



# FCC RADIO TEST REPORT

|             |                                                                         |
|-------------|-------------------------------------------------------------------------|
| Applicant   | : ZHEJIANG DALI TECHNOLOGY CO.,LTD                                      |
| Address     | : No.639 Binkang Road, Binjiang District, 510053<br>Hangzhou, P.R.CHINA |
| Equipment   | : Thermal Imaging Riflescopes                                           |
| Model No.   | : RS135-384, RS150-384, RS135-640, RS150-640                            |
| Trade Name  | : N/A                                                                   |
| FCC ID      | : 2AWAA-RS1                                                             |
| Test Period | : Apr. 01~Apr. 14, 2020                                                 |

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of **Cerpass Technology (Suzhou) Co., Ltd.**, the test report shall not be reproduced except in full.
- The test report must not be used by the clients to claim product certification approval by any agency of the Government.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.10 – 2013& FCC Part15.247** and the energy emitted by this equipment was **passed**.

Approved by:

  
Miro Chueh  
EMC/RF Manager

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory



**TAF LAB Code: 1439**

Cerpass Technology (SuZhou) Co., Ltd.



**CNAS LAB Code: L5515**



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**History of this test report**

☒ ORIGINAL

☐ Additional attachment as following record:

| Attachment No. | Issue Date    | Description   |
|----------------|---------------|---------------|
| SEFI2004062    | Apr. 16, 2020 | Initial Issue |
|                |               |               |
|                |               |               |
|                |               |               |
|                |               |               |
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| Report Type                         |                   | Description |
|-------------------------------------|-------------------|-------------|
| <input checked="" type="checkbox"/> | Original report   | NA          |
| <input type="checkbox"/>            | Derivative Report | NA          |



## 1. Summary of Test Procedure and Test Results

### 1.1 Applicable Standards

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

| FCC Rule                                                                                              | Description of Test                | Result |
|-------------------------------------------------------------------------------------------------------|------------------------------------|--------|
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.203/15.247 (b)                                      | . Antenna Requirement              | Pass   |
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.207                                                 | . AC Power Line Conducted Emission | Pass   |
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.205/15.209;<br>Part2 section 2.1051, 2.1053, 2.1057 | . Spurious Emission(Radiated)      | Pass   |
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.247(d);<br>Part2 section 2.1051 and 2.1057          | . Spurious Emission(Conducted)     | Pass   |
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.247(a)(2);<br>Part2 section 2.1049                  | . 6dB Bandwidth                    | Pass   |
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.247(b);<br>Part2 section 2.1046                     | . Maximum Peak Output Power        | Pass   |
| FCC CFR Title 47 Part 15 Subpart C:<br>Section 15.247(e)                                              | . Power Spectral Density           | Pass   |

\*The lab has lowered the uncertainty risk of test equipment, environment, and staff technicians according to ISO-IEC17025. Therefore we define test result as compliant when it complies with the standard without further evaluation of test result uncertainty.



## 2. Test Configuration of Equipment under Test

### 2.1 Feature of Equipment under Test

|                   |                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Product           | Thermal Imaging Riflescopes                                                                                                         |
| Test Model        | RS135-384, RS150-384, RS135-640, RS150-640                                                                                          |
| Model Discrepancy | All models are identical to each other except for the lens and resolution.<br>Model RS135-384 is the representative for final test. |
| Frequency Range   | 802.11b/g/n(20MHz): 2412-2462MHz                                                                                                    |
| Modulation        | 802.11b: CCK, DQPSK, DBPSK<br>802.11g: 64 QAM, 16 QAM, QPSK, BPSK<br>802.11n: BPSK, QPSK, 16-QAM, 64-QAM                            |
| Data Rate         | 802.11b: 1, 2, 5.5, 11Mbps<br>802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps<br>802.11n: up to 144.4Mbps                                 |
| EUT Power Rating: | Input: DC5V                                                                                                                         |
| Antenna Spec.     | PCB Antenna with 1.16dBi                                                                                                            |

Note: for more details, please refer to the User's manual of the EUT.

### 2.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (2412MHz~2462MHz)

| Channel    | Frequency(MHz) | Channel    | Frequency(MHz) |
|------------|----------------|------------|----------------|
| <b>*01</b> | <b>2412</b>    | 07         | 2442           |
| 02         | 2417           | 08         | 2447           |
| 03         | 2422           | 09         | 2452           |
| 04         | 2427           | 10         | 2457           |
| 05         | 2432           | <b>*11</b> | <b>2462</b>    |
| <b>*06</b> | <b>2437</b>    | ---        | ---            |

Note: Channels remarked \* are selected to perform test.



## 2.3 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- The complete test system included support units and EUT for the RF test.
- An executive program, "**RFTestTool.apk**" which transmits and receives data through Wireless.
- The EUT had been tested under operating condition  
After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.  
EUT staying in continuous transmitting mode was programmed.
- Test modes:

| Conducted Emissions from the AC mains power ports / Radiation Emissions (30MHz ~ 1GHz) |                         |
|----------------------------------------------------------------------------------------|-------------------------|
| Test Mode                                                                              | Operating Description   |
| 1                                                                                      | 802.11b (1 Mbps)        |
| 2                                                                                      | 802.11g (6 Mbps)        |
| 3                                                                                      | 802.11n HT20 (6.5 Mbps) |
| caused "Test Mode 1 " generated the worst case, it was reported as the final data.     |                         |
| Radiated emission (above 1GHz) & Conducted measurement                                 |                         |
| Test Mode                                                                              | Operating Description   |
| 1                                                                                      | 802.11b (1 Mbps)        |
| 2                                                                                      | 802.11g (6 Mbps)        |
| 3                                                                                      | 802.11n HT20 (6.5 Mbps) |
| caused "Test Mode 1~3" generated the worst case, it was reported as the final data.    |                         |

## 2.4 Description of Test System

| Device   | Manufacturer | Model No.  | Description |
|----------|--------------|------------|-------------|
| Notebook | Sony         | PCG-71811P | R33021      |
| Adapter  | UGREEN       | CD122      | N/A         |

### Used cable

| Cable     | Quantity | Description                      |
|-----------|----------|----------------------------------|
| DC Cable  | 1        | 1.7m Non Shielding               |
| USB Cable | 1        | 1.0m Non Shielding with one core |



## 2.5 General Information of Test

|                                     |           |                                                                                                                                                                                            |
|-------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | Test Site | <b>Cerpass Technology Corporation Test Laboratory</b><br>Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.)<br>Tel:+886-3-3226-888<br>Fax:+886-3-3226-881 |
|                                     | TAF       | 1439                                                                                                                                                                                       |
|                                     | FCC       | TW1079, TW1061                                                                                                                                                                             |
|                                     | IC        | 4934E-1, 4934E-2                                                                                                                                                                           |
|                                     | VCCI      | T-2205 for Telecommunication Test<br>C-4663 for Conducted emission test<br>R-4399, R-4218 for Radiated emission test<br>G-812, G-813 for radiated disturbance above 1GHz                   |
| <input checked="" type="checkbox"/> | Test Site | Cerpass Technology (Suzhou) Co.,Ltd<br>Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China<br>Tel: +86-512-6917-5888<br>Fax: +86-512-6917-5666                   |
|                                     | CNAS      | L5515                                                                                                                                                                                      |
|                                     | FCC       | CN1243                                                                                                                                                                                     |
|                                     | A2LA      | 4981.01                                                                                                                                                                                    |
|                                     | IC        | 7290A                                                                                                                                                                                      |
|                                     | VCCI      | T-11945 for Telecommunication Test<br>C-12919 for Conducted emission test<br>R-12670 for Radiated emission test<br>G-10227 for radiated disturbance above 1GHz                             |

| Test Item                        | Test Site  | Tested Date | Environmental Conditions | Tested By  |
|----------------------------------|------------|-------------|--------------------------|------------|
| RF Conducted                     | RFCON01-NK | 2020/04/14  | 22°C / 63%               | Amos Zhang |
| Radiated Emissions               | 3M01-NK    | 2020/04/13  | 26°C / 51%               | Amos Zhang |
| AC Power Line Conducted Emission | CON01-NK   | 2020/04/13  | 25°C / 48%               | Amos Zhang |



## 2.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

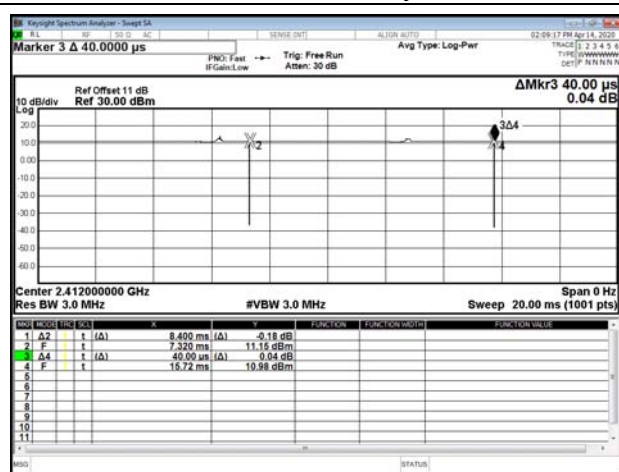
| Measurement Item                         | Measurement Frequency | Polarization          | Uncertainty |
|------------------------------------------|-----------------------|-----------------------|-------------|
| Conducted Emission                       | 9 kHz ~ 30 MHz        | Line / Neutral        | ±2.9076 dB  |
| Radiated Emission                        | 9 kHz ~ 40,000 MHz    | Vertical / Horizontal | ±0.948 dB   |
| Spurious Emission<br>(Conducted)         | -                     | -                     | ±4.011 dB   |
| Maximum Peak and<br>Average Output Power | -                     | -                     | ±0.322 dB   |
| Power Spectral Density                   | -                     | -                     | ±0.322 dB   |
| Bandwidth                                | -                     | -                     | 74.224Hz    |



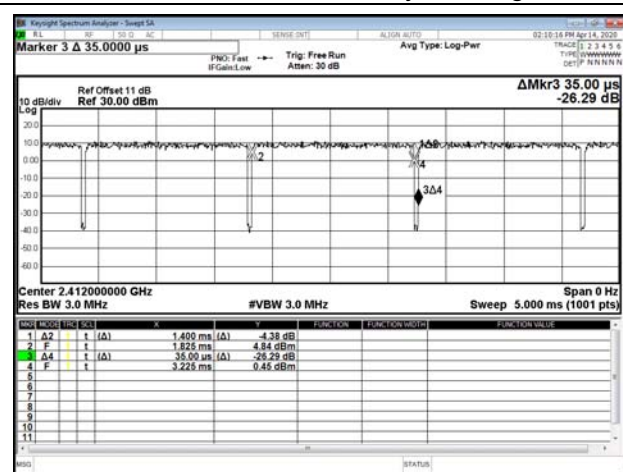
## 2.7 Duty cycle

| Mode           | Frequency (MHz) | Measurement (%) |
|----------------|-----------------|-----------------|
| 802.11b        | 2412            | 99.53           |
| 802.11g        | 2412            | 97.56           |
| 802.11n(20MHz) | 2412            | 97.04           |

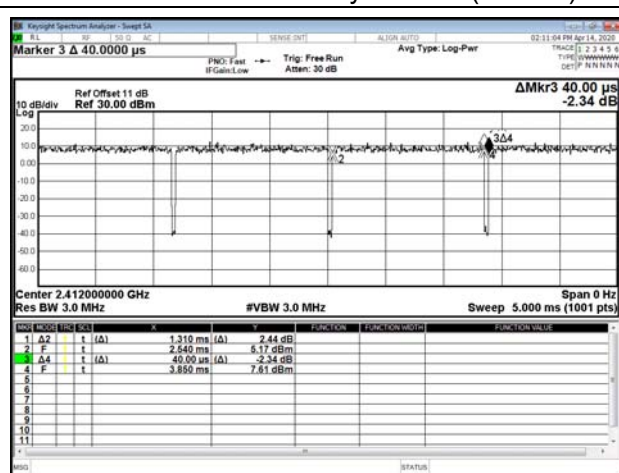
Transmit at channel 1 by 802.11b



Transmit at channel 1 by 802.11g



Transmit at channel 1 by 802.11n(20MHz)





### 3. Test Equipment and Ancillaries Used for Tests

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|----------------------|--------------|-----------|------------|------------------|-------------|
| EMI Receiver         | R&S          | ESCI3     | 100563     | 2019.06.21       | 2020.06.20  |
| LISN                 | Schwarzbeck  | NSLK 8127 | 8127-920   | 2019.09.25       | 2020.09.24  |
| Pulse Limiter        | R&S          | ESH3-Z2   | 100529     | 2020.03.11       | 2021.03.10  |
| Software             | Farad        | Ez-EMC    | ver.ct3a1  | N/A              | N/A         |

| Instrument/Ancillary | Manufacturer         | Model No.        | Serial No.            | Calibration Date | Valid Date. |
|----------------------|----------------------|------------------|-----------------------|------------------|-------------|
| Bilog Antenna        | Sunol                | JB1              | A072414-2<br>-2       | 2019.07.13       | 2020.07.13  |
| EMI Receiver         | R&S                  | ESCI3            | 101183                | 2019.06.28       | 2020.06.27  |
| EMI Receiver         | R&S                  | ESCI7            | 100968                | 2019.07.28       | 2020.07.27  |
| Preamplifier         | EM Electronics corp. | EM330            | 60618                 | 2020.03.11       | 2021.03.10  |
| Horn Antenna         | Schwarzbeck          | BBHA9120 D       | 9120D-619             | 2019.07.13       | 2020.07.13  |
| Horn Antenna         | Schwarzbeck          | BBHA9170         | 9170-348              | 2019.06.23       | 2020.06.22  |
| Spectrum Analyzer    | R&S                  | FSP40            | 100324                | 2019.07.13       | 2020.07.12  |
| Preamplifier         | EMCI                 | EMCI 030-00-3230 | SN016723              | 2020.03.11       | 2021.03.10  |
| Preamplifier         | EM Electronics corp. | EM01G18G         | SN060714              | 2020.03.23       | 2021.03.22  |
| Spectrum Analyzer    | KEYSIGHT             | N9010A           | MY53400169            | 2019.08.25       | 2020.08.24  |
| Software             | E3                   | AUDIX            | Version:<br>8.14.806b | N/A              | N/A         |



## 4. Antenna Requirements

### 4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.2 Antenna Construction and Directional Gain

| Antenna     | Peak Gain |
|-------------|-----------|
| PCB Antenna | 1.16dBi   |



## 5. Test of AC Power Line Conducted Emission

### 5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 6.2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

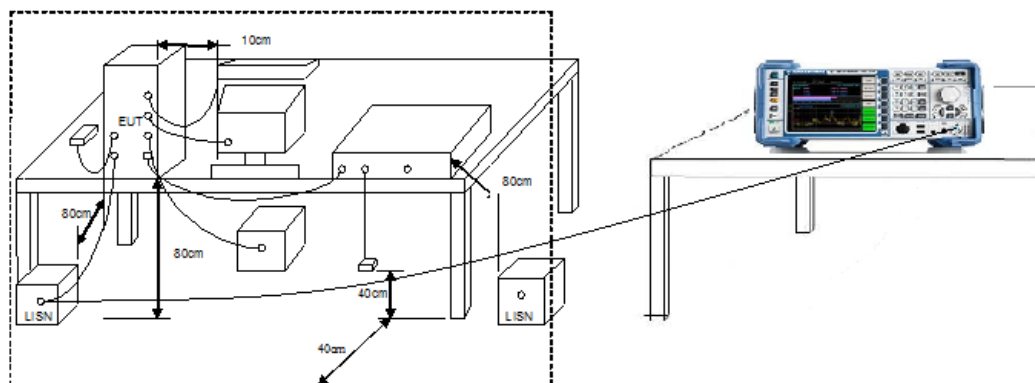
| Frequency (MHz) | Quasi Peak (dB $\mu$ V) | Average (dB $\mu$ V) |
|-----------------|-------------------------|----------------------|
| 0.15 – 0.5      | 66-56*                  | 56-46*               |
| 0.5 – 5.0       | 56                      | 46                   |
| 5.0 – 30.0      | 60                      | 50                   |

\*Decreases with the logarithm of the frequency.

### 5.2 Test Procedures

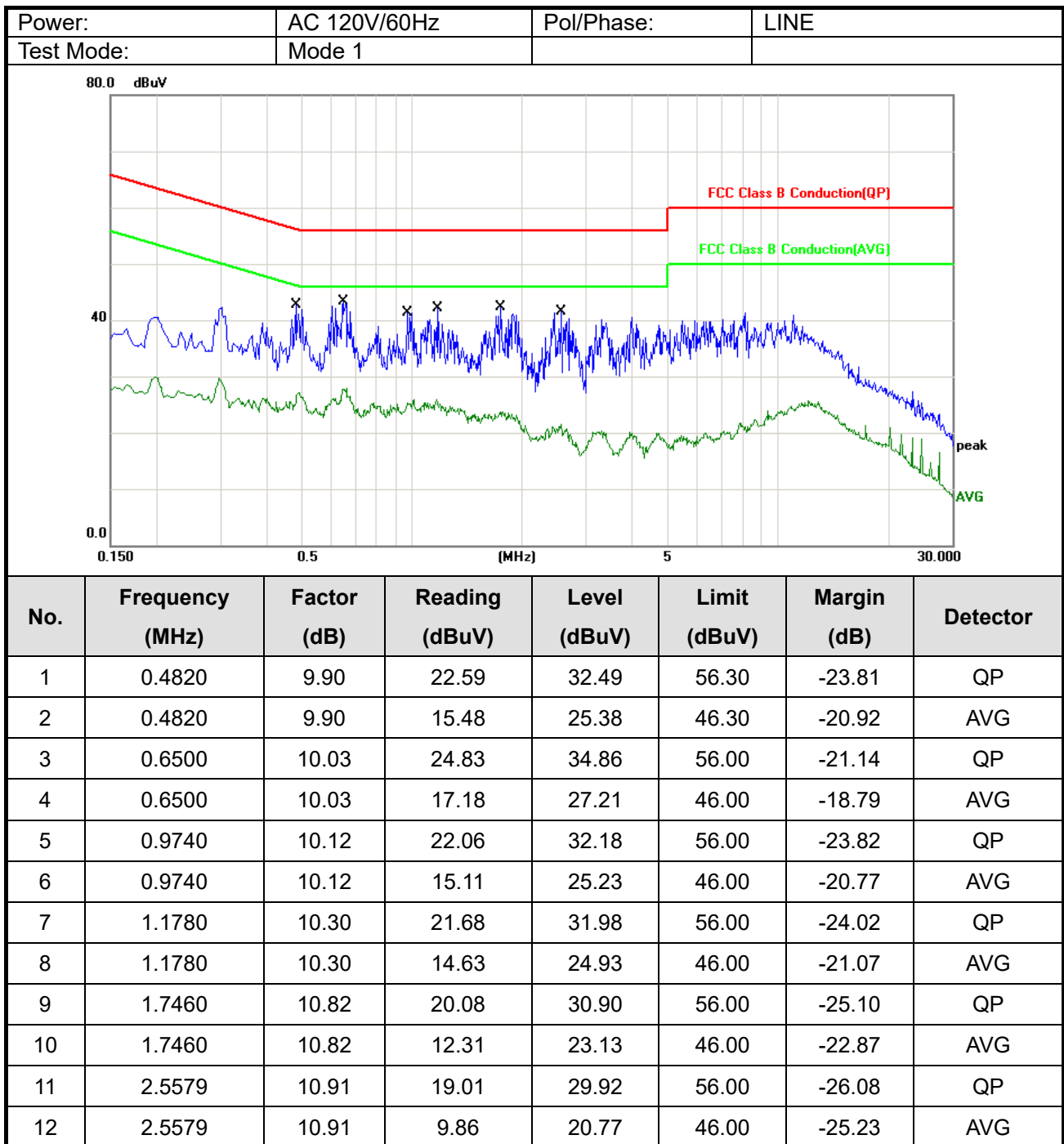
The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of Oct 2014 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 5.3 Typical Test Setup



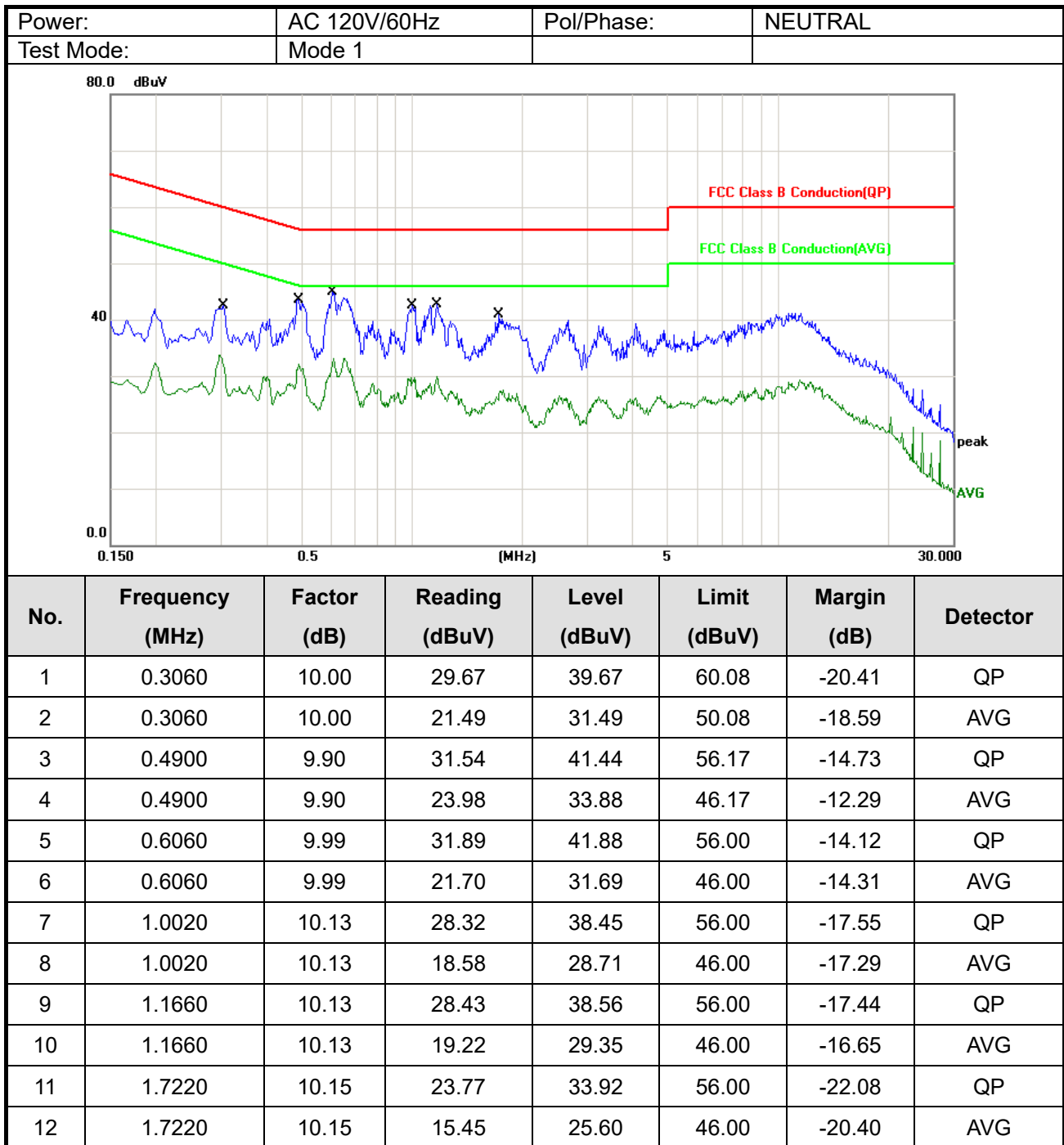


## 5.4 Test Result and Data



Note: Level = Reading + Factor

Margin = Level – Limit



Note: Level = Reading + Factor

Margin = Level – Limit



## 6. Test of Spurious Emission (Radiated)

### 6.1 Test Limit

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

| FREQUENCIES(MHz) | FIELD STRENGTH<br>(microvolts/meter) | MEASUREMENT<br>DISTANCE(meters) |
|------------------|--------------------------------------|---------------------------------|
| 0.009~0.490      | 2400/F(kHz)                          | 300                             |
| 0.490~1.705      | 24000/F(kHz)                         | 30                              |
| 1.705~30.0       | 30                                   | 30                              |
| 30~88            | 100                                  | 3                               |
| 88~216           | 150                                  | 3                               |
| 216~960          | 200                                  | 3                               |
| Above 960        | 500                                  | 3                               |

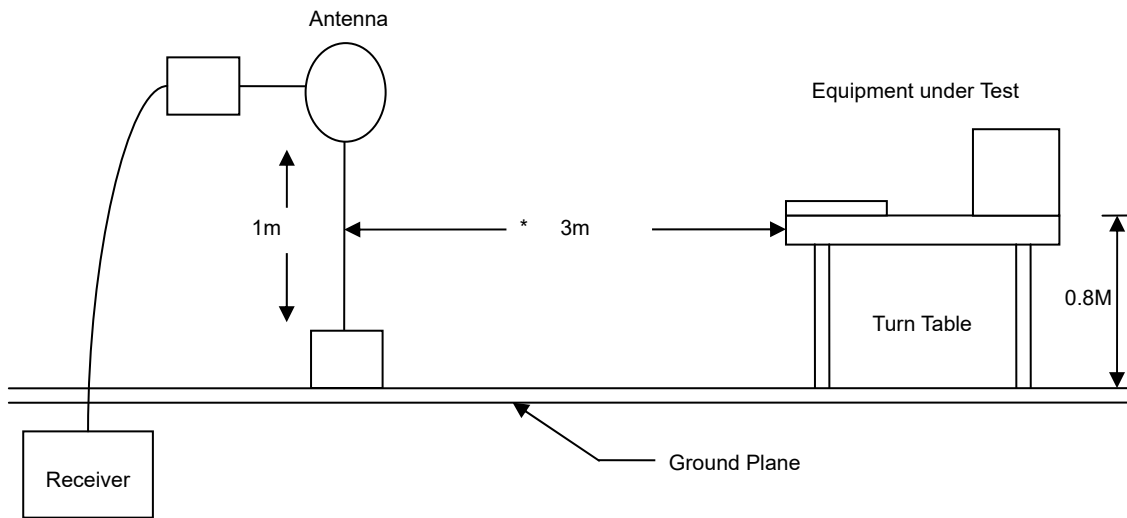
### 6.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter for frequency below 1GHz and 1.5meter for frequency above 1GHz above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than AVG limit (that means the emission level in peak mode also complies with the limit in AVG mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in AVG mode again and reported.

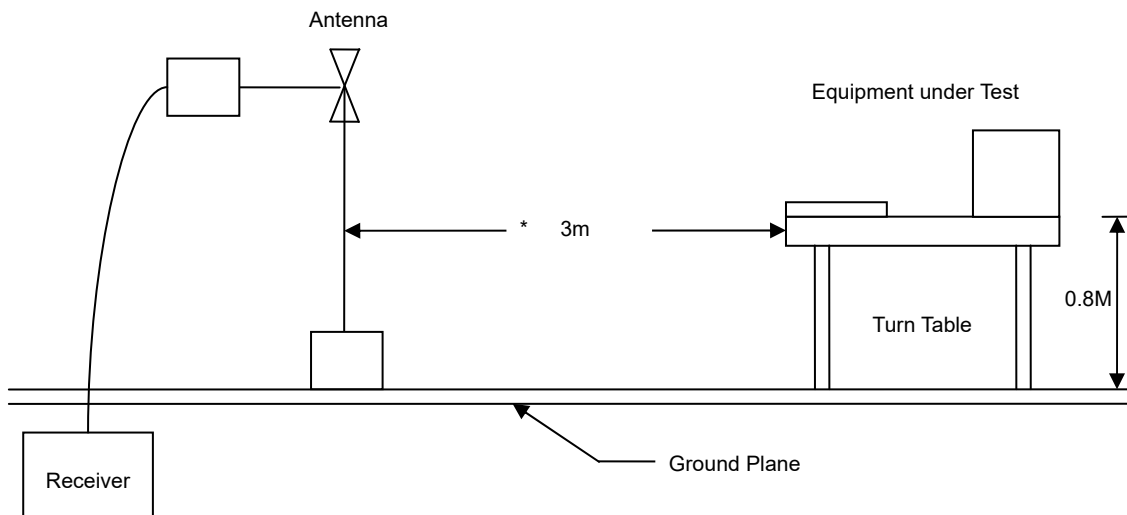


### 6.3 Typical Test Setup

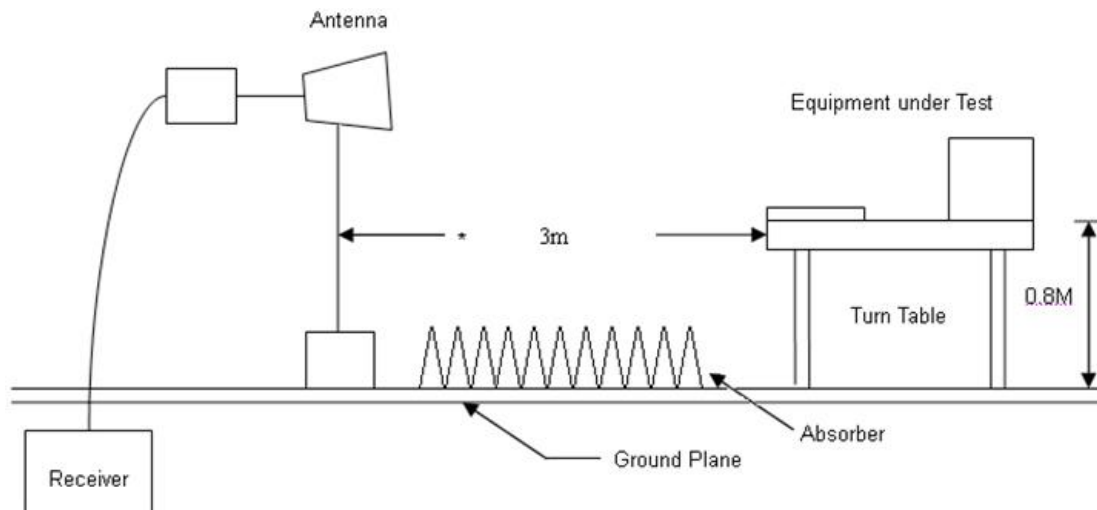
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup

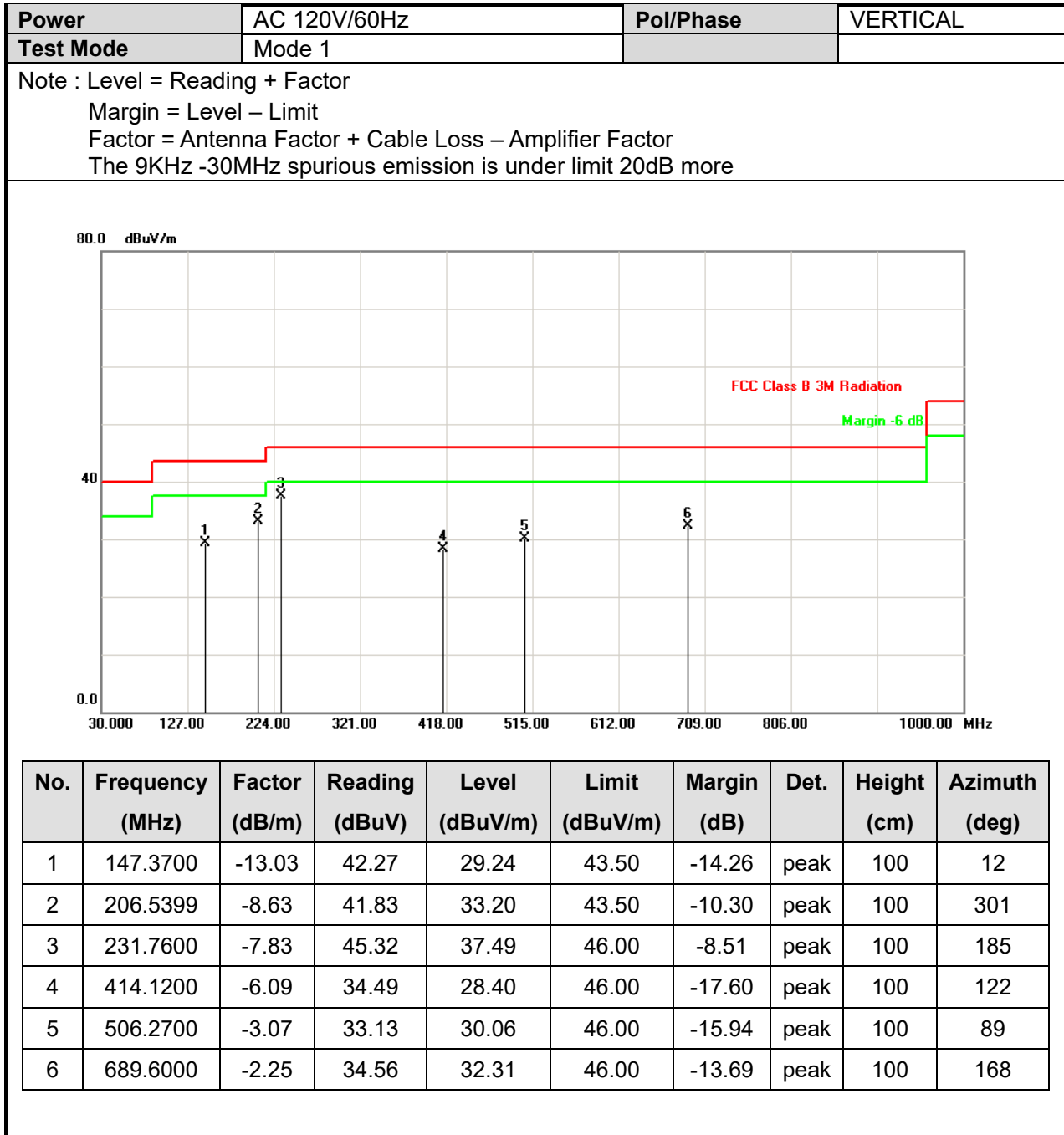


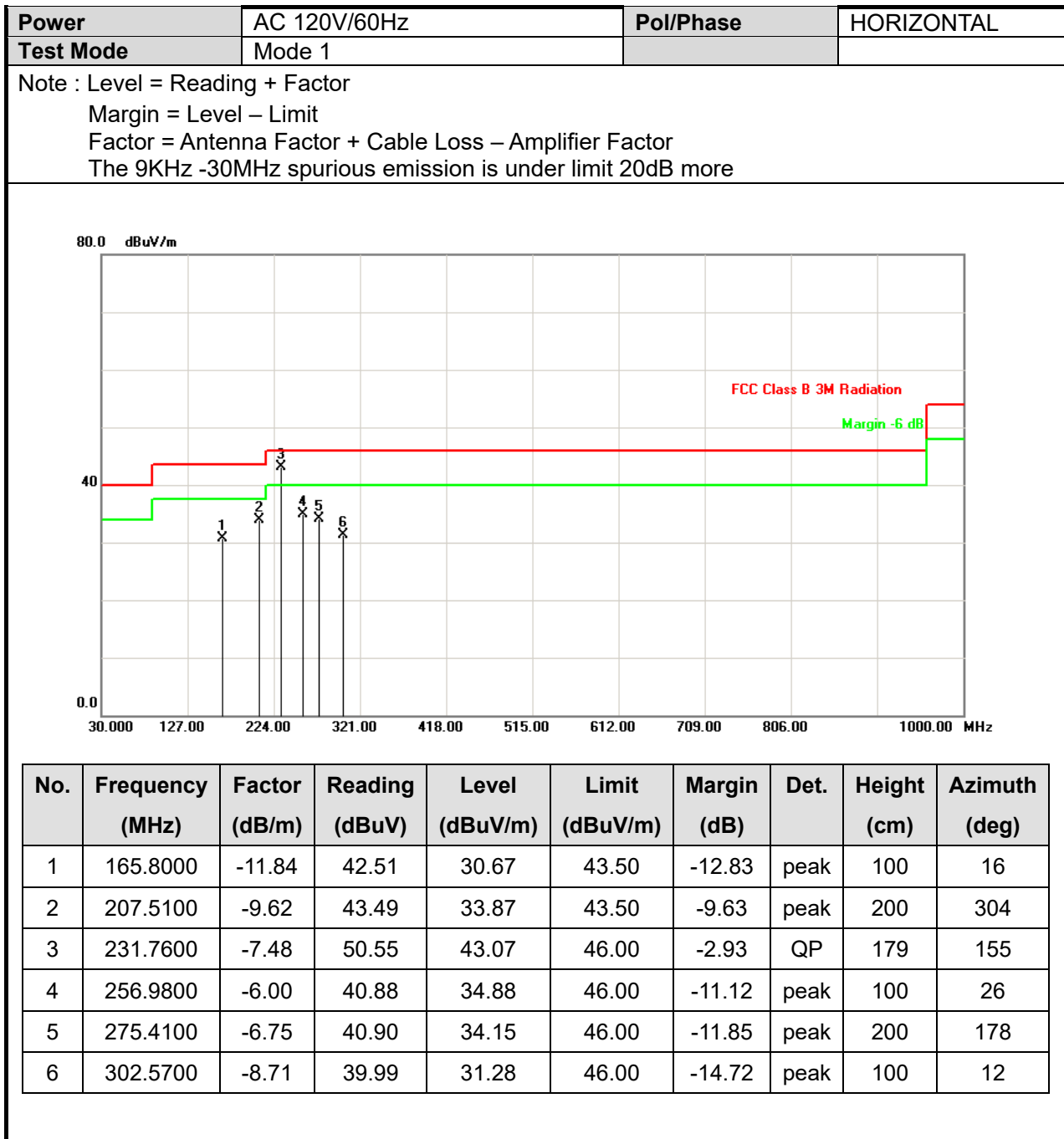


## 6.4 Test Result and Data (9KHz ~ 30MHz)

The 9kHz-30MHz spurious emission is under limit 20dB more.

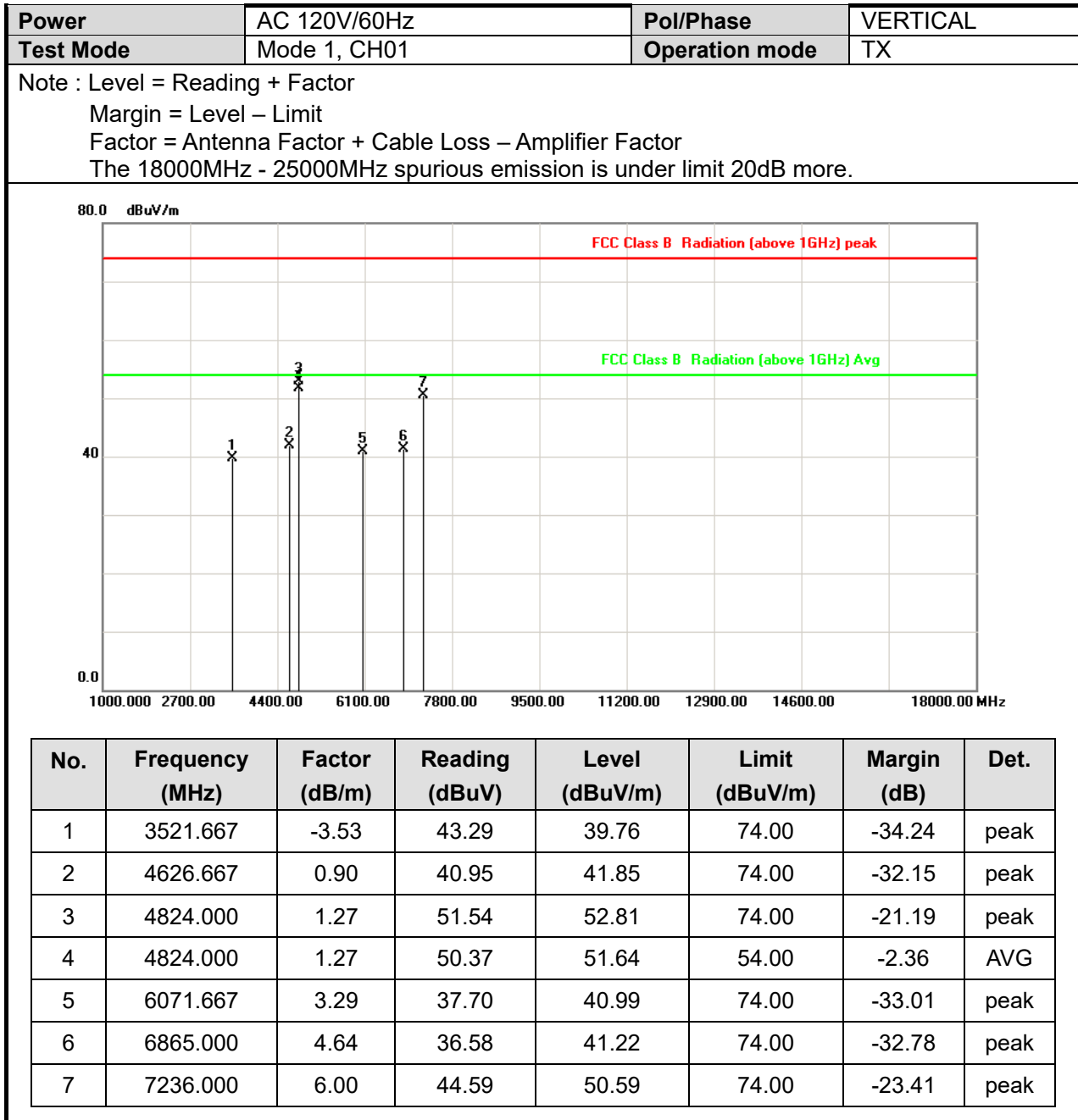
## 6.5 Test Result and Data (30MHz ~ 1GHz)

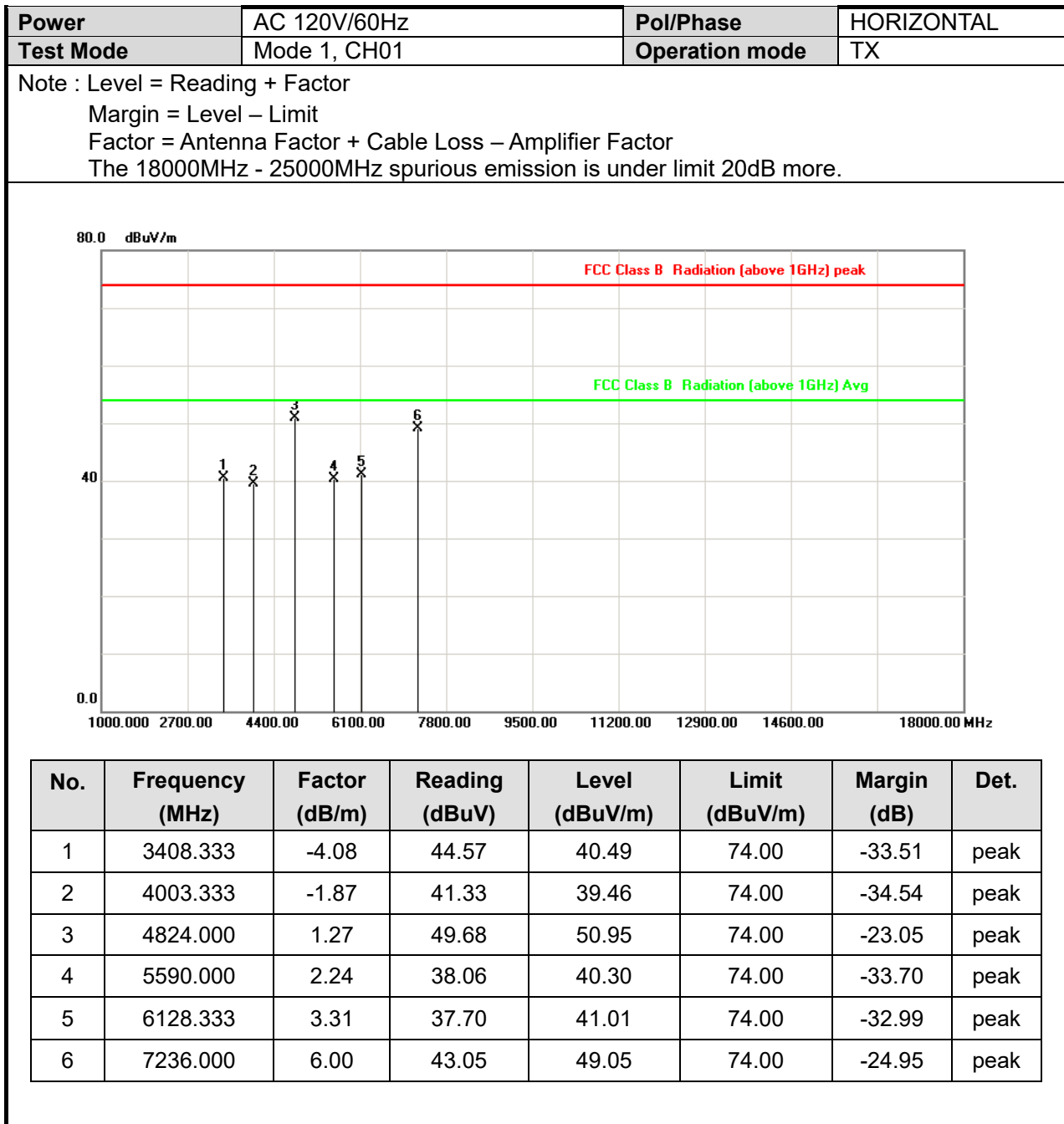


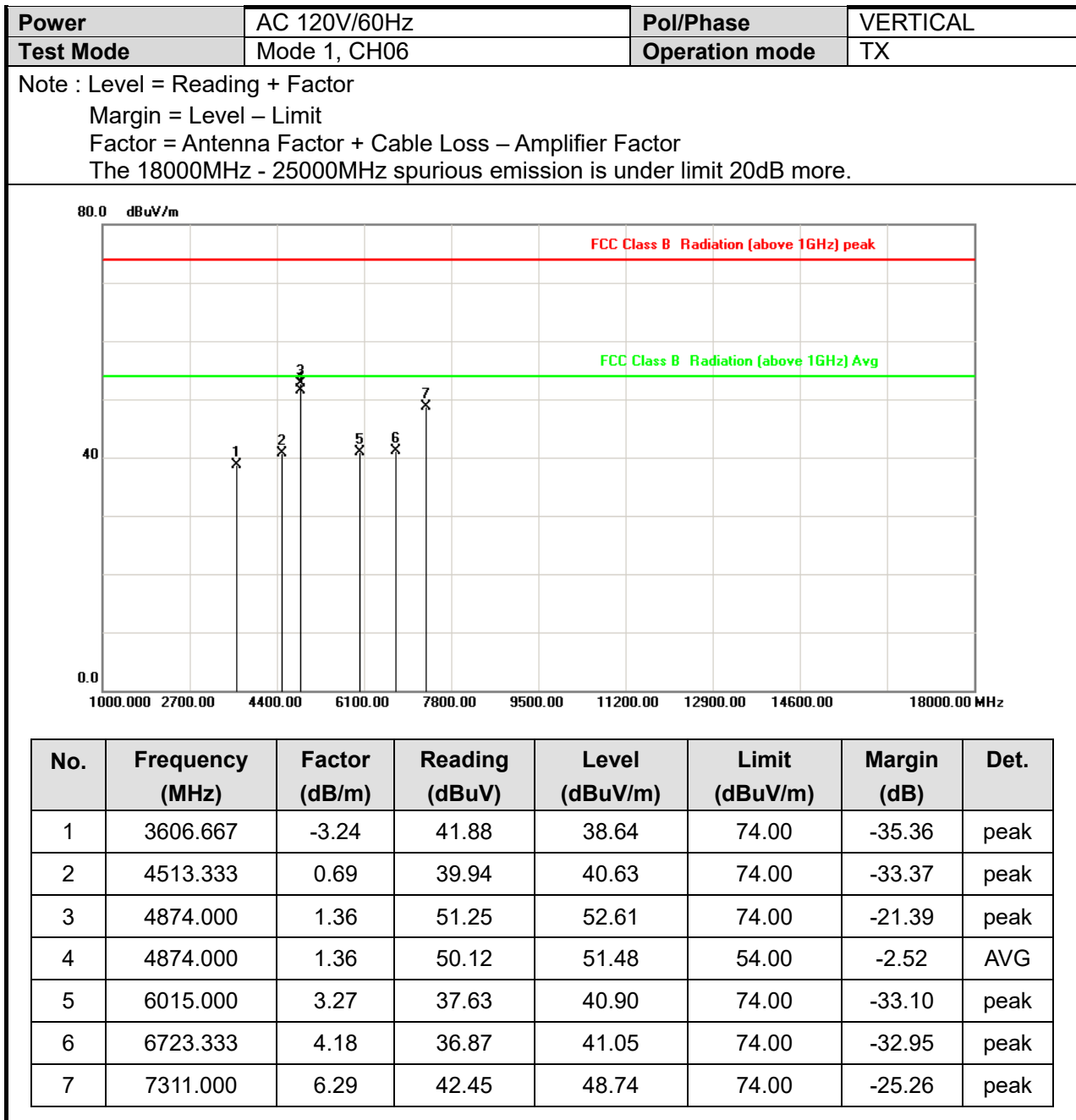


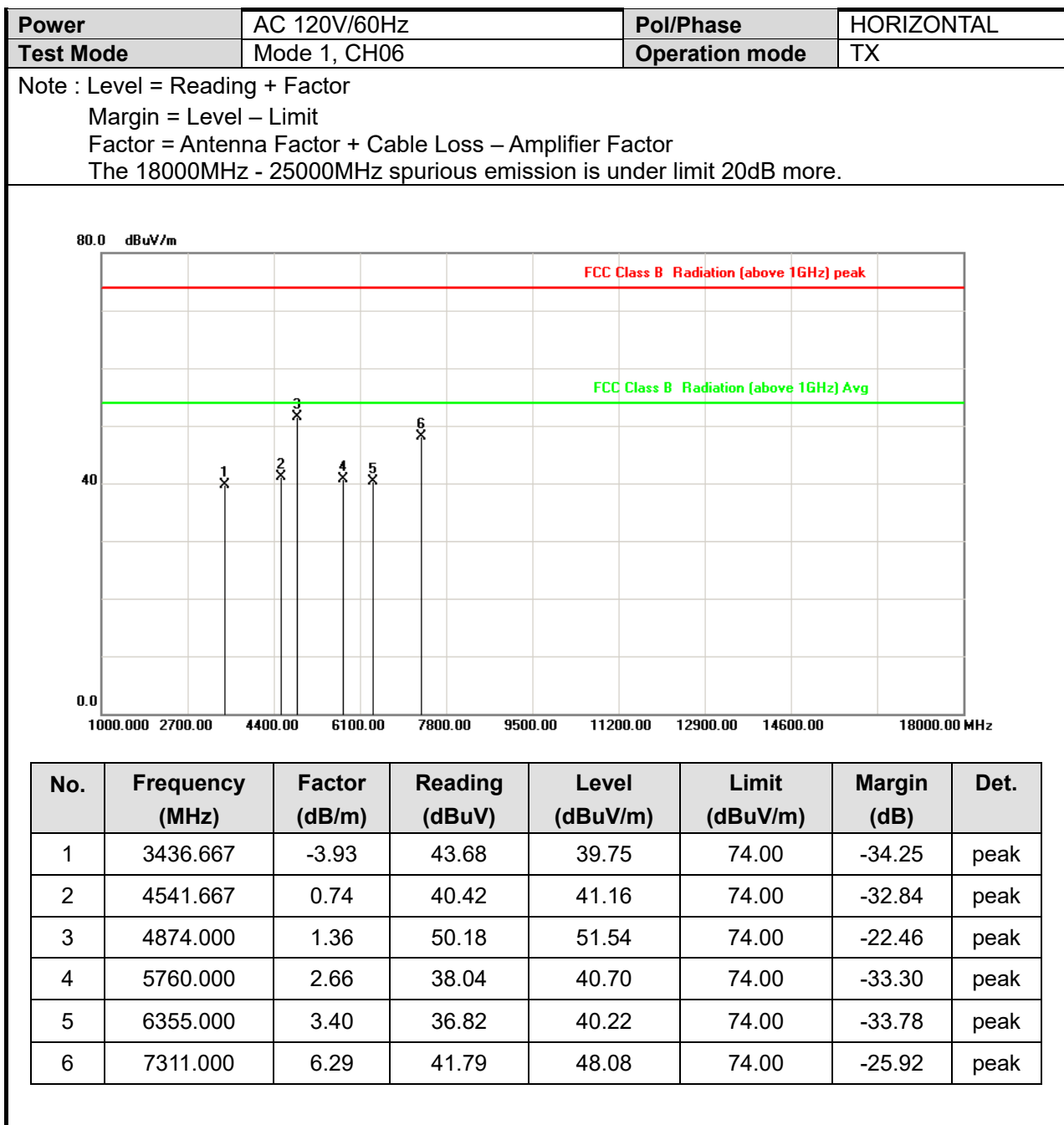


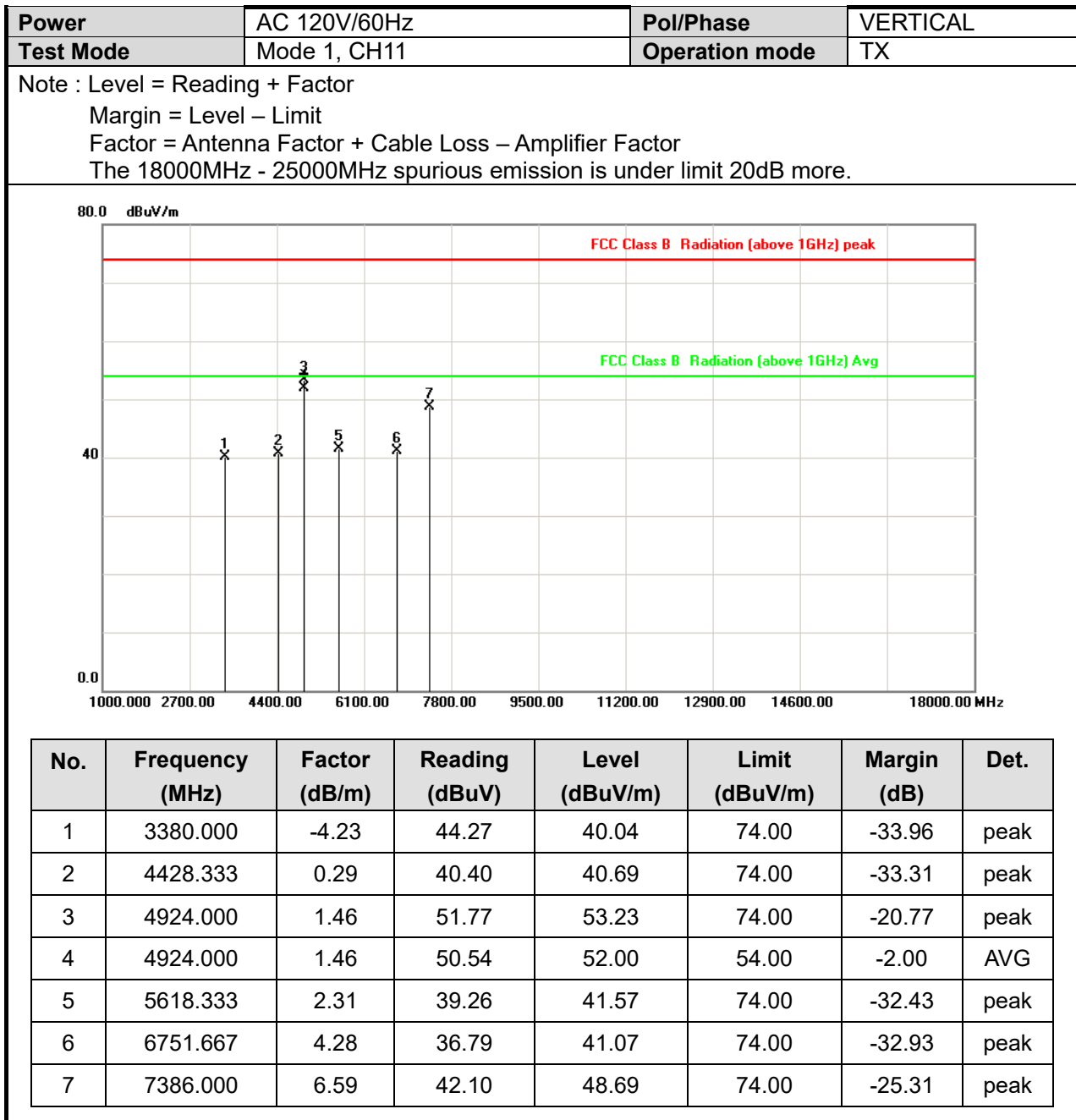
## 6.6 Test Result and Data (1GHz ~ 25GHz)

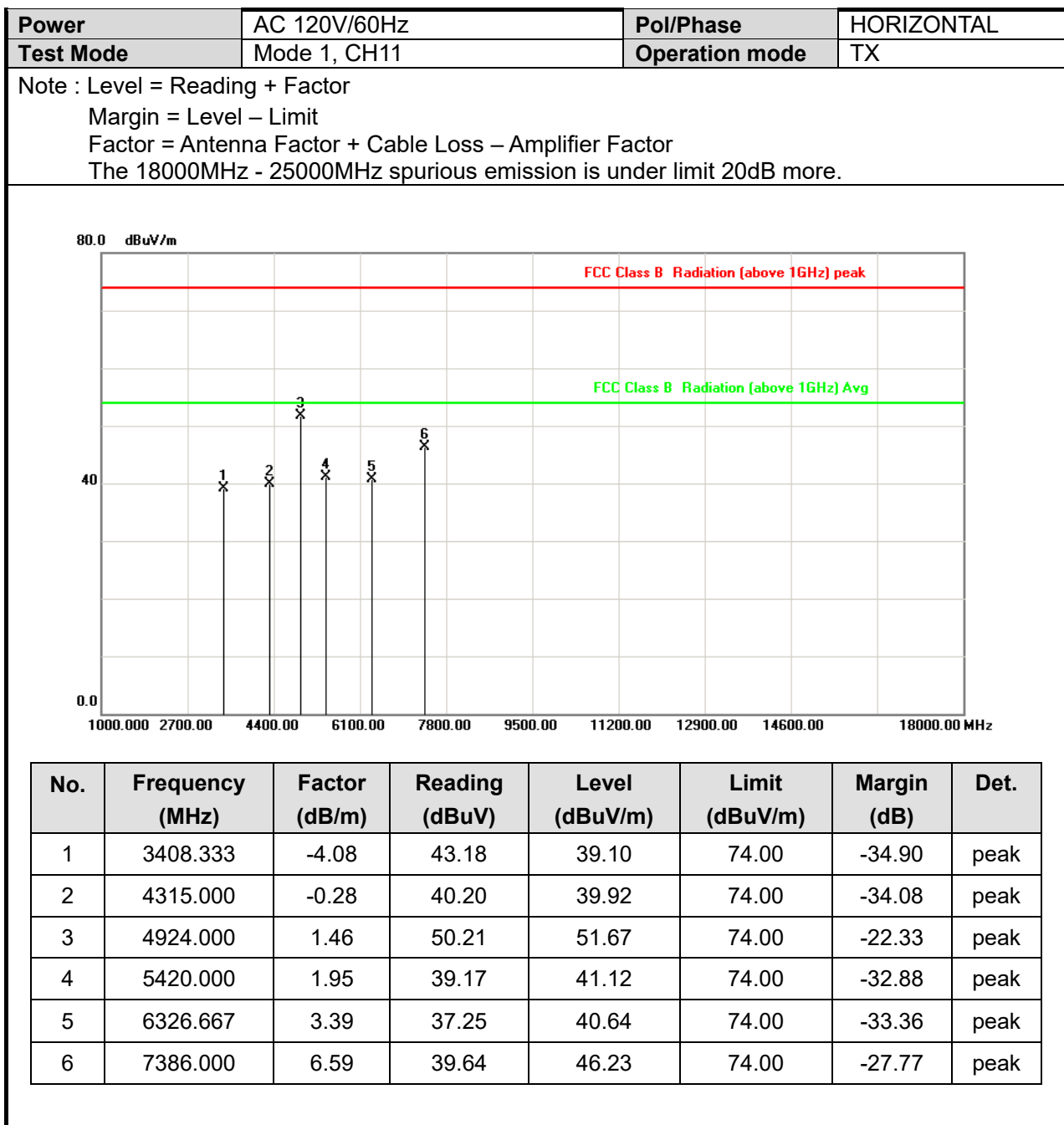


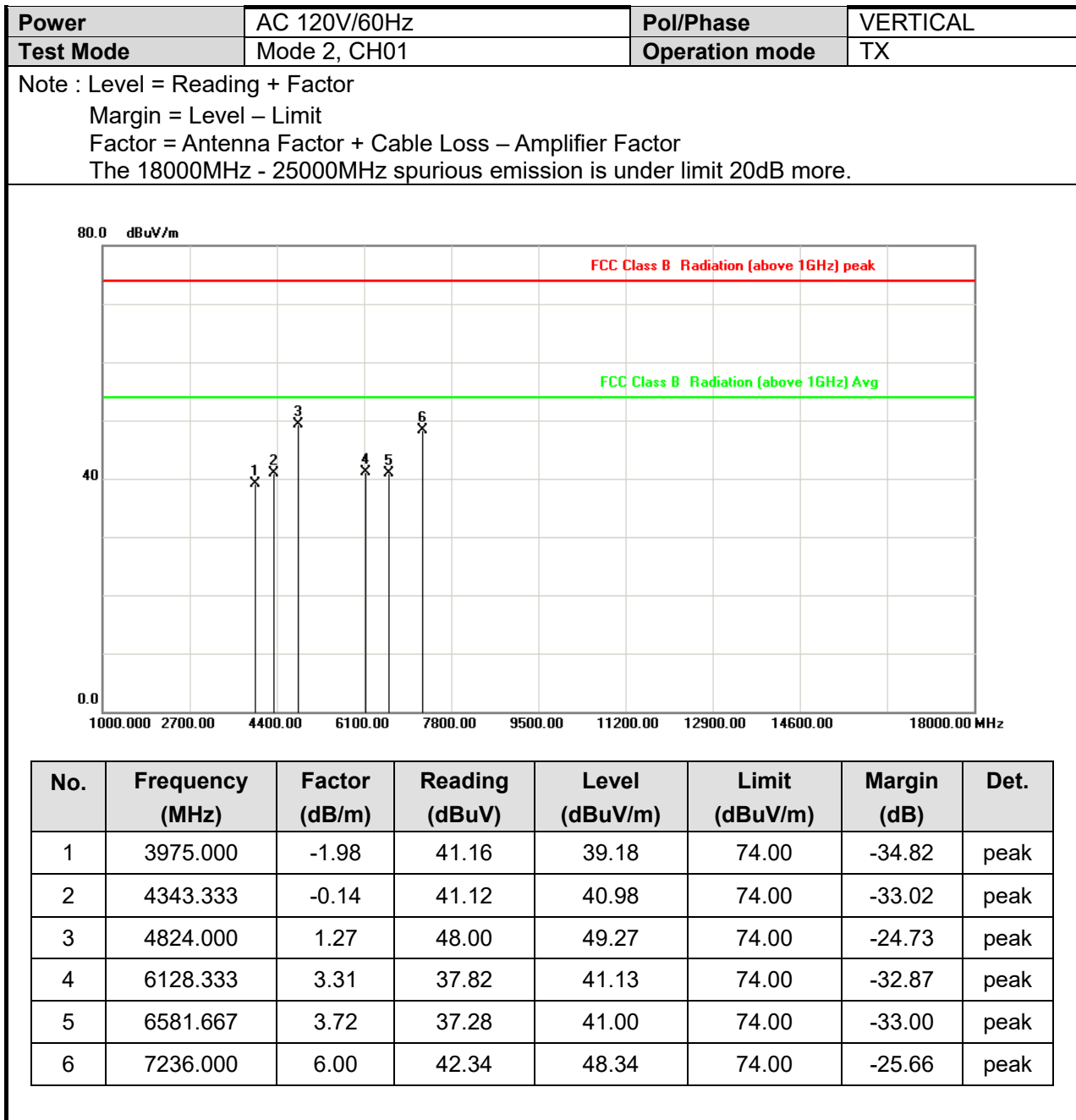


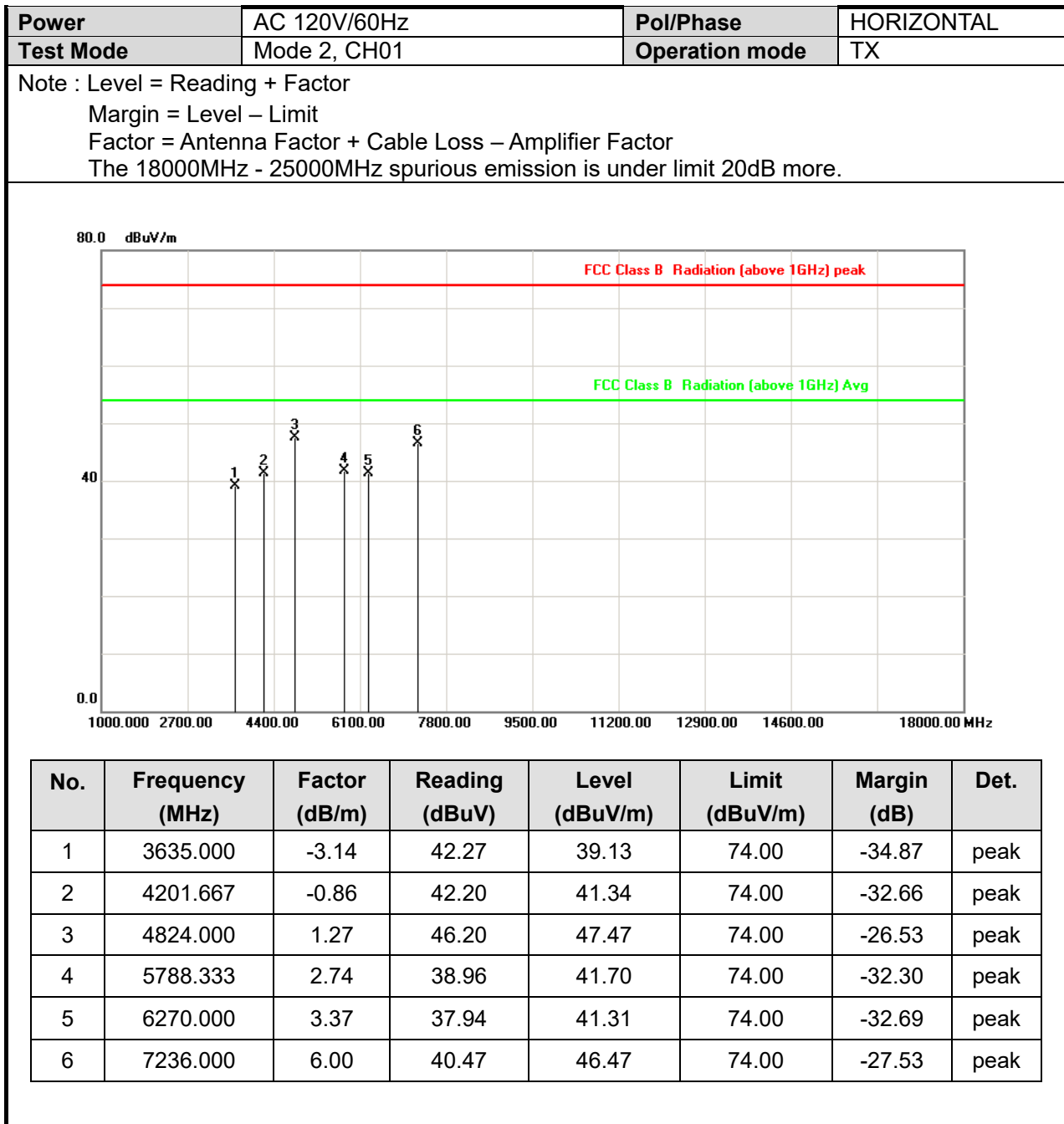


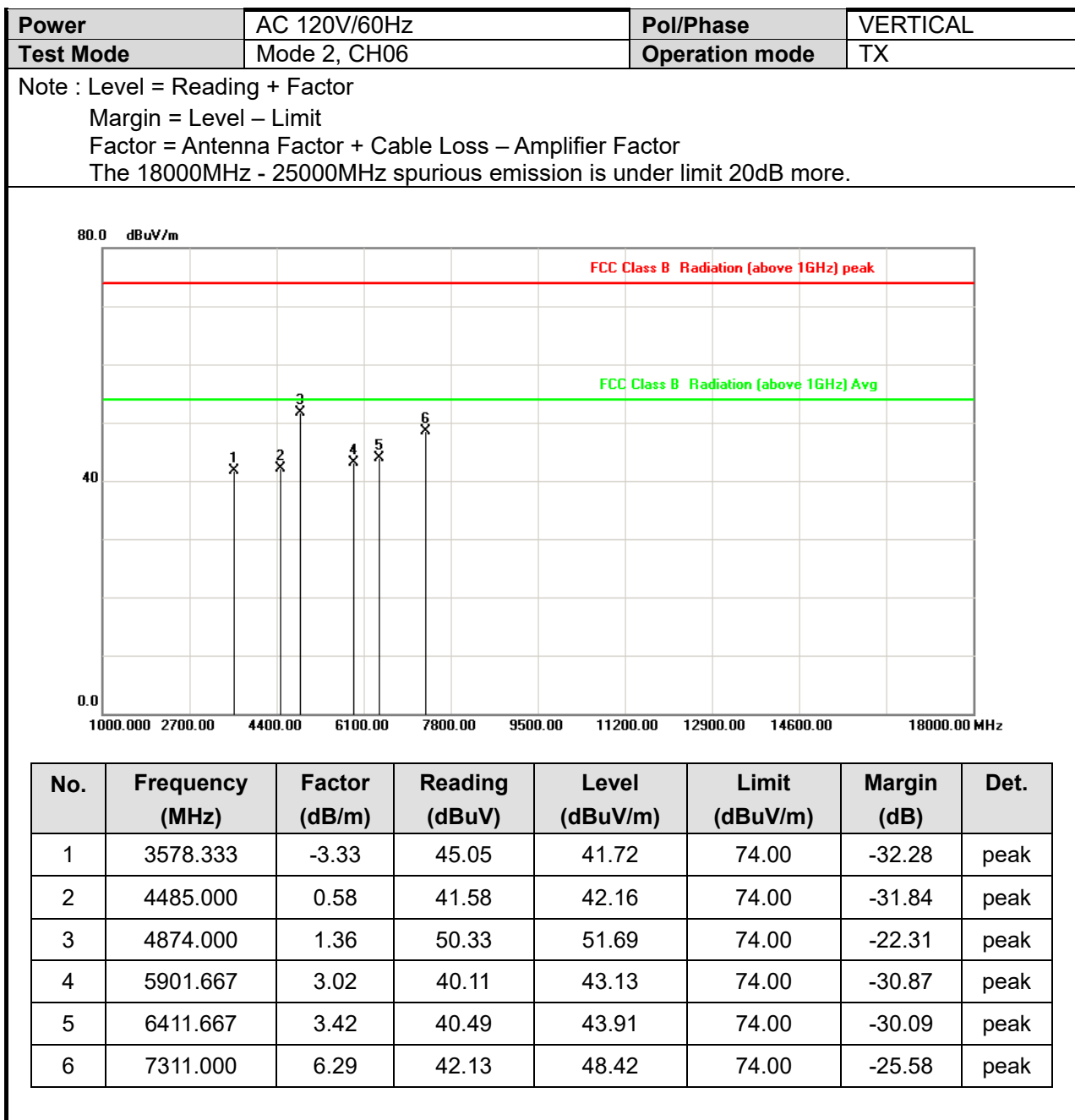


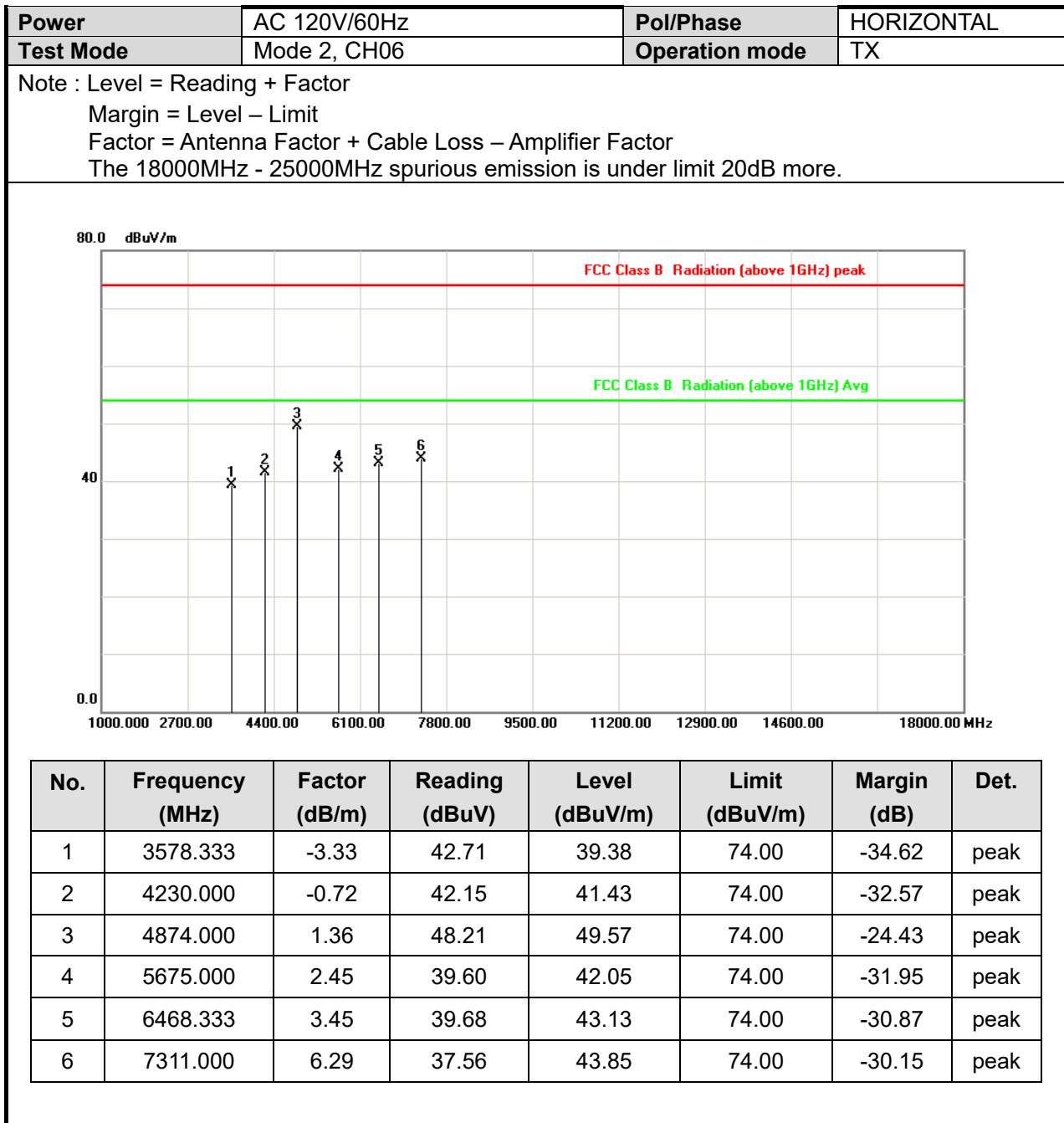


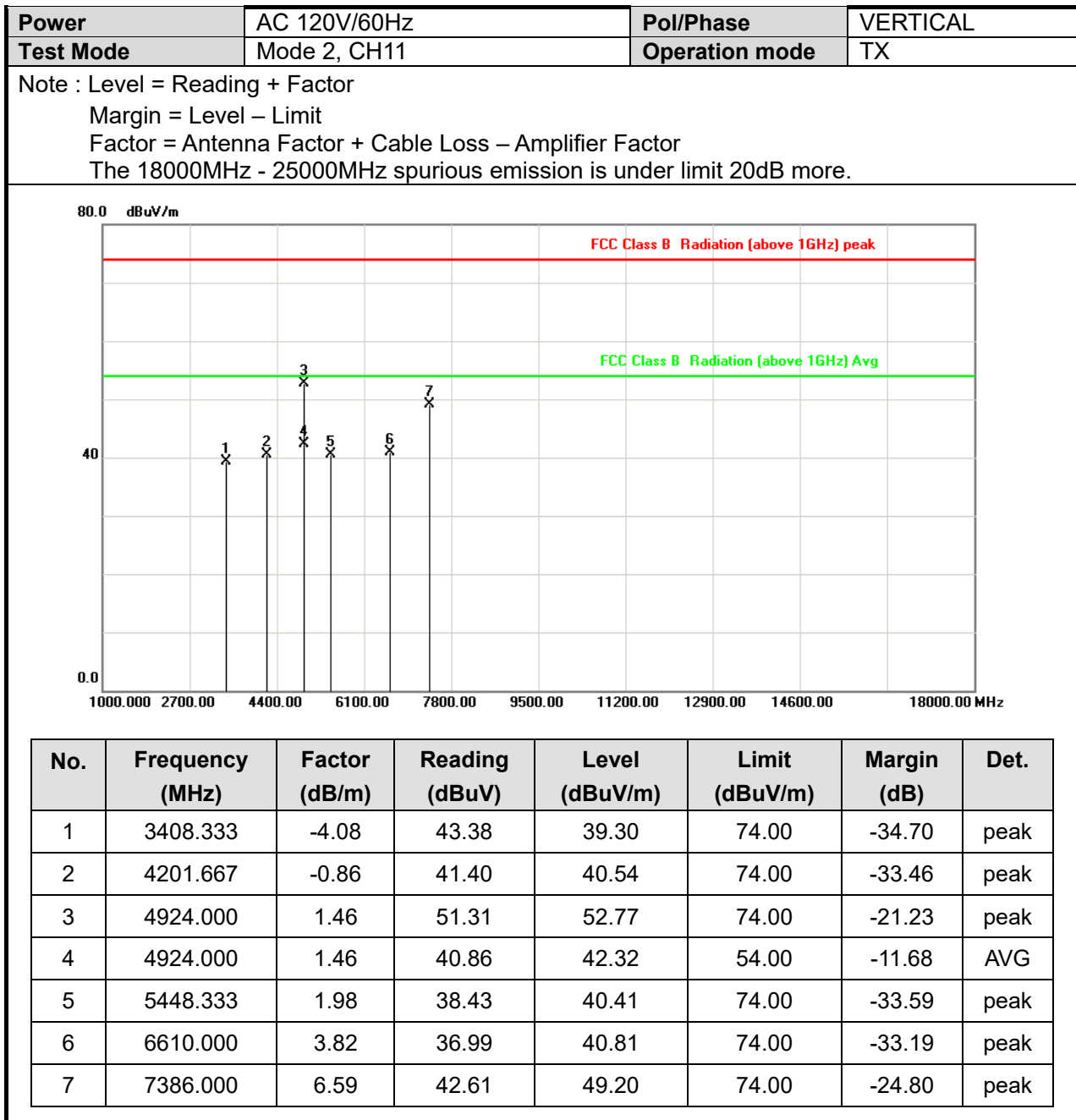


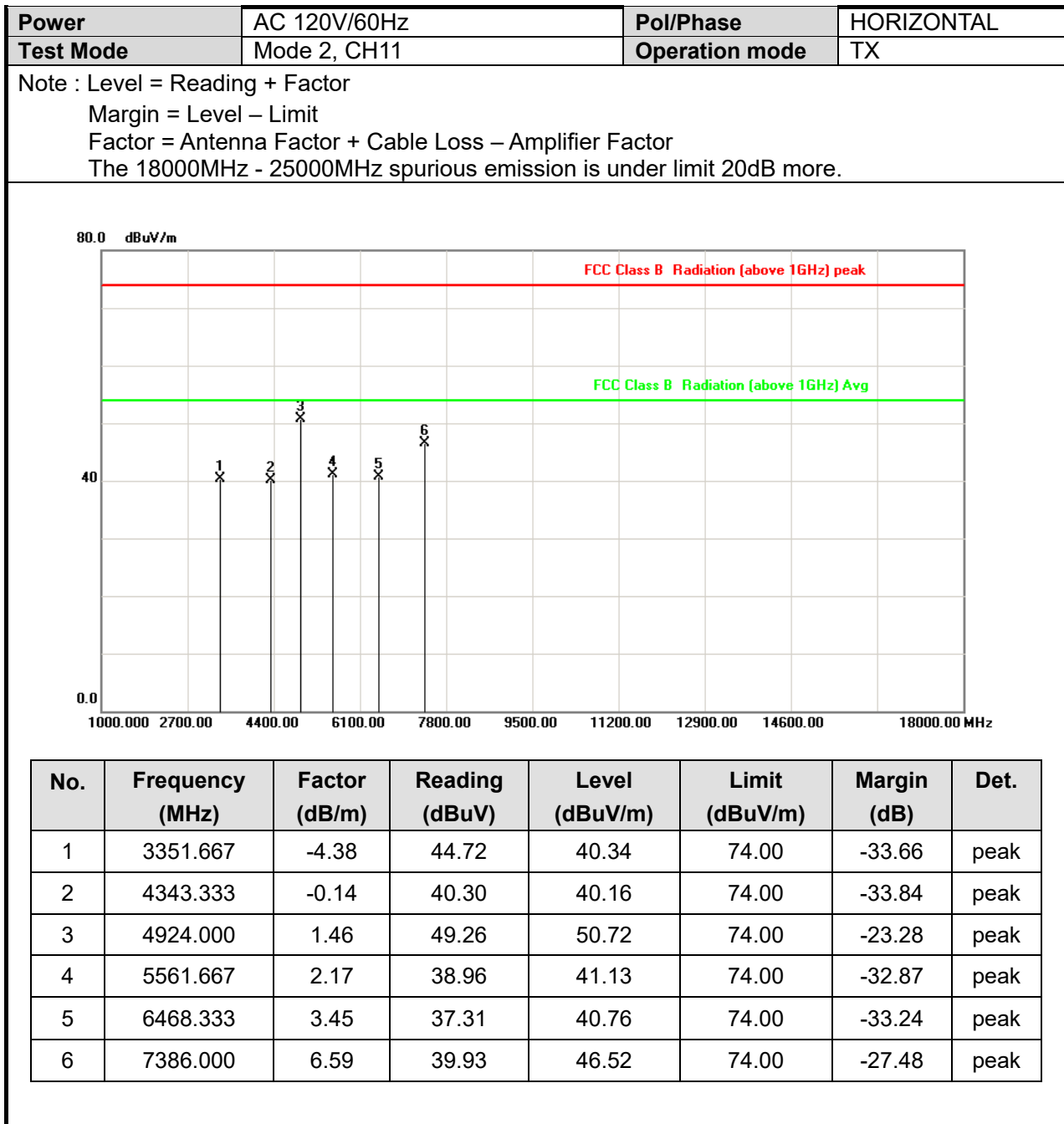


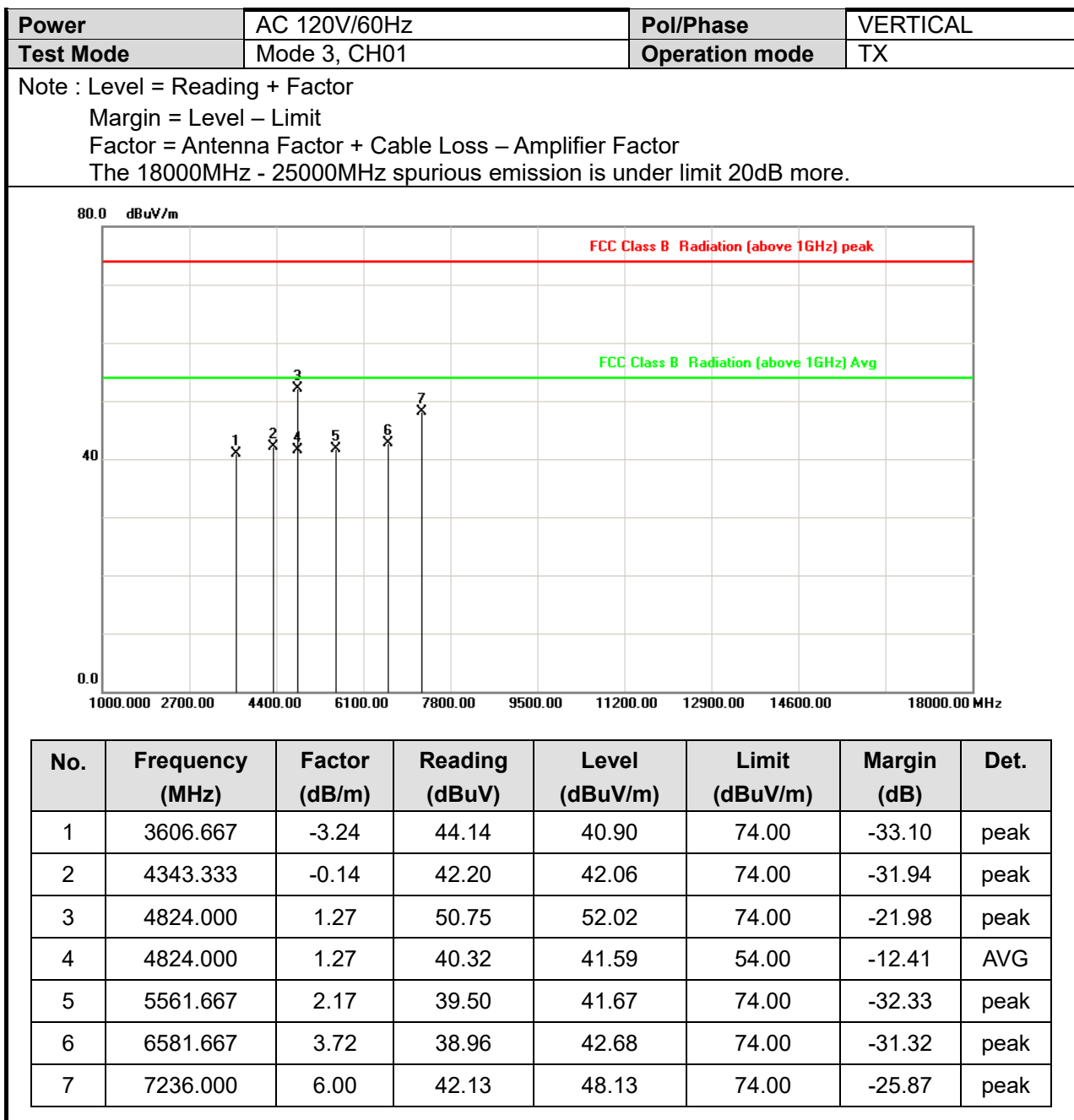


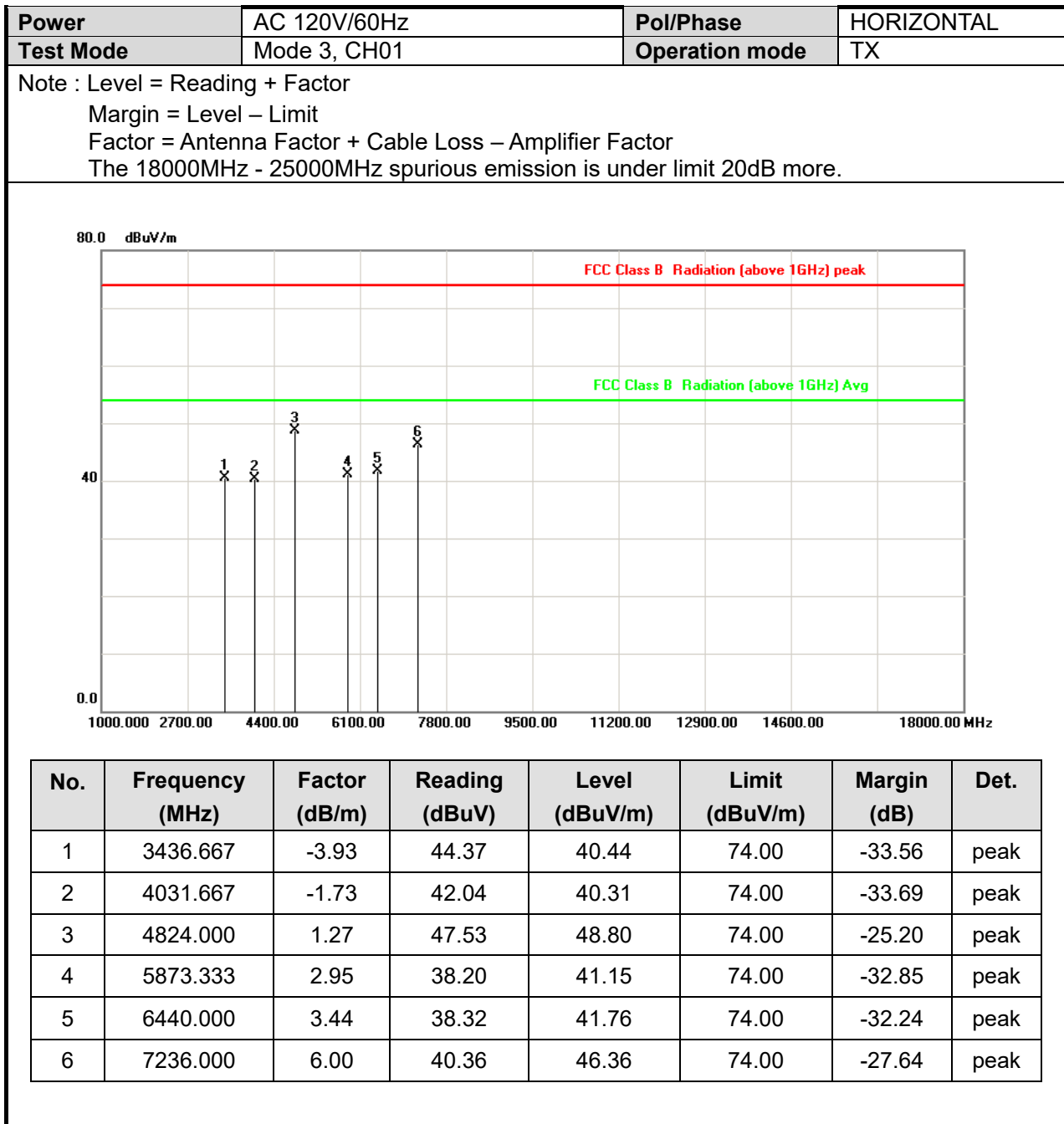


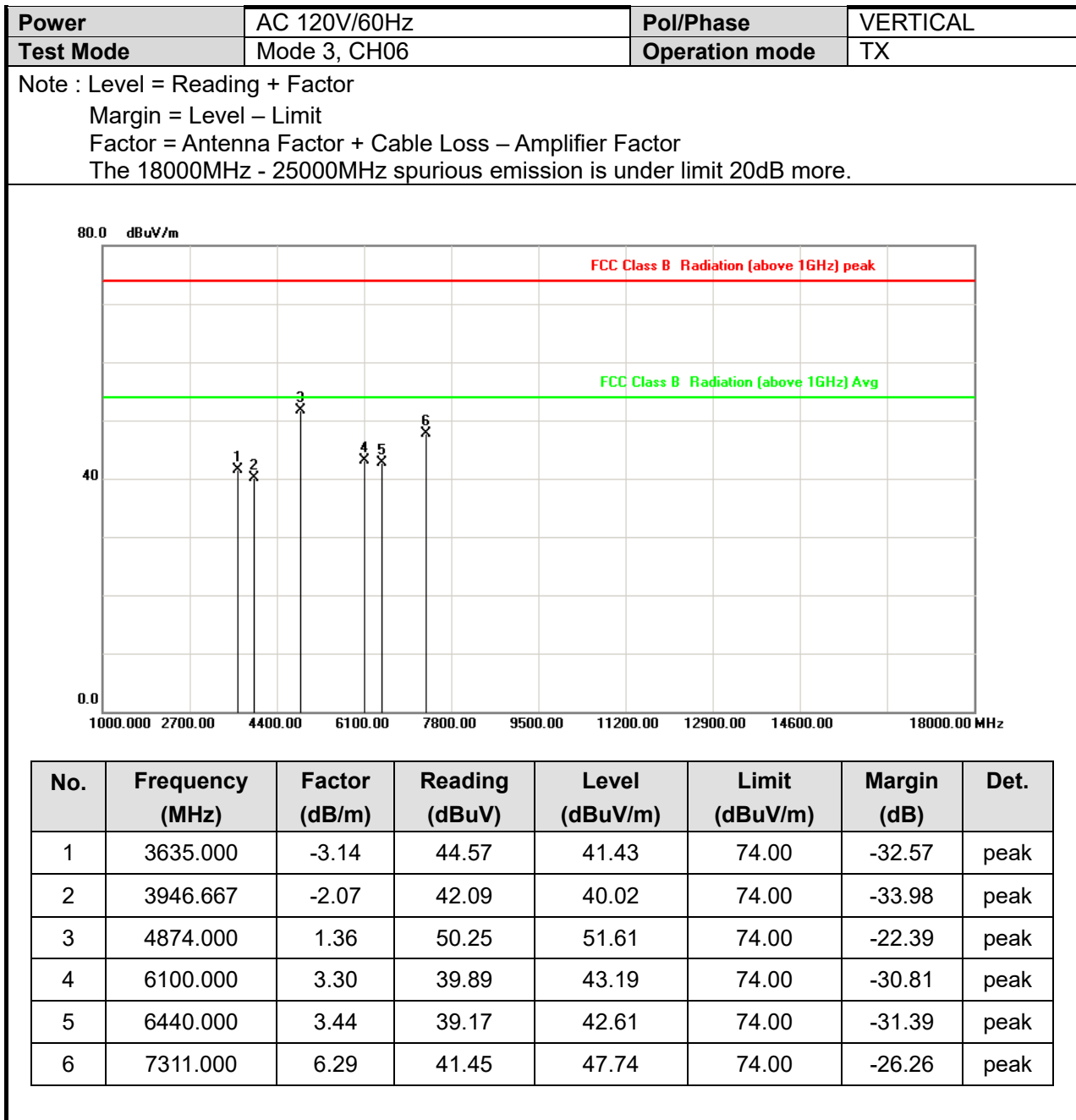


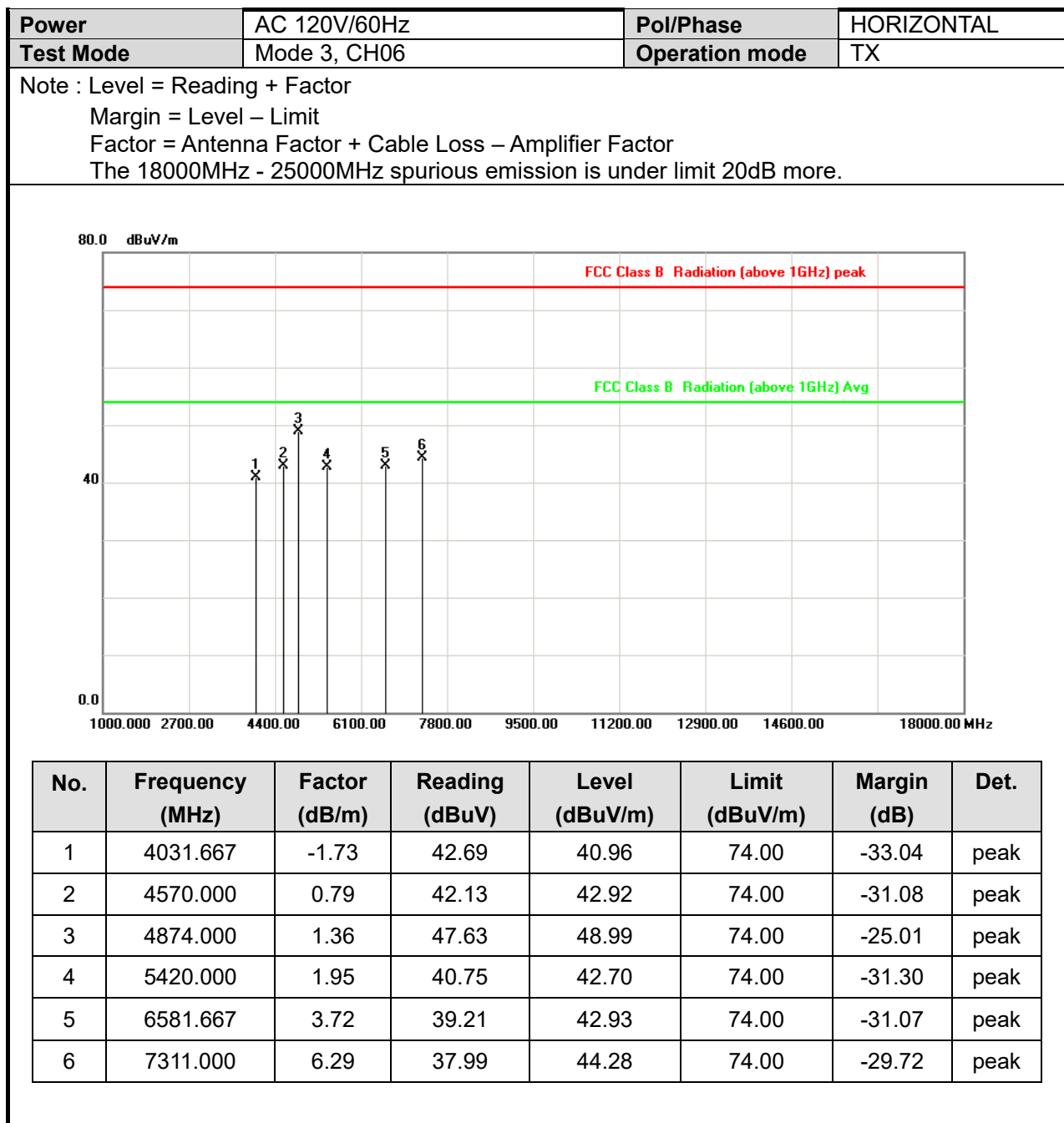


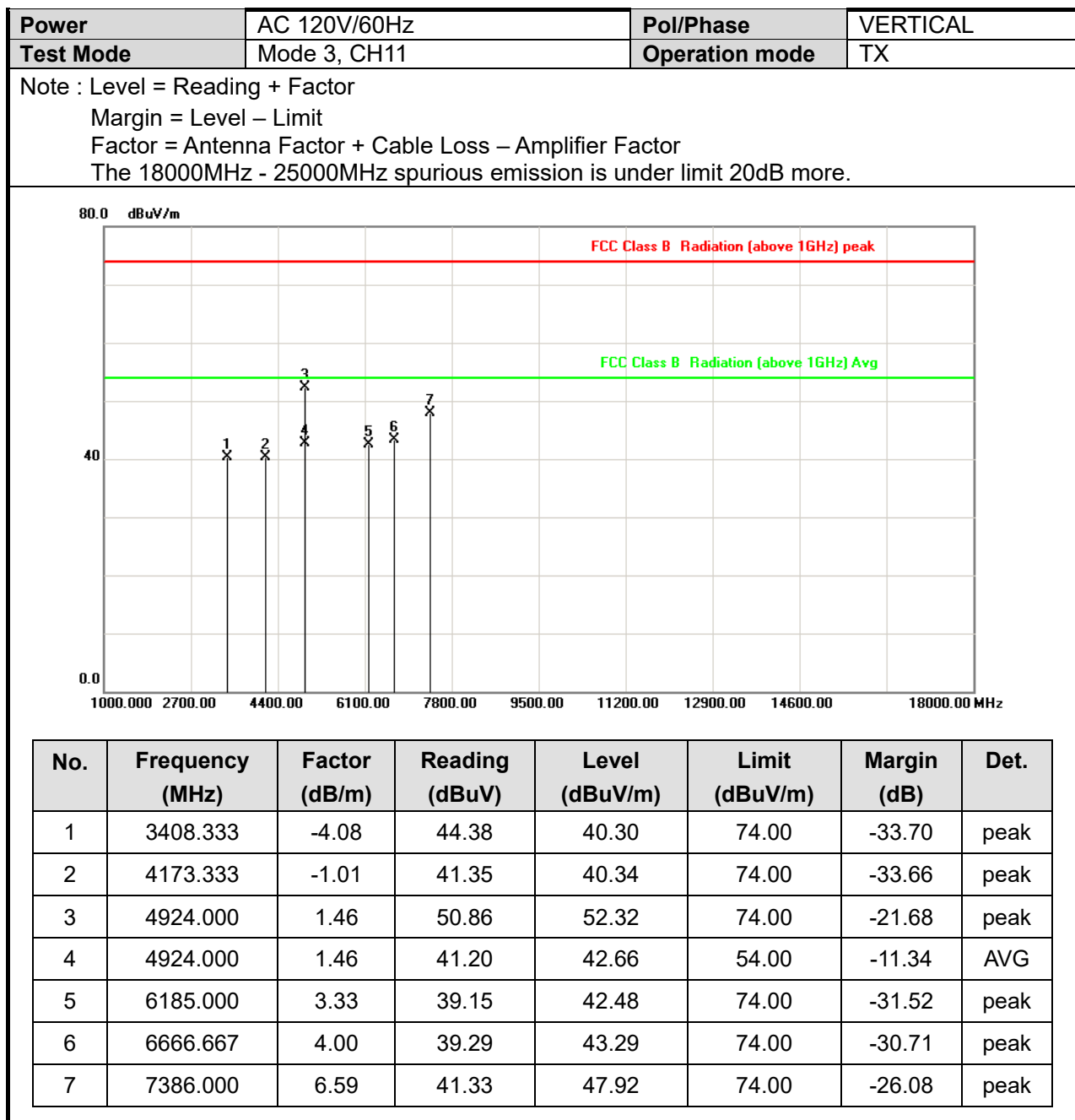


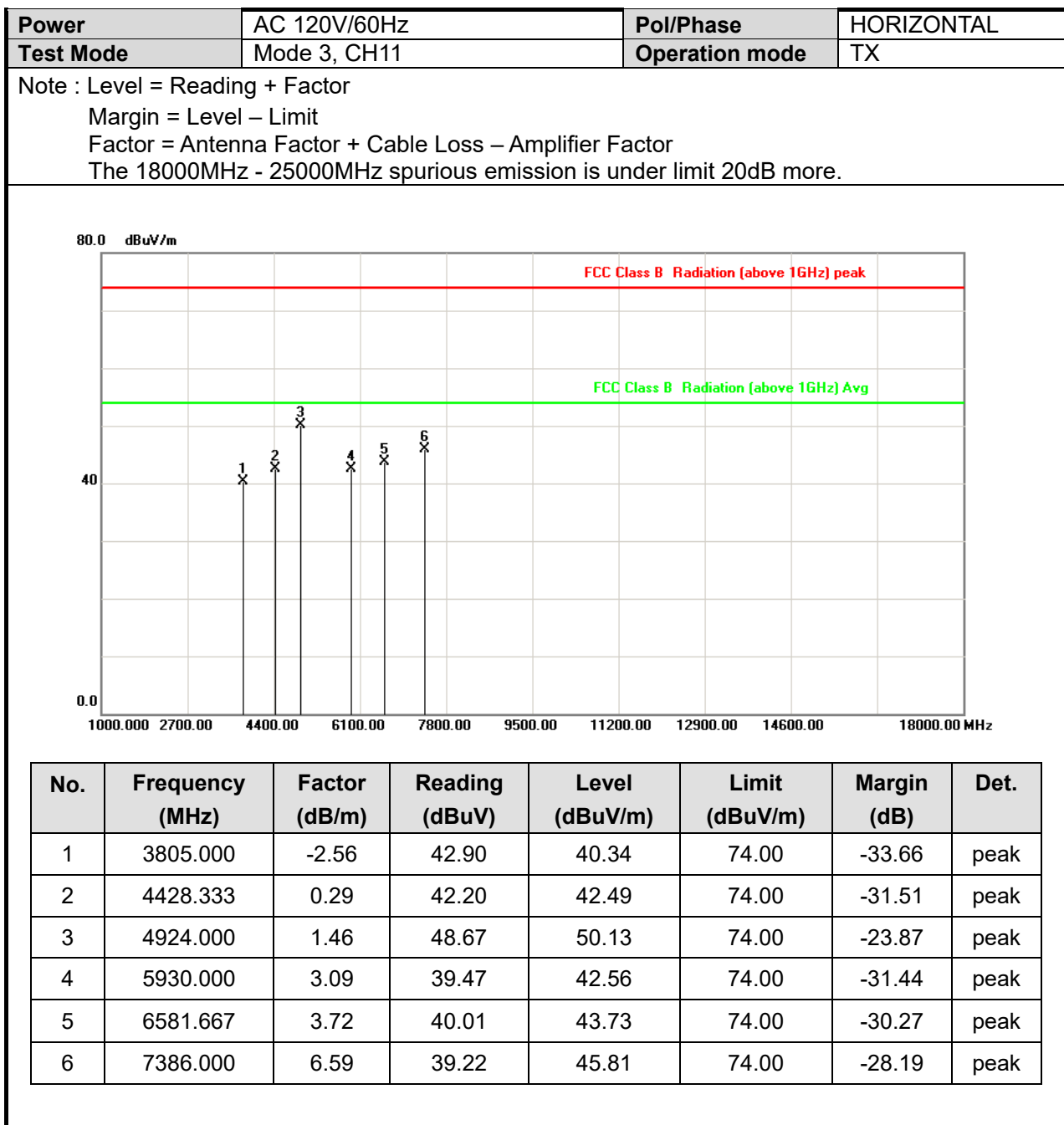














## 6.7 Restricted Bands of Operation

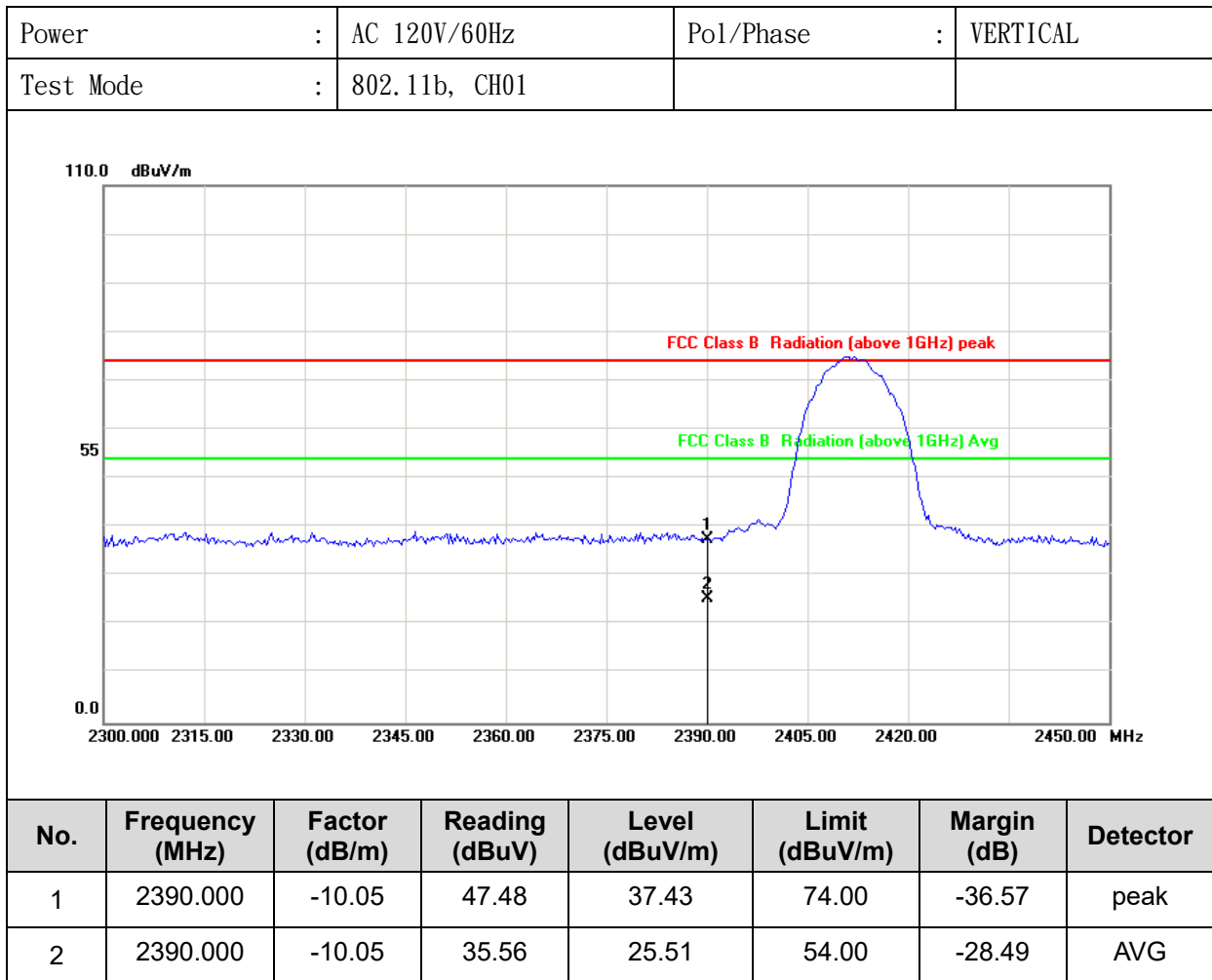
Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                 | MHz                   | MHz             | GHz             |
|---------------------|-----------------------|-----------------|-----------------|
| 0.09000 – 0.11000   | 16.42000 – 16.42300   | 399.9 – 410.0   | 4.500 – 5.250   |
| 0.49500 – 0.505**   | 16.69475 – 16.69525   | 608.0 – 614.0   | 5.350 – 5.460   |
| 2.17350 – 2.19050   | 16.80425 – 16.80475   | 960.0 – 1240.0  | 7.250 – 7.750   |
| 4.12500 – 4.12800   | 25.50000 – 25.67000   | 1300.0 – 1427.0 | 8.025 – 8.500   |
| 4.17725 – 4.17775   | 37.50000 – 38.25000   | 1435.0 – 1626.5 | 9.000 – 9.200   |
| 4.20725 – 4.20775   | 73.00000 – 74.60000   | 1645.5 – 1646.5 | 9.300 – 9.500   |
| 6.21500 – 6.21800   | 74.80000 – 75.20000   | 1660.0 – 1710.0 | 10.600 – 12.700 |
| 6.26775 – 6.26825   | 108.00000 – 121.94000 | 1718.8 – 1722.2 | 13.250 – 13.400 |
| 6.31175 – 6.31225   | 123.00000 – 138.00000 | 2200.0 – 2300.0 | 14.470 – 14.500 |
| 8.29100 – 8.29400   | 149.90000 – 150.05000 | 2310.0 – 2390.0 | 15.350 – 16.200 |
| 8.36200 – 8.36600   | 156.52475 – 156.52525 | 2483.5 – 2500.0 | 17.700 – 21.400 |
| 8.37625 – 8.38675   | 156.70000 – 156.90000 | 2655.0 – 2900.0 | 22.010 – 23.120 |
| 8.41425 – 8.41475   | 162.01250 – 167.17000 | 3260.0 – 3267.0 | 23.600 – 24.000 |
| 12.29000 – 12.29300 | 167.72000 – 173.20000 | 3332.0 – 3339.0 | 31.200 – 31.800 |
| 12.51975 – 12.52025 | 240.00000 – 285.00000 | 3345.8 – 3358.0 | 36.430 – 36.500 |
| 12.57675 – 12.57725 | 322.00000 – 335.40000 | 3600.0 – 4400.0 | Above 38.6      |
| 13.36000 – 13.41000 |                       |                 |                 |

\*\* : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

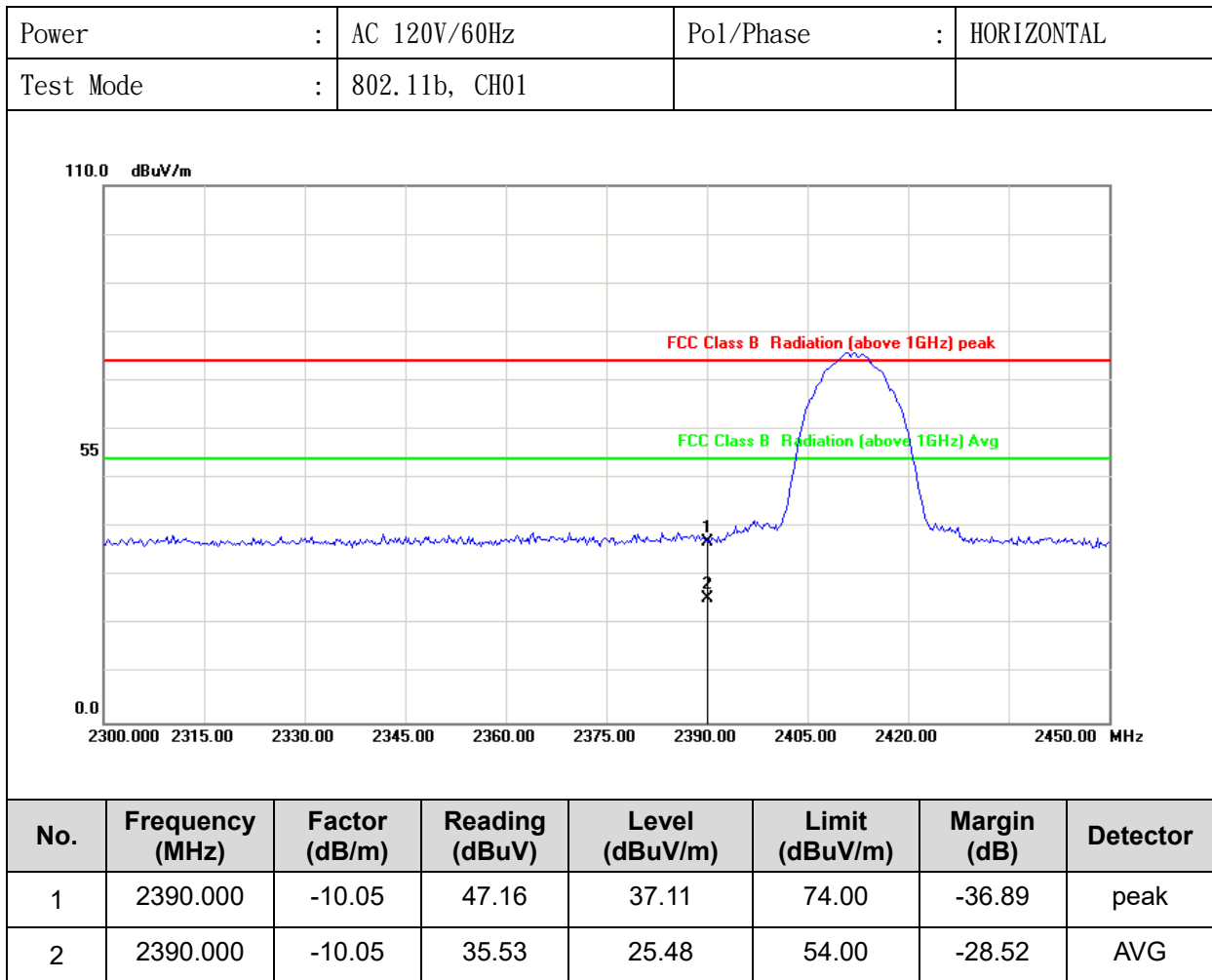


## 6.8 Restrict Band Emission Measurement Data



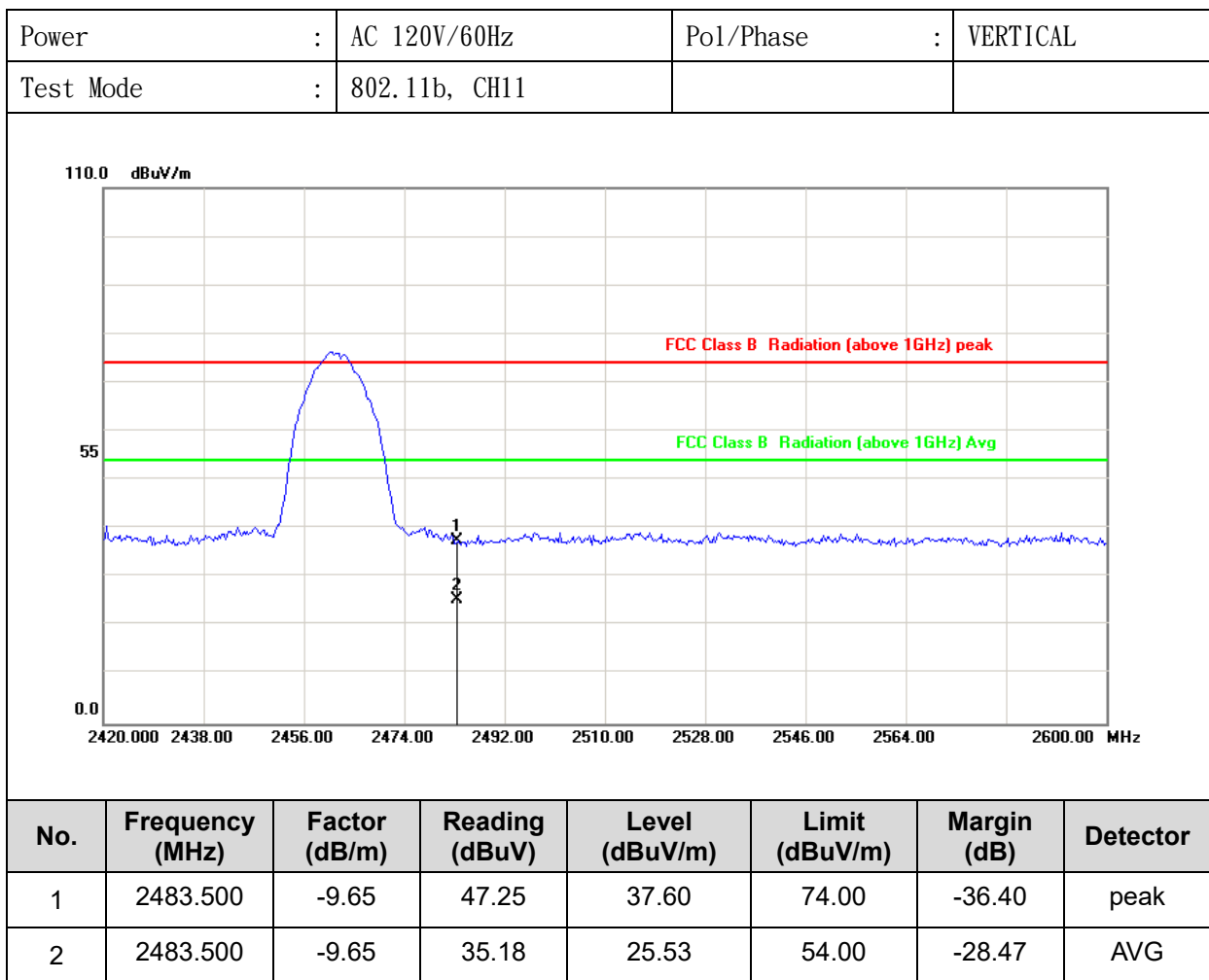
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



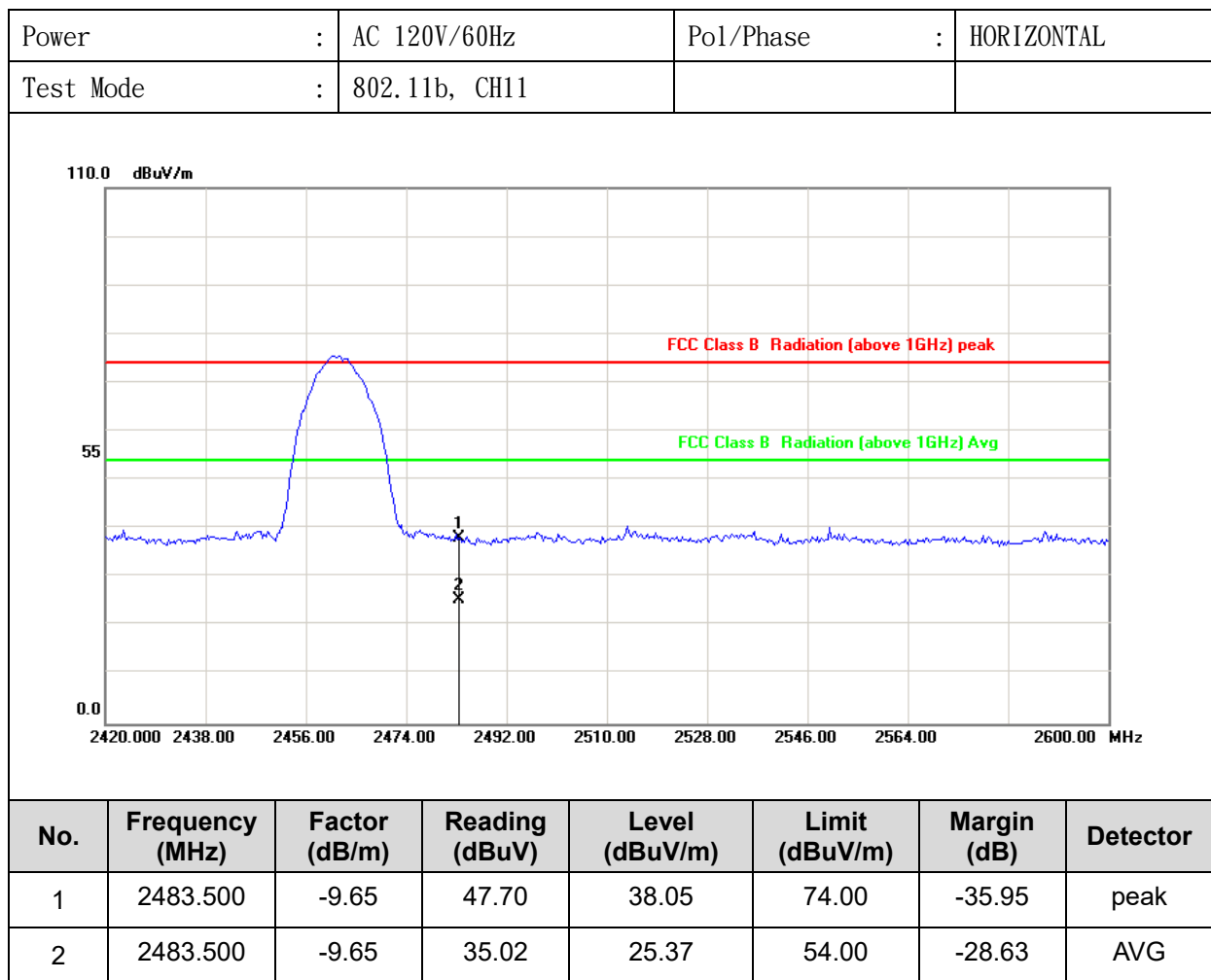
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

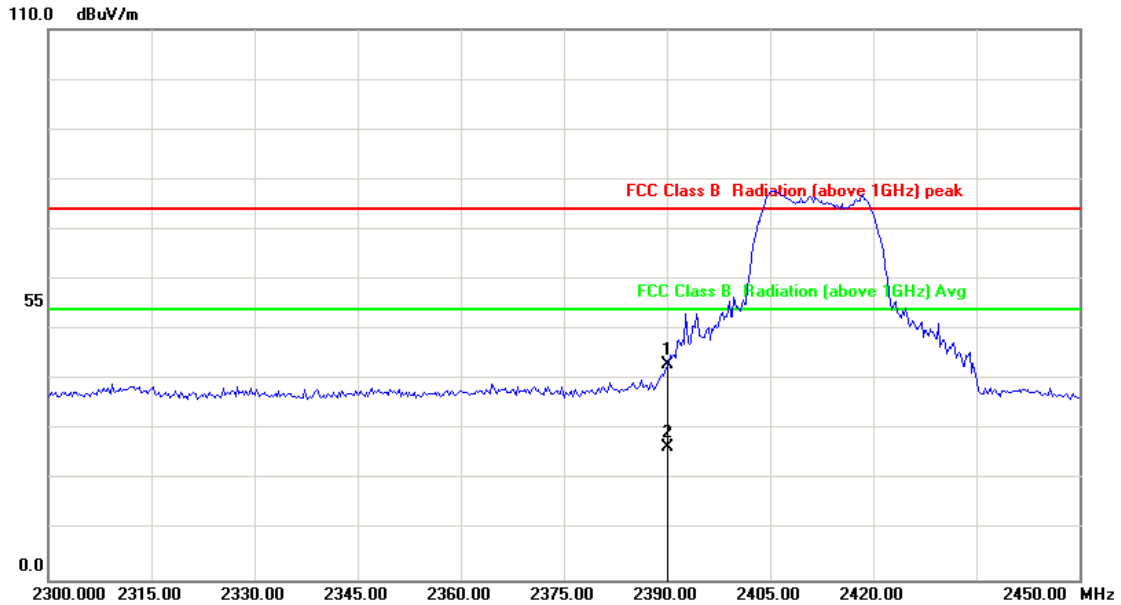


Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



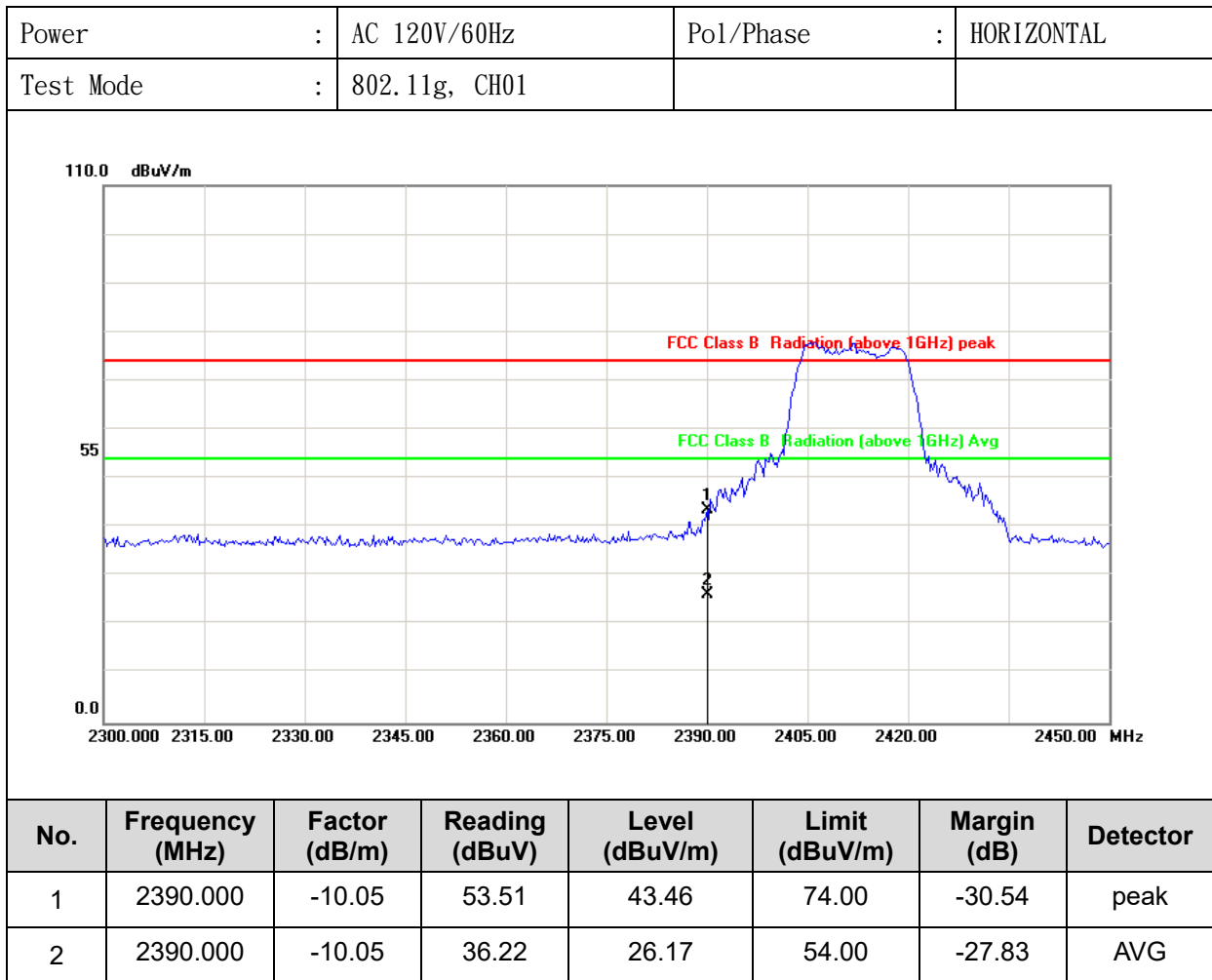
|           |                 |           |            |
|-----------|-----------------|-----------|------------|
| Power     | : AC 120V/60Hz  | Pol/Phase | : VERTICAL |
| Test Mode | : 802.11g, CH01 |           |            |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1   | 2390.000        | -10.05        | 53.10          | 43.05          | 74.00          | -30.95      | peak     |
| 2   | 2390.000        | -10.05        | 36.58          | 26.53          | 54.00          | -27.47      | AVG      |

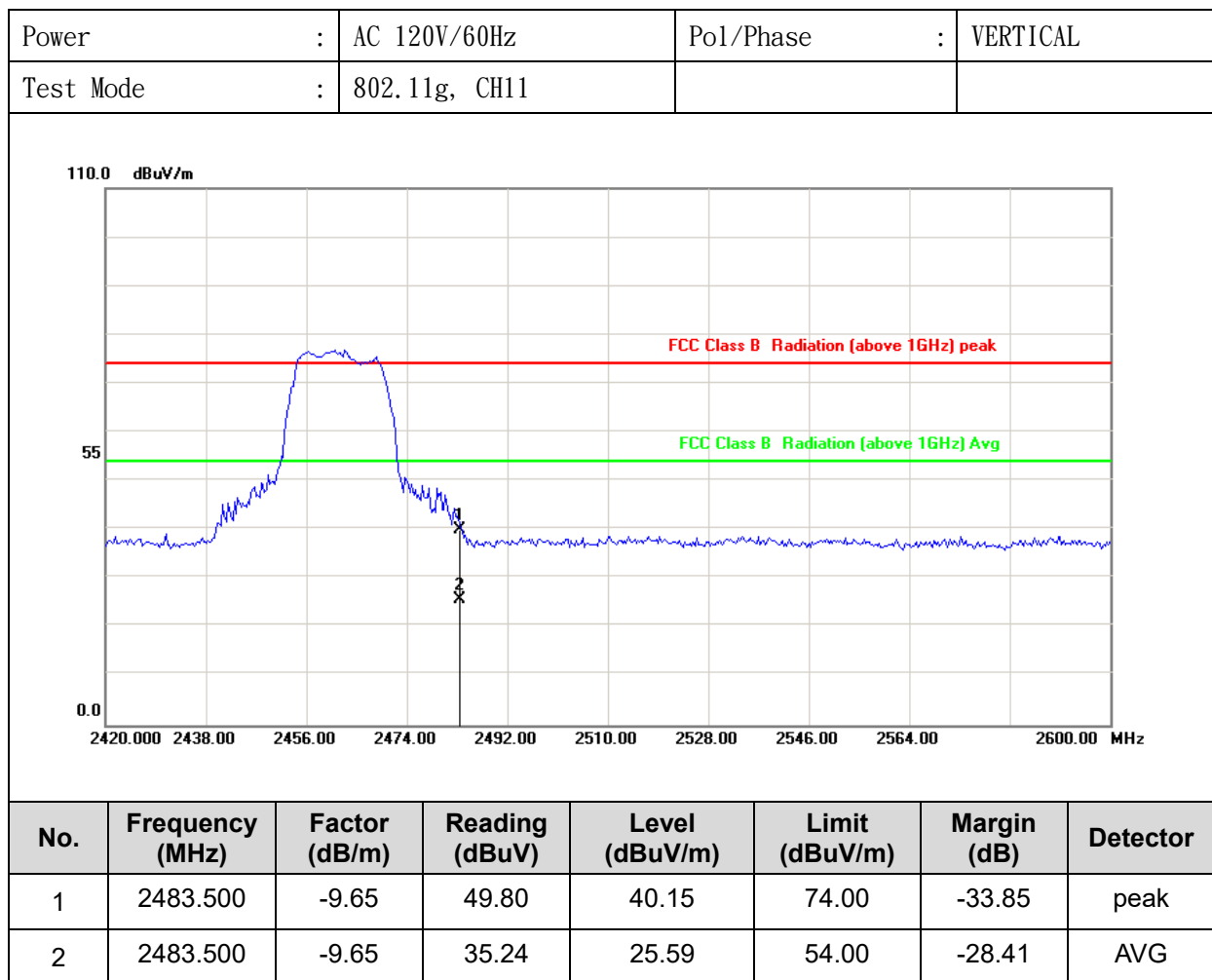
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



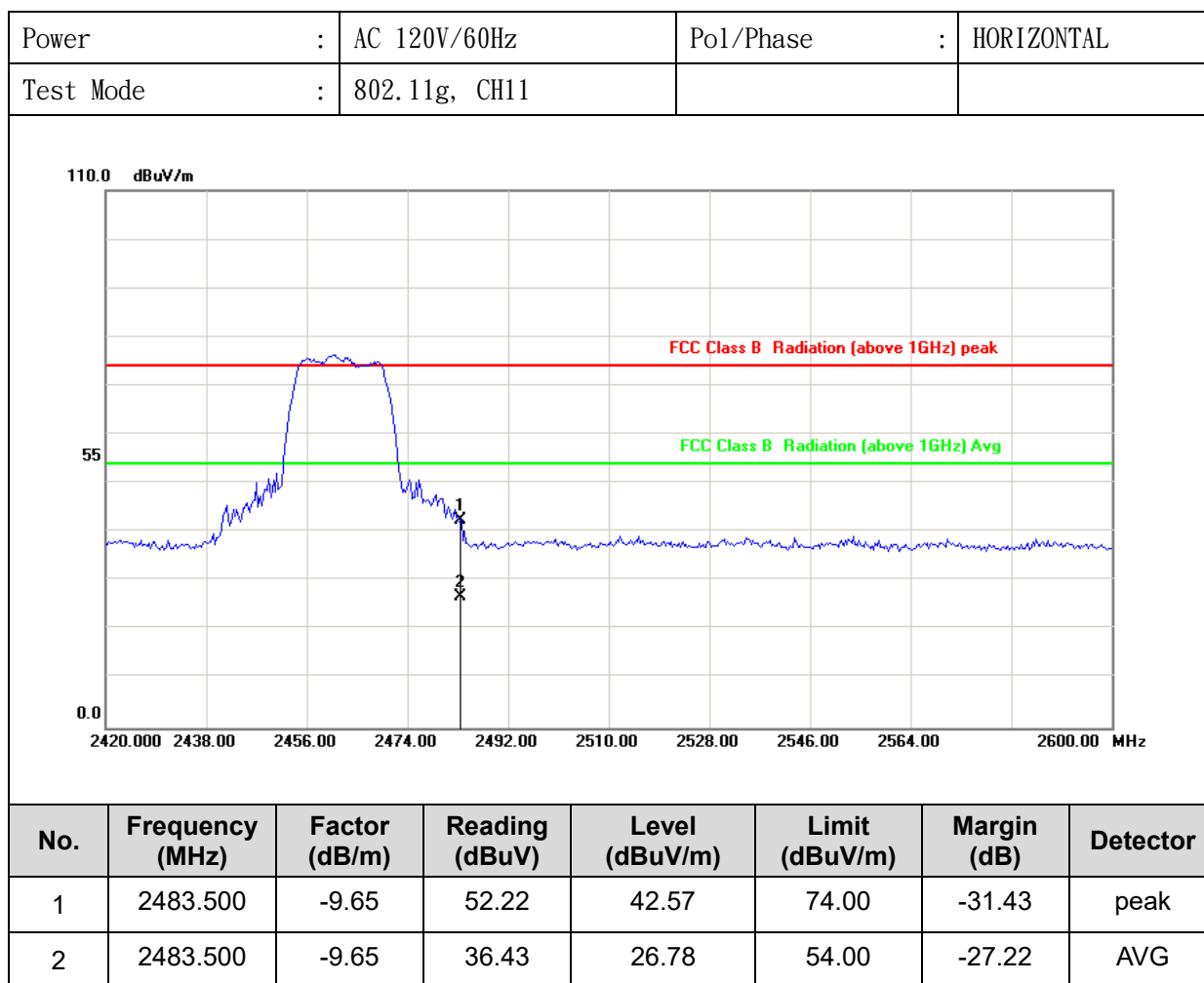
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



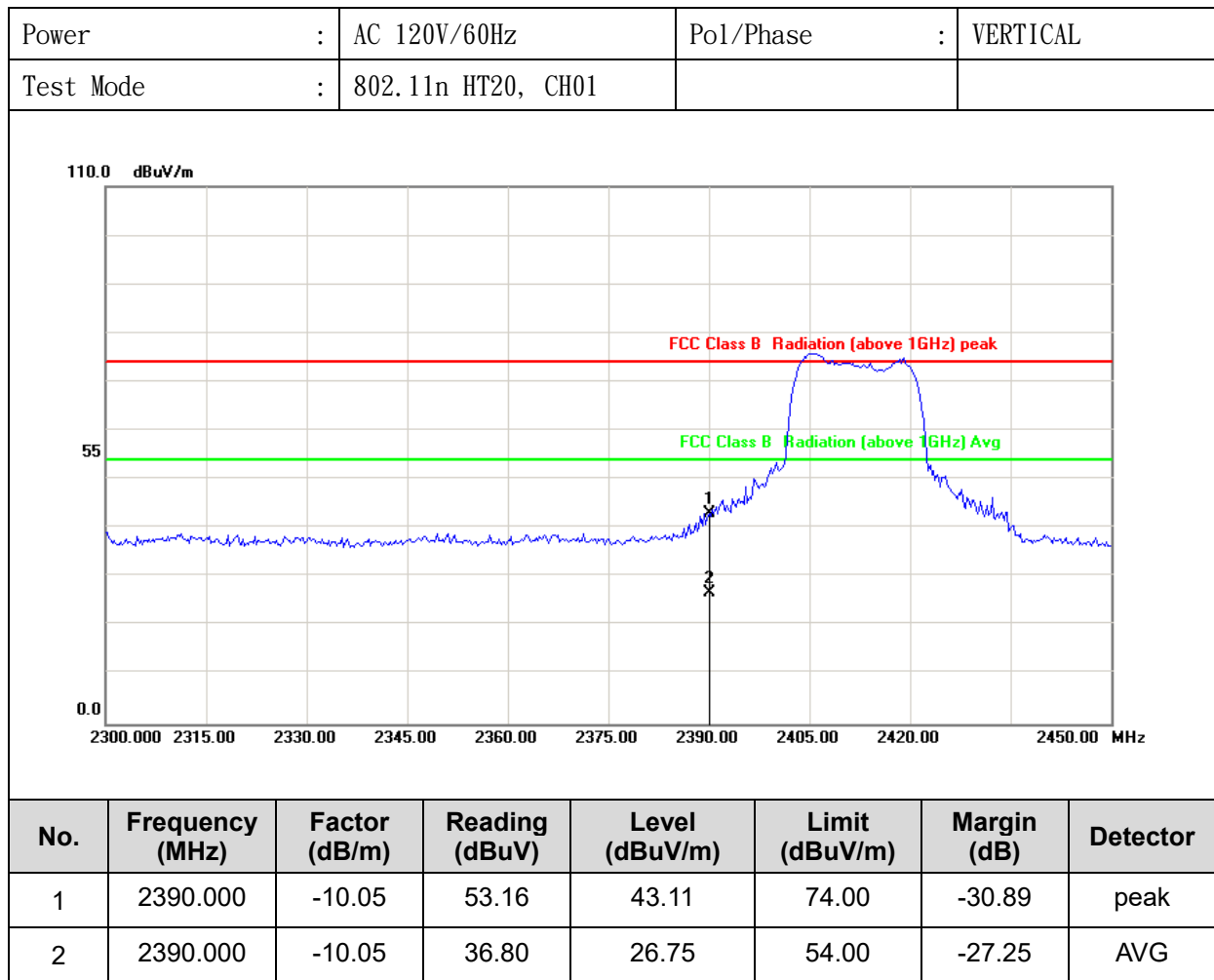
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



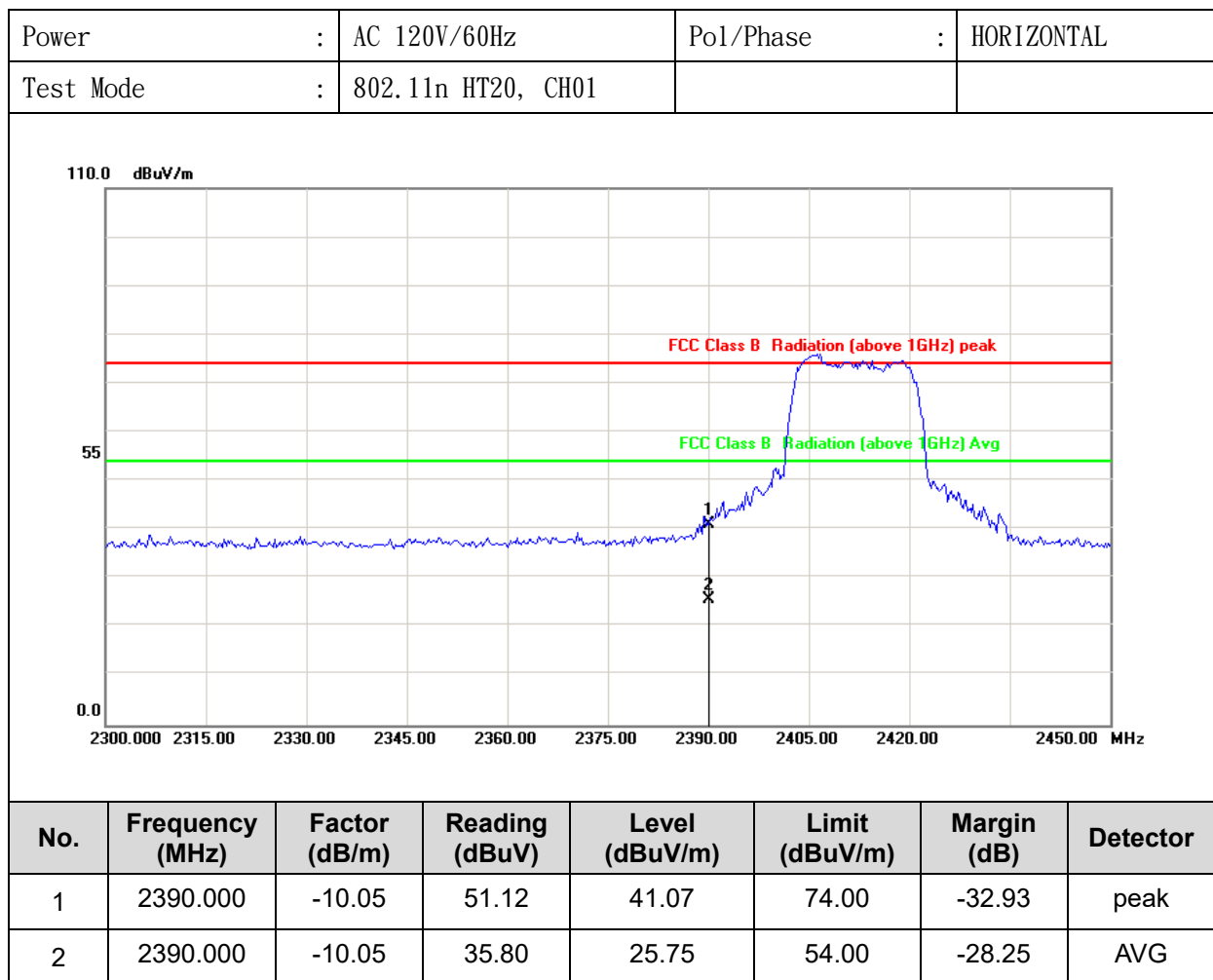
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



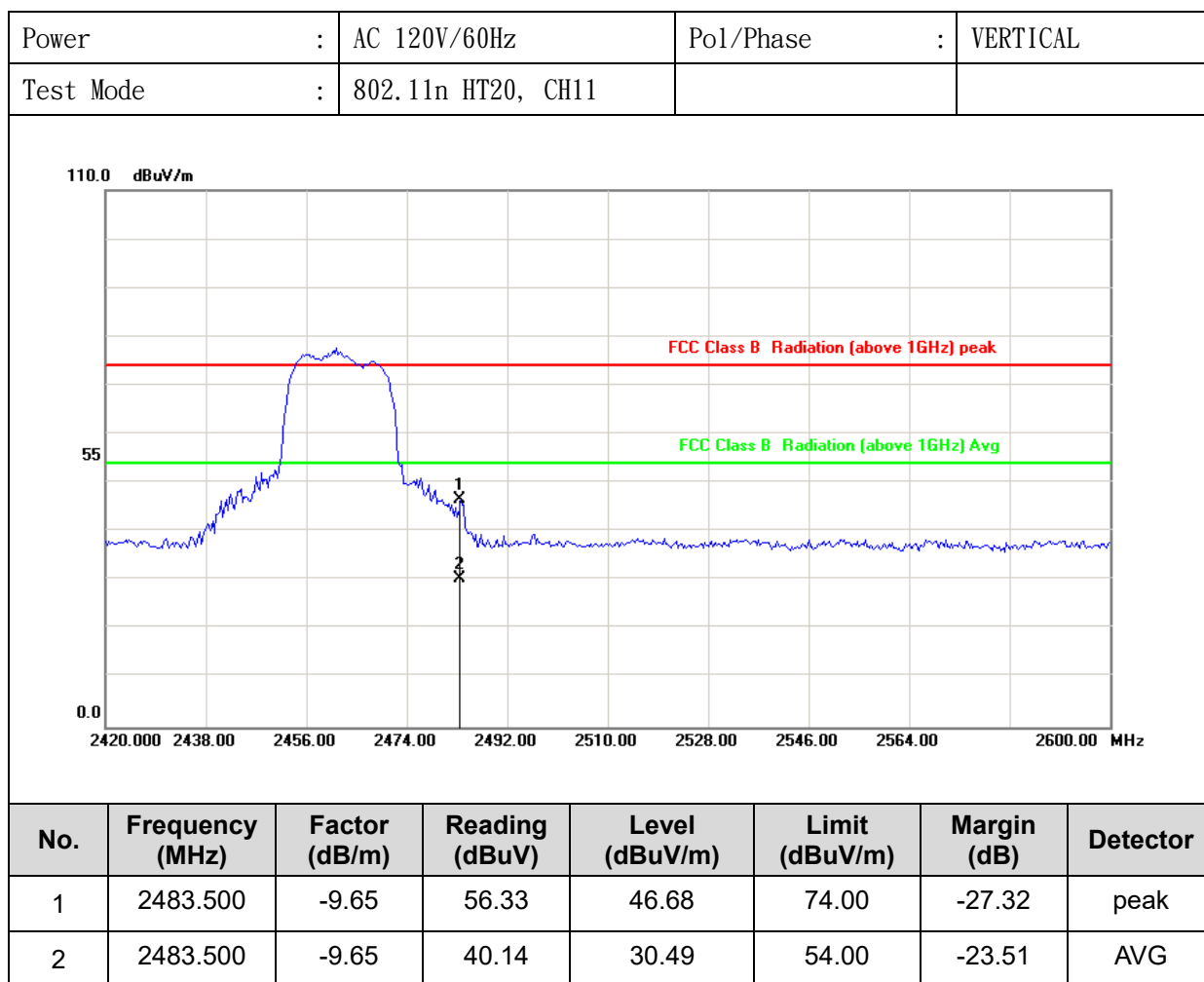
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



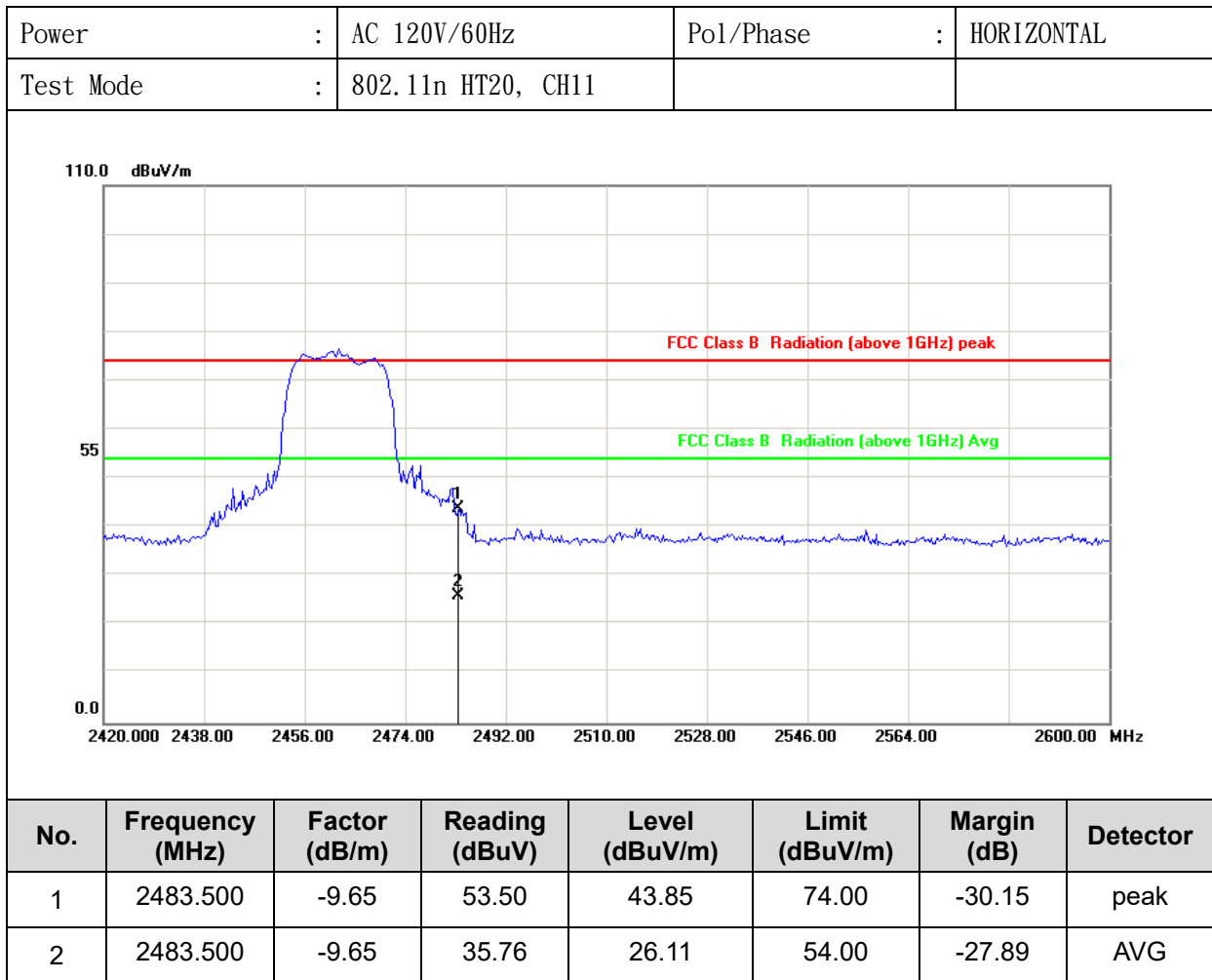
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



## 7. Test of Spurious Emission (Conducted)

### 7.1 Test Limit

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 7.2 Test Procedure

KDB 558074 D01 DTS Meas Guidance v05r02

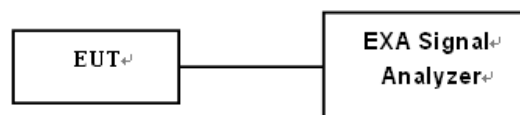
#### 1. Reference level measurement

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to  $\geq 1.5$  times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW  $\geq 3 \times$  RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

#### 2. Emission level measurement

- (a) Set the center frequency and span to encompass frequency range to be measured
- (b) RBW = 100kHz
- (c) VBW = 300kHz
- (d) Detector = Peak
- (e) Trace mode = max hold
- (f) Sweep time = auto couple
- (g) The trace was allowed to stabilize

### 7.3 Test Setup Layout

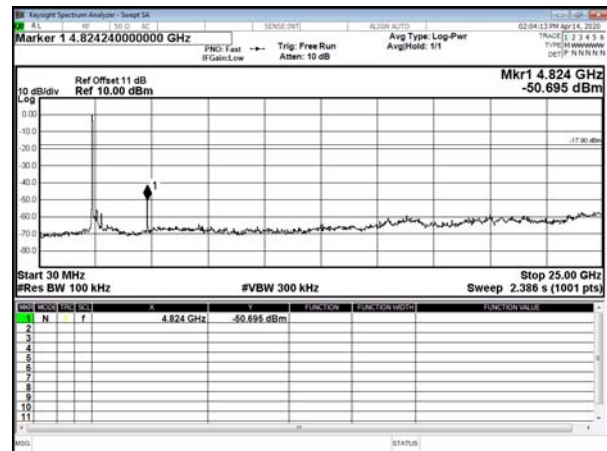
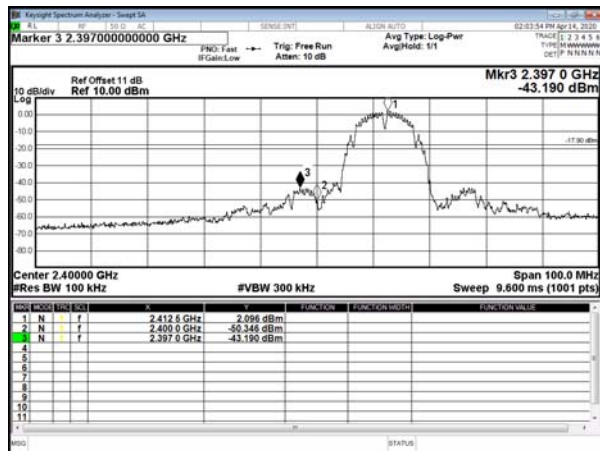




## 7.4 Test Result and Data

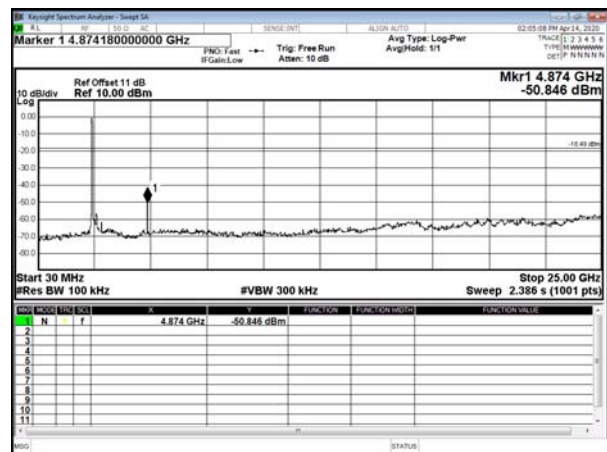
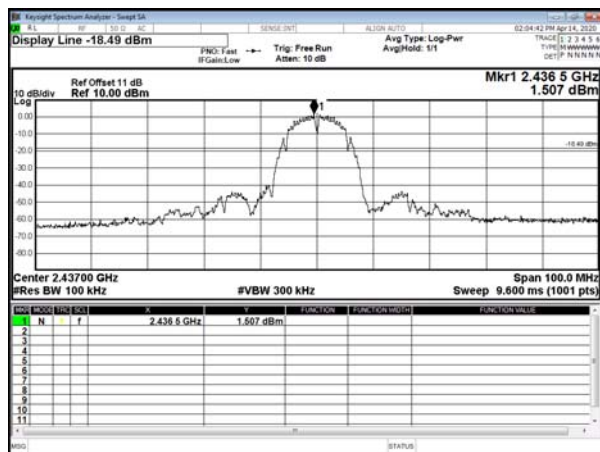
Modulation Standard: 802.11b

Channel: 01



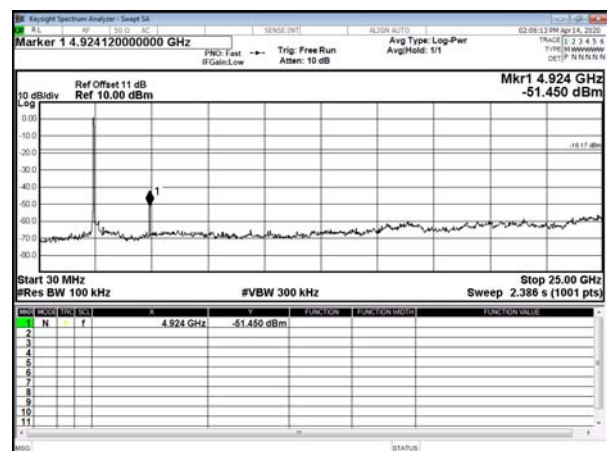
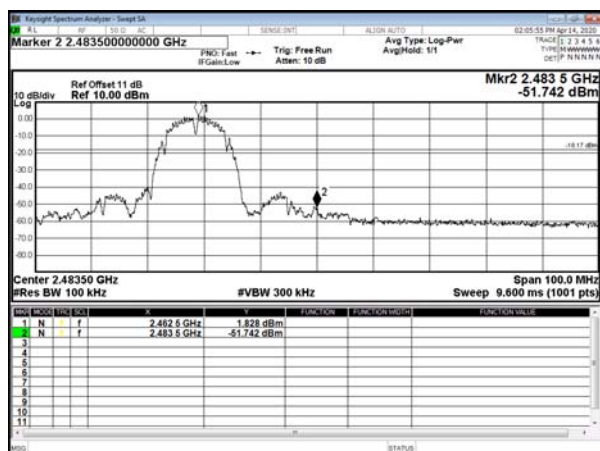
Modulation Standard: 802.11b

Channel: 06

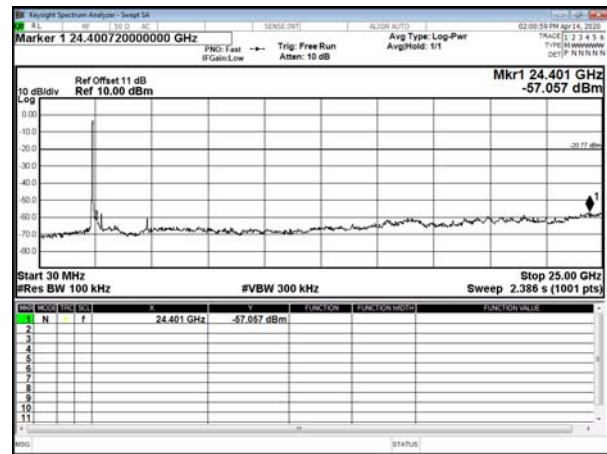
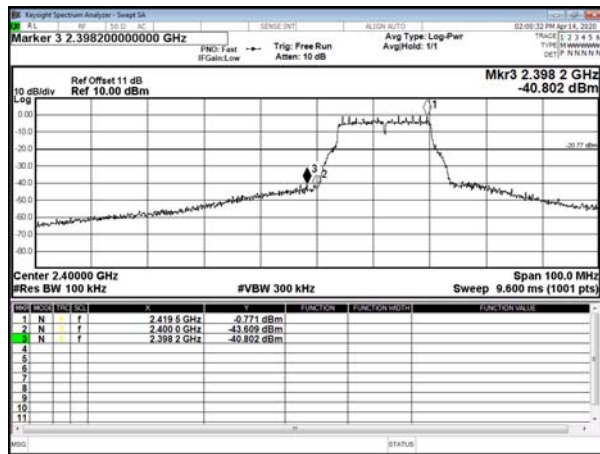


Modulation Standard: 802.11b

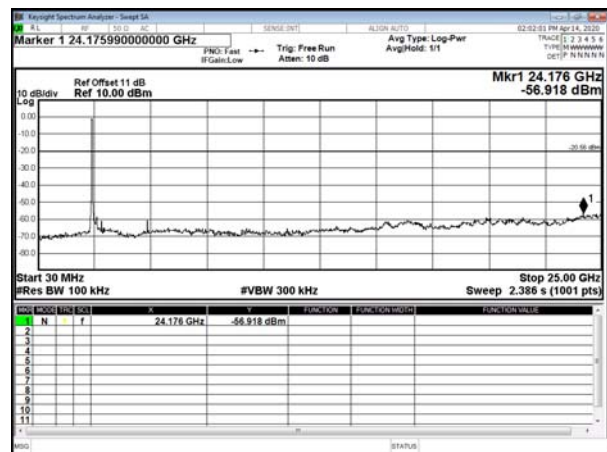
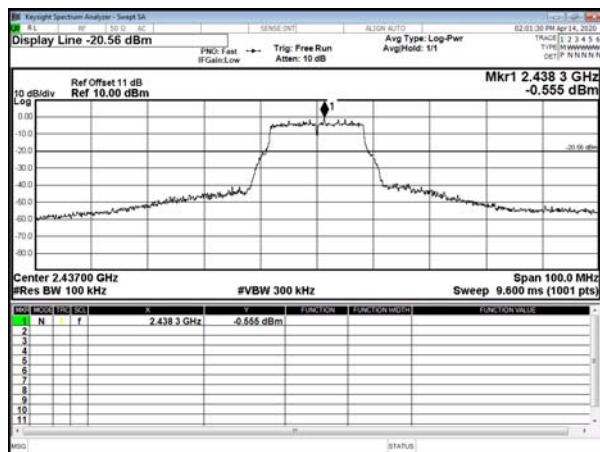
Channel: 11



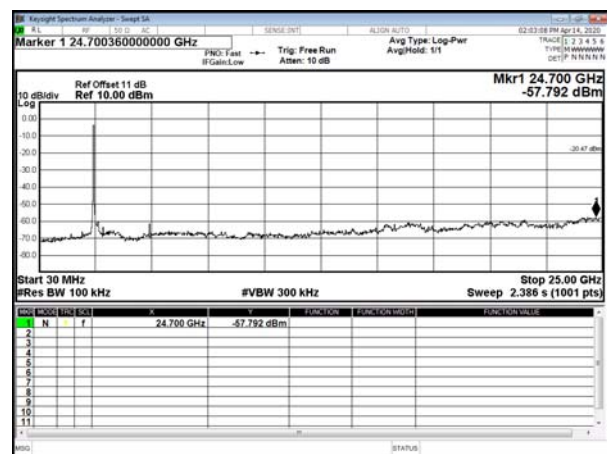
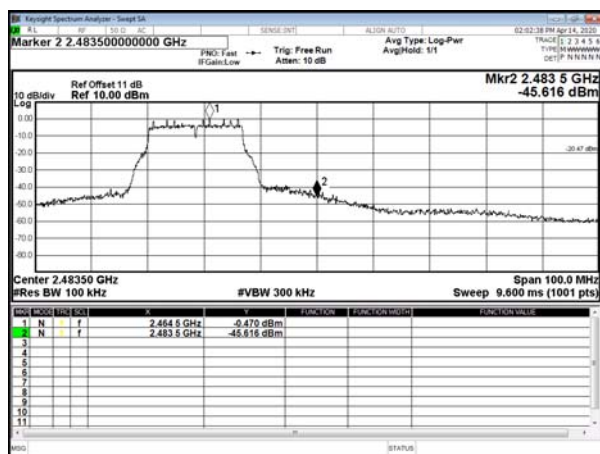
Modulation Standard: 802.11g  
Channel: 01



Modulation Standard: 802.11g  
Channel: 06

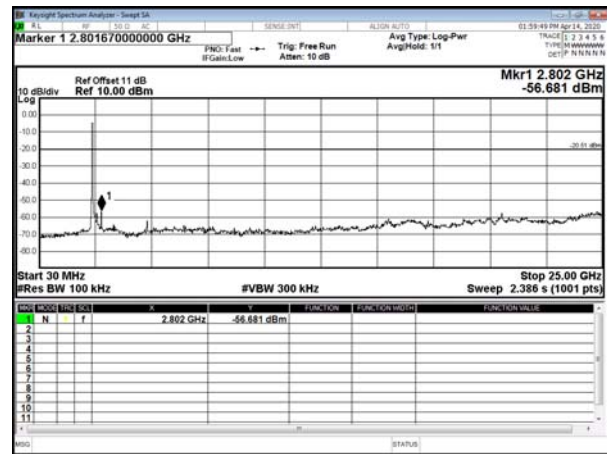
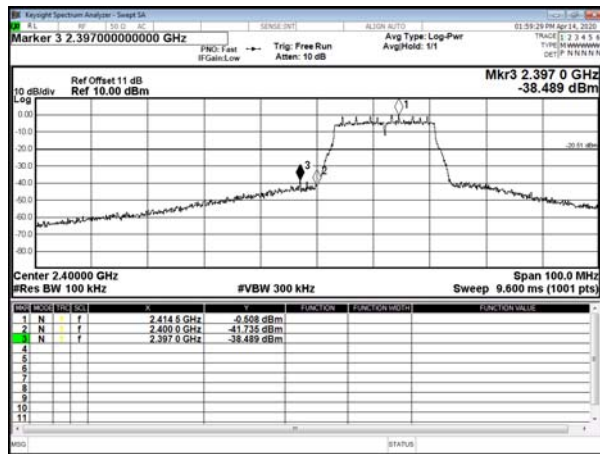


Modulation Standard: 802.11g  
Channel: 11

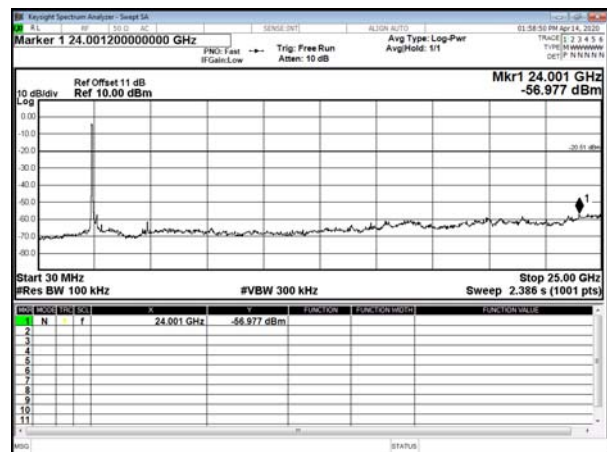
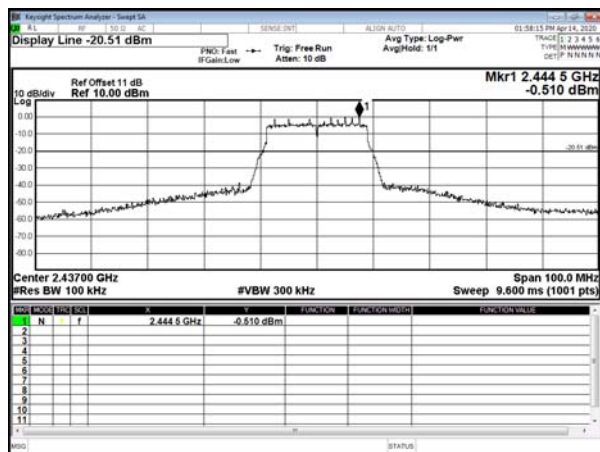




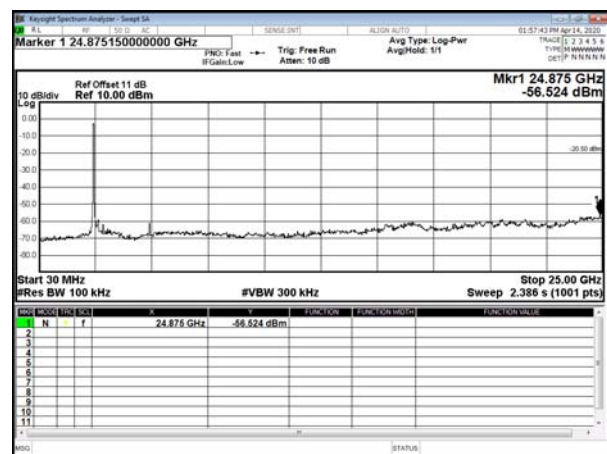
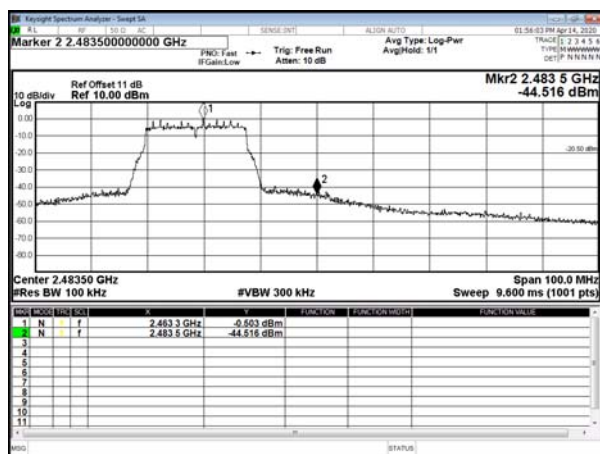
Modulation Standard: 802.11n HT20  
Channel: 01



Modulation Standard: 802.11n HT20  
Channel: 06



Modulation Standard: 802.11n HT20  
Channel: 11





## 8. 6dB Bandwidth Measurement Data

### 8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 8.2 Test Procedures

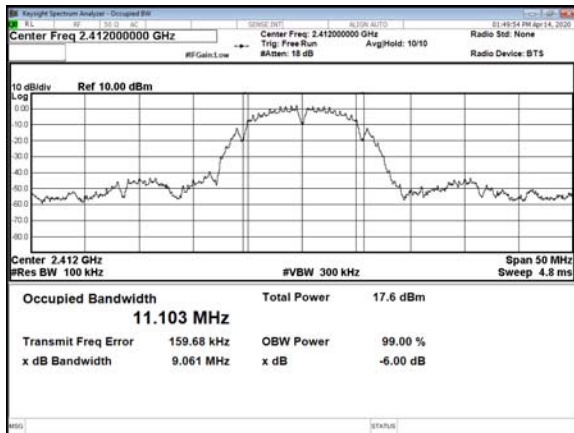
- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100 KHz and VBW to 300 KHz.
- Set spectrum analyzer X dB to 6 dB.
- Set spectrum analyzer peak detector with maximum hold.

### 8.3 Test Setup Layout

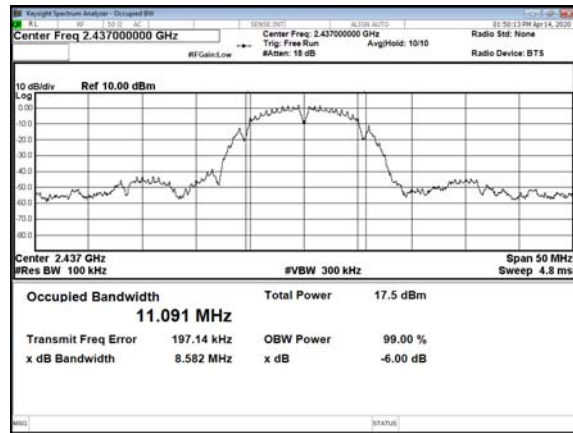


**8.4 Test Result and Data**

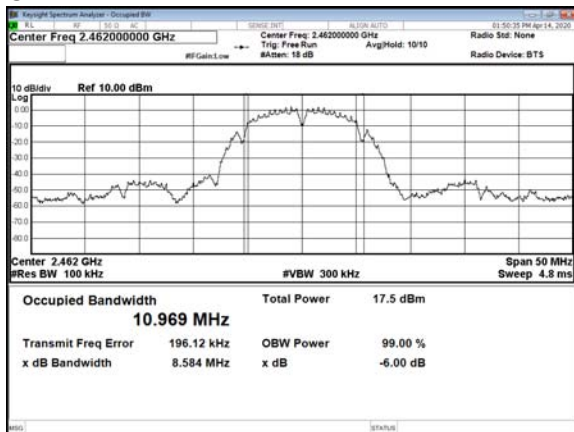
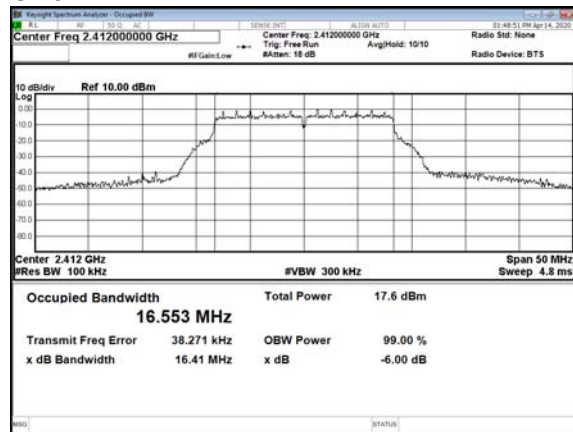
| Modulation Type   | Channel | Frequency (MHz) | 6dB Bandwidth (MHz) |
|-------------------|---------|-----------------|---------------------|
| IEEE 802.11b      | 01      | 2412            | 9.061               |
|                   | 06      | 2437            | 8.582               |
|                   | 11      | 2462            | 8.584               |
| IEEE 802.11g      | 01      | 2412            | 16.41               |
|                   | 06      | 2437            | 16.41               |
|                   | 11      | 2462            | 16.38               |
| IEEE 802.11n HT20 | 01      | 2412            | 17.61               |
|                   | 06      | 2437            | 17.62               |
|                   | 11      | 2462            | 17.65               |

Modulation Type: 802.11b  
CH01

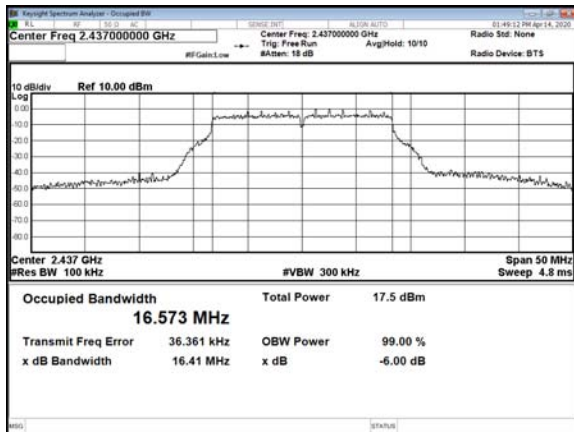
## CH06



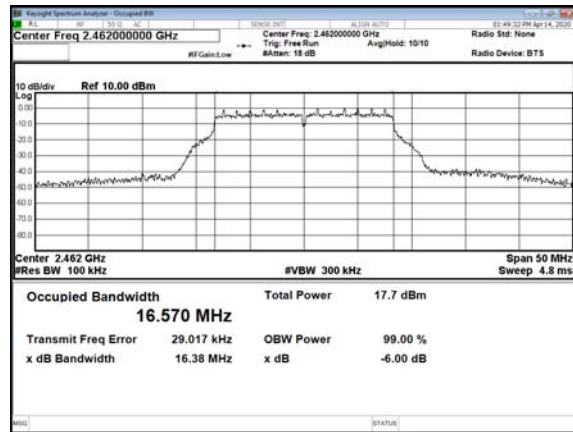
## CH11

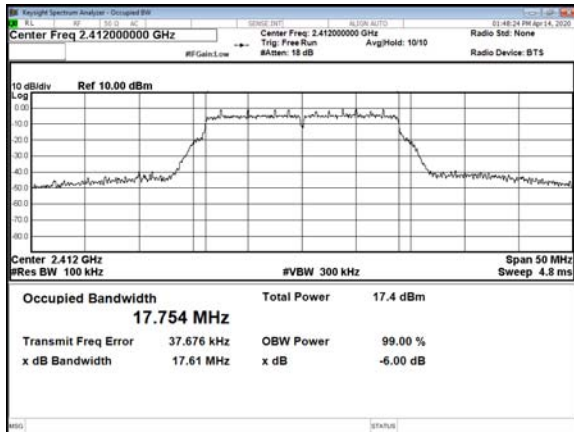
Modulation Type: 802.11g  
CH01

## CH06



## CH11

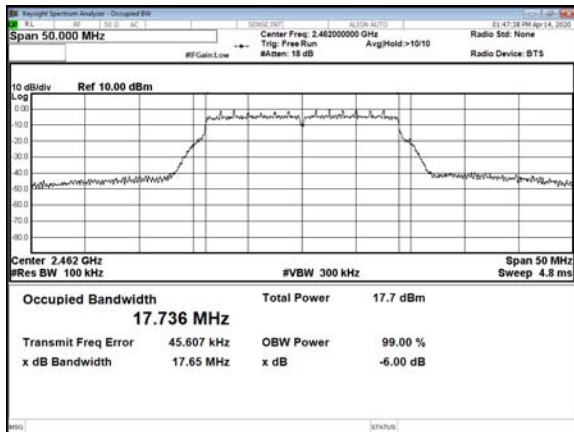


Modulation Type: 802.11n HT20  
CH01

## CH06



## CH11





## 9. Maximum Peak Output Power

### 9.1 Test Limit

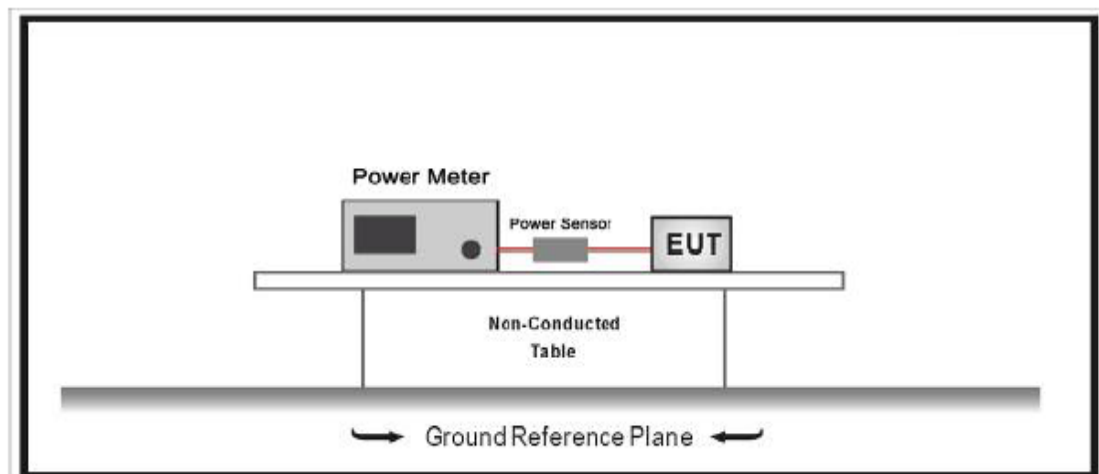
The Maximum Peak Output Power Measurement is 30dBm.

### 9.2 Test Procedures

Test procedure refers to KDB 558074 D01 DTS Meas Guidance v05r02 Peak power meter method.

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

### 9.3 Test Setup Layout



**9.4 Test Result and Data**

| Modulation Type   | Frequency (MHz) | Peak Power (dBm) | Peak Power Output (mW) |
|-------------------|-----------------|------------------|------------------------|
| IEEE 802.11b      | 2412            | 13.42            | 21.979                 |
|                   | 2437            | 13.19            | 20.845                 |
|                   | 2462            | 13.33            | 21.528                 |
| IEEE 802.11g      | 2412            | 18.69            | 73.961                 |
|                   | 2437            | 18.38            | 68.865                 |
|                   | 2462            | 18.40            | 69.183                 |
| IEEE 802.11n HT20 | 2412            | 18.53            | 71.285                 |
|                   | 2437            | 18.42            | 69.502                 |
|                   | 2462            | 18.47            | 70.307                 |



## 10. Power Spectral Density

### 10.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

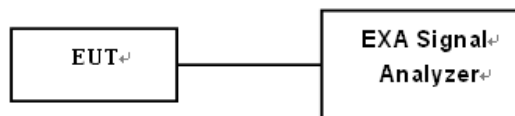
### 10.2 Test Procedures

Test procedure refers to section 11.10.2 Method PKPSD (peak PSD).

The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set the VBW  $\geq [3 \times \text{RBW}]$ .
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
  - i) Use the peak marker function to determine the maximum amplitude level within the RBW.
  - j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

### 10.3 Test Setup Layout

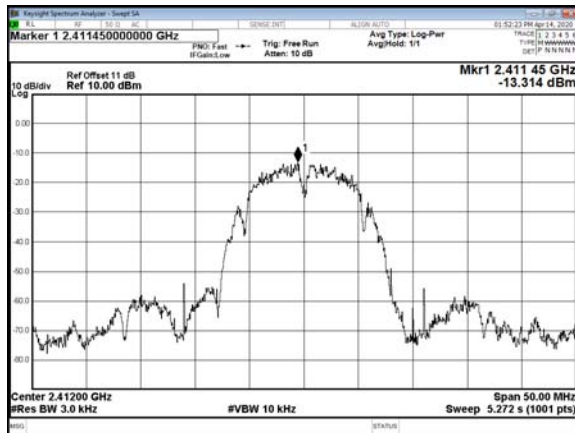


**10.4 Test Result and Data**

| Modulation Type   | Frequency (MHz) | Power Spectral Density (dBm) |
|-------------------|-----------------|------------------------------|
| IEEE 802.11b      | 2412            | -13.314                      |
|                   | 2437            | -12.659                      |
|                   | 2462            | -13.425                      |
| IEEE 802.11g      | 2412            | -15.127                      |
|                   | 2437            | -14.807                      |
|                   | 2462            | -16.154                      |
| IEEE 802.11n HT20 | 2412            | -14.602                      |
|                   | 2437            | -16.034                      |
|                   | 2462            | -15.810                      |



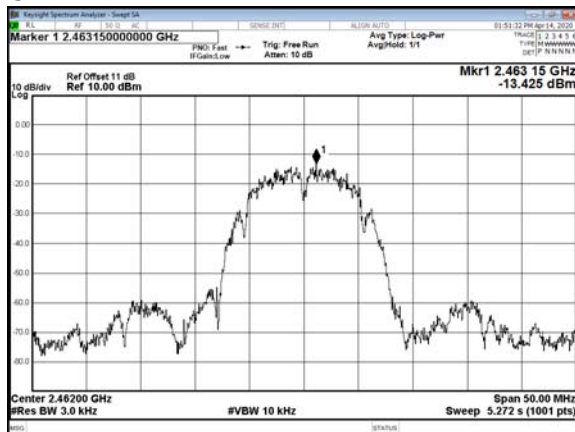
Modulation Type: 802.11b  
CH01



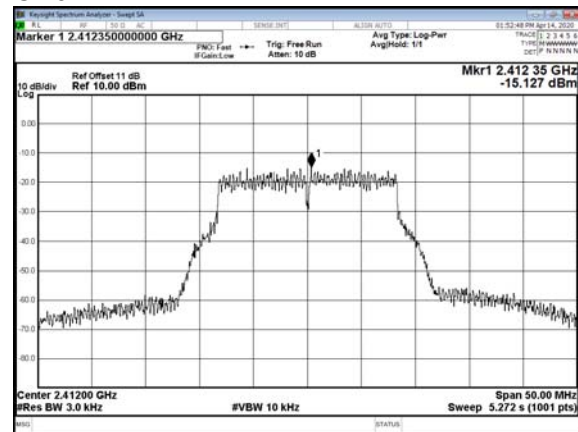
CH06



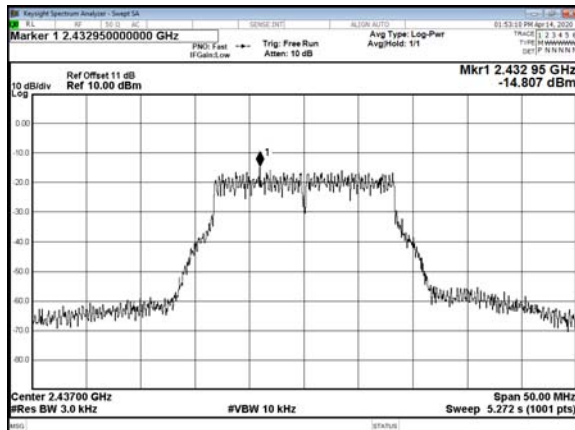
CH11



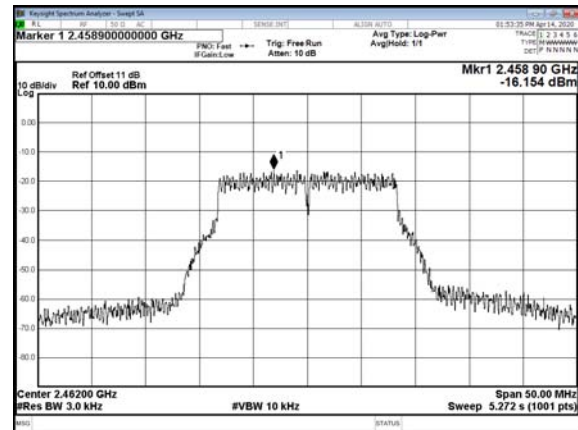
Modulation Type: 802.11g  
CH01



CH06

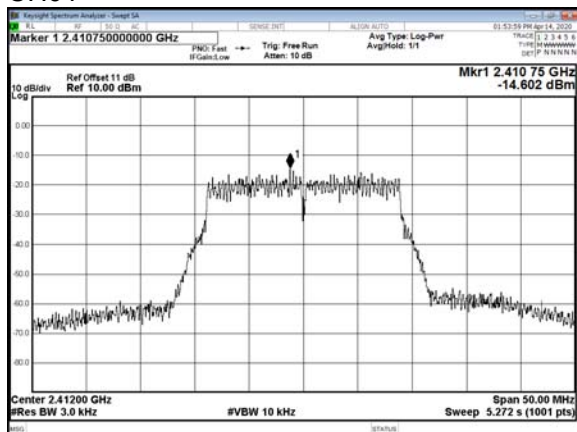


CH11

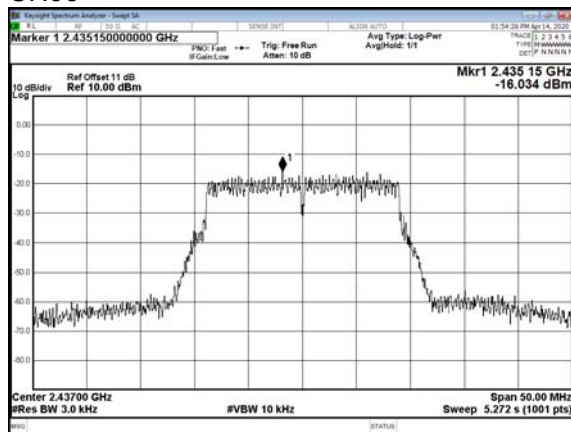




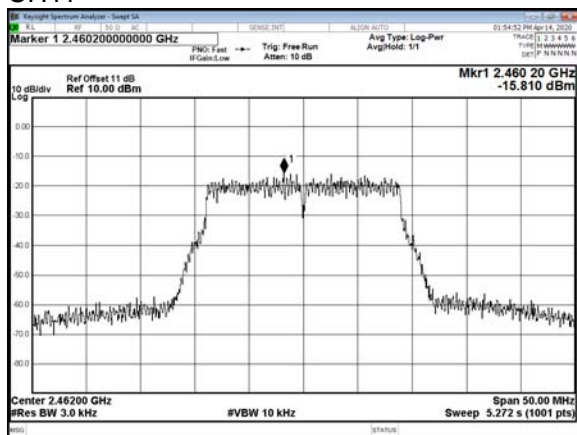
Modulation Type: 802.11n HT20  
CH01



CH06



CH11



----- End of the report -----