



FCC / IC Test Report

FOR:

Bot Home Automation

Model Name:

Chime

Product Description:

Wi-Fi Enabled Doorbell

FCC ID: 2AEUPBHACM001

IC ID: 20271- BHACM001

47 CFR Part 15.247

RSS-247 Issue 1 & RSS-Gen Issue 4

TEST REPORT #: EMC_BOTH0-003-15001_15.247_DTS_WLAN

DATE: 2015-07-16



IC recognized # 3462B-1

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1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant IC standard RSS-247 issue 1. No deviations were ascertained.

| Company | Product Description | Model # |
|---------------------|------------------------|---------|
| Bot Home Automation | Wi-Fi Enabled Doorbell | Chime |

Responsible for Testing Laboratory:

| 2015-07-19 | Compliance | Franz Engert (Compliance Manager) | |
|------------|------------|--------------------------------------|-----------|
| Date | Section | Name | Signature |

Responsible for the Report:

| 2015-07-19 | Compliance | Franz Engert (Compliance Manager) | |
|------------|------------|--------------------------------------|-----------|
| Date | Section | Name | Signature |

The test results of this test report relate exclusively to the test item specified in Section3.

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.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

| | |
|------------------------------------|--|
| Company Name: | CETECOM Inc. |
| Department: | Compliance |
| Address: | 411 Dixon Landing Road Milpitas, CA 95035 U.S.A. |
| Telephone: | +1 (408) 586 6200 |
| Fax: | +1 (408) 586 6299 |
| Compliance Manager: | Franz Engert |
| Responsible Project Leader: | Yu-Chien Ho |

2.2 Identification of the Client

| | |
|--------------------------|------------------------|
| Client Firm/Name: | Ring |
| Street Address: | 1523 26th Street |
| City/Zip Code | Santa Monica, CA 90404 |
| Country | USA |
| Contact Person: | Tim Simons |
| Phone No. | 310-227-2217 |
| e-mail: | tim@ring.com |

2.3 Identification of the Manufacturer

| | |
|-------------------------------|--|
| Manufacturer's Name: | Ennoconn |
| Manufacturers Address: | 3F, Number A03 Building, A District |
| City/Zip Code | Longxi Town, Bolou County, Huizhou City, Guangdong |
| Country | China |

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

| | |
|---|---|
| Marketing Name / Model No: | Ring / Chime |
| HW Version : | V1 |
| FCC-ID : | 2AEUPBHACM001 |
| IC-ID: | 20271- BHACM001 |
| Product Description: | Wi-Fi Enabled Doorbell |
| Technology/ Type(s) of Modulation: | 802.11b/g/n with CCK, DQPSK, DBPSK + DSSS QBSK, BPSK, 16 QAM, 64 QAM + OFDM |
| Modes of Operation | 802.11b/g/n (Client) |
| Channel Bandwidths | Up to 20 MHz |
| Operating Frequency Ranges (MHz)/ Channels: | Nominal band: 2400 – 2483.5 MHz; 2412 MHz (Ch. 1) – 2462 (Ch.11), 11 channels |
| Antenna info: | PCB - Inverted F 2.4 GHz: 2.0 dBi |
| Maximum Output Powers: | Conducted: 18.18 dBm (65.76 mW) for 802.11b Conducted: 19.96 dBm (99.08 mW) for 802.11g Conducted: 19.32 dBm (85.51 mW) for 802.11n |
| Power Supply/ Rated Operating Voltage Range: | Input: 110-240V~50-60 Hz, 2.0-1.0 A |
| operating temperature range | Tlow: 0° C/ Tnom: 25° C/ Tmax: 40° C |
| Prototype / Production unit | Production |

3.2 Identification of the Equipment Under Test (EUT)

| EUT # | Serial Number | HW Version | SW Version | Notes/Comments |
|-------|--------------------|------------|------------|------------------|
| 1 | UH81517014585BUB2C | 01 | V1 | Radiated Sample |
| 2 | UH81517014604BUB2O | 01 | V1 | Conducted Sample |

3.3 Identification of Accessory equipment

| AE # | Type | Manufacturer | Model | Serial Number |
|------|------|--------------|-------|---------------|
| 1 | N/A | | | |

3.4 Environmental conditions during Test:

The following environmental conditions were maintained during the course of testing:

Ambient Temperature: 20-25°C

Relative humidity: 40-60%

3.5 Dates of Testing:

2015/05/15 – 2015/05/25

3.6 Testing Notes:

The EUT was set in WLAN Test mode using Radio Tool GUI.

3.7 Test mode of operation:

| Mode | Data rate (Mbps) | Modulation scheme |
|-----------------------|------------------|-------------------|
| 802.11b | 11 | CCK |
| 802.11g | 6 | BPSK+DSSS |
| 802.11n (HT20) | 6.5 (MCS0) | BPSK+OFDM |

The Device was set to continuous framed Tx (burst) mode per test SW. When 98% duty cycle cannot be achieved, duty cycle correction factor shall be added to the measurement results.

For radiated spurious emissions, the EUT was tested on low, mid and high channels (2.4GHz) in 802.11g mode only since it produced the highest output power test results.

4 Subject of Investigation

The objective of the evaluation documented in this report was to assess if the performance of the EUT meets the relevant requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 issue 1 of Industry Canada.

This test report is to support a request for new equipment authorization under the FCC ID: **2AEUPBHACM001** and IC ID: **20271- BHACM001**.

All testing was performed on the product referred to in Section 3 as EUT.

The EUT was tested with the transmitter sets on low, mid and high channels. For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

5 Summary of Measurement Results

| Test Specification | Test Case | Temperature and Voltage Conditions | Mode | Pass | Fail | NA | NP | Result |
|---|---|------------------------------------|---------------------------------|------|------|----|----|----------|
| §15.247(e) RSS-247 5.2(2) | Power Spectral Density | Nominal | 802.11b 802.11g 802.11n20 | ■ | □ | □ | □ | Complies |
| §15.247(a)(1) RSS-247 5.2(1) | Emission Bandwidth | Nominal | 802.11b 802.11g 802.11n20 | ■ | □ | □ | □ | Complies |
| §15.247(b)(1) RSS-247 5.4(4) | Maximum Conducted Output Power and EIRP | Nominal | 802.11b 802.11g 802.11n20 | ■ | □ | □ | □ | Complies |
| §15.247(d) §15.247(a) RSS-247 5.5 RSS Gen 8.10 | Band edge & Restricted Band Edge compliance | Nominal | 802.11b 802.11g 802.11n20 | ■ | □ | □ | □ | Complies |
| §15.247(d) §15.209(a) RSS-Gen 6.13 | TX Spurious emissions-Radiated | Nominal | 802.11g | ■ | □ | □ | □ | Complies |
| §15.207(a) RSS-Gen 8.8 | AC Conducted Emissions | Nominal | 802.11g | ■ | □ | □ | □ | Complies |

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

6 Measurements

6.1 Radiated Measurement Procedure

Ref: ANSI C63.10 (2013)

Section 5.4: Measurements around the EUT

Measurements shall be made at a test site that incorporates a turntable allowing EUT rotation of 0° through 360°, except where the EUT is so large that a suitable turntable is not readily available. A remotely controlled turntable shall be installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. Continuous azimuth searches shall be made. The maximum field strength at the frequency being measured shall be reported in the test report.³² See ANSI C63.4 for details of the test site, turntable, and antenna positioner. Where a continuous azimuth search cannot be made, as is the case for example where the EUT is so large that a suitable turntable is not readily available, frequency scans of the EUT field strength with both polarizations of the measuring antenna shall be made, starting with a minimum of 16 azimuth angles around the EUT, nominally spaced by 22.5°, in characterizing the EUT radio-noise profile. If directional EUT radiation patterns are suspected, especially above 1 GHz then additional and smaller azimuth angles shall be examined.

Section 5.3.2: Test distance for frequencies below 30 MHz

Radiated emissions limits are usually defined at a specific distance from the EUT. Where possible, measurements shall be made at the distance specified in the limits. This might not be possible in all cases, however, due to the physical limitations of the test facility, physical access problems at the required distance (especially for measurements that must be made in situ or on-site), or levels of ambient noise or other radiated signals present at the time and location where measurements are made. See 6.4.3 for more information about antenna selection, location, and test distance. If measurements cannot practically be made at the EUT limit distance, then they may be made at a different distance (usually closer) and extrapolated to the limit distance using one of the procedures described in 6.4.4, 6.4.5, or 7.7, depending on the EUT source and size.³¹ The test report shall specify the extrapolation method used to determine compliance of the EUT.

Section 5.3.3: Test distance for frequencies at or above 30 MHz

Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment (see 4.3.4). Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. Measurements from 18 GHz to 40 GHz are typically made at distances significantly less than 3 m from the EUT. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade of distance (inverse of linear distance for field-strength measurements or inverse of linear distance-squared for power-density measurements).

ANSI C63.10 (2013)**Section 6.6.4.2: Exploratory radiated emissions 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 and, if applicable, the EUT configuration that produces the maximum level of emissions. The frequencies of maximum emission may be determined by manually positioning the antenna close to the EUT, and then moving the antenna over all sides of the EUT while observing a spectral display. It is advantageous to have prior knowledge of the frequencies of emissions, although this may be determined from such a near-field scan. The near-field scan shall only be used to determine the frequency but not the amplitude of the emissions. Where exploratory measurements are not adequate to determine the worst-case operating modes and are used only to identify the frequencies of the highest emissions, additional preliminary tests can be required.

Preliminary tests shall be performed following the procedures in 6.3 on a site meeting the requirements of 5.2. For emissions from the EUT, the maximum level shall be determined by rotating the EUT and its antenna through 0° to 360°. For each mode of operation required to be tested, the frequency spectrum (based on findings from exploratory measurements) shall be monitored.

Section 6.6.4.3: Final radiated emissions measurements

The final measurements are performed on a site meeting the requirements of 5.2. Using the orientation and equipment arrangement of the EUT based on the measurement results found during the preliminary (exploratory) measurements per 6.6.4.2, the EUT arrangement, appropriate modulation, and modes of operation that produce the emissions that have the highest amplitude relative to the limit shall be selected for the final measurement. The final measurement shall follow all the procedures in 6.3 with the EUT operating on frequencies per 5.6. For each mode selected, record the frequency and amplitude of the highest fundamental emission (if applicable), as well as the frequency and amplitude of the six highest spurious emissions relative to the limit. Emissions more than 20 dB below the limit do not need to be reported.

Measurements are performed with the EUT rotated from 0° to 360°. the antenna height scanned in accordance with 6.6.3.1, 6.6.3.2, or 6.6.3.3, as appropriate; and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Variations in cable or wire placement shall be explored to maximize the measured emissions.

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.

6.2 Sample Calculations for Radiated Measurements

6.2.1 Field Strength 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 μ V
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

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

Eg:

| Frequency (MHz) | Measured SA (dB μ V) | Cable Loss (dB) | Antenna Factor Correction (dB) | Field Strength Result (dB μ 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.

6.2.2 Measurement Uncertainty

| | Uncertainty in dB radiated <30MHz | Uncertainty in dB radiated 30MHz - 1GHz | Uncertainty in dB radiated > 1GHz | Uncertainty in dB Conducted measurement |
|---|-----------------------------------|---|-----------------------------------|---|
| standard deviation k=1 | 2.48 | 1.93 | 2.16 | 0.63 |
| 95% confidence interval in dB | 4.86 | 3.79 | 4.23 | 1.24 |
| 95% confidence interval in dB in delta to Result | +/-2.5 dB | +/-2.0 dB | +/- 2.3dB | +/-0.7dB |

6.3 Conducted Emissions Procedure

Ref: ANSI C63.10 (2013)

Section 6.2: Standard test method for ac power-line conducted emissions from unlicensed wireless devices

Section 6.2.1: General considerations

AC power-line conducted emission measurements shall be made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz, to determine the line-to-ground radio-noise voltage that is conducted from all of the EUT current-carrying power input terminals that are directly (or indirectly via separate transformers or power supplies) connected to a public power network. These measurements may also be required between 9 kHz and 150 kHz.

If the EUT normally receives power from another device that in turn connects to the public utility ac power lines, measurements shall be made on that device with the EUT in operation to demonstrate that the device continues to comply with the appropriate limits while providing the EUT with power. If the EUT is operated only from internal or dedicated batteries, with no provisions for connection to the public utility ac power lines (600 VAC or less) to operate the EUT (such as an adapter), then ac power-line conducted measurements are not required.

For direct current (dc) powered devices where the ac power adapter is not supplied with the device, an “off-the-shelf” unmodified ac power adapter shall be used. If the device is supposed to be installed in a host (e.g., the device is a module or PC card), then it is tested in a typical compliant host (see also 5.10.3).

Section 6.2.2: Measurement requirements

The LISN housing, measuring instrument case, reference ground plane, vertical conducting plane, if used, shall be bonded together.

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

ANSI C63.10 (2013)**Section 6.2.4: Exploratory ac power-line conducted emission measurements**

Exploratory tests shall be run with the modulating signal(s) specified in 5.12 applied to the EUT.

Antenna(s) can be integral or detachable. If detachable, the antenna(s) shall be attached during the test.

On any one convenient frequency specified in 5.5 and 5.6, exploratory measurements shall be used to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement. For each mode of operation and for each ac power current-carrying conductor, cable manipulation shall be performed within the range of likely configurations. For this measurement or series of measurements, the frequency spectrum of interest shall be monitored looking for the emission that has the highest amplitude relative to the limit. Once that emission is found for each current-carrying conductor of each power cord associated with the EUT (but not the cords associated with non-EUT equipment in the overall system), the one configuration and arrangement and mode of operation that produces the emission closest to the limit over all of the measured conductors shall be recorded.

Section 6.2.5: Final ac power-line conducted emission measurements

Based on the exploratory tests of the EUT performed in 6.2.4, the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation. If the EUT is composed of equipment units that have their own separate ac power connections (e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network), then each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be measured separately. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

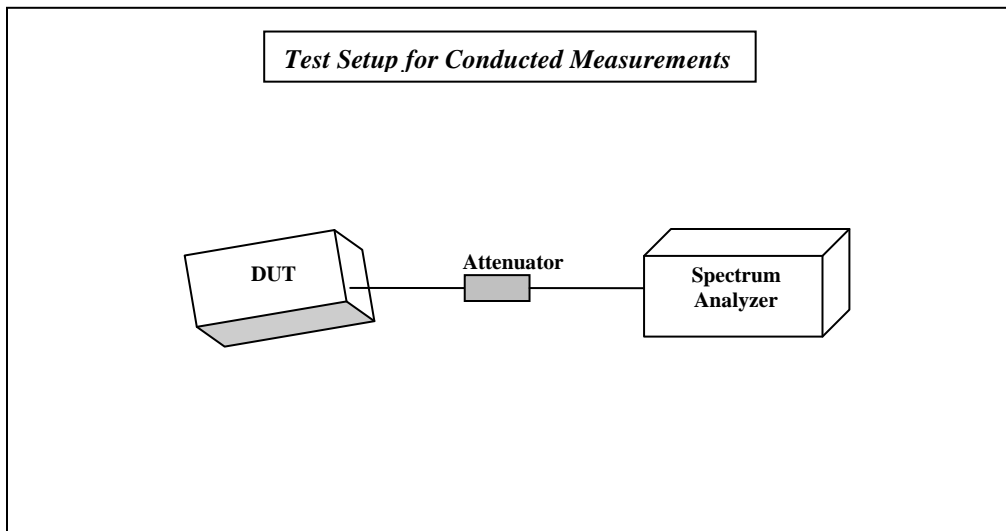
If the EUT operates above 30 MHz and uses a detachable antenna, then these measurements shall be made with a representative antenna connected to the antenna output terminals. These tests shall be made with the antenna connected and, if adjustable, fully extended.

Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency.

6.4 RF Conducted Measurement Procedure

Reference: FCC KDB 558074 D01 DTS Meas Guidance v03r0

(Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) Operating Under §15.247)



1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the SA (Rohde-Schwarz Spectrum Analyzer) to connect the EUT at the required mode of test.
3. Measurements are to be performed with the EUT set to the low, middle and high channels and for CCK, BPSK, and QAM modulation schemes.

7 Maximum Peak Conducted Output Power

7.1 Limits:

FCC §15.247 (b) (3): 1W (30 dBm)

RSS-247 issue 1, section 5.4 (4): 1W (30 dBm)

EIRP:

FCC §15.247 (b) (3): 6W (36 dBm)

RSS-247 issue 1, section 5.4 (4): 4W (36 dBm)

7.2 Test Conditions:

Tnom: 22°C; Vnom: 120 VAC

7.3 Test Procedure:

Measurement according to FCC KDB 558074 D01 DTS Measure Guidance v03r03 section 9.1.1

Maximum peak conducted output power

Spectrum Analyzer settings:

| | |
|------------------|---|
| Centre Frequency | The center frequency of the channel under test. |
| RBW | \geq DTS bandwidth |
| VBW | $\geq 3 \times$ RBW |
| Span | $\geq 3 \times$ RBW |
| Detector | peak |
| Sweep time | auto |
| Trace | Max hold |

- Allow trace to fully stabilize

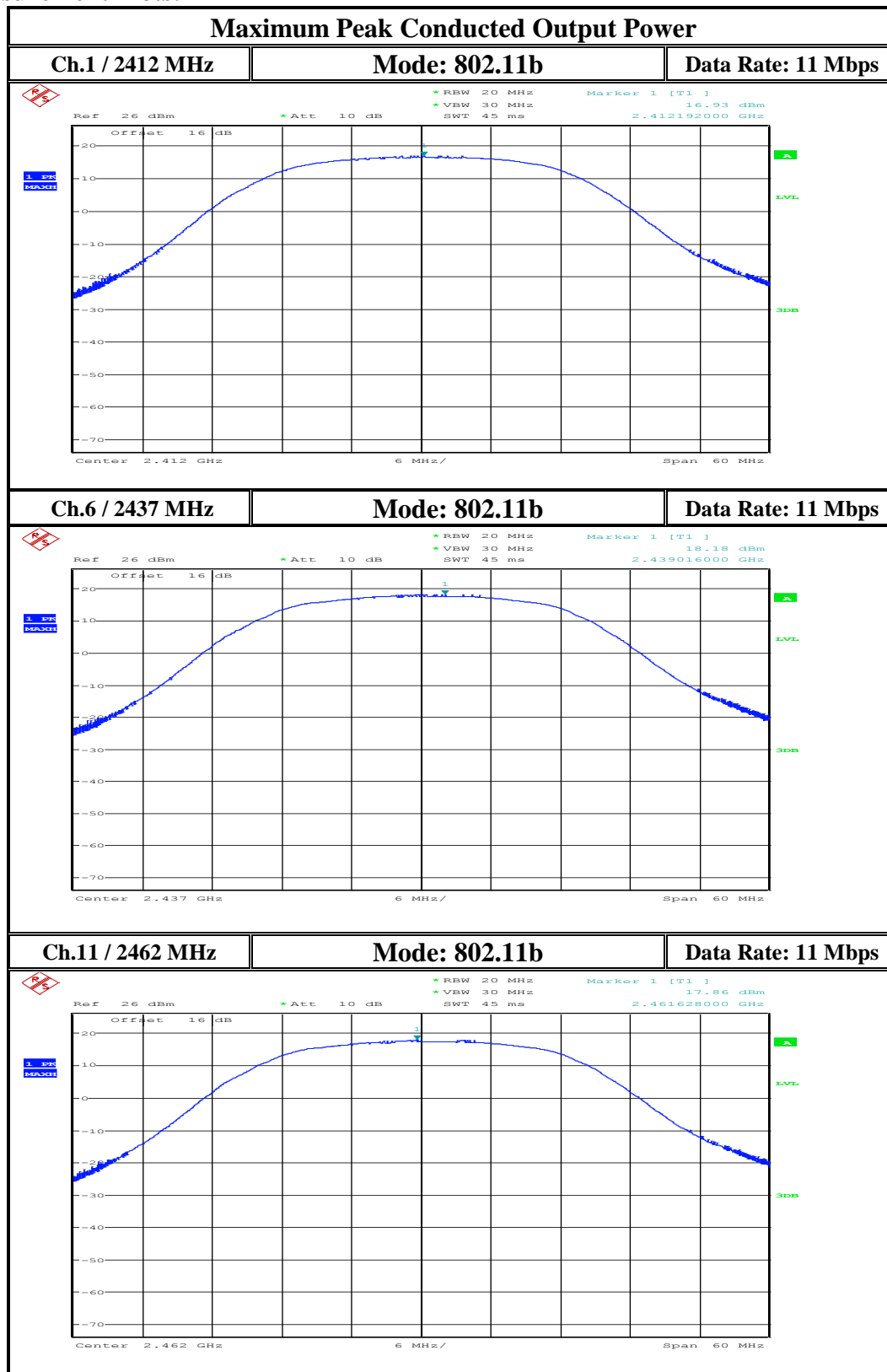
- Use peak marker function to determine the peak amplitude level.

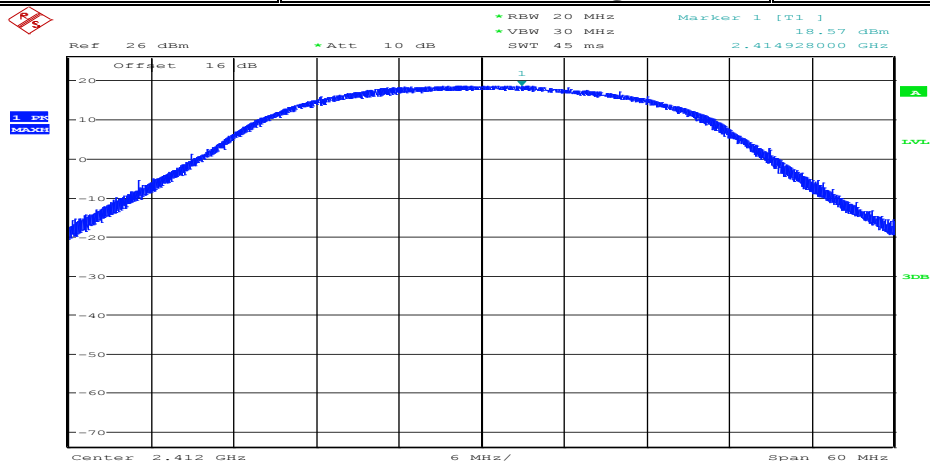
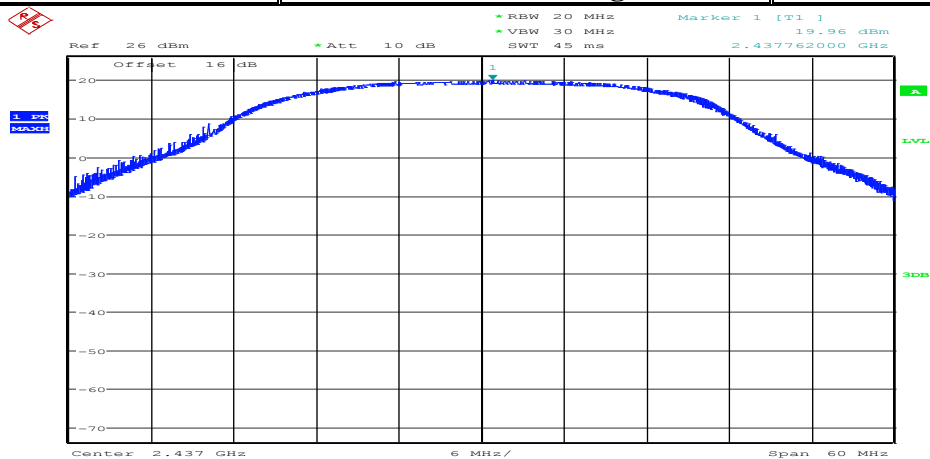
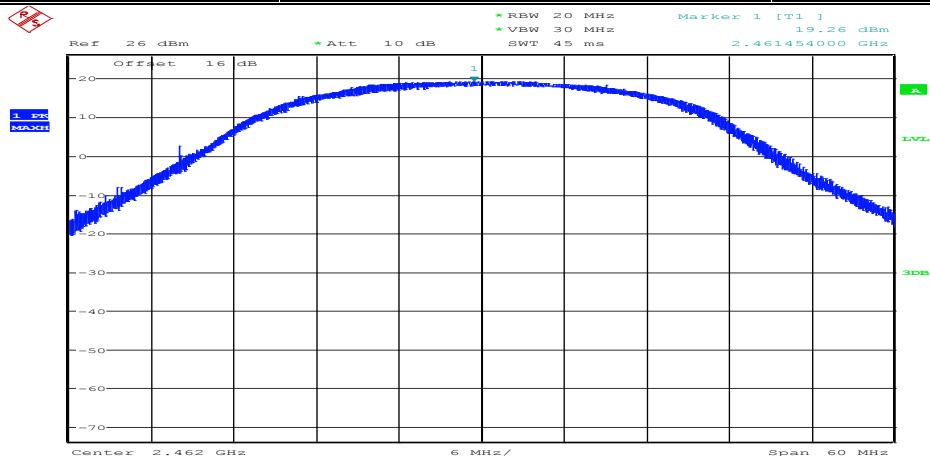
7.4 Test Results:

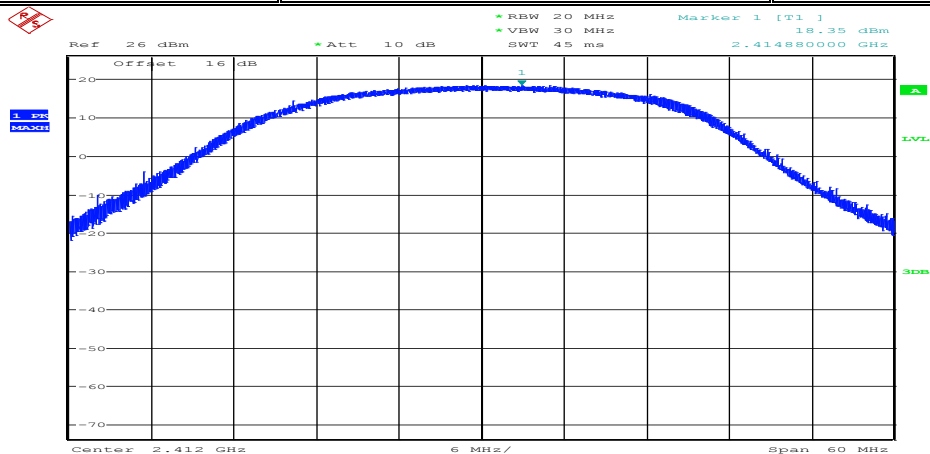
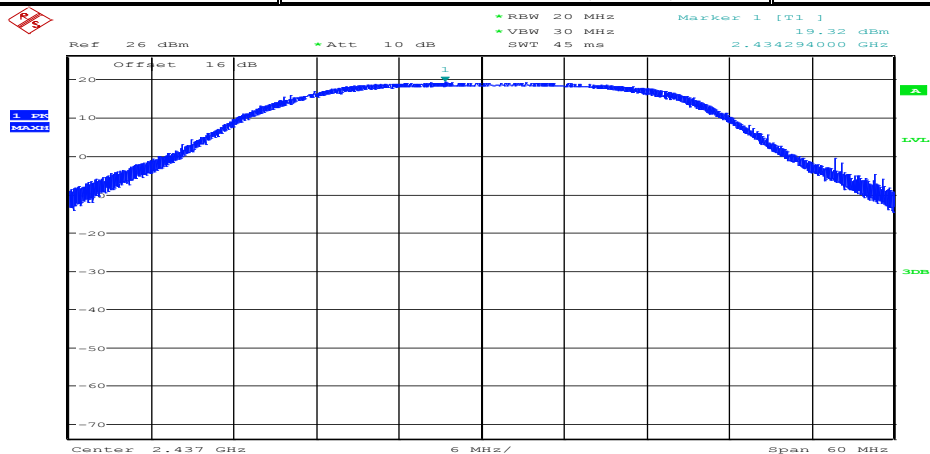
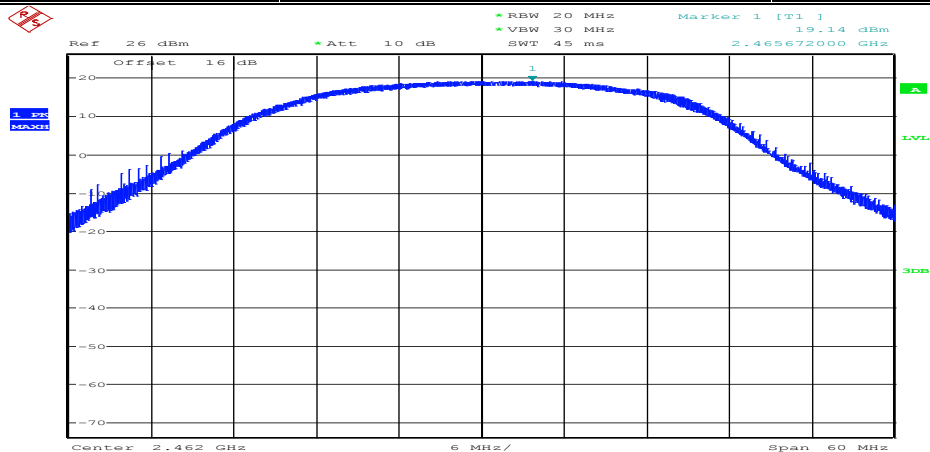
| Maximum Peak Conducted Output Power & EIRP (dBm) | | | | | | | |
|---|---------------------|--------------------|-------|--------------------|-------|--------------------|-------|
| <u>Conducted Power</u> FCC Limit = 30 dBm RSS Limit = 30 dBm <u>EIRP</u> FCC Limit = 36 dBm RSS Limit = 36 dBm | | Frequency (MHz) | | | | | |
| | | 2412 Channel 1 | | 2437 Channel 6 | | 2462 Channel 11 | |
| | | Conducted Power | EIRP | Conducted Power | EIRP | Conducted Power | EIRP |
| | | Conducted Power | EIRP | Conducted Power | EIRP | Conducted Power | EIRP |
| Mode | Data Rate (Mbps) | Conducted Power | EIRP | Conducted Power | EIRP | Conducted Power | EIRP |
| 802.11b | 11 | 16.93 | 18.93 | 18.18 | 20.18 | 17.86 | 19.86 |
| 802.11g | 6 | 18.57 | 20.57 | 19.96 | 21.96 | 19.26 | 21.26 |
| 802.11n | 6.5 (MCS0) | 18.35 | 20.35 | 19.32 | 21.32 | 19.14 | 21.14 |
| Antenna Gain = 2.0 dBi | | | | | | | |

7.5 Measurement Verdict:

Pass

7.6 Measurement Plots:

Maximum Peak Conducted Output Power**Ch.1 / 2412 MHz****Mode: 802.11g****Data Rate: 6 Mbps****Ch.6 / 2437 MHz****Mode: 802.11g****Data Rate: 6 Mbps****Ch.11 / 2462 MHz****Mode: 802.11g****Data Rate: 6 Mbps**

Maximum Peak Conducted Output Power**Ch.1 / 2412 MHz****Mode: 802.11n (HT20)****Data Rate: MCS0****Ch.6 / 2437 MHz****Mode: 802.11n (HT20)****Data Rate: MCS0****Ch.11 / 2462 MHz****Mode: 802.11n (HT20)****Data Rate: MCS0**

8 Power Spectral Density

8.1 Limits:

FCC §15.247 (e)

RSS-247 issue 1, section 5.2 (2)

For digitally modulated systems, the power spectral density conducted from the transmitter to the antenna shall not be greater the 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.2 Test Conditions:

Tnom: 21°C; Vnom: 120 VAC

8.3 Test Procedure:

Measurement according to FCC KDB 558074 D01 DTS Measure Guidance v03r03 section 10.2

Peak Power Spectral Density

Spectrum Analyzer settings:

| | |
|------------------|---|
| Centre Frequency | The center frequency of the channel under test. |
| RBW | ≥ 3 kHz |
| VBW | $\geq 3 \times$ RBW |
| Span | ≥ 1.5 times the OBW |
| Sweep time | Auto |
| Detector | Peak |
| Trace | Max hold |

- Allow trace to fully stabilize
- Use peak marker function to determine the peak amplitude level.
- If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

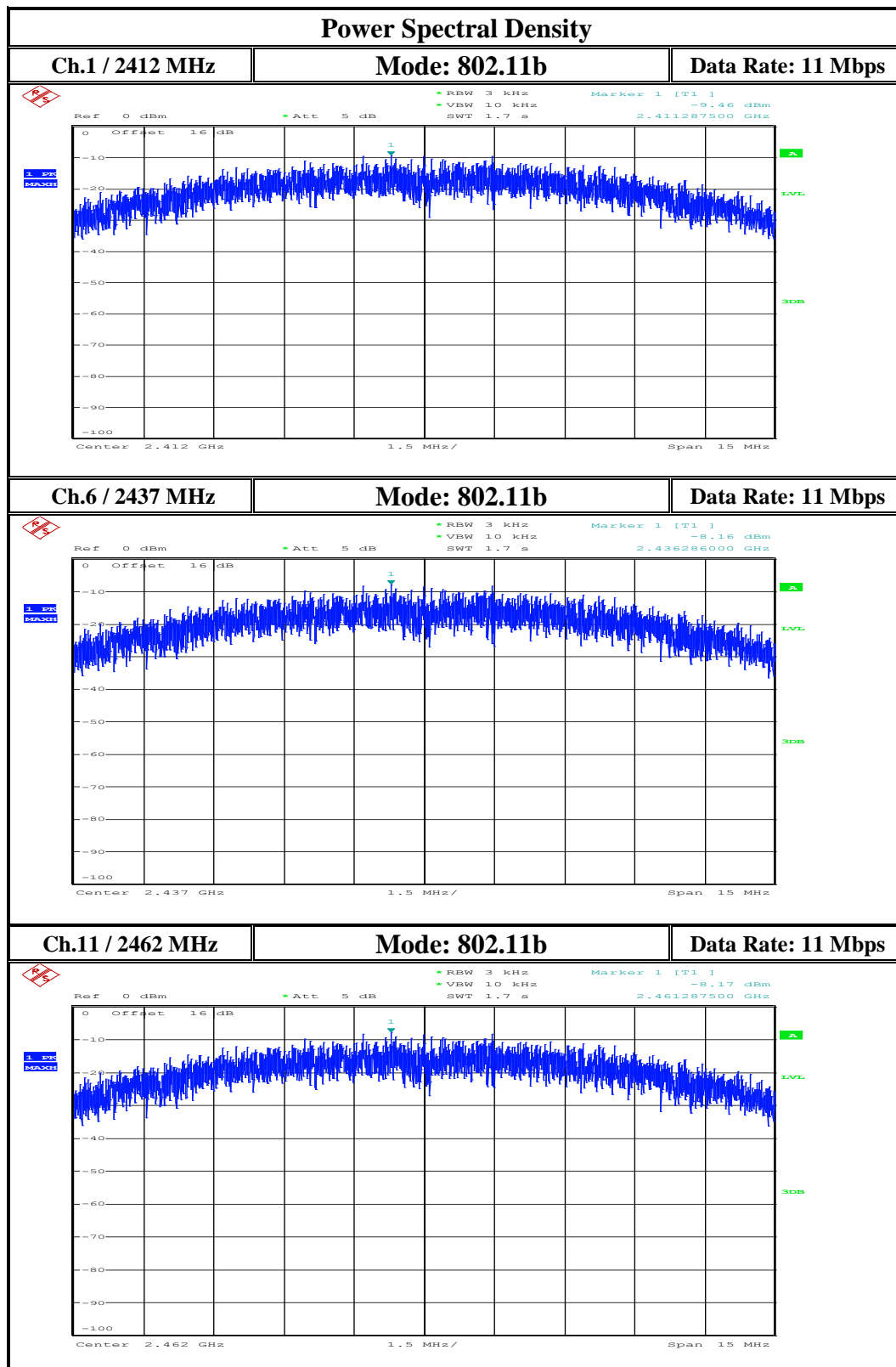
8.4 Test Result:

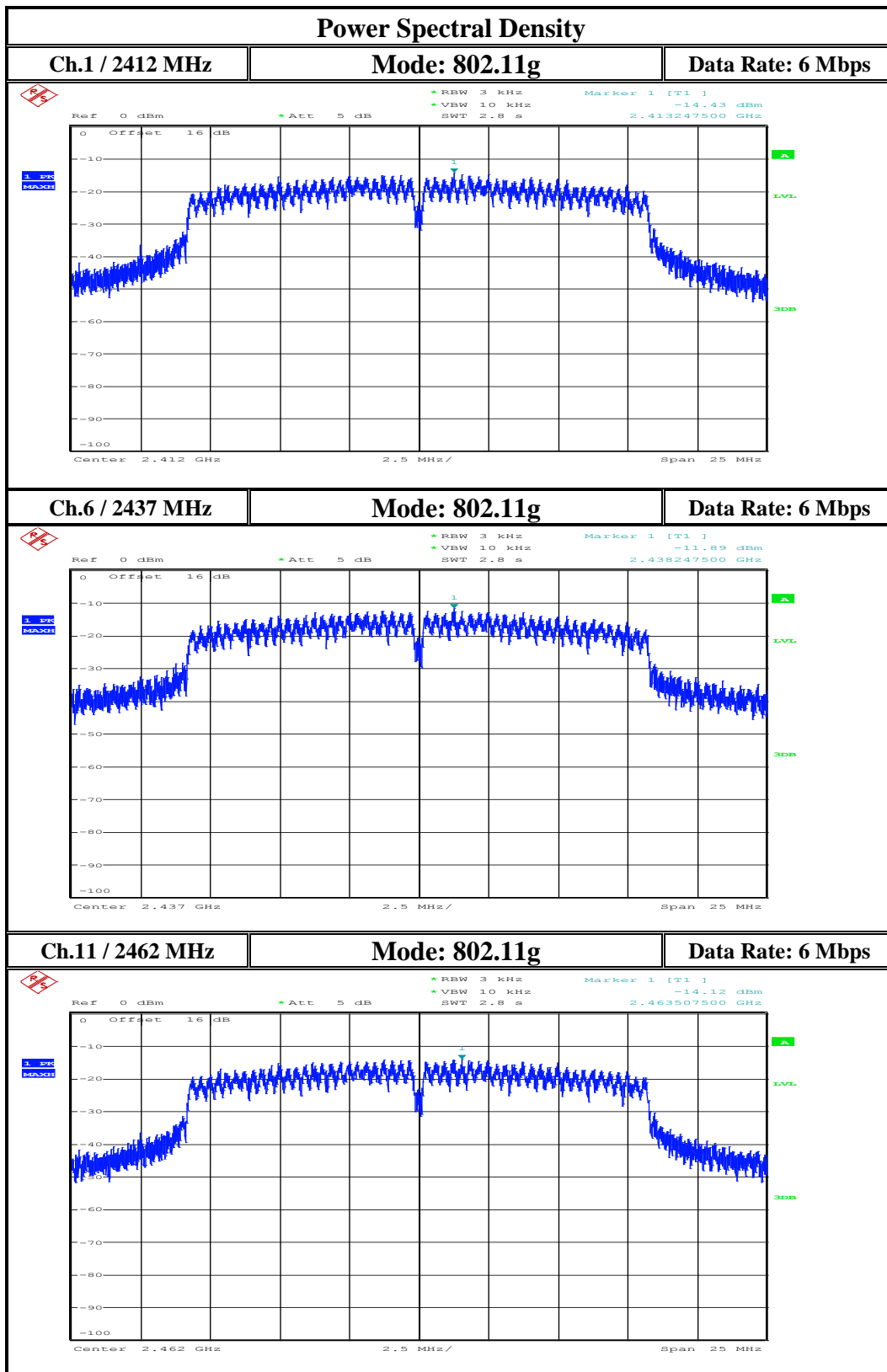
| Power Spectral Density (dBm) | | | | |
|---------------------------------------|---------------------|-------------------|-------------------|--------------------|
| FCC Limit = 8 dBm IC Limit = 8 dBm | | Frequency (MHz) | | |
| | | 2412 Channel 1 | 2437 Channel 6 | 2462 Channel 11 |
| Operating Mode | Data Rate (Mbps) | Measured | Measured | Measured |
| 802.11b | 11 | -9.46 | -8.18 | -8.17 |
| 802.11g | 6 | -14.43 | -11.89 | -14.12 |
| 802.11n (HT20) | 6.5 (MCS0) | -14.69 | -12.26 | -13.46 |

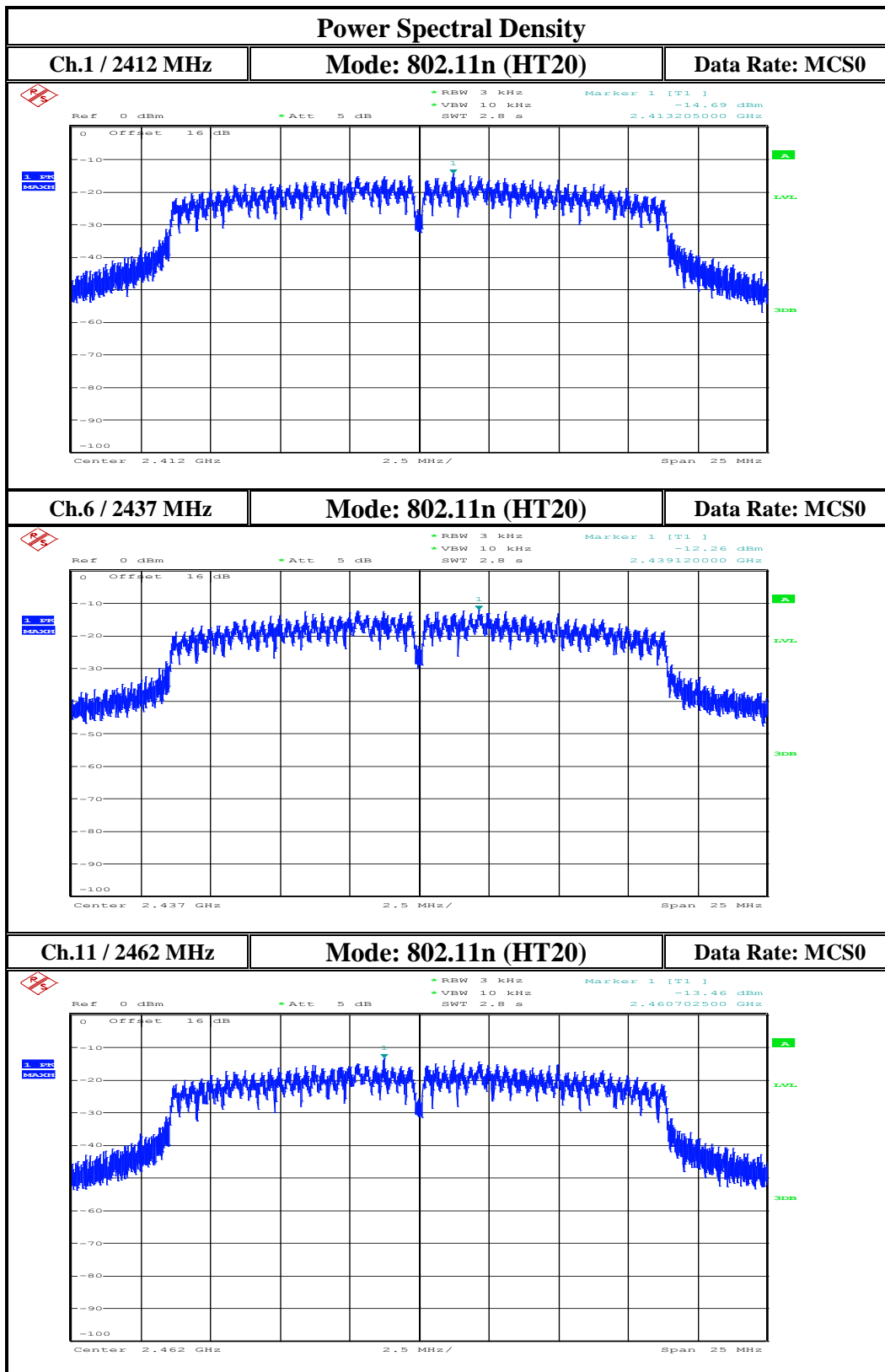
8.5 Measurement Verdict:

Pass

8.6 Measurement Plots:







9 Band Edge Compliance & Restricted and Non-restricted Band Edge

9.1 Limits:

§15.209/15.205 & RSS-GEN issue 4. Sections 8.9 and 8.10

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (²) |
| 13.36 - 13.41 | | | |

FCC15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

RSS-247 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

9.2 Test Conditions

Tnom: 20°C; Vnom: 120 VAC

9.3 Test Procedure

FCC KDB 558074 D01 v03r03 section 11.2, 11.3 (Non restricted Band Edge)

FCC KDB 558074 D01 v03r03 section 12.2 (Restricted Bands)

Spectrum Analyzer settings for non-Restricted band edge:

Reference level measurement:

| | |
|------------------|---|
| Centre Frequency | DTS channel center frequency |
| Span | ≥ 1.5 times the DTS bandwidth or encompass frequency range to be measured. |
| RBW | = 100 kHz |
| VBW | $\geq 3 \times$ RBW |
| Sweep time | Auto |
| Detector | Peak |
| Trace Mode | Max hold |

- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.
- Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Emission level measurement:

| | |
|------------|---------------------------------|
| Span | frequency range to be measured. |
| RBW | = 100 kHz |
| VBW | $\geq 3 \times$ RBW |
| Sweep time | Auto |
| Detector | Peak |
| Trace Mode | Max hold |

- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.
- Ensure that the band edge and the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power and at least 30 dB if measurement based on the use of RMS averaging.

For Restricted Bands measurement

*PEAK LIMIT= 74dB μ V/m @ 3m (-21.2 dBm)

*AVG. LIMIT = 54dB μ V/m @ 3m (-41.2 dBm)

| Peak Measurement | |
|------------------|--------------------------------------|
| Start frequency | The beginning of the restricted band |
| Stop frequency | The end of the restricted band |
| RBW | = 1 MHz |
| VBW | $\geq 3 \times$ RBW |
| Sweep time | Auto |
| Detector | Peak |
| Trace Mode | Max hold |

- Allow sweeps to continue until the trace stabilizes.
- Use the peak marker function to determine the maximum amplitude level.
- Add the specified antenna gain to the peak readings.
- Compare to the peak limit (-21.2 dBm) specified above.

| Average Measurement | |
|---------------------|---|
| Start frequency | The beginning of the restricted band |
| Stop frequency | The end of the restricted band |
| RBW | = 1 MHz |
| VBW | $\geq 3 \times$ RBW |
| Sweep time | Auto |
| Detector | power averaging (RMS) or sample detector (when RMS not available) |
| Trace Mode | averaging (RMS) mode over a minimum of 100 traces |

- Use the peak marker function to determine the maximum amplitude level.
- Add the duty cycle correction factor and the specified antenna gain to the maximum readings.
- Compare to the average limit (-41.2 dBm) specified above.

9.4 Test Data:

| Lower Band Edge (non-restricted band) | | | | | |
|--|--------------------------------|--------------------------------------|--------------------------------|--------------------|--------------------|
| Mode: 802.11b | | | | | |
| Measured Frequency (MHz) | Emission Level (dBm) Pk | Highest level inband (dBm) Pk | Calculated Delta in dBc | Limit (dBc) | Margin (dB) |
| 2399 | -44.00 | 2.86 | -46.86 | -20 | 26.86 |
| Mode: 802.11g | | | | | |
| 2398 | -25.40 | -1.56 | -23.84 | -20 | 3.84 |
| Mode: 802.11n | | | | | |
| 2487.5 | -24.00 | -1.64 | -22.63 | -20 | 2.63 |

| Duty Cycle Correction Factor Calculation for RMS measurements | | | | | |
|--|------------------|---------------------------------|---------------------------------|-----------------------|----------------------------------|
| Mode | TXon (ms) | Period = TXon+TXoff (ms) | DC = TXon / TXon + TXoff | DC% = DC x 100 | DCCF = 10 log (1/DC) (dB) |
| 802.11b | 0.256 | 0.578 | 0.444 | 44% | 3.53 |
| 802.11g | 0.159 | 0.393 | 0.405 | 40% | 3.93 |
| 802.11n20 | 0.162 | 0.335 | 0.483 | 48% | 3.15 |

| Mode: 802.11b | | | | | | |
|--|----------------------|--------------------|--------------------|---------------------------------|-------------|-------------|
| Lower Restricted Band / Frequency Range: 2310 MHz – 2390 MHz | | | | | | |
| Measured Frequency (MHz) | Emission Level (dBm) | Duty Cycle CF (dB) | Antenna Gain (dBi) | Calculated Emission Level (dBm) | Limit (dBm) | Margin (dB) |
| 2328.2 | -39.82 Pk | N/A | 2.0 | -37.82 | -21.2 Pk | 16.62 |
| 2326.2 | -54.96 Av | 3.53 | 2.0 | -49.43 | -41.2 Av | 8.23 |
| Upper Restricted Band / Frequency Range: 2483.5 MHz – 2500 MHz | | | | | | |
| 2489.7 | -40.17 Pk | N/A | 2.0 | -38.17 | -21.2 Pk | 16.97 |
| 2499.8 | -53.84 Av | 3.53 | 2.0 | -48.31 | -41.2 Av | 7.11 |

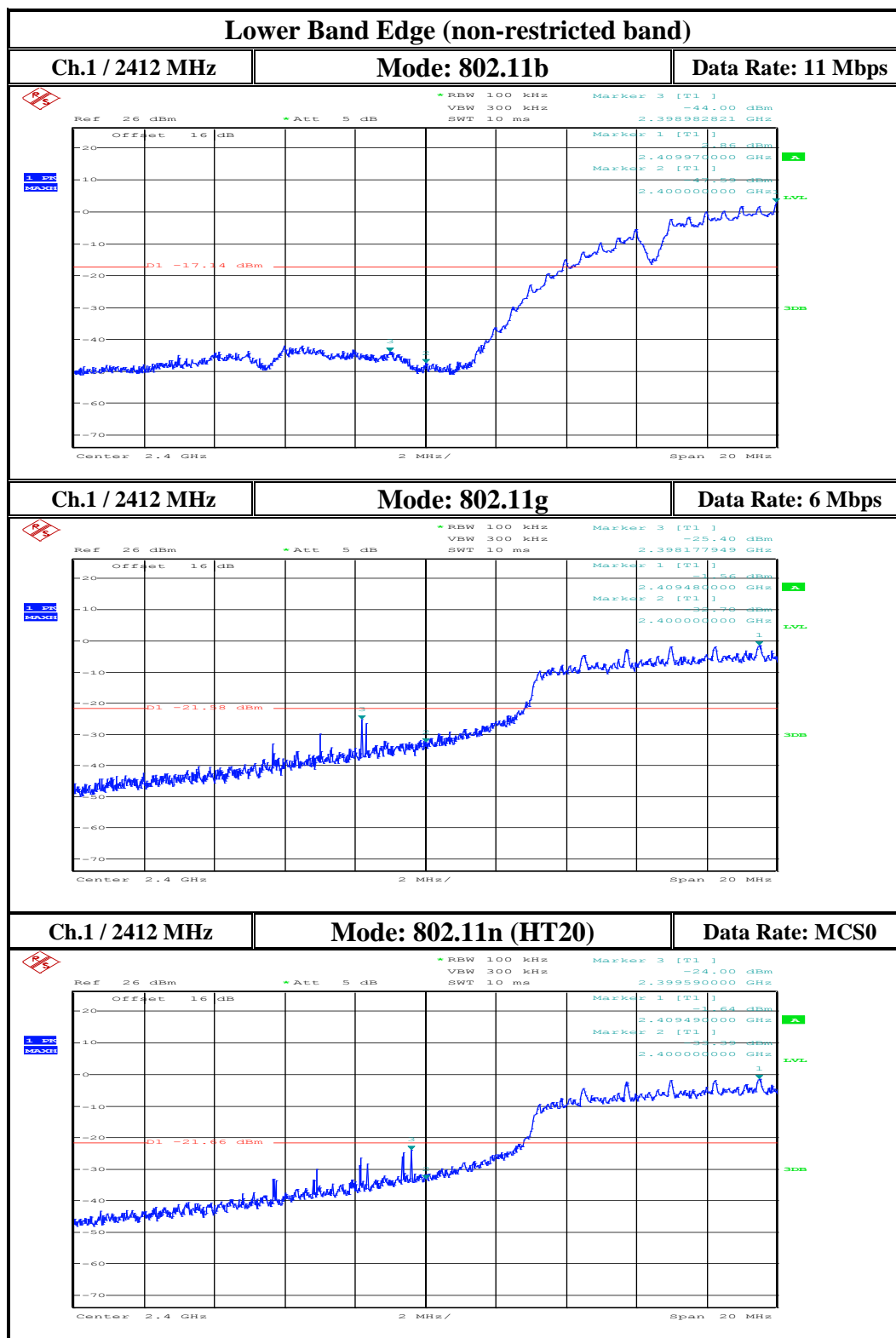
| Mode: 802.11g | | | | | | |
|--|----------------------|--------------------|--------------------|---------------------------------|-------------|-------------|
| Lower Restricted Band / Frequency Range: 2310 MHz – 2390 MHz | | | | | | |
| Measured Frequency (MHz) | Emission Level (dBm) | Duty Cycle CF (dB) | Antenna Gain (dBi) | Calculated Emission Level (dBm) | Limit (dBm) | Margin (dB) |
| 2389.8 | -31.09 Pk | N/A | 2.0 | -29.09 | -21.2 Pk | 7.89 |
| 2389.8 | -61.25 Av | 3.93 | 2.0 | -55.32 | -41.2 Av | 14.12 |
| Upper Restricted Band / Frequency Range: 2483.5 MHz – 2500 MHz | | | | | | |
| 2483.5 | -33.14 Pk | N/A | 2.0 | -31.14 | -21.2 Pk | 9.94 |
| 2483.9 | -58.94 Av | 3.93 | 2.0 | -53.01 | -41.2 Av | 11.81 |

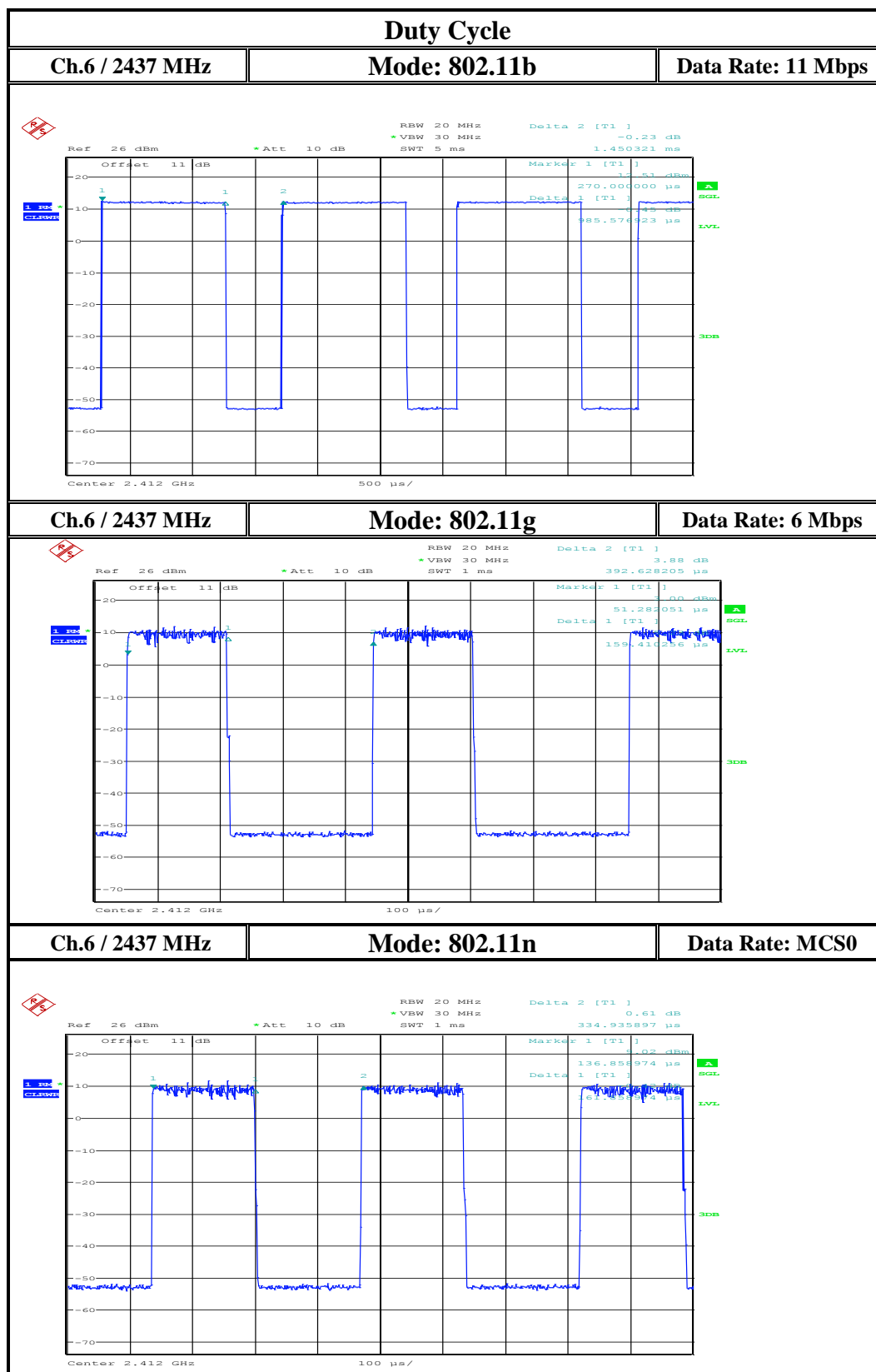
| Mode: 802.11n (HT20) | | | | | | |
|--|----------------------|--------------------|--------------------|---------------------------------|-------------|-------------|
| Lower Restricted Band / Frequency Range: 2310 MHz – 2390 MHz | | | | | | |
| Measured Frequency (MHz) | Emission Level (dBm) | Duty Cycle CF (dB) | Antenna Gain (dBi) | Calculated Emission Level (dBm) | Limit (dBm) | Margin (dB) |
| 2389.4 | -31.68 Pk | N/A | 2.0 | -29.68 | -21.2 Pk | 8.48 |
| 2389.3 | -61.38 Av | 3.15 | 2.0 | -56.23 | -41.2 Av | 15.03 |
| Upper Restricted Band / Frequency Range: 2483.5 MHz – 2500 MHz | | | | | | |
| 2484.8 | -31.51 Pk | N/A | 2.0 | -29.51 | -21.2 Pk | 8.31 |
| 2483.9 | -59.07 Av | 3.15 | 2.0 | -53.92 | -41.2 Av | 12.72 |

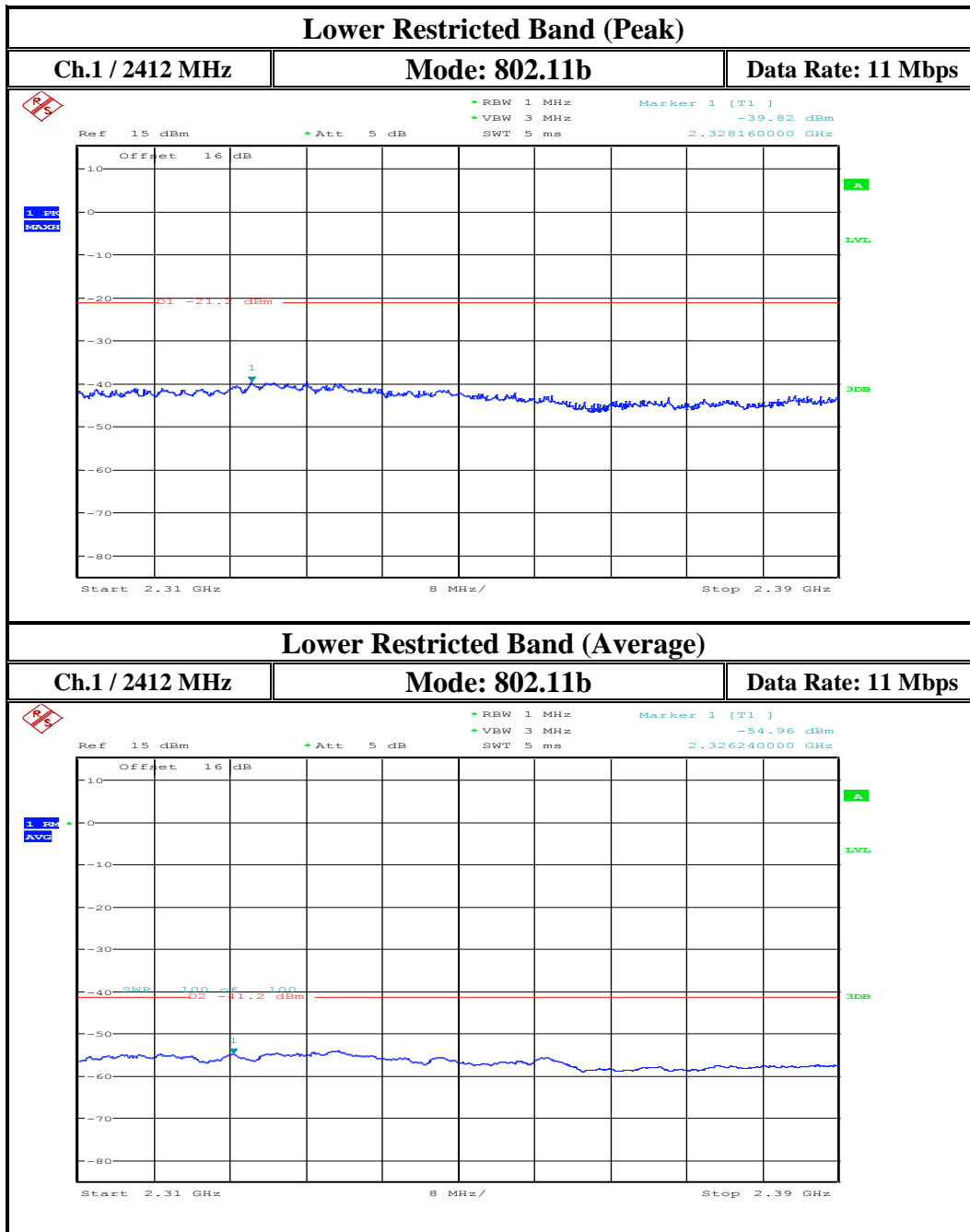
9.5 Measurement Verdict:

Pass

9.6 Measurement Plots:





Lower Restricted Band Edge

Ref 15 dBm

* Att 5 dB

* RBW 1 MHz

* VBW 3 MHz

SWT 5 ms

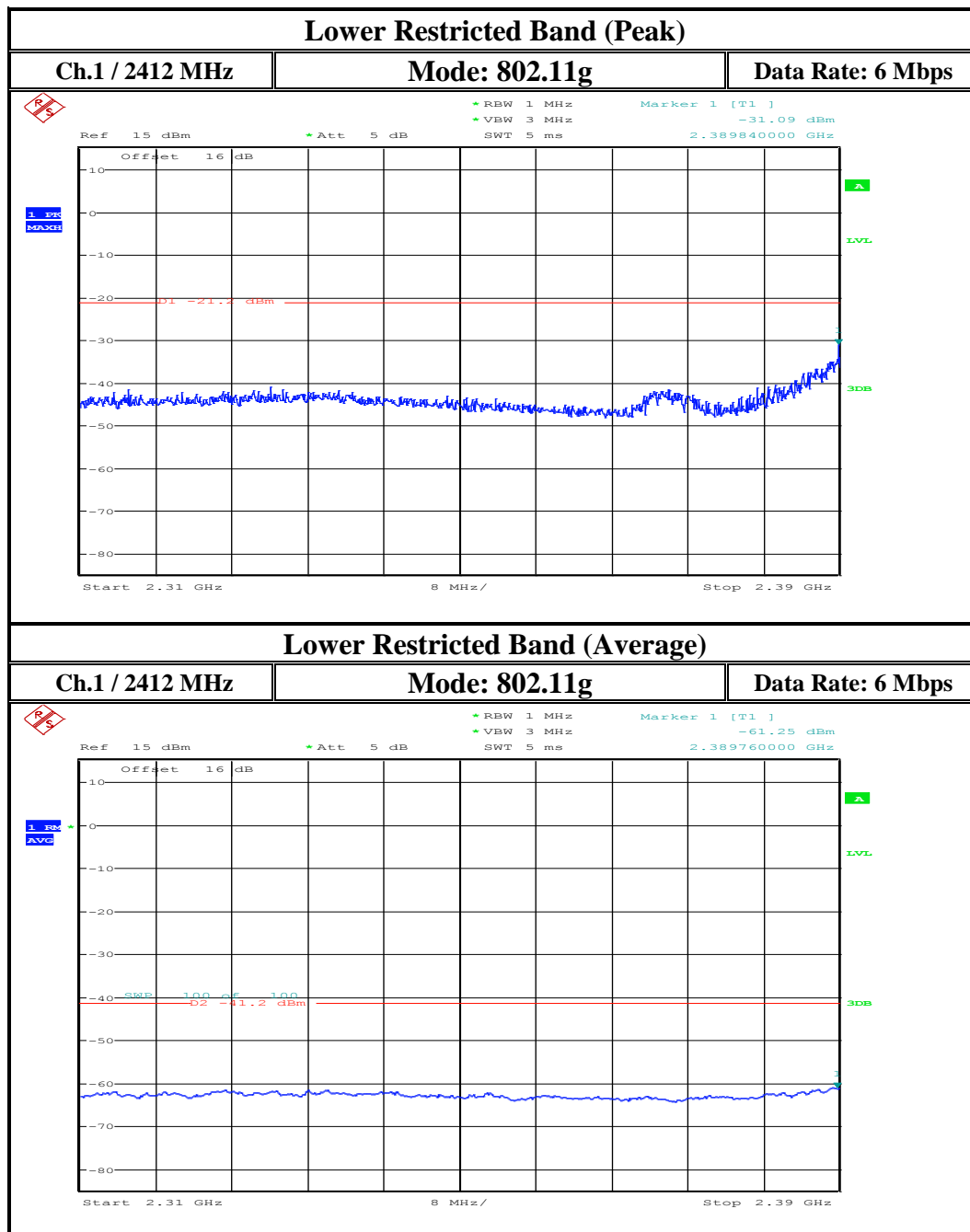
Marker 1 [T1]

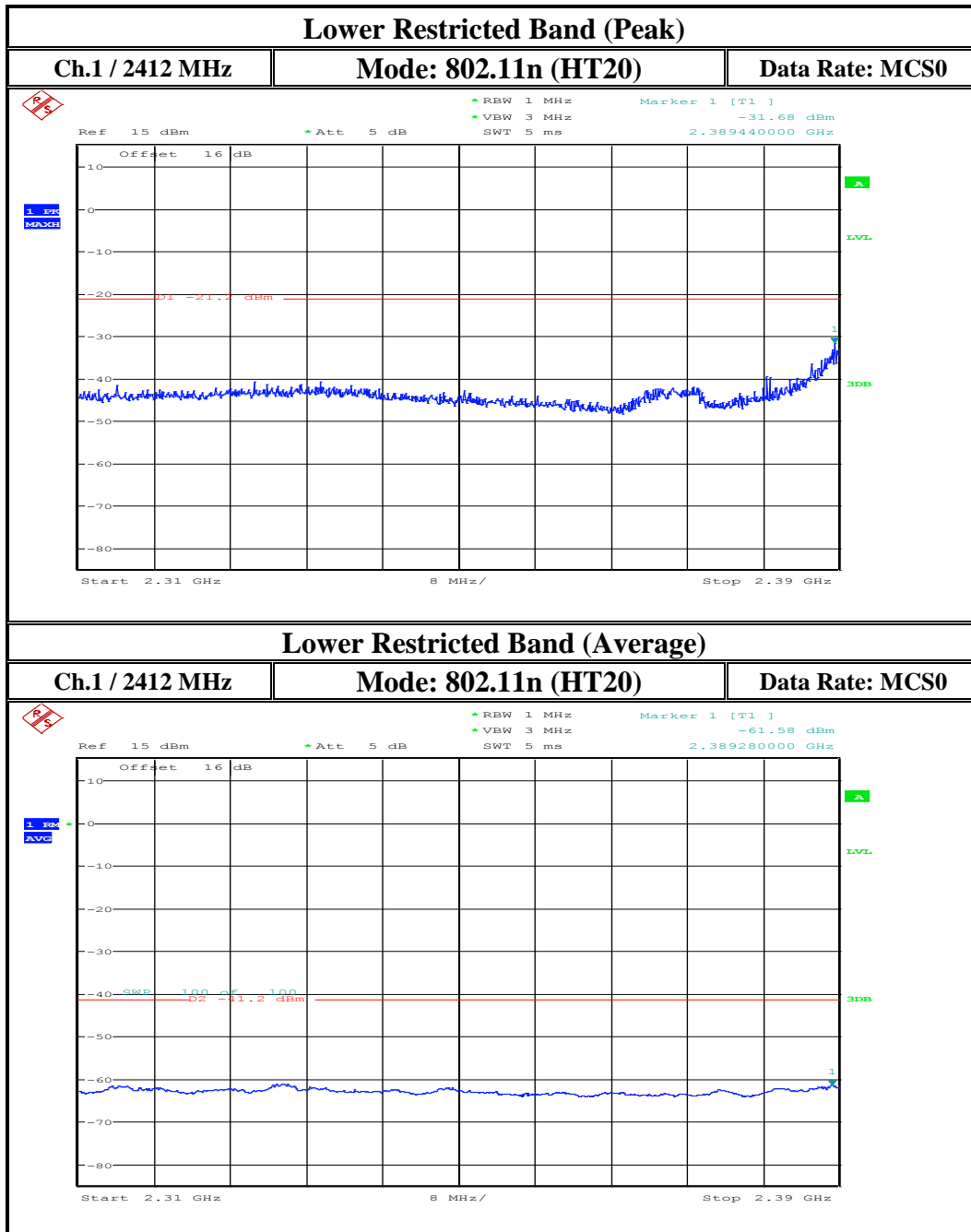
-54.96 dBm
2.326240000 GHz

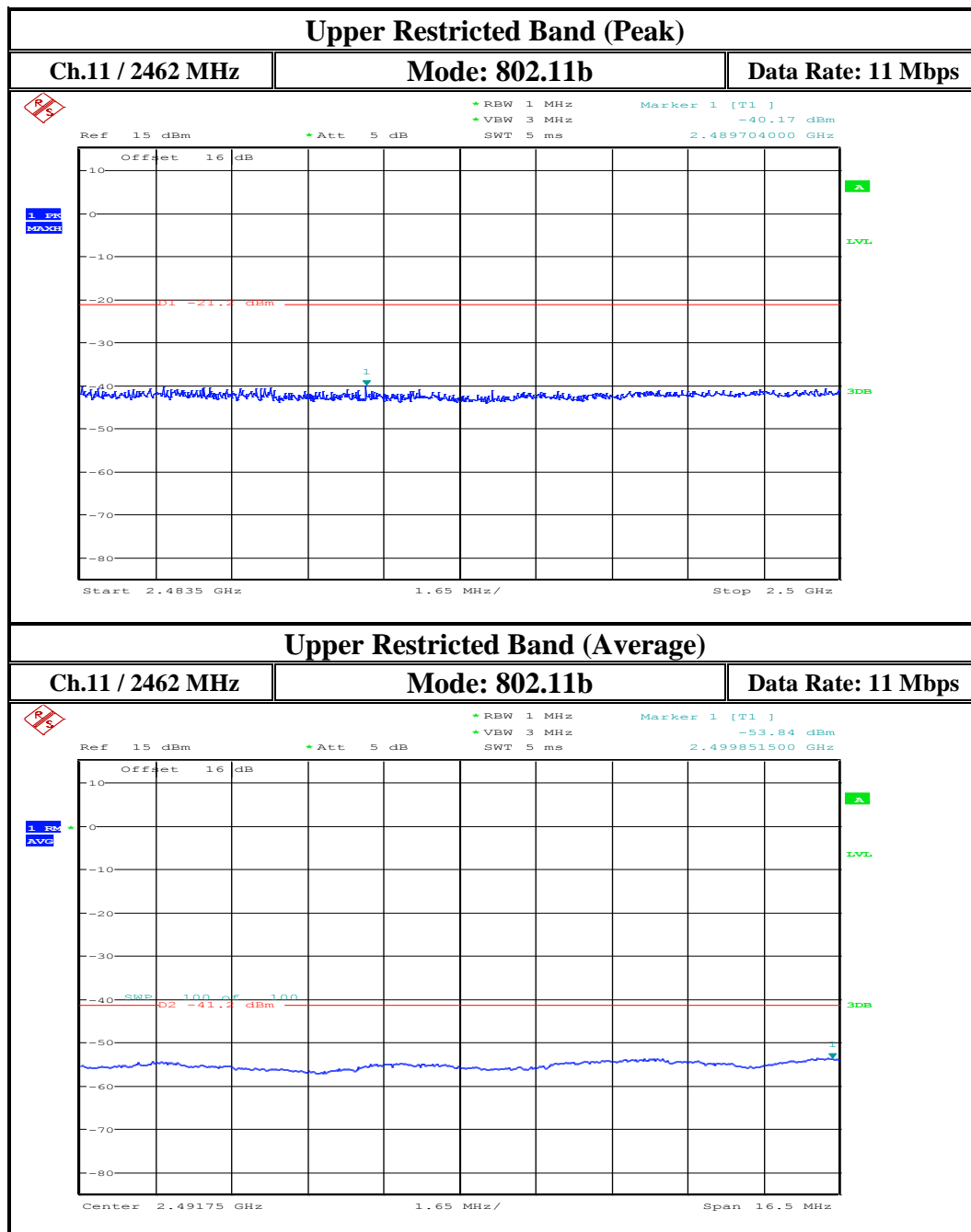
Offset 16 dB

dB

Start 2.31 GHz8 MHz/Stop 2.39 GHz







Ref 15 dBm

* Att 5 dB

* RBW 1 MHz

* VBW 3 MHz

SWT 5 ms

Marker 1 [T1]

-53.84 dBm
2.499851500 GHz

Offset 16 dB

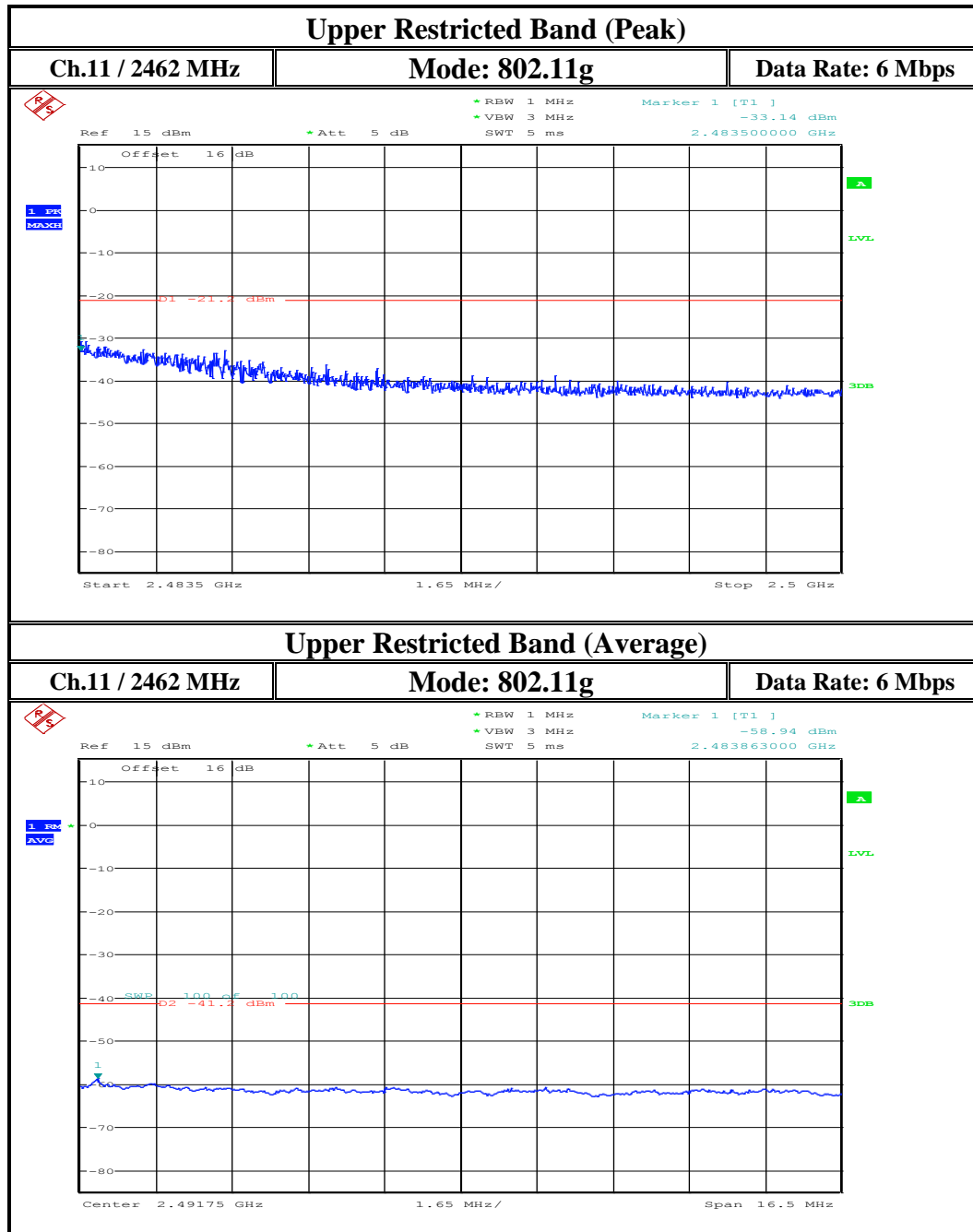
1.500 MHz

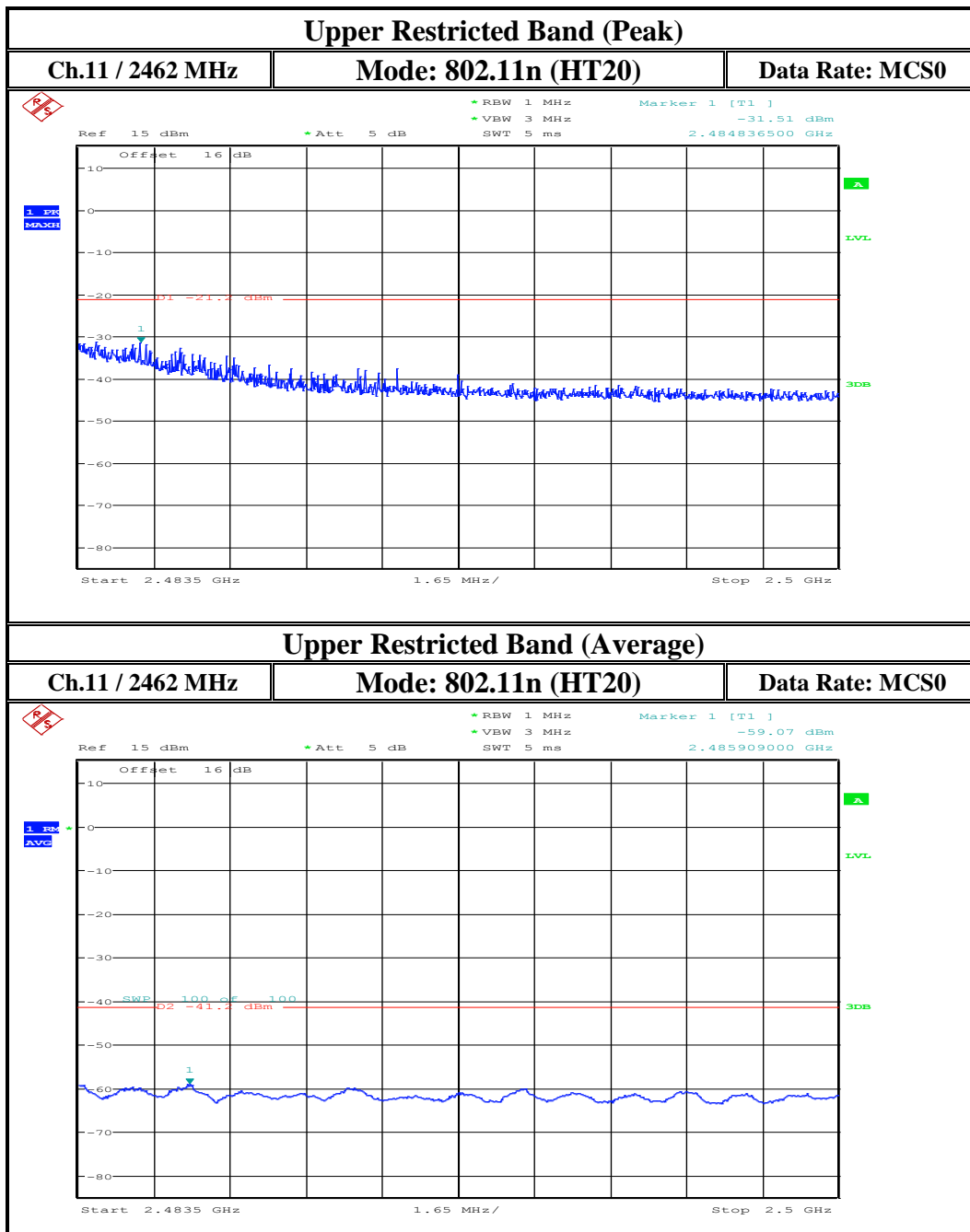
1.500 MHz

Center 2.49175 GHz

1.65 MHz/

Span 16.5 MHz





10 Occupied Bandwidth (6dB Bandwidth / 99% Bandwidth)

10.1 Limits:

§15.247 (a) (2)

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

10.2 Test Conditions:

Tnom: 21°C; Vnom: 120 VAC

10.3 Test Procedure

Measurement according to FCC KDB 558074 D01 v03r03 section 8.1

For 6dB bandwidth:

Spectrum Analyzer settings:

| | |
|------------------|--|
| Centre Frequency | The centre frequency of the channel under test |
| Span | Wide enough to capture the entire emission bandwidth |
| RBW | 100 KHz |
| VBW | $\geq 3 \times \text{RBW}$ |
| Sweep time | Auto |
| Detector | Peak |
| Trace Mode | Max hold |

- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the peak level measured in the fundamental emission.

For 99% bandwidth:

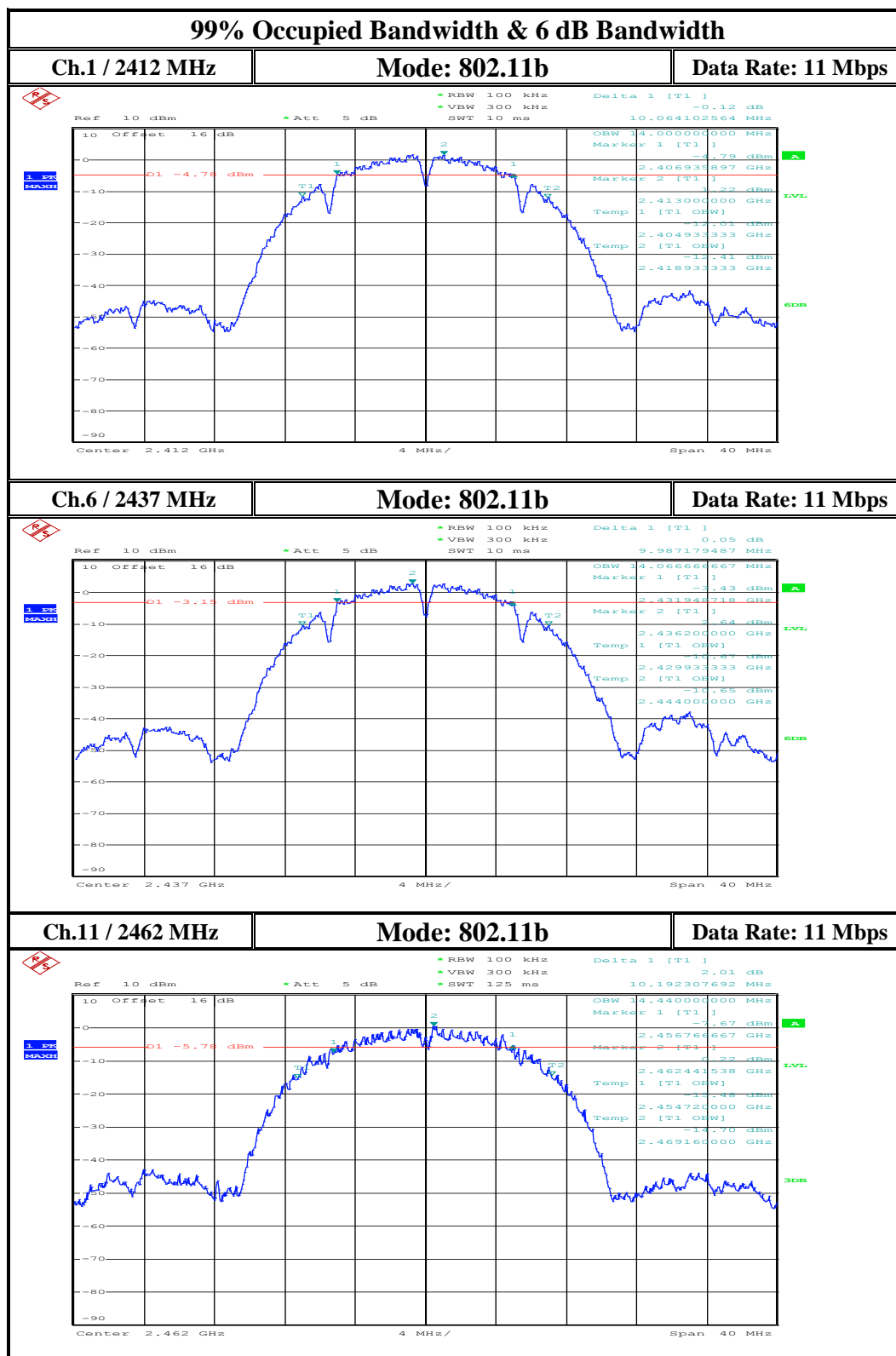
- Use the occupied bandwidth in the measurement function of the spectrum analyzer with power bandwidth setting at 99%

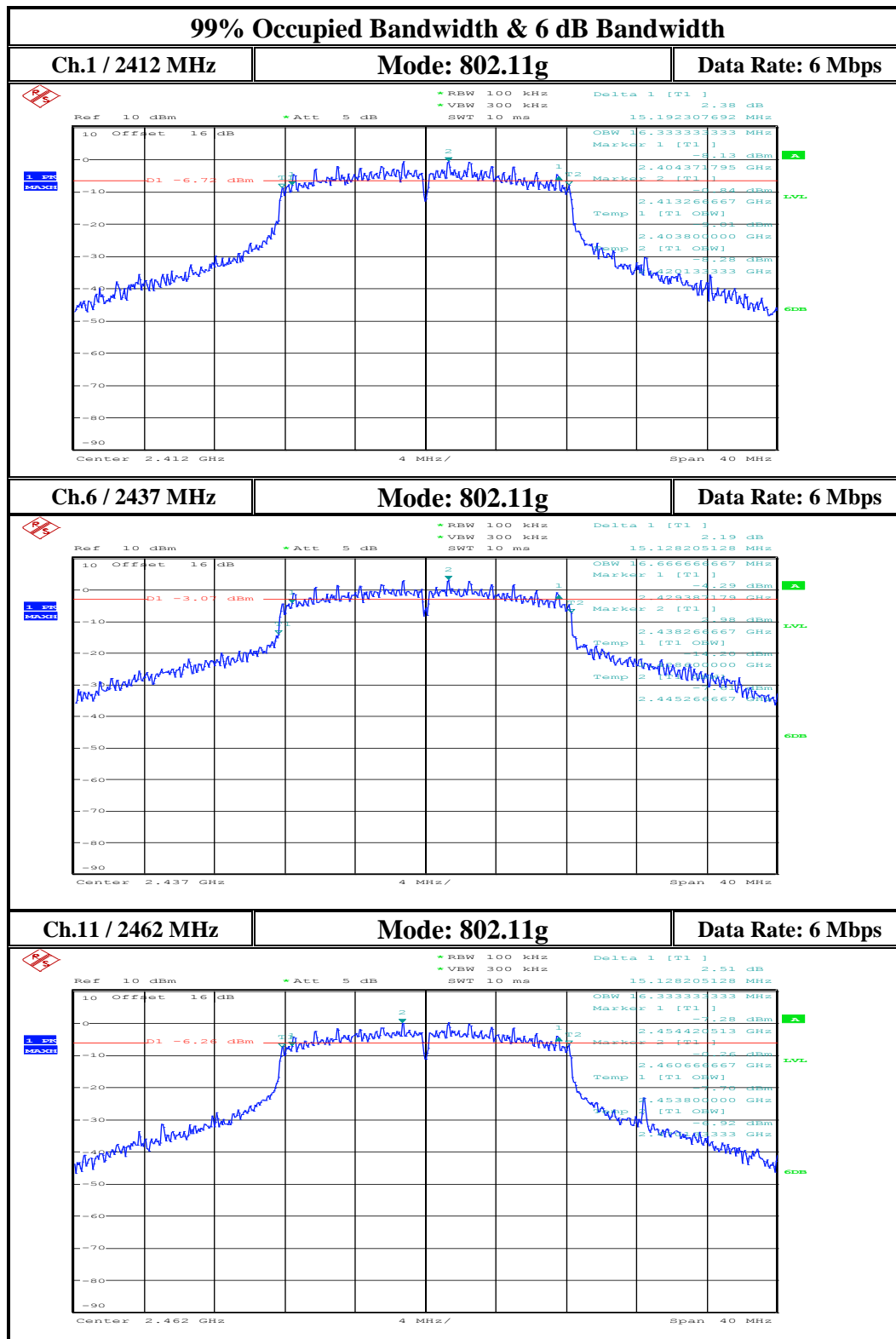
10.4 Test Results:

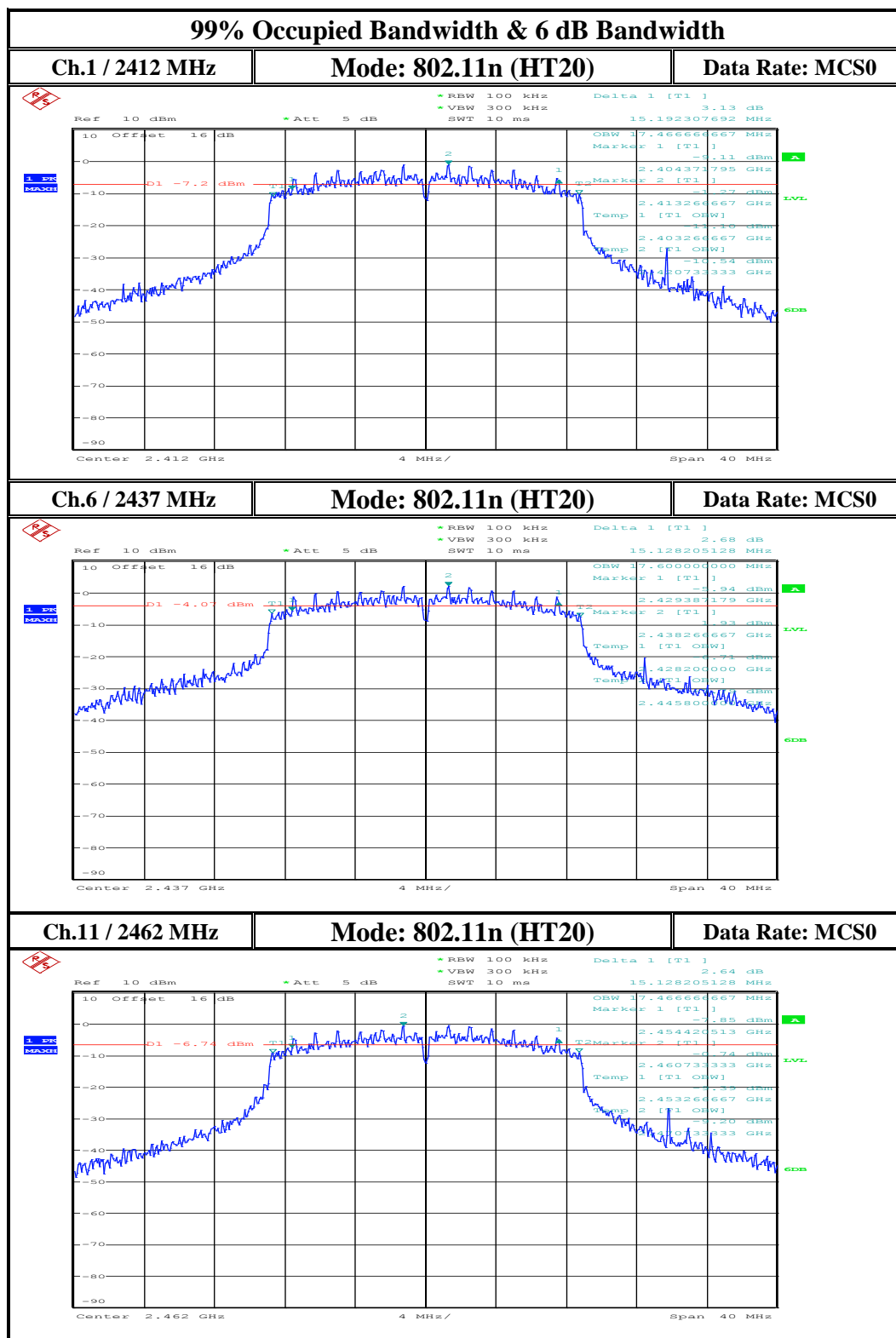
| 6dB Bandwidth / 99% Bandwidth | | | | | | |
|-------------------------------|------------------------|-------|------------------------|-------|-------------------------|-------|
| Mode | Channel 1 (2412MHz) | | Channel 6 (2437MHz) | | Channel 11 (2462MHz) | |
| | 6dB | 99% | 6dB | 99% | 6dB | 99% |
| 802.11b | 10.06 | 14.00 | 9.99 | 14.07 | 10.19 | 14.44 |
| 802.11g | 15.19 | 16.33 | 15.13 | 16.66 | 15.13 | 16.33 |
| 802.11n | 15.19 | 17.47 | 15.13 | 17.60 | 15.13 | 17.47 |

10.5 Measurement Verdict:

Pass

10.6 Measurement Plots:





11 Transmitter Spurious Emissions & Restricted Bands- Radiated**11.1 Limits:****§15.247/15.205/15.209 / RSS-Gen 8.9/ 8.10**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (²) |
| 13.36 - 13.41 | | | |

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

*PEAK LIMIT= 74dB μ V/m

*AVG. LIMIT= 54dB μ V/m

Table 1:

| Frequency of emission (MHz) | Field strength @ 3m (μ V/m) | Field strength @ 3m (dB μ V/m) |
|-----------------------------|----------------------------------|------------------------------------|
| 30–88 | 100 | 40dB μ V/m |
| 88–216 | 150 | 43.5 dB μ V/m |
| 216–960 | 200 | 46 dB μ V/m |
| Above 960 | 500 | 54 dB μ V/m |

Table 2:

| Frequency of emission (MHz) | Field strength ($\mu\text{V/m}$) / (dBuV/m) | Measurement Distance (m) |
|-----------------------------|---|--------------------------|
| 0.009–0.490 | 2400/F(kHz) / ----- | 300 |
| 0.490–1.705 | 24000/F(kHz) / ----- | 30 |
| 1.705–30.0 | 30 / (29.5) | 30 |

Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements described in 5.4.

The highest (or worst-case) data rate shall be recorded for each measurement.

11.2 Test Conditions

Tnom: 23°C; Vnom: 120 VAC

11.3 Test Procedure:

Measurement according to ANSI C63.10:2013 (also refer to section 6.1 in this test report)

Analyzer Settings:

From 9 KHz – 30 MHz

RBW = 9 KHz

Detector: Peak

From 30 MHz – 1 GHz

Detector = Peak / Quasi-Peak

RBW=120 KHz (<1GHz)

Above 1 GHz

Detector = Peak / Average

RBW= 1MHz

Test mode: 802.11g (OFDM)

Modulation: BPSK @ 6 Mbps- the highest conducted output power.

Plots reported here represent the worst case emissions for horizontal and vertical antenna polarizations and for three orientations of the EUT.

11.4 Test Data

| Frequency (MHz) | Max.Peak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarity | Azimuth (deg) | Corr. (dB) | Limit (dBμV/) | Margin (dB) |
|-----------------|-------------------|-----------------|-----------------|-------------|----------|---------------|------------|---------------|-------------|
| 275.100000 | 26.7 | 100.0 | 120.000 | 100.0 | H | 270.0 | 14.8 | 46.0 | 19.4 |
| 384.100000 | 27.4 | 100.0 | 120.000 | 100.0 | V | 16.0 | 18.7 | 46.0 | 18.7 |
| 625.300000 | 30.5 | 100.0 | 120.000 | 100.0 | V | 276.0 | 23.7 | 46.0 | 15.5 |
| 864.900000 | 26.6 | 100.0 | 120.000 | 100.0 | V | 0.0 | 26.6 | 46.0 | 19.4 |
| 887.200000 | 26.6 | 100.0 | 120.000 | 100.0 | V | 90.0 | 26.7 | 46.0 | 19.4 |

| Frequency (MHz) | MaxPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarity | Azimuth (deg) | Corr (dB) | Limit (dBμV/m) | Margin (dB) |
|-----------------|------------------|-----------------|-----------------|-------------|----------|---------------|-----------|----------------|-------------|
| 4071.00000 | 61.9 | 100.0 | 1000.000 | 150.0 | H | 4.0 | 8.9 | 74.0 | 12.1 |
| 4883.80000 | 58.9 | 100.0 | 1000.000 | 150.0 | V | 11.0 | 11.3 | 74.0 | 15.1 |

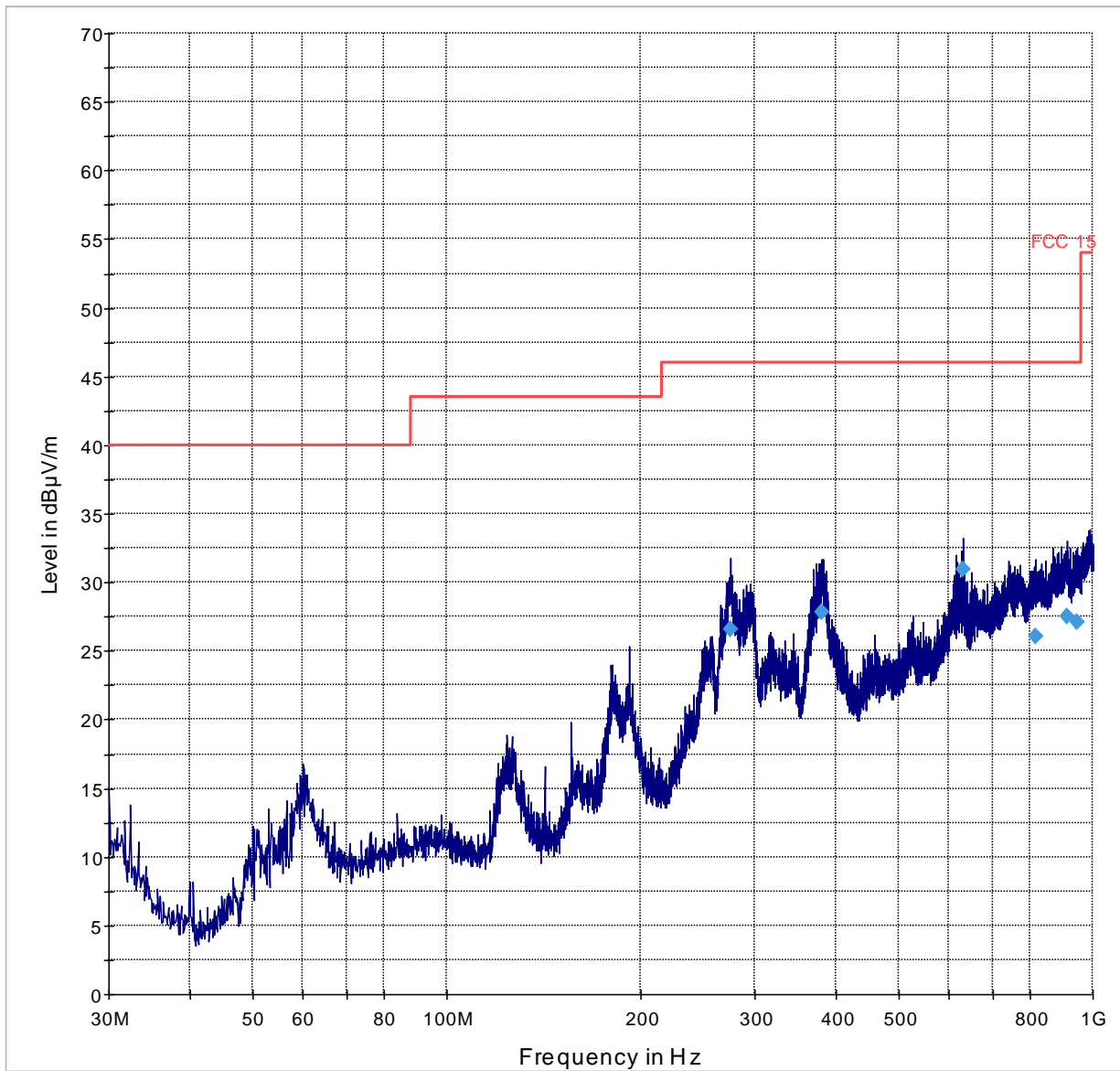
Note: All readings in tables above were corrected. Correction factors in the table were compensated in the software setting.

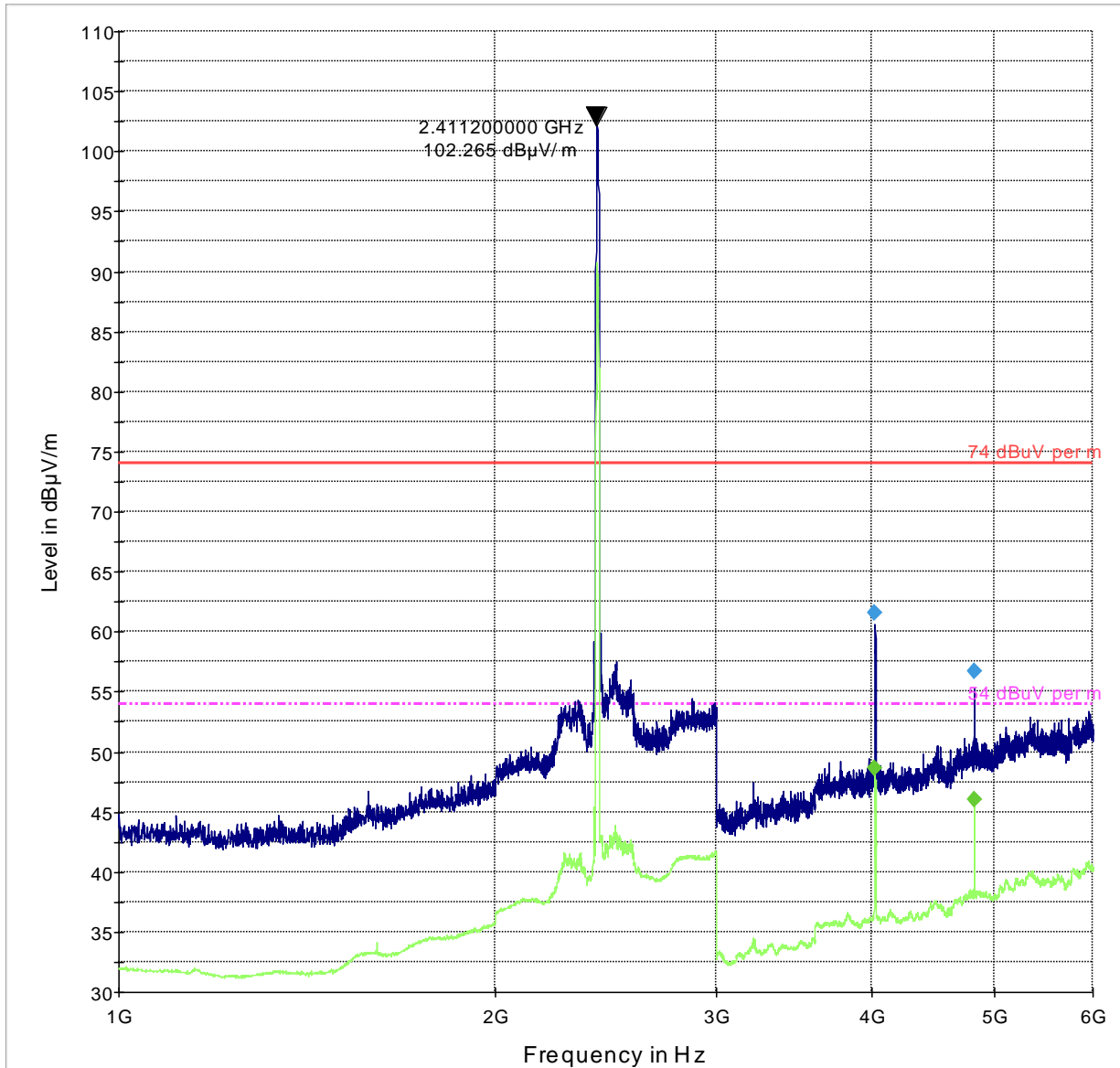
11.5 Test Verdict:

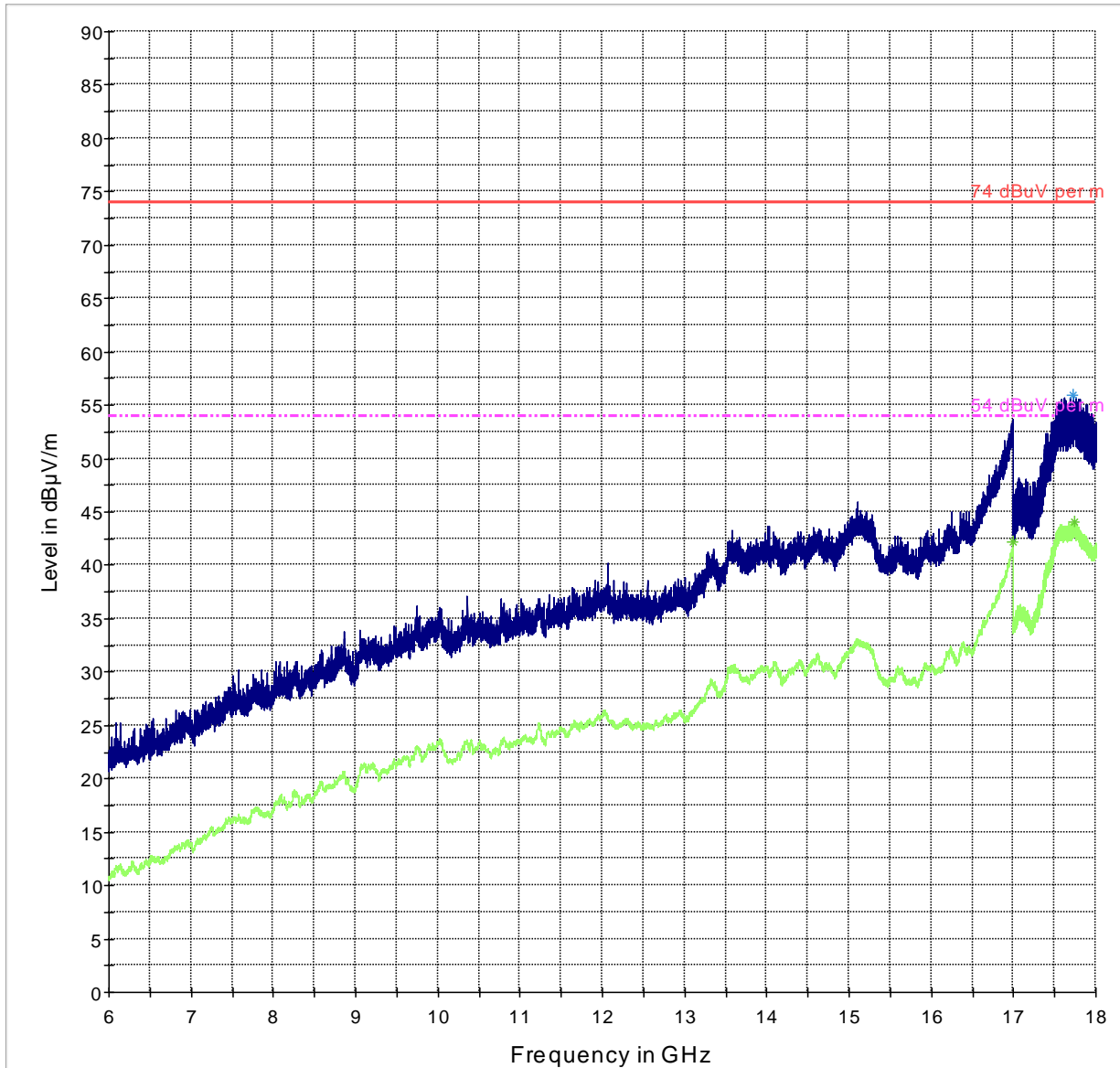
Pass.

11.6 Measurement plots:

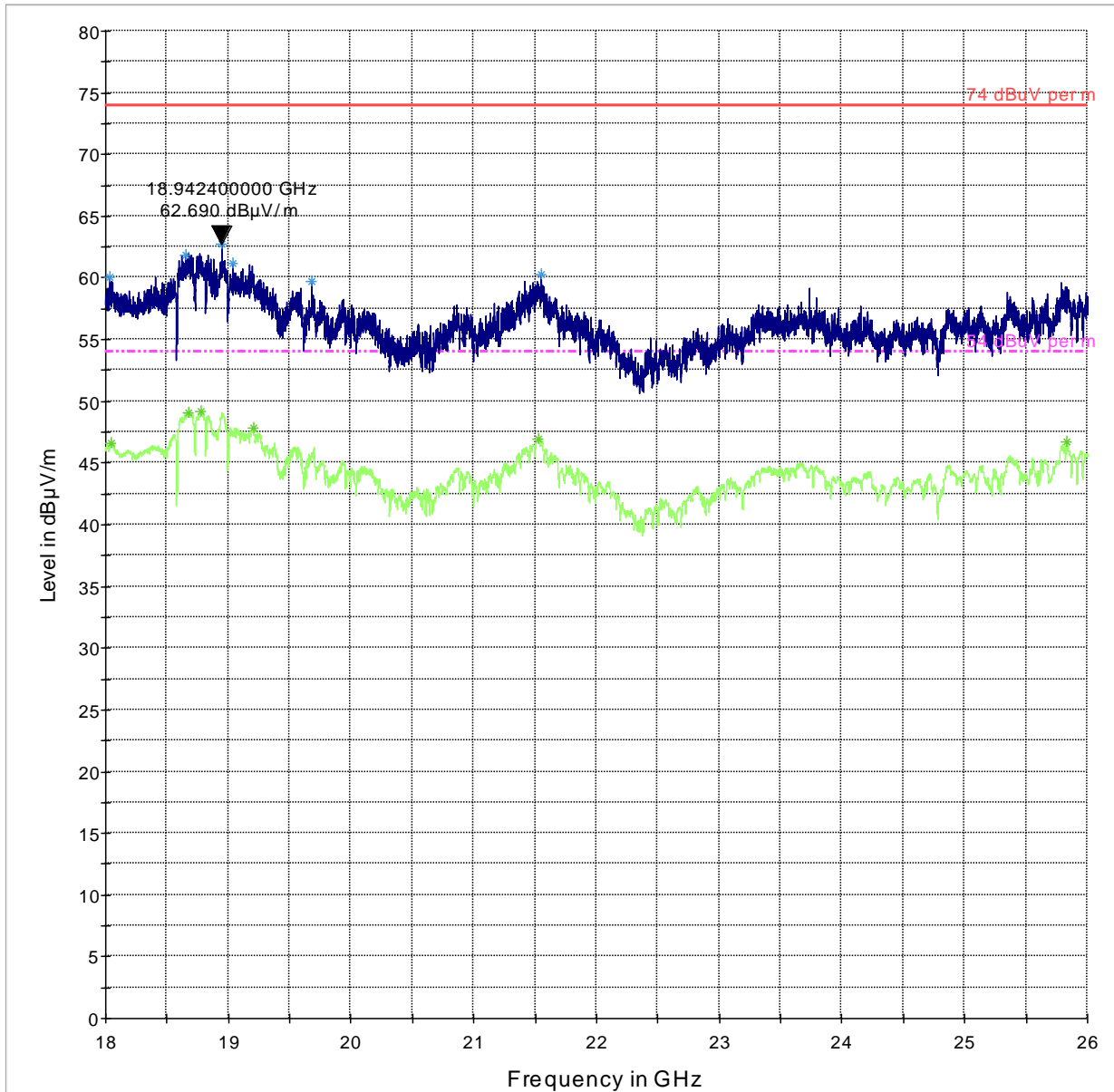
11.6.1 30 MHz – 1 GHz: Ch. 1, 2412 MHz, 802.11g

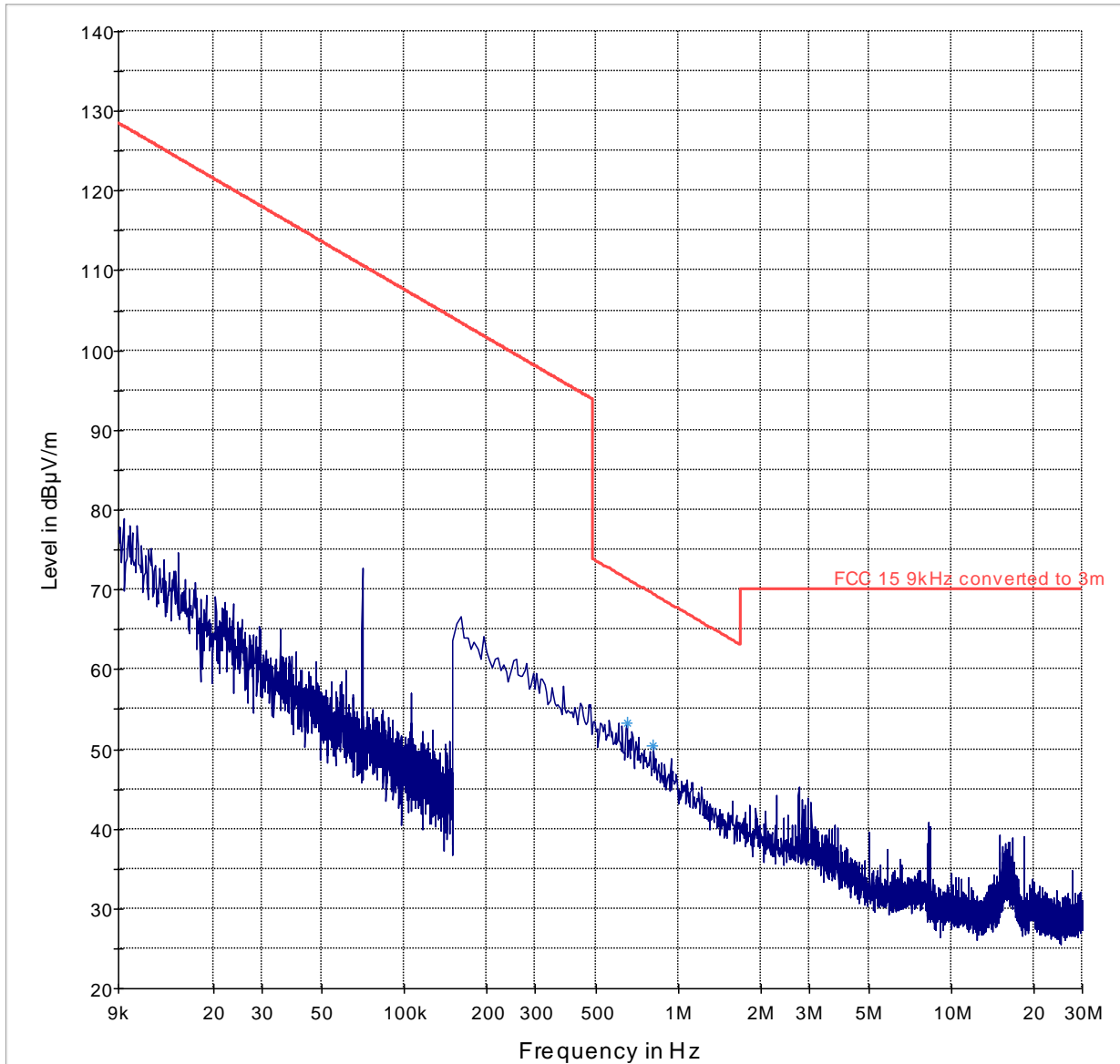


11.6.2 1 GHz – 6 GHz: Ch. 1, 2412 MHz, 802.11g

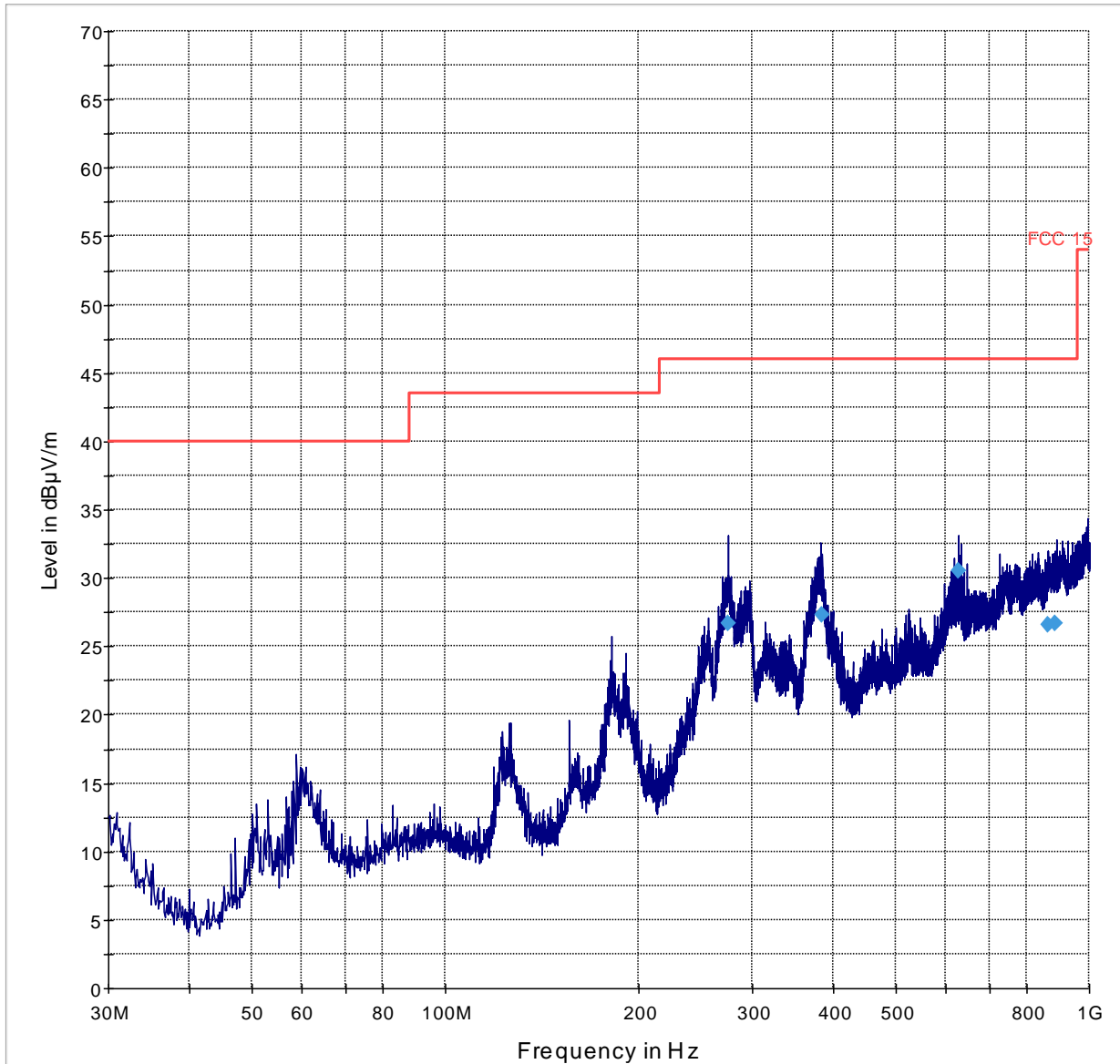
11.6.3 6 GHz – 18 GHz: Ch. 1, 2412 MHz, 802.11g

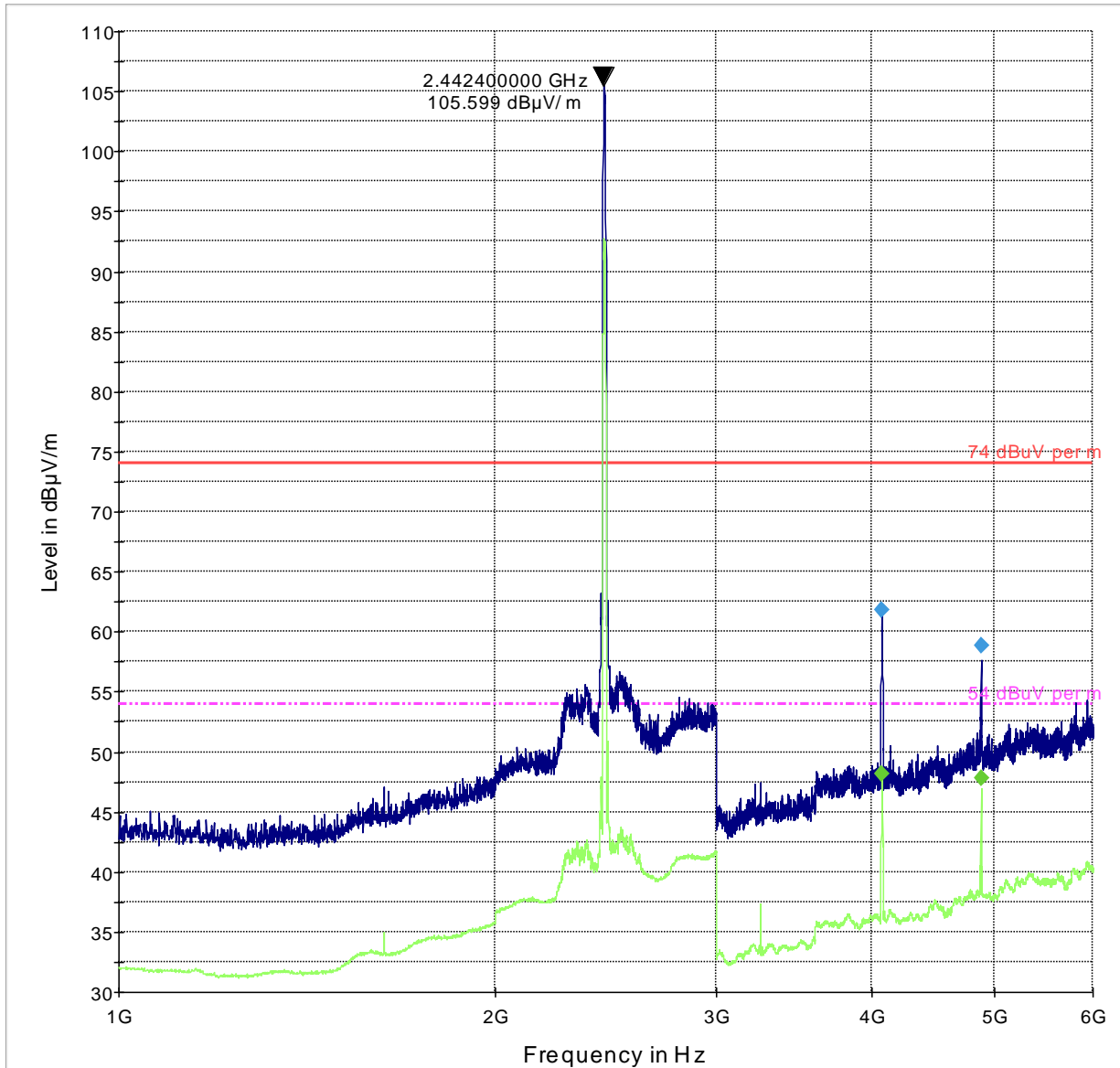
11.6.4 18 GHz – 26 GHz: Ch. 1, 2412 MHz, 802.11g

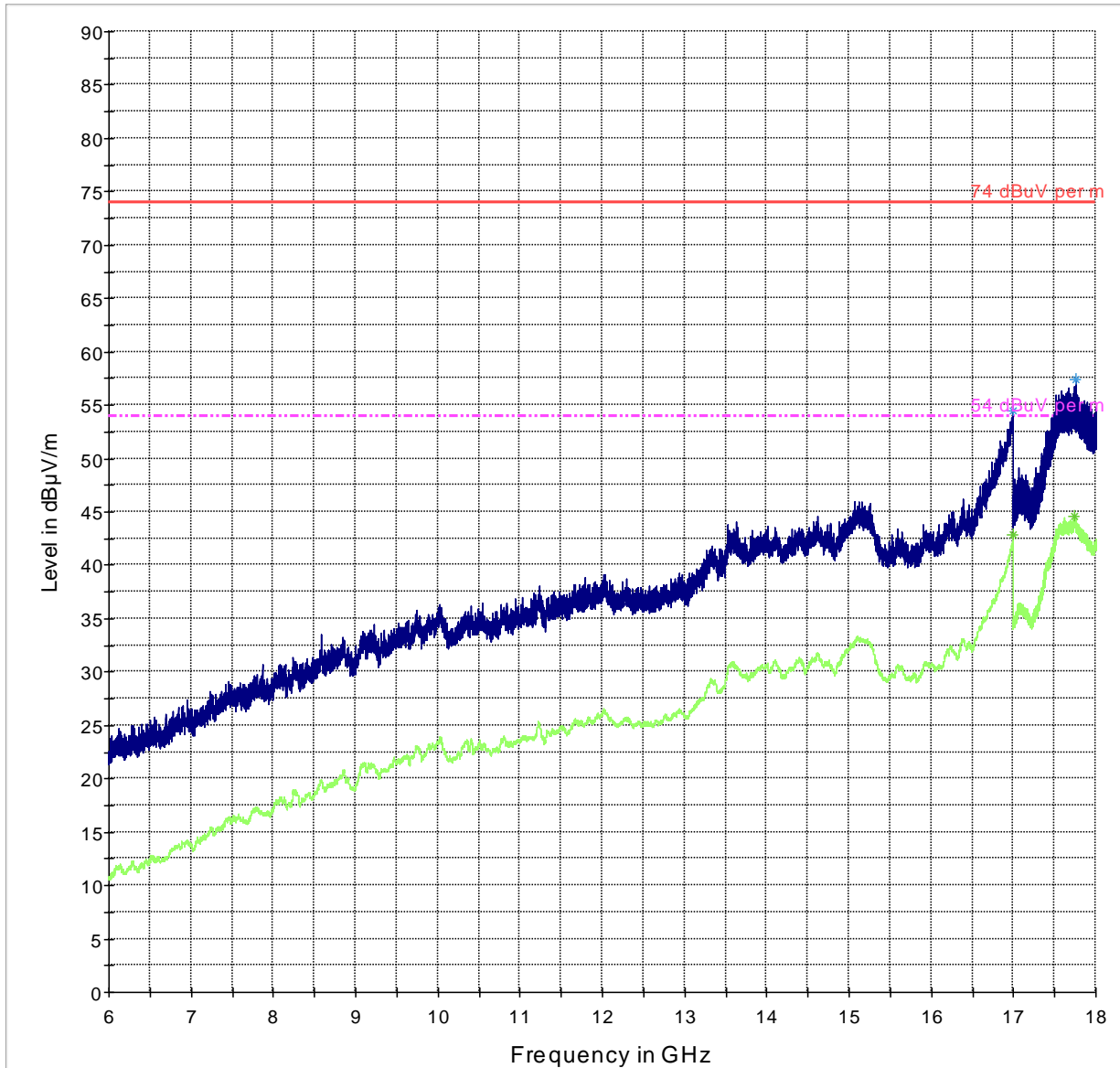


11.6.5 9 KHz – 30 MHz: Ch.7, 2442 MHz, 802.11g

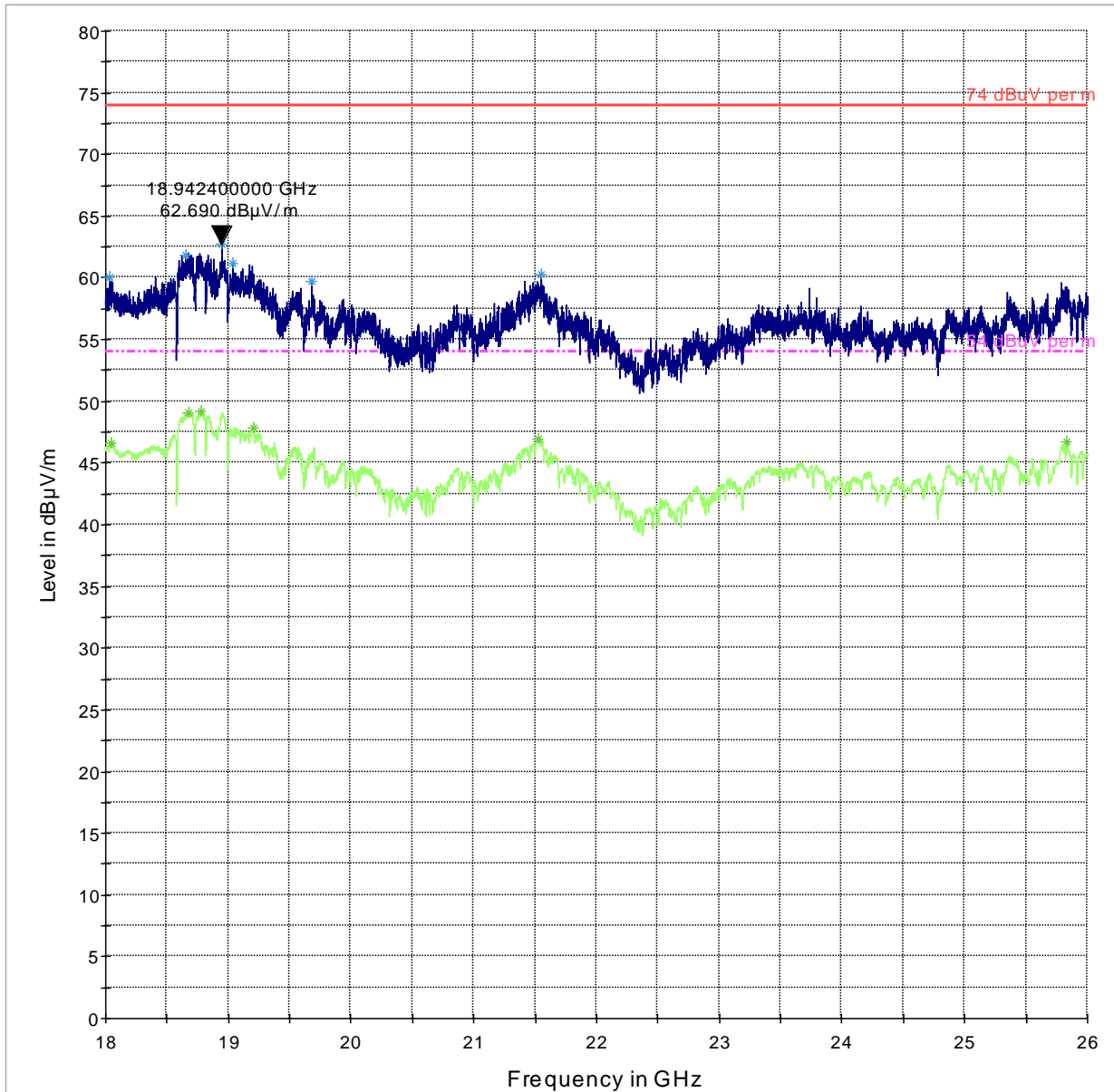
11.6.6 30 MHz – 1 GHz: Ch. 7, 2442 MHz, 802.11g



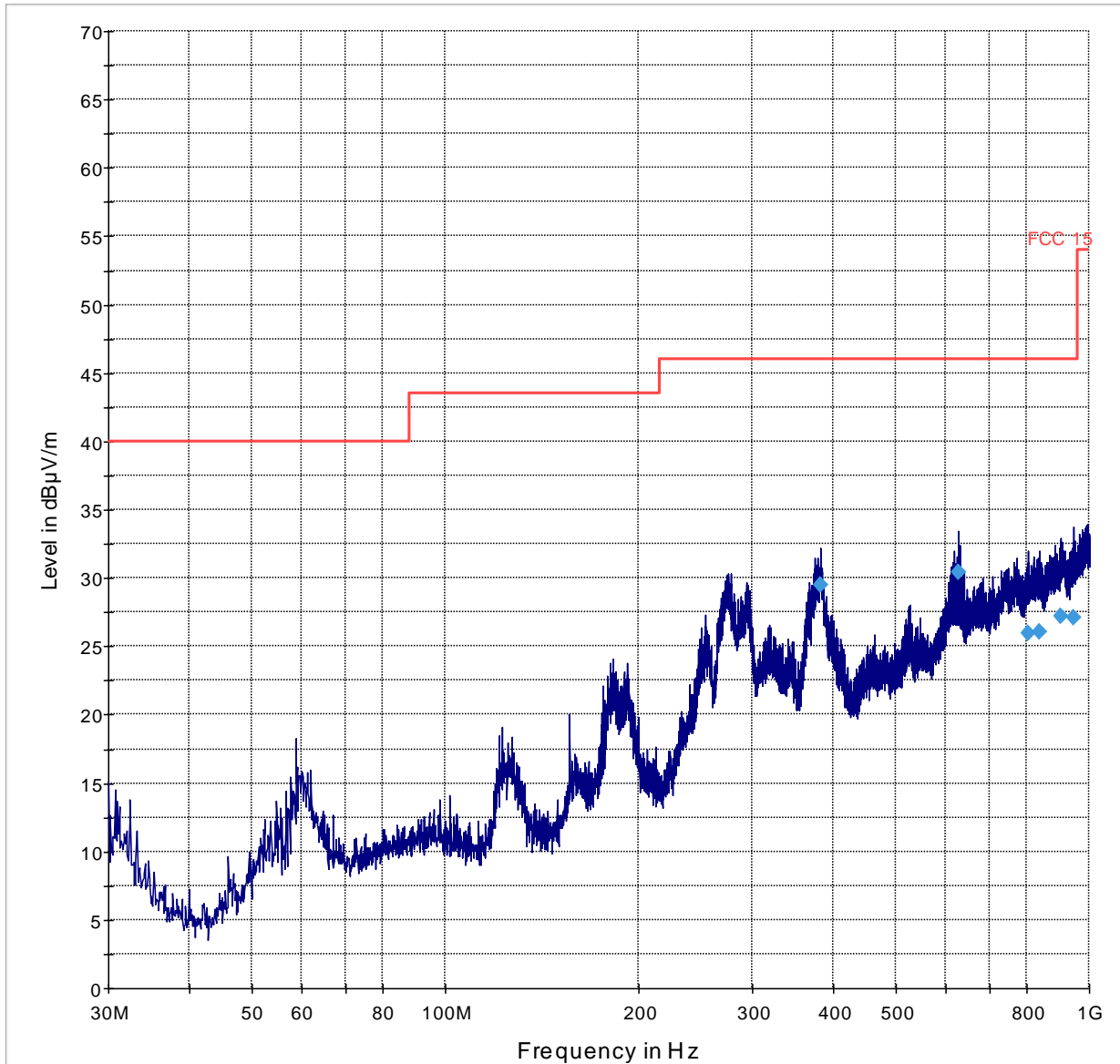
11.6.7 1 GHz – 6 GHz: Ch. 7, 2442 MHz, 802.11g

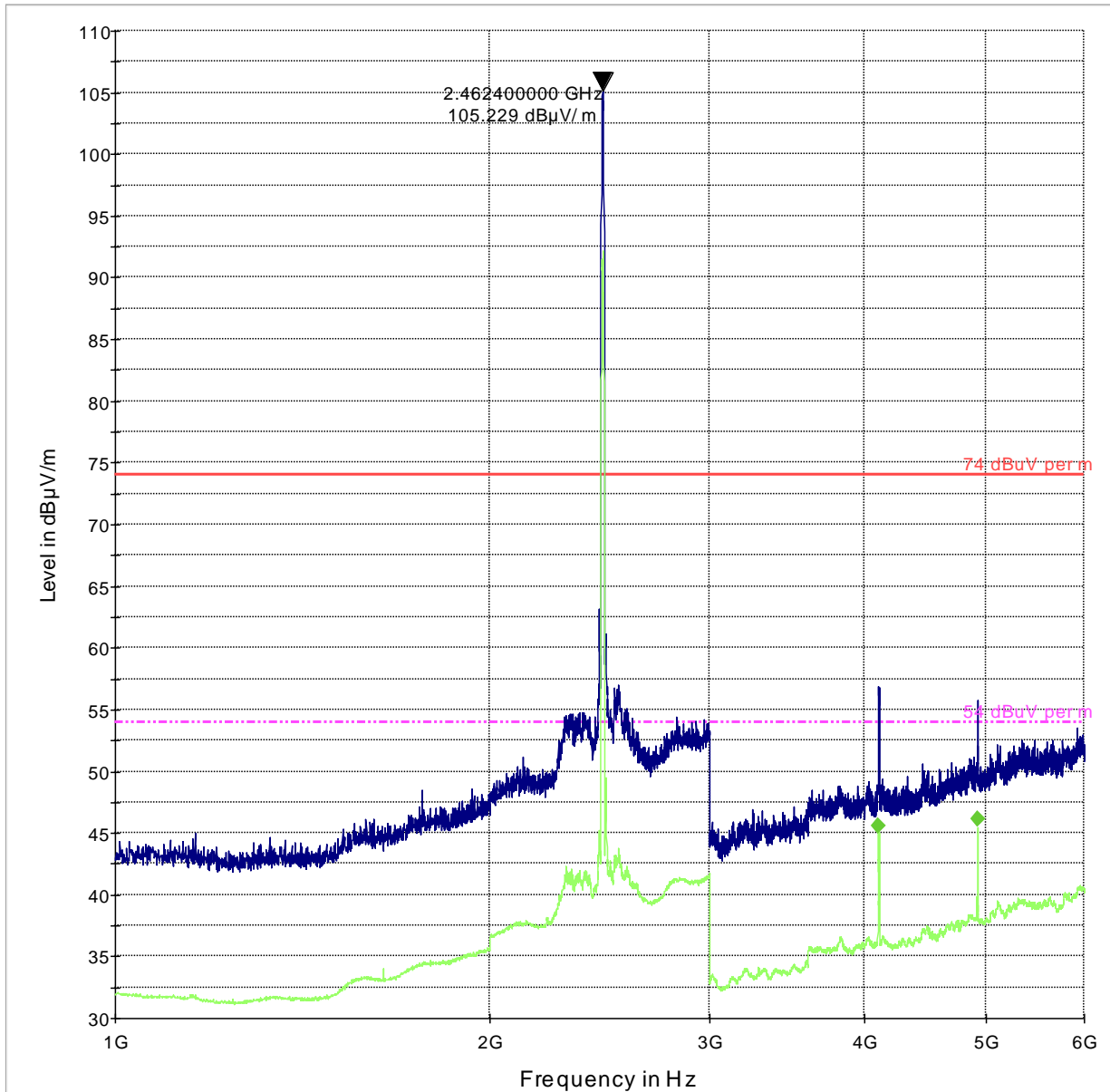
11.6.8 6 GHz – 18 GHz: Ch. 7, 2442 MHz, 802.11g

11.6.9 18 GHz – 26 GHz: Ch. 7, 2442 MHz, 802.11g

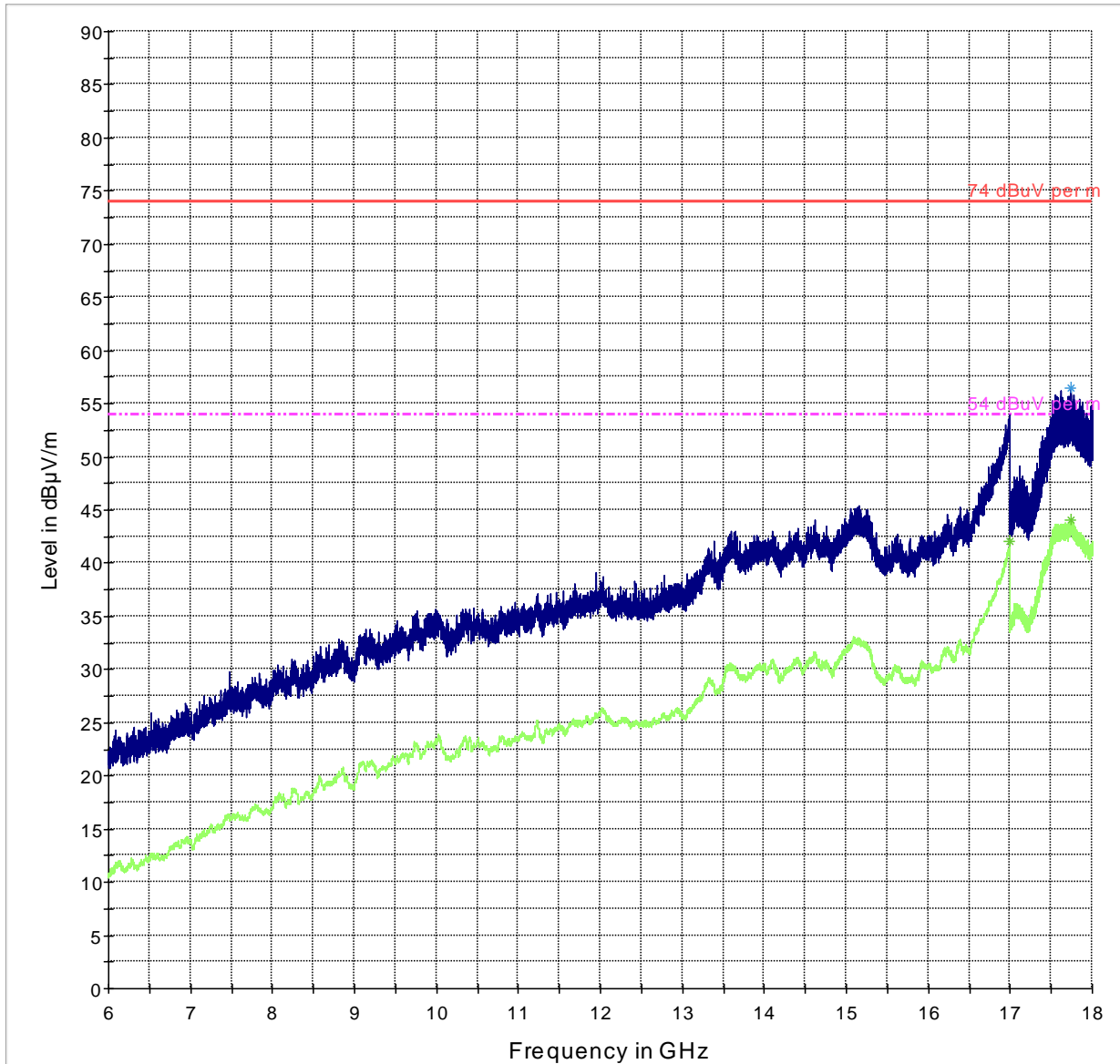


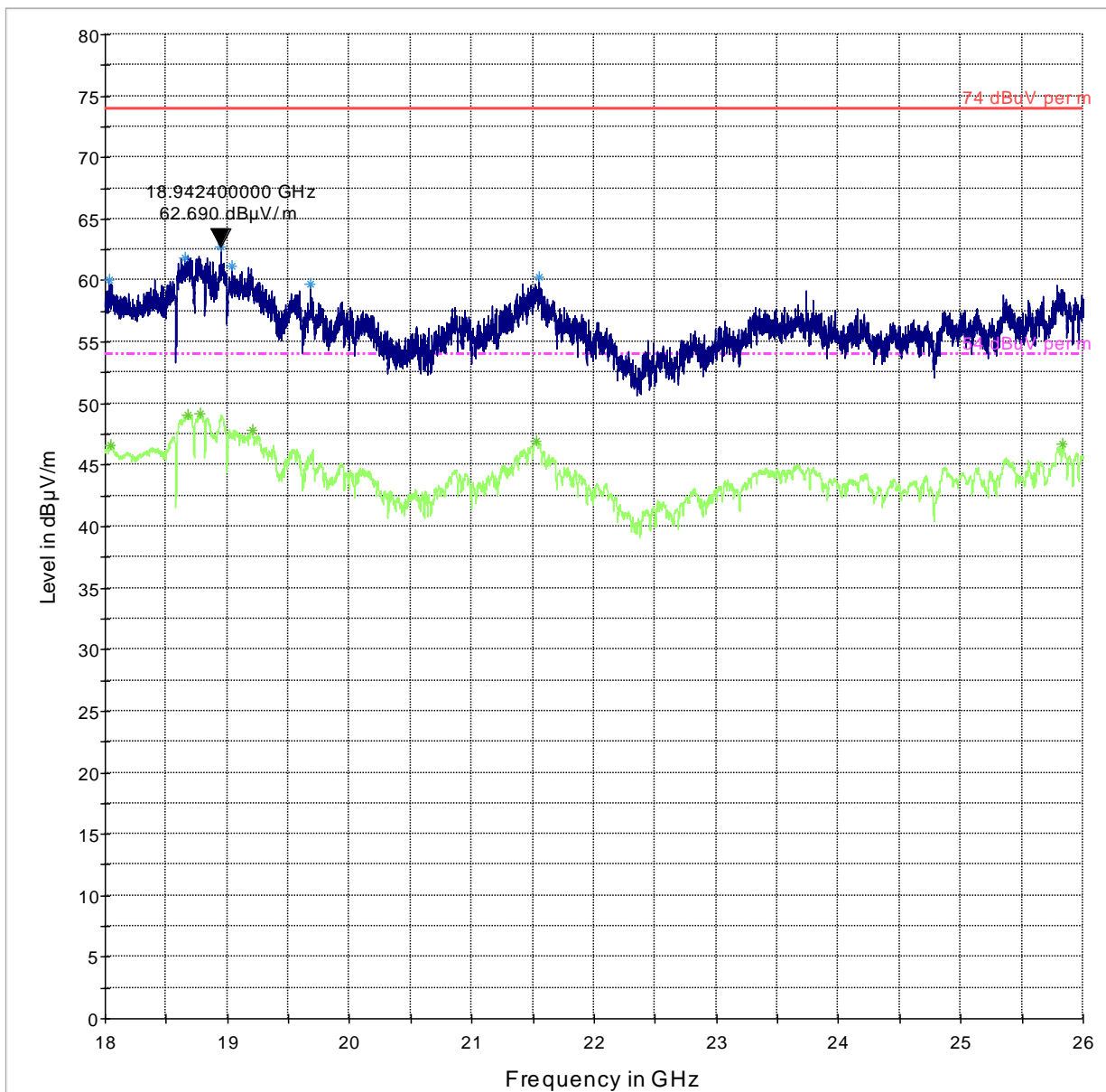
11.6.1030 MHz – 1 GHz: Ch. 11, 2462 MHz, 802.11g



11.6.111 GHz – 6 GHz: Ch. 11, 2462 MHz, 802.11g

11.6.126 GHz – 18 GHz: Ch. 11, 2462 MHz, 802.11g



11.6.1318 GHz – 26 GHz: Ch. 11, 2462 MHz, 802.11g

12 AC Power Line Conducted Emissions

The purpose of this test is to measure unwanted radio frequency currents induced in any AC conductor external to the equipment which could conduct interference to other equipment via the AC electrical network.

12.1 Limits:

§15.207 & RSS-Gen 8.8

(a) Except as shown in paragraphs (b) and (c) of this section of the CFR, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table (1), as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Table 1:

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

*Decreases with the logarithm of the frequency.

12.2 Test Conditions:

Test mode: 802.11g (OFDM)

Modulation: BPSK @ 6 Mbps- the highest conducted output power.

Tnom: 20°C; Vnom: 120 VAC

12.3 Test Procedure:

Measurement according to ANSI C63.10:2013 section 6.2 and 4.1 (also refer to section 6, 6.3 in this test report)

Analyzer Settings:

RBW = 9 KHz (CISPR Bandwidth)

Detector: Qusi-Peak / Average

12.4 Results

Plots shown here represent the combined worse case emissions for power lines (phases and neutral line).
Pass.

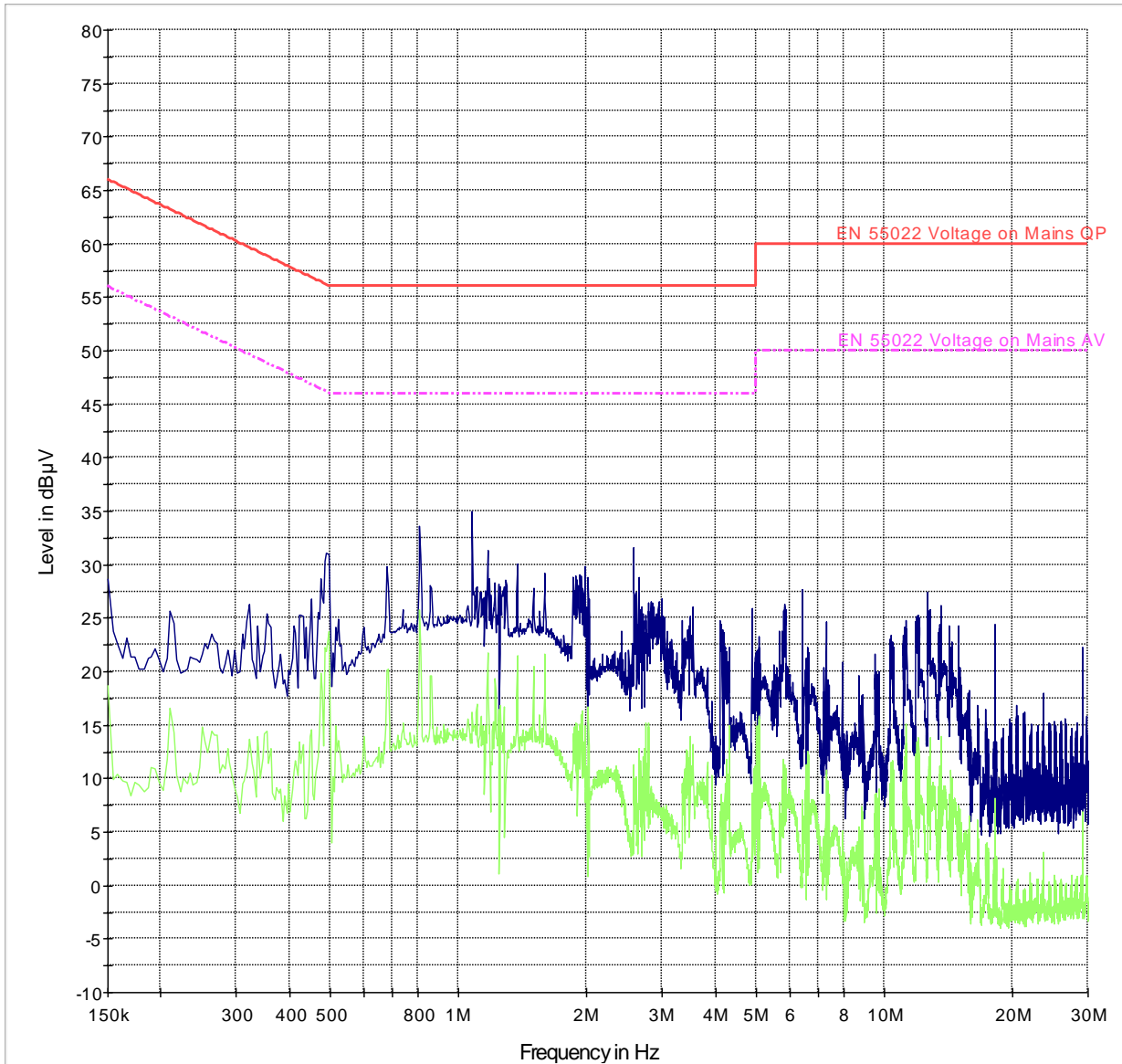
12.5 Test Data

Conducted Emissions: 150 KHz – 30 MHz

Note: All peak levels are below average limit. Final measurements are not required.

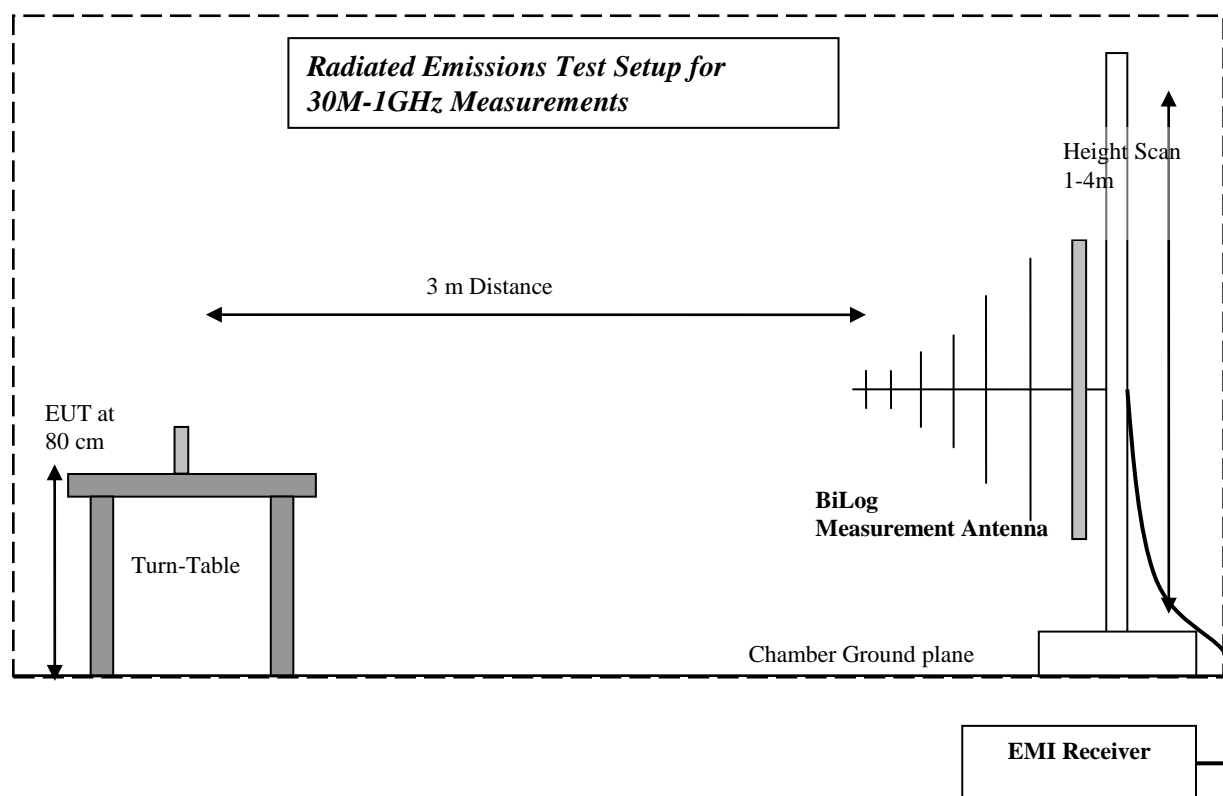
12.6 Measurement Plots:

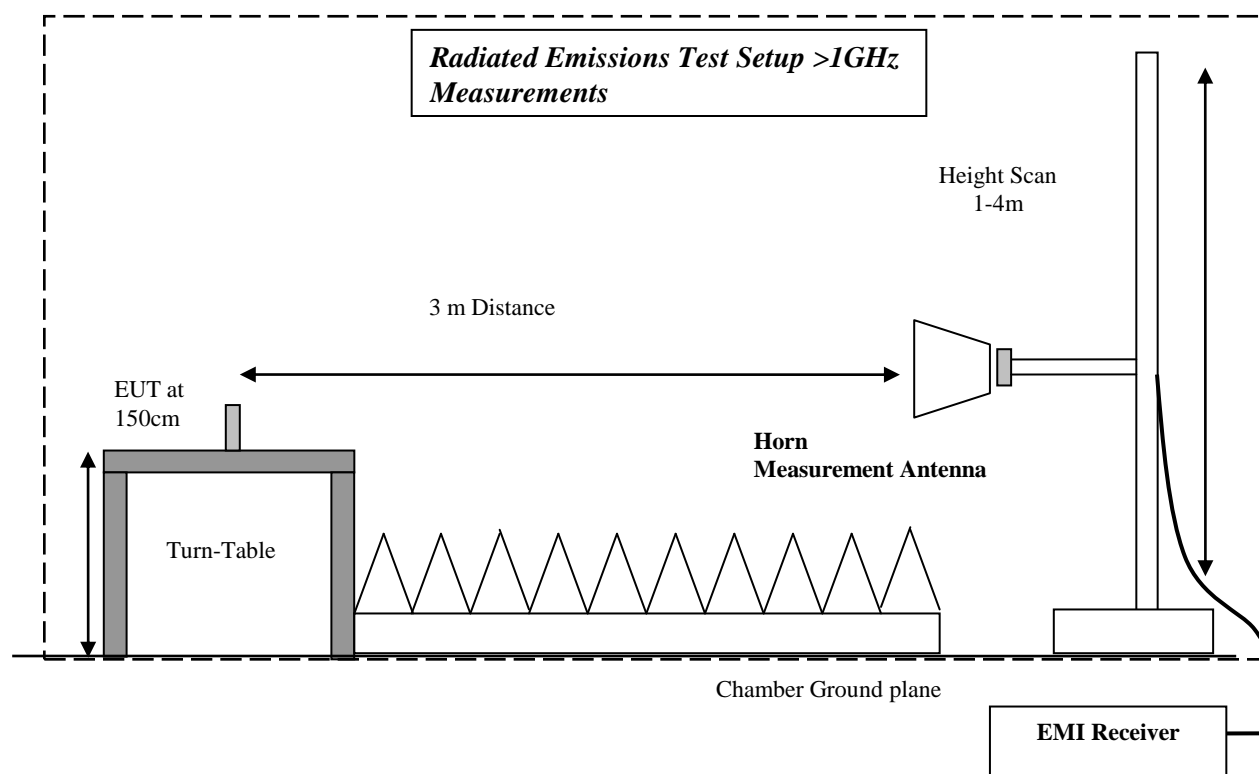
12.6.1 Conducted Emissions: 150 KHz – 30 MHz



13 Test Equipment and Ancillaries used for tests

| No. | Equipment Name | Manufacturer | Type/model | Serial No. | Cal Date | Cal Interval |
|----------------------------|--------------------------|--------------------------|------------|------------|----------|--------------|
| 3m Semi- Anechoic Chamber: | | | | | | |
| | 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 | 100251-kB | Jun 2015 | 2 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 | 4 Years |
| | Horn Antenna | EMCO | 3115 | 35114 | Mar 2012 | 4 Years |
| | LISN | Fischer Custom Comm. Inc | 05-25-2-08 | 08014 | Mar 2015 | 2 years |
| | Spectrum Analyzer | Rohde&Schwarz | FSU 8 | 200256 | Jul 2015 | 2 Years |

14 Test Setup Diagram:



15 Revision History

| Date | Report Name | Version | Report prepared by |
|-------------|-------------------------------------|----------------|-------------------------------|
| 2015-07-16 | EMC_BOTH0-003-15001_15.247_DTS_WLAN | initial | Franz Engert |