UL LLC
333 Pfingsten Rd.
Northbrook, IL 60062

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(847) 272-8800

| | |
|---|---|
| Job Number: | 1001501612 |
| Project Number: | 12CA26460 |
| File Number: | MC15186 |
| Date:<br>Revision Date | June 3, 2012<br>June 13, 2012 |
| FCC ID<br>IC<br>Model: | KOBATA12A<br>3521A-ATA12A<br>08E91-E54-1M0-01 |

# Electromagnetic Compatibility Test Report

## For

# Lear Corp.

# Test Report Details

| | |
|---|---|
| Tests Performed By: | **UL LLC**<br>**333 Pfingsten Rd.**<br>**Northbrook, IL 60062** |
| Tests Performed For: | **Lear Corp**<br>**21557 Telegraph Rd.**<br>**Southfield, MI 48034** |
| Applicant Contact:<br>Phone:<br>E-mail: | **Riad Ghabra**<br>**248-447-1337**<br>**rghabra@lear.com** |
| Test Report Date:<br>Revision Date: | **June 3, 2012**<br>**June 13, 2012** |
| Product Type: | **Periodic Transmitter** |
| Product standards | **FCC Part 15.231, RSS-210** |
| FCC ID<br>IC<br>Model Number: | **KOBATA12A**<br>**3521A-ATA12A**<br>**08E91-E54-1M0-01** |
| Sample Serial Number: | **Prototype** |
| EUT Category: | **Transmitter** |
| Testing Start Date: | **May 22, 2012** |
| Date Testing Complete: | **June 6, 2012** |
| **Overall Results:** | **Compliant** |

UL LLC reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. UL LLC shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL LLC issued reports. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

# Report Directory

Report Revision History

| Revision Date | Description | Revised By | Revision Reviewed By |
|---|---|---|---|
| June 6, 2012 | Added RX data, Added IC and FCC ID. | MF | BM |
| June 13, 2012 | Corrected Emissions data tables | MF | BM |

# 1.0 G E N E R A L - Product Description

## 1.1 Equipment Description

Equipment under test (EUT) is a periodic transmitter at 434MHz

## 1.2 Equipment Marking Plate

See Label Exhibit

### 1.3 Device Configuration During Test

#### 1.3.1 Equipment Used During Test:

| Use | Product Type | Manufacturer | Model | Comments |
|---|---|---|---|---|
| **EUT** | Transmitter | Lear | 08E91-E54-1M0-01 | None |
| Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test) | | | | |

#### 1.3.2 Input/Output Ports:

| Port # | Name | Type* | Cable Max. >3m (Y/N) | Cable Shielded (Y/N) | Comments |
|---|---|---|---|---|---|
| 0 | Enclosure | N/E | — | — | None |
| Note:<br>AC = AC Power Port DC = DC Power Port N/E = Non-Electrical<br>I/O = Signal Input or Output Port (Not Involved in Process Control)<br>TP = Telecommunication Ports | | | | | |

#### 1.3.3 EUT Internal Operating Frequencies:

| Frequency (MHz) | Description |
|---|---|
| 434 | TX frequency |

#### 1.3.4 Power Interface:

| Mode # /Rated | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Phases (#) | Comments |
|---|---|---|---|---|---|---|
| 1 | 3VDC<br>Battery Operated | - | - | DC | - | None |

### 1.4 EUT Configurations

| Mode # | Description |
|---|---|
| 1 | EUT was set to transmit. |

### 1.5 EUT Operation Modes

| Mode # | Description |
|---|---|
| 1 | EUT set to transmit CW signal |
| 2 | EUT set to transmit single pulse train with modulation |

### 1.6 Rational for EUT Configuration

| Mode # | Description |
|---|---|
| 1 | The Fundamental frequencies were measured in various axis (X, Y, and Z) and worst case axis was established. All harmonics were measured based on the worst case axis found. Z-axis was worst case from the fundamental |

## 2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL LLC in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

### 2.1 Deviations from standard test methods

| |
|---|
| None |

### 2.2 Device Modifications Necessary for Compliance

| |
|---|
| None |

### 2.3 Reference Standards

| Standard Number | Standard Name | Standard Date |
|---|---|---|
| 47 CFR Part 15 | Radio Frequency Devices | 2010 |
| RSS-210 | Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment | Issue 8 |

### 2.4 Results Summary

This product is considered Class B

| Requirement – Test | Result (Compliant / Non-Compliant)* |
|---|---|
| Duty Cycle | Compliant |
| Cease operation | Compliant |
| Polling operation | Compliant |
| Occupied BW | Compliant |
| Radiated Emissions | Compliant |

Test Engineer:

Reviewer:

Michael Ferrer (Ext.41312)
Senior Project Engineer
International EMC Services
Conformity Assessment Services

Bartlomiej Mucha(Ext.41216)
Staff Engineer
International EMC Services
Conformity Assessment Services

## 3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

## 4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

| | |
|---|---|
| FCC | 47 CFR Part 15 – Intentional Radiators |
| IC | RSS-210 and RSS-Gen License - exempt Radio Apparatus |

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

| | | | | | |
|---|---|---|---|---|---|
| Ambient Temperature, °C | 22.5 ± 2.5 | Relative Humidity, % | 45 ± 15 | Barometric Pressure, mBar | 950 ± 150 |

**Sample Calculations**
Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

### 4.1 Test Conditions and Results – Occupied Bandwidth

| | |
|---|---|
| Test Description | Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard. |
| Basic Standard | 15.231(c), RSS-210 A1.1.3 |
| **Occupied Bandwidth Limits** | |
| 0.25% OF CENTER FREQUENCY | |

**Table 1 Occupied Bandwidth Configuration Settings**

| Power Interface Mode # | EUT Configurations Mode # | EUT Operation Mode # |
|---|---|---|
| 1 | 1 | 2 |
| Supplementary information: None | | |

**Table 2 Occupied Bandwidth Spectrum Analyzer Settings**

| Resolution Bandwidth (MHz) | Occupied Bandwidth Requirements | |
|---|---|---|
| | dBc | % |
| 50kHz | -20 | 99 |
| Supplementary information: None | | |

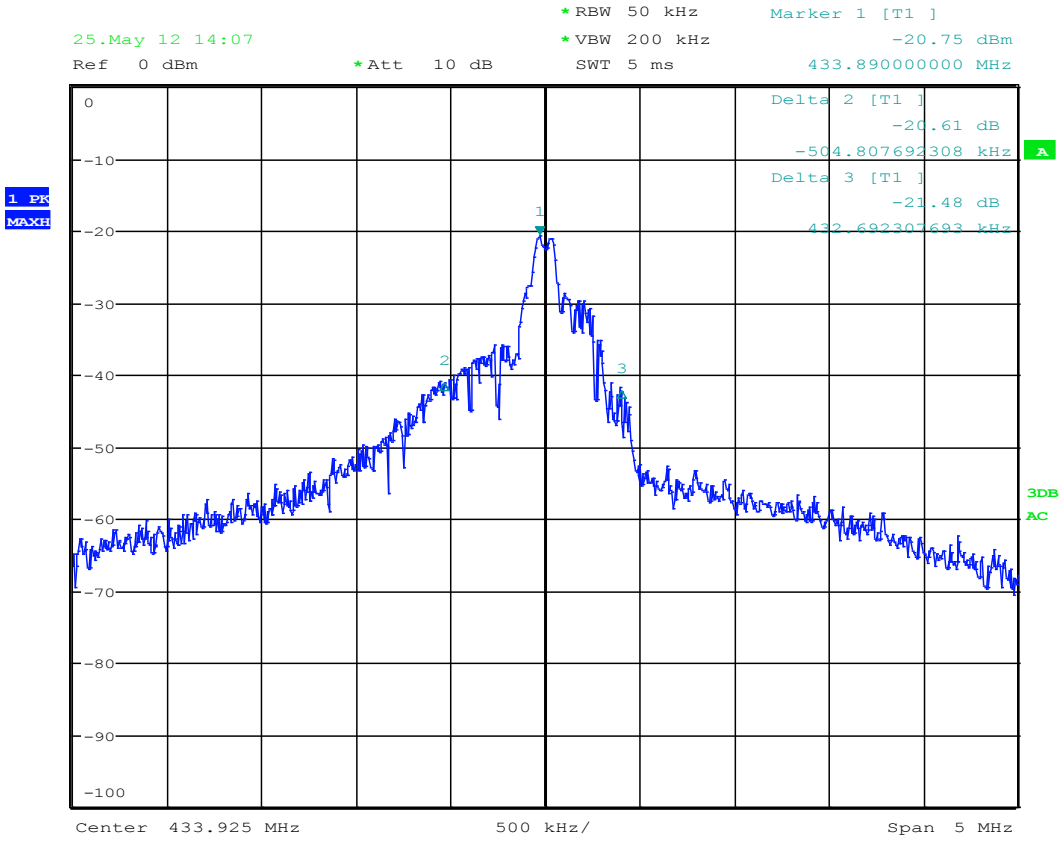
**Table 3 Occupied Bandwidth Test Equipment**

| Test Equipment Used | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal Date | Cal Due Date |
| EMI Test Receiver | Rohde & Schwarz | ESU | EMC4323 | Dec 28 2011 | Dec 31 2012 |
| Generic Near Field Loop Antenna | - | - | - | - | - |

| OCB | kHz |
|---|---|
| 20dB | 927.5 |
| 99% | 980 |

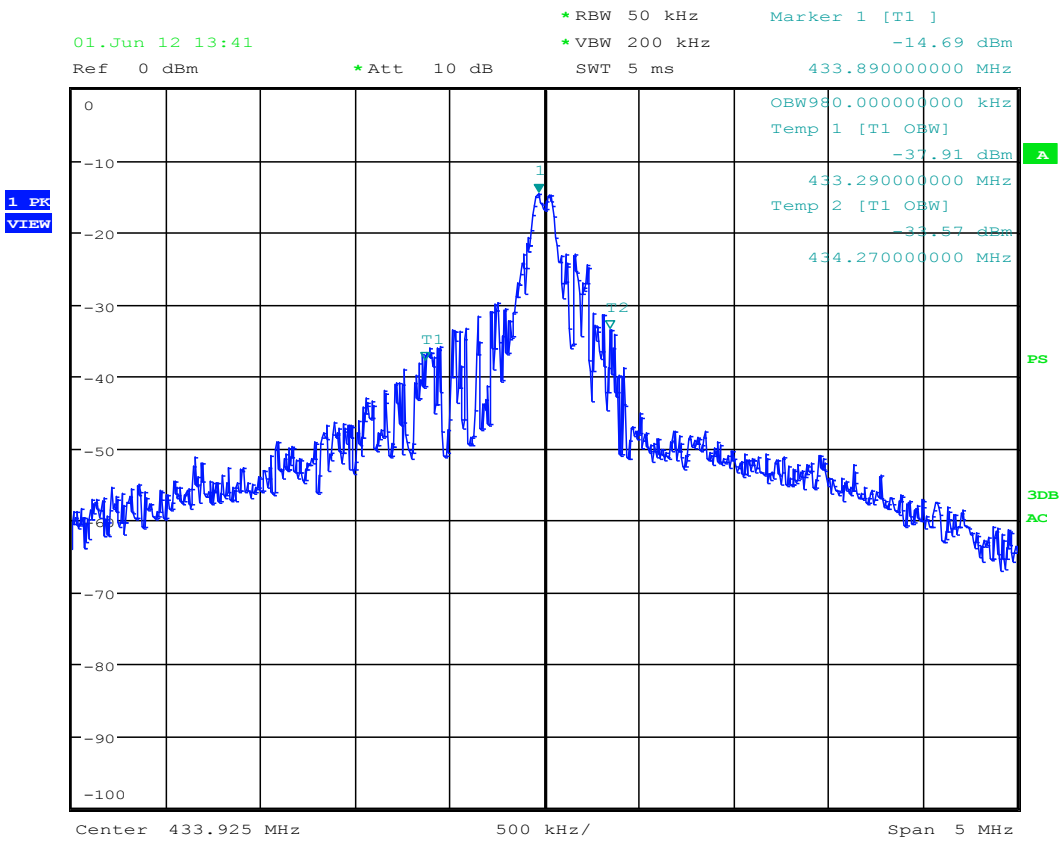
**Figure 1 Test Setup for Occupied Bandwidth**

**Figure 2 Occupied Bandwidth Graph 20dB**




Date: 25.MAY.2012 14:07:46

**Figure 3 Occupied Bandwidth Graph 99%**




Date: 1.JUN.2012 13:41:03

### 4.2 Test Conditions and Results – Cease Operation

| | |
|---|---|
| Test Description | Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency. |
| Basic Standard | 15.231(a)(1), RSS-210 A1.1.1(a) |
| **Cease Operation Limits** | |
| The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin. | |

**Table 4 Cease Operation Configuration Settings**

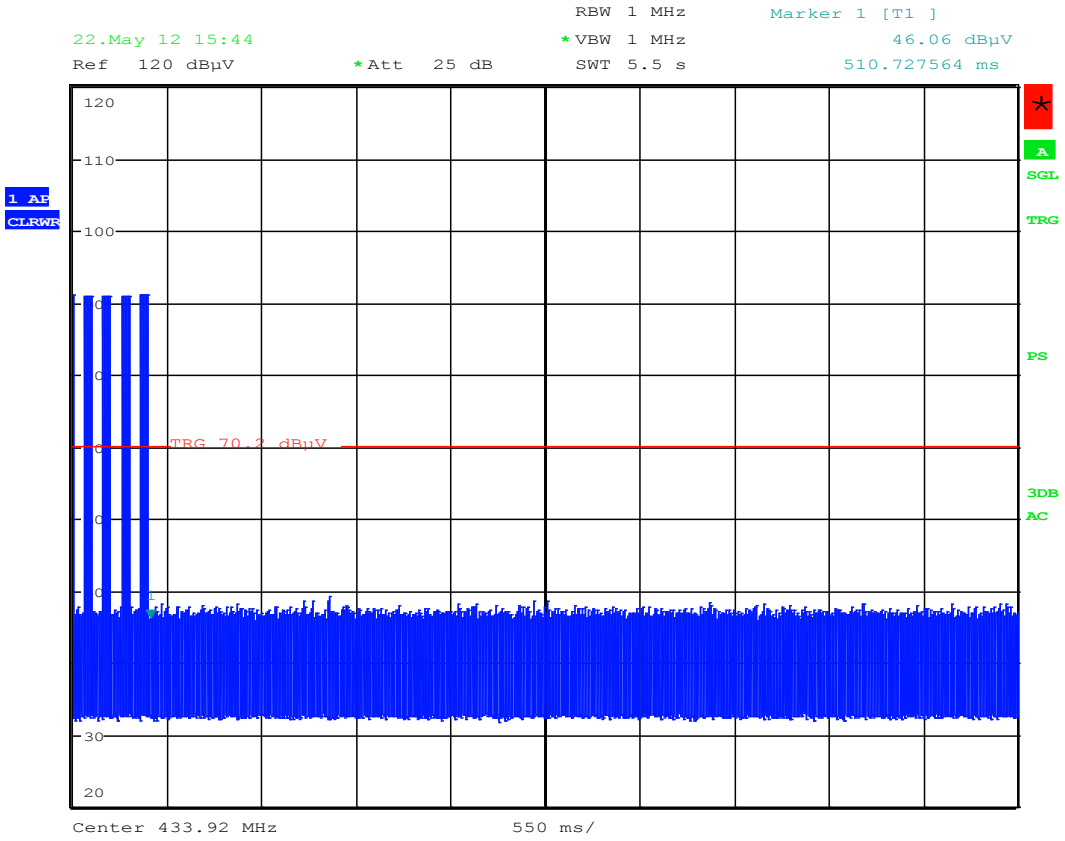
| Power Interface Mode # (See Section 1.3.4) | EUT Configurations Mode # (See Section 1.6) | EUT Operation Mode # (See 1.5) |
|---|---|---|
| 1 | 1 | 2 |
| Supplementary information: None | | |

**Table 5 Cease Operation Test Equipment**

| **Test Equipment Used** | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal Date | Cal Due Date |
| EMI Test Receiver | Rohde & Schwarz | ESU | EMC4323 | Dec 28 2011 | Dec 31 2012 |
| Generic Near Field Loop Antenna | - | - | - | - | - |

**Figure 4 Test Setup for Cease Operation**

**Figure 5 Cease Operation Graph**




Date: 22.MAY.2012 15:44:50

Transmission 0.51 seconds

### 4.3 Test Conditions and Results – Polling Operation

| | |
|---|---|
| Test Description | Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency. |
| Basic Standard | 15.231(a)(3), RSS-210 A1.1.1(c) |
| **Polling Operation Limits** | |
| Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmission does not exceed 2 seconds per hour for each transmitter. | |

**Table 6 Cease Operation Configuration Settings**

| Power Interface Mode # (See Section 1.3.4) | EUT Configurations Mode # (See Section 1.6) | EUT Operation Mode # (See 1.5) |
|---|---|---|
| 1 | 1 | 2 |
| Supplementary information: EUT was programed to transmit polling transmission at worst case. This burst transmission will only transmit a maximum of 4 times in complete operation. | | |

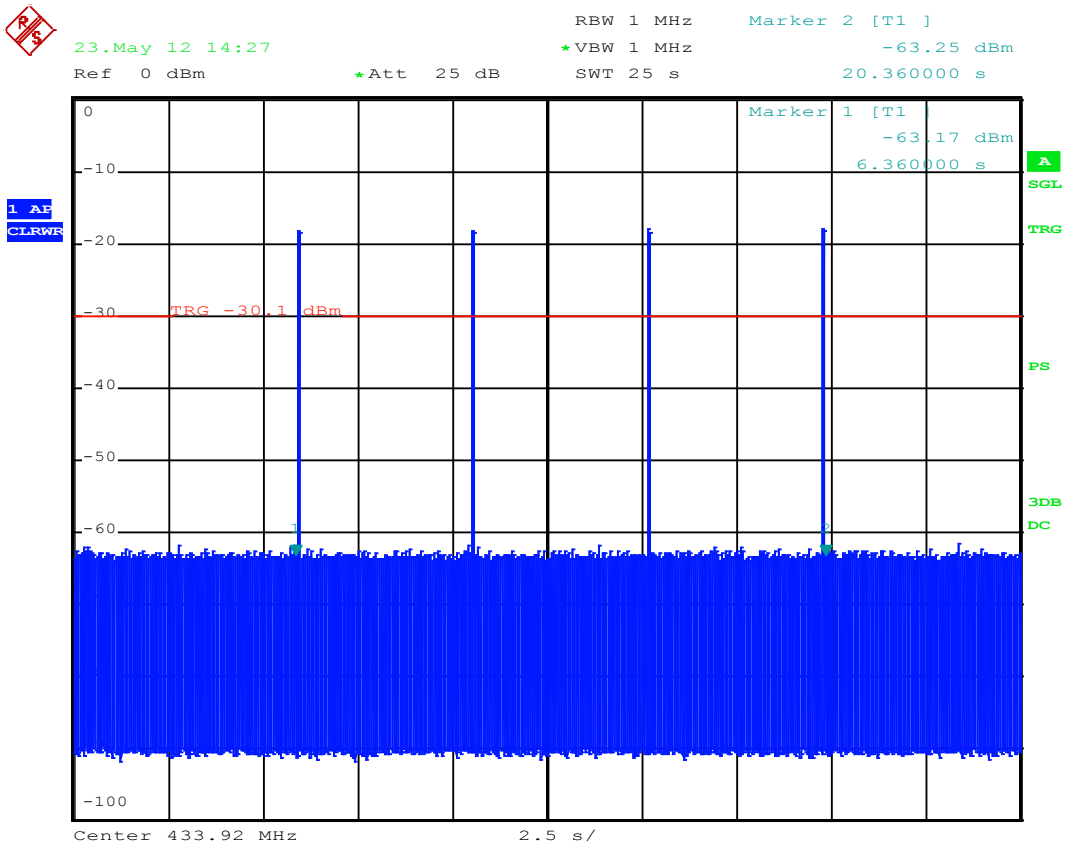
**Table 7 Polling Operation Test Equipment**

| Test Equipment Used | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal Date | Cal Due Date |
| EMI Test Receiver | Rohde & Schwarz | ESU | EMC4323 | Dec 28 2011 | Dec 31 2012 |
| Generic Near Field Loop Antenna | - | - | - | - | - |

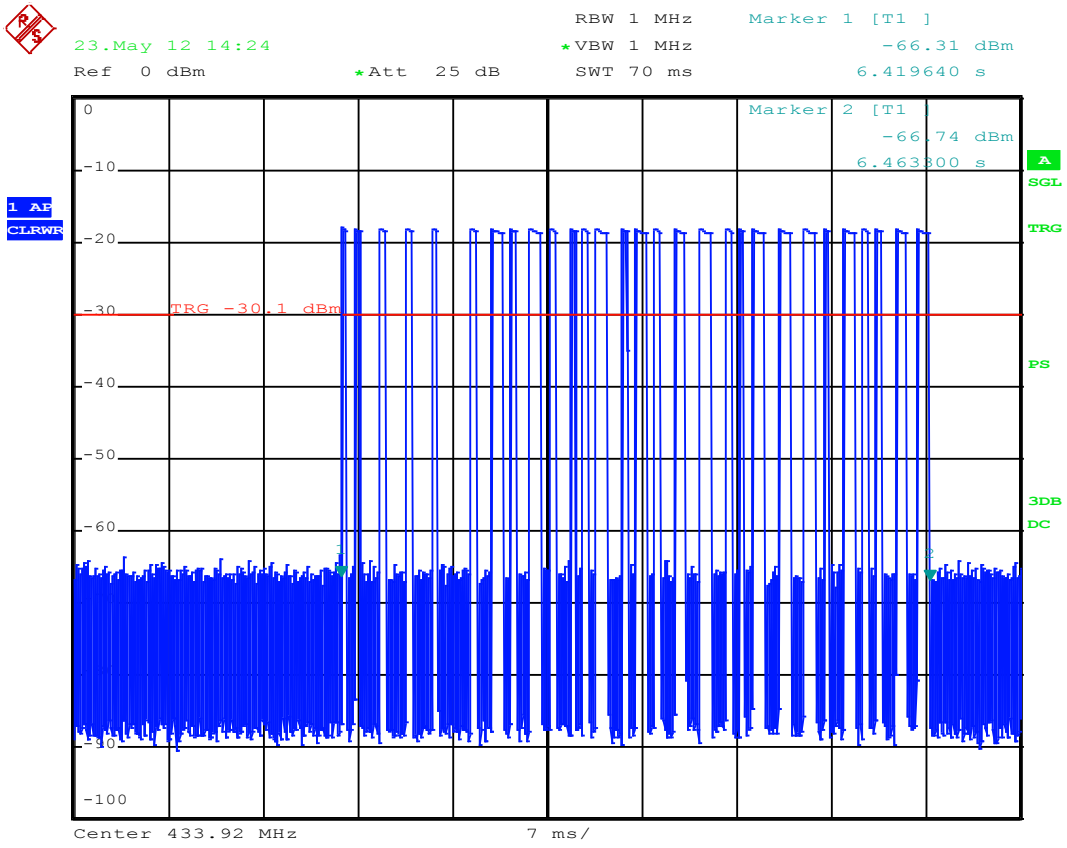
| Pulse Width (S) | # of pules | Total on Transmission time over 1 hour. Limit 2 secs |
|---|---|---|
| 0.044s | 4 | 0.176s |

**Figure 6 Test Setup for Polling Operation**

**Figure 7 Polling Operation Graph**




Date: 23.MAY.2012 14:27:46




Date: 23.MAY.2012 14:24:39

Pulse train

### 4.4 Test Conditions and Results – Pulse Train

| | |
|---|---|
| Test Description | Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency. |
| Basic Standard | FCC Part 15 Subpart A, 15.35 |
| **Pulse Train Limits** | |
| There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results. | |

**Table 8 Pulse Train Configuration Settings**

| Power Interface Mode # (See Section 1.3.4) | EUT Configurations Mode # (See Section 1.6) | EUT Operation Mode # (See 1.5) |
|---|---|---|
| 1 | 1 | 2 |
| Supplementary information: None | | |

**Table 9 Pulse Train Calculation**

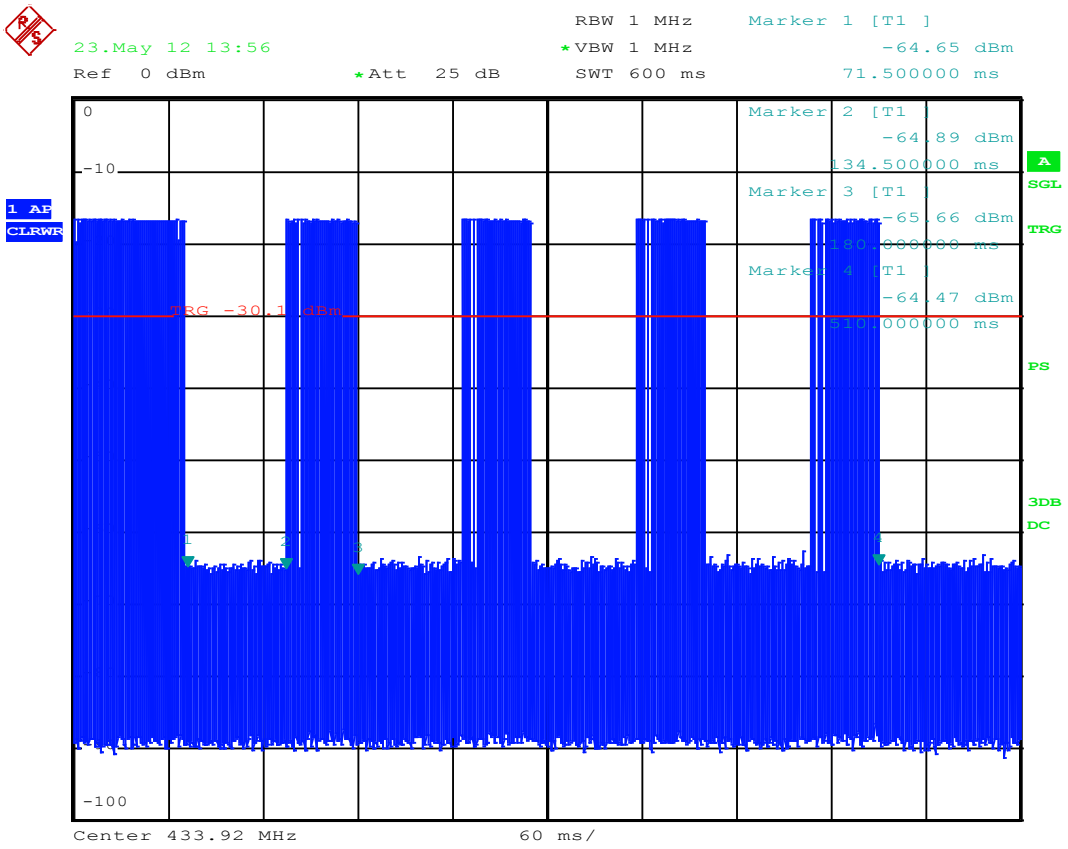
| Pulse Width (mS) | Total Transmission time or 100ms which ever is lesser | Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$ |
|---|---|---|
| 0.495ms Short 1 (29 pulses)<br>0.609ms Short 2 (1 pulse)<br>0.985ms Long (1 pulse) | 15.949ms over 100ms | -15.95dB |

**Table 10 Pulse Train Test Equipment**

| Test Equipment Used | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal Date | Cal Due Date |
| EMI Test Receiver | Rohde & Schwarz | ESU | EMC4323 | Dec 28 2011 | Dec 31 2012 |
| Generic Near Field Loop Antenna | - | - | - | - | - |

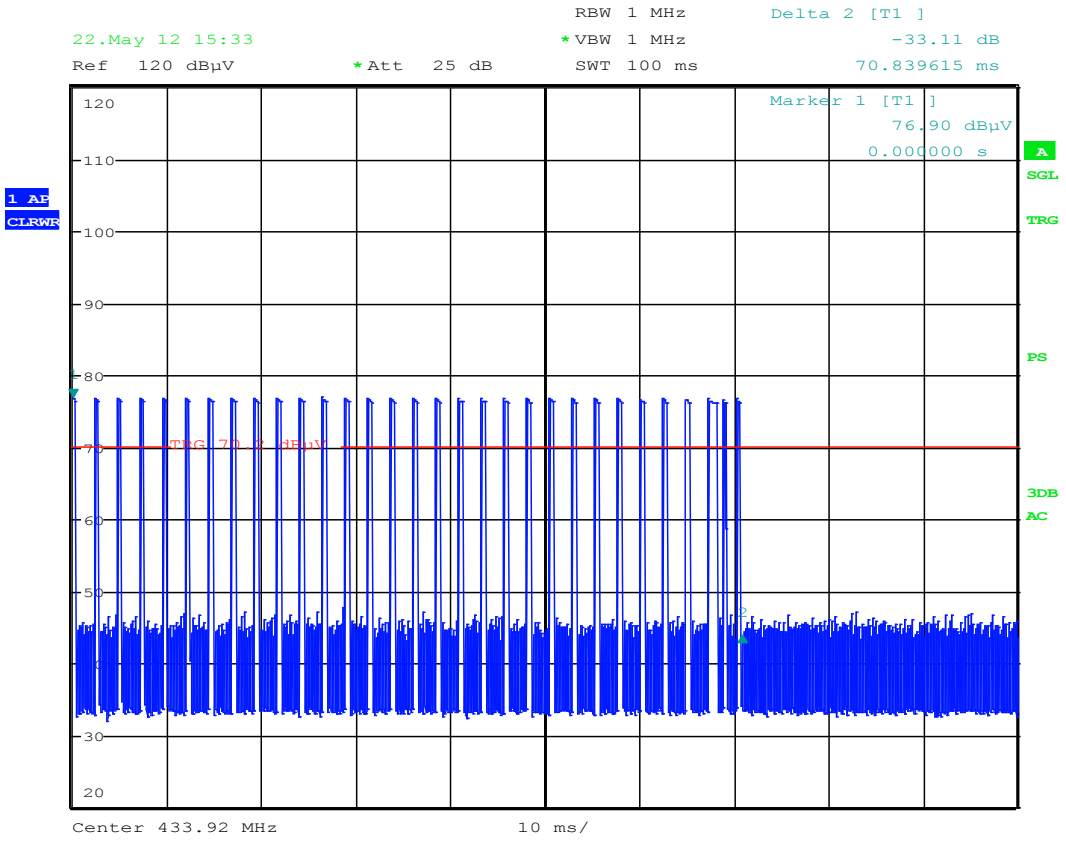
**Figure 8 Test Setup for Pulse Train**

**Figure 9 Pulse Train Graph**



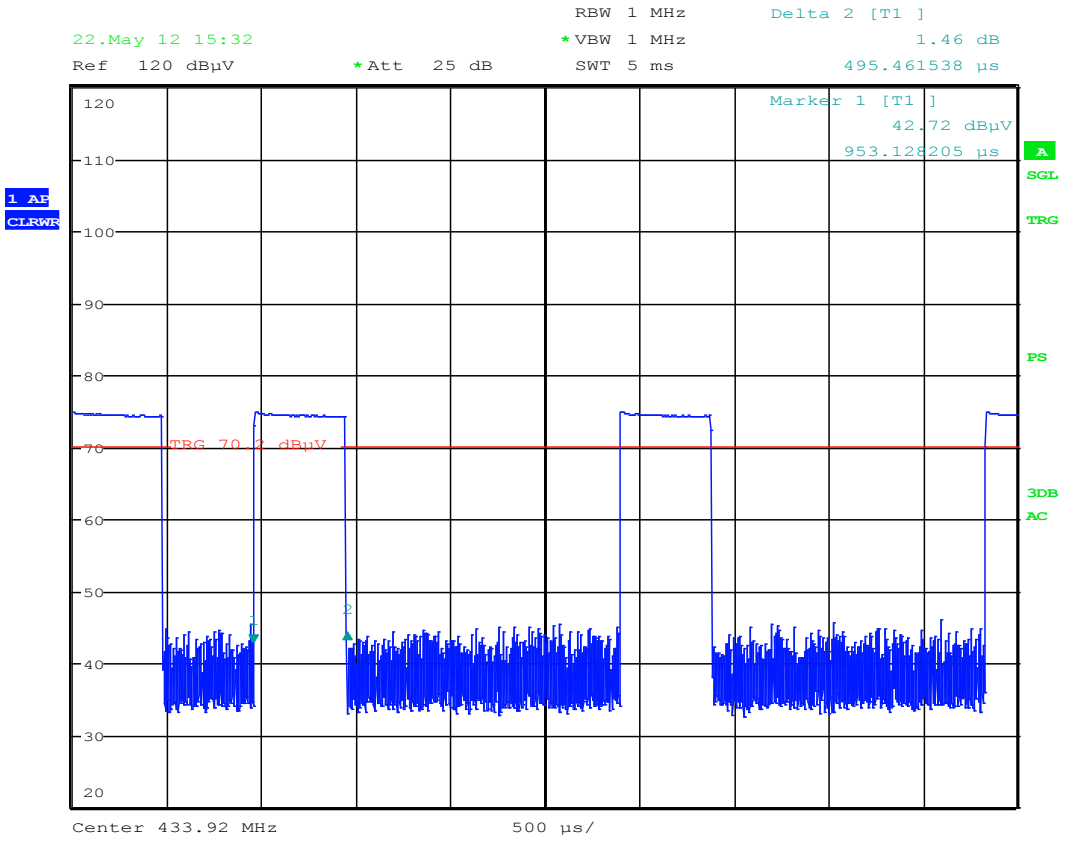

Date: 23.MAY.2012 13:56:39

Total pulse train



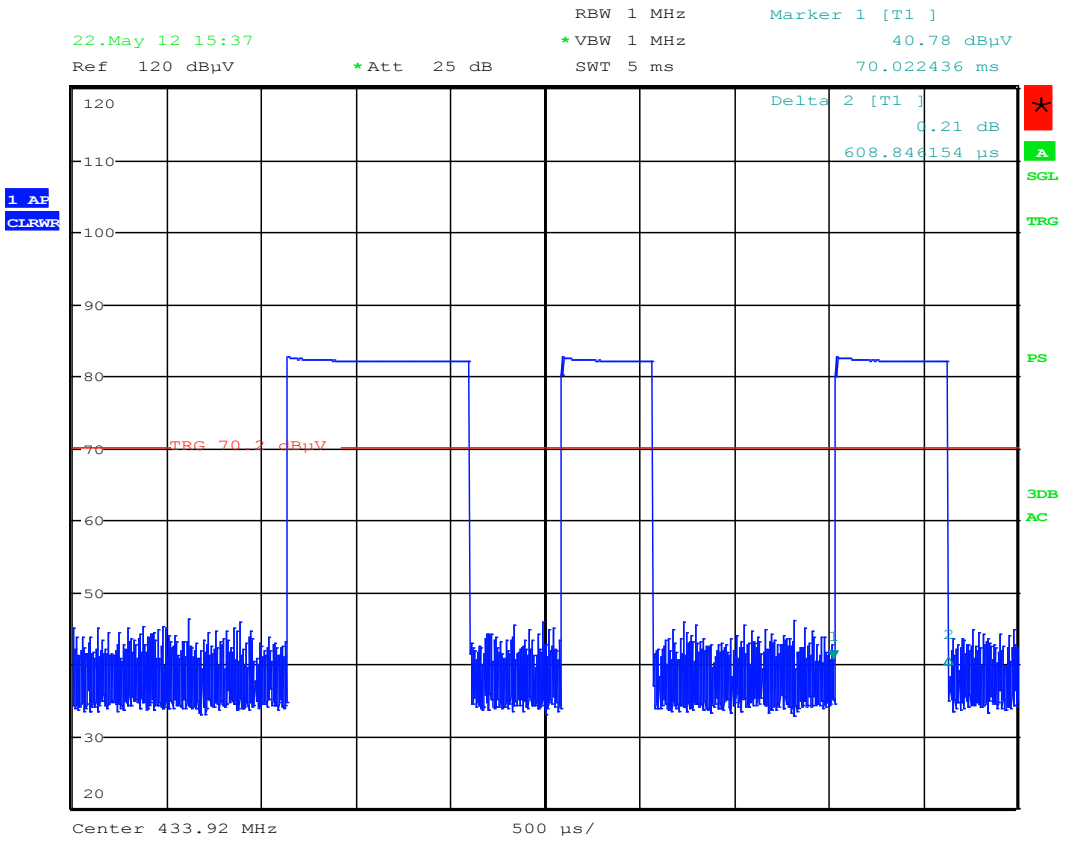

Date: 22.MAY.2012 15:33:34

Worst case 100ms



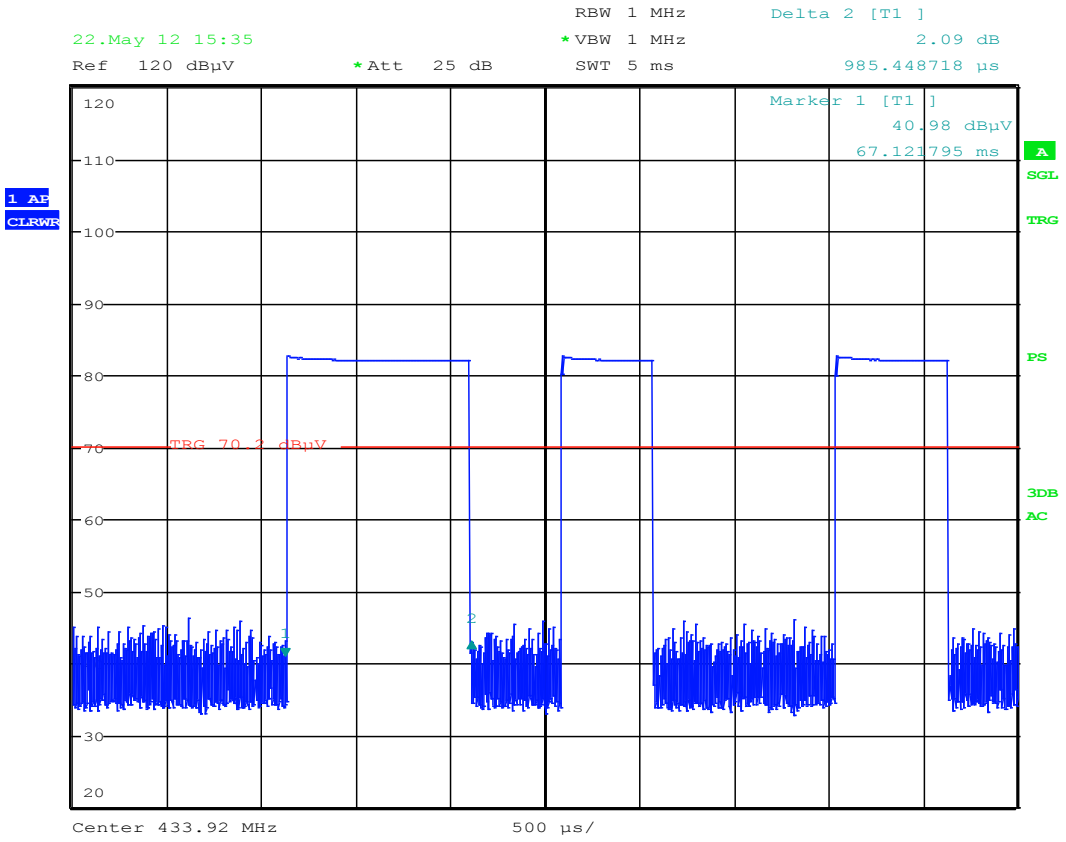

Date: 22.MAY.2012 15:32:02

Short Pulse 1




Date: 22.MAY.2012 15:37:27

Short Pulse 2




Date: 22.MAY.2012 15:35:43

Long Pulse

## 4.5 Test Conditions and Results – RADIATED EMISSIONS

| | |
|---|---|
| Test Description | Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. 2003 Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 and 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. |

| | | |
|---|---|---|
| Basic Standard | 15.231(b), RSS-210 A1.1 | |
| UL LPG | 80-EM-S0029 | |
| | Frequency range | Measurement Point |
| Fully configured sample scanned over the following frequency range | 30MHz – 1GHz | (10 meter measurement distance) |
| Fully configured sample scanned over the following frequency range | 1GHz – 5GHz (TX) | (3 meter measurement distance) |
| Fully configured sample scanned over the following frequency range | 1GHz – 3GHz (RX) | (3 meter measurement distance) |

**Limits - Class B 3m**

| Frequency (MHz) | Limit (dBµV/m) | |
|---|---|---|
| | Quasi-Peak | Average |
| 30-88 | 39 | NA |
| 88-216 | 43 | NA |
| 216-960 | 46 | NA |
| 960-1000 | 54 | NA |
| 1000-5000 | NA | 54 (at 3-meter) |
| 434 | 100.8 (Peak) | 80.8 |
| Harmonics (not in restricted band) | 80.8 (Peak) | 60.8 |

Supplementary information: Worst case Fundamental axis was Z-axis. Included at the end is the RX scan data from 30MHz-3GHz. Emissions extrapolated to 3m.

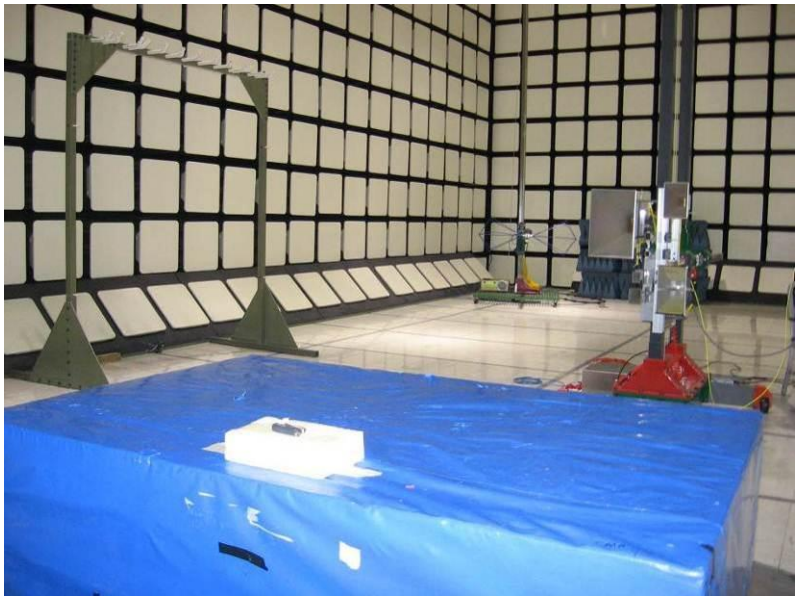
**Table 11 Radiated Emissions EUT Configuration Settings**

| Power Interface Mode # | EUT Configurations Mode # | EUT Operation Mode # |
|---|---|---|
| 1 | 1 | 1 |
| Supplementary information: None | | |

**Table 12 Radiated Emissions Test Equipment**

| Description | Manufacturer | Model | Identifier | Cal. Date | Cal. Due Date |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESU | EMC4323 | 20111228 | 20121231 |
| Bicon Antenna | Chase | VBA6106A | EMC4078 | 20120117 | 20130131 |
| Log-P Antenna | Chase | UPA6109 | EMC4313 | 20110929 | 20120629 |
| Spectrum Analyzer | Rhode & Schwarz | FSEK | EMC4182 | 20111227 | 20121231 |
| Antenna Array | UL | BOMS | EMC4276 | 20111227 | 20121231 |

**Figure 10 Test setup for Radiated Emissions**



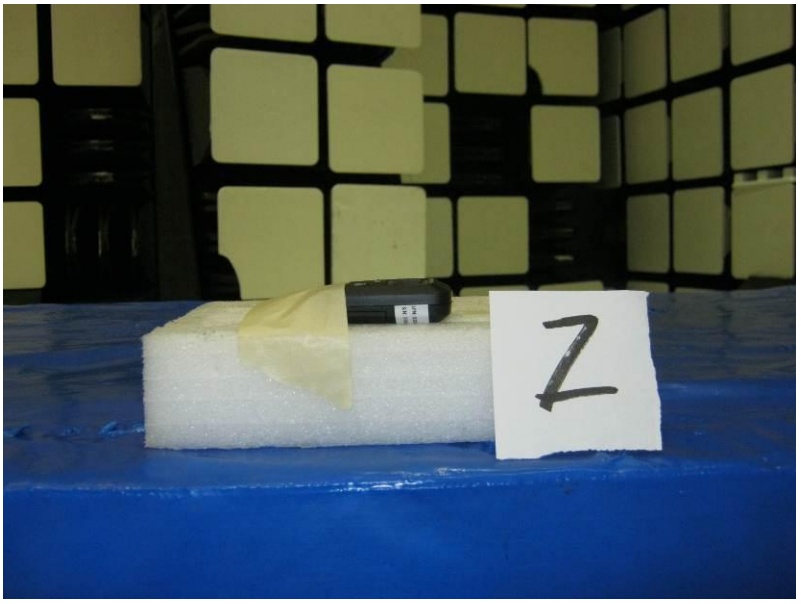


**Figure 11 Radiated Emissions Graph 30-1000MHz Z-Axis**

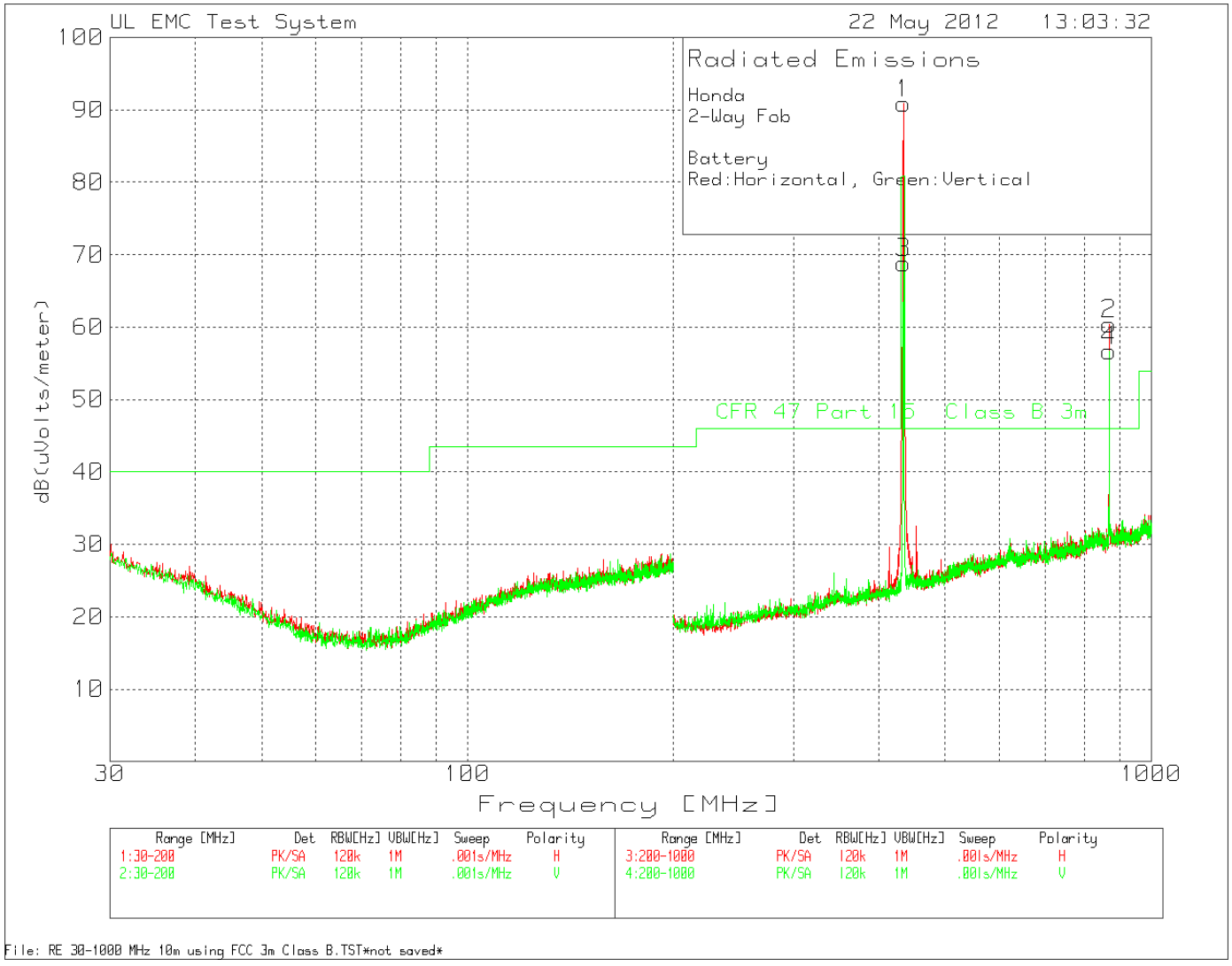


**Table 13 Radiated Emissions Data Points 30-1000MHz**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Honda | | | | | | | | | | | | |
| 2-Way Fob | | | | | | | | | | | | |
| Battery | | | | | | | | | | | | |
| Red:Horizontal, Green:Vertical | | | | | | | | | | | | |
| Z-axis | | | | | | | | | | | | |
| Test Frequency | Meter Reading | Detector | Antenna Factor | Gain Path Loss | 10m to 3m [dB] | Duty Cycle | dB(uVolts/meter) | Limit | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 433.92019 | 96.17 | QP | 16.1 | -32.1 | 10.5 | -15.95 | 74.72 | 80.8 | -6.08 | 128 | 205 | Horz |
| 433.92019 | 96.62 | PK | 16.1 | -32.1 | 10.5 | -15.95 | 75.17 | 80.8 | -5.63 | 128 | 205 | Horz |
| 433.92019 | 72.78 | QP | 16.1 | -32.1 | 10.5 | -15.95 | 51.33 | 80.8 | -29.47 | 140 | 185 | Vert |
| 433.92019 | 73.23 | PK | 16.1 | -32.1 | 10.5 | -15.95 | 51.78 | 80.8 | -29.02 | 140 | 185 | Vert |
| 867.84135 | 56.56 | QP | 22.4 | -31.6 | 10.5 | -15.95 | 41.91 | 46 | -4.09 | 42 | 100 | Horz |
| 867.8413 | 57.01 | PK | 22.4 | -31.6 | 10.5 | -15.95 | 42.36 | 46 | -3.64 | 42 | 100 | Horz |
| 867.84135 | 53.32 | QP | 22.4 | -31.6 | 10.5 | -15.95 | 38.67 | 46 | -7.33 | 6 | 202 | Vert |
| 867.8413 | 53.49 | PK | 22.4 | -31.6 | 10.5 | -15.95 | 38.84 | 46 | -7.16 | 6 | 202 | Vert |
| | | | | | | | | | | | | |
| PK - Peak detector | | | | | | | | | | | | |
| QP - Quasi-Peak detector | | | | | | | | | | | | |

**Figure 12 Radiated Emissions Graph 1-5GHz X-Axis**

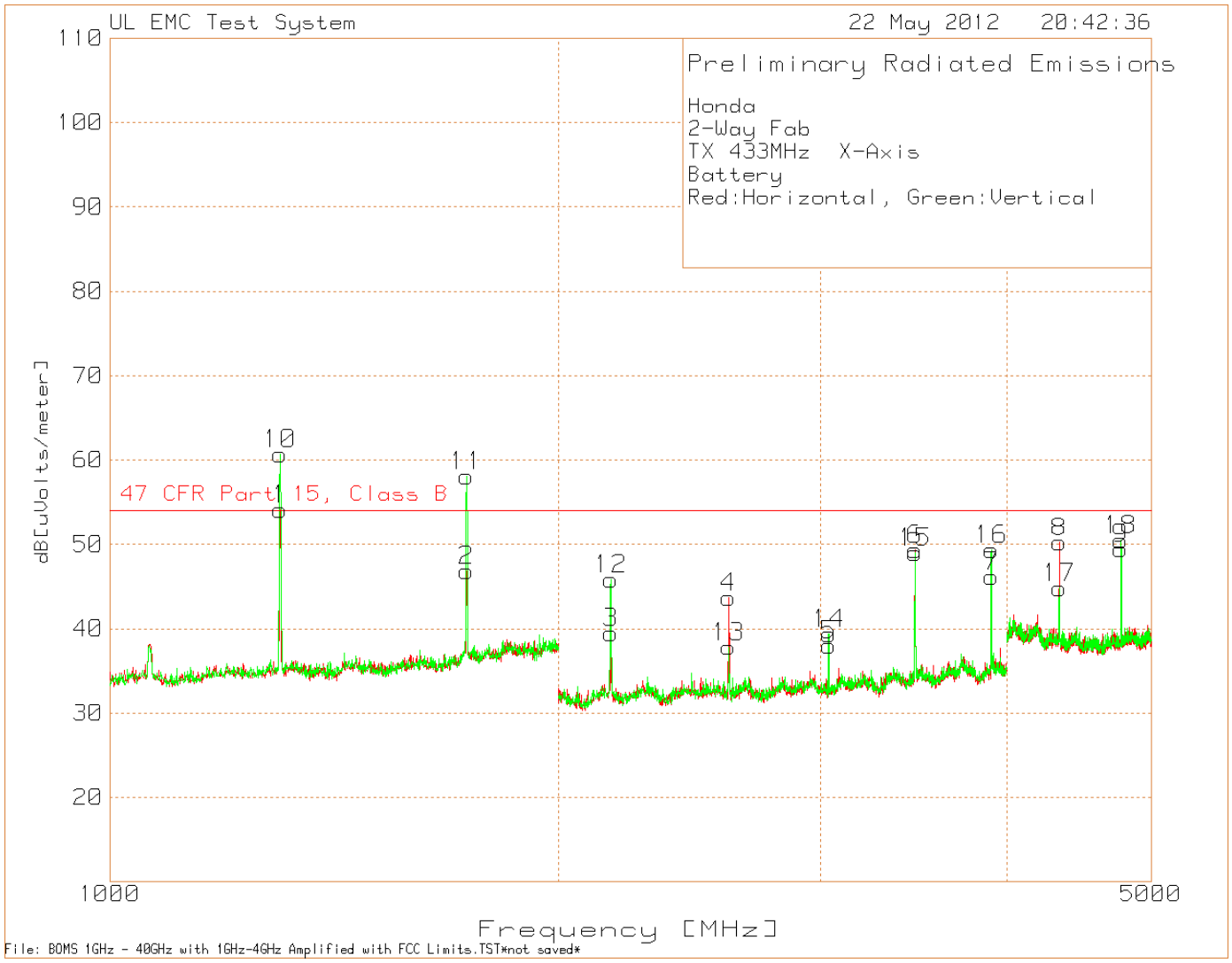


**Table 14 Radiated Emissions Data Points 1-5GHz X-Axis**

| Honda | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Way Fab | | | | | | | | | | | | | | |
| TX 433MHz X-Axis | | | | | | | | | | | | | | |
| Red:Horizontal, Grenn:Vertical | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Test Frequency | Meter Reading | Detector | Antenna factor | BOMS Factor [dB] | Duty Cycle | dB[uVolts/meter] | 47 CFR Part 15, Class B PK | Margin | dB[uVolts/meter] w/Duty Cycle | 47 CFR Part 15, Class B AV | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 1301.7064 | 83.1 | PK | 25.2 | -56.29 | -15.95 | 52.01 | 74 | -21.99 | 36.06 | 54 | -17.94 | 48 | 107 | Horz |
| 1301.7725 | 83.19 | PK | 25.2 | -56.29 | -15.95 | 52.1 | 74 | -21.9 | 36.15 | 54 | -17.85 | 30 | 109 | Horz |
| 3471.4098 | 77.59 | PK | 23.5 | -51.27 | -15.95 | 49.82 | 74 | -24.18 | 33.87 | 54 | -20.13 | 154 | 109 | Horz |
| 4339.1132 | 77.07 | PK | 28.1 | -52.91 | -15.95 | 52.26 | 74 | -21.74 | 36.31 | 54 | -17.69 | 145 | 110 | Horz |
| 4773.508 | 75.72 | PK | 27.7 | -52.27 | -15.95 | 51.15 | 74 | -22.85 | 35.2 | 54 | -18.8 | 133 | 107 | Horz |
| 4773.0511 | 73.84 | PK | 27.7 | -52.29 | -15.95 | 49.25 | 74 | -24.75 | 33.3 | 54 | -20.7 | 0 | 114 | Vert |
| 1301.7024 | 97.13 | PK | 25.2 | -56.29 | -15.95 | 66.04 | 74 | -7.96 | 50.09 | 54 | -3.91 | 268 | 126 | Vert |
| 1735.6242 | 86.55 | PK | 26.4 | -54.43 | -15.95 | 58.52 | 74 | -15.48 | 42.57 | 54 | -11.43 | 221 | 100 | Vert |
| 3471.3878 | 78.51 | PK | 23.5 | -51.27 | -15.95 | 50.74 | 74 | -23.26 | 34.79 | 54 | -19.21 | 331 | 137 | Vert |
| 3905.3978 | 75.94 | PK | 23.8 | -51.91 | -15.95 | 47.83 | 74 | -26.17 | 31.88 | 54 | -22.12 | 149 | 100 | Vert |
| | | | | | | | | | | | | | | |
| PK - Peak detector | | | | | | | | | | | | | | |

**Figure 13 Radiated Emissions Graph 1-5GHz Y-Axis**

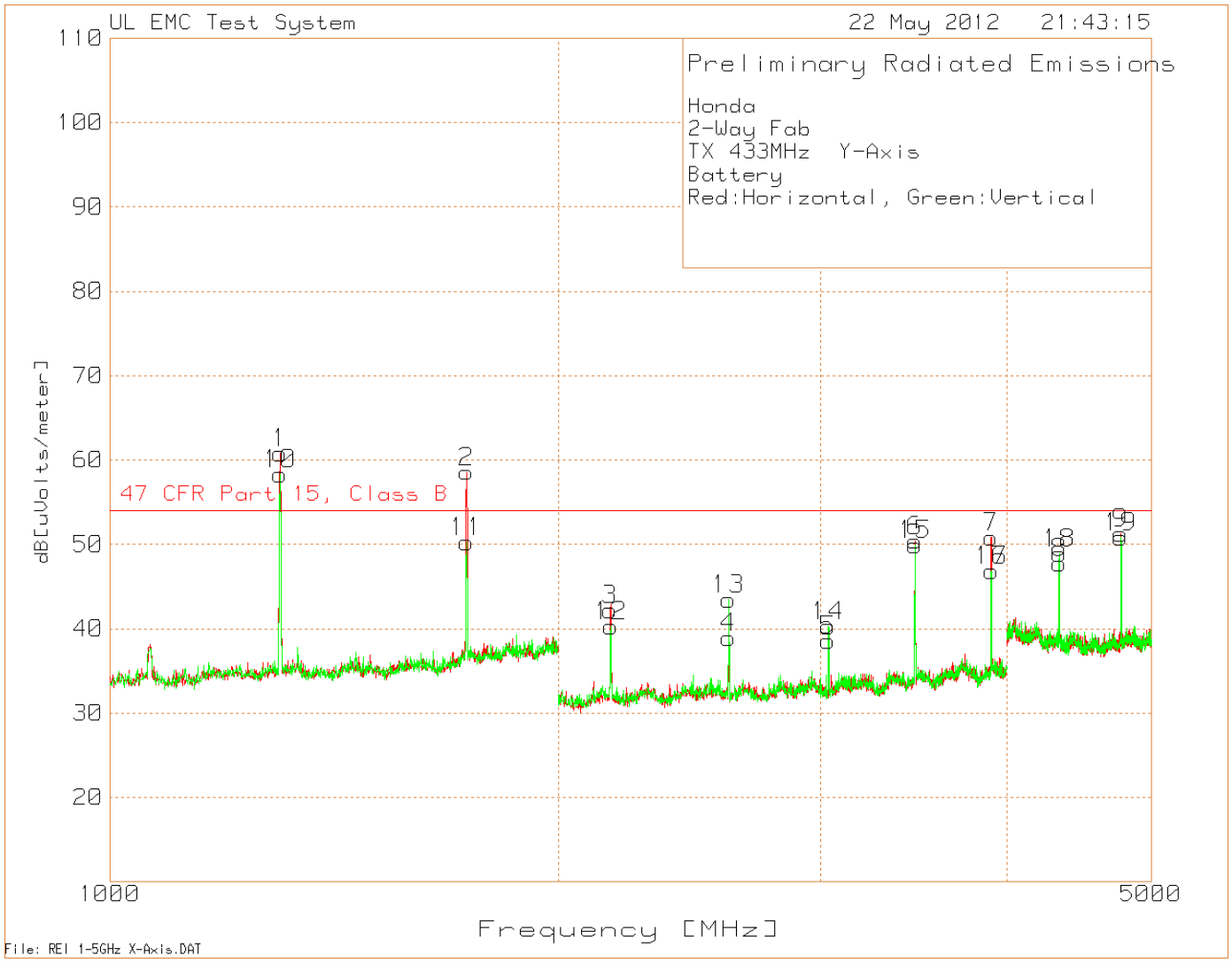


**Table 15 Radiated Emissions Data Points 1-5GHz Y-Axis**

| Honda | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Way Fab | | | | | | | | | | | | | | |
| TX 433MHz Y-Axis | | | | | | | | | | | | | | |
| Red:Horizontal, Grenn:Vertical | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Test Frequency | Meter Reading | Detector | Antenna Factor | BOMS Factor [dB] | Duty Cycle | dB[uVolts/meter] | 47 CFR Part 15, Class B PK | Margin | dB[uVolts/meter] w/Duty Cycle | 47 CFR Part 15, Class B AV | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 1301.7004 | 98.84 | PK | 25.2 | -56.29 | -15.95 | 67.75 | 74 | -6.25 | 51.8 | 54 | -2.2 | 134 | 119 | Horz |
| 1735.6784 | 87.52 | PK | 26.4 | -54.43 | -15.95 | 59.49 | 74 | -14.51 | 43.54 | 54 | -10.46 | 129 | 124 | Horz |
| 3471.4198 | 80.22 | PK | 23.5 | -51.27 | -15.95 | 52.45 | 74 | -21.55 | 36.5 | 54 | -17.5 | 289 | 100 | Horz |
| 3905.524 | 80.58 | PK | 23.8 | -51.91 | -15.95 | 52.47 | 74 | -21.53 | 36.52 | 54 | -17.48 | 83 | 100 | Horz |
| 4773.3337 | 76.86 | PK | 27.7 | -52.28 | -15.95 | 52.28 | 74 | -21.72 | 36.33 | 54 | -17.67 | 0 | 103 | Horz |
| 1301.7665 | 91.56 | PK | 25.2 | -56.29 | -15.95 | 60.47 | 74 | -13.53 | 44.52 | 54 | -9.48 | 220 | 216 | Vert |
| 1735.5962 | 76.69 | PK | 26.4 | -54.43 | -15.95 | 48.66 | 74 | -25.34 | 32.71 | 54 | -21.29 | 301 | 101 | Vert |
| 3471.1994 | 81.6 | PK | 23.5 | -51.28 | -15.95 | 53.82 | 74 | -20.18 | 37.87 | 54 | -16.13 | 121 | 124 | Vert |
| 4339.3156 | 75.85 | PK | 28.1 | -52.91 | -15.95 | 51.04 | 74 | -22.96 | 35.09 | 54 | -18.91 | 192 | 100 | Vert |
| 4773.1593 | 73.65 | PK | 27.7 | -52.28 | -15.95 | 49.07 | 74 | -24.93 | 33.12 | 54 | -20.88 | 71 | 100 | Vert |
| | | | | | | | | | | | | | | |
| PK - Peak detector | | | | | | | | | | | | | | |

**Figure 14 Radiated Emissions Graph 1-5GHz Z-Axis**

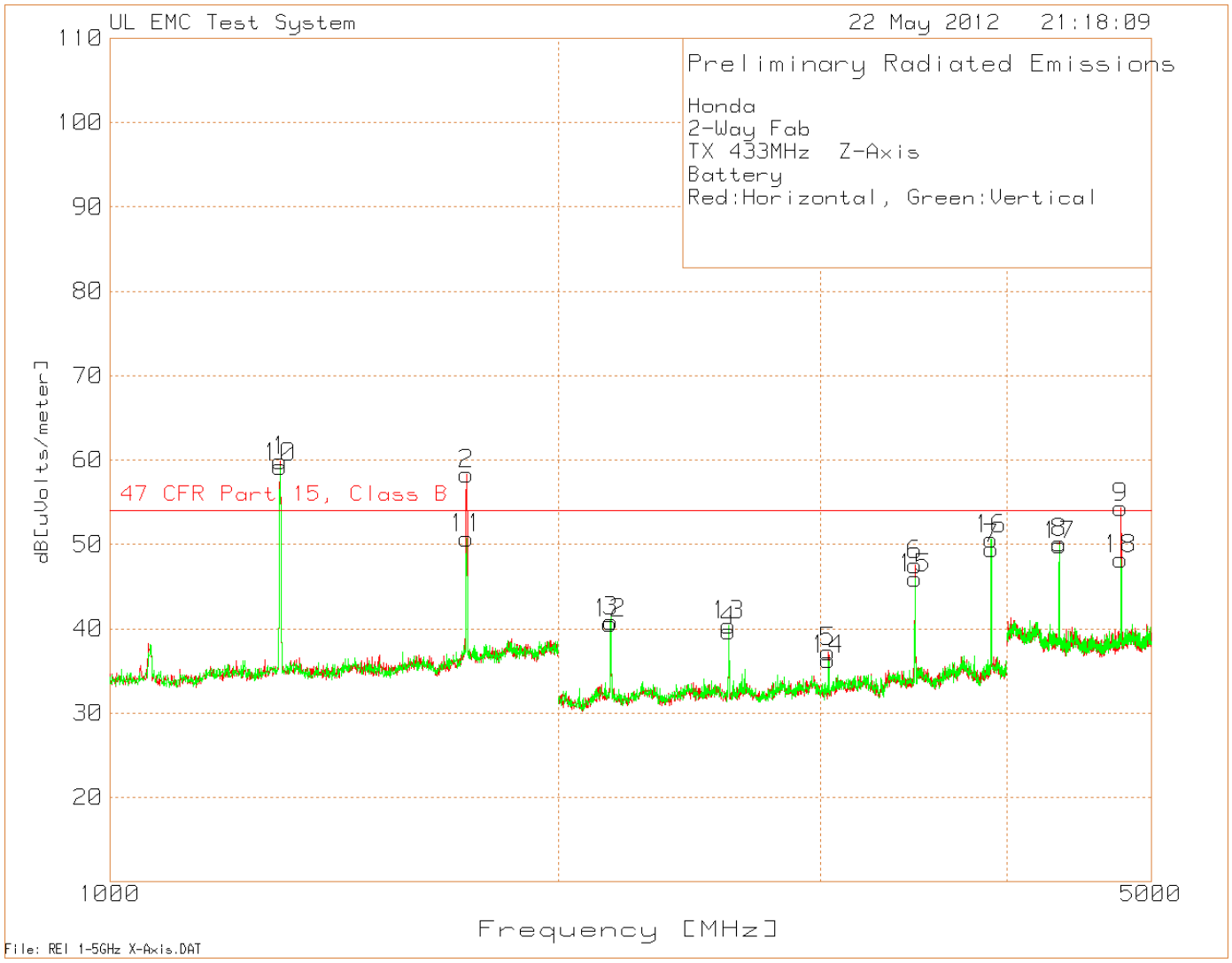
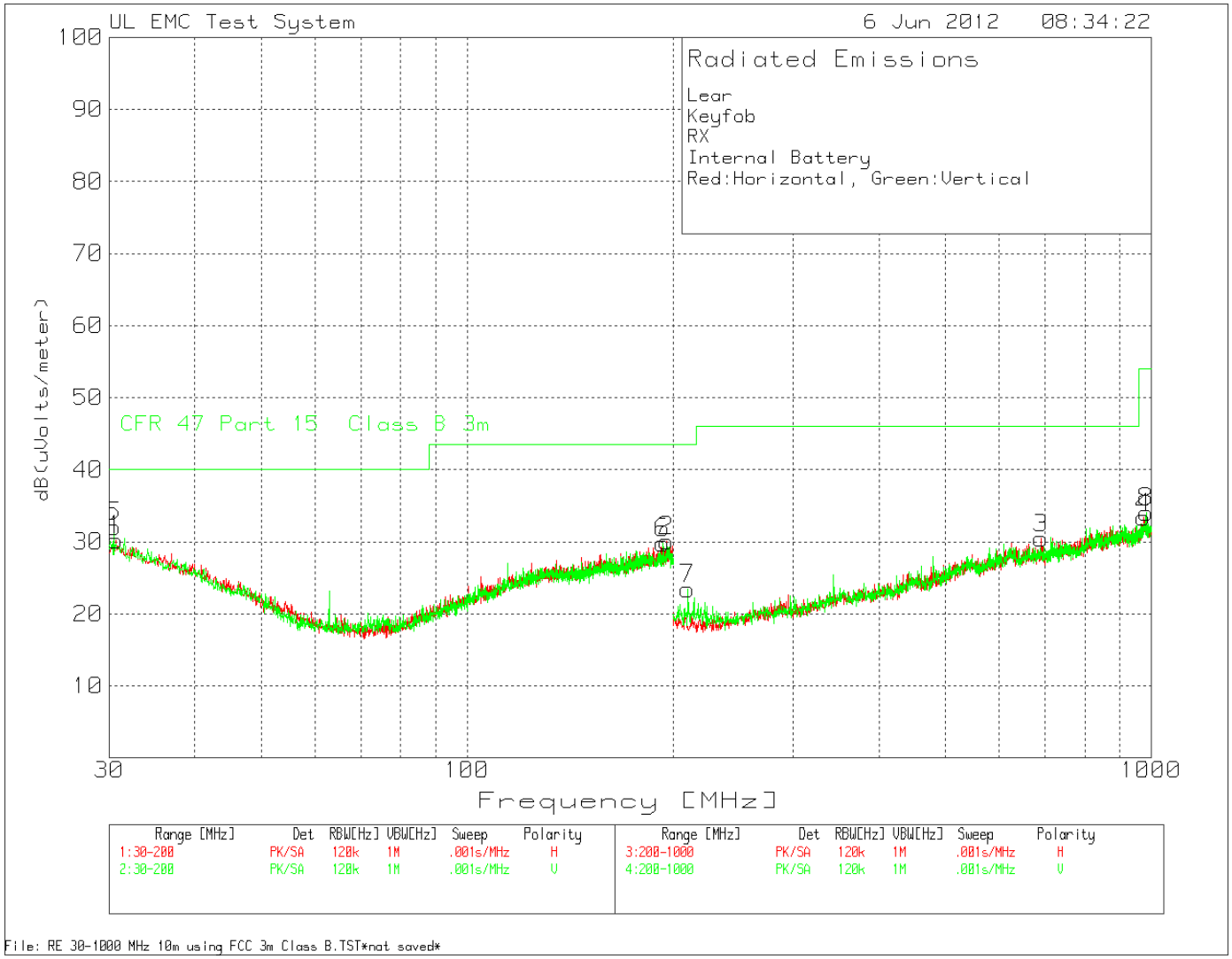


**Table 16 Radiated Emissions Data Points 1-5GHz Z-Axis**

| Honda | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Way Fab | | | | | | | | | | | | | | |
| TX 433MHz Z-Axis | | | | | | | | | | | | | | |
| Red:Horizontal, Green:Vertical | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Test Frequency | Meter Reading | Detector | Antenna Factor | BOMS Factor [dB] | Duty Cycle | dB[uVolts/meter] | 47 CFR Part 15, Class B PK | Margin | dB[uVolts/meter] w/Duty Cycle | 47 CFR Part 15, Class B AV | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 1301.8597 | 97.4 | PK | 25.2 | -56.29 | -15.95 | 66.31 | 74 | -7.69 | 50.36 | 54 | -3.64 | 40 | 120 | Horz |
| 1301.7425 | 98.81 | PK | 25.2 | -56.29 | -15.95 | 67.72 | 74 | -6.28 | 51.77 | 54 | -2.23 | 53 | 120 | Horz |
| 1735.6253 | 86.66 | PK | 26.4 | -54.43 | -15.95 | 58.63 | 74 | -15.37 | 42.68 | 54 | -11.32 | 39 | 127 | Horz |
| 3471.506 | 77.75 | PK | 23.5 | -51.26 | -15.95 | 49.99 | 74 | -24.01 | 34.04 | 54 | -19.96 | 79 | 100 | Horz |
| 3905.2896 | 77.69 | PK | 23.8 | -51.92 | -15.95 | 49.57 | 74 | -24.43 | 33.62 | 54 | -20.38 | 82 | 100 | Horz |
| 3905.0852 | 75.52 | PK | 23.8 | -51.93 | -15.95 | 47.39 | 74 | -26.61 | 31.44 | 54 | -22.56 | 0 | 102 | Vert |
| 4339.3747 | 76.16 | PK | 28.1 | -52.91 | -15.95 | 51.35 | 74 | -22.65 | 35.4 | 54 | -18.6 | 103 | 100 | Horz |
| 4773.0832 | 78.63 | PK | 27.7 | -52.29 | -15.95 | 54.04 | 74 | -19.96 | 38.09 | 54 | -15.91 | 197 | 100 | Horz |
| 4773.1493 | 74.57 | PK | 27.7 | -52.28 | -15.95 | 49.99 | 74 | -24.01 | 34.04 | 54 | -19.96 | 40 | 103 | Vert |
| 4339.0491 | 73.74 | PK | 28.1 | -52.91 | -15.95 | 48.93 | 74 | -25.07 | 32.98 | 54 | -21.02 | 90 | 100 | Vert |
| 1301.7204 | 91.12 | PK | 25.2 | -56.29 | -15.95 | 60.03 | 74 | -13.97 | 44.08 | 54 | -9.92 | 302 | 208 | Vert |
| 1735.6483 | 79.74 | PK | 26.4 | -54.43 | -15.95 | 51.71 | 74 | -22.29 | 35.76 | 54 | -18.24 | 149 | 100 | Vert |
| PK - Peak detector | | | | | | | | | | | | | | |

**Figure 15 Radiated Emissions Graph RX 30-1000MHz Z-Axis**




All Emissions noise floor.

**Figure 16 Radiated Emissions Graph RX 1-3 GHz Z-Axis**


All Emissions either noise floor or ambient from PC in test equipment.

## 5.0 IMMUNITY TEST RESULTS

Immunity tests not required per the standard

## Appendix A

**Accreditations and Authorizations**

NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see http://ts.nist.gov/standards/scopes/1004140.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III (2-3). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6