



# FCC/IC Partial Scope Test Report

FOR

**Manufacturer: Hanchet Entry Systems Inc.**

**Model Number: K100-622-PA**

**Product Description: Aperio Cabinet Lock**

**FCC ID: VC3-K100622PA**

**IC Certification Number: 7160A-K100622PA**

**FCC CFR 47 Part 15.247 for DTS**

**IC RSS-210 Issue 8, Annex 8**

**TEST REPORT #: EMC\_HANC1-001-13501\_K100LF\_DTS-R**

**DATE: March 11, 2014**



**FCC :  
Accredited**

**IC recognized #  
3462B-1**

**CETECOM Inc.**

411 Dixon Landing Road ♦ Milpitas, CA 95035 ♦ U.S.A.

Phone: + 1 (408) 586 6200 ♦ Fax: + 1 (408) 586 6299 ♦ E-mail: [info@cetecomusa.com](mailto:info@cetecomusa.com) ♦ <http://www.cetecom.com>

CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

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## 1 Assessment

The following equipment, as detailed in section 3 of this test report, was evaluated against the applicable criteria specified in FCC CFR 47 Part 15.247 and Industry Canada Standards RSS 210 Issue 8, Annex 8.

No deviations were ascertained during the course of the tests performed.

This partial scope test report only contains the details of the *radiated* measurements of the above listed rules. *Conducted* RF antenna port measurements are documented in a separate test report as identified in section 4.

| Manufacturer                 | Description                | Model #     |
|------------------------------|----------------------------|-------------|
| Hanchett Entry Systems, Inc. | Aperio Wall Mounted Reader | K100-622-PA |

### Responsible for Testing Laboratory:

Franz Engert

March 11, 2014    Compliance    (Manager of Compliance)

| Date | Section | Name | Signature |
|------|---------|------|-----------|
|------|---------|------|-----------|

### Responsible for the Report:

Josie Sabado

March 11, 2014    Compliance    (Test Lab Manager)

| Date | Section | Name | Signature |
|------|---------|------|-----------|
|------|---------|------|-----------|

The test results of this test report relate exclusively to the test item specified in Section 3. CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

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## **2 Administrative Data**

### **2.1 Identification of the Testing Laboratory Issuing the Test Report**

|                                 |                                                        |
|---------------------------------|--------------------------------------------------------|
| <b>Company Name:</b>            | CETECOM Inc.                                           |
| <b>Department:</b>              | Compliance                                             |
| <b>Address:</b>                 | 411 Dixon Landing Road<br>Milpitas, CA 95035<br>U.S.A. |
| <b>Telephone:</b>               | +1 (408) 586 6200                                      |
| <b>Fax:</b>                     | +1 (408) 586 6299                                      |
| <b>Acting Test Lab Manager:</b> | Franz Engert                                           |
| <b>Test Engineer:</b>           | Josie Sabado                                           |

### **2.2 Identification of the Client**

|                          |                            |
|--------------------------|----------------------------|
| <b>Applicant's Name:</b> | Assa Abloy                 |
| <b>Street Address:</b>   | 10027 S. 51st St. Ste. 102 |
| <b>City/Zip Code</b>     | Phoenix, AZ 85044          |
| <b>Country</b>           | USA                        |
| <b>Contact Person:</b>   | Josh Peabody               |
| <b>Phone No.</b>         | 623-582-4626               |
| <b>e-mail:</b>           | josh.peabody@assaabloy.com |

### **2.3 Identification of the Manufacturer**

|                               |                              |
|-------------------------------|------------------------------|
| <b>Manufacturer's Name:</b>   | Hanchett Entry Systems, Inc. |
| <b>Manufacturers Address:</b> | 10027 S. 51st St. Ste. 102   |
| <b>City/Zip Code</b>          | Phoenix, AZ 85044            |
| <b>Country</b>                | USA                          |

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### 3 Equipment under Test (EUT)

#### 3.1 Specification of the Equipment under Test

|                                                     |                                                                                                      |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Marketing Name:</b>                              | K100-622-PA Aperio Cabinet Lock                                                                      |
| <b>Model Number:</b>                                | K100-622-PA                                                                                          |
| <b>FCC-ID :</b>                                     | VC3-K100622PA                                                                                        |
| <b>IC Certification Number:</b>                     | 7160A-K100622PA                                                                                      |
| <b>Product Description:</b>                         | Aperio Cabinet Lock                                                                                  |
| <b>Technology / Type(s) of Modulation:</b>          | 802.15.4 Zigbee: OQPSK                                                                               |
| <b>Nominal Channel Bandwidths:</b>                  | 5 MHz                                                                                                |
| <b>Operating Frequency Ranges (MHz) / Channels:</b> | Nominal band: 2400 – 2483.5;<br>Channel Center to center: 2405 (Ch. 11) – 2475 (Ch. 25), 15 channels |
| <b>Antenna info:</b>                                | Chip Antenna, Manufacturer stated max antenna gain 0.5 dBi                                           |
| <b>Max. Output Powers:</b>                          | Radiated (EIRP): -16.28 dBm                                                                          |
| <b>Rated Operating Voltage Range:</b>               | Battery, 2 x Lithium AA Cell, 1.5VDC (Nominal)                                                       |
| <b>Rated Operating Temperature Range:</b>           | -10 °C to +50 °C                                                                                     |
| <b>Test Sample Status:</b>                          | Prototype                                                                                            |
| <b>Other Radios included:</b>                       | 125 kHz RFID                                                                                         |

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### 3.2 Identification of the Equipment Under Test (EUT)

| EUT # | Serial Number | HW Version  | SW Version                                          | Note |
|-------|---------------|-------------|-----------------------------------------------------|------|
| 1     | 10065         | 7080058.011 | k100_main2_aperio_se_onl-<br>0.0.27283_bl-0.0.27283 |      |

### 3.3 Identification of Accessory Equipment

No accessory equipment

### 3.4 Other EUT Notes

The device was configured with manufacturer provided test software, capable of setting the unit in different supported modulation schemes, data rates and channels of operation.

The device was set to continuous framed transmit (burst) mode per test software, which allowed the EUT to be operated with 100% duty cycle during testing.

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#### 4 Summary of Measurement Results

| Test Specification              | Test Case                                        | Temperature and Voltage Conditions | Pass                                | Fail                     | NA                                  | NP                                  | Result   |
|---------------------------------|--------------------------------------------------|------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------|
| §15.247(a)(2)<br>RSS210 A8.2(a) | 6 dB Bandwidth                                   | Nominal                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Note 1   |
| §15.247(b)(3)<br>RSS210 A8.4(4) | Maximum Peak Conducted Output Power              | Nominal                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Note 1   |
| §15.247(b)(4)                   | Antenna Gain                                     | Nominal                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Complies |
| RSS210 A8.4(4)                  | EIRP                                             | Nominal                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Complies |
| §15.247(d)<br>RSS210 A8.5       | Unwanted Emissions at the Band Edges - Conducted | Nominal                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Note 1   |
| §15.247(d)<br>RSS210 A8.5       | Unwanted Emissions at the Band Edges - Radiated  | Nominal                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Complies |
| §15.247(d)<br>RSS210 A8.5       | Unwanted Emissions into Non-Restricted Bands     | Nominal                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Note 1   |
| §15.247(d)<br>RSS210 A8.5       | Unwanted Emissions into Restricted Bands         | Nominal                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | Complies |
| §15.247(e)<br>RSS210 A8.2(b)    | Power Spectral Density                           | Nominal                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Note 1   |
| §15.207(a)<br>RSS Gen           | AC Power Line Conducted Emissions                | Nominal                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Note 2   |

**Note:** NA= Not Applicable; NP= Not Performed.

1. Conducted RF antenna port measurements are documented in a separate test report described in section 5.7.
2. EUT is battery operated. AC power line conducted emissions is not applicable.

## **5 Measurement Information**

### **5.1 Dates of Testing**

November 13, 2013

### **5.2 Measurement Uncertainty**

The following measurement uncertainties are applicable to the measurements described in this test report:

Conducted power and emission measurements: +/- 0.5dB

Radiated power and emission measurements: +/- 3.0 dB

### **5.3 Nominal EUT Conditions During Test**

The following nominal EUT conditions were used during the course of testing, unless otherwise stated:

EUT Voltage: Battery, 2 x Lithium AA Cell, 1.5VDC (Nominal)

### **5.4 Nominal Environmental Conditions During Test**

The following nominal environmental conditions were maintained during the course of testing, unless otherwise stated:

Ambient Temperature: 20-25°C

Relative humidity: 40-60%

### **5.5 Measurement Method:**

All radiated testing is performed according to guidelines in FCC publication KDB 558074 D01Meas Guidance v03r01: Measurement Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) operating under 15.247, April 2013 and in ANSI C63.4 (2009).

### **5.6 Radiated Measurement Procedure**

#### **ANSI C63.4 (2009) Section 8.3.1.1: Exploratory radiated emission measurements**

Exploratory radiated measurements shall be performed at the measurement distance or at a closer distance than that specified for compliance to determine the emission characteristics of the EUT. At near distances, for EUTs of comparably small size, it is relatively easy to determine the spectrum signature of the EUT and, if applicable, the EUT configuration that produces the maximum level of emissions. A shielded room may be used for exploratory testing, but may have anomalies that can lead to significant errors in amplitude measurements.

Broadband antennas and a spectrum analyzer or a radio-noise meter with a panoramic display are often useful in this type of testing. It is recommended that either a headset or loudspeaker be connected as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT when the exploratory and final testing is performed in an OATS with strong ambient signals. Caution should be taken if either antenna height between 1 and 4 meters or EUT azimuth is not fully explored. Not fully

exploring these parameters during exploratory testing may require complete testing at the OATS or semi-anechoic chamber when the final full spectrum testing is conducted.

The EUT should be set up in its typical configuration and arrangement, and operated in its various modes. For tabletop systems, cables or wires should be manipulated within the range of likely arrangements. For floor-standing equipment, the cables or wires should be located in the same manner as the user would install them and no further manipulation is made. For combination EUTs, the tabletop and floor-standing portions of the EUT shall follow the procedures for their respective setups and cable manipulation. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions.

For each mode of operation required to be tested, the frequency spectrum shall be monitored. Variations in antenna height between 1 and 4 m, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) shall be explored to produce the emission that has the highest amplitude relative to the limit. A step-by-step technique for determining this emission can be found in Annex C.

When measuring emissions above 1 GHz, the frequencies of maximum emission shall be determined by manually positioning the antenna close to the EUT and by moving the antenna over all sides of the EUT while observing a spectral display. It will be advantageous to have prior knowledge of the frequencies of emissions above 1 GHz. If the EUT is a device with dimensions approximately equal to that of the measurement antenna beam width, the measurement antenna shall be aligned with the EUT.

#### **ANSI C63.4 (2009) Section 8.3.1.2: Final radiated emission measurements**

Based on the measurement results in 8.3.1.1, the one EUT, cable and wire arrangement, and mode of operation that produces the emission that has the highest amplitude relative to the limit is selected for the final measurement. The final measurement is then performed on a site meeting the requirements of 5.3, 5.4, or 5.5 as appropriate without variation of the EUT arrangement or EUT mode of operation. If the EUT is relocated from an exploratory test site to a final test site, the highest emission shall be re-maximized at the final test location before final radiated emissions measurements are performed.

However, antenna height and polarity and EUT azimuth are to be varied. In addition, the full frequency spectrum (for the range to be checked for meeting compliance) shall be investigated.

This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. During the full frequency spectrum investigation, particular focus should be made on those frequencies found in exploratory testing that were used to find the final test configuration, mode of operation, and arrangement (associated with achieving the least margin with respect to the limit). This full spectrum test constitutes the compliance measurement.

For measurements above 1 GHz, use the cable, EUT arrangement, and mode of operation determined in the exploratory testing to produce the emission that has the highest amplitude relative to the limit. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the “cone of radiation” from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. The antenna may have to be higher or lower than the EUT, depending on the EUT’s size and mounting height, but the antenna should be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. If the transmission line for the measurement antenna restricts its range of height

|                         |                                  |                                      |
|-------------------------|----------------------------------|--------------------------------------|
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| <b>Date of Report :</b> | March 11, 2014                   | <b>IC Cert. No.:</b> 7160A-K100622PA |

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and polarization, the steps needed to ensure the correct measurement of the maximum emissions, shall be described in detail in the report of measurements. Data collected shall satisfy the report requirements of Clause 10.

#### NOTES

- 1— Where limits are specified by agencies for both average and peak (or quasi-peak) detection, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.
- 2—Use of waveguide and flexible waveguide may be necessary at frequencies above 10 GHz to achieve usable signal-to noise ratios at required measurement distances. If so, it may be necessary to restrict the height search of the antenna, and special care should be taken to ensure that maximum emissions are correctly measured.
- 3—All presently known devices causing emissions above 10 GHz are physically small compared with the beam-widths of typical horn antennas used for EMC measurements. For such EUTs and frequencies, it may be preferable to vary the height and polarization of the EUT instead of the receiving antenna to maximize the measured emissions.

All radiated test data in this report shows the worst case emissions for H/V measurement antenna polarizations and for all three orthogonal orientations of the EUT.

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### 5.6.1 Sample Calculations for Radiated Measurements

Measurements from the Spectrum Analyzer/ Receiver are used to calculate the Field Strength, taking into account the following parameters:

1. Measured reading in dB $\mu$ V
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

FS (dB $\mu$ V/m) = Measured Value on SA (dB $\mu$ V) + Cable Loss (dB) + Antenna Factor (dB/m)

Eg:

| Frequency<br>(MHz) | Measured SA<br>(dB $\mu$ V) | Cable Loss<br>(dB) | Antenna Factor<br>Correction<br>(dB) | Field Strength<br>Result<br>(dB $\mu$ V/m) |
|--------------------|-----------------------------|--------------------|--------------------------------------|--------------------------------------------|
| 1000               | 80.5                        | 3.5                | 14                                   | 98.0                                       |

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the above equation.

### 5.7 Associated Test Reports

Conducted RF antenna port measurements are documented in test report number EMC\_HANC1-001-13501\_R100LF\_DTS-C issued by CETECOM Inc.

### 5.8 Other Testing Notes

The EUT was tested on the low, mid and high channels of the tested frequency band.

## 6 Measurement Results

### 6.1 Antenna Gain / EIRP

#### 6.1.1 References

##### §15.247 (b)(4)

The conducted output power limit specified in FCC §15.247 (b)(3) is based on the use of antennas with directional gains that do not exceed 6 dBi.

##### RSS-210 A8.4(4)

The EIRP shall not exceed 4 W (36 dBm).

#### 6.1.2 Testing Notes

Radiated EIRP is calculated as

$$\text{Radiated EIRP} = \text{Conducted Measurement} + \text{Antenna Gain}$$

#### 6.1.3 Test Result

**Maximum Antenna Gain:** 0.5 dBi (Manufacturer Declared)

The following maximum peak conducted output power measurements are taken from the test report referenced in section 4.

| Measured Maximum Peak Conducted Output Power (dBm) |                    |                    |                    |
|----------------------------------------------------|--------------------|--------------------|--------------------|
| Mode                                               | Frequency (MHz)    |                    |                    |
|                                                    | 2405<br>Channel 11 | 2440<br>Channel 18 | 2475<br>Channel 25 |
| 802.15.4 ZigBee                                    | -17.64             | -16.78             | -16.81             |

| Calculated Maximum Peak Radiated Output Power (dBm) |                    |                    |                    |
|-----------------------------------------------------|--------------------|--------------------|--------------------|
| Mode                                                | Frequency (MHz)    |                    |                    |
|                                                     | 2405<br>Channel 11 | 2440<br>Channel 18 | 2475<br>Channel 25 |
| 802.15.4 ZigBee                                     | -17.14             | -16.28             | -16.31             |

#### 6.1.4 Measurement Verdict

Pass

## **6.2 Unwanted Emissions at the Band Edges – Radiated**

### **6.2.1 References**

#### **§15.247 (d)**

#### **RSS-210 A8.5**

Radiated emissions which fall in the restricted bands, as defined in §15.205 (a) and RSS-Gen 7.2.2 (c), must also comply with the radiated emission limits specified in §15.209 (a) and RSS-Gen 7.2.5.

#### **§15.205 (a)**

#### **RSS-Gen 7.2.2 (c)**

Only spurious emissions are permitted in any of the frequency bands listed in the tables in these sections.

#### **§15.209**

#### **RSS-Gen 7.2.5**

The emissions from an intentional radiator shall not exceed the limits in the tables in these sections using an average detector.

#### **§15.35 (b)**

When average radiated emissions measurements are specified, the limit on the peak level of the radio frequency emissions is 20 dB above the maximum permitted average emission limit.

### **6.2.2 Spectrum Analyzer Settings**

|                                 | <b>Low Band<br/>Edge – Peak</b> | <b>Low Band<br/>Edge – Average</b> | <b>High Band<br/>Edge – Peak</b> | <b>High Band<br/>Edge - Average</b> |
|---------------------------------|---------------------------------|------------------------------------|----------------------------------|-------------------------------------|
| <b>Start Frequency</b>          | 2.31 GHz                        | 2.31 GHz                           | 2.46 GHz                         | 2.46 GHz                            |
| <b>Stop Frequency</b>           | 2.42 GHz                        | 2.42 GHz                           | 2.51 GHz                         | 2.51 GHz                            |
| <b>Resolution<br/>Bandwidth</b> | 1 MHz                           | 1 MHz                              | 1 MHz                            | 1 MHz                               |
| <b>Video Bandwidth</b>          | 1 MHz                           | 10 Hz                              | 1 MHz                            | 10 Hz                               |
| <b>Detector</b>                 | Peak                            | Peak                               | Peak                             | Peak                                |
| <b>Trace Mode</b>               | Max Hold                        | Max Hold                           | Max Hold                         | Max Hold                            |
| <b>Sweep Time</b>               | Auto                            | Auto                               | Auto                             | Auto                                |

### **6.2.3 Testing Notes**

Measurement distance: 3 m

### **6.2.4 Measurement Verdict**

Pass

Test Report #: EMC\_HANC1-001-13501\_K100LF\_DTS-R

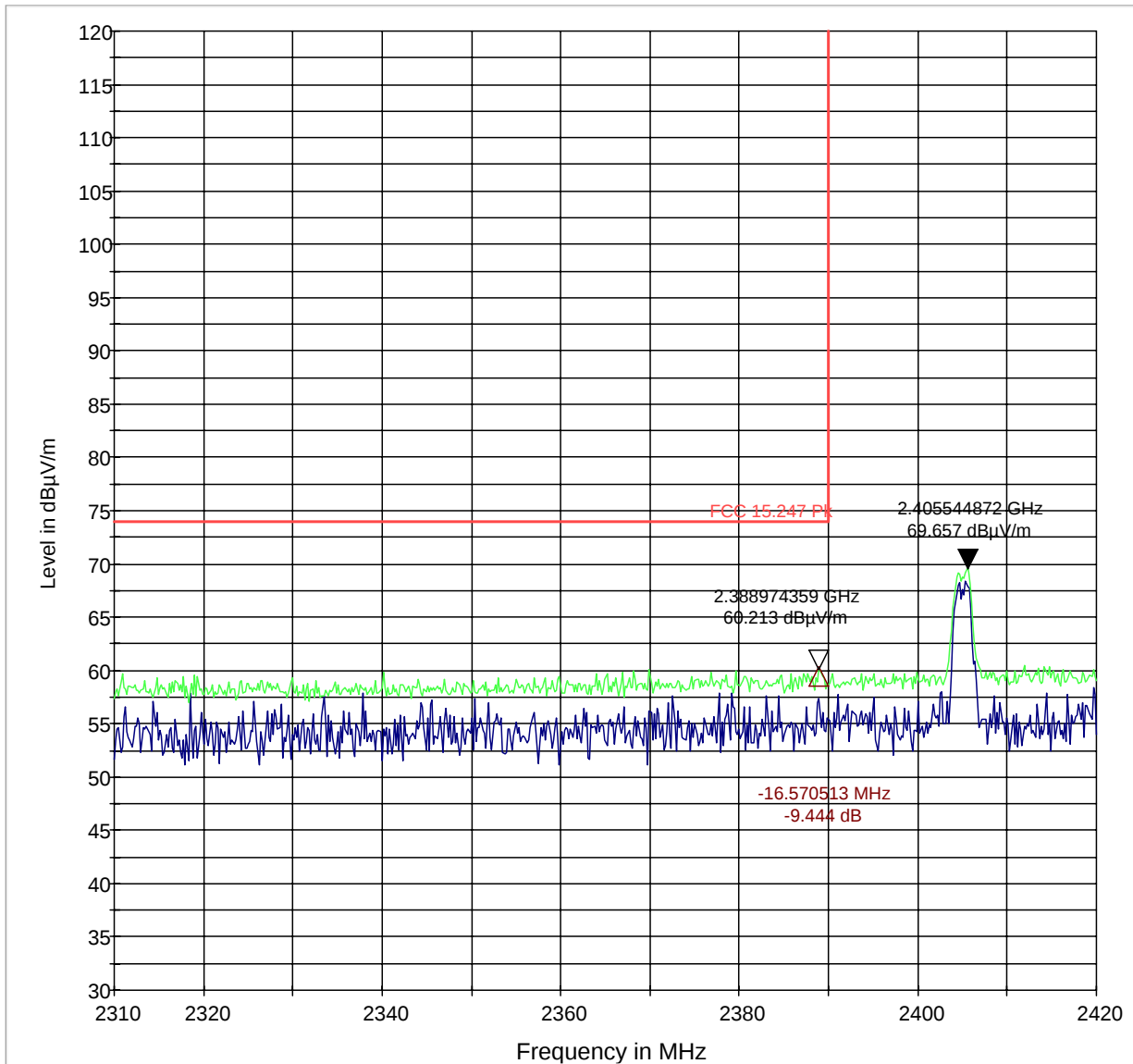
FCC ID: VC3-K100622PA

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### 6.3 Test Plots

#### Lower band edge peak – Zigbee mode: 2405 MHz

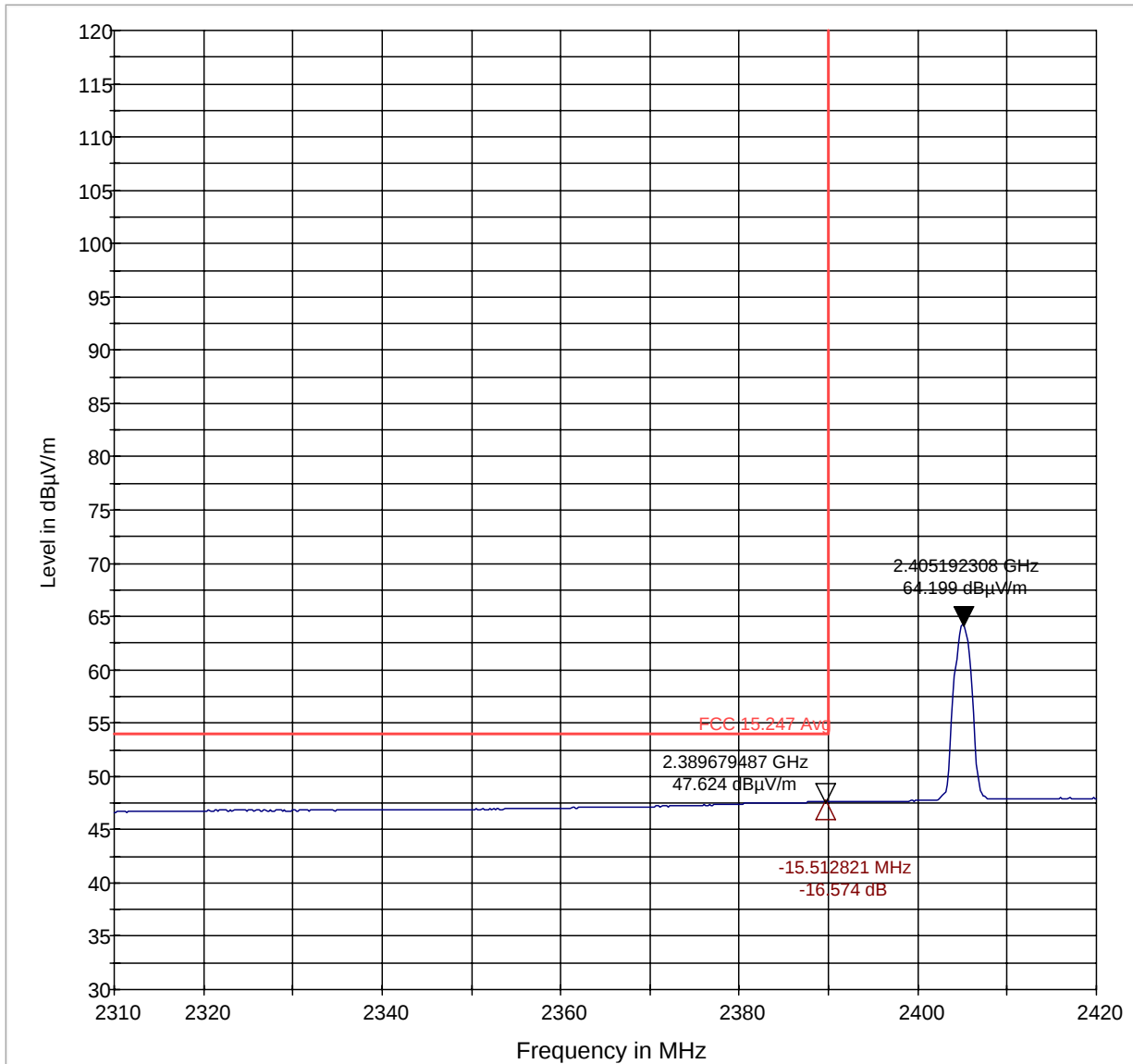


MaxPeak-ClearWrite-PK+    MaxPeak-MaxHold-PK+    FCC 15.247 Pk

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## Lower band edge average -Zigbee mode: 2405 MHz



MaxPeak-MaxHold-PK+ Average-MaxHold-AVG FCC 15.247 Avg

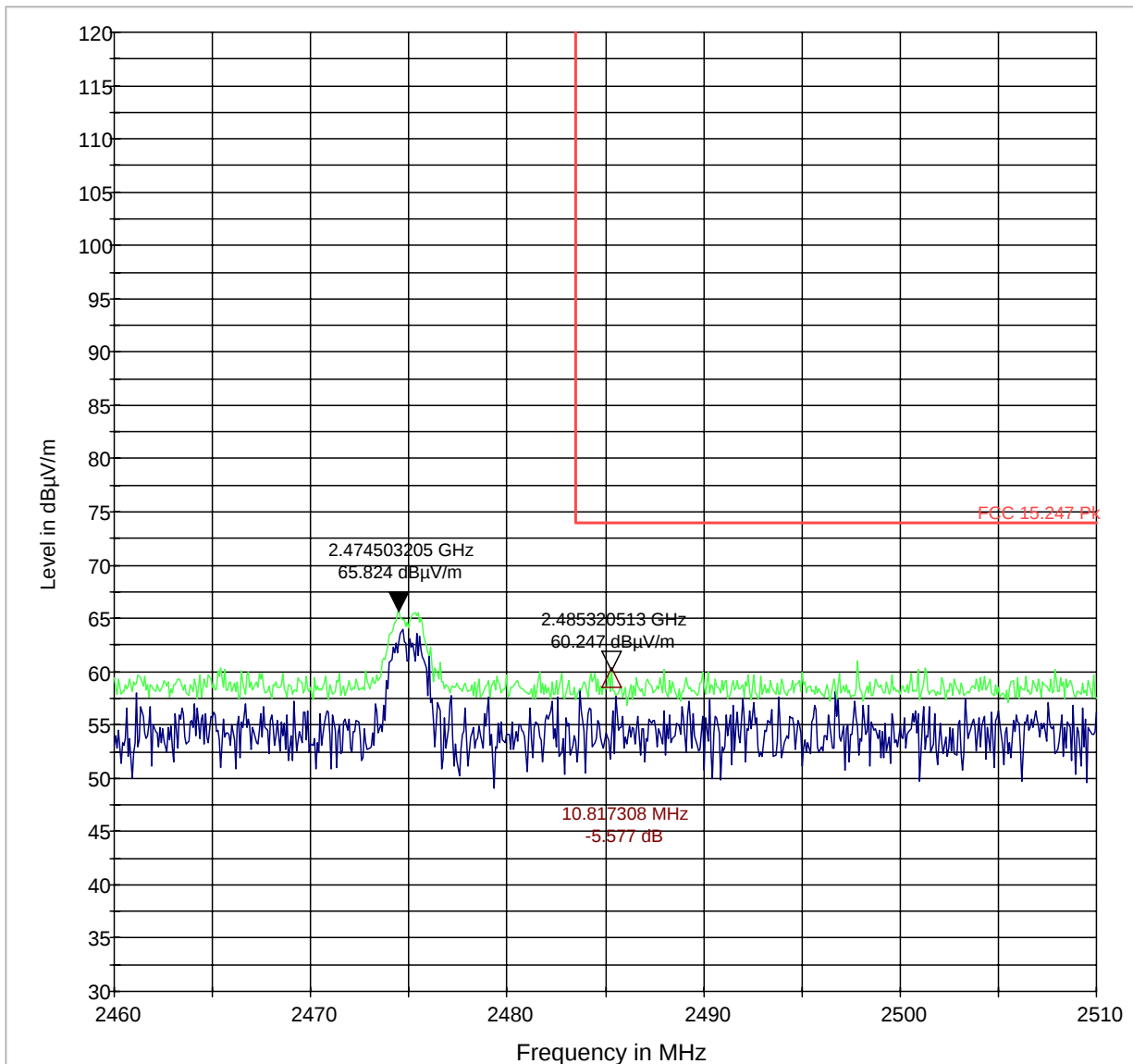
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## Higher band edge peak -Zigbee mode: 2475 MHz



MaxPeak-ClearWrite-PK+    MaxPeak-MaxHold-PK+    FCC 15.247 Pk

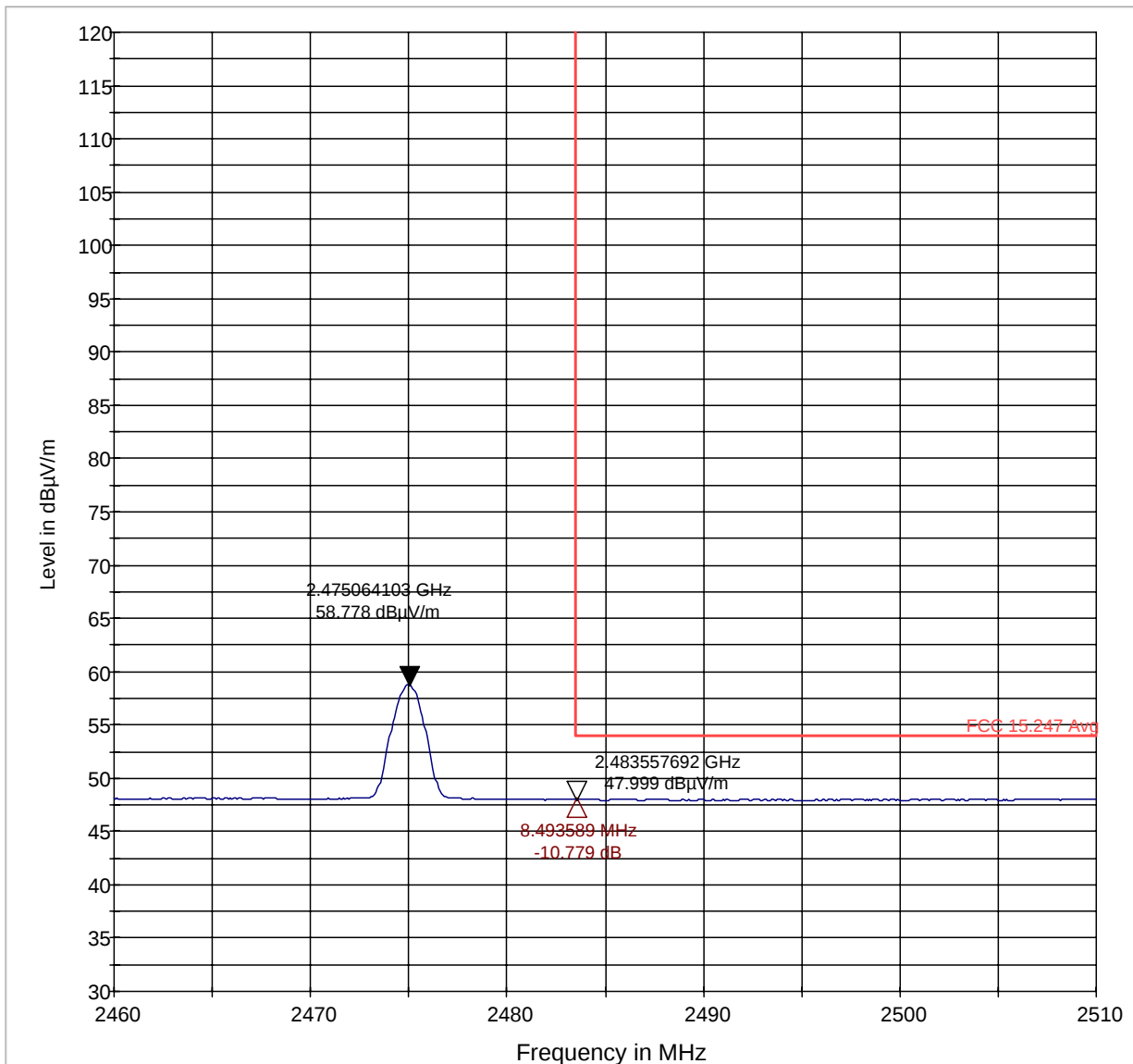
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## Higher band edge average-Zigbee mode: 2475 MHz



— MaxPeak-MaxHold-PK+ — FCC 15.247 Avg

## 6.4 Unwanted Emissions into Restricted Frequency Bands - Radiated

### 6.4.1 References

#### §15.247 (d)

#### RSS-210 A8.5

Radiated emissions which fall in the restricted bands, as defined in §15.205 (a) and RSS-Gen 7.2.2 (c), must also comply with the radiated emission limits specified in §15.209 (a) and RSS-Gen 7.2.5.

#### §15.205 (a)

#### RSS-Gen 7.2.2 (c)

Only spurious emissions are permitted in any of the frequency bands listed in the tables in these sections.

#### §15.209

#### RSS-Gen 7.2.5

The emissions from an intentional radiator shall not exceed the limits in the tables in these sections using an average detector.

#### §15.35 (b)

When average radiated emissions measurements are specified, the limit on the peak level of the radio frequency emissions is 20 dB above the maximum permitted average emission limit.

### 6.4.2 Spectrum Analyzer Settings

|                             | Transmitter Spurious Emissions 9 kHz – 1 GHz |               |                  |                |
|-----------------------------|----------------------------------------------|---------------|------------------|----------------|
|                             | 9 – 150 kHz                                  | 150 – 490 kHz | 490 kHz – 30 MHz | 30 MHz – 1 GHz |
| <b>Resolution Bandwidth</b> | 200 Hz                                       | 9 kHz         | 9 kHz            | 120 kHz        |
| <b>Video Bandwidth</b>      | 2 kHz                                        | 100 kHz       | 100 kHz          | 1 MHz          |
| <b>Detector</b>             | Peak                                         | Peak          | Peak             | Peak           |
| <b>Trace Mode</b>           | Max Hold                                     | Max Hold      | Max Hold         | Max Hold       |
| <b>Sweep Time</b>           | Auto                                         | Auto          | Auto             | Auto           |

|                             | Transmitter Spurious Emissions 1 GHz – 26 GHz |                 |                 |                 |                 |                 |
|-----------------------------|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                             | 1 – 3 GHz                                     | 3 – 10 GHz      | 10 – 13 GHz     | 13 – 17.5 GHz   | 17.5 – 18 GHz   | 18 – 26 GHz     |
| <b>Resolution Bandwidth</b> | 1 MHz                                         | 1 MHz           | 120 kHz         | 120 kHz         | 10 kHz          | 1 MHz           |
| <b>Video Bandwidth</b>      | 10 MHz                                        | 10 MHz          | 1 MHz           | 1 MHz           | 100 kHz         | 10 MHz          |
| <b>Detector</b>             | Peak<br>Average                               | Peak<br>Average | Peak<br>Average | Peak<br>Average | Peak<br>Average | Peak<br>Average |
| <b>Trace Mode</b>           | Max Hold                                      | Max Hold        | Max Hold        | Max Hold        | Max Hold        | Max Hold        |
| <b>Sweep Time</b>           | Auto                                          | Auto            | Auto            | Auto            | Auto            | Auto            |

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### **6.4.3 Testing Notes**

Measurement distance: 3 m

For the measurement range up to 30 MHz in the following plots the field strength results from 3m distance measurement are extrapolated to 300m and 30m distance respectively, by 40dB/decade, according to part 15.31(f)(2), per antenna factor scaling. The red limit line shows the 300 m limit up to 490 kHz, the 30m limit up to 30 MHz and 3m limit above 30MHz.

Measurements below 1000 MHz are performed with a peak detector and compared to average limits. Measurements with an average detector are not required.

Measurements between 9 kHz – 30 MHz and between 18 GHz – 26 GHz are performed at one channel because the emissions in these frequency ranges are the same for all channels.

### **6.4.4 Measurement Verdict**

Pass

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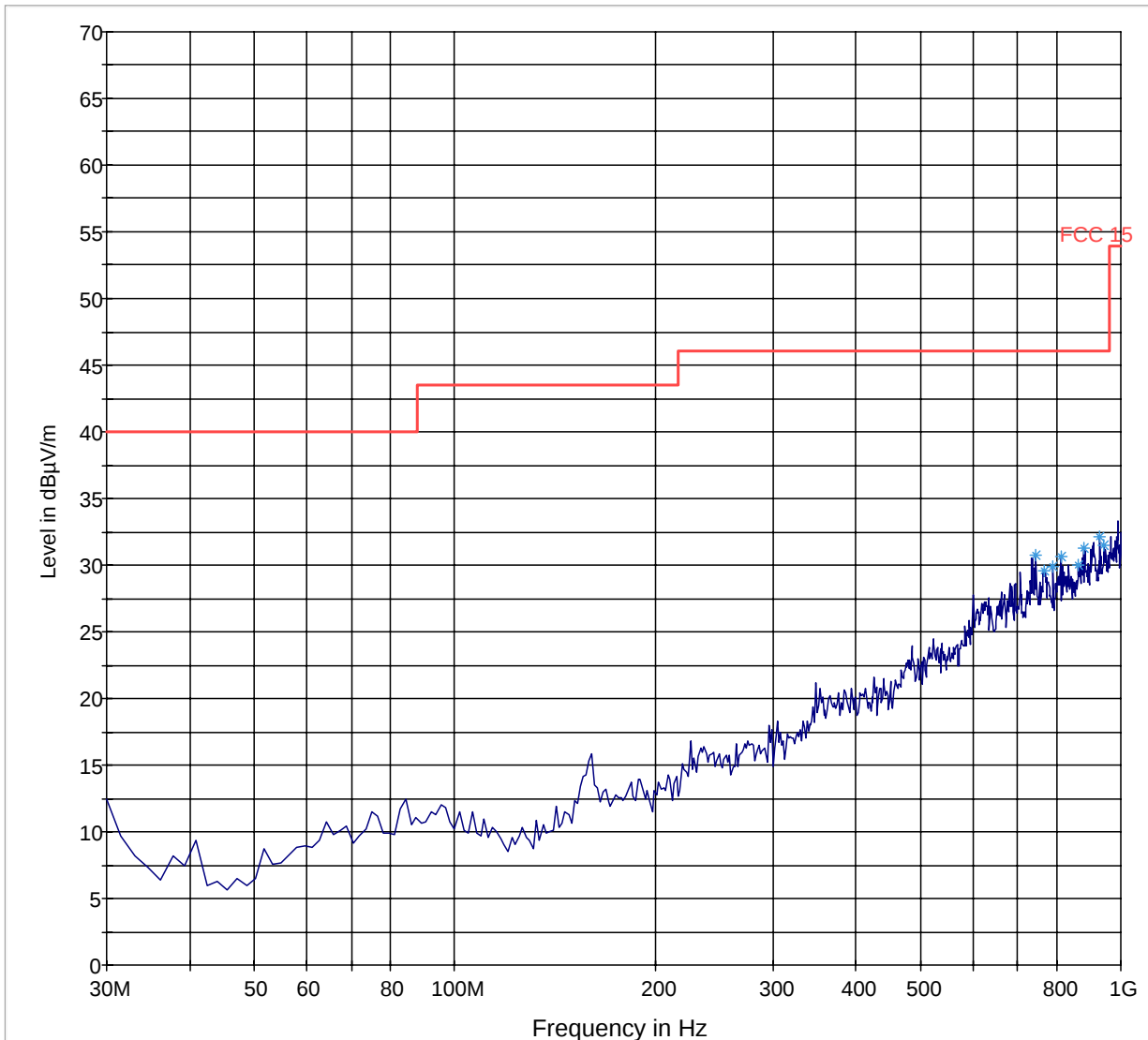
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## 6.4.5 Test Plots

### Transmitter Radiated Spurious Emission- Ch11 (2405 MHz): 30 MHz – 1 GHz



— FCC 15    — Preview Result 1-PK+    \* Data Reduction Result 1 [3]-PK+

**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

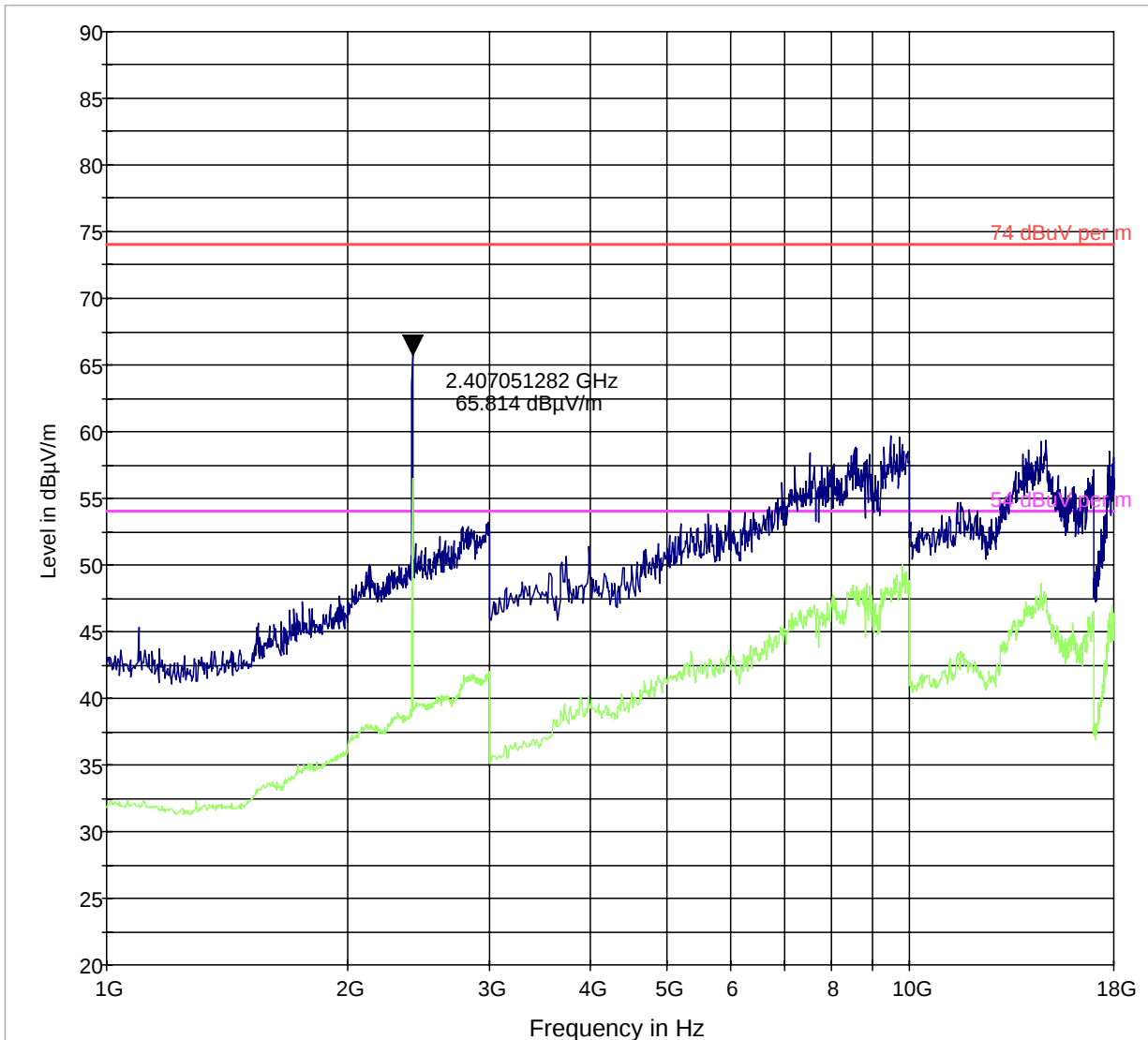
**FCC ID:** VC3-K100622PA

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# **Transmitter Radiated Spurious Emission- Ch11 (2405 MHz): 1 GHz – 18 GHz**

Note: Emission above the limit line is from the transmitter.



— 74 dBuV per m — 54 dBuV per m — Preview Result 1-PK+ — Preview Result 2-AVG

**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

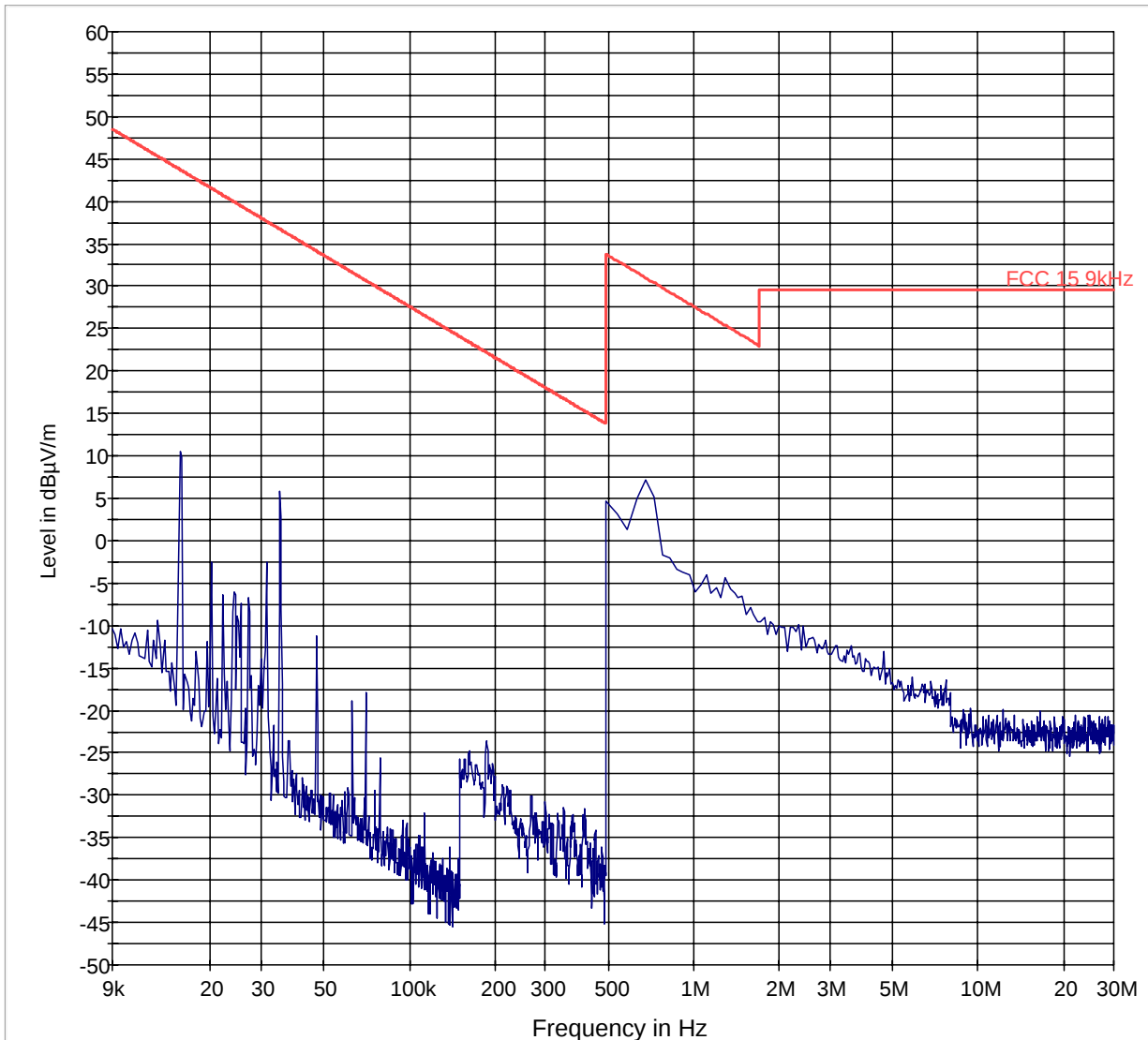
**FCC ID:** VC3-K100622PA

**Date of Report :** March 11, 2014

**IC Cert. No.:** 7160A-K100622PA

**Transmitter Radiated Spurious Emission- Ch 18 (2440 MHz): 9 kHz – 30 MHz**

Note: Worst case representation for all channels in this frequency range



— FCC 15.9kHz — Preview Result 1-PK+

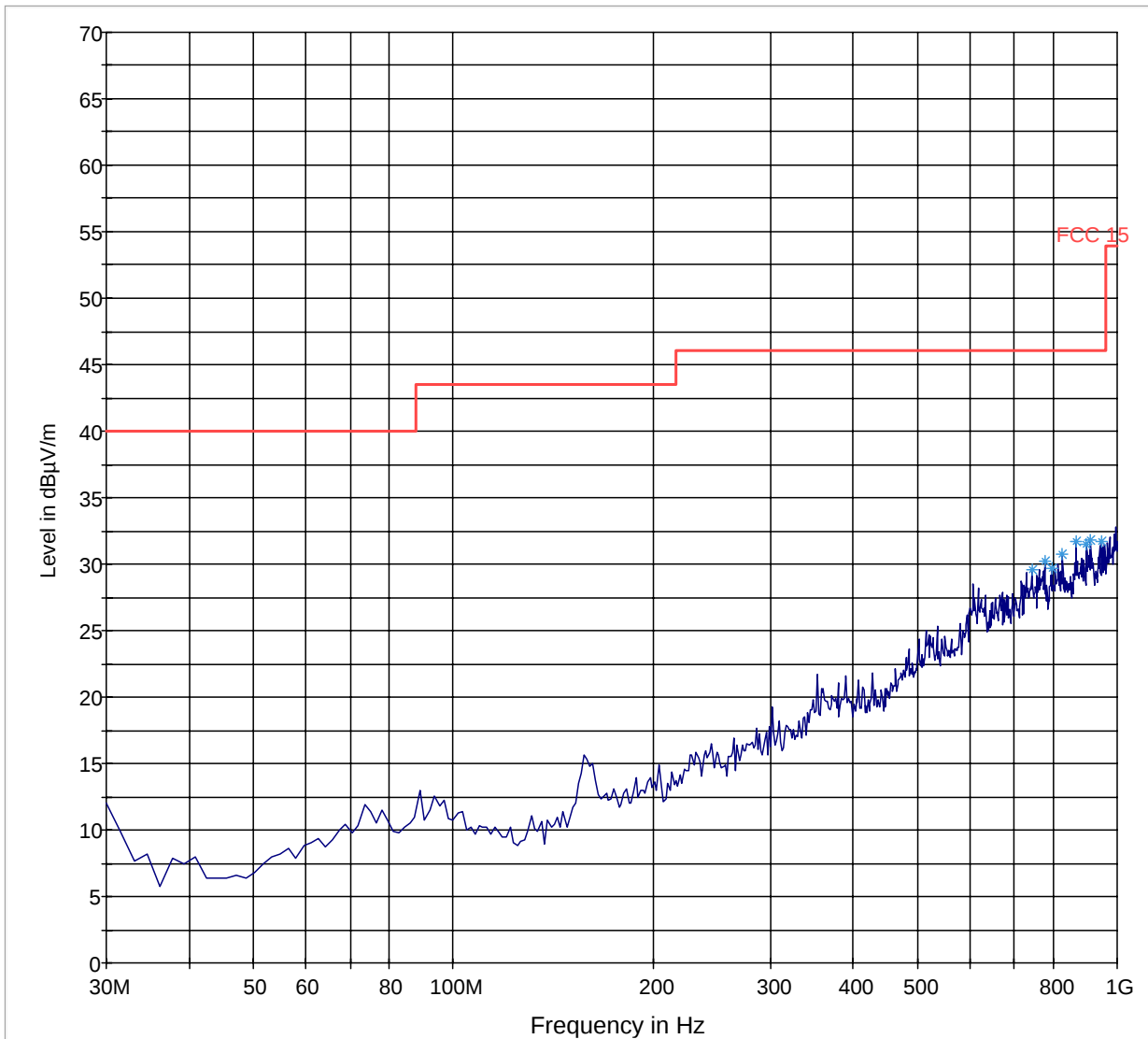
**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

**FCC ID:** VC3-K100622PA

**Date of Report :** March 11, 2014

**IC Cert. No.:** 7160A-K100622PA

**Transmitter Radiated Spurious Emission- Ch18 (2440 MHz): 30 MHz – 1 GHz**



— FCC 15    — Preview Result 1-PK+    \* Data Reduction Result 1 [3]-PK+

**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

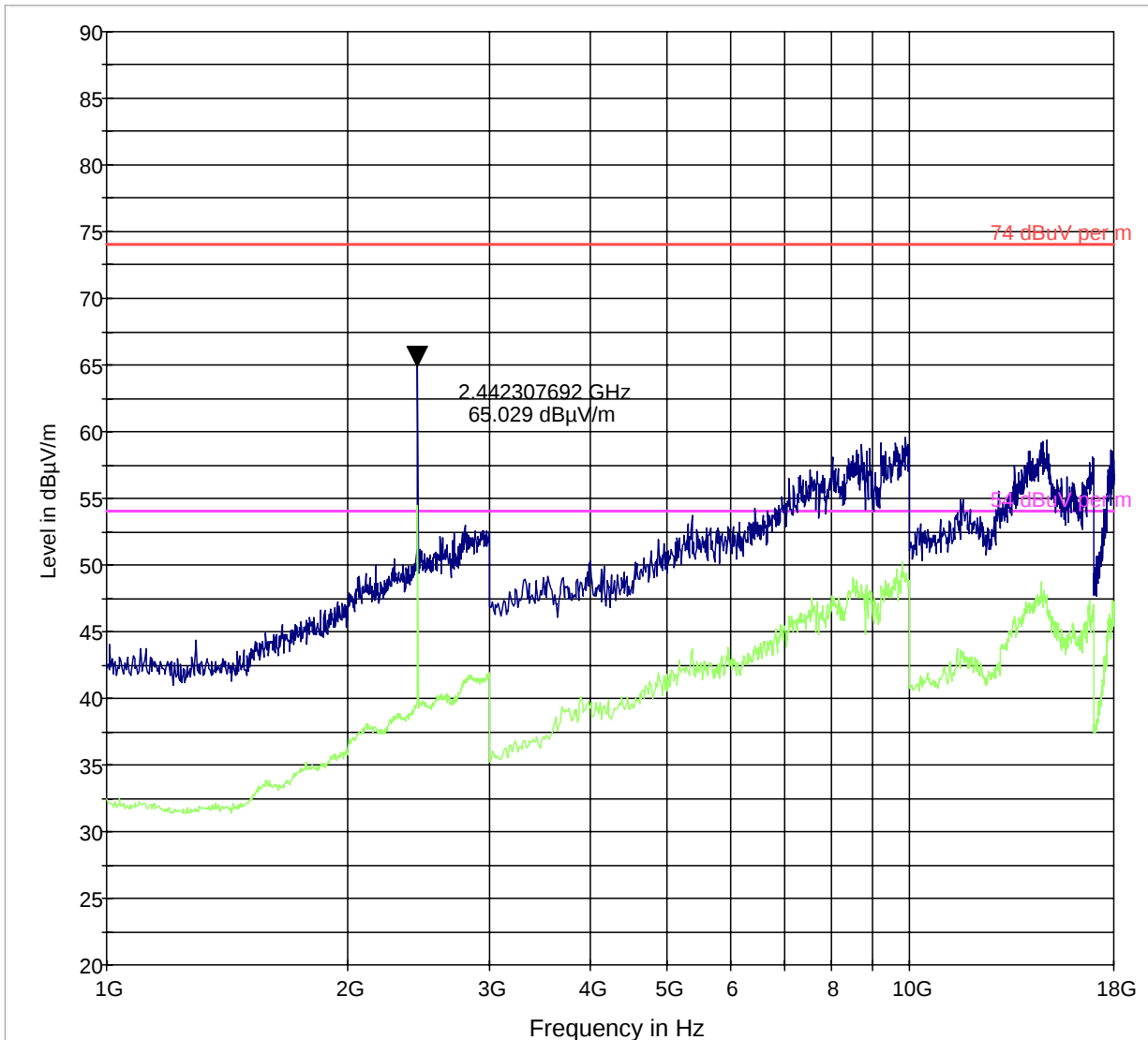
**FCC ID:** VC3-K100622PA

**Date of Report :** March 11, 2014

**IC Cert. No.:** 7160A-K100622PA

# **Transmitter Radiated Spurious Emission- Ch18 (2440 MHz): 1 GHz – 18 GHz**

Note: The emission above the limit line from the transmitter.



— 74 dBuV per m — 54 dBuV per m — Preview Result 1-PK+ — Preview Result 2-AVG

**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

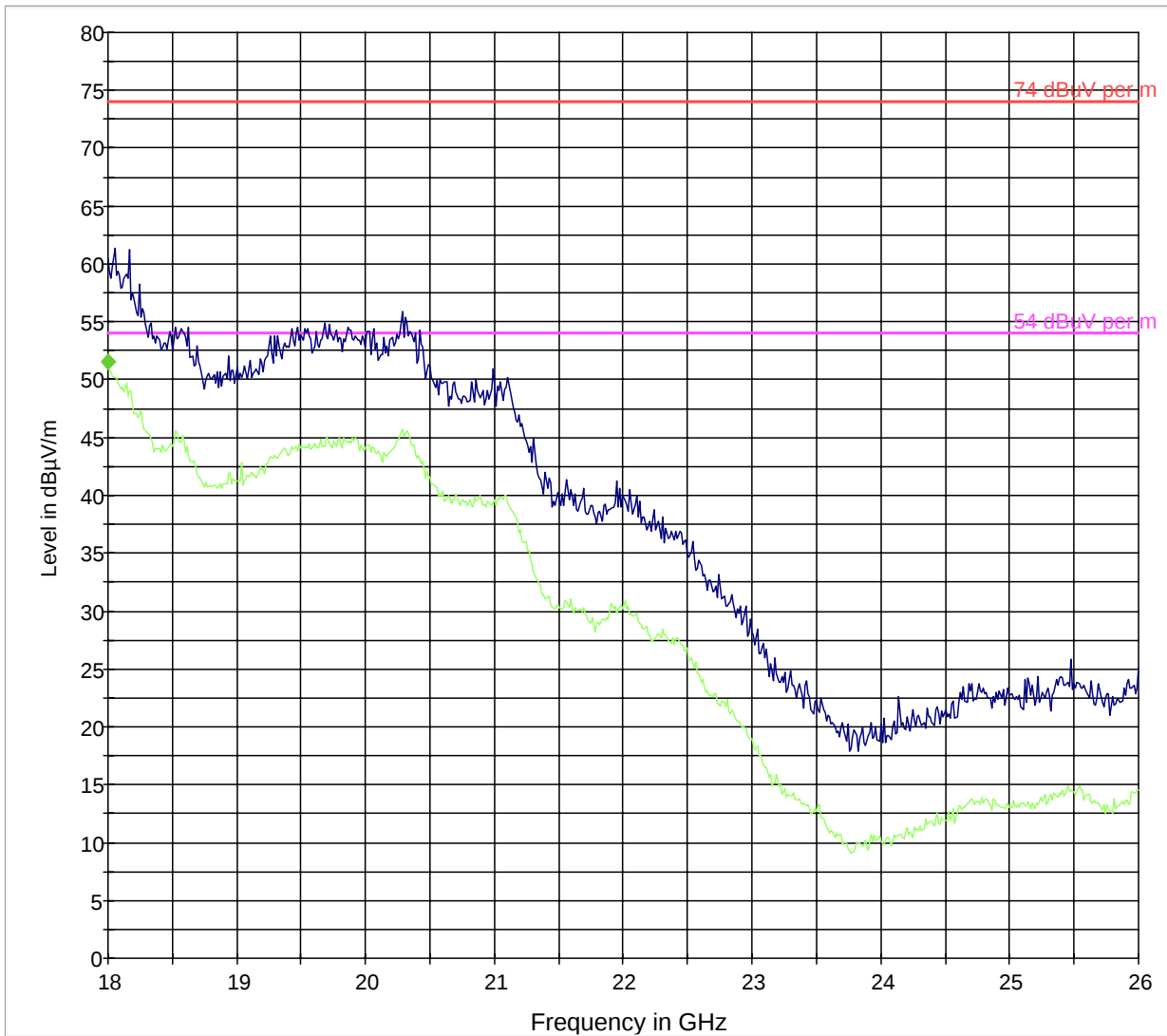
**FCC ID:** VC3-K100622PA

**Date of Report :** March 11, 2014

**IC Cert. No.:** 7160A-K100622PA

## Transmitter Radiated Spurious Emission- Ch18 (2440 MHz): 18 GHz – 26 GHz

Note: Worst case representation of all channels



— 74 dBuV per m     
 — 54 dBuV per m     
 — Preview Result 1-PK+

— Preview Result 2-AVG     
 ◆ Final Result 2-AVG

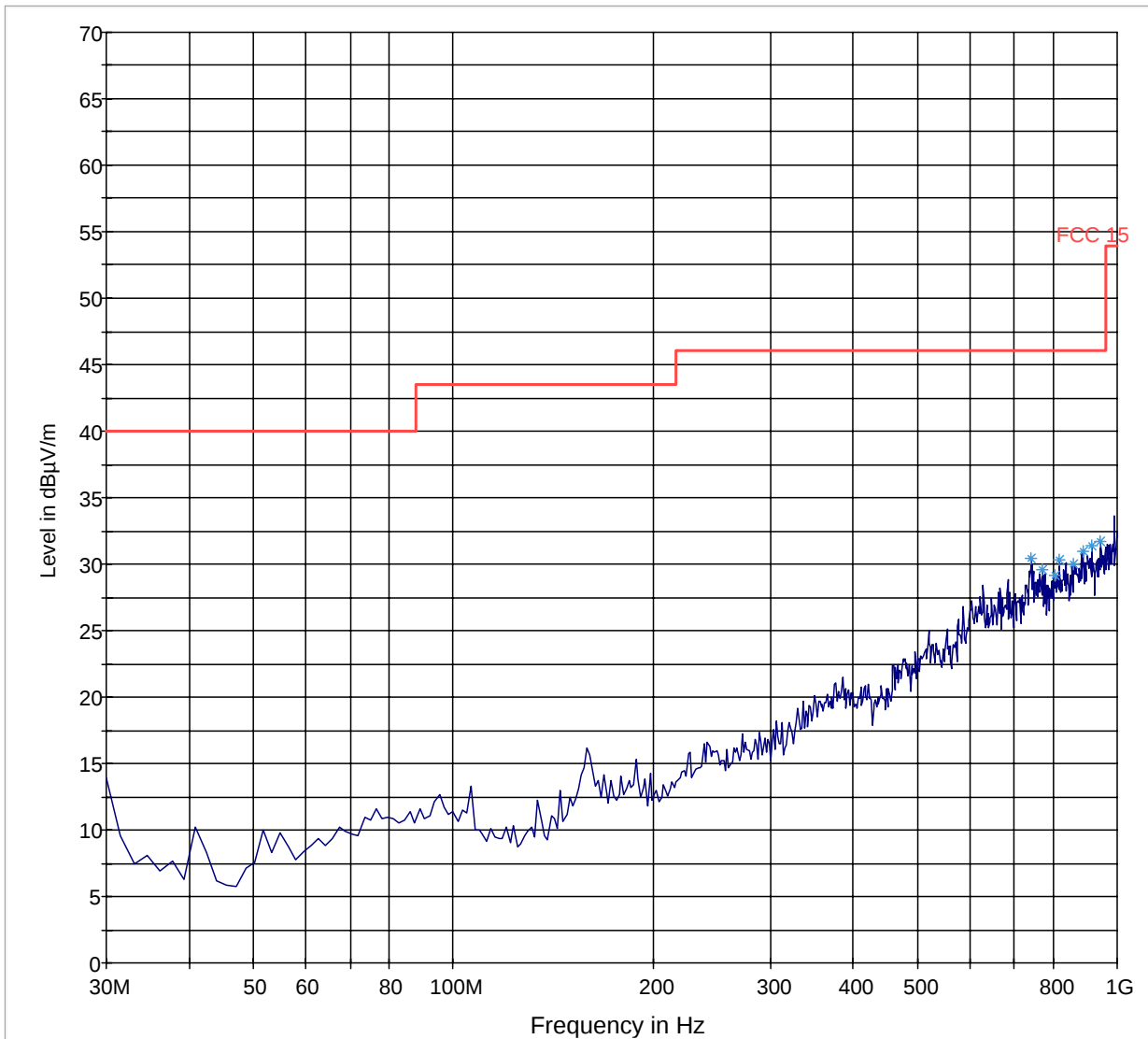
**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

**FCC ID:** VC3-K100622PA

**Date of Report :** March 11, 2014

**IC Cert. No.:** 7160A-K100622PA

**Transmitter Radiated Spurious Emission- Ch25 (2475 MHz): 30 MHz – 1 GHz**



— FCC 15    — Preview Result 1-PK+    \* Data Reduction Result 1 [3]-PK+

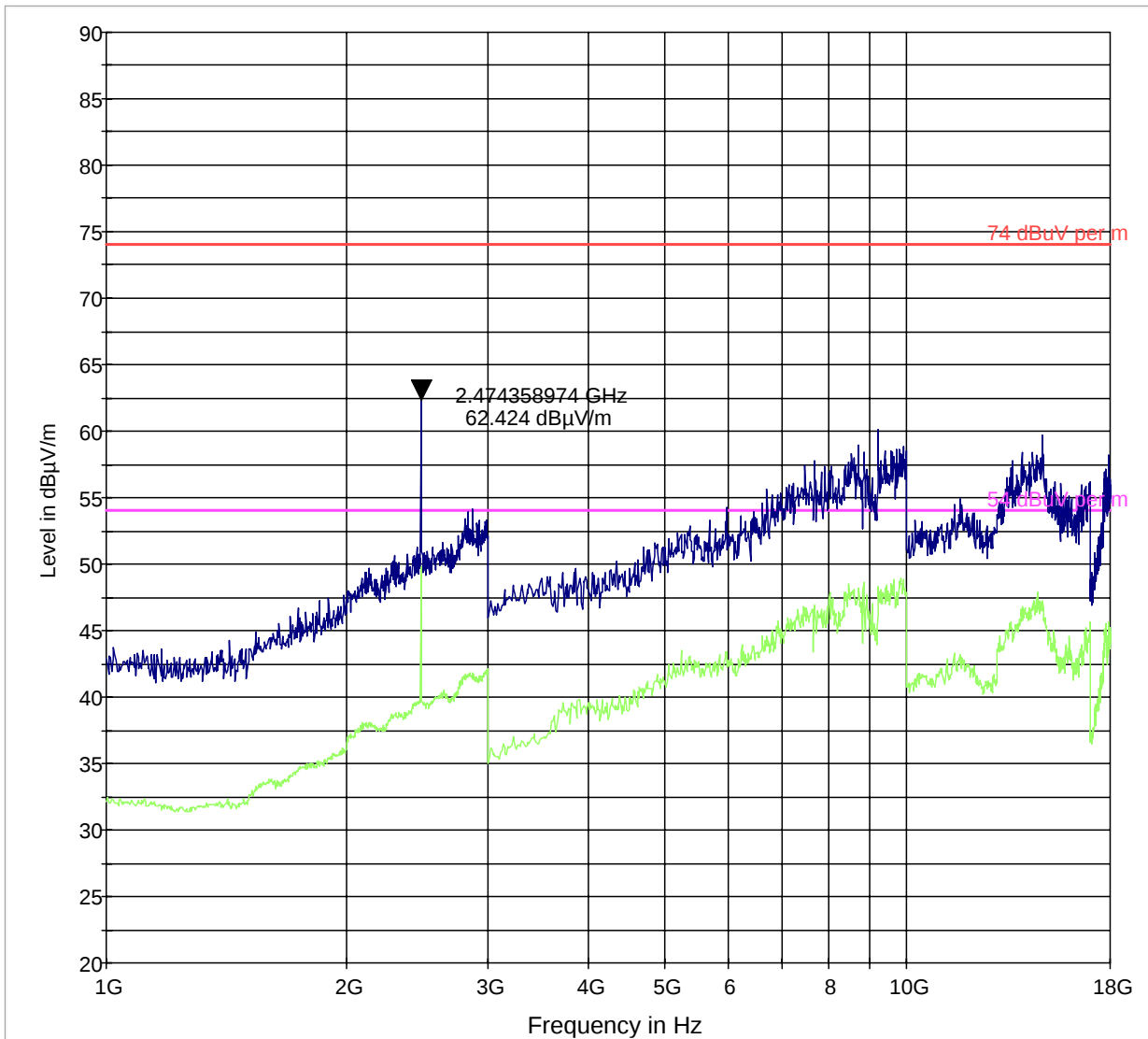
**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

**FCC ID:** VC3-K100622PA

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**IC Cert. No.:** 7160A-K100622PA

**Transmitter Radiated Spurious Emission- Ch25 (2475 MHz): 1 GHz – 18 GHz**



— 74 dBμV per m — 54 dBμV per m — Preview Result 1-PK+ — Preview Result 2-AVG

**Test Report #:** EMC\_HANC1-001-13501\_K100LF\_DTS-R

**FCC ID:** VC3-K100622PA

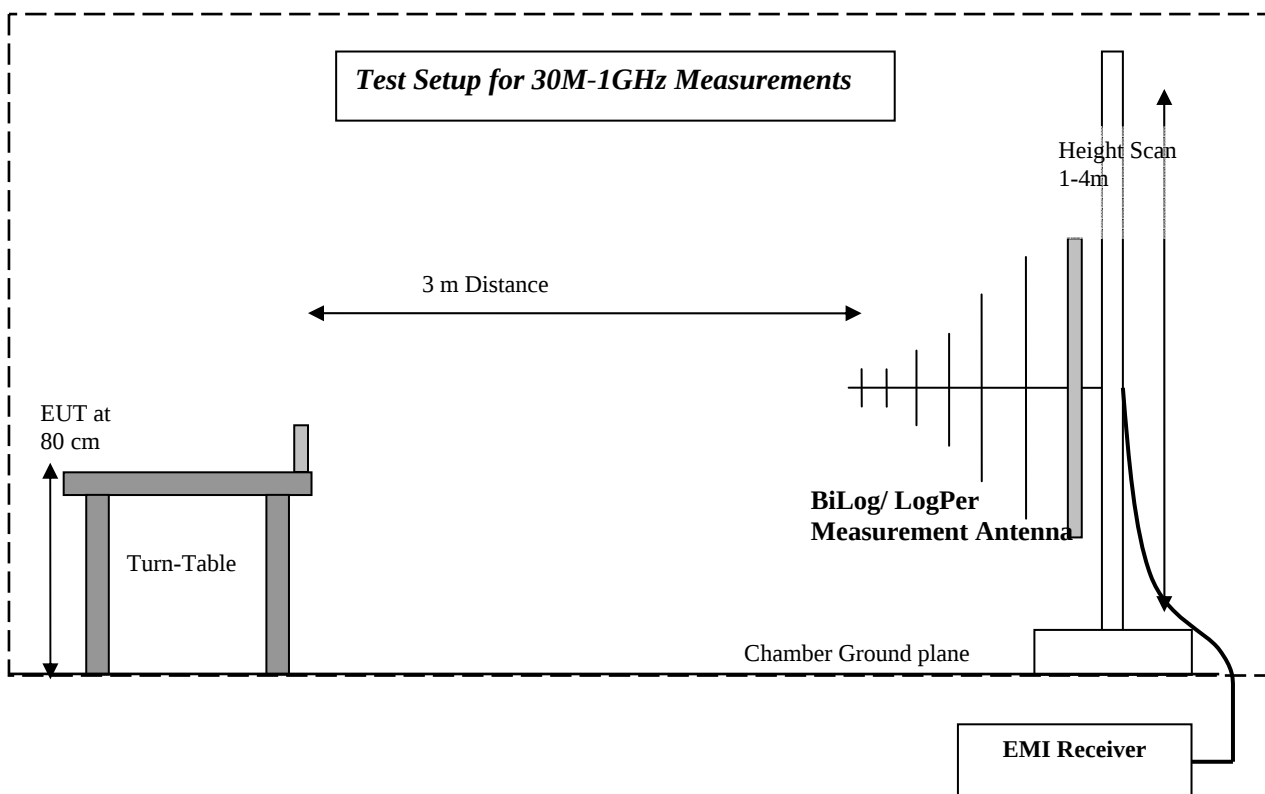
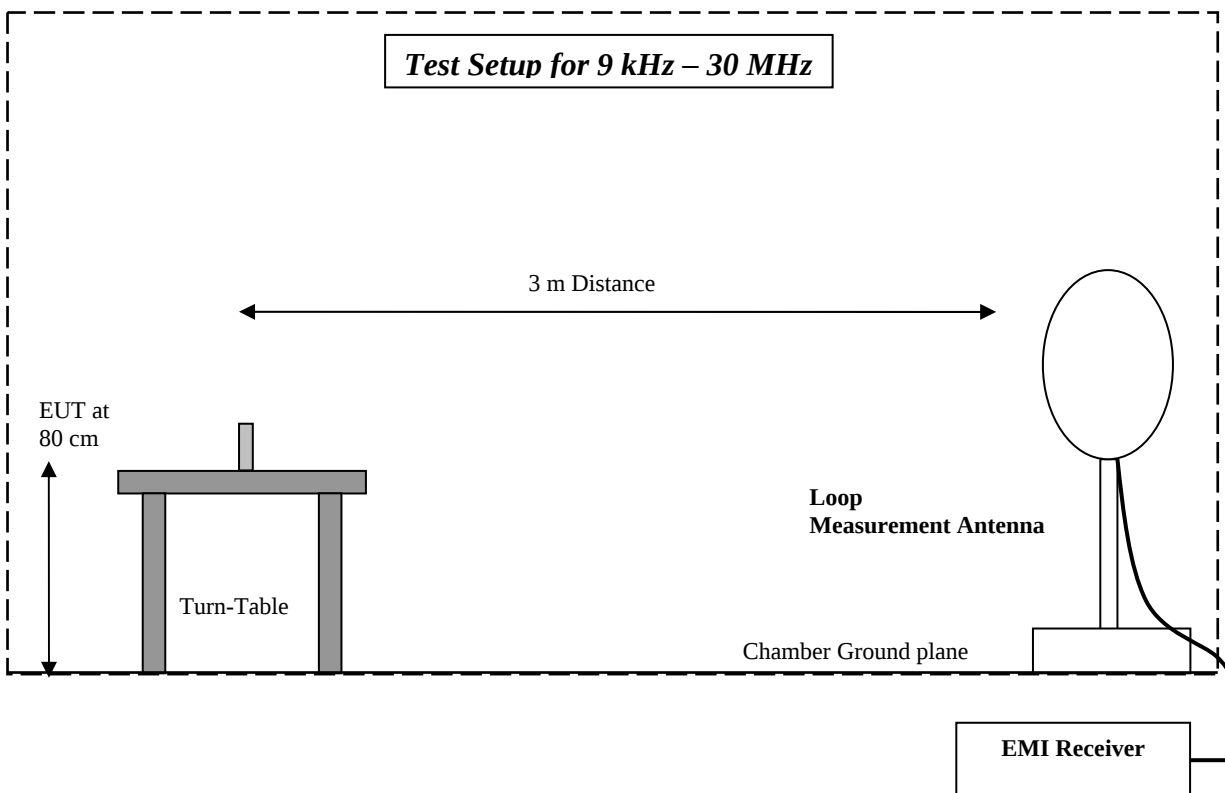
**Date of Report :** March 11, 2014

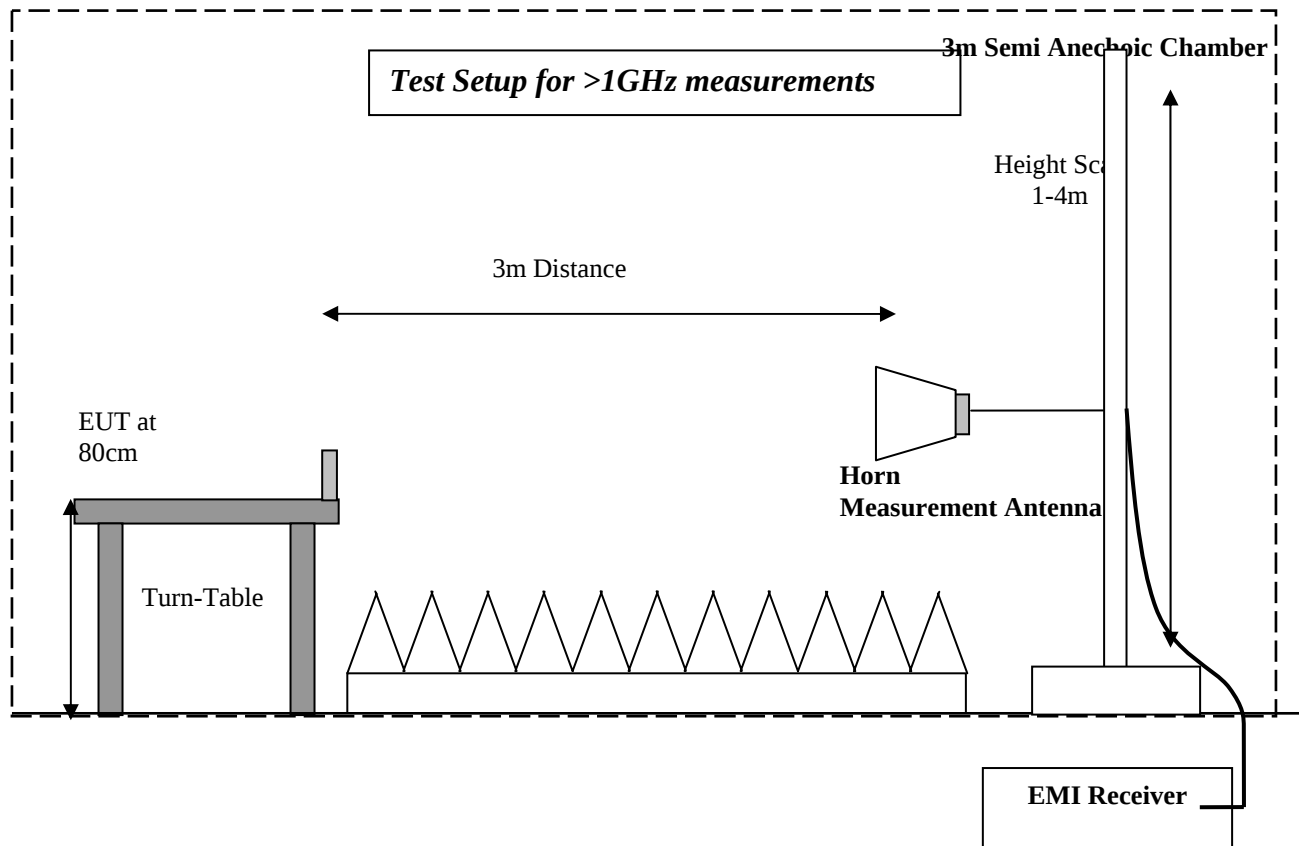
**IC Cert. No.:** 7160A-K100622PA

## 7 Test Equipment and Ancillaries used for tests

| No.                        | Equipment Name              | Manufacturer  | Type/model | Serial No. | Cal Date | Cal Interval |
|----------------------------|-----------------------------|---------------|------------|------------|----------|--------------|
| 3m Semi- Anechoic Chamber: |                             |               |            |            |          |              |
|                            | EMC32 Measurement Software  | Rohde&Schwarz | 8.52.0     | N/A        | N/A      | N/A          |
|                            | Turn table                  | EMCO          | 2075       | N/A        | N/A      | N/A          |
|                            | MAPS Position Controller    | ETS Lindgren  | 2092       | 0004-1510  | N/A      | N/A          |
|                            | Antenna Mast                | EMCO          | 2075       | N/A        | N/A      | N/A          |
|                            | Relay Switch Unit           | Rohde&Schwarz | RSU        | 338964/001 | N/A      | N/A          |
|                            | EMI Receiver/Analyzer(*)    | Rohde&Schwarz | ESU 40     | 100365     | Feb 2013 | 1 Year       |
|                            | 1500MHz HP Filter           | Filtek        | HP12/1700  | 14c48      | N/A      | N/A          |
|                            | 2800 MHz HP Filter          | Filtek        | HP12/2800  | 14C47      | N/A      | N/A          |
|                            | Pre-Amplifier               | Miteq         | JS40010260 | 340125     | N/A      | N/A          |
|                            | Binconilog Antenna          | EMCO          | 3141       | 0005-1186  | Apr 2012 | 3 Years      |
|                            | Binconilog Antenna          | ETS           | 3149       | J000123908 | Feb 2012 | 3 years      |
|                            | Horn Antenna                | EMCO          | 3115       | 35114      | Mar 2012 | 3 Years      |
|                            | LISN                        | FCC           | 50-25-2-08 | 08014      | Jul 2012 | 2 Year       |
| Ancillary equipment        |                             |               |            |            |          |              |
|                            | Multimeter                  | Klein Tools   | MM200      | 001        | Apr 2011 | 3 Years      |
|                            | Humidity Temperature Logger | Dickson       | TM320      | 03280063   | Apr 2013 | 1 Year       |
|                            | Digital Barometer           | VWR           | 35519-055  | 91119547   | Nov 2011 | 3 Years      |
|                            | DC Power Supply             | HP            | E3610A     | KR83023316 | N/A      | N/A          |
|                            | DC Power Supply             | Protek        | 3003B      | H012771    | N/A      | N/A          |
|                            | Communication Antenna       | IBP5-900/1940 | Kathrein   | N/A        | N/A      | N/A          |

## 8 Block Diagrams



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## 9 Revision History

| Date           | Report Name – Changes to Report                        | Report prepared by |
|----------------|--------------------------------------------------------|--------------------|
| March 11, 2014 | EMC_HANC1-001-13501_K100LF_DTS-R<br>1. Original Report | J. Sabado          |