



**FCC 47 CFR PART 15 SUBPART C**

**CERTIFICATION TEST REPORT**

**FOR**

**Steam Controller**

**MODEL NUMBER: 1001**

**FCC ID: 2AES41001**

**REPORT NUMBER: 10723151A**

**ISSUE DATE: July 8, 2015**

*Prepared for*  
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NVLAP Lab code: 100414-0

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Revision History

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| Issue |          |               |            |
|-------|----------|---------------|------------|
| Rev.  | Date     | Revisions     | Revised By |
| --    | 07/08/15 | Initial Issue | M.Ferrer   |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Valve Corporation  
10900 NE 4<sup>th</sup> St.  
Suite 500  
Bellevue, WA 98004

**EUT DESCRIPTION:** Steam Controller

**MODEL:** 1001

**SERIAL NUMBER:** Prototype

**DATE TESTED:** March 24, 2015 – July 8, 2015

| APPLICABLE STANDARDS     |              |
|--------------------------|--------------|
| STANDARD                 | TEST RESULTS |
| CFR 47 Part 15 Subpart C | Pass         |

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. 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.

Approved & Released For  
UL LLC By:



Bart Mucha  
Staff Engineer  
UL LLC

Tested By:



MICHAEL FERRER  
Program Manager  
UL LLC

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

Testing Deviation - EUT was tested 1.5m height for above 1GHz Radiated Emissions in accordance TCB Conference call Dec 2014.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL 60062 USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/Standards/scopes/1004140.htm>

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

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)

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test               | Range       | Equipment         | Uncertainty k=2 |
|--------------------|-------------|-------------------|-----------------|
| Radiated Emissions | 9k-30MHz    | E-Field Loop      | 2.14dB          |
| Radiated Emissions | 30-200MHz   | Bicon 10m Horz    | 4.27dB          |
| Radiated Emissions | 30-200MHz   | Bicon 10m Vert    | 4.28dB          |
| Radiated Emissions | 200-1000MHz | LogP 10m Horz     | 3.33dB          |
| Radiated Emissions | 200-1000MHz | LogP 10m Vert     | 3.39dB          |
| Radiated Emissions | 30-200MHz   | Bicon 3m Horz     | 3.30dB          |
| Radiated Emissions | 30-130MHz   | Bicon 3m Vert     | 4.84dB          |
| Radiated Emissions | 130-200MHz  | Bicon 3m Vert     | 4.94dB          |
| Radiated Emissions | 200-1000MHz | LogP 3m Horz      | 3.46dB          |
| Radiated Emissions | 200-1000MHz | LogP 3m Vert      | 4.98dB          |
| Radiated Emissions | 1-6GHz      | Horn              | 5.02dB          |
| Radiated Emissions | 6-18GHz     | Horn              | 5.34dB          |
| Radiated Emissions | 18-26GHz    | Horn              | 6.60dB          |
| Conducted Ant Port | 30MHz-26GHz | Spectrum Analyzer | 2.94            |

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a wireless controller. The device is battery powered. There is a USB port, but it is only used as an alternative connection to the PC. When USB connection is made, the wireless portion is disabled. The USB does not charge the device.

### 5.2. MAXIMUM OUTPUT E-FIELD STRENGTH

The transmitter has a maximum output E-field as follows:

| Frequency Range<br>(MHz) | Mode | Output PK E-field<br>Strength<br>(dBuV/m) | Output AV E-<br>field Strength<br>(dBuV/m) |
|--------------------------|------|-------------------------------------------|--------------------------------------------|
| 2402-2480                | TX   | 100.18                                    | 87.84                                      |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of 3.43 dBi.

### 5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case axis is Y-axis.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |       |
|------------------------|--------------|-------|
| Description            | Manufacturer | Model |
| EUT                    | Valve        | 1001  |
| Laptop                 | Lenovo       | T420  |
|                        |              |       |
|                        |              |       |
|                        |              |       |
|                        |              |       |

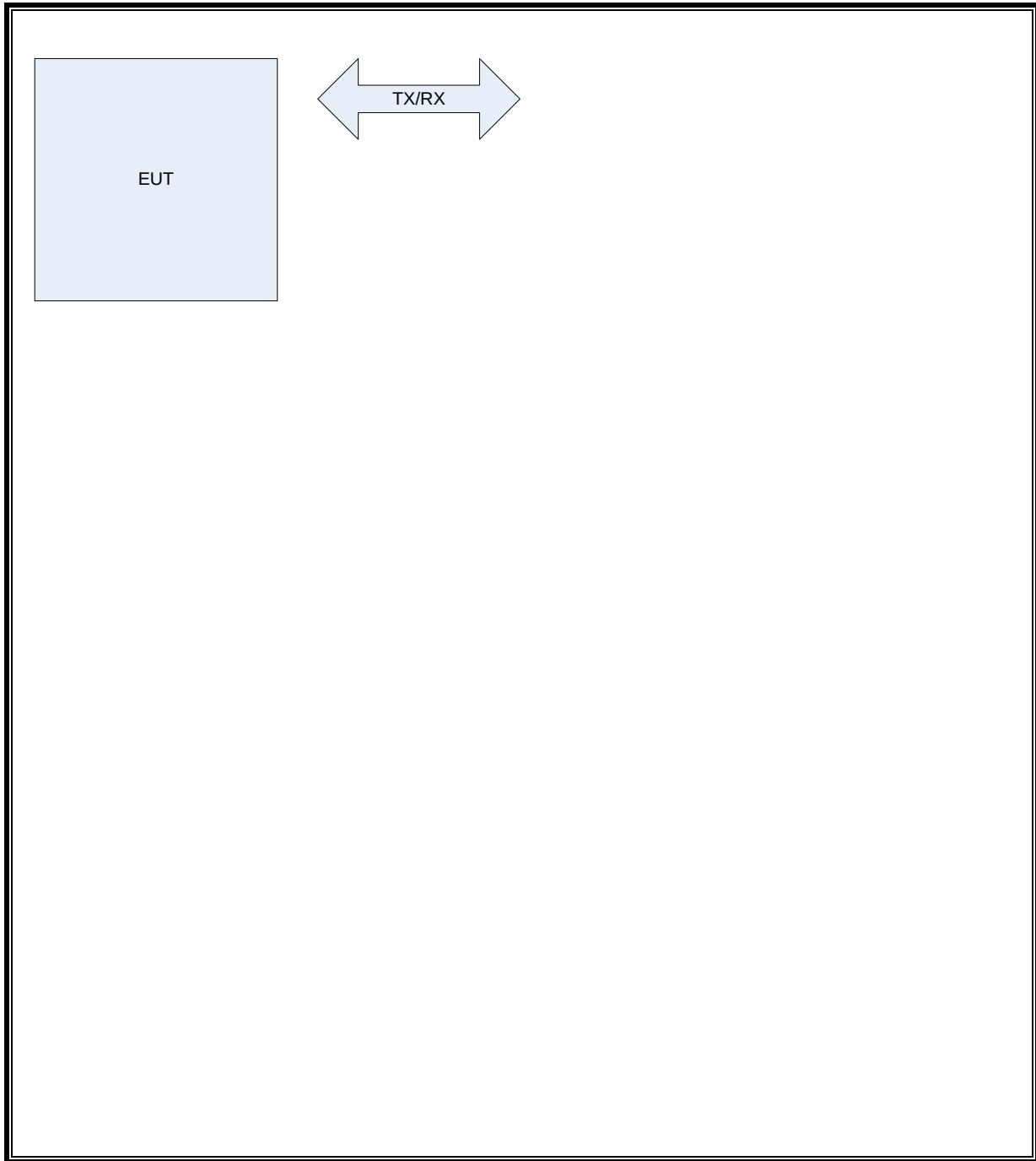
### I/O CABLES

| I/O Cable List |      |                      |                |            |                  |                      |
|----------------|------|----------------------|----------------|------------|------------------|----------------------|
| Cable No       | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks              |
| 1              | USB  | 1                    | USB            | IO         | >3m              | Only used to program |
|                |      |                      |                |            |                  |                      |
|                |      |                      |                |            |                  |                      |
|                |      |                      |                |            |                  |                      |
|                |      |                      |                |            |                  |                      |
|                |      |                      |                |            |                  |                      |

### TEST SETUP

The EUT is a standalone device that is battery powered. The USB port is only used for programming and then removed during testing.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List |                 |          |                       |          |          |
|---------------------|-----------------|----------|-----------------------|----------|----------|
| Description         | Manufacturer    | Model    | T No.                 | Cal Date | Cal Due  |
| Radiated Software   | UL              | UL EMC   | Ver 9.5, May 20, 2015 |          |          |
| Conducted Software  | UL              | UL EMC   | Ver 9.5, Oct 24 2014  |          |          |
| EMI Test Receiver   | Rohde & Schwarz | ESCI     | EMC4328               | 20141230 | 20151231 |
| Bicon Antenna       | Chase           | VBA6106A | EMC4078               | 20140401 | 20150401 |
| Log-P Antenna       | Chase           | UPA6109  | EMC4313               | 24141119 | 20151130 |
| Spectrum Analyzer   | Rohde & Schwarz | ESU      | EMC4323               | 20141216 | 20151231 |
| Antenna Array       | UL              | BOMS     | EMC4276               | 20141201 | 20151231 |
| EMI Test Receiver   | Agilent         | N9030A   | EMC4360               | 20141219 | 20151219 |
| Loop Antenna        | EMCO            | 6502/1   | EMC4026               | 20150420 | 20160430 |

Radiated Emissions 30-1000MHz was performed March 25, 2015

## 7. TEST RESULTS

### 7.1.1. OCCUPIED BANDWIDTH

#### LIMITS

None; for reporting purposes only.

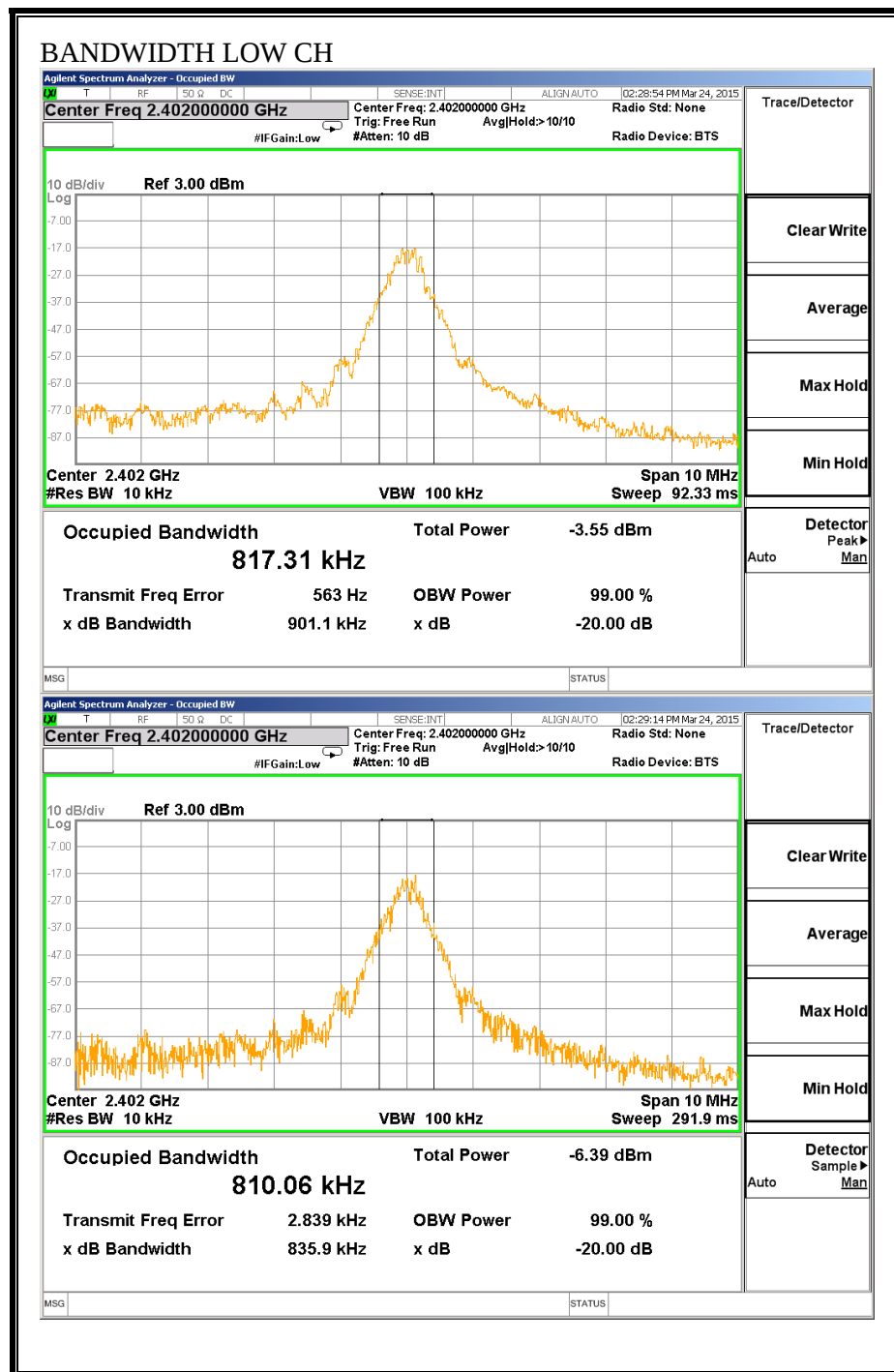
#### TEST PROCEDURE

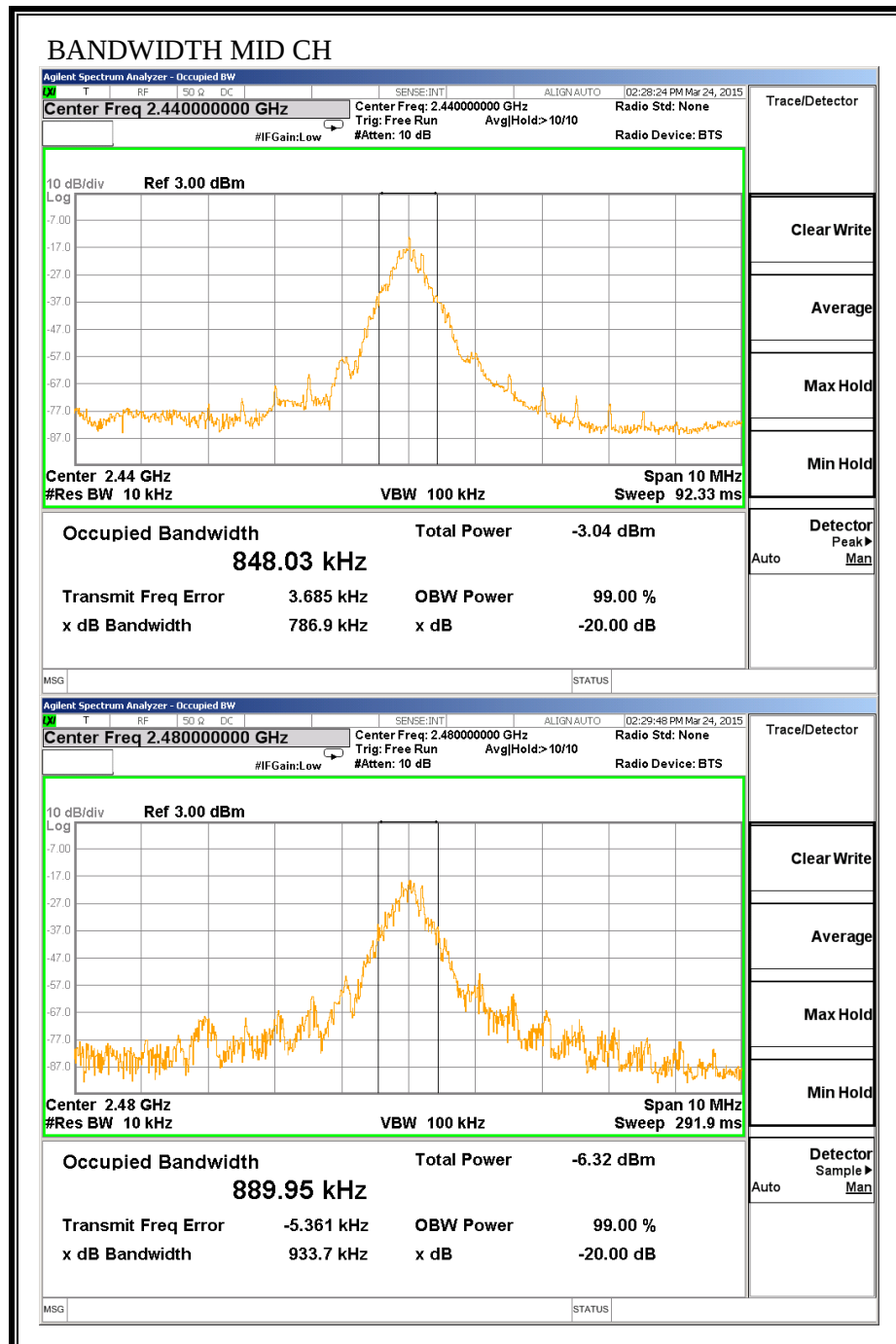
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

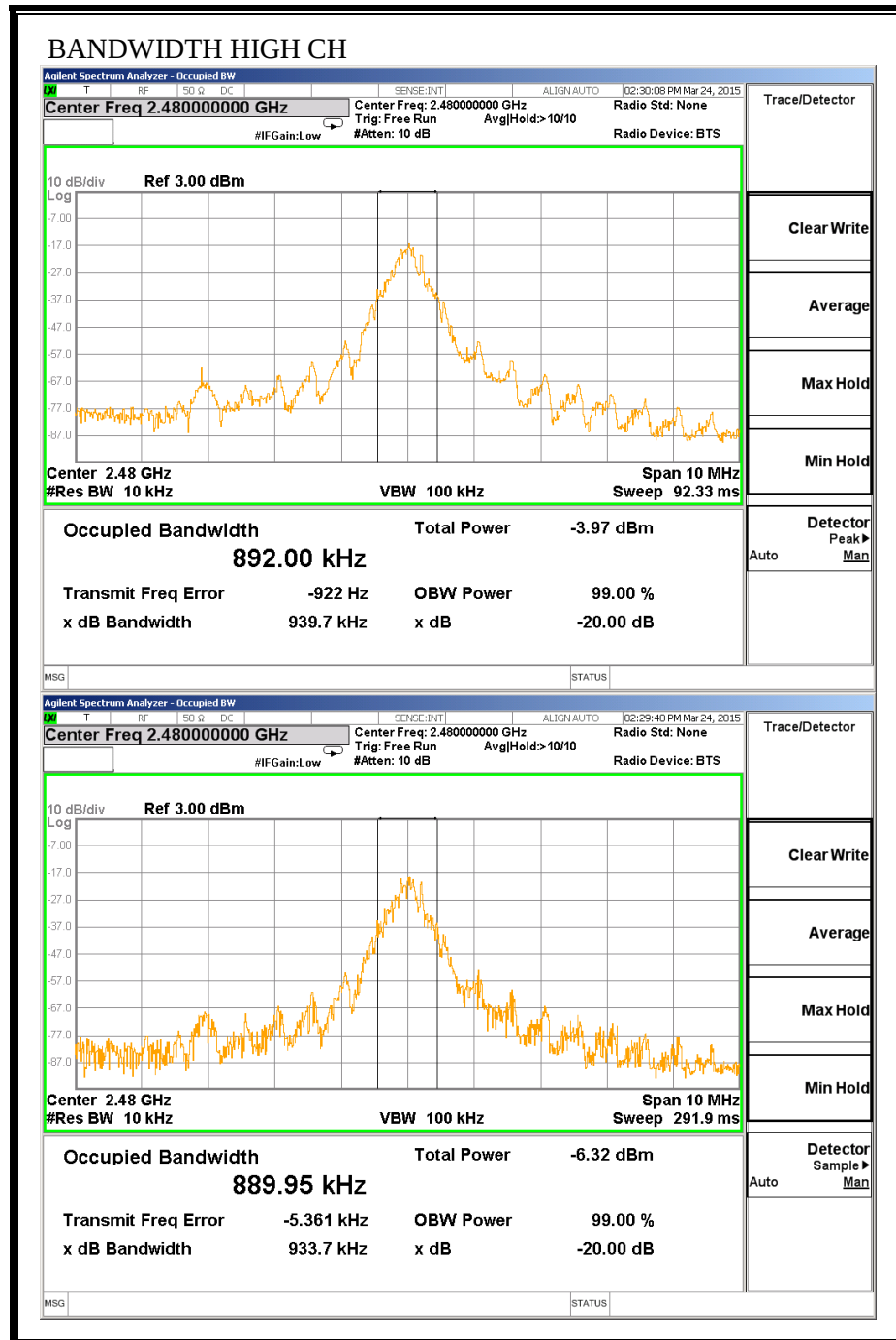
#### RESULTS

| Channel | Frequency<br>(MHz) | 99% Bandwidth<br>(kHz) | 20dB Bandwidth<br>(kHz) |
|---------|--------------------|------------------------|-------------------------|
| Low     | 2402               | 810.06                 | 901.1                   |
| Middle  | 2440               | 889.95                 | 786.9                   |
| High    | 2480               | 889.95                 | 939.7                   |

**99% BANDWIDTH**







## 7.2. RADIATED EMISSIONS

### LIMIT

IC RSS-210, A2.9  
FCC 15.249

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------|--------------------------------------------------|------------------------------------------------|
| 902–928 MHz .....     | 50                                               | 500                                            |
| 2400–2483.5 MHz ..... | 50                                               | 500                                            |
| 5725–5875 MHz .....   | 50                                               | 500                                            |
| 24.0–24.25 GHz .....  | 250                                              | 2500                                           |

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

| Frequency (MHz)   | Field strength (microvolts/meter) | Measurement distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009–0.490 ..... | 2400/F(kHz)                       | 300                           |
| 0.490–1.705 ..... | 24000/F(kHz)                      | 30                            |
| 1.705–30.0 .....  | 30                                | 30                            |
| 30–88 .....       | 100 **                            | 3                             |
| 88–216 .....      | 150 **                            | 3                             |
| 216–960 .....     | 200 **                            | 3                             |
| Above 960 .....   | 500                               | 3                             |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

## **RESULTS**

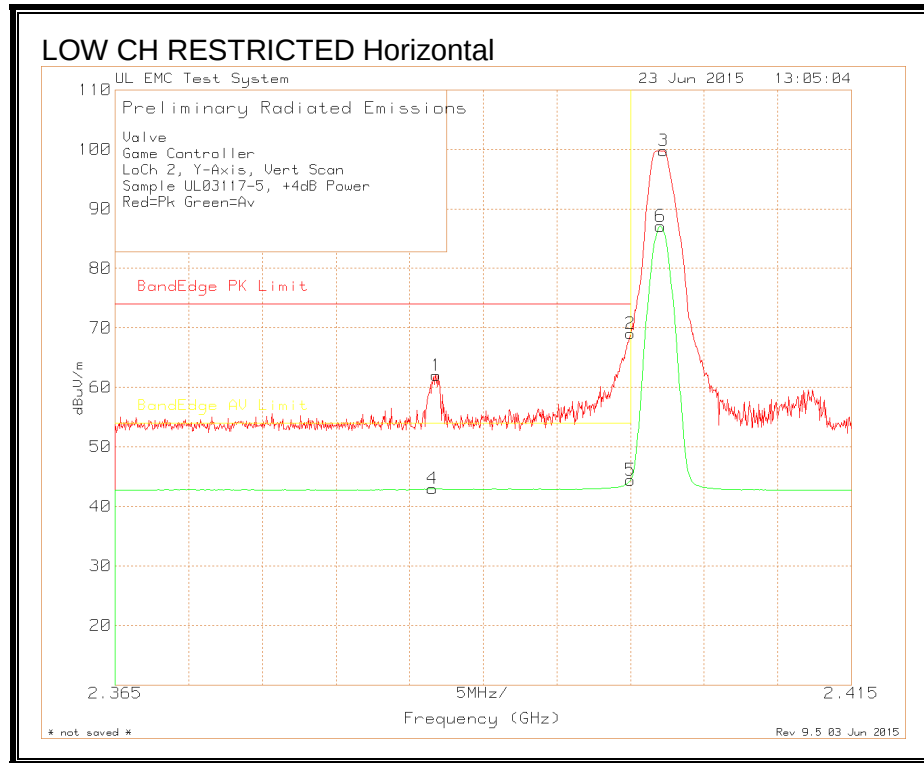
### **7.2.1. FUNDAMENTAL FREQUENCY RADIATED EMISSION**

Valve  
Game Controller  
Fundamentals, Y-Axis  
Sample UL03117-5, 4dB Power  
Red=Pk Green=Av

| Test      | Meter    | Antenna  | Corrected |         | 47 CFR |                 | 47 CFR  |        | 47 CFR  |        | 47 CFR   |  |
|-----------|----------|----------|-----------|---------|--------|-----------------|---------|--------|---------|--------|----------|--|
| Frequency | Reading  | Gain     | Gain/Loss | Reading | 47 CFR | Margin          | Part 15 | Margin | Azimuth | Height |          |  |
| (GHz)     | (dBuV)   | Detector | dB/m      | (dB)    | dBuV/m | Part 15 PK (dB) | AV      | (dB)   | [Degs]  | [cm]   | Polarity |  |
| 2.402     | 73.05 Pk |          | 21.8      | 4.58    | 99.43  | 114             | -14.57  | -      | 321     | 100    | H        |  |
| 2.402     | 60.73 Av |          | 21.8      | 4.58    | 87.11  | 114             | -26.89  | 94     | -6.89   | 321    | 100 H    |  |
| 2.402     | 72.14 Pk |          | 21.8      | 4.58    | 98.52  | 114             | -15.48  | -      | 135     | 106    | V        |  |
| 2.402     | 59.8 Av  |          | 21.8      | 4.58    | 86.18  | 114             | -27.82  | 94     | -7.82   | 135    | 106 V    |  |
| 2.44      | 73.7 Pk  |          | 21.9      | 4.58    | 100.18 | 114             | -13.82  | -      | 321     | 100    | H        |  |
| 2.44      | 61.36 Av |          | 21.9      | 4.58    | 87.84  | 114             | -26.16  | 94     | -6.16   | 321    | 100 H    |  |
| 2.44      | 72.43 Pk |          | 21.9      | 4.58    | 98.91  | 114             | -15.09  | -      | 145     | 100    | V        |  |
| 2.44      | 60.08 Av |          | 21.9      | 4.58    | 86.56  | 114             | -27.44  | 94     | -7.44   | 145    | 100 V    |  |
| 2.4797    | 73.24 Pk |          | 22        | 4.36    | 99.6   | 114             | -14.4   | -      | 320     | 100    | H        |  |
| 2.48      | 60.9 Av  |          | 22        | 4.36    | 87.26  | 114             | -26.74  | 94     | -6.74   | 320    | 100 H    |  |
| 2.48      | 71.57 Pk |          | 22        | 4.36    | 97.93  | 114             | -16.07  | -      | 138     | 100    | V        |  |
| 2.48      | 59.18 Av |          | 22        | 4.36    | 85.54  | 114             | -28.46  | 94     | -8.46   | 138    | 100 V    |  |

## 7.2.2. TRANSMITTER RESTRICTED BAND EDGES

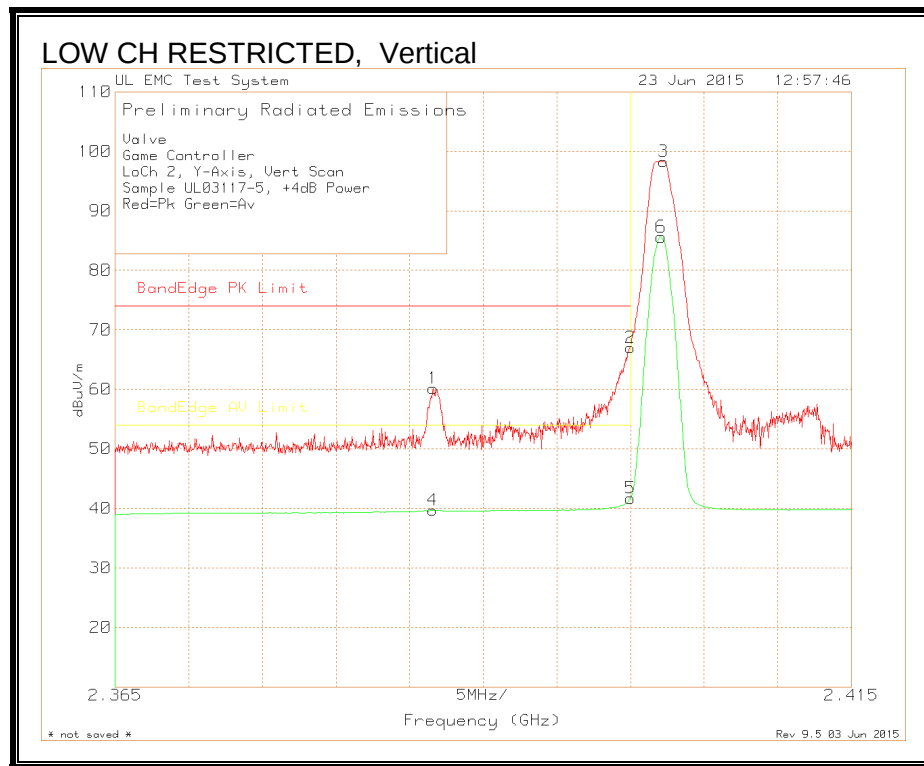
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Valve  
Game Controller  
LoCh 2, Y-Axis, Vert Scan  
Sample UL03117-5, +4dB Power  
Red=Pk Green=Av

| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Antenna Factor (dB/m) | Corrected Gain/Loss (dB) | Corrected Reading (dBuV/m) | BandEdge PK Limit (dB) | BandEdge Margin (dB) | BandEdge AV Limit (dB) | BandEdge Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|------------|----------------------|----------------------|-----------------------|--------------------------|----------------------------|------------------------|----------------------|------------------------|----------------------|----------------|-------------|----------|
| 1          | 2.3868               | 35.52 Pk             | 21.8                  | 4.69                     | 62.01                      | 74                     | -11.99               | 54                     | 8.01                 | 116            | 100         | H        |
| 2          | 2.4                  | 42.65 Pk             | 21.8                  | 4.61                     | 69.06                      | 74                     | -4.94                | 54                     | 15.06                | 116            | 100         | H        |
| 3          | 2.4023               | 73.38 Pk             | 21.8                  | 4.58                     | 99.76                      | -                      | -                    | -                      | -                    | 116            | 100         | H        |
| 4          | 2.3866               | 16.48 AV             | 21.8                  | 4.69                     | 42.97                      | 74                     | -31.03               | 54                     | -11.03               | 116            | 100         | H        |
| 5          | 2.4                  | 17.98 AV             | 21.8                  | 4.61                     | 44.39                      | 74                     | -29.61               | 54                     | -9.61                | 116            | 100         | H        |
| 6          | 2.4021               | 60.68 AV             | 21.8                  | 4.58                     | 87.06                      | -                      | -                    | -                      | -                    | 116            | 100         | H        |

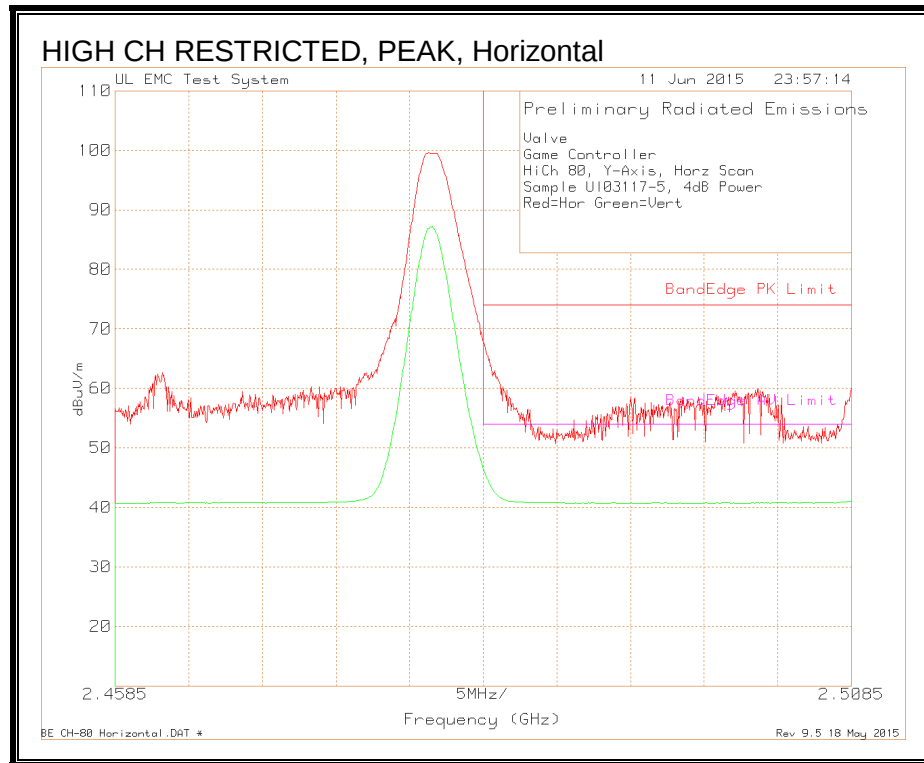
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



Valve  
Game Controller  
LoCh 2, Y-Axis, Vert Scan  
Sample UL03117-5, +4dB Power  
Red=Pk Green=Av

| Marker No. | Test Frequency (GHz) | Meter Reading(d BuV) Detector | Antenna Gain dB/m | Corrected Gain/Loss (dB) | Reading dBuV/m | BandEdge PK Limit | Margin (dB) | BandEdge AV Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|------------|----------------------|-------------------------------|-------------------|--------------------------|----------------|-------------------|-------------|-------------------|-------------|----------------|-------------|----------|
|            |                      |                               |                   |                          |                |                   |             |                   |             |                |             |          |
| 1          | 2.3866               | 33.69 Pk                      | 21.8              | 4.69                     | 60.18          | 74                | -13.82      | 54                | 6.18        | 294            | 100 V       |          |
| 2          | 2.4                  | 40.58 Pk                      | 21.8              | 4.61                     | 66.99          | 74                | -7.01       | 54                | 12.99       | 294            | 100 V       |          |
| 3          | 2.4023               | 71.92 Pk                      | 21.8              | 4.58                     | 98.3           | -                 | -           | -                 | -           | 294            | 100 V       |          |
| 4          | 2.3866               | 13.2 AV                       | 21.8              | 4.69                     | 39.69          | 74                | -34.31      | 54                | -14.31      | 294            | 100 V       |          |
| 5          | 2.4                  | 15.27 AV                      | 21.8              | 4.61                     | 41.68          | 74                | -32.32      | 54                | -12.32      | 294            | 100 V       |          |
| 6          | 2.4021               | 59.2 AV                       | 21.8              | 4.58                     | 85.58          | -                 | -           | -                 | -           | 294            | 100 V       |          |

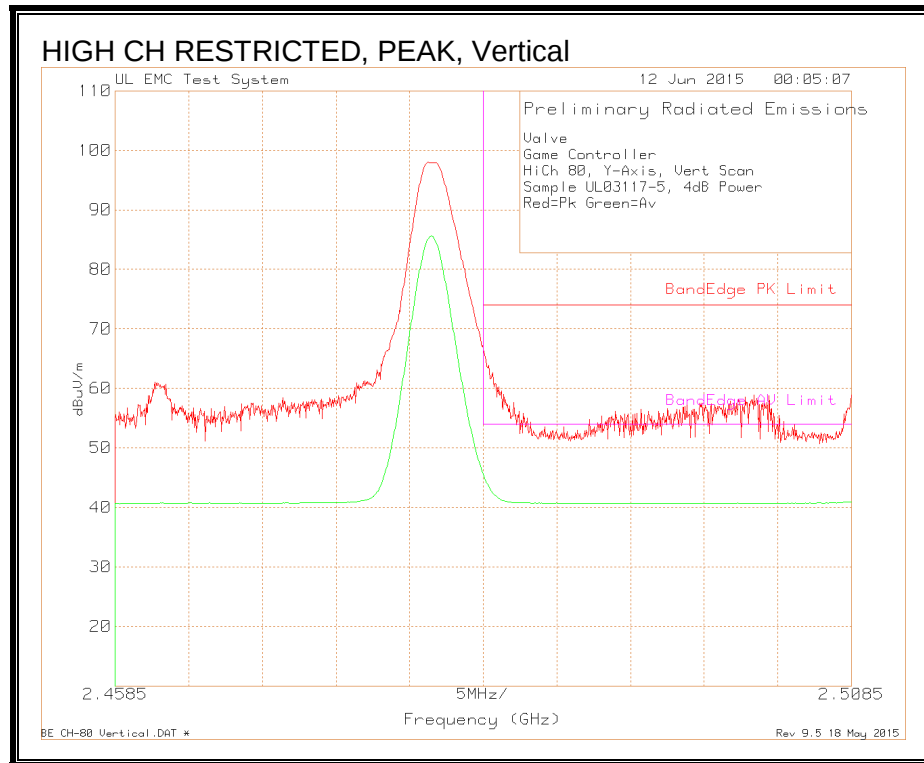
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



Valve  
Game Controller  
HiCh 80, Y-Axis, Horz Scan  
Sample UI03117-5, 4dB Power  
Red=Hor Green=Vert

|        | Test     | Meter     |          | Antenna |           | Corrected |          |        |          |        |         |        |          |  |
|--------|----------|-----------|----------|---------|-----------|-----------|----------|--------|----------|--------|---------|--------|----------|--|
| Marker | Frequenc | Reading(d |          | Gain    | Gain/Loss | Reading   | BandEdge | Margin | BandEdge | Margin | Azimuth | Height |          |  |
| No.    | y (GHz)  | BuV)      | Detector | dB/m    | (dB)      | dBuV/m    | PK Limit | (dB)   | AV Limit | (dB)   | [Degs]  | [cm]   | Polarity |  |
| 1      | 2.4798   | 73.21     | Pk       | 22      | 4.36      | 99.57     | -        | -      | -        | -      | 320     | 100    | H        |  |
| 2      | 2.4835   | 41.6      | Pk       | 22.1    | 4.37      | 68.07     | -        | -      | -        | -      | 320     | 100    | H        |  |
| 3      | 2.4835   | 41.23     | Pk       | 22.1    | 4.37      | 67.7      | 74       | -6.3   | 54       | 13.7   | 320     | 100    | H        |  |
| 4      | 2.4836   | 41.19     | Pk       | 22.1    | 4.37      | 67.66     | 74       | -6.34  | 54       | 13.66  | 320     | 100    | H        |  |
| 5      | 2.4799   | 60.85     | Pk       | 22      | 4.36      | 87.21     | -        | -      | -        | -      | 320     | 100    | H        |  |
| 6      | 2.4835   | 20.45     | Pk       | 22.1    | 4.37      | 46.92     | -        | -      | -        | -      | 320     | 100    | H        |  |
| 7      | 2.4835   | 20.06     | Pk       | 22.1    | 4.37      | 46.53     | 74       | -27.47 | 54       | -7.47  | 320     | 100    | H        |  |
| 8      | 2.4836   | 19.68     | Pk       | 22.1    | 4.37      | 46.15     | 74       | -27.85 | 54       | -7.85  | 320     | 100    | H        |  |

**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



Valve

Game Controller

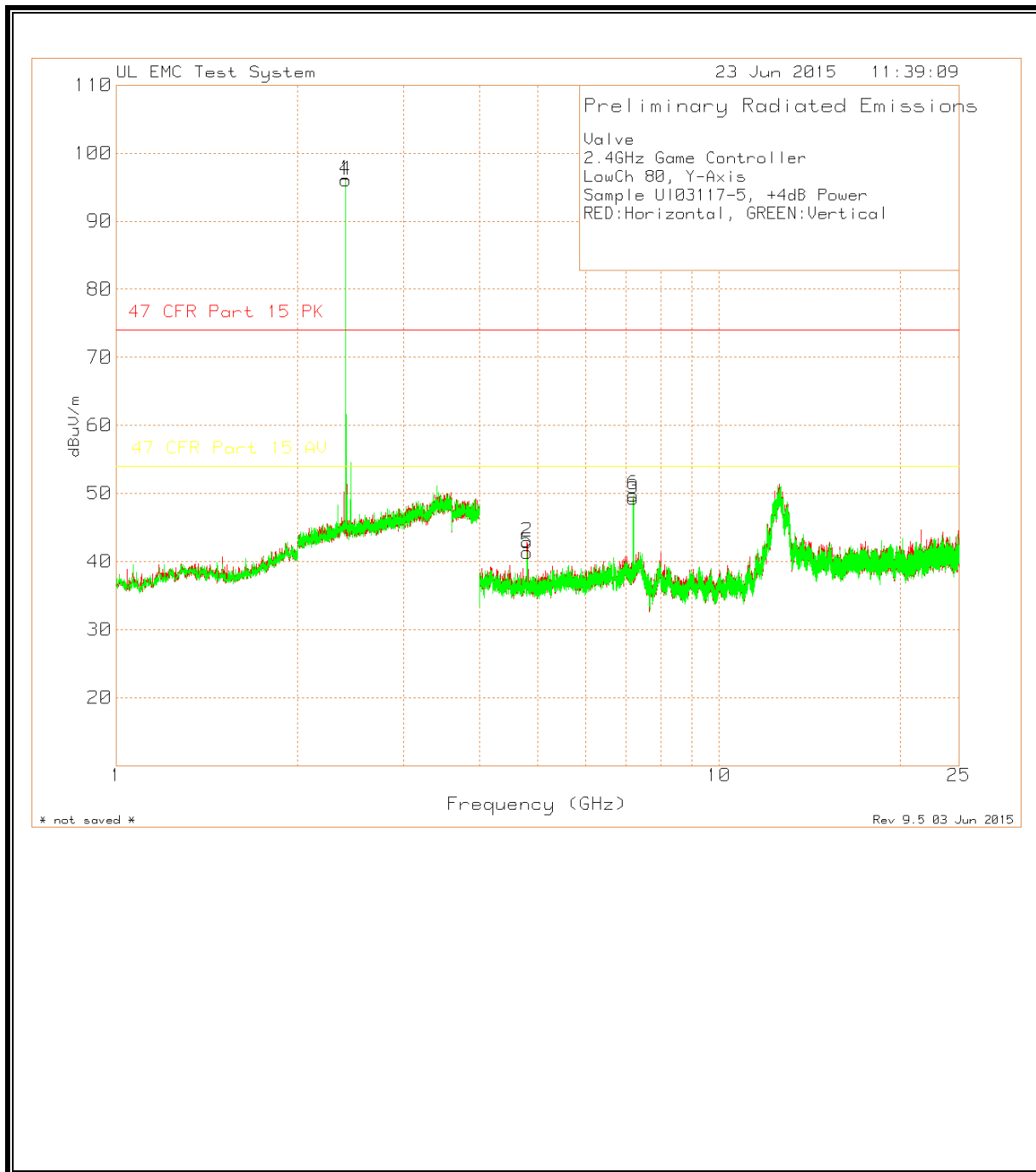
HiCh 80, Y-Axis, Vert Scan

Sample UL03117-5, 4dB Power

Red=Pk Green=Av

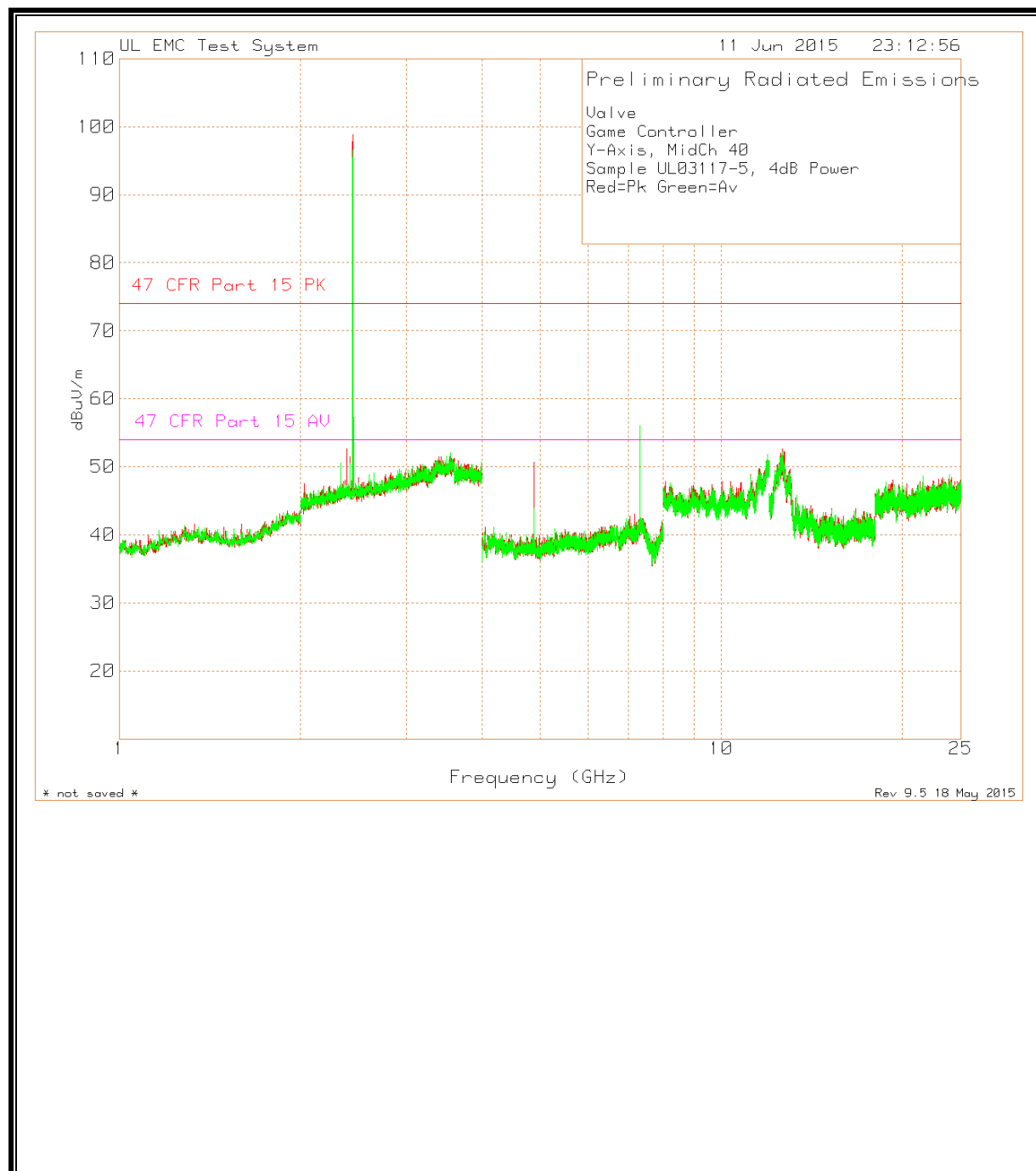
| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Antenna Gain (dB/m) | Corrected Reading (dBuV/m) | BandEdge PK Limit (dB) | BandEdge Margin (dB) | BandEdge AV Limit (dB) | BandEdge Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|------------|----------------------|----------------------|---------------------|----------------------------|------------------------|----------------------|------------------------|----------------------|----------------|-------------|----------|
| 1          | 2.4798               | 71.61 Pk             | 22                  | 4.36                       | 97.97                  | -                    | -                      | -                    | 138            | 100         | V        |
| 2          | 2.4834               | 40.63 Pk             | 22.1                | 4.37                       | 67.1                   | -                    | -                      | -                    | 138            | 100         | V        |
| 3          | 2.4835               | 40.2 Pk              | 22.1                | 4.37                       | 66.67                  | 74                   | -7.33                  | 54                   | 12.67          | 138         | 100 V    |
| 4          | 2.4836               | 39.22 Pk             | 22.1                | 4.37                       | 65.69                  | 74                   | -8.31                  | 54                   | 11.69          | 138         | 100 V    |
| 5          | 2.48                 | 59.26 AV             | 22                  | 4.36                       | 85.62                  | -                    | -                      | -                    | 138            | 100         | V        |
| 6          | 2.4834               | 19.71 AV             | 22.1                | 4.37                       | 46.18                  | -                    | -                      | -                    | 138            | 100         | V        |
| 7          | 2.4835               | 19.06 AV             | 22.1                | 4.37                       | 45.53                  | 74                   | -28.47                 | 54                   | -8.47          | 138         | 100 V    |
| 8          | 2.4836               | 18.46 AV             | 22.1                | 4.37                       | 44.93                  | 74                   | -29.07                 | 54                   | -9.07          | 138         | 100 V    |

### 7.2.3. HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz



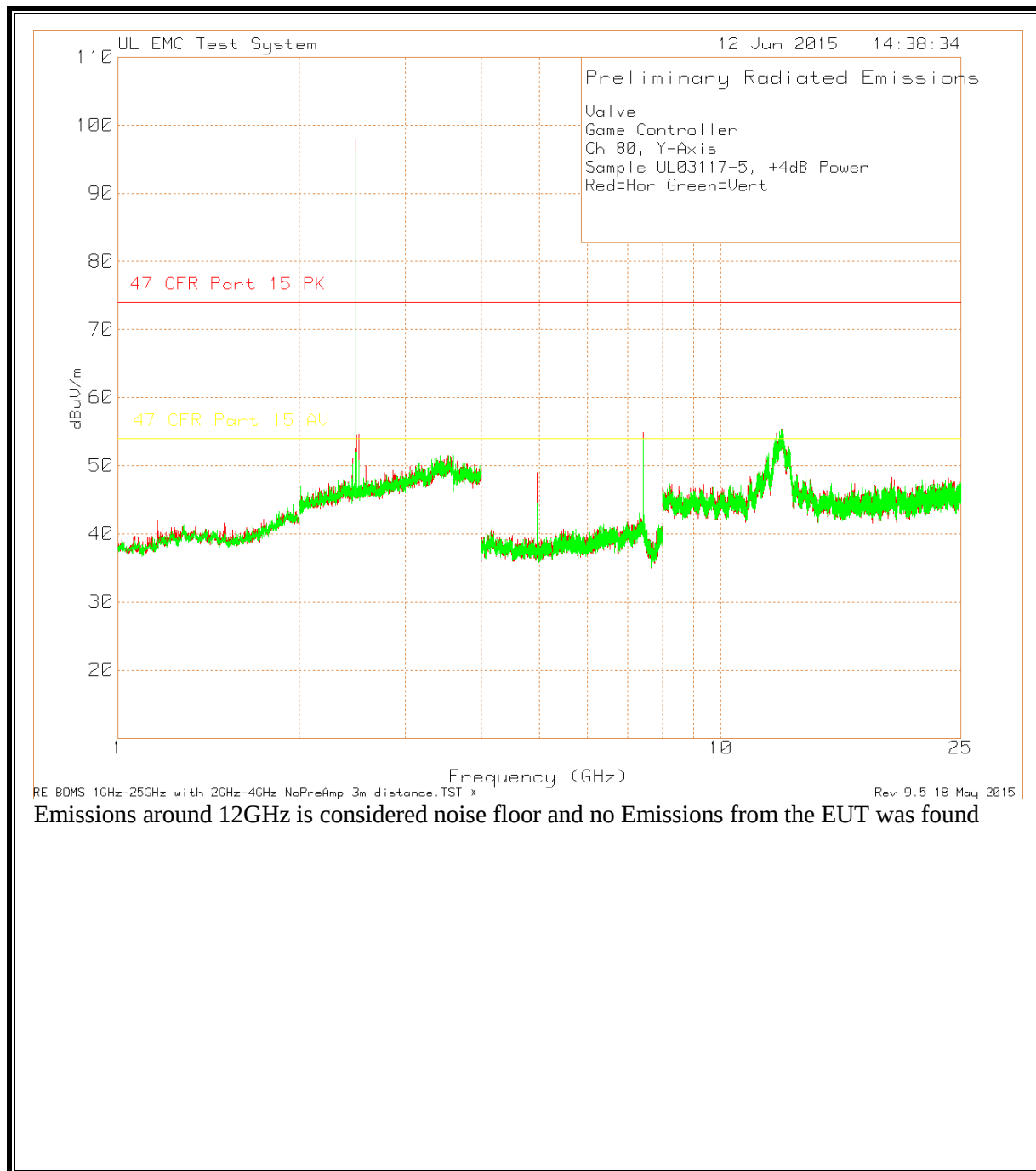
Valve  
2.4GHz Game Controller  
LowCh 80, Y-Axis  
Sample UI03117-5, +4dB Power  
RED:Horizontal, GREEN:Vertical

| Test     | Meter    | Antenna  | Corrected |         | 47 CFR |                 | 47 CFR  |        | 47 CFR  |        | 47 CFR   |   |
|----------|----------|----------|-----------|---------|--------|-----------------|---------|--------|---------|--------|----------|---|
| Frequenc | Reading  | Gain     | Gain/Loss | Reading | 47 CFR | Margin          | Part 15 | Margin | Azimuth | Height |          |   |
| y (GHz)  | (dBuV)   | Detector | dB/m      | (dB)    | dBuV/m | Part 15 PK (dB) | AV      | (dB)   | [Degs]  | [cm]   | Polarity |   |
| 4.8035   | 74.6 Pk  |          | 27.7      | -50.66  | 51.64  | 74              | -22.36  | -      |         | 346    | 124      | H |
| 4.804    | 55.11 Av |          | 27.7      | -50.65  | 32.16  | 74              | -41.84  | 54     | -21.84  | 346    | 124      | H |
| 7.2066   | 67.79 Pk |          | 29.7      | -46.65  | 50.84  | 74              | -23.16  | -      |         | 236    | 100      | H |
| 7.2062   | 53.68 Av |          | 29.7      | -46.65  | 36.73  | 74              | -37.27  | 54     | -17.27  | 236    | 100      | H |
| 4.8038   | 71.01 Pk |          | 27.7      | -50.65  | 48.06  | 74              | -25.94  | -      |         | 21     | 120      | V |
| 4.8041   | 52.26 Av |          | 27.7      | -50.65  | 29.31  | 74              | -44.69  | 54     | -24.69  | 21     | 120      | V |
| 7.2052   | 69.98 Pk |          | 29.7      | -46.66  | 53.02  | 74              | -20.98  | -      |         | 330    | 186      | V |
| 7.2062   | 55.5 Av  |          | 29.7      | -46.65  | 38.55  | 74              | -35.45  | 54     | -15.45  | 330    | 186      | V |



Valve  
Game Controller  
Y-Axis, MidCh 40  
Sample UL03117-5, 4dB Power  
Red=Pk Green=Av

| Test      | Meter    |          |           | Corrected |        | 47 CFR          |          | 47 CFR |         |        |          |
|-----------|----------|----------|-----------|-----------|--------|-----------------|----------|--------|---------|--------|----------|
| Frequency | Reading  | Antenna  | Gain/Loss | Reading   | 47 CFR | Margin          | Part 15  | Margin | Azimuth | Height |          |
| (GHz)     | (dBuV)   | Detector | Gains     | (dB)      | dBuV/m | Part 15 PK (dB) | AV       | (dB)   | [Degs]  | [cm]   | Polarity |
| 4.8794    | 75.31 Pk |          | 27.7      | -50.35    | 52.66  | 74              | -21.34 - | -      |         | 184    | 146 H    |
| 4.88      | 58.56 Av |          | 27.7      | -50.35    | 35.91  | 74              | -38.09   | 54     | -18.09  | 184    | 146 H    |
| 4.8794    | 71.37 Pk |          | 27.7      | -50.35    | 48.72  | 74              | -25.28 - | -      |         | 220    | 157 V    |
| 4.88      | 54.48 Av |          | 27.7      | -50.35    | 31.83  | 74              | -42.17   | 54     | -22.17  | 220    | 157 V    |
| 7.3193    | 70.98 Pk |          | 30.6      | -45.88    | 55.7   | 74              | -18.3 -  | -      |         | 154    | 127 H    |
| 7.3201    | 56.37 Av |          | 30.6      | -45.89    | 41.08  | 74              | -32.92   | 54     | -12.92  | 154    | 127 H    |
| 7.3206    | 72.23 Pk |          | 30.6      | -45.9     | 56.93  | 74              | -17.07 - | -      |         | 168    | 150 V    |
| 7.3201    | 57.52 Av |          | 30.6      | -45.89    | 42.23  | 74              | -31.77   | 54     | -11.77  | 168    | 150 V    |

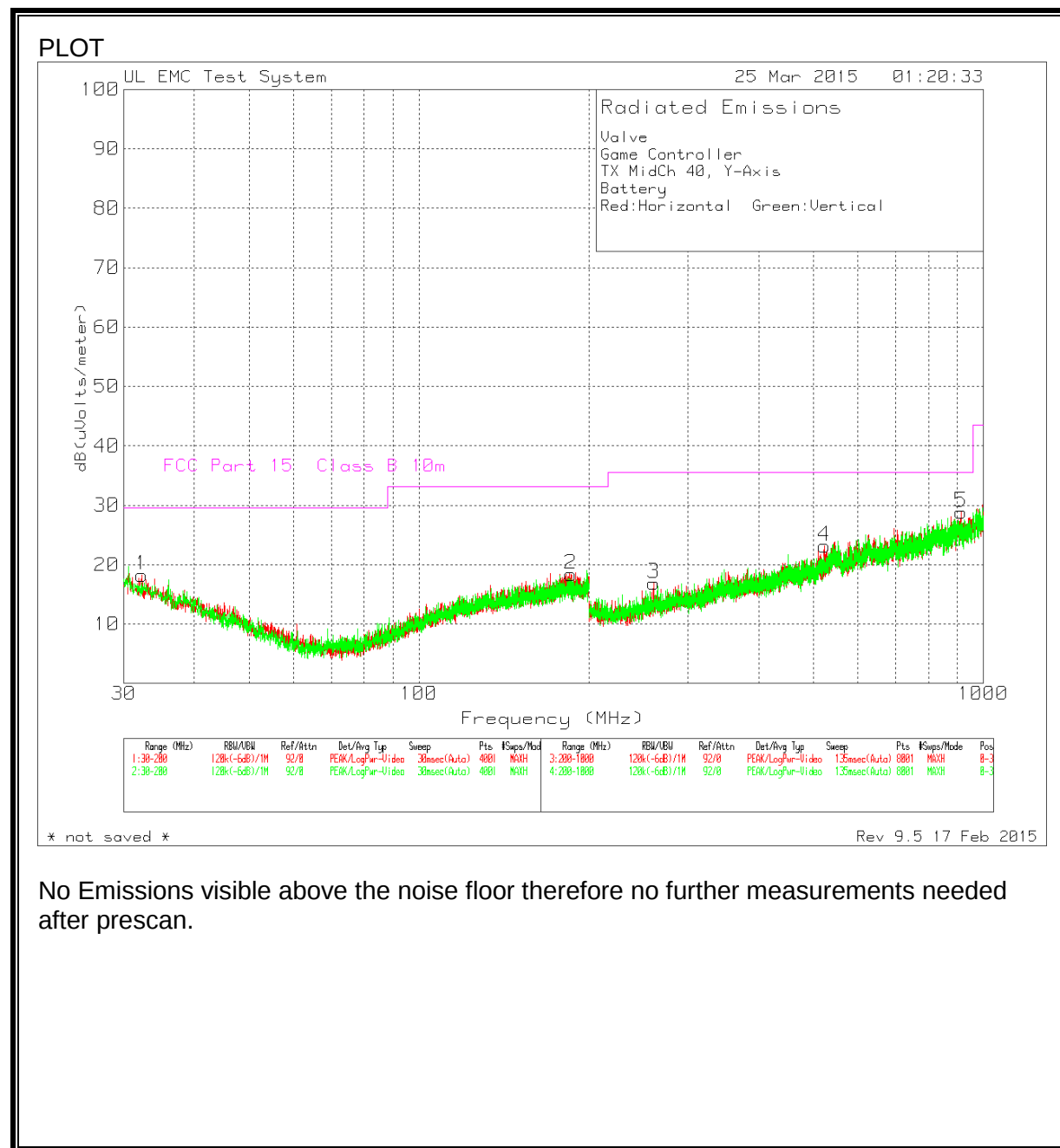


Valve  
Game Controller  
Ch 80, Y-Axis  
Sample UL03117-5, +4dB Power  
Red=Hor Green=Vert

| Test      | Meter   | Antenna  | Corrected |         | 47 CFR |                 | 47 CFR  |        | 47 CFR  |        | 47 CFR   |  |
|-----------|---------|----------|-----------|---------|--------|-----------------|---------|--------|---------|--------|----------|--|
| Frequency | Reading | Gain     | Gain/Loss | Reading | 47 CFR | Margin          | Part 15 | Margin | Azimuth | Height |          |  |
| (GHz)     | (dBuV)  | Detector | dB/m      | (dB)    | dBuV/m | Part 15 PK (dB) | AV      | (dB)   | [Degs]  | [cm]   | Polarity |  |
| 4.9593    | 73.04   | Pk       | 27.8      | -50.74  | 50.1   | 74              | -23.9   | -      |         | 13     | 145 H    |  |
| 4.96      | 59.67   | Av       | 27.8      | -50.74  | 36.73  | 74              | -37.27  | 54     | -17.27  | 13     | 145 H    |  |
| 7.4392    | 72.83   | Pk       | 30.6      | -46.79  | 56.64  | 74              | -17.36  | -      |         | 345    | 135 H    |  |
| 7.44      | 58.16   | Av       | 30.6      | -46.82  | 41.94  | 74              | -32.06  | 54     | -12.06  | 345    | 135 H    |  |
| 7.4392    | 71.63   | Pk       | 30.6      | -46.79  | 55.44  | 74              | -18.56  | -      |         | 342    | 150 V    |  |
| 7.44      | 56.94   | Av       | 30.6      | -46.82  | 40.72  | 74              | -33.28  | 54     | -13.28  | 342    | 150 V    |  |
| 4.9596    | 70.77   | Pk       | 27.8      | -50.74  | 47.83  | 74              | -26.17  | -      |         | 51     | 164 V    |  |
| 4.96      | 57.07   | Av       | 27.8      | -50.74  | 34.13  | 74              | -39.87  | 54     | -19.87  | 51     | 164 V    |  |

## 7.2.4. WORST-CASE BELOW 1 GHz

### SPURIOUS EMISSIONS 30 TO 1000 MHz



# **SPURIOUS EMISSIONS 9k TO 30 MHz**

