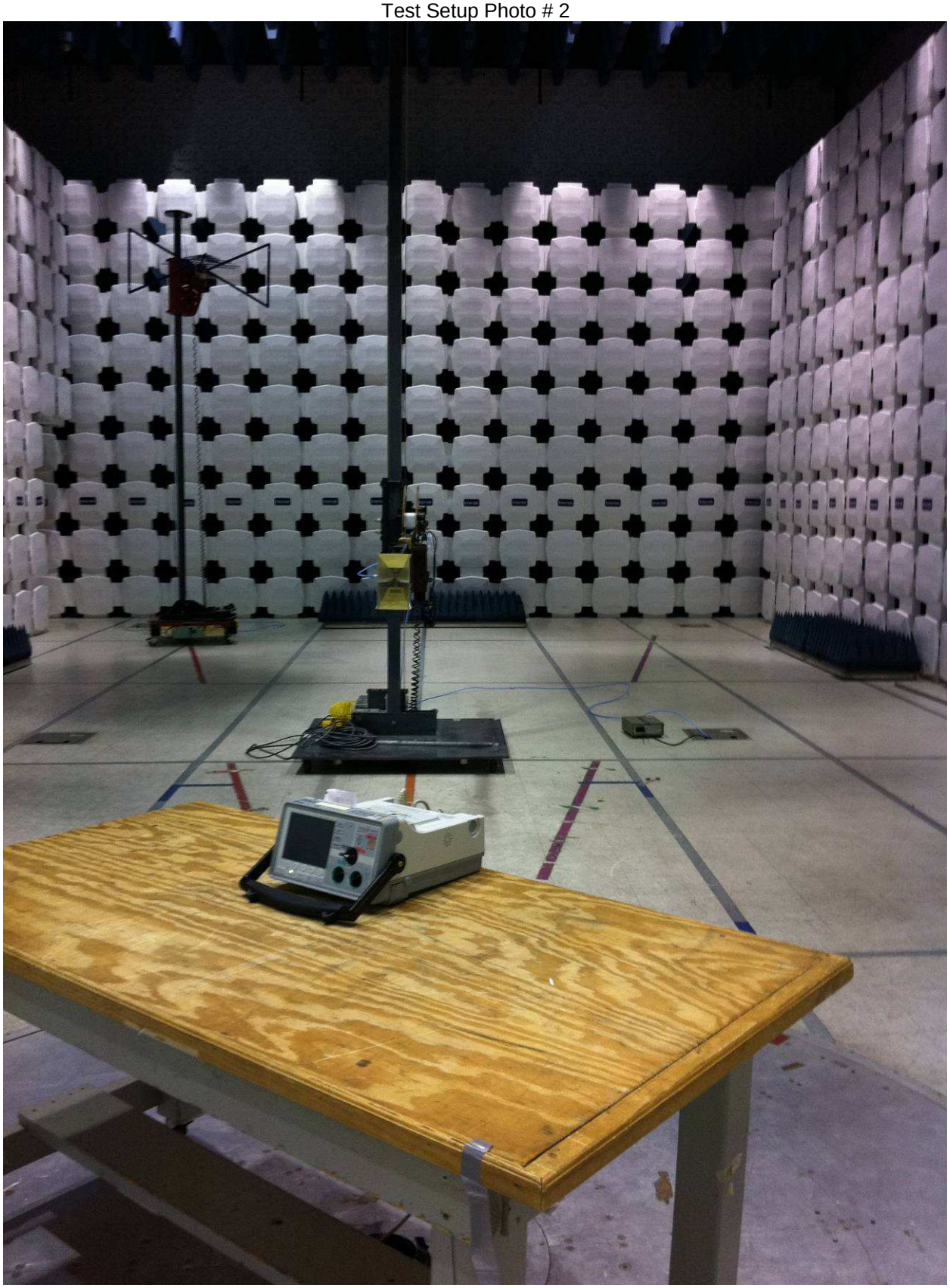
P is the power in watts.

## 6.4 Setup Photographs:

Test Setup Photo # 1



Test Setup Photo # 2



## 6.5 Data:

Intertek

**Radiated Emissions**

Company: Zoll Medical — Antenna & Cables: N — Bands: N, LF, HF, SHF
Model #: ZOLL E Series Data Comm Card — Antenna: HORN2 V3m 10-08-2011.txt — HORN2 H3m 10-08-2011.txt
Serial #: IN0411-00032 — Cable(s): 3mTrackB 145-416 08-31-2011.txt — NONE.
Engineers: Nicholas Abbondante — Location: 10m Chamber — Barometer: SAF767 — Filter: NONE
Project #: G100398565 — Date(s): 08/19/11
Standard: FCC Part 15 Subpart C 15.247 — Temp/Humidity/Pressure: 25c — 54% — 1003mB
Receiver: R&S ESIB (145108) 04-06-2012 — Limit Distance (m): 3
PreAmp: NONE. — Test Distance (m): 3
PreAmp Used? (Y or N): N — Voltage/Frequency: 115V/60Hz — Frequency Range: Frequencies Shown
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Note: Fundamental Field Strength | | | | | | | | | | | | | |
| PK | V | 2402.000 | 49.72 | 28.33 | 5.80 | 0.00 | 0.00 | 83.86 | - | - | 1/3 MHz | | |
| PK | H | 2402.000 | 49.88 | 28.15 | 5.80 | 0.00 | 0.00 | 83.83 | - | - | 1/3 MHz | | |
| PK | V | 2441.000 | 51.08 | 28.35 | 5.88 | 0.00 | 0.00 | 85.31 | - | - | 1/3 MHz | | |
| PK | H | 2441.000 | 51.99 | 28.25 | 5.88 | 0.00 | 0.00 | 86.12 | - | - | 1/3 MHz | | |
| PK | V | 2480.000 | 53.89 | 28.37 | 5.96 | 0.00 | 0.00 | 88.22 | - | - | 1/3 MHz | | |
| PK | H | 2480.000 | 54.03 | 28.36 | 5.96 | 0.00 | 0.00 | 88.35 | - | - | 1/3 MHz | | |
| Note: 100 kHz reference for 20 dBc limit | | | | | | | | | | | | | |
| PK | V | 2402.000 | 49.14 | 28.33 | 5.80 | 0.00 | 0.00 | 83.28 | - | - | 100/300 kHz | | |
| PK | H | 2402.000 | 49.54 | 28.15 | 5.80 | 0.00 | 0.00 | 83.49 | - | - | 100/300 kHz | | |
| PK | V | 2441.000 | 50.64 | 28.35 | 5.88 | 0.00 | 0.00 | 84.87 | - | - | 100/300 kHz | | |
| PK | H | 2441.000 | 51.78 | 28.25 | 5.88 | 0.00 | 0.00 | 85.91 | - | - | 100/300 kHz | | |
| PK | V | 2480.000 | 53.65 | 28.37 | 5.96 | 0.00 | 0.00 | 87.98 | - | - | 100/300 kHz | | |
| PK | H | 2480.000 | 53.90 | 28.36 | 5.96 | 0.00 | 0.00 | 88.22 | - | - | 100/300 kHz | | |

Maximum Peak Power Calculation Given a 1.5 dBi antenna gain:

| Channels | dBuV/m | mW conducted | dBm conducted | mW EIRP | dBm EIRP |
|---|---|---|---|---|---|
| 1 | 83.86 | 0.052 | -12.86 | 0.073 | -11.37 |
| 40 | 86.12 | 0.087 | -10.60 | 0.123 | -9.11 |
| 79 | 88.35 | 0.146 | -8.37 | 0.205 | -6.88 |

| | | | |
|---|---|---|---|
| Test Personnel: | Nicholas Abbondante | Test Date: | 08/19/2011 |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | Emissions below the limits specified in section 6.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | Ambient Temperature: | 25 ℃ |
| Input Voltage: | 120VAC/60Hz | Relative Humidity: | 54 % |
| | | Atmospheric Pressure: | 1003 mbar |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | | |

Deviations, Additions, or Exclusions: None

# 7 Transmitter Radiated Spurious Emissions

## 7.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247, DA 00-705, ANSI C63.4, RSS-Gen, and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

**Measurement Uncertainty**

For radiated emissions, $U_{lab}$ (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < $U_{CISPR}$ (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

**Sample Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

**Example:**

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

## 7.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-414 | Cables 145-400 145-409 145-4-5 145-403 | Huber + Suhner | 3m Track A cables | multiple | 08/31/2010 | 08/31/2011 |
| 145034' | BiLog Antenna (30 MHz to 1GHz) | Schaffner Chase EMC | CBL6111C | none | 01/07/2011 | 01/07/2012 |
| 145003' | Preamplifier (150 KHz to 1.3 GHz) | Hewlett Packard | 8447D | 2443A04077 | 09/24/2010 | 09/24/2011 |
| 145014' | Preamplifier (1 GHz to 26.5 GHz) | Hewlett Packard | 8449B | 3008A00232 | 12/28/2010 | 12/28/2011 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |
| 145128' | EMI Receiver 40 GHz (20 Hz - 40 Ghz) | Rohde & Schwarz | ESI | 8392831001 | 08/10/2010 | 09/10/2011 |
| REA002' | 2.5GHz High Pass Filter | Reactel, Inc | 7HS-2.5G/18G-S11 | 06-1 | 12/06/2010 | 12/06/2011 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| EMC02' | ANTENNA, RIDGED GUIDE, 1-18 GHZ | EMCO | 3115 | 2784 | 10/08/2010 | 10/08/2011 |
| CBL030' | High Frequency Cable 40GHz | Megaphase | TM40 K1K1 80 | CBL030 | 01/06/2011 | 01/06/2012 |
| MEG005' | High Frequency Cable | Megaphase | TM40-K1K1-197 | 8148601-001 | 01/06/2011 | 01/06/2012 |
| PRE9' | 100MHz-40GHz Preamp | MITEQ | NSP4000-NFG | 1260417 | 05/12/2011 | 05/12/2012 |
| ROS001' | Spectrum Analyzer 20Hz - 40 GHz | Rohde & Schwartz | FSEK-30 | 100225 | 01/13/2011 | 01/13/2012 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| C5 | Teseq | Build 5.26.00.3 |
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 08/27/10 |

## 7.3 Results:

The sample tested was found to comply.

In any 100 kHz bandwidth outside the frequency band , the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

FCC Part 15.209(a) & RSS-210 A8.5 – Restricted Band Radiated Spurious/Harmonics Limits

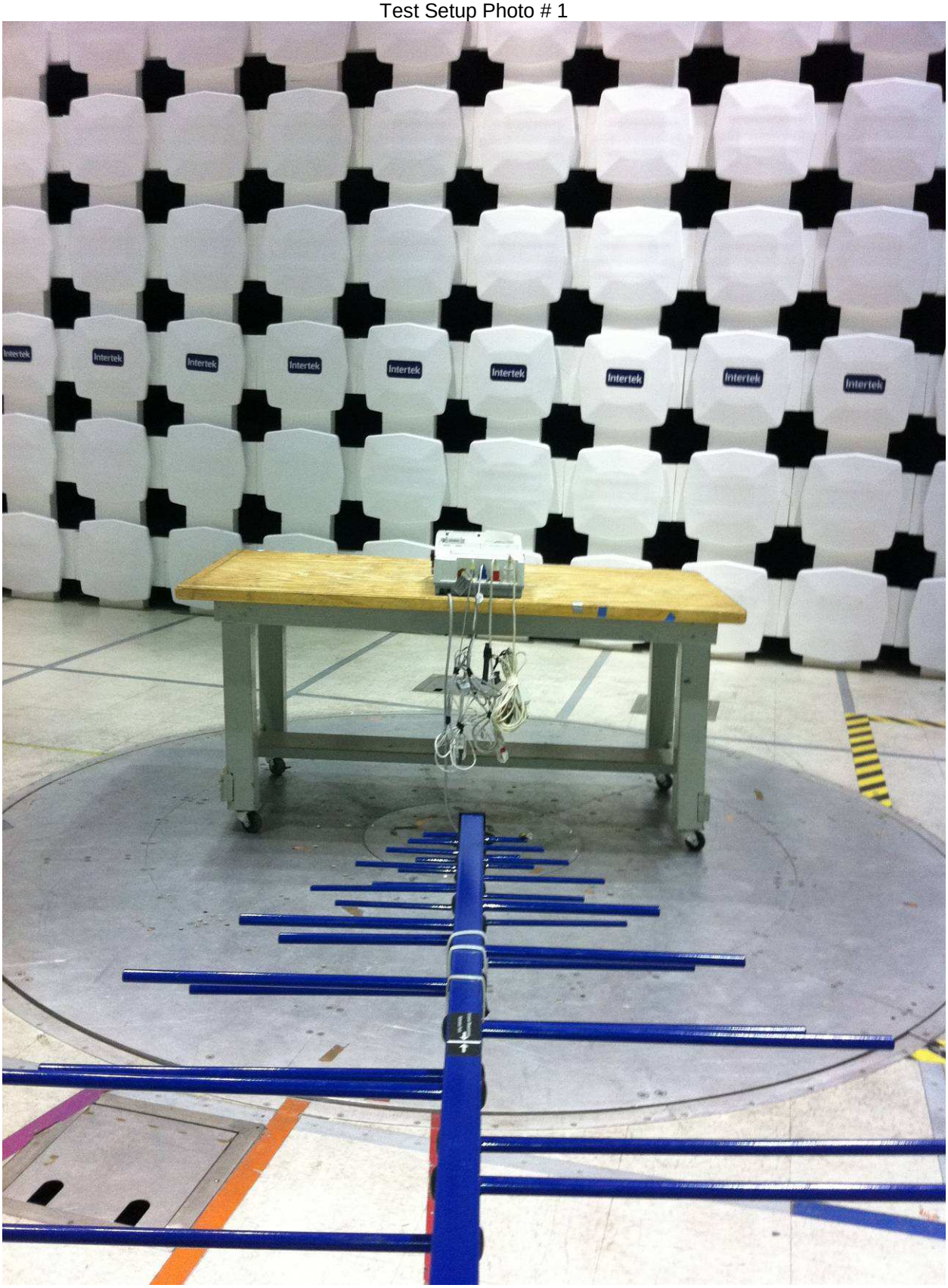
| Frequency | Field Strength | | Test Distance |
|---|---|---|---|
| (MHz) | µV/m | dBµV/m | (meters) |
| 30–88 | 100 | 40.00 | 3 |
| 88–216 | 150 | 43.52 | 3 |
| 216–960 | 200 | 46.02 | 3 |
| Above 960 | 500 | 53.98 | 3 |

FCC Part 15.247(d) & RSS-210 A8.5 – Non Restricted Band Radiated Spurious/Harmonics Limits

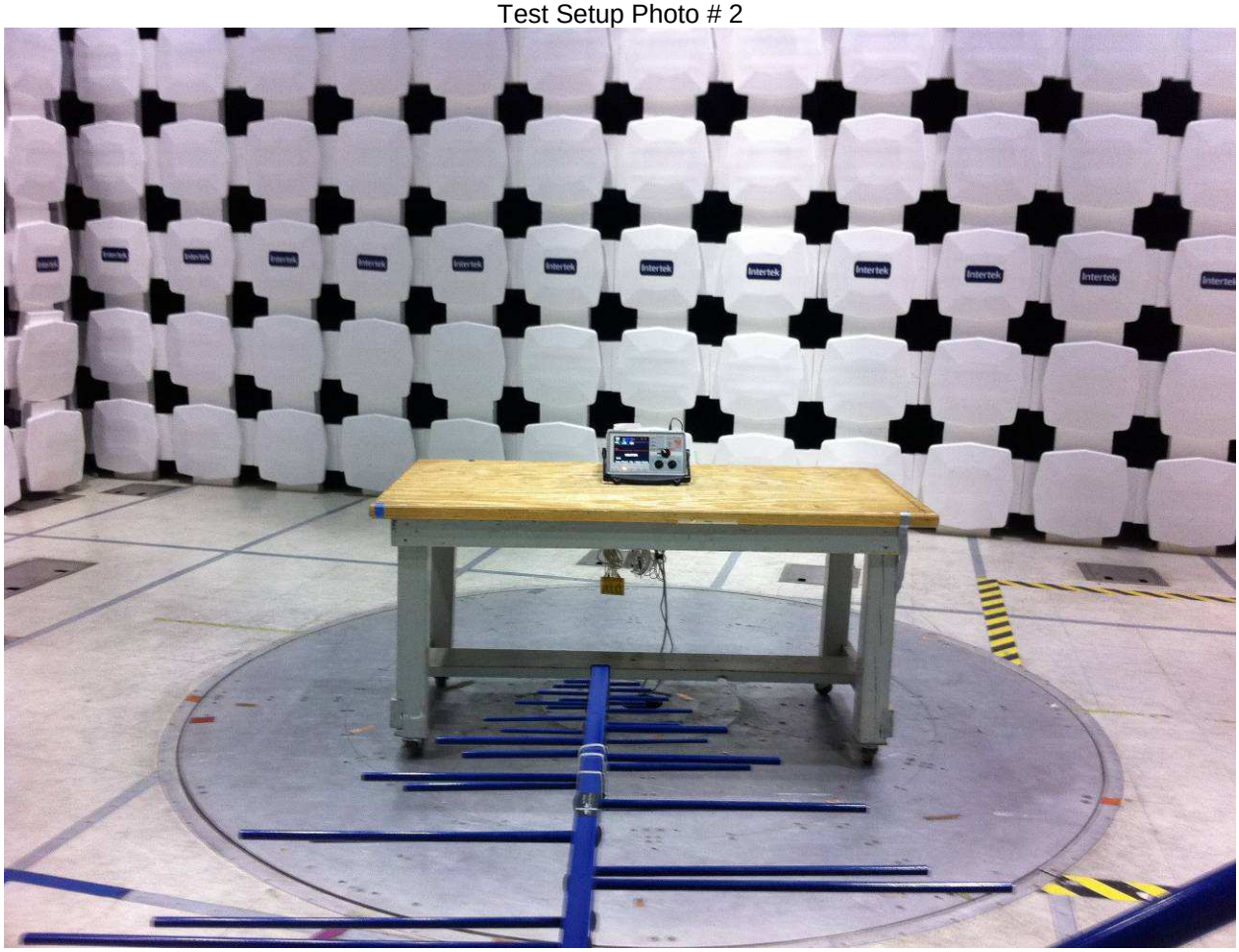
| Channels | Fundamental Field Strength (dBuV/m) | Spurious/Harmonics Limits (dBuV/m) | Test Distance (meters) |
|---|---|---|---|
| 1 | 83.49 | 63.49 | 3 |
| 40 | 85.91 | 65.91 | 3 |
| 79 | 88.22 | 68.22 | 3 |

## 7.4 Setup Photographs:

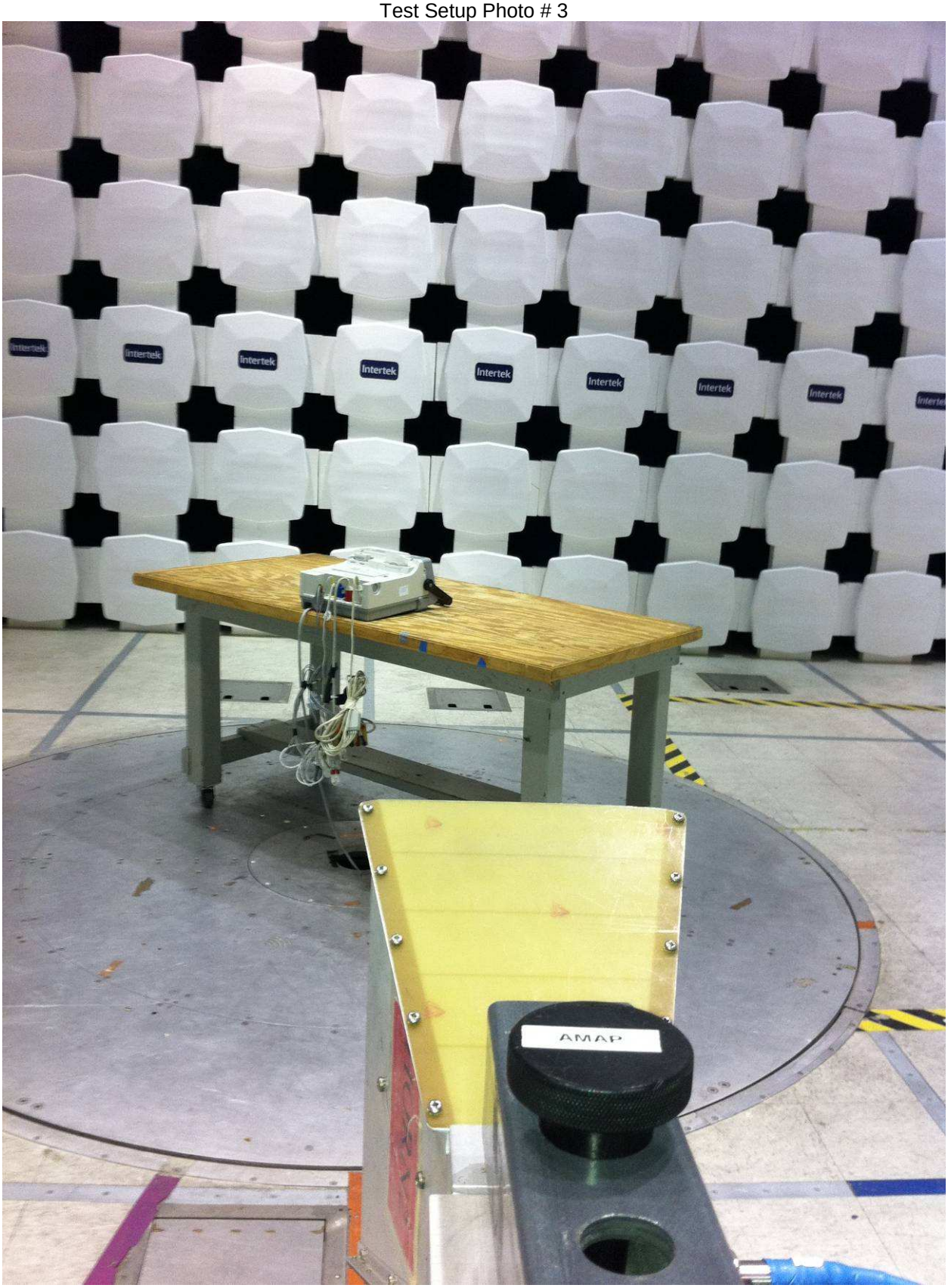
Test Setup Photo # 1



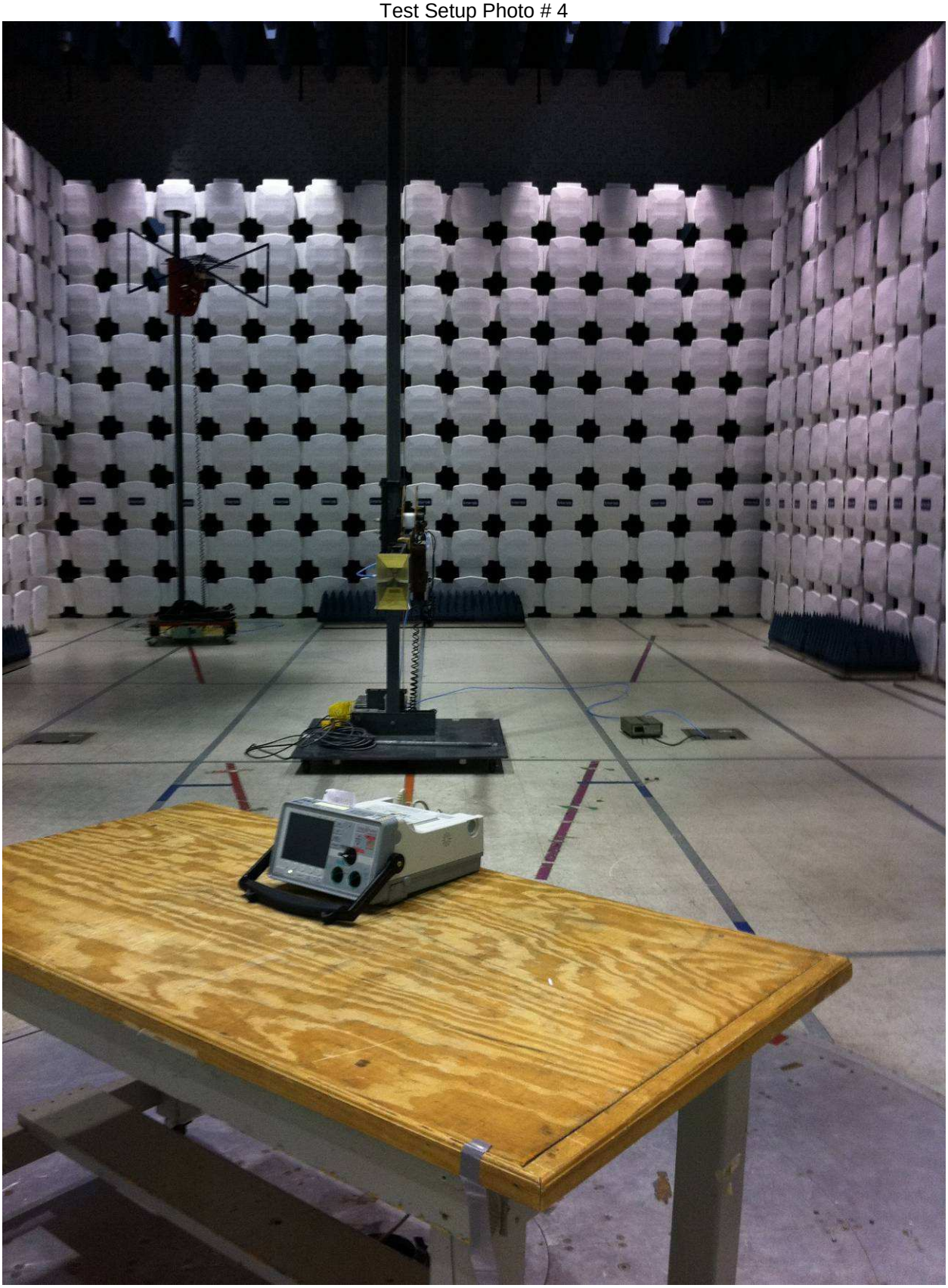
Test Setup Photo # 2



Test Setup Photo # 3



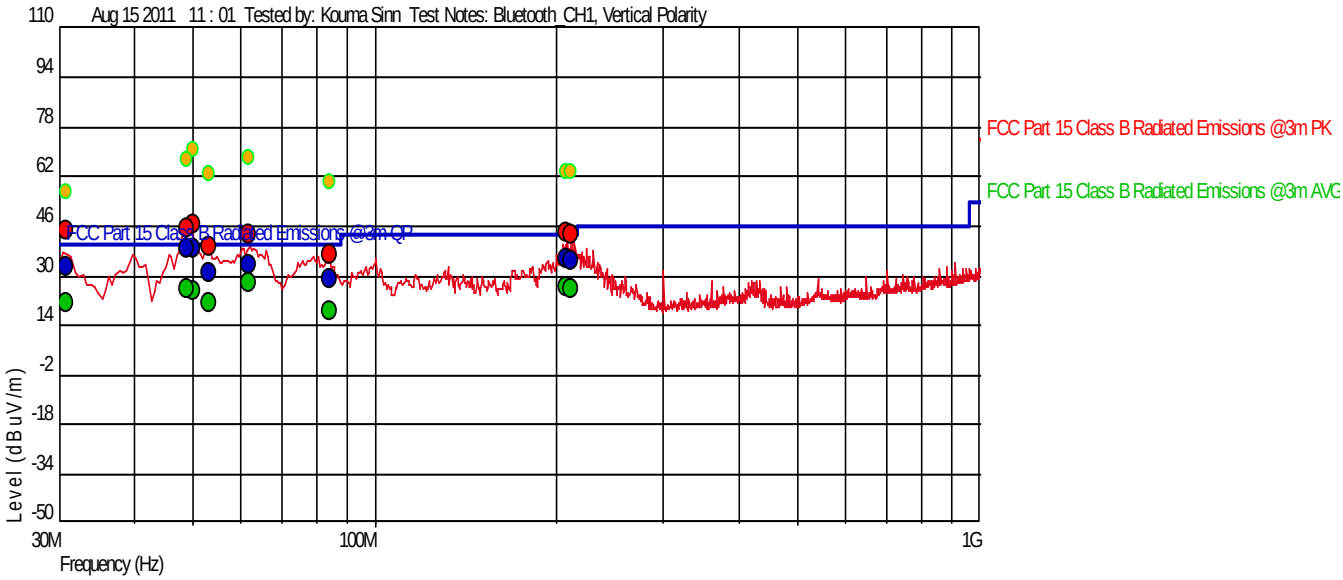
Test Setup Photo # 4



## 7.5 Plots/Data:

**FCC Part 15.209, FCC Part 15.247, RSS-210**

**Channel 1 (2.402GHz) Radiated Emissions @ 3m, Vertical Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw

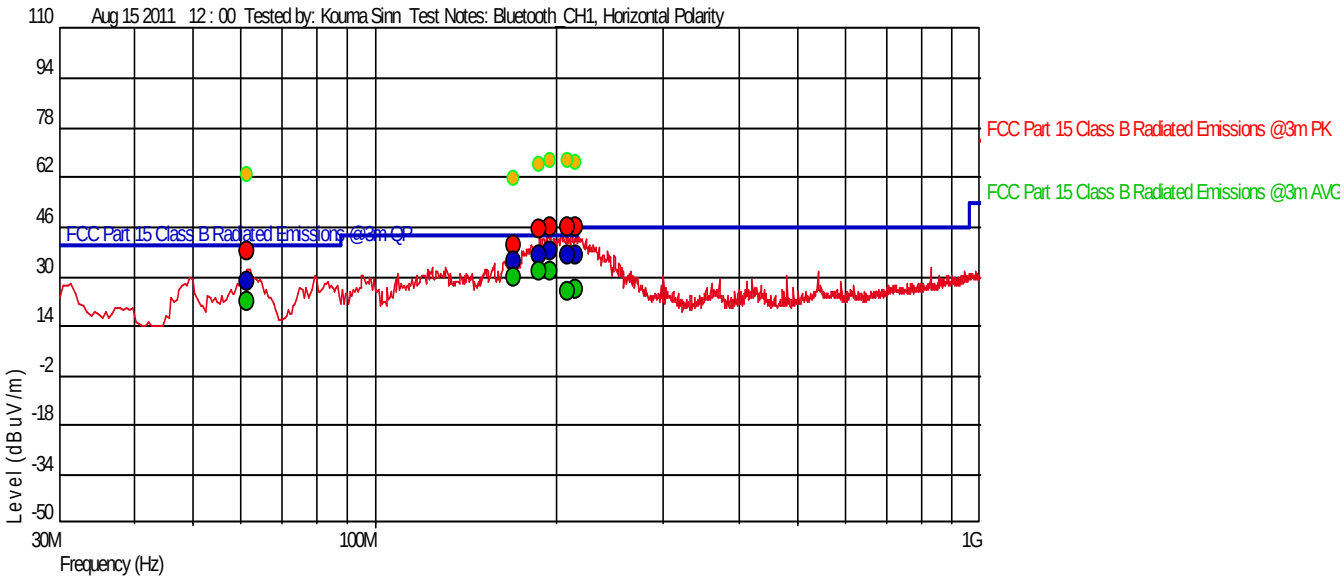
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Vert (\|) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 30.850M | 33.13 | 17.305 | -26.553 | 40.00 | -6.87 | \| | 143 | 1.36 | 120k |
| 48.932M | 38.55 | 8.334 | -26.310 | 40.00 | -1.45 | \| | 66 | 1.19 | 120k |
| 50.029M | 38.59 | 7.988 | -26.289 | 40.00 | -1.41 | \| | 266 | 1.19 | 120k |
| 53.001M | 31.29 | 7.200 | -26.229 | 40.00 | -8.71 | \| | 211 | 1.18 | 120k |
| 61.847M | 33.87 | 5.215 | -26.080 | 40.00 | -6.13 | \| | 46 | 1.46 | 120k |
| 84.098M | 29.00 | 8.700 | -26.000 | 40.00 | -11.00 | \| | 343 | 1.59 | 120k |
| 207.555M | 35.22 | 10.500 | -24.888 | 43.52 | -8.30 | \| | 255 | 1.41 | 120k |
| 211.212M | 34.71 | 10.403 | -24.882 | 43.52 | -8.81 | \| | 256 | 1.37 | 120k |

**FCC Part 15.209, FCC Part 15.247, RSS-210**

**Channel 1 (2.402GHz) Radiated Emissions @ 3m, Horizontal Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

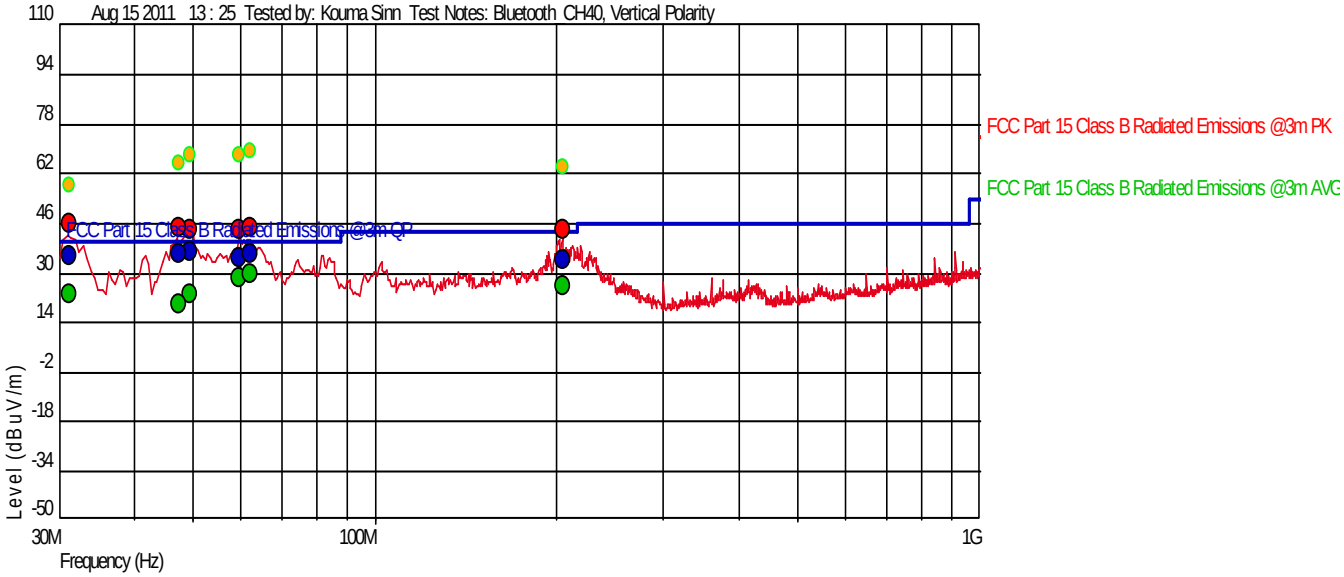
Level (dBuV/m) = AF + CL + PA + Raw
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Hor (--) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 61.507M | 28.67 | 5.551 | -26.084 | 40.00 | -11.33 | -- | 163 | 3.07 | 120k |
| 169.382M | 34.64 | 9.700 | -25.169 | 43.52 | -8.88 | -- | 349 | 1.83 | 120k |
| 186.978M | 37.00 | 9.000 | -25.009 | 43.52 | -6.52 | -- | 315 | 1.53 | 120k |
| 194.740M | 37.89 | 9.000 | -24.943 | 43.52 | -5.63 | -- | 319 | 1.19 | 120k |
| 208.199M | 36.72 | 9.236 | -24.887 | 43.52 | -6.80 | -- | 333 | 1.18 | 120k |
| 214.642M | 36.78 | 9.014 | -24.876 | 43.52 | -6.74 | -- | 190 | 1.52 | 120k |

**FCC Part 15.209, FCC Part 15.247, RSS-210**

**Channel 40 (2.441GHz) Radiated Emissions @ 3m, Vertical Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

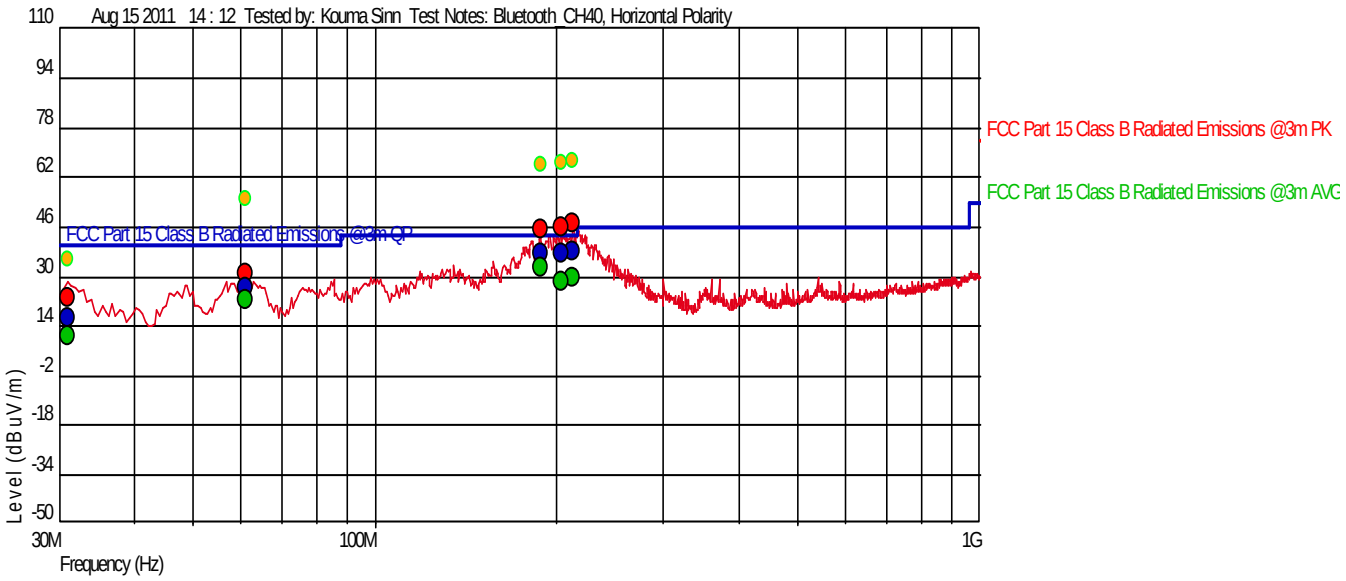
Level (dBuV/m) = AF + CL + PA + Raw
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Vert (\|) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 31.135M | 35.35 | 17.146 | -26.551 | 40.00 | -4.65 | \| | 86 | 1.19 | 120k |
| 47.389M | 36.40 | 9.044 | -26.340 | 40.00 | -3.60 | \| | 70 | 1.30 | 120k |
| 49.385M | 36.51 | 8.185 | -26.302 | 40.00 | -3.49 | \| | 218 | 1.67 | 120k |
| 59.665M | 34.85 | 5.634 | -26.106 | 40.00 | -5.15 | \| | 37 | 1.19 | 120k |
| 62.080M | 36.44 | 5.192 | -26.078 | 40.00 | -3.56 | \| | 88 | 1.41 | 120k |
| 204.588M | 34.14 | 10.475 | -24.892 | 43.52 | -9.38 | \| | 262 | 1.40 | 120k |

**FCC Part 15.209, FCC Part 15.247, RSS-210**

**Channel 40 (2.441GHz) Radiated Emissions @ 3m, Horizontal Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw

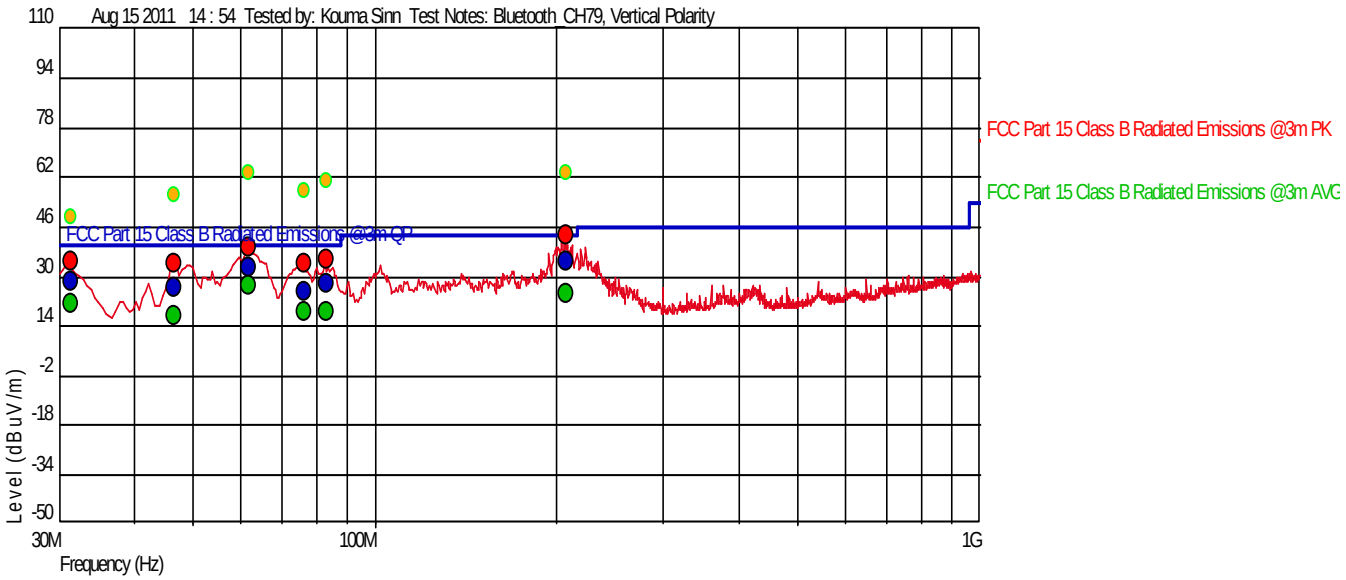
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Hor (--) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 31.022M | 16.48 | 18.096 | -26.552 | 40.00 | -23.52 | -- | 110 | 1.59 | 120k |
| 61.139M | 26.26 | 5.514 | -26.088 | 40.00 | -13.74 | -- | 328 | 3.25 | 120k |
| 187.747M | 37.79 | 9.000 | -25.002 | 43.52 | -5.73 | -- | 335 | 1.49 | 120k |
| 203.757M | 37.68 | 9.250 | -24.894 | 43.52 | -5.84 | -- | 335 | 1.44 | 120k |
| 212.025M | 38.09 | 9.119 | -24.880 | 43.52 | -5.43 | -- | 334 | 1.49 | 120k |

**FCC Part 15.209, FCC Part 15.247, RSS-210**

**Channel 79 (2.480GHz) Radiated Emissions @ 3m, Vertical Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

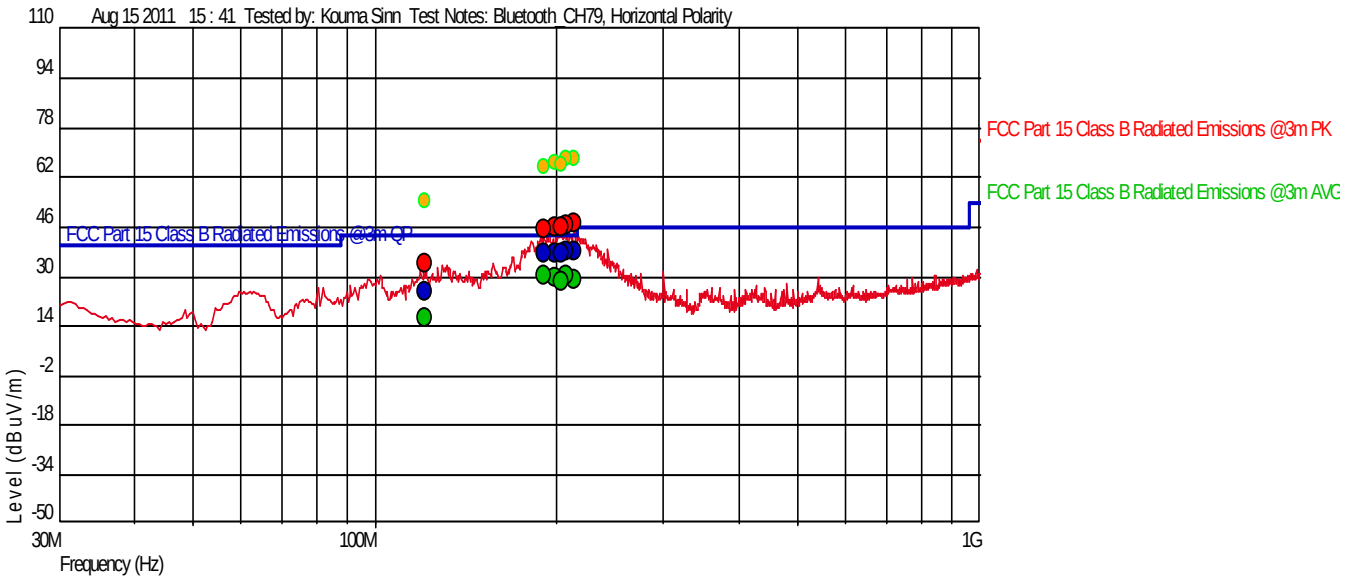
Level (dBuV/m) = AF + CL + PA + Raw
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Vert (\|) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 31.370M | 28.69 | 17.052 | -26.549 | 40.00 | -11.31 | \| | 262 | 1.19 | 120k |
| 46.441M | 26.34 | 9.536 | -26.359 | 40.00 | -13.66 | \| | 355 | 1.30 | 120k |
| 61.648M | 33.08 | 5.235 | -26.082 | 40.00 | -6.92 | \| | 99 | 1.18 | 120k |
| 76.385M | 25.35 | 7.415 | -26.000 | 40.00 | -14.65 | \| | 234 | 1.67 | 120k |
| 82.944M | 27.75 | 8.194 | -26.000 | 40.00 | -12.25 | \| | 133 | 1.71 | 120k |
| 206.472M | 34.72 | 10.500 | -24.889 | 43.52 | -8.80 | \| | 251 | 1.42 | 120k |

**FCC Part 15.209, FCC Part 15.247, RSS-210**

**Channel 79 (2.480GHz) Radiated Emissions @ 3m, Horizontal Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Hor (--) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 121.236M | 25.26 | 11.476 | -25.646 | 43.52 | -18.26 | -- | 166 | 2.54 | 120k |
| 190.493M | 37.25 | 8.951 | -24.979 | 43.52 | -6.27 | -- | 334 | 1.30 | 120k |
| 199.018M | 37.37 | 9.100 | -24.908 | 43.52 | -6.15 | -- | 329 | 1.44 | 120k |
| 203.053M | 37.53 | 9.222 | -24.895 | 43.52 | -5.99 | -- | 344 | 1.48 | 120k |
| 207.227M | 38.31 | 9.255 | -24.888 | 43.52 | -5.21 | -- | 312 | 1.31 | 120k |
| 213.097M | 38.30 | 9.076 | -24.879 | 43.52 | -5.22 | -- | 333 | 1.42 | 120k |

## FCC Part 15.209, FCC Part 15.247, RSS-210

## Channel 1 (2.402GHz) Radiated Emissions @ 3m, 1-18GHz

**Radiated Emissions**

Company: Zoll Medical Corp
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Vathana Ven
Project #: G100398565
Standard: FCC Part 15.209, FCC Part 15.247, RSS-210
Receiver: R&S ESI (145-128) 09-10-2011
PreAmp: PRE_145014_12-28-2011.txt
Date(s): 07/26/11
Location: 10M
Limit Distance (m): 3
Test Distance (m): 3
Antenna & Cables: HF
Antenna: HORN2 V3m 10-08-2011.txt
Cable(s): 3mTrackB 145-416 08-31-2011.txt
Barometer: DAV002
Temp/Humidity/Pressure: 21 deg C
Bands: N, LF, HF, SHF
HORN2 H3m 10-08-2011.txt
NONE.
Filter: REA002
63%
994 mB
PreAmp Used? (Y or N): Y
Voltage/Frequency: 120VAC/60Hz
Frequency Range: 1-18GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 4804.000 | 45.34 | 32.87 | 8.30 | 34.88 | 0.00 | 51.63 | 54.00 | -2.37 | 1/3 MHz | RB | RB | |
| AVG | V | 4804.000 | 36.83 | 32.87 | 8.30 | 34.88 | 0.00 | 43.12 | 54.00 | -10.88 | 1/3 MHz | RB | | Noise Floor |
| PK | V | 7206.000 | 30.48 | 35.94 | 10.52 | 35.53 | 0.00 | 41.41 | 63.49 | -22.08 | 100/300 kHz | | | Noise Floor |
| PK | V | 9608.000 | 32.18 | 37.72 | 12.17 | 35.94 | 9.54 | 36.59 | 63.49 | -26.90 | 100/300 kHz | | 1 Meter | Noise Floor |
| PK | V | 12010.000 | 42.14 | 39.35 | 13.24 | 35.17 | 9.54 | 50.02 | 54.00 | -3.98 | 1/3 MHz | RB | 1 Meter | Noise Floor |
| AVG | V | 12010.000 | 29.28 | 39.35 | 13.24 | 35.17 | 9.54 | 37.16 | 54.00 | -16.84 | 1/3 MHz | RB | 1 Meter | Noise Floor |
| PK | V | 14412.000 | 34.09 | 42.01 | 15.96 | 34.07 | 9.54 | 48.44 | 63.49 | -15.05 | 100/300 kHz | | 1 Meter | Noise Floor |
| PK | V | 16814.000 | 30.42 | 39.76 | 16.88 | 34.87 | 9.54 | 42.65 | 63.49 | -20.84 | 100/300 kHz | | 1 Meter | Noise Floor |

## Channel 1 (2.402GHz) Radiated Emissions @ 3m, 18-25GHz

**Radiated Emissions**

Company: Zoll Medical
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Kouma Sinn
Project #: G100398565
Standard: FCC Part 15.209, FCC Part 15.247, RSS-210
Receiver: ROS001
PreAmp: PRE9 05-12-2012.txt
Date(s): 08/16/11
Location: 10m Chamber
Limit Distance (m): 3
Test Distance (m): 1
Antenna & Cables: N
Antenna: EMC04 V1m 01-25-2012.txt
Cable(s): CBL030 01-06-2012.txt
Barometer: SAF767
Temp/Humidity/Pressure: 22C
Bands: N, LF, HF, SHF
EMC04 H1m 01-25-2012.txt
MEG005 01-06-2012.txt
Filter: NONE
55%
998mbar
PreAmp Used? (Y or N): Y
Voltage/Frequency: 120VAC/60Hz
Frequency Range: 18-25GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CH1 -2.402GHz. No emissions were detected. Readings below are noise floor signals. | | | | | | | | | | | | | | |
| PK | V | 19216.000 | 21.70 | 45.33 | 17.13 | 29.02 | 9.54 | 45.60 | 74.00 | -28.40 | 100/300KHz | RB | RB | |
| AVG | V | 19216.000 | 20.46 | 45.33 | 17.13 | 29.02 | 9.54 | 44.36 | 54.00 | -9.64 | 100/300KHz | RB | RB | |
| PK | V | 19216.000 | 33.80 | 45.33 | 17.13 | 29.02 | 9.54 | 57.70 | 74.00 | -16.30 | 1/3MHz | RB | RB | |
| AVG | V | 19216.000 | 25.00 | 45.33 | 17.13 | 29.02 | 9.54 | 48.90 | 54.00 | -5.10 | 1/3MHz | RB | RB | |
| PK | V | 21618.000 | 23.50 | 45.47 | 18.15 | 26.74 | 9.54 | 50.84 | 74.00 | -23.16 | 100/300KHz | | | |
| AVG | V | 21618.000 | 17.96 | 45.47 | 18.15 | 26.74 | 9.54 | 45.30 | 54.00 | -8.70 | 100/300KHz | | | |
| PK | V | 24020.000 | 22.27 | 45.42 | 18.90 | 26.57 | 9.54 | 50.49 | 74.00 | -23.51 | 100/300KHz | | | |
| AVG | V | 24020.000 | 17.96 | 45.42 | 18.90 | 26.57 | 9.54 | 46.18 | 54.00 | -7.82 | 100/300KHz | | | |

## Channel 40 (2.441GHz) Radiated Emissions @ 3m, 1-18GHz

**Radiated Emissions**

Company: Zoll Medical Corp
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Vathana Ven
Project #: G100398565
Standard: FCC Part 15.209, FCC Part 15.247, RSS-210
Receiver: R&S ESI (145-128) 09-10-2011
PreAmp: PRE_145014_12-28-2011.txt
Antenna & Cables: HF
Antenna: HORN2 V3m 10-08-2011.txt
Cable(s): 3mTrackB 145-416 08-31-2011.txt
Location: 10M
Barometer: DAV002
Filter: REA002
Date(s): 07/26/11
Temp/Humidity/Pressure: 21 deg C 63% 994 mB
Limit Distance (m): 3
Test Distance (m): 3
PreAmp Used? (Y or N): Y
Voltage/Frequency: 120VAC/60Hz
Frequency Range: 1-18GHz
Bands: N, LF, HF, SHF
HORN2 H3m 10-08-2011.txt
NONE.

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 4882.000 | 46.17 | 32.97 | 8.38 | 34.88 | 0.00 | 52.64 | 54.00 | -1.36 | 1/3 MHz | RB | RB | |
| AVG | V | 4882.000 | 39.44 | 32.97 | 8.38 | 34.88 | 0.00 | 45.91 | 54.00 | -8.09 | 1/3 MHz | RB | RB | |
| PK | V | 7323.000 | 40.92 | 36.31 | 10.58 | 35.53 | 0.00 | 52.28 | 54.00 | -1.72 | 1/3 MHz | RB | RB | Noise Floor |
| AVG | V | 7323.000 | 29.70 | 36.31 | 10.58 | 35.53 | 0.00 | 41.06 | 54.00 | -12.94 | 1/3 MHz | RB | RB | Noise Floor |
| PK | V | 9764.000 | 33.55 | 37.81 | 12.34 | 35.94 | 0.00 | 47.76 | 63.49 | -15.73 | 100/300 kHz | | | Noise Floor |
| PK | V | 12205.000 | 42.56 | 39.17 | 13.67 | 35.17 | 9.54 | 50.69 | 54.00 | -3.31 | 1/3 MHz | RB | 1 Meter | Noise Floor |
| AVG | V | 12205.000 | 29.36 | 39.17 | 13.67 | 35.17 | 9.54 | 37.49 | 54.00 | -16.51 | 1/3 MHz | RB | 1 Meter | Noise Floor |
| PK | V | 14646.000 | 32.67 | 41.45 | 16.14 | 34.07 | 9.54 | 46.65 | 63.49 | -16.84 | 100/300 kHz | | 1 Meter | Noise Floor |
| PK | V | 17087.000 | 30.16 | 40.78 | 16.84 | 34.87 | 9.54 | 43.37 | 63.49 | -20.12 | 100/300 kHz | | 1 Meter | Noise Floor |

## Channel 40 (2.441GHz) Radiated Emissions @ 3m, 18-25GHz

**Radiated Emissions**

Company: Zoll Medical
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Kouma Sinn
Project #: G100398565
Standard: FCC Part 15.209, FCC Part 15.247, RSS-210
Receiver: ROS001
PreAmp: PRE9 05-12-2012.txt
Antenna & Cables: N
Antenna: EMC04 V1m 01-25-2012.txt
Cable(s): CBL030 01-06-2012.txt
Location: 10m Chamber
Barometer: SAF767
Filter: NONE
Date(s): 08/16/11
Temp/Humidity/Pressure: 22C 55% 998mbar
Limit Distance (m): 3
Test Distance (m): 1
PreAmp Used? (Y or N): Y
Voltage/Frequency: 120VAC/60Hz
Frequency Range: 18-25GHz
Bands: N, LF, HF, SHF
EMC04 H1m 01-25-2012.txt
MEG005 01-06-2012.txt

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CH40 -2.441GHz. No emissions were detected. Readings below are noise floor signals. | | | | | | | | | | | | | | |
| PK | V | 19528.000 | 22.94 | 45.54 | 17.46 | 28.96 | 9.54 | 47.43 | 74.00 | -26.57 | 100/300KHz | RB | RB | |
| AVG | V | 19528.000 | 20.46 | 45.54 | 17.46 | 28.96 | 9.54 | 44.95 | 54.00 | -9.05 | 100/300KHz | RB | RB | |
| PK | V | 19528.000 | 33.79 | 45.54 | 17.46 | 28.96 | 9.54 | 58.28 | 74.00 | -15.72 | 1/3MHz | RB | RB | |
| AVG | V | 19528.000 | 24.26 | 45.54 | 17.46 | 28.96 | 9.54 | 48.75 | 54.00 | -5.25 | 1/3MHz | RB | RB | |
| PK | V | 21969.000 | 21.35 | 45.28 | 18.27 | 25.36 | 9.54 | 49.99 | 74.00 | -24.01 | 100/300KHz | | | |
| AVG | V | 21969.000 | 17.96 | 45.28 | 18.27 | 25.36 | 9.54 | 46.60 | 54.00 | -7.40 | 100/300KHz | | | |
| PK | V | 24410.000 | 23.14 | 45.93 | 19.66 | 27.96 | 9.54 | 51.24 | 74.00 | -22.76 | 100/300KHz | | | |
| AVG | V | 24410.000 | 18.52 | 45.93 | 19.66 | 27.96 | 9.54 | 46.62 | 54.00 | -7.38 | 100/300KHz | | | |

## Channel 79 (2.480GHz) Radiated Emissions @ 3m, 1-18GHz

**Radiated Emissions**

Company: Zoll Medical Corp
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Vathana Ven
Project #: G100398565
Standard: FCC Part 15.209, FCC Part 15.247, RSS-210
Receiver: R&S ESI (145-128) 09-10-2011
PreAmp: PRE_145014_12-28-2011.txt
PreAmp Used? (Y or N): Y
Antenna & Cables: HF
Antenna: HORN2 V3m 10-08-2011.txt
Cable(s): 3mTrackB 145-416 08-31-2011.txt
Location: 10M
Barometer: DAV002
Date(s): 07/26/11
Temp/Humidity/Pressure: 21 deg C 63% 994 mB
Limit Distance (m): 3
Test Distance (m): 3
Voltage/Frequency: 120VAC/60Hz
Bands: N, LF, HF, SHF
HORN2 H3m 10-08-2011.txt
Filter: REA002
Frequency Range: 1-18GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 4960.000 | 46.10 | 33.05 | 8.46 | 34.88 | 0.00 | 52.73 | 54.00 | -1.27 | 1/3 MHz | RB | RB | |
| AVG | V | 4960.000 | 41.74 | 33.05 | 8.46 | 34.88 | 0.00 | 48.37 | 54.00 | -5.63 | 1/3 MHz | RB | RB | |
| PK | V | 7440.000 | 37.91 | 36.35 | 10.65 | 35.63 | 0.00 | 49.28 | 54.00 | -4.72 | 1/3 MHz | RB | RB | Noise Floor |
| AVG | V | 7440.000 | 26.74 | 36.35 | 10.65 | 35.63 | 0.00 | 38.11 | 54.00 | -15.89 | 1/3 MHz | RB | RB | Noise Floor |
| PK | V | 9920.000 | 28.07 | 38.04 | 12.50 | 35.97 | 0.00 | 42.64 | 63.49 | -20.85 | 100/300 kHz | | | Noise Floor |
| PK | V | 12400.000 | 37.80 | 38.99 | 14.10 | 35.05 | 9.54 | 46.30 | 54.00 | -7.70 | 1/3 MHz | RB | 1 Meter | Noise Floor |
| AVG | V | 12400.000 | 25.40 | 38.99 | 14.10 | 35.05 | 9.54 | 33.90 | 54.00 | -20.10 | 1/3 MHz | RB | 1 Meter | Noise Floor |
| PK | V | 14880.000 | 26.09 | 40.25 | 15.94 | 34.47 | 9.54 | 38.27 | 54.00 | -15.73 | 100/300 kHz | | 1 Meter | Noise Floor |
| PK | V | 17360.000 | 22.60 | 42.08 | 17.38 | 34.64 | 9.54 | 37.89 | 54.00 | -16.11 | 100/300 kHz | | 1 Meter | Noise Floor |

## Channel 79 (2.480GHz) Radiated Emissions @ 3m, 18-25GHz

**Radiated Emissions**

Company: Zoll Medical
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Kouma Sinn
Project #: G100398565
Standard: FCC Part 15.209, FCC Part 15.247, RSS-210
Receiver: ROS001
PreAmp: PRE9 05-12-2012.txt
PreAmp Used? (Y or N): Y
Antenna & Cables: N
Antenna: EMC04 V1m 01-25-2012.txt
Cable(s): CBL030 01-06-2012.txt
Location: 10m Chamber
Barometer: SAF767
Date(s): 08/16/11
Temp/Humidity/Pressure: 22C 55% 998mbar
Limit Distance (m): 3
Test Distance (m): 1
Voltage/Frequency: 120VAC/60Hz
Bands: N, LF, HF, SHF
EMC04 H1m 01-25-2012.txt
MEG005 01-06-2012.txt
Filter: NONE
Frequency Range: 18-25GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CH79 -2.480GHz. No emissions were detected. Readings below are noise floor signals. | | | | | | | | | | | | | | |
| PK | V | 19840.000 | 21.42 | 45.42 | 17.44 | 28.98 | 9.54 | 45.76 | 74.00 | -28.24 | 100/300KHz | RB | RB | |
| AVG | V | 19840.000 | 18.52 | 45.42 | 17.44 | 28.98 | 9.54 | 42.86 | 54.00 | -11.14 | 100/300KHz | RB | RB | |
| PK | V | 19840.000 | 33.41 | 45.42 | 17.44 | 28.98 | 9.54 | 57.75 | 74.00 | -16.25 | 1/3MHz | RB | RB | |
| AVG | V | 19840.000 | 25.32 | 45.42 | 17.44 | 28.98 | 9.54 | 49.66 | 54.00 | -4.34 | 1/3MHz | RB | RB | |
| PK | V | 22320.000 | 22.06 | 45.36 | 18.13 | 25.52 | 9.54 | 50.49 | 74.00 | -23.51 | 100/300KHz | RB | RB | |
| AVG | V | 22320.000 | 16.71 | 45.36 | 18.13 | 25.52 | 9.54 | 45.14 | 54.00 | -8.86 | 100/300KHz | RB | RB | |
| PK | V | 22320.000 | 33.26 | 45.36 | 18.13 | 25.52 | 9.54 | 61.69 | 74.00 | -12.31 | 1/3MHz | RB | RB | |
| AVG | V | 22320.000 | 24.26 | 45.36 | 18.13 | 25.52 | 9.54 | 52.69 | 54.00 | -1.31 | 1/3MHz | RB | RB | |
| PK | V | 24800.000 | 22.13 | 46.34 | 19.59 | 29.64 | 9.54 | 48.88 | 74.00 | -25.12 | 100/300KHz | | | |
| AVG | V | 24800.000 | 20.00 | 46.34 | 19.59 | 29.64 | 9.54 | 46.75 | 54.00 | -7.25 | 100/300KHz | | | |

Test Personnel(s): Vathana Ven
Kouma Sinn KPS
Supervising Engineer: (Where Applicable) N/A
Product Standard: FCC Part 15.247, RSS-210 Annex 8
Input Voltage: 115VAC/60Hz
Pretest Verification w/ Ambient Signals or BB Source: **Ambient Signals**

Test Date(s): 07/26/2011
08/15/2011, 08/16/2011
Test Levels: Emissions below the limits specified in Section 7.3
Ambient Temperature: 21, 21, 22 ºC
Relative Humidity: 63, 65, 55 %
Atmospheric Pressure: 994, 999, 998 mbars

Deviations, Additions, or Exclusions: None

# 8 Hopping Channel Separation

## 8.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247 and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

## 8.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |
| 145128' | EMI Receiver 40 GHz (20 Hz - 40 Ghz) | Rohde & Schwarz | ESI | 8392831001 | 08/10/2010 | 09/10/2011 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| None | | |

## 8.3 Results:

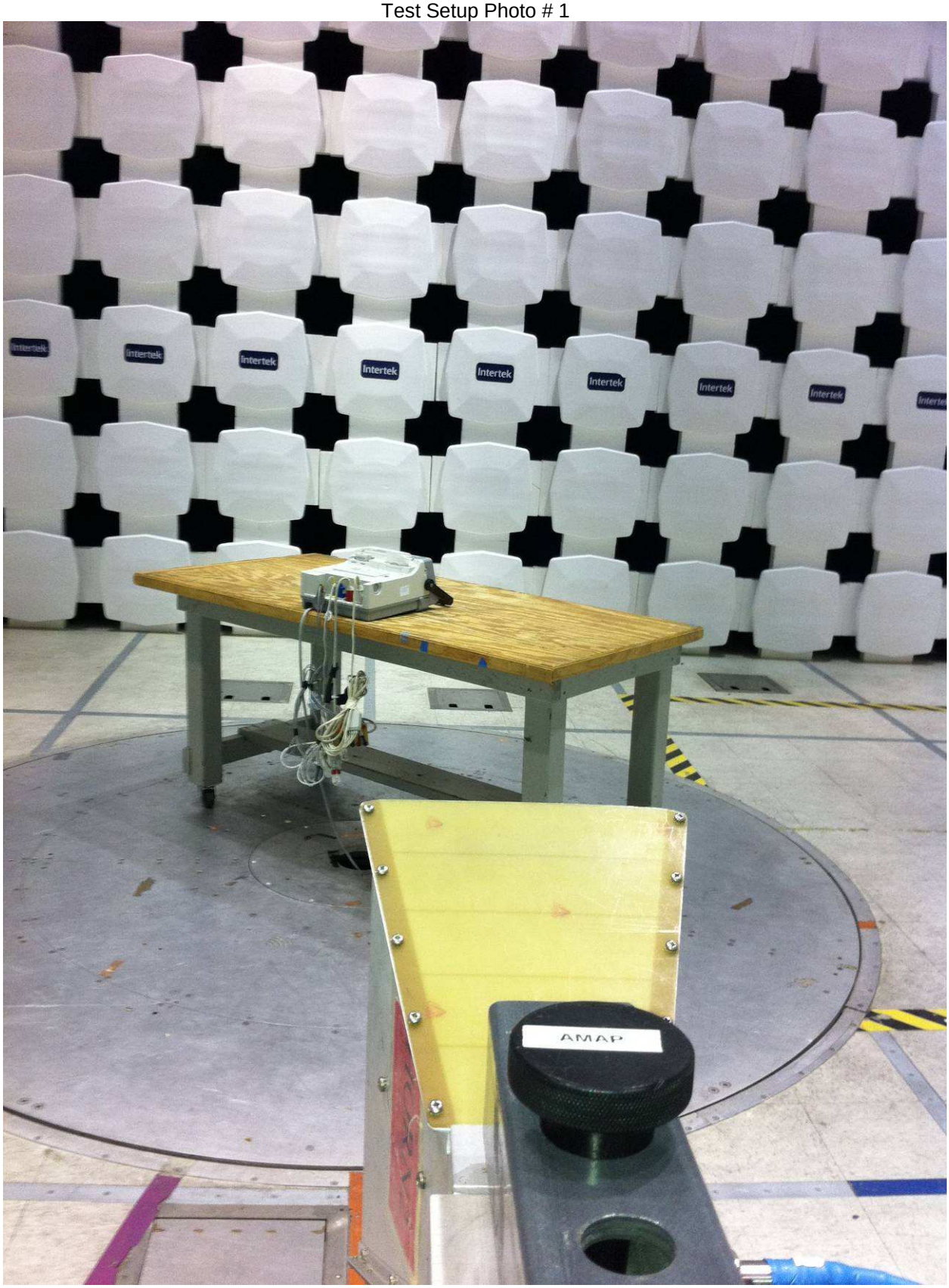
The sample tested was found to comply, since output power is below 125 mW and therefore the channel separation must be at least 2/3 of the 20 dB bandwidth.

FCC Part 15.247 (1) & RSS-210 A8.1 (b)

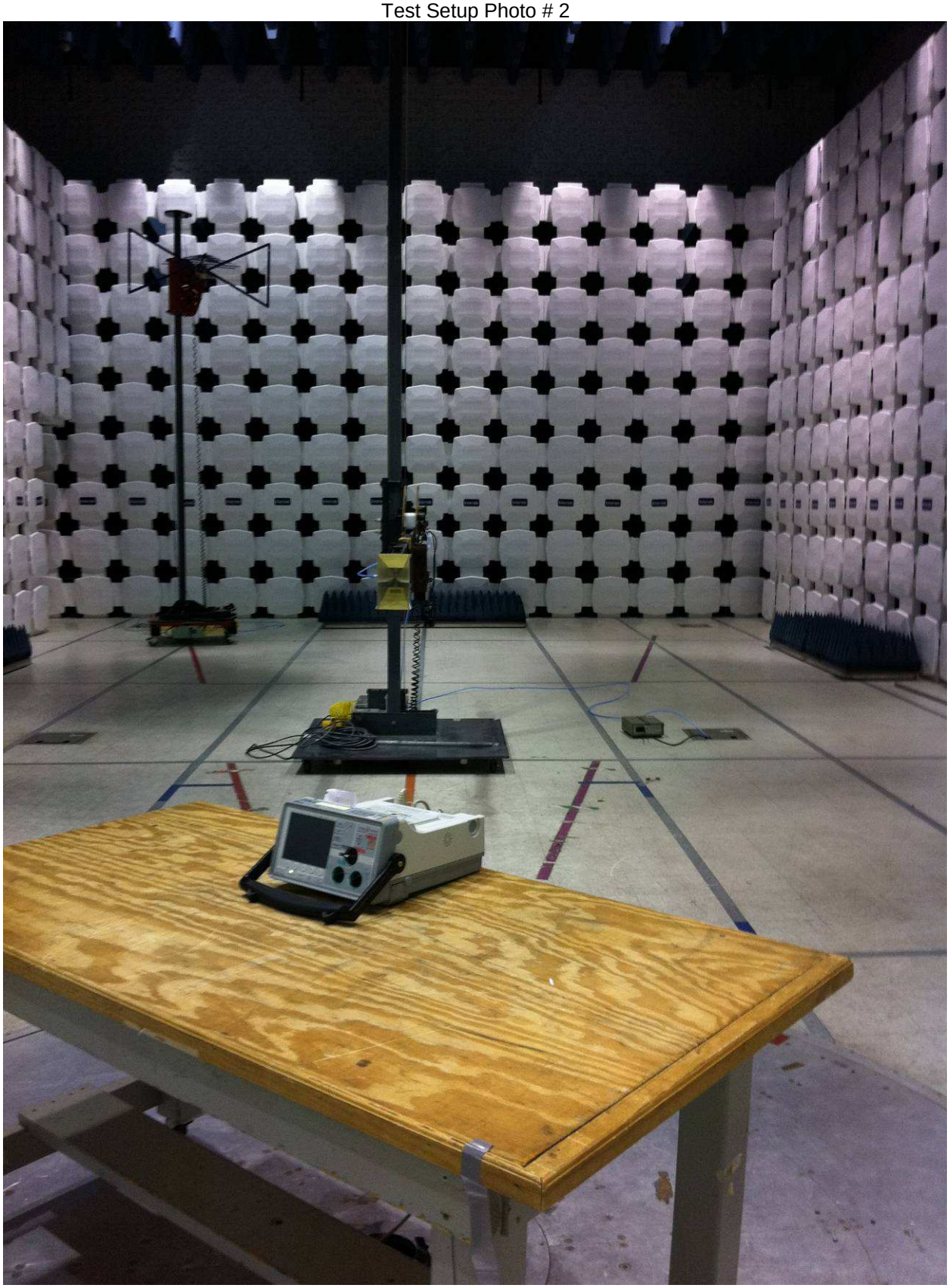
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

## 8.4 Setup Photographs:

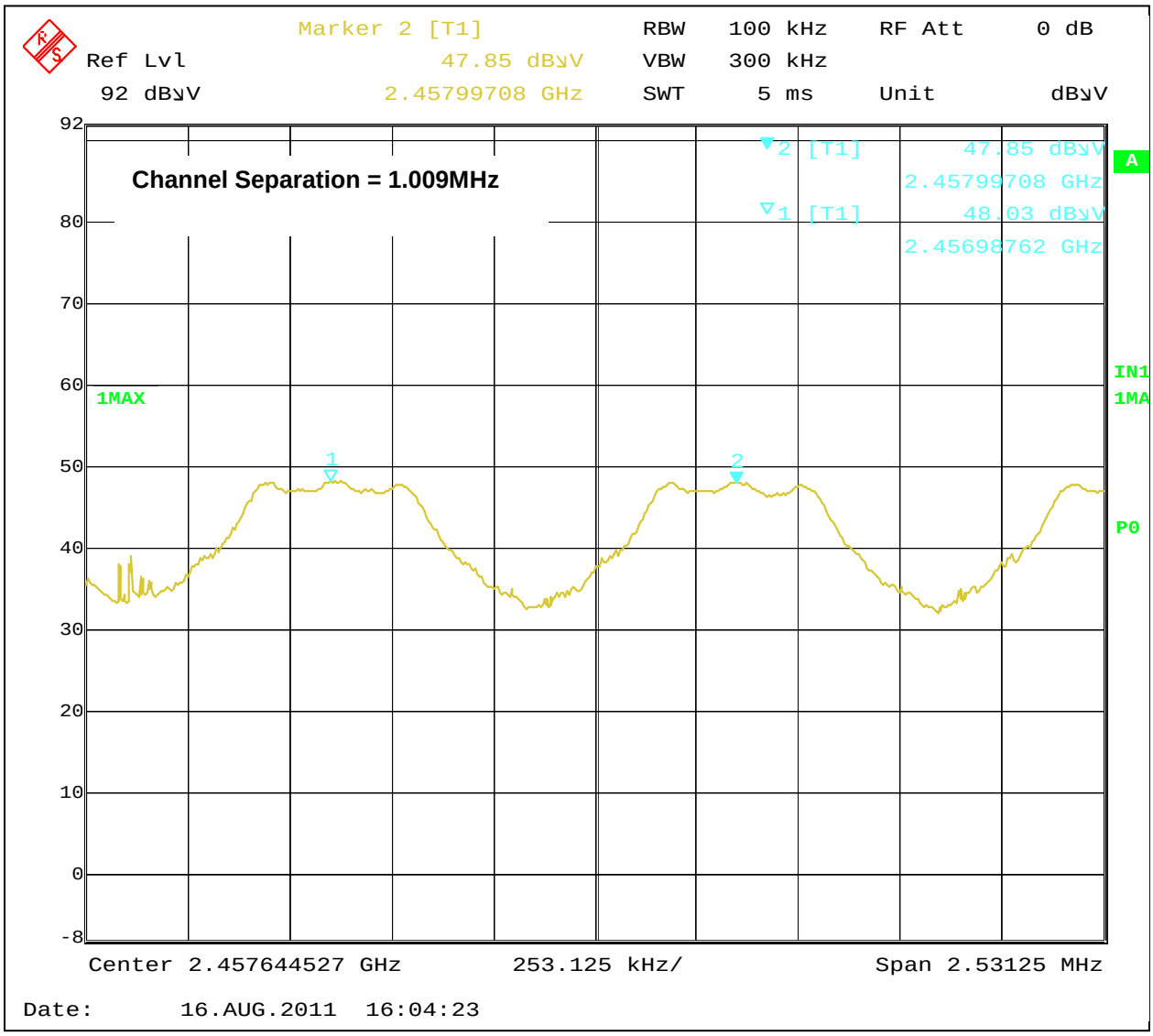
Test Setup Photo # 1



Test Setup Photo # 2



## 8.5 Plots/Data:




| | | | |
|---|---|---|---|
| Test Personnel: | Kouma Sinn KPS | Test Date: | 08/16/2011 |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | Emissions below the limits specified in Section 8.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | Ambient Temperature: | 20 ℃ |
| Input Voltage: | 115VAC/60Hz | Relative Humidity: | 55 % |
| | | Atmospheric Pressure: | 998 mbar |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | | |

Deviations, Additions, or Exclusions: None

# 9 Number of Hopping Frequency

## 9.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247 and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

## 9.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |
| 145128' | EMI Receiver 40 GHz (20 Hz - 40 Ghz) | Rohde & Schwarz | ESI | 8392831001 | 08/10/2010 | 09/10/2011 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| None | | |

## 9.3 Results:

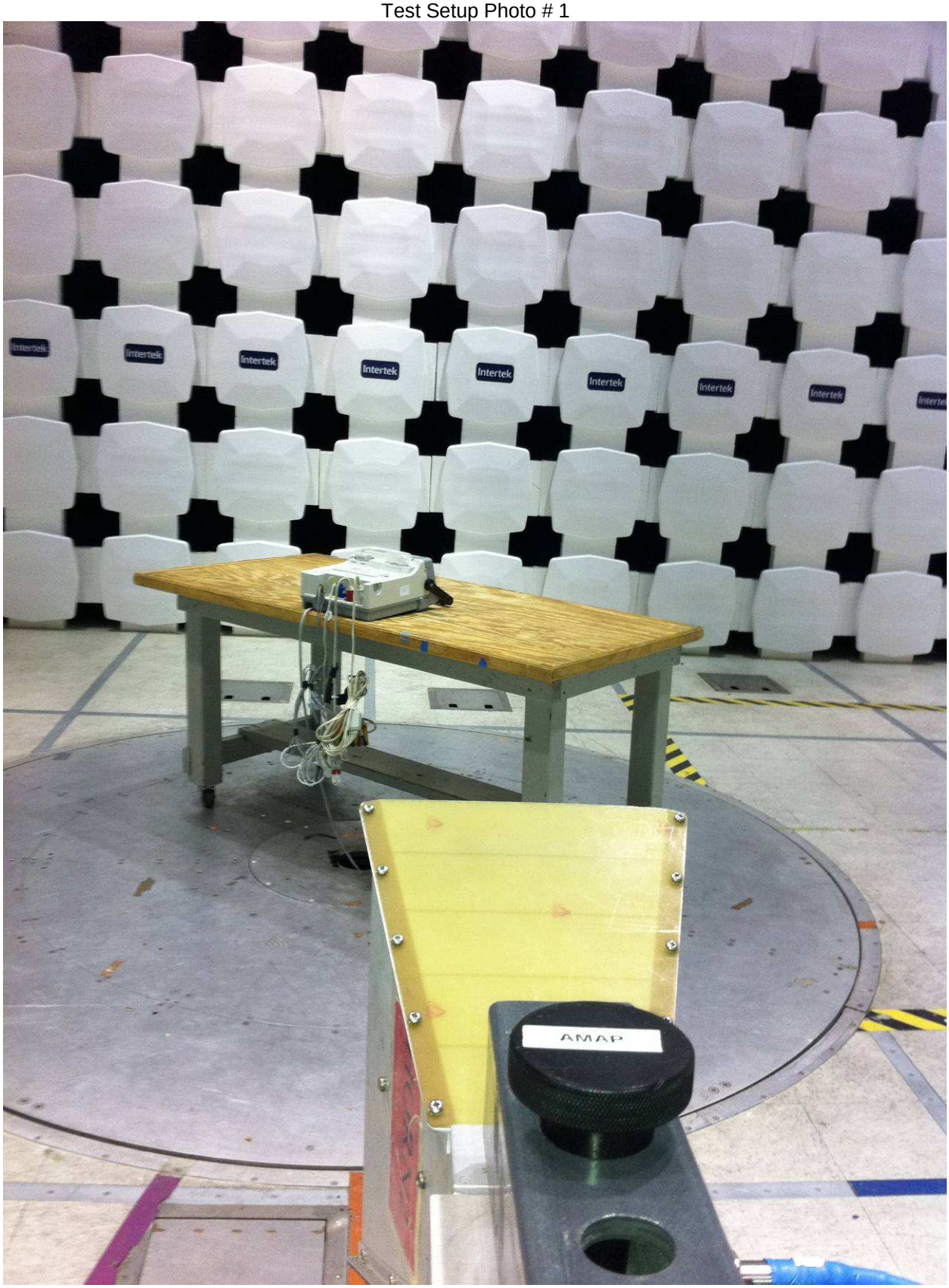
The sample tested was found to comply.

FCC Part 15.247 (1) (iii) & RSS-210 A8.1 (d)

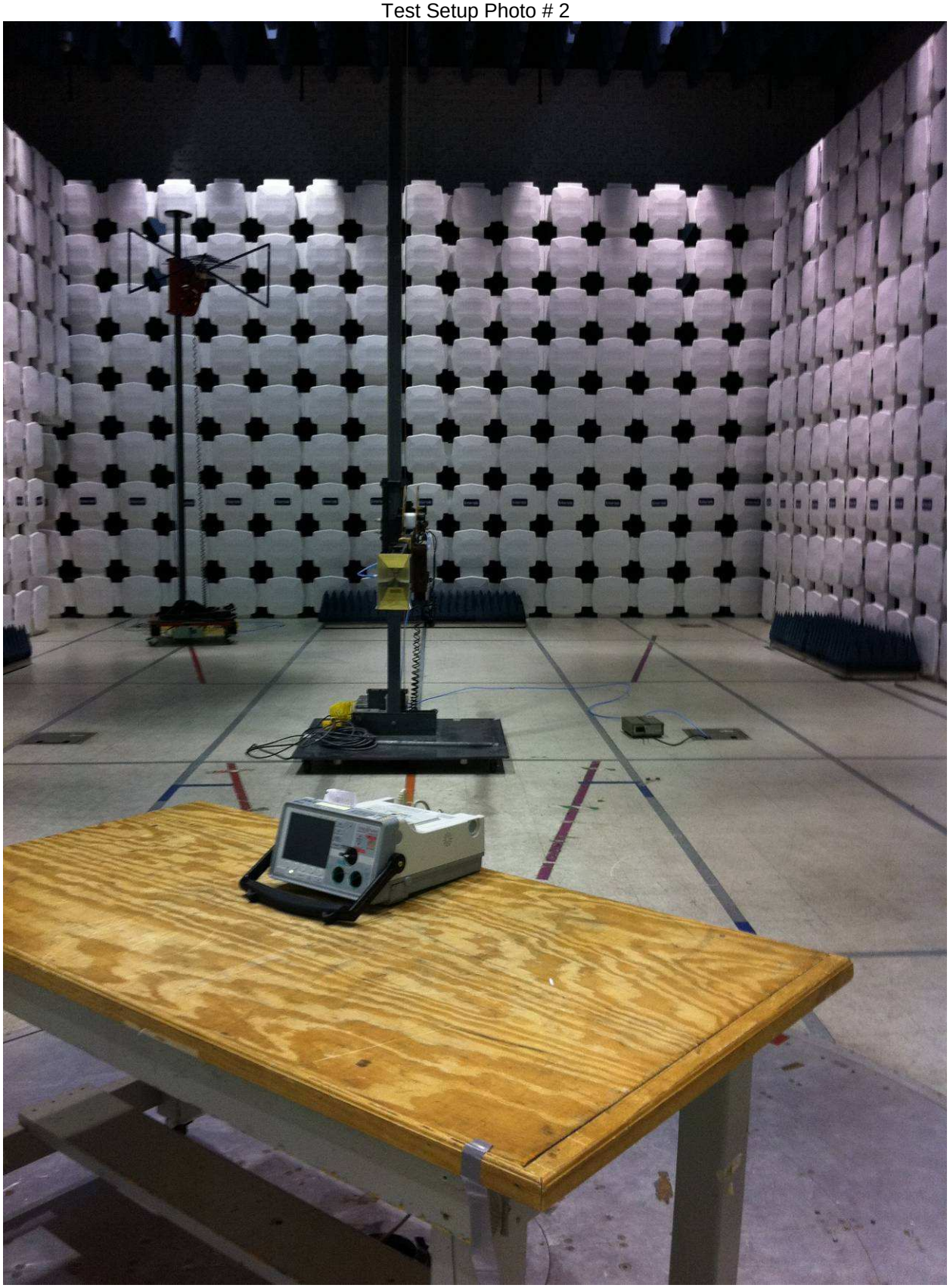
Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

## 9.4 Setup Photographs:

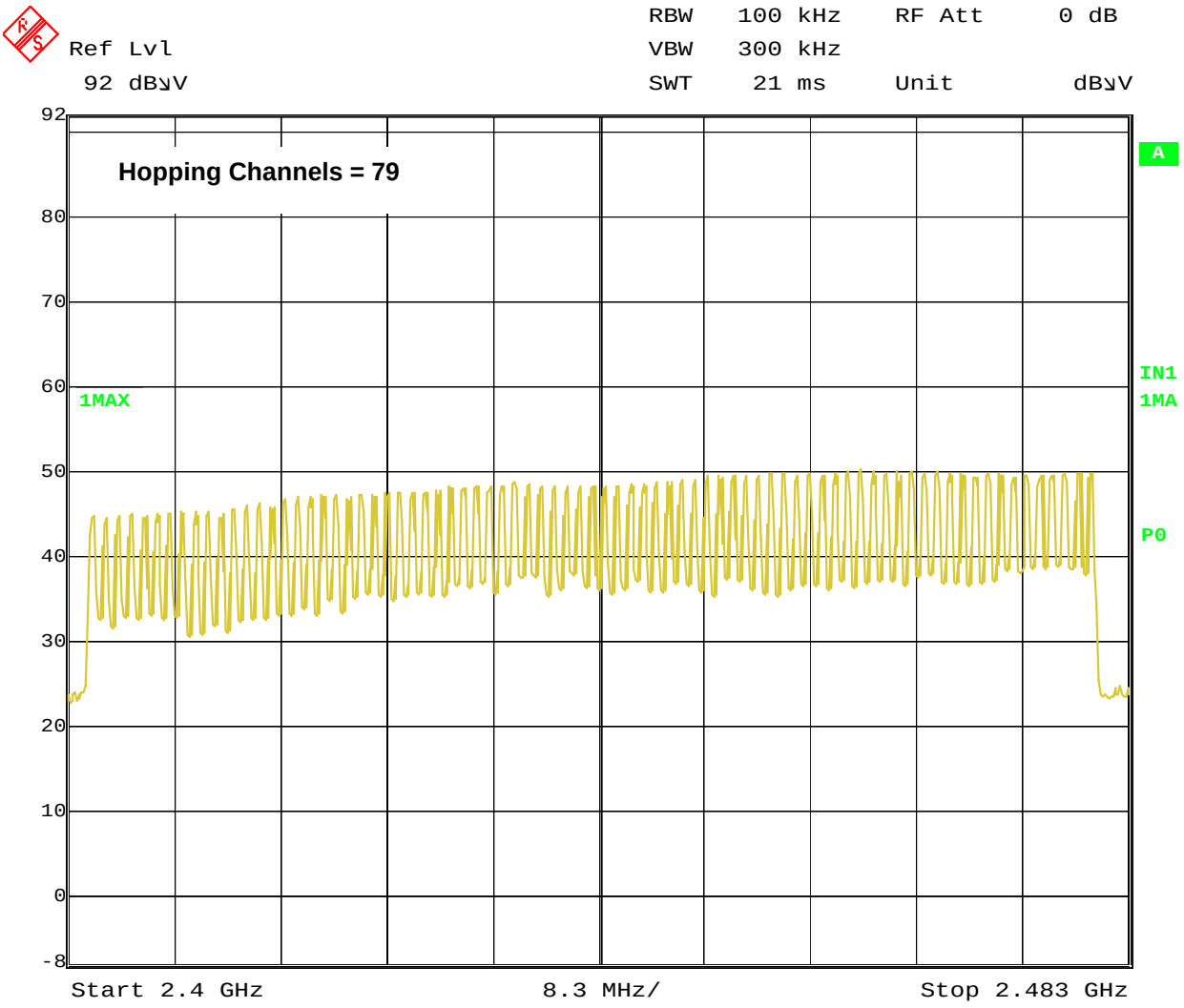
Test Setup Photo # 1



Test Setup Photo # 2



## 9.5 Plots/Data:




Date: 16.AUG.2011 15:29:55

| | | | |
|---|---|---|---|
| Test Personnel: | Kouma Sinn KPS | Test Date: | 08/16/2011 |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | Emissions below the limits specified in Section 9.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | Ambient Temperature: | 20 ℃ |
| Input Voltage: | 115VAC/60Hz | Relative Humidity: | 55 % |
| | | Atmospheric Pressure: | 998 mbar |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | | |

Deviations, Additions, or Exclusions: None

# 10 Hopping Channel Bandwidth

## 10.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247, DA 00-705, ANSI C63.4, RSS-Gen, and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

## 10.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |
| 145108' | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESIB40 | 100209 | 04/28/2011 | 04/28/2012 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| None | | |

## 10.3 Results:

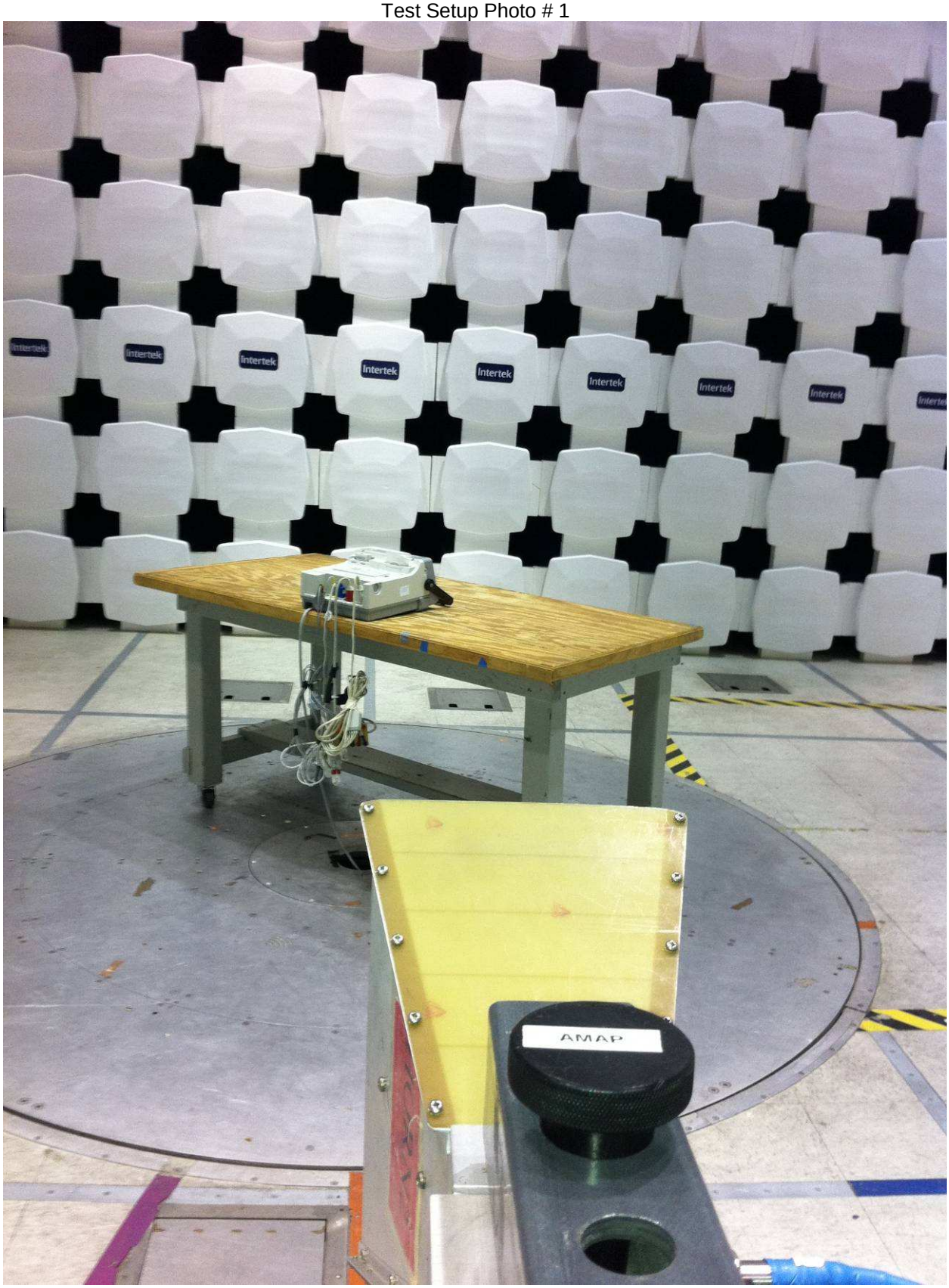
The sample tested was found to comply.

FCC Part 15.247 (1) & RSS-210 A8.1 (b)

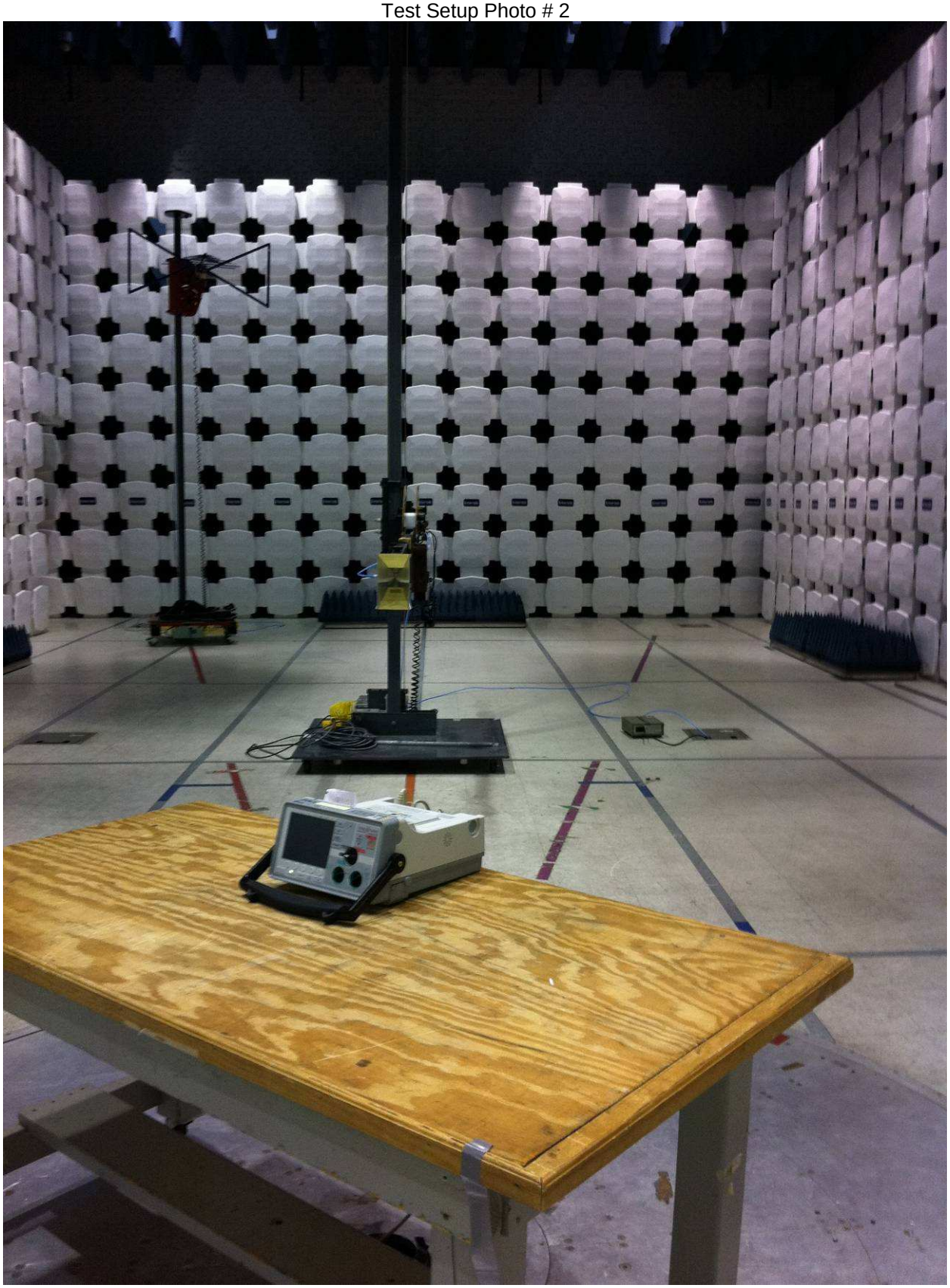
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

## 10.4 Setup Photographs:

Test Setup Photo # 1

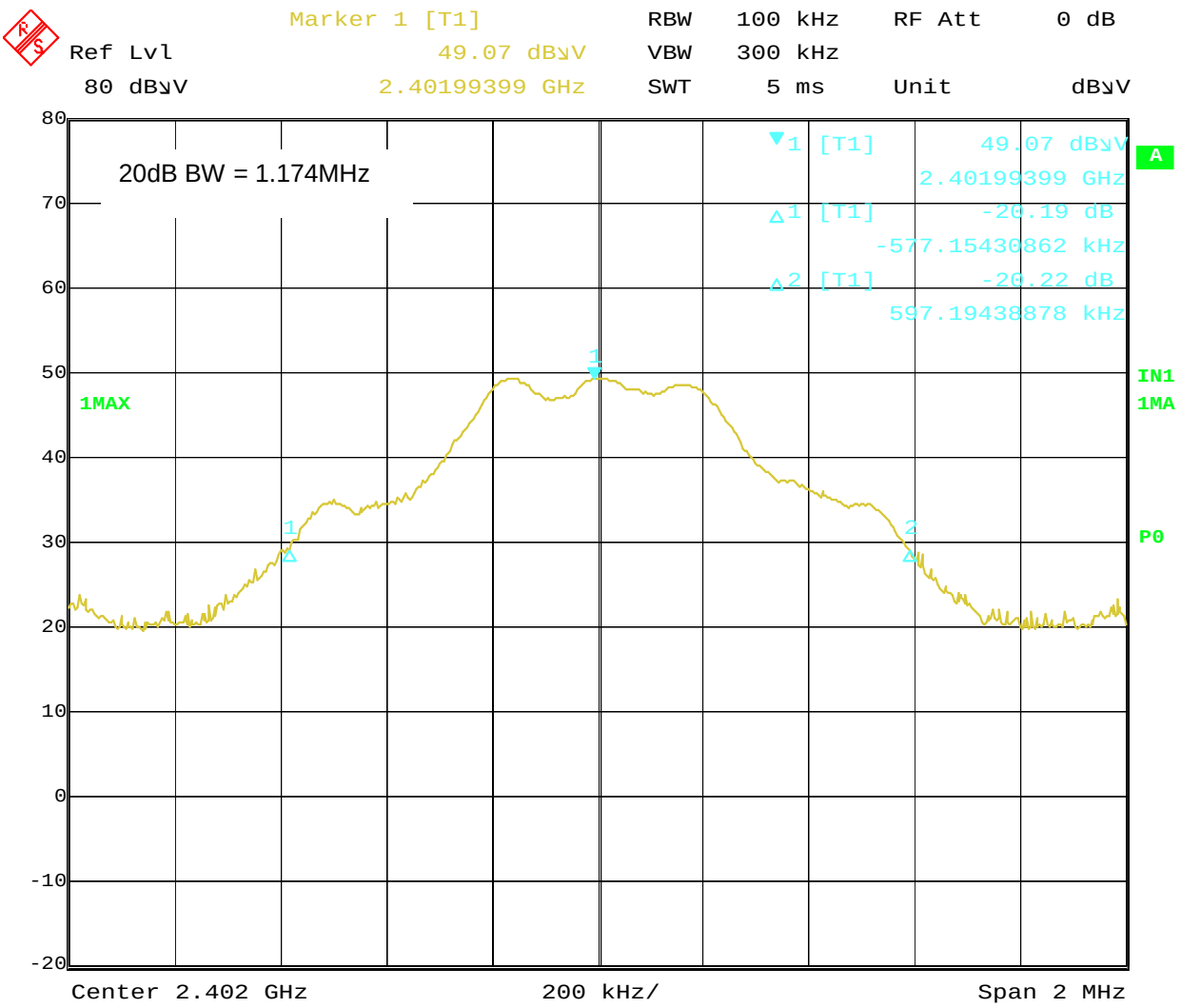


Test Setup Photo # 2

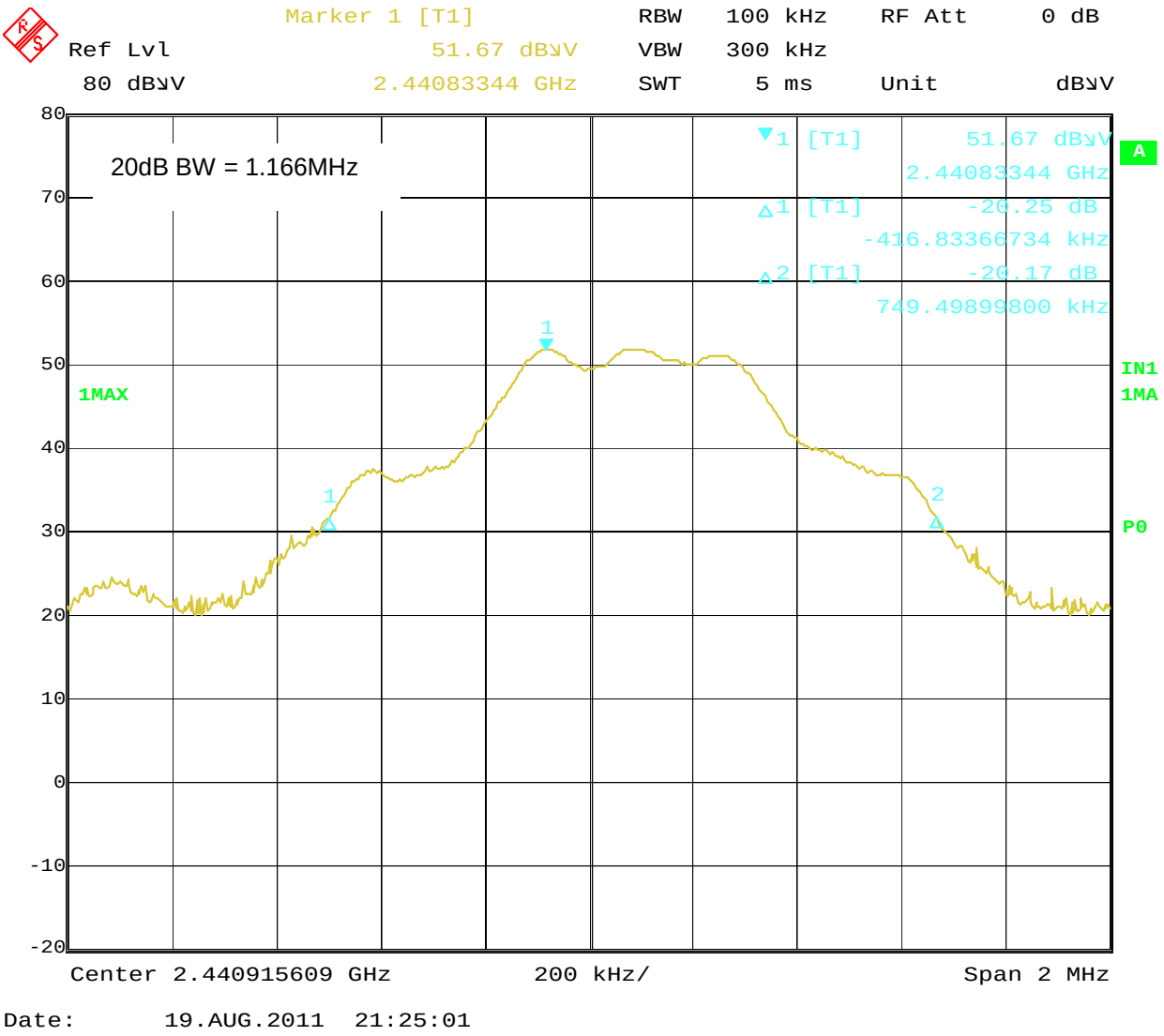


## 10.5 Data:

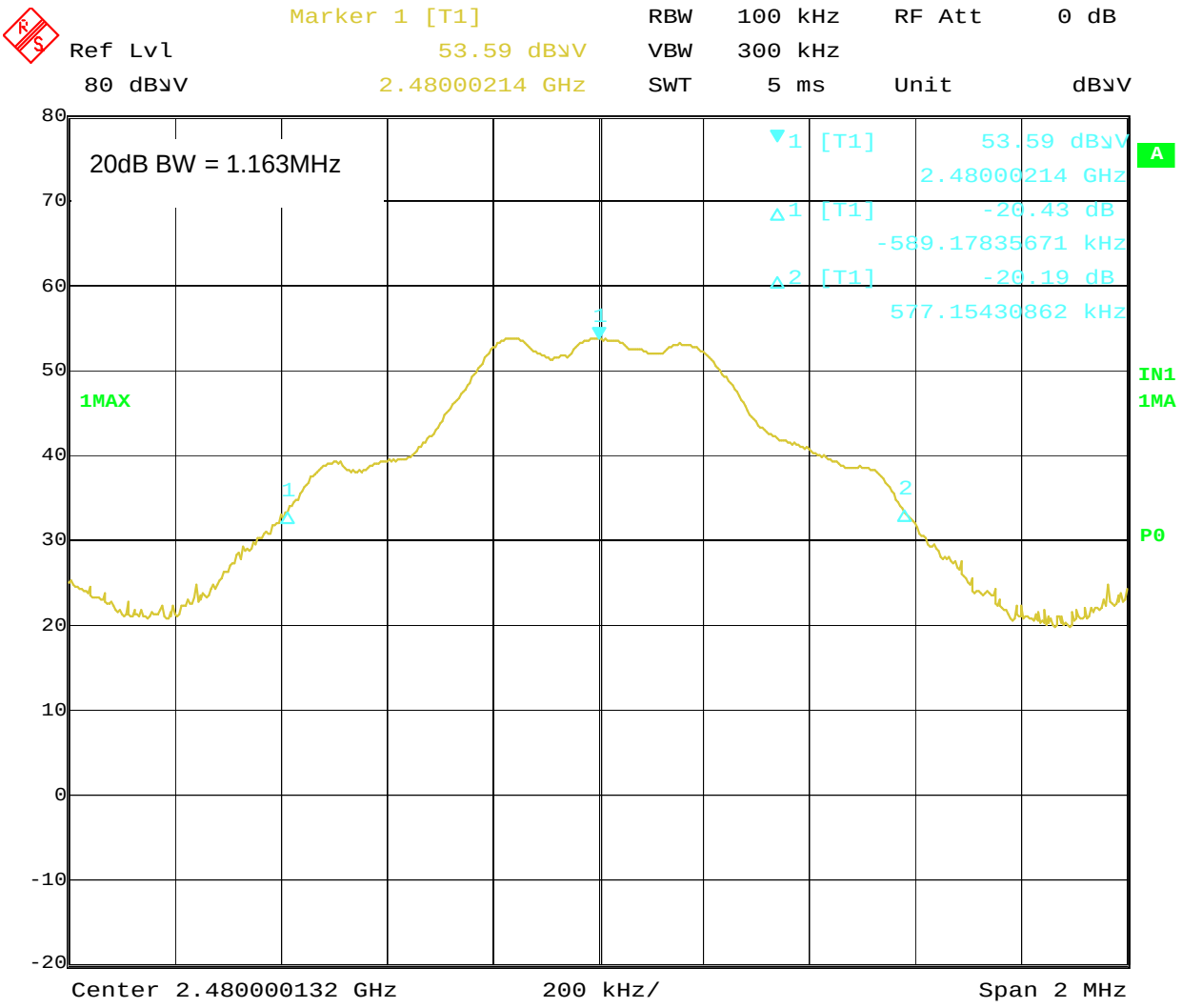
Channel 1 20dB Bandwidth



Channel 40 20dB Bandwidth



Channel 79 20dB Bandwidth




| | | | |
|---|---|---|---|
| Test Personnel: | Nicholas Abbondante | Test Date: | 08/19/2011 (Night Shift) |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | See section 10.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | Ambient Temperature: | 25 ℃ |
| Input Voltage: | 115VAC/60Hz | Relative Humidity: | 54 % |
| | | Atmospheric Pressure: | 1003 mbar |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | | |

# 11 Hopping Dwell time

## 11.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247 and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

## 11.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |
| 145108' | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESIB40 | 100209 | 04/28/2011 | 04/28/2012 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| None | | |

## 11.3 Results:

The sample tested was found to comply.

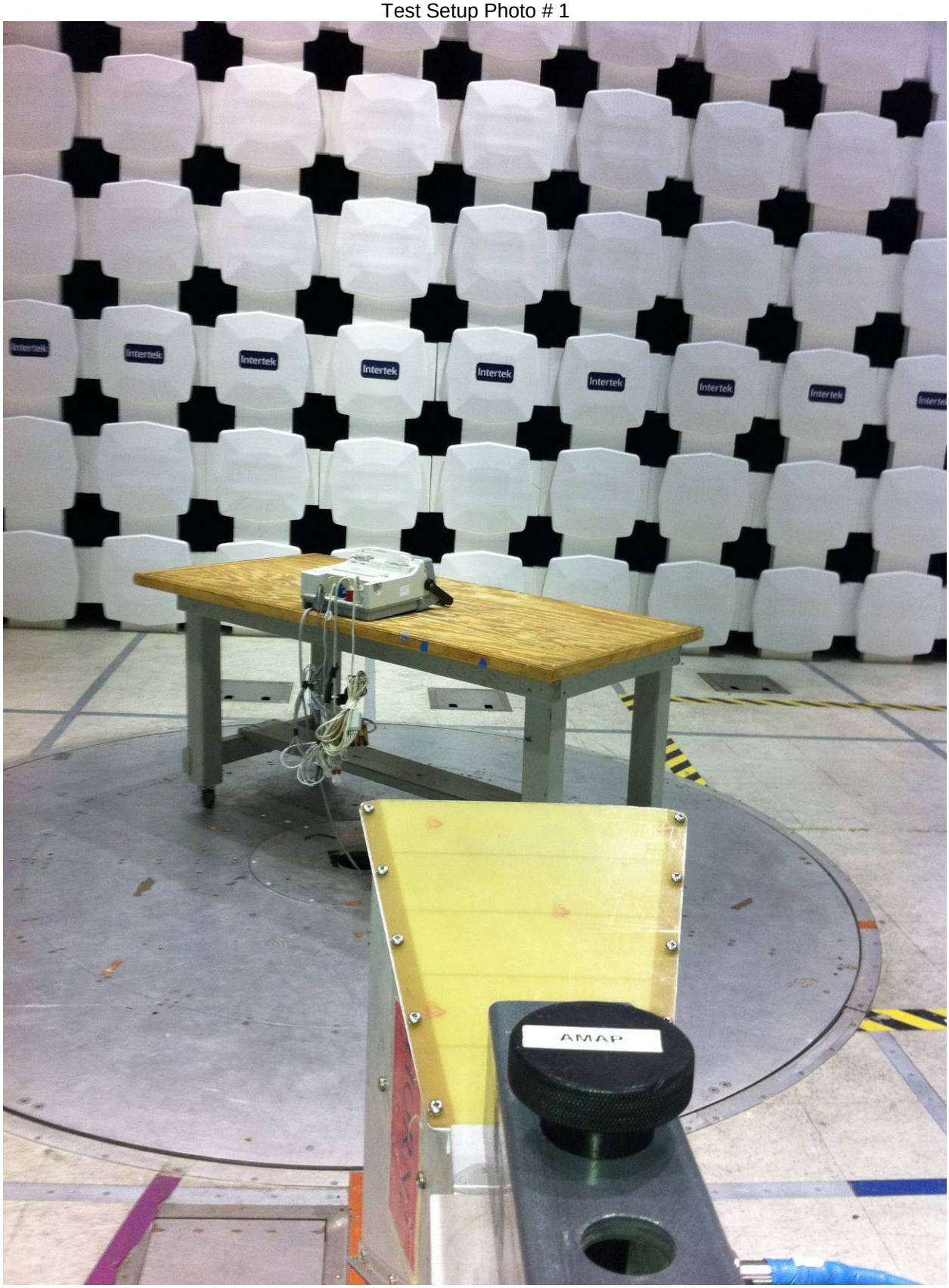
FCC Part 15.247 (1) (iii) & RSS-210 A8.1 (c)

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

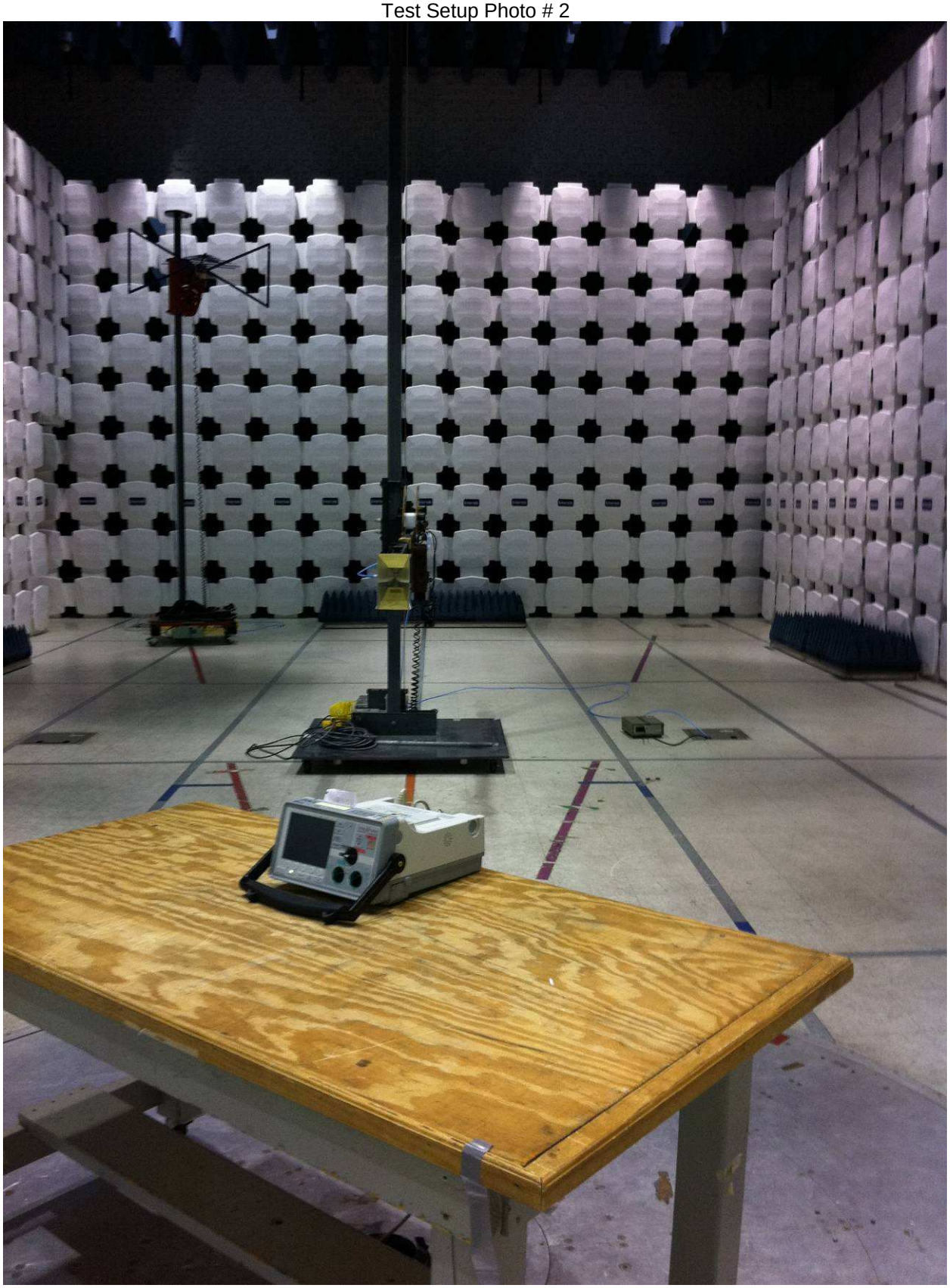
Bluetooth utilizes 79 channels, therefore dwell time must not exceed 0.4 seconds in any 31.6 second period. The worst case dwell time was achieved using DH5 packets, with 312.4 ms of dwell time on a channel during a 31.6 second time frame.

## 11.4 Setup Photographs:

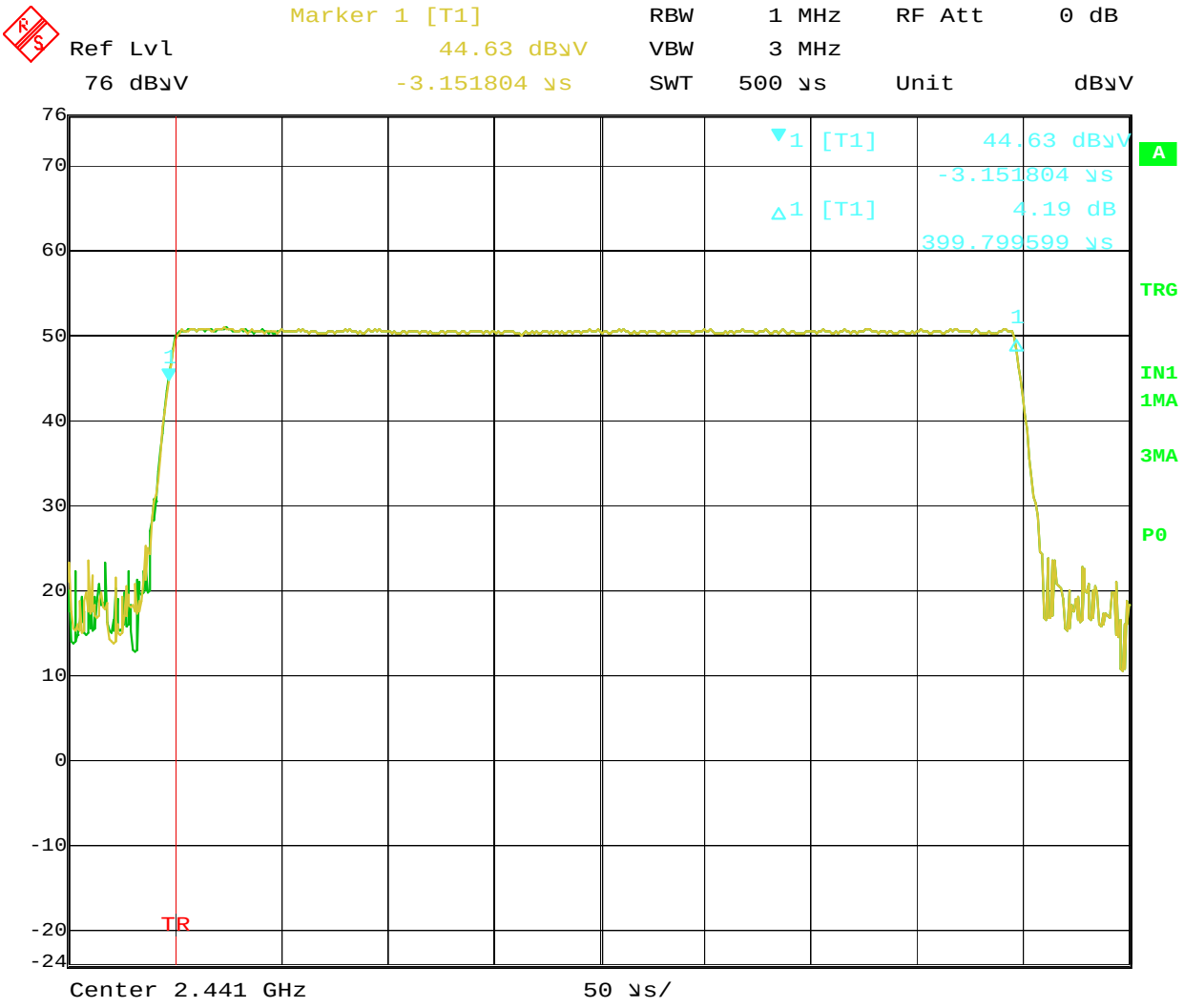
Test Setup Photo # 1



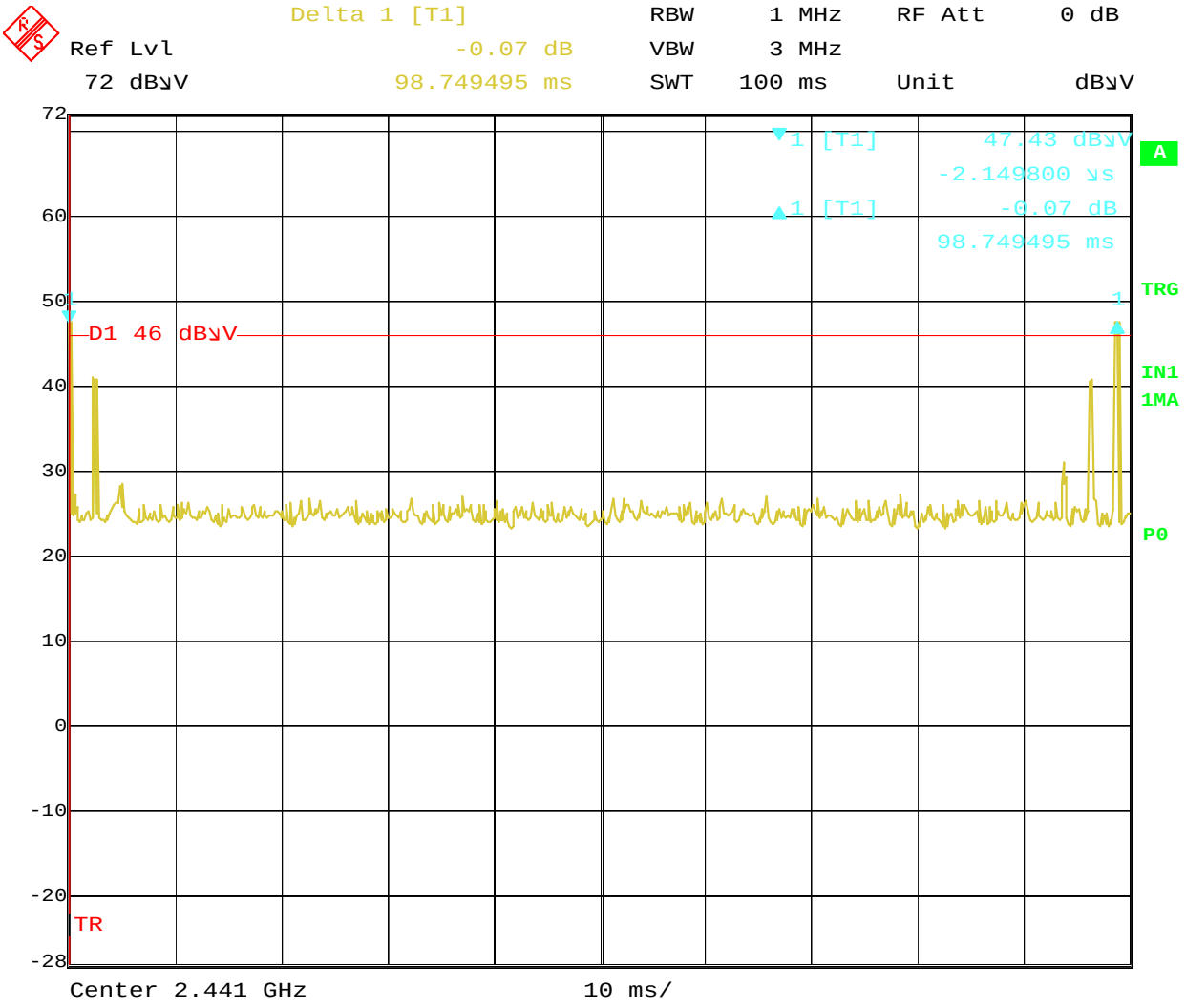
Test Setup Photo # 2



## 11.5 Plots/Data:

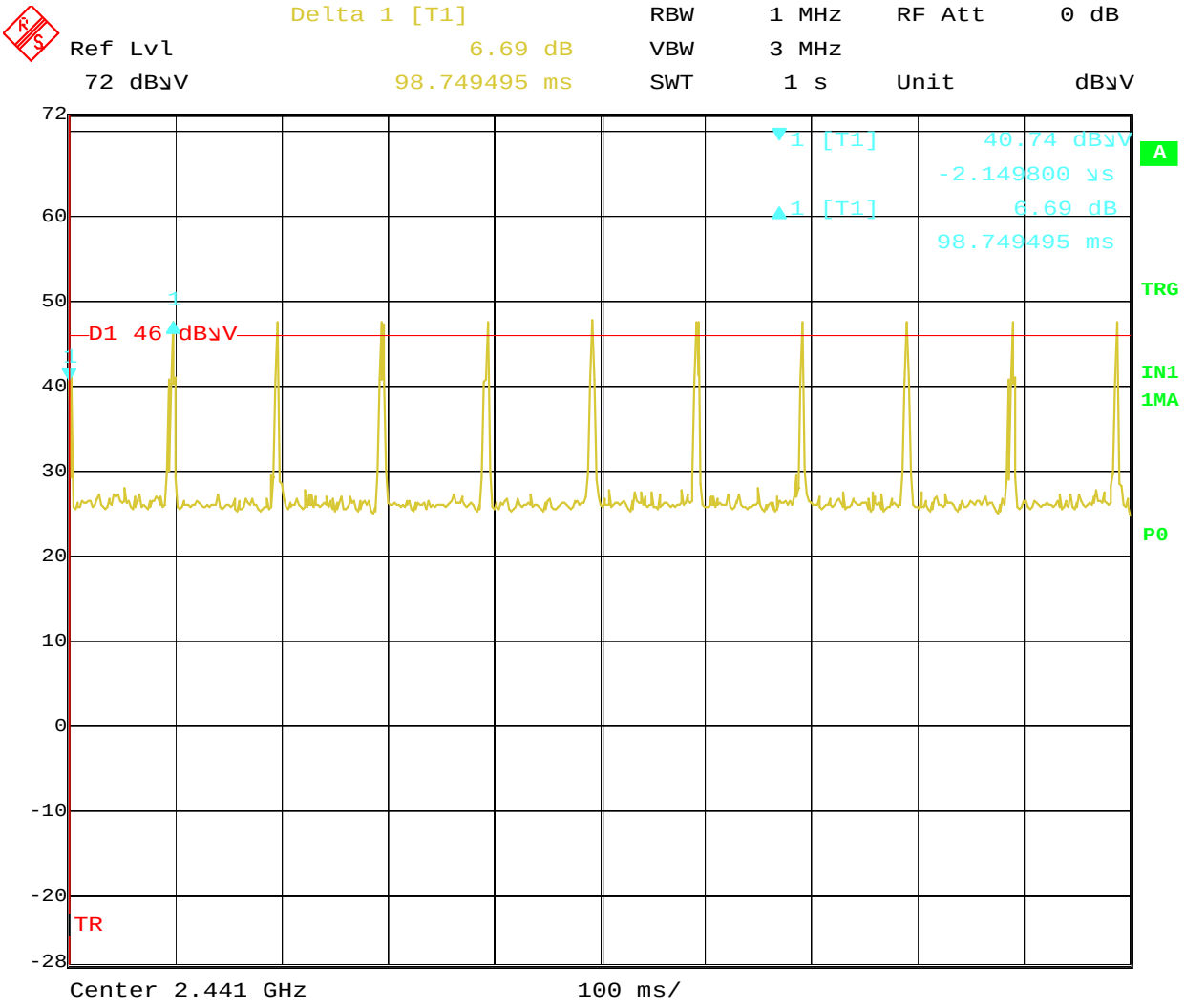



DH1, Packet Length, 399.8 us

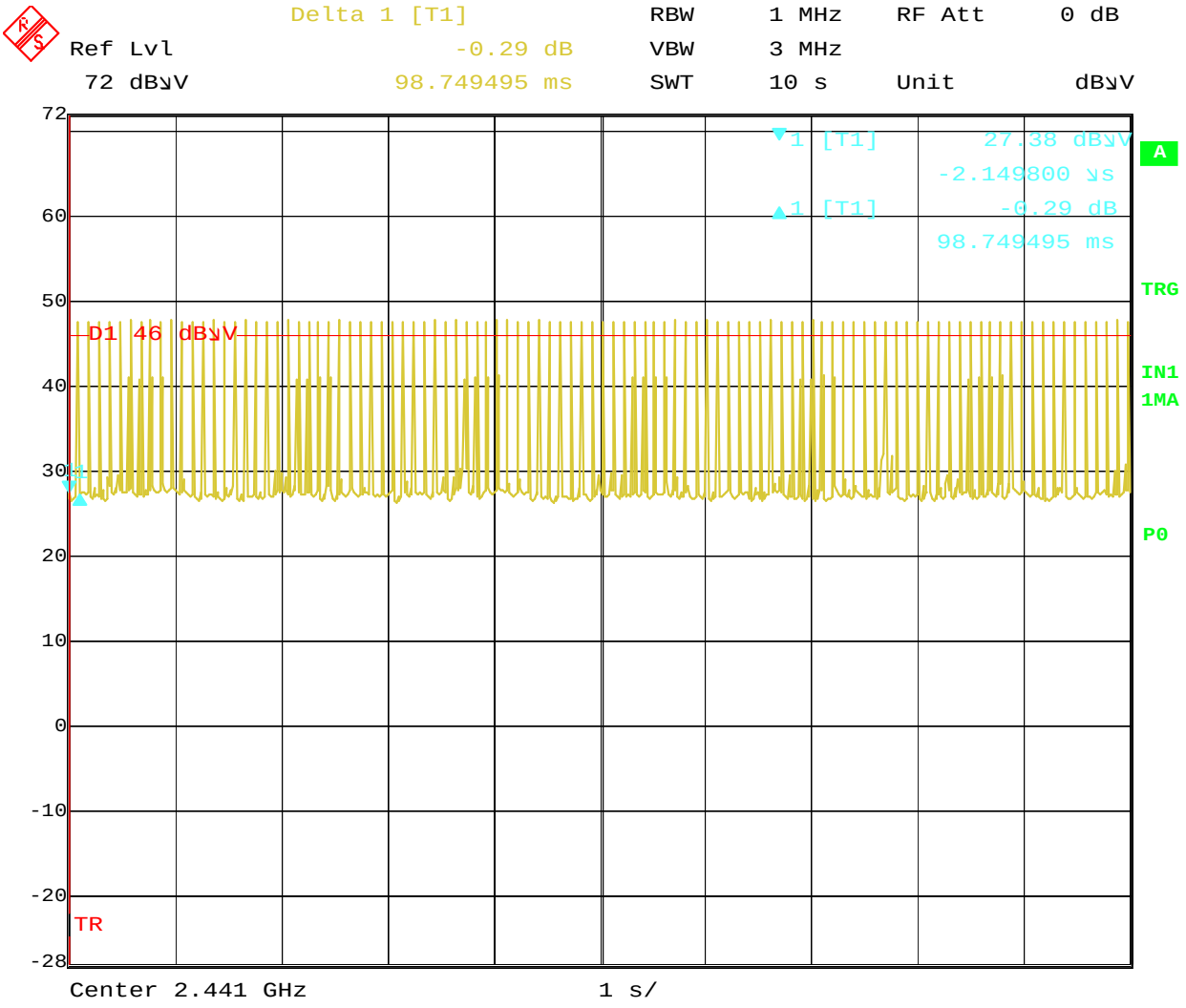



Date: 19.AUG.2011 23:20:05

DH1, Hops in 100ms, 98.75 ms interval

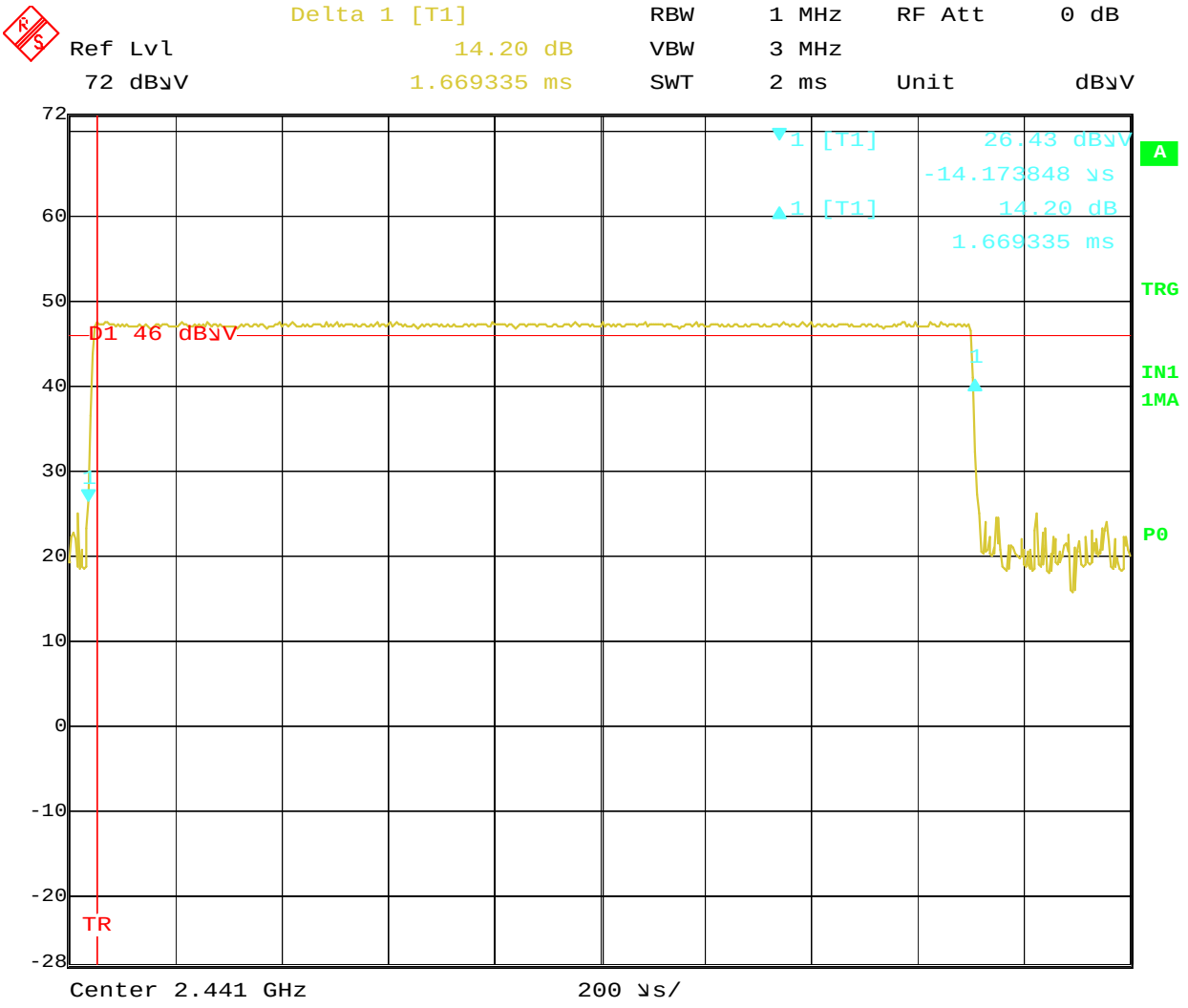



DH1, 10 hops in 1 second



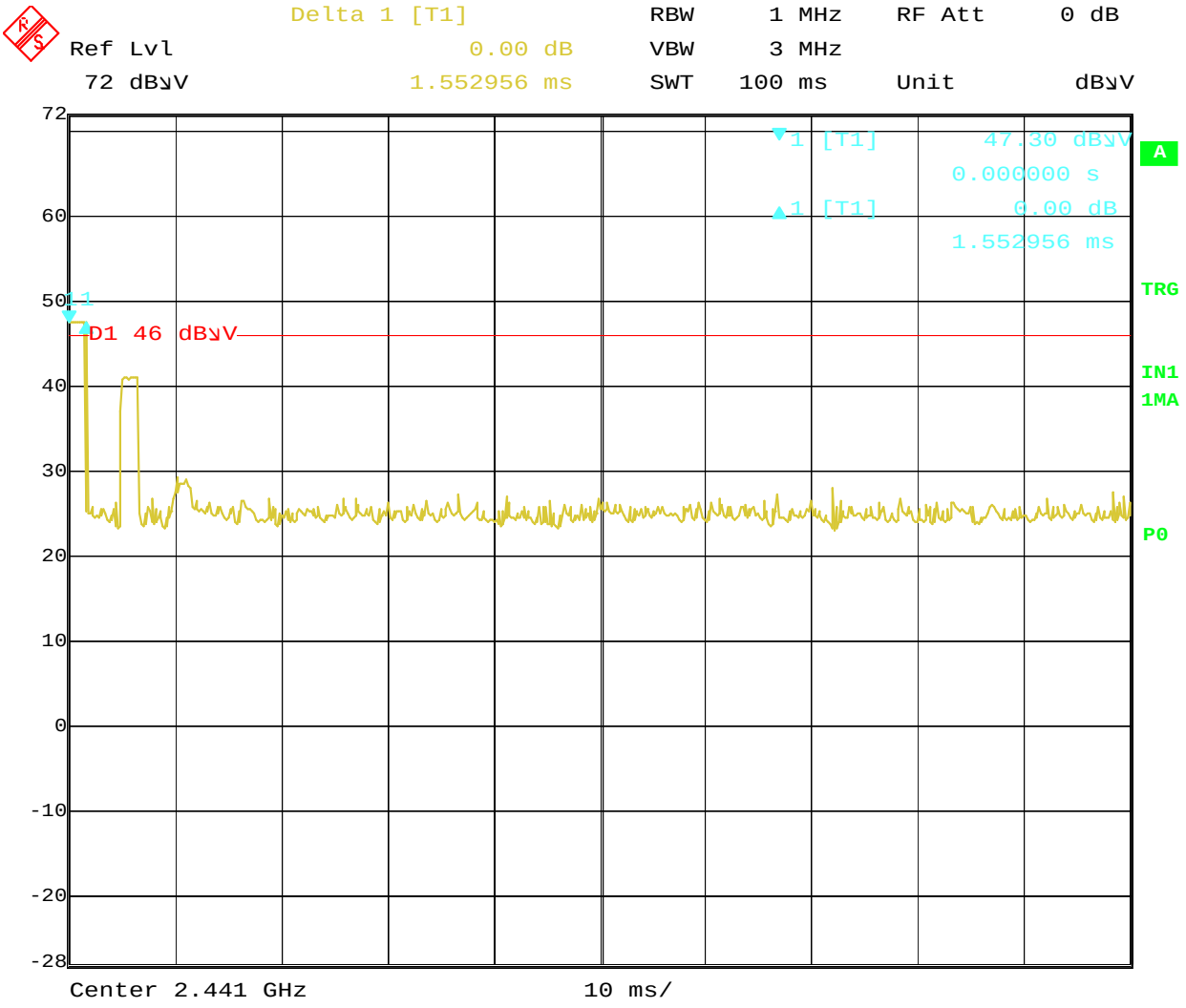

Date: 19.AUG.2011 23:21:39

DH1, 101 hops in 10 seconds



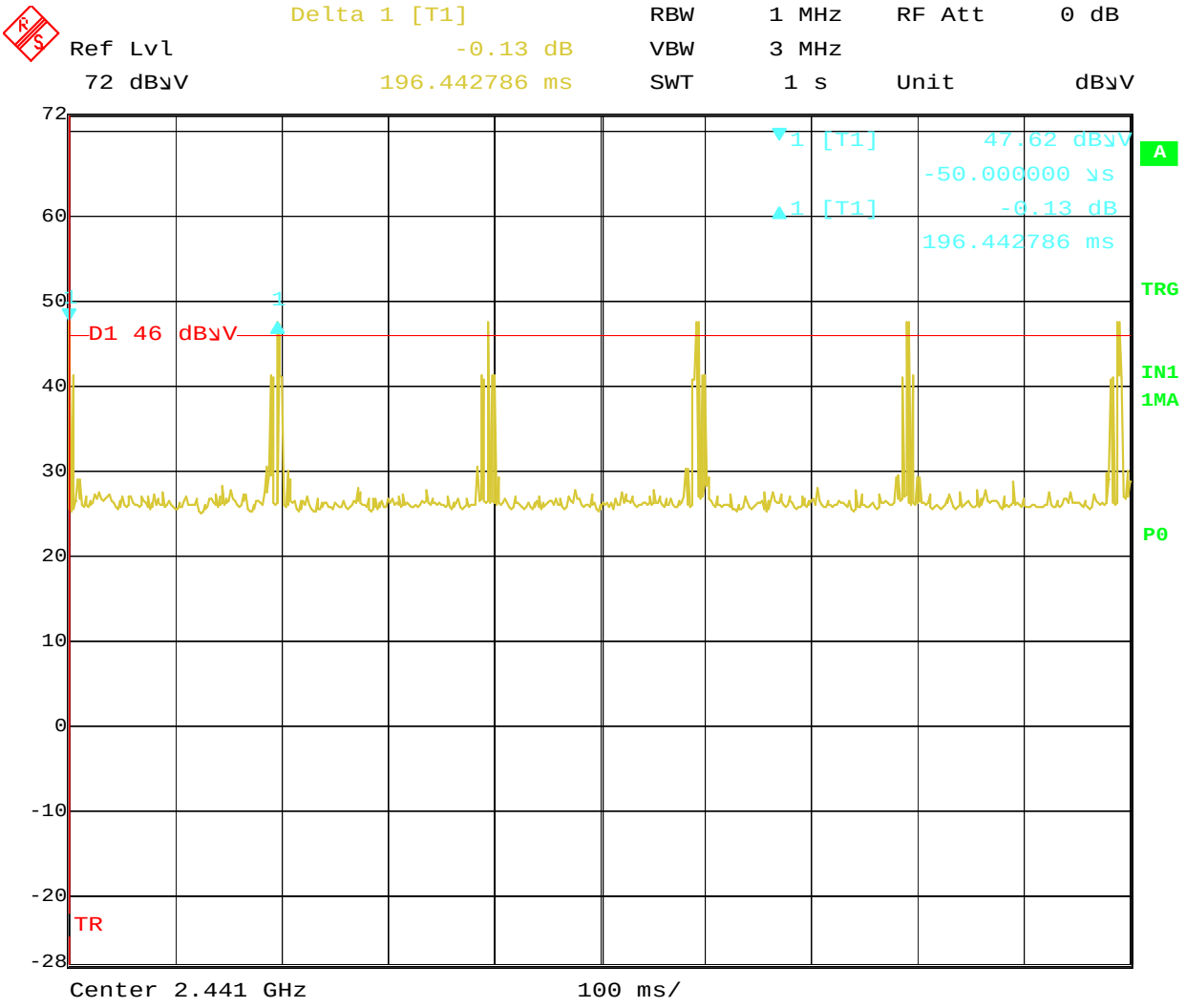

Date: 19.AUG.2011 23:46:07

DH3, Packet Length, 1.67 ms



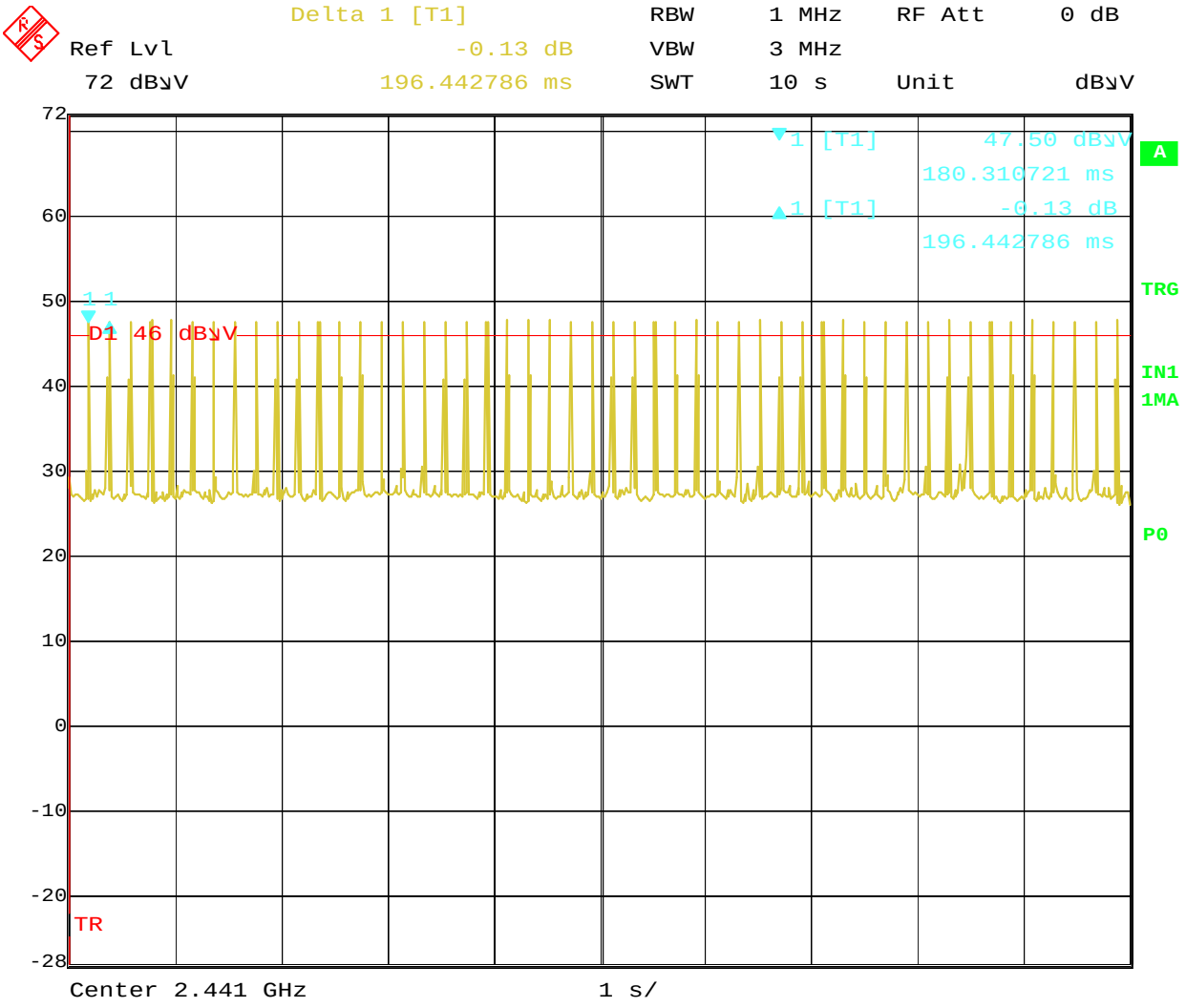

Date: 19.AUG.2011 23:47:08

DH3, one hop in 100 ms



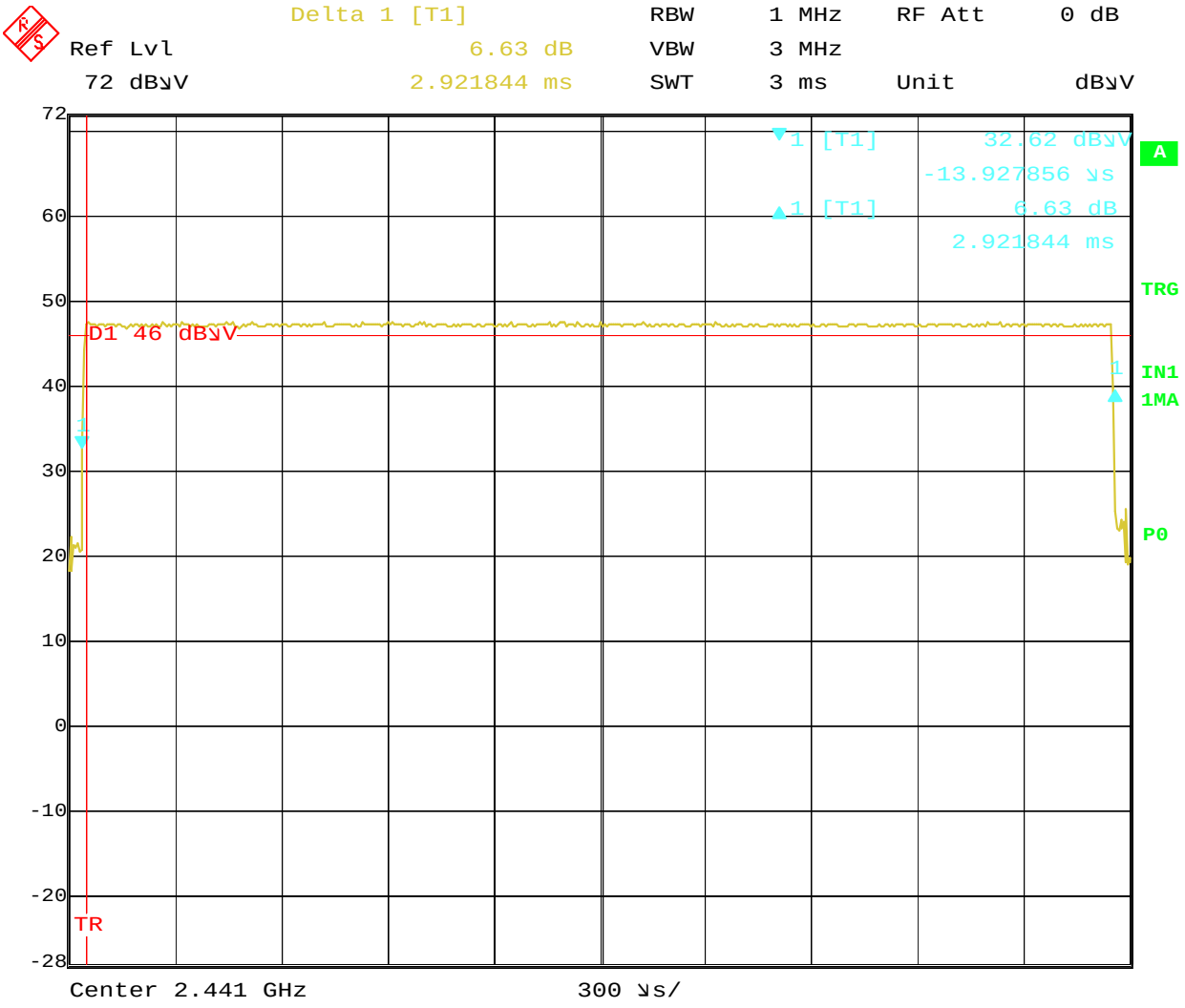

Date: 19.AUG.2011 23:48:04

DH3, 6 hops in 1 second, 196.4ms hop interval



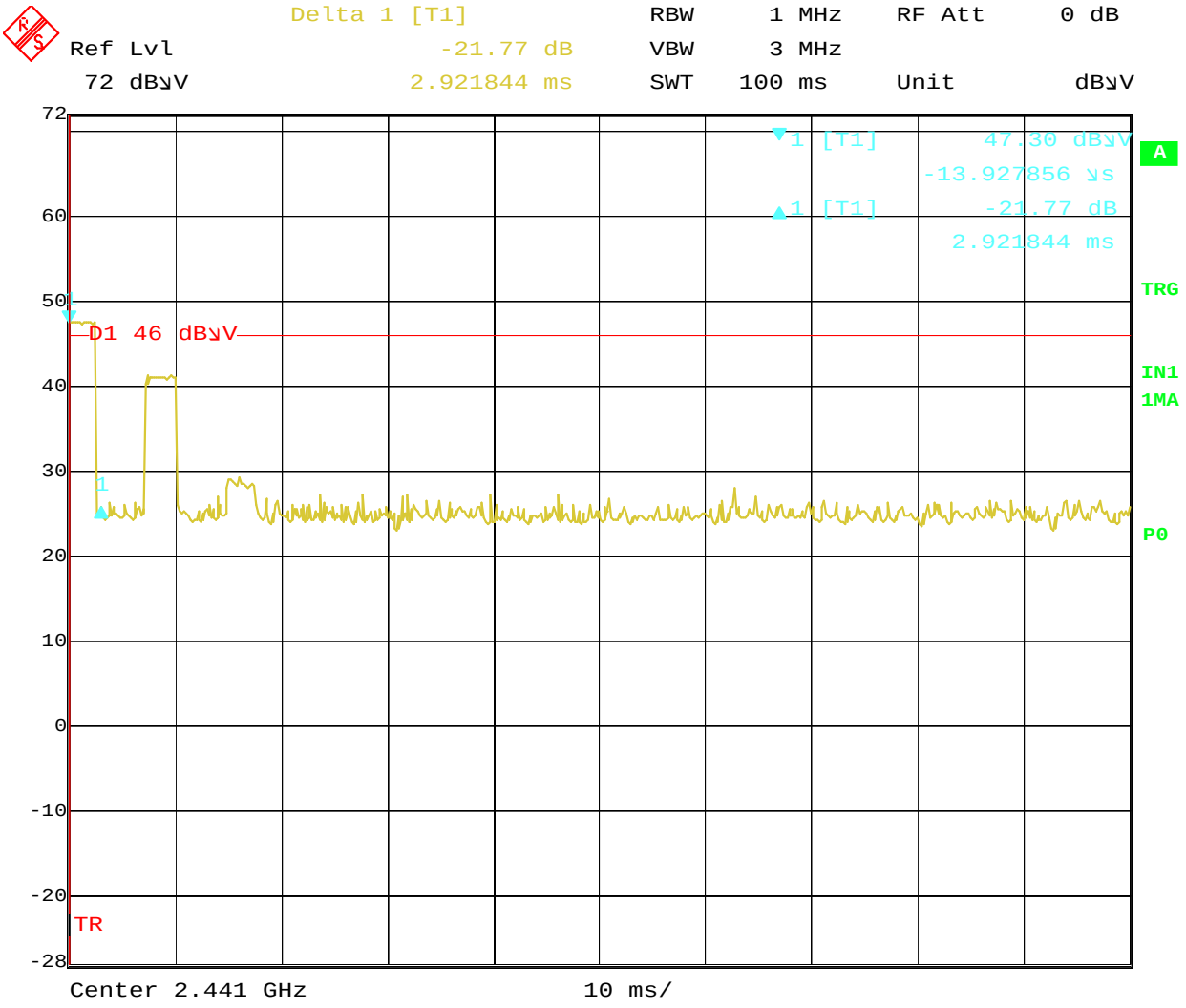

Date: 19.AUG.2011 23:48:50

DH3, 51 hops in 10 seconds

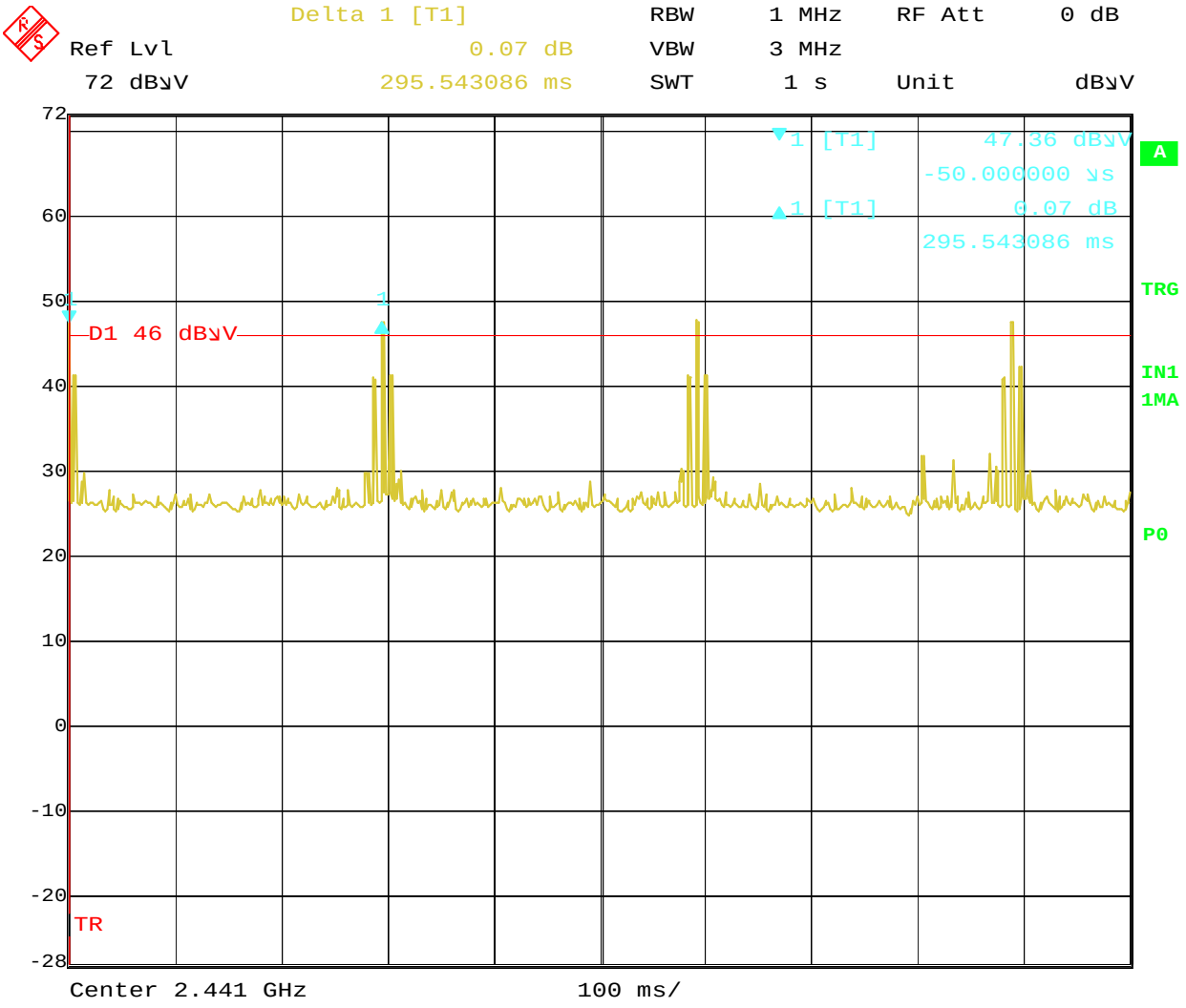



Date: 19.AUG.2011 23:54:10

DH5, Packet Length 2.92 ms

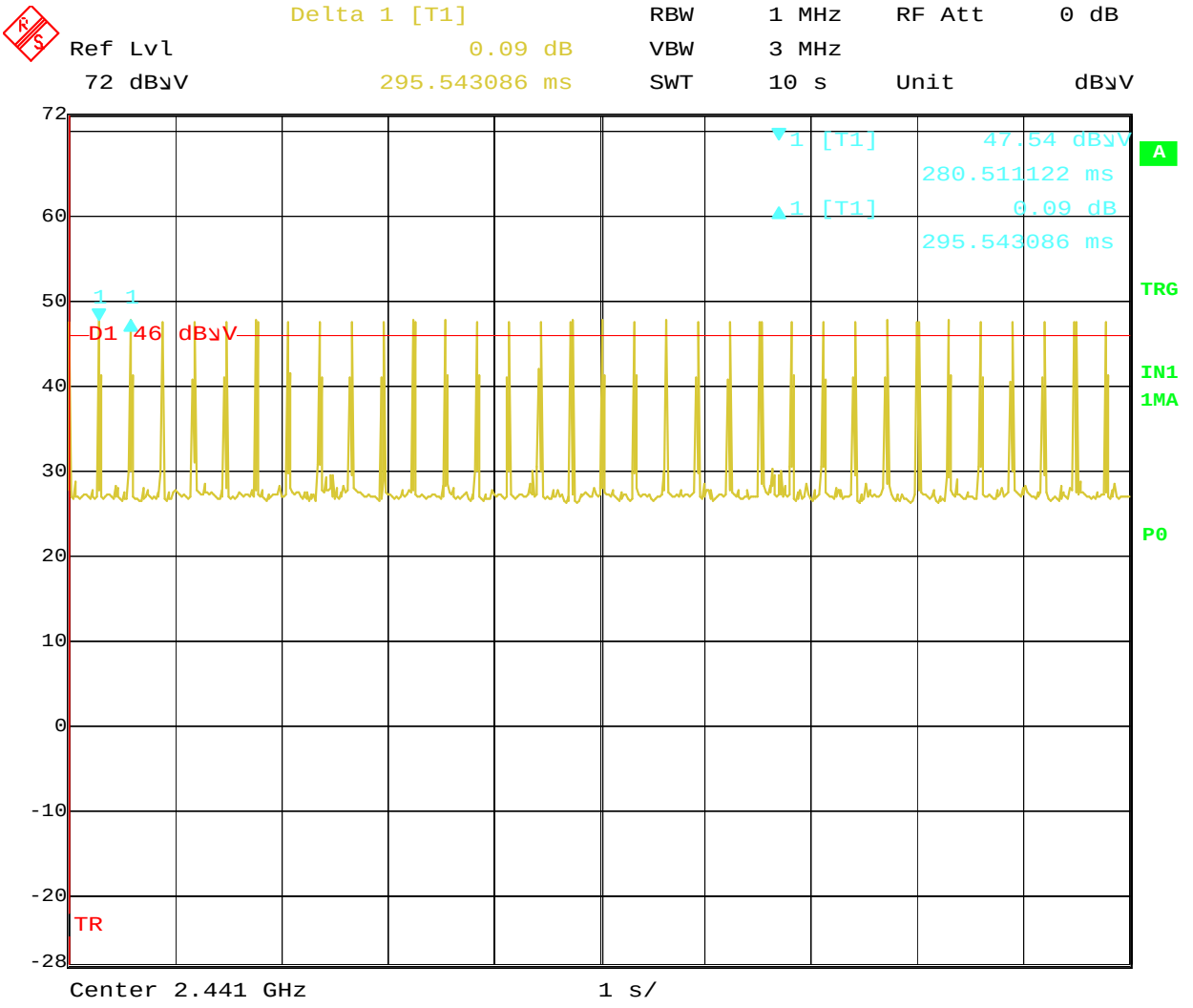



DH5, one hop in 100 ms




Date: 19.AUG.2011 23:55:35

DH5, 4 hops in 1 second, 295.5 ms hop interval




DH5, 34 hops in 10 seconds

For DH1, the packet length was measured to be 399.8 us. The hop interval is 98.75 ms, therefore the duty cycle is based on two hops in a 100ms period, or 0.8%. Dwell time in 31.6 seconds would include 320 hops based on the measured hop interval, resulting in a dwell time of 128 ms.

For DH3, the packet length was measured to be 1.67 ms. The hop interval is 196.4 ms, therefore the duty cycle is based on one hop in a 100ms period, or 1.67%. Dwell time in 31.6 seconds would include 161 hops based on the measured hop interval, resulting in a dwell time of 268.9 ms.

For DH5, the packet length was measured to be 2.92 ms. The hop interval is 295.5 ms, therefore the duty cycle is based on one hop in a 100ms period, or 2.92%. Dwell time in 31.6 seconds would include 107 hops based on the measured hop interval, resulting in a dwell time of 312.4 ms.

| | | | |
|---|---|---|---|
| Test Personnel: | Nicholas Abbondante NNA | Test Date: | 08/19/2011 |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | See section 11.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | | |
| Input Voltage: | 115VAC/60Hz | Ambient Temperature: | 25 ℃ |
| | | Relative Humidity: | 54 % |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | Atmospheric Pressure: | 1003 mbar |

Deviations, Additions, or Exclusions: None

# 12 Band-edge Compliance

## 12.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C Section 15.247, DA 00-705, ANSI C63.4, RSS-Gen, and RSS-210 Annex 8.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

## 12.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| SAF767' | Weatherstation | Davis Instruments | Perception II | PE91222A03 | 01/14/2011 | 01/14/2012 |
| 145-416' | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN2' | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 10/08/2010 | 10/08/2011 |
| 145108' | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESIB40 | 100209 | 04/28/2011 | 04/28/2012 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| None | Teseq | Build 5.26.00.3 |

## 12.3 Results:

The sample tested was found to comply. Note that the requirement is 20 dBc at the lower band edge, and the device must meet the general limits of 15.209 using the marker-delta method at the upper band edge due to the restricted band located there.

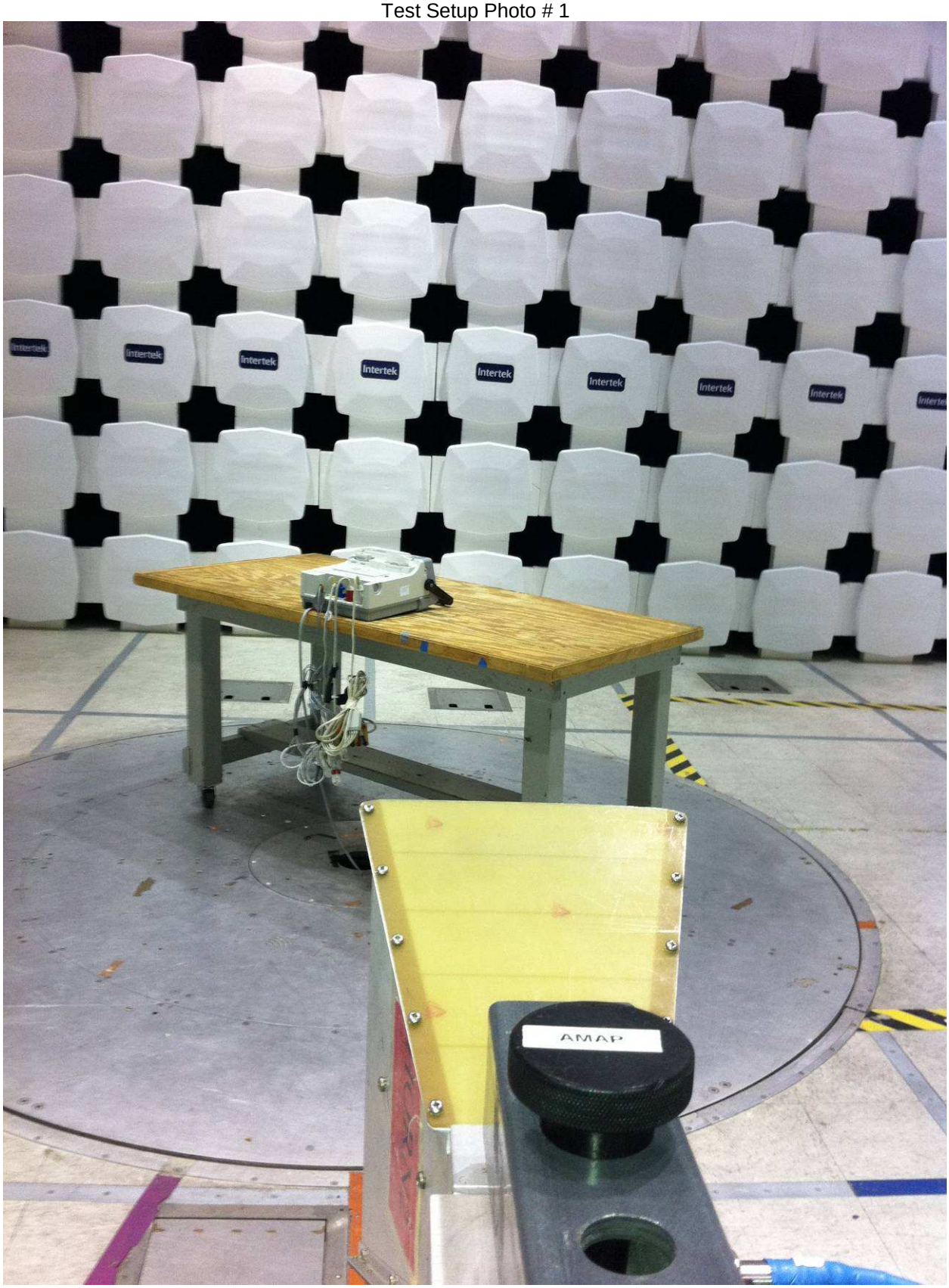
In any 100 kHz bandwidth outside the frequency band , the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

FCC Part 15.209(a) & RSS-210 A8.5 – Restricted Band Radiated Spurious/Harmonics Limits

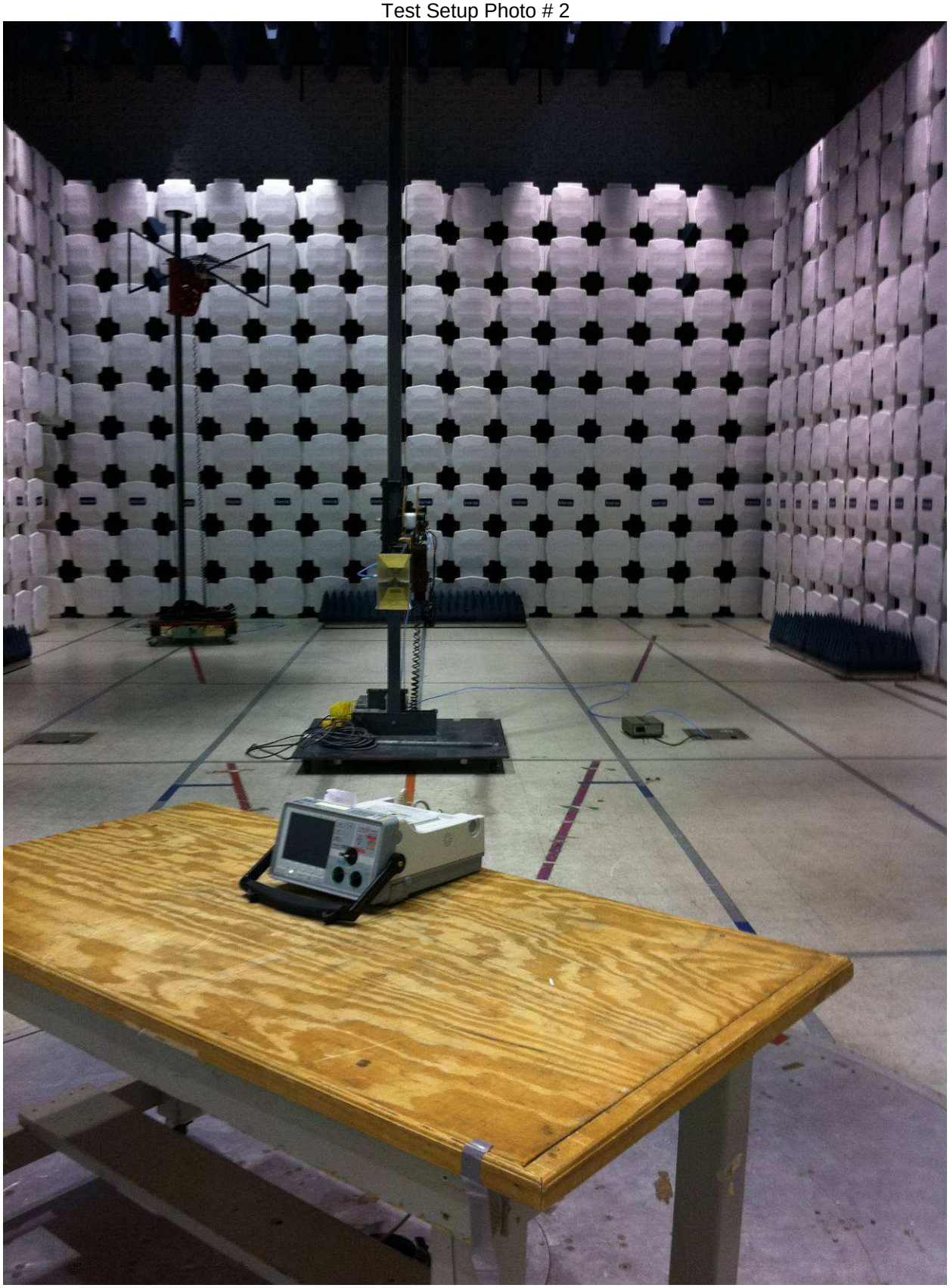
| Frequency | Field Strength | | Test Distance |
|---|---|---|---|
| (MHz) | µV/m | dBµV/m | (meters) |
| 30–88 | 100 | 40.00 | 3 |
| 88–216 | 150 | 43.52 | 3 |
| 216–960 | 200 | 46.02 | 3 |
| Above 960 | 500 | 53.98 | 3 |

## 12.4 Setup Photographs:

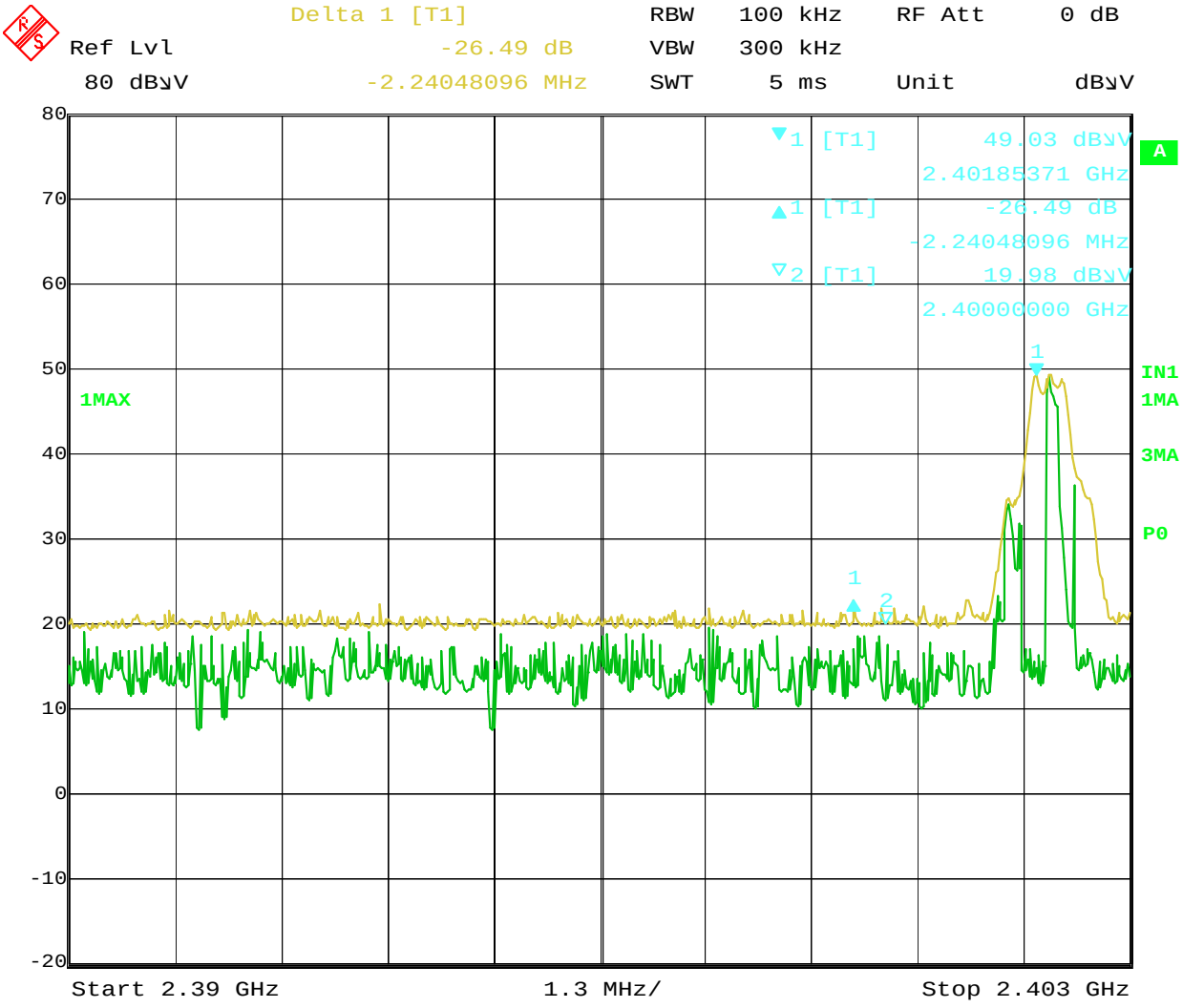
Test Setup Photo # 1



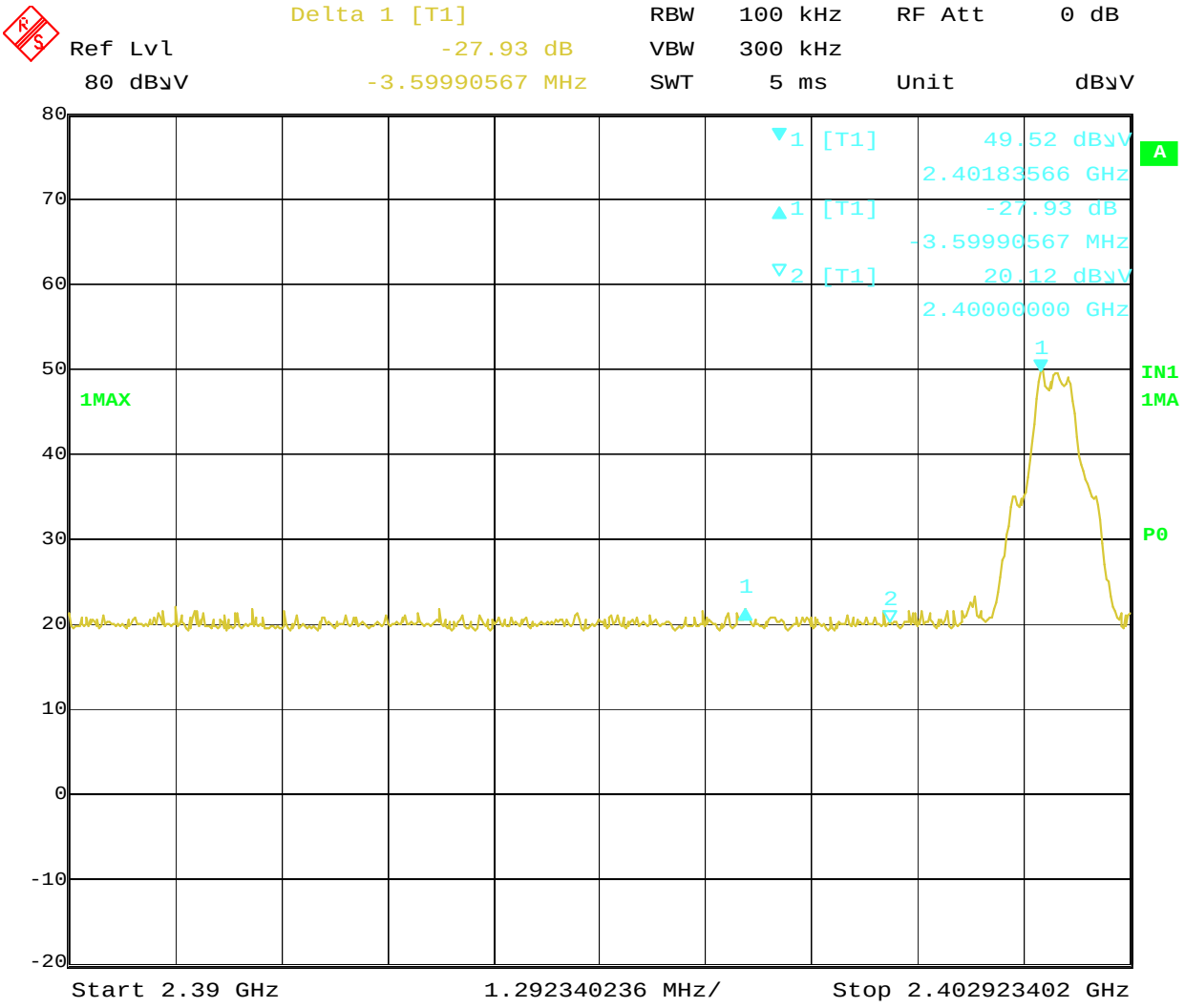
Test Setup Photo # 2



## 12.5 Plots/Data:

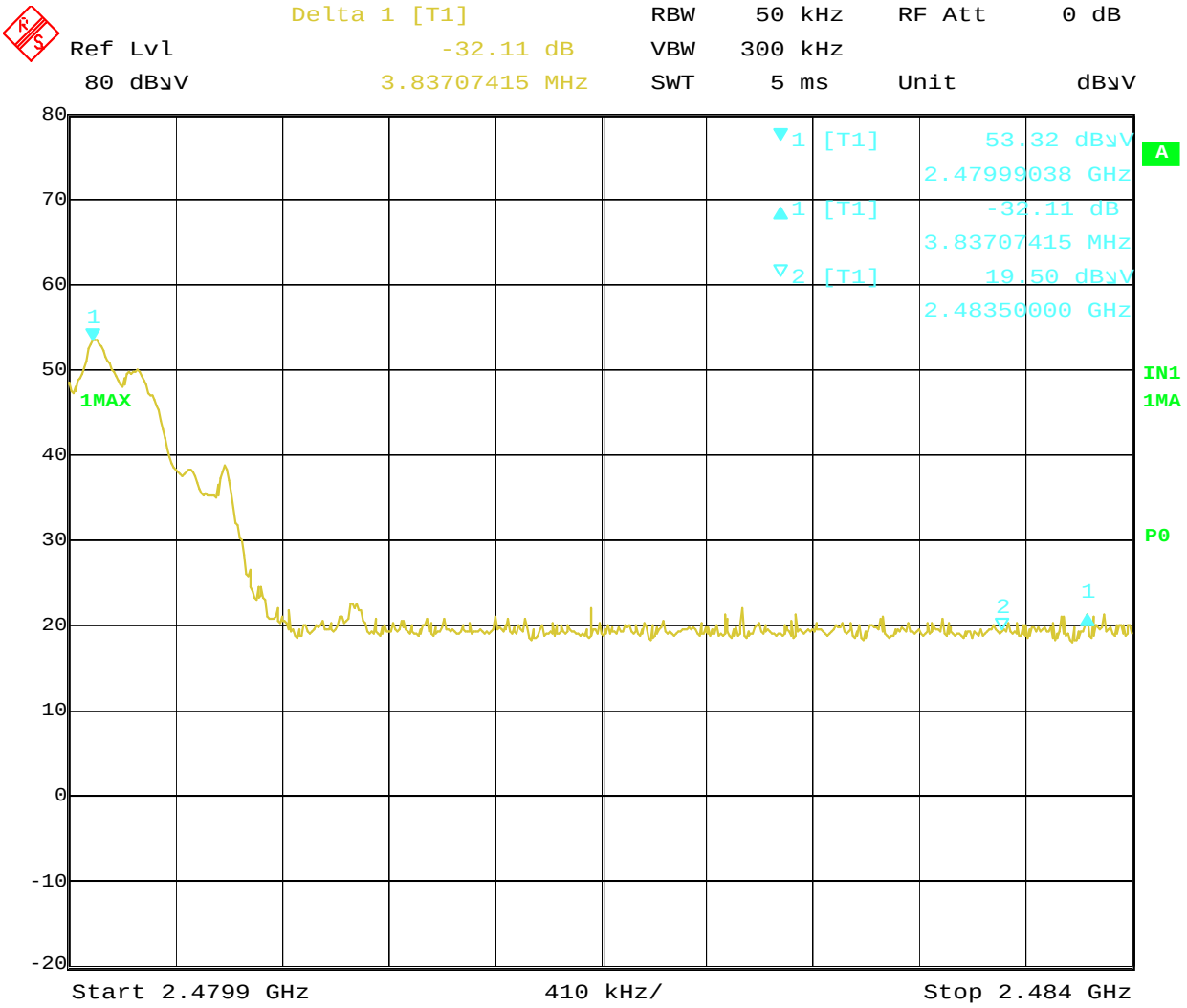



Lower Band Edge Compliance, Vertical Polarity



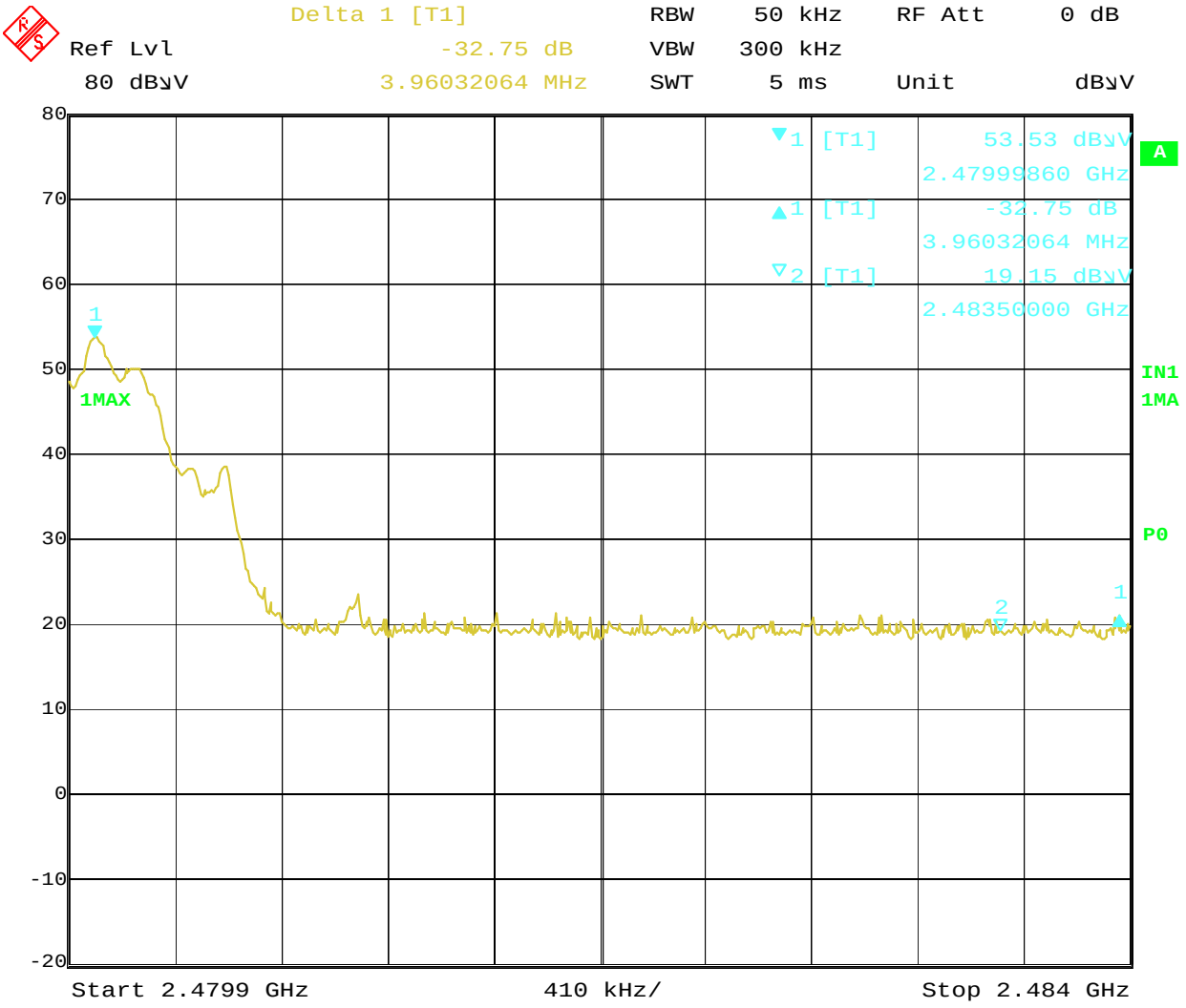

Date: 19.AUG.2011 21:52:57

Lower Band Edge Compliance, Horizontal




Date: 19.AUG.2011 20:57:15

Upper Band Edge Compliance, Vertical Polarity, Marker Delta 32.11 dB




Date: 19.AUG.2011 21:02:36

Upper Band Edge Compliance, Horizontal Polarity, Marker Delta 32.75 dB

Intertek

**Radiated Emissions**

Company: Zoll Medical
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineers: Nicholas Abbondante
Project #: G100398565
Standard: FCC Part 15 Subpart C 15.247
Receiver: R&S ESIB (145108) 04-06-2012
PreAmp: NONE.

Date(s): 08/19/11
Location: 10m Chamber
Limit Distance (m): 3
Test Distance (m): 3

Antenna & Cables: N
Antenna: HORN2 V3m 10-08-2011.txt
Cable(s): 3mTrackB 145-416 08-31-2011.txt
Barometer: SAF767
Temp/Humidity/Pressure: 25c 54% 1003mB

Bands: N, LF, HF, SHF
HORN2 H3m 10-08-2011.txt
NONE.
Filter: NONE

PreAmp Used? (Y or N): N
Voltage/Frequency: 115V/60Hz
Frequency Range: Frequencies Shown

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Note: Fundamental Field Strength | | | | | | | | | | | | | |
| PK | V | 2402.000 | 49.72 | 28.33 | 5.80 | 0.00 | 0.00 | 83.86 | - | - | 1/3 MHz | | |
| PK | H | 2402.000 | 49.88 | 28.15 | 5.80 | 0.00 | 0.00 | 83.83 | - | - | 1/3 MHz | | |
| PK | V | 2441.000 | 51.08 | 28.35 | 5.88 | 0.00 | 0.00 | 85.31 | - | - | 1/3 MHz | | |
| PK | H | 2441.000 | 51.99 | 28.25 | 5.88 | 0.00 | 0.00 | 86.12 | - | - | 1/3 MHz | | |
| PK | V | 2480.000 | 53.89 | 28.37 | 5.96 | 0.00 | 0.00 | 88.22 | - | - | 1/3 MHz | | |
| PK | H | 2480.000 | 54.03 | 28.36 | 5.96 | 0.00 | 0.00 | 88.35 | - | - | 1/3 MHz | | |
| Note: Upper Band Edge Compliance (using marker-delta method factor of 32.11 dB) | | | | | | | | | | | | | |
| Note: Average obtained by applying the worst case duty cycle (DH5 datarate, 2.92% duty cycle, -30.7 dB average factor) | | | | | | | | | | | | | |
| PK | V | 2483.500 | 21.78 | 28.37 | 5.97 | 0.00 | 0.00 | 56.12 | 74.00 | -17.88 | 1/3 MHz | RB | |
| AVG | V | 2483.500 | -8.92 | 28.37 | 5.97 | 0.00 | 0.00 | 25.42 | 54.00 | -28.58 | 1/3 MHz | RB | |
| Note: Upper Band Edge Compliance (using marker-delta method factor of 32.75 dB) | | | | | | | | | | | | | |
| Note: Average obtained by applying the worst case duty cycle (DH5 datarate, 2.92% duty cycle, -30.7 dB average factor) | | | | | | | | | | | | | |
| PK | H | 2483.500 | 21.28 | 28.37 | 5.97 | 0.00 | 0.00 | 55.61 | 74.00 | -18.39 | 1/3 MHz | RB | |
| AVG | H | 2483.500 | -9.42 | 28.37 | 5.97 | 0.00 | 0.00 | 24.91 | 54.00 | -29.09 | 1/3 MHz | RB | |

See section 11 for plots of channel dwell time which were used to determine the duty cycle.

| | | | |
|---|---|---|---|
| Test Personnel: | Nicholas Abbondante | Test Date: | 08/19/2011 |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | See section 12.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | | |
| Input Voltage: | 115VAC/60Hz | Ambient Temperature: | 25 ℃ |
| | | Relative Humidity: | 54 % |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | Atmospheric Pressure: | 1003 mbar |

Deviations, Additions, or Exclusions: None

# 13 Receiver Spurious Emissions

## 13.1 Method

Tests are performed in accordance with ANSI C 63.4:2003 and RSS-Gen.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

**Measurement Uncertainty**

For radiated emissions, $U_{lab}$ (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < $U_{CISPR}$ (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

**Sample Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

**Example:**

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

## 13.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| DAV002' | Weather Station | Davis Instruments | 7400 | PE80519A93 | 08/12/2011 | 08/12/2012 |
| 145-410' | Cables 145-400 145-406 145-407 145-405 145-403 | Huber + Suhner | 10m Track A Cables | multiple | 08/31/2010 | 08/31/2011 |
| 145034' | BiLog Antenna (30 MHz to 1GHz) | Schaffner Chase EMC | CBL6111C | none | 01/07/2011 | 01/07/2012 |
| 145003' | Preamplifier (150 KHz to 1.3 GHz) | Hewlett Packard | 8447D | 2443A04077 | 09/24/2010 | 09/24/2011 |
| 145128' | EMI Receiver 40 GHz (20 Hz - 40 Ghz) | Rohde & Schwarz | ESI | 8392831001 | 08/10/2010 | 08/31/2011 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| C5 | Teseq | Build 5.26.00.3 |

## 13.3 Results:

The sample tested was found to comply.

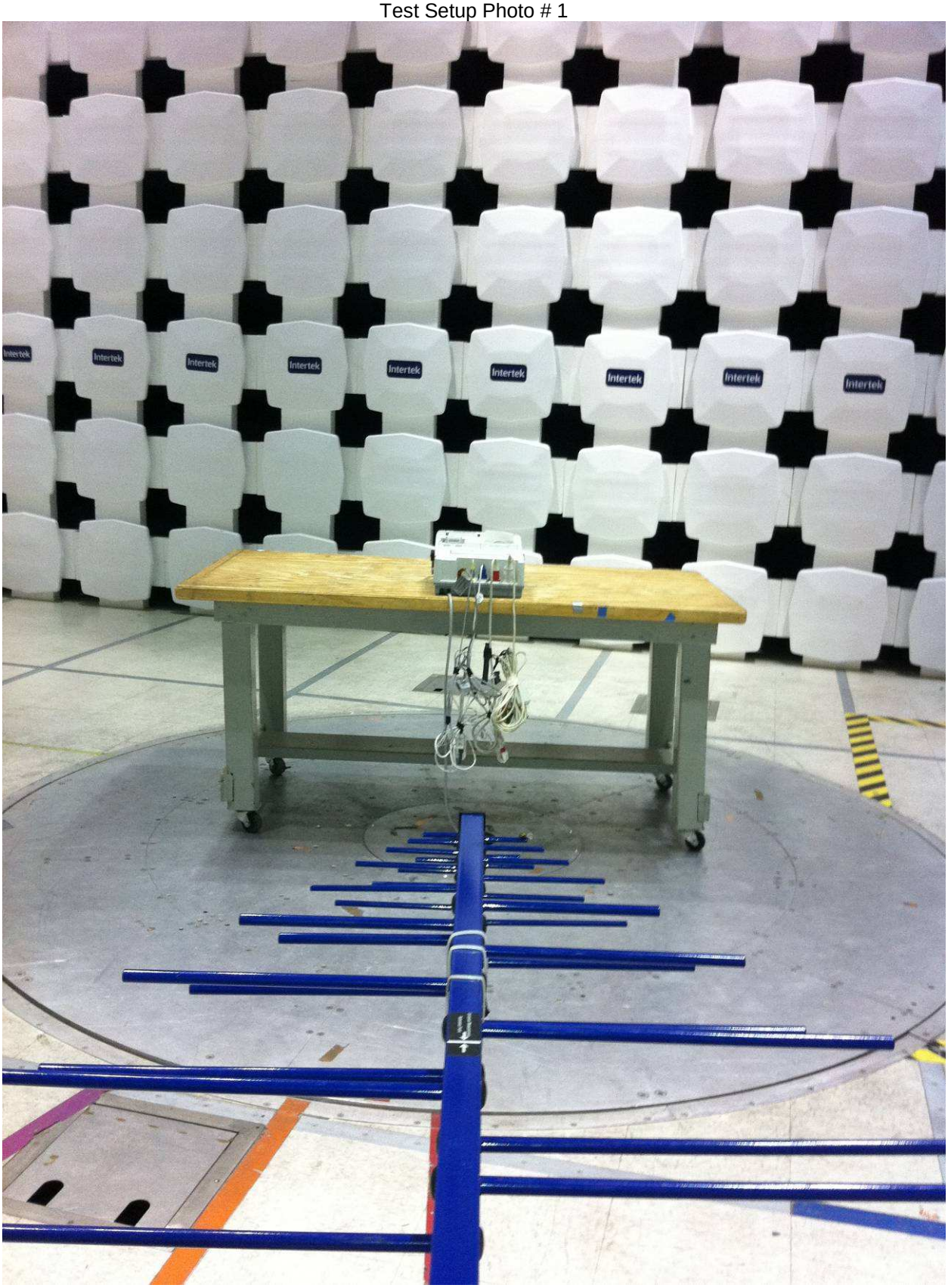
The field strength of any emissions shall not exceed the limits as follows:

FCC Part 15:2011 Subpart B Section 15.109 (a) & RSS-Gen Issue 3 December 2010, Section 6.1 Table 2

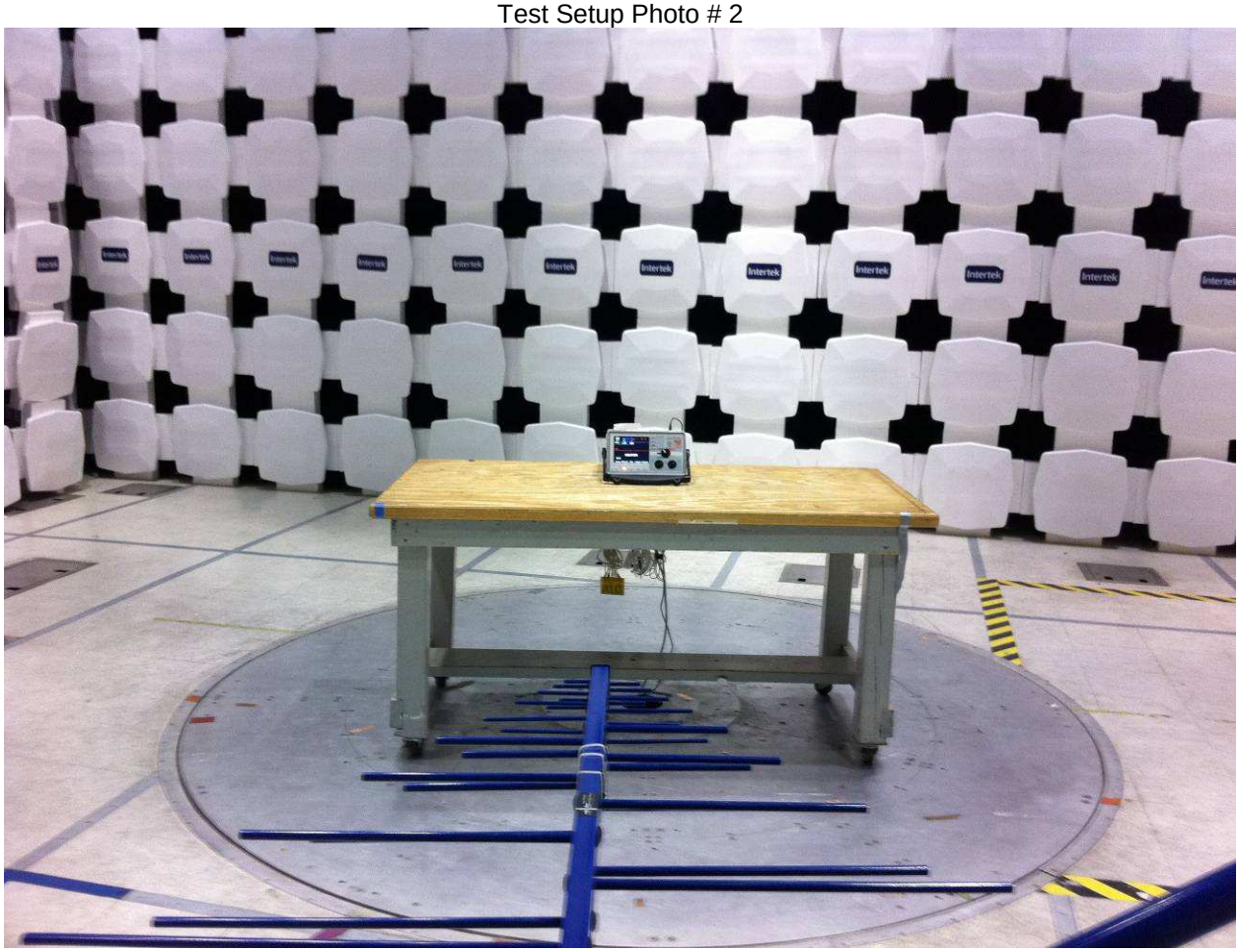
| Frequency | Field Strength | | Test Distance |
|---|---|---|---|
| (MHz) | µV/m | dBµV/m | (meters) |
| 30–88 | 100 | 40.00 | 3 |
| 88–216 | 150 | 43.52 | 3 |
| 216–960 | 200 | 46.02 | 3 |
| Above 960 | 500 | 53.98 | 3 |

## 13.4 Setup Photographs:

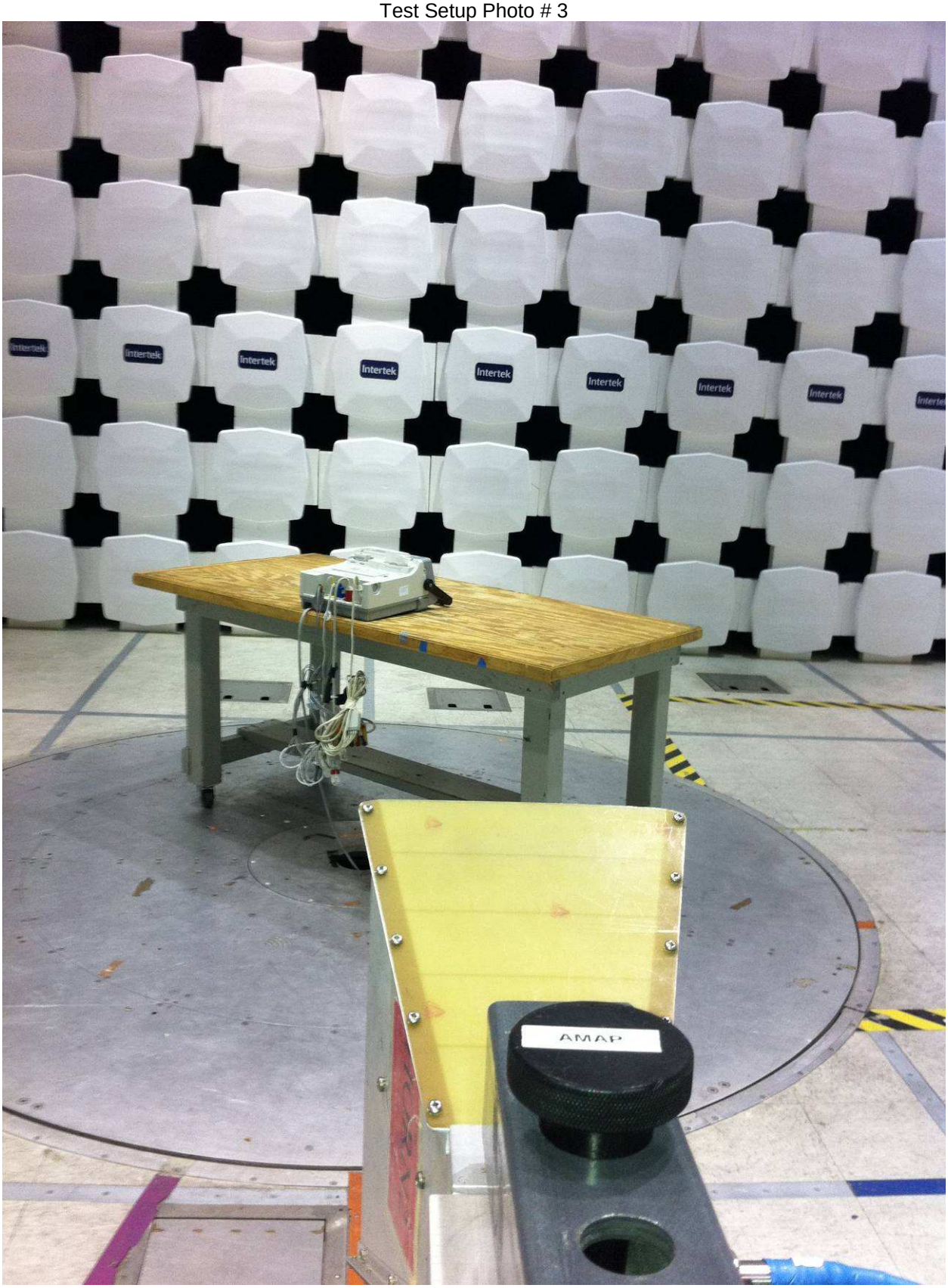
Test Setup Photo # 1



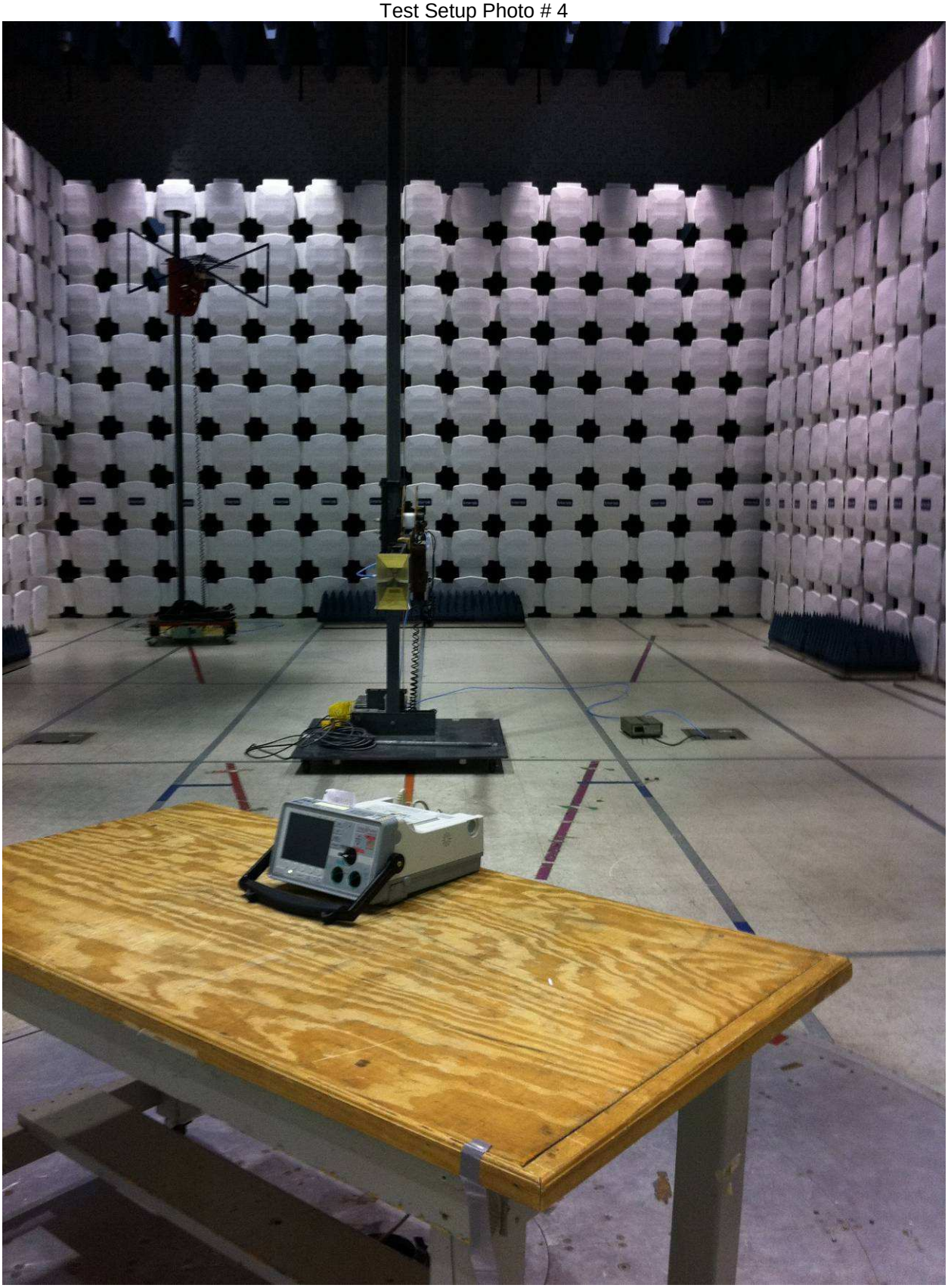
Test Setup Photo # 2



Test Setup Photo # 3



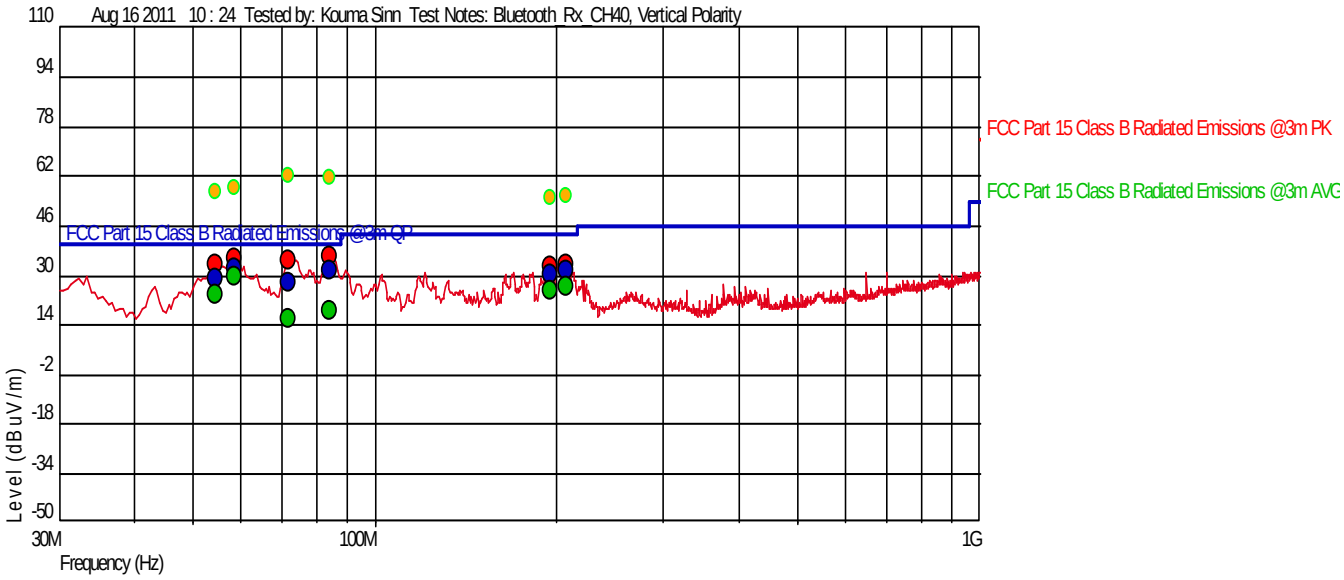
Test Setup Photo # 4



## 13.5 Plots/Data:

**FCC Part 15.209, RSS-Gen**

**Channel 40 (2.441GHz) Radiated Emissions @ 3m, Vertical Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw

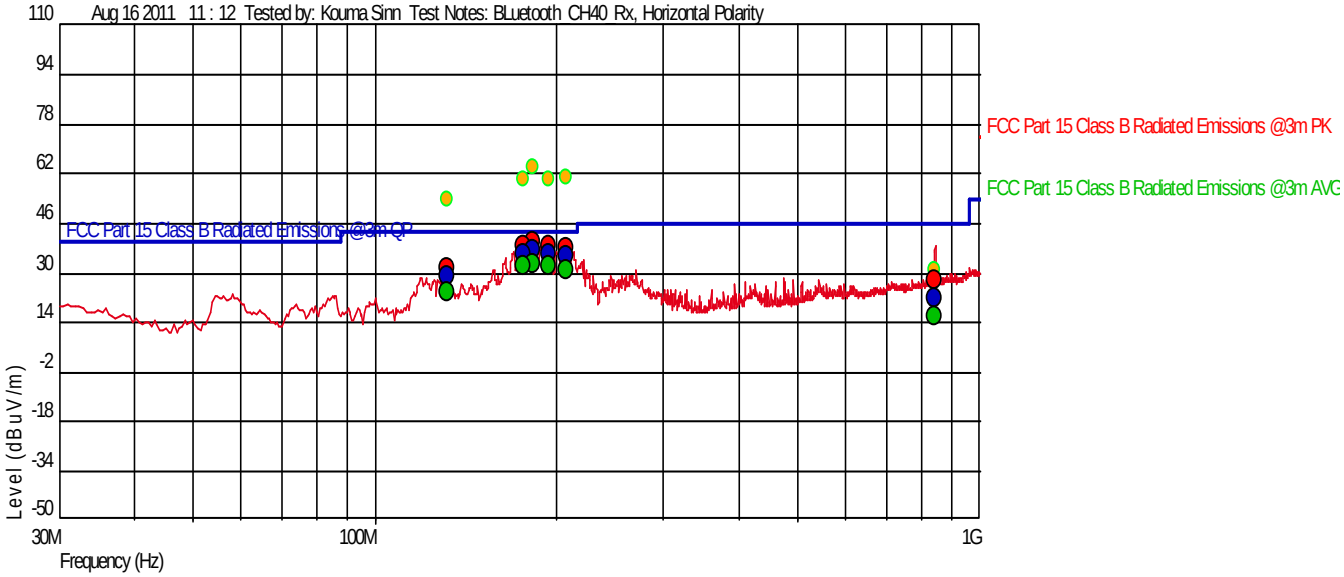
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Vert (\|) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 54.345M | 28.88 | 6.862 | -26.203 | 40.00 | -11.12 | \| | 225 | 1.26 | 120k |
| 58.454M | 32.36 | 5.864 | -26.127 | 40.00 | -7.64 | \| | 228 | 1.30 | 120k |
| 71.746M | 27.87 | 6.149 | -26.000 | 40.00 | -12.13 | \| | 49 | 1.37 | 120k |
| 83.988M | 31.67 | 8.694 | -26.000 | 40.00 | -8.33 | \| | 271 | 1.55 | 120k |
| 194.905M | 30.21 | 9.800 | -24.942 | 43.52 | -13.31 | \| | 356 | 1.78 | 120k |
| 207.474M | 31.31 | 10.500 | -24.888 | 43.52 | -12.21 | \| | 348 | 1.44 | 120k |

**FCC Part 15.209, RSS-Gen**

**Channel 40 (2.441GHz) Radiated Emissions @ 3m, Horizontal Polarity, 30-1000MHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw

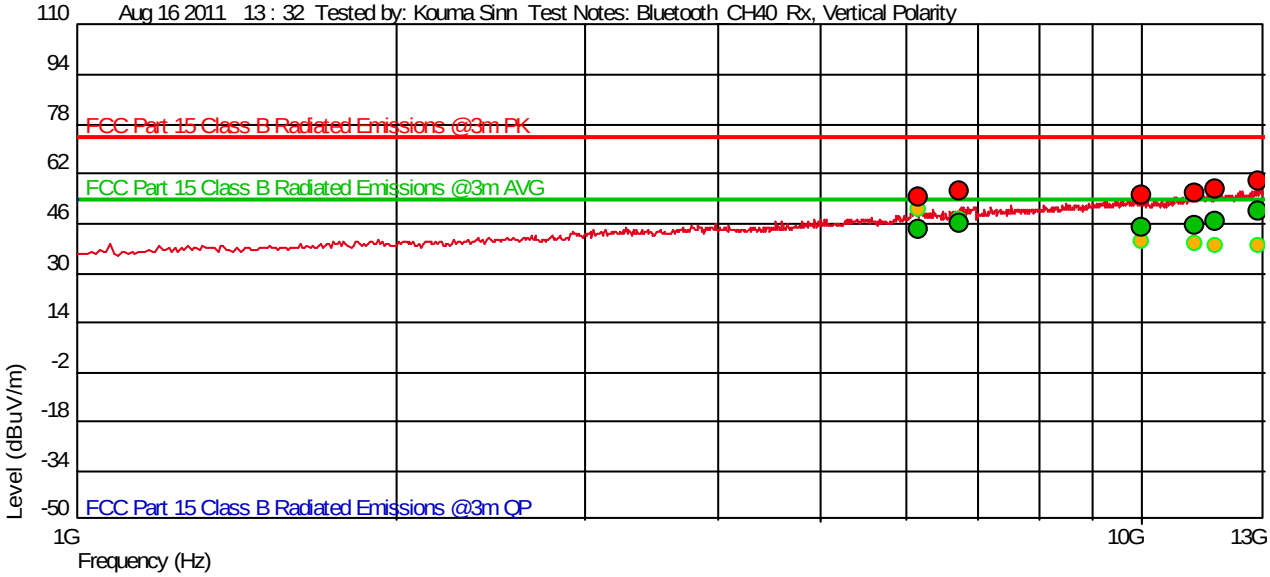
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Quasi-Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Hor (--) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 131.946M | 28.78 | 11.116 | -25.535 | 43.52 | -14.74 | -- | 282 | 2.24 | 120k |
| 176.092M | 36.10 | 9.291 | -25.106 | 43.52 | -7.42 | -- | 84 | 1.70 | 120k |
| 182.213M | 37.49 | 9.000 | -25.051 | 43.52 | -6.03 | -- | 94 | 1.19 | 120k |
| 194.232M | 36.21 | 9.000 | -24.947 | 43.52 | -7.31 | -- | 90 | 1.69 | 120k |
| 207.440M | 35.27 | 9.251 | -24.888 | 43.52 | -8.25 | -- | 72 | 1.30 | 120k |
| 843.901M | 21.78 | 22.400 | -23.328 | 46.02 | -24.24 | -- | 55 | 3.79 | 120k |

**FCC Part 15.209, RSS-Gen**

**Channel 40 (2.441GHz) Radiated Emissions @ 3m, Vertical Polarity, 1-13GHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Peak

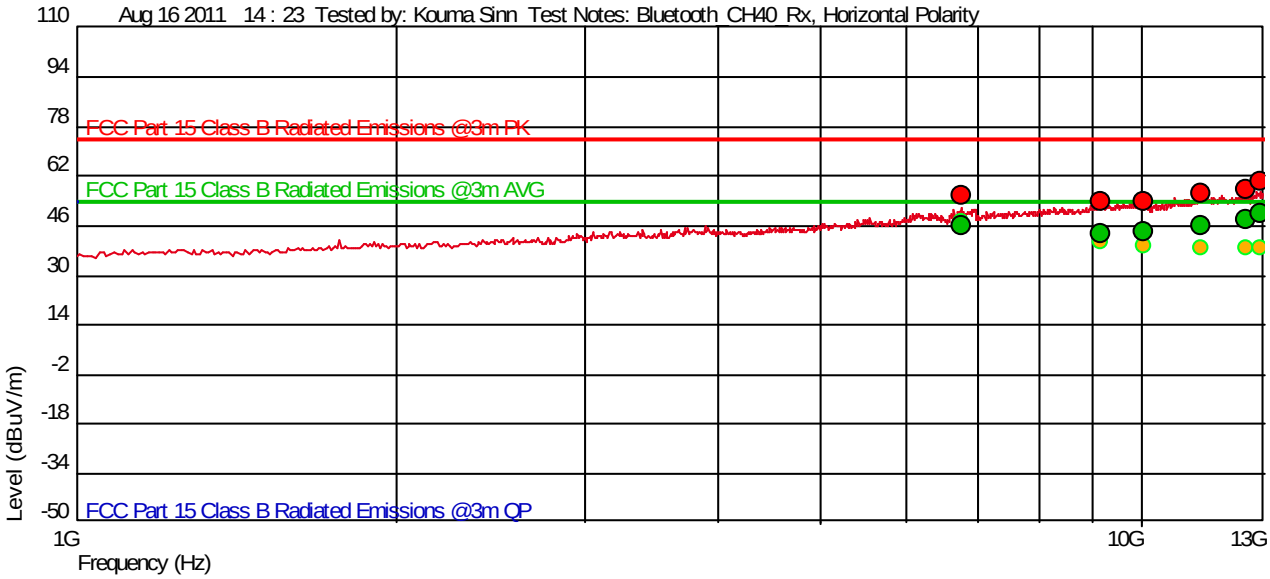
| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Vert (\|) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 6.177G | 54.67 | 34.399 | -24.967 | 74.00 | -19.33 | \| | 260 | 1.35 | 1M |
| 6.744G | 56.49 | 34.894 | -25.525 | 74.00 | -17.51 | \| | 161 | 3.72 | 1M |
| 9.988G | 54.81 | 38.104 | -23.392 | 74.00 | -19.19 | \| | 284 | 3.93 | 1M |
| 11.187G | 55.79 | 38.481 | -21.738 | 74.00 | -18.21 | \| | 282 | 2.99 | 1M |
| 11.724G | 57.03 | 39.499 | -21.769 | 74.00 | -16.97 | \| | 145 | 1.97 | 1M |
| 12.840G | 59.52 | 39.305 | -19.881 | 74.00 | -14.48 | \| | 199 | 3.96 | 1M |

Measured: Average

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Vert (\|) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 6.177G | 43.95 | 34.399 | -24.967 | 54.00 | -10.05 | \| | 260 | 1.35 | 1M |
| 6.744G | 46.02 | 34.894 | -25.525 | 54.00 | -7.98 | \| | 161 | 3.72 | 1M |
| 9.988G | 44.42 | 38.104 | -23.392 | 54.00 | -9.58 | \| | 284 | 3.93 | 1M |
| 11.187G | 45.33 | 38.481 | -21.738 | 54.00 | -8.67 | \| | 282 | 2.99 | 1M |
| 11.724G | 46.48 | 39.499 | -21.769 | 54.00 | -7.52 | \| | 145 | 1.97 | 1M |
| 12.840G | 49.85 | 39.305 | -19.881 | 54.00 | -4.15 | \| | 199 | 3.96 | 1M |

**FCC Part 15.209, RSS-Gen**

**Channel 40 (2.441GHz) Radiated Emissions @ 3m, Horizontal Polarity, 1-13GHz**




"PORTRAIT"

- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable

Level (dBuV/m) = AF + CL + PA + Raw

AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: Peak

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Hor (--) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 6.768G | 55.83 | 34.905 | -25.525 | 74.00 | -18.17 | -- | 224 | 2.56 | 1M |
| 9.146G | 53.89 | 37.697 | -23.904 | 74.00 | -20.11 | -- | 13 | 3.63 | 1M |
| 10.032G | 53.82 | 38.123 | -23.345 | 74.00 | -20.18 | -- | 303 | 1.49 | 1M |
| 11.350G | 56.29 | 38.776 | -21.676 | 74.00 | -17.71 | -- | 331 | 1.54 | 1M |
| 12.535G | 57.89 | 38.797 | -20.641 | 74.00 | -16.11 | -- | 165 | 3.09 | 1M |
| 12.931G | 59.94 | 39.408 | -19.659 | 74.00 | -14.06 | -- | 101 | 3.32 | 1M |

Measured: Average

| Frequency (Hz) | Level (dBuV/m) | Ant. Fact. (dB) | Other Fact. (dB) | Limit (dBuV/m) | Margin (dB) | Hor (--) | Angle (deg) | Mast Height (m) | RBW (Hz) |
|---|---|---|---|---|---|---|---|---|---|
| 6.768G | 46.23 | 34.905 | -25.525 | 54.00 | -7.77 | -- | 224 | 2.56 | 1M |
| 9.146G | 43.35 | 37.697 | -23.904 | 54.00 | -10.65 | -- | 13 | 3.63 | 1M |
| 10.032G | 44.18 | 38.123 | -23.345 | 54.00 | -9.82 | -- | 303 | 1.49 | 1M |
| 11.350G | 46.02 | 38.776 | -21.676 | 54.00 | -7.98 | -- | 331 | 1.54 | 1M |
| 12.535G | 47.86 | 38.797 | -20.641 | 54.00 | -6.14 | -- | 165 | 3.09 | 1M |
| 12.931G | 50.03 | 39.408 | -19.659 | 54.00 | -3.97 | -- | 101 | 3.32 | 1M |

| | | | |
|---|---|---|---|
| Test Personnel: | Kouma Sinn | Test Date: | 08/16/2011 |
| Supervising Engineer: (Where Applicable) | N/A | Test Levels: | Emissions below the limits specified in Section 14.3 |
| Product Standard: | FCC Part 15.247, RSS-210 Annex 8 | Performance Criteria: | N/A |
| Input Voltage: | 115VAC/60Hz | Ambient Temperature: | 22 ºC |
| | | Relative Humidity: | 55 % |
| Pretest Verification w/ Ambient Signals or BB Source: | **Ambient Signals** | Atmospheric Pressure: | 998mbars |

Deviations, Additions, or Exclusions: None

# 14 AC Mains Conducted Emissions

## 14.1 Method

Tests are performed in accordance with ANSI C 63.4:2003 and RSS-Gen.

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

**Measurement Uncertainty**

For conducted emissions, $U_{lab}$ (3.2 dB in worst case) < $U_{CISPR}$ (3.6 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

**Sample Calculations**

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBµV
RF = Reading from receiver in dBµV
LF = LISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBµV to µV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in µV
NF = Net Reading in dBµV

**Example:**

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBµV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 µV/m

## 14.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| BAR3' | Digital 4 Line Barometer | Mannix | 0ABA116 | BAR3 | 08/11/2010 | 08/11/2012 |
| ROS002' | 9kHz to 3GHz EMI Test Receiver | Rohde & Schwartz | ESCI 1166.5950K03 | 100067 | 04/15/2011 | 04/15/2012 |
| CBLBNC60' | Cable, BNC - BNC, 10m long | Alpha | RG-58C/U | CBL10MS1 | 09/15/2011 | 09/15/2012 |
| 145015' | LISN: 50 Ohm/50 microHenry | Solar Electronics | 9252-50-R-24-BNC | 971617 | 01/18/2011 | 01/18/2012 |
| DS27' | Attenuator, 20dB | Mini Circuits | 20dB, 50 ohm | DS27 | 04/19/2011 | 04/19/2012 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 08/27/10 |

## 14.3 Results:

The sample tested was found to comply.

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the table below

FCC Part 15.207 (a) & RSS-Gen Section 7.2.4 (Table 4)

| Frequency of emission (MHz) | Conducted limit (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15–0.5 | 66 to 56* | 56 to 46* |
| 0.5–5 | 56 | 46 |
| 5–30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

### 14.4 Setup Photographs:

## 14.5 Data:

**Conducted Emissions**

Company: Zoll Medical Corp
Model #: ZOLL E Series Data Comm Card
Serial #: IN0411-00032
Engineer(s): Vathana Ven
Project #: G100398565
Standard: FCC Part 15 Subpart C 15.247/RSS-210
Barometer: BAR3

Location: 10M
Date: 07/26/11
Temp/Humidity/Pressure: 20 deg C 60% 999 mB
Voltage/Frequency: 120VAC/60Hz

Receiver: R&S ESCI (ROS002) 04-15-2012
Cable: CBLBNC60_9-15-2011.txt
LISN 1: LISN145015_line1_1-18-2012.txt
LISN 2: LISN145015_line2_1-18-2012.txt
LISN 3: NONE.
LISN 4: NONE.
Attenuator: DS27_4-19-2012.txt
Frequency Range: 0.150-30MHz

Net is the sum of worst-case lisn, cable, & attenuator losses, and initial reading, factors are not shown
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor; Bandwidth denoted as RBW/VBW

| Detector Type | Frequency MHz | Reading Line 1 dB(uV) | Reading Line 2 dB(uV) | Reading Line 3 dB(uV) | Reading Line 4 dB(uV) | Net dB(uV) | QP Limit dB(uV) | Margin dB | Bandwidth |
|---|---|---|---|---|---|---|---|---|---|
| QP | 0.150 | 34.50 | 35.90 | | | 56.26 | 66.00 | -9.74 | 9/30 kHz |
| QP | 0.212 | 28.10 | 29.50 | | | 49.80 | 63.13 | -13.32 | 9/30 kHz |
| QP | 11.418 | 12.30 | 12.00 | | | 32.88 | 60.00 | -27.12 | 9/30 kHz |
| QP | 12.658 | 13.66 | 13.60 | | | 34.25 | 60.00 | -25.75 | 9/30 kHz |
| QP | 13.648 | 17.90 | 18.30 | | | 38.89 | 60.00 | -21.11 | 9/30 kHz |
| QP | 15.968 | 18.70 | 19.00 | | | 39.62 | 60.00 | -20.38 | 9/30 kHz |

| Detector Type | Frequency MHz | Reading Line 1 dB(uV) | Reading Line 2 dB(uV) | Reading Line 3 dB(uV) | Reading Line 4 dB(uV) | Net dB(uV) | Average Limit dB(uV) | Margin dB | Bandwidth |
|---|---|---|---|---|---|---|---|---|---|
| AVG | 0.150 | 10.60 | 12.50 | | | 32.86 | 56.00 | -23.14 | 9/30 kHz |
| AVG | 0.212 | 25.50 | 27.00 | | | 47.30 | 53.13 | -5.82 | 9/30 kHz |
| AVG | 11.418 | 0.40 | 0.00 | | | 20.98 | 50.00 | -29.02 | 9/30 kHz |
| AVG | 12.658 | 3.40 | 2.90 | | | 23.99 | 50.00 | -26.01 | 9/30 kHz |
| AVG | 13.648 | 15.30 | 15.50 | | | 36.09 | 50.00 | -13.91 | 9/30 kHz |
| AVG | 15.968 | 15.70 | 15.60 | | | 36.33 | 50.00 | -13.67 | 9/30 kHz |

Test Personnel: Vathana Ven
Supervising Engineer: (Where Applicable) N/A
Product Standard: FCC Part 15.247 & RSS-210 Annex 8
Input Voltage: 120VAC/60Hz
Pretest Verification w/ Ambient Signals or BB Source: **Ambient Signals**

Test Date: 07/26/2011
Test Levels: See test results
Ambient Temperature: 20 ºC
Relative Humidity: 60 %
Atmospheric Pressure: 999 mbars

Deviations, Additions, or Exclusions: None

## 15 Revision History

| Revision Level | Date | Report Number | Notes |
|---|---|---|---|
| 0 | 08/25/2011 | 100398565BOX-002a | Original Issue |
| 1 | 10/31/2011 | 100398565BOX-002c | Changed model # from E-series with Zango Card to ZOLL E Series Data Comm Card |
| 2 | 11/04/2011 | 100398565BOX-002d | E Series as host and serial number for card added |
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