



# FCC RADIO TEST REPORT

|            |                                                                                                            |
|------------|------------------------------------------------------------------------------------------------------------|
| Applicant  | : SHENZHEN Hitevision Technology Co., Ltd.                                                                 |
| Address    | : Honghe Mansion No. 1 Building A, 1 Danzi North Road, Shatian, Kengzi Street, Pingshan District, Shenzhen |
| Equipment  | : Wireless Module                                                                                          |
| Model No.  | : AZ832-HN                                                                                                 |
| Trade Name | : N/A                                                                                                      |
| FCC ID     | : 2ACYT-AZ832                                                                                              |
| Standard   | : FCC part 15 Subpart C §15.247                                                                            |

## I HEREBY CERTIFY THAT :

The sample was received on Mar. 31, 2022 and the testing was completed on May. 11, 2022 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Leevin Li /Supervisor



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## History of this test report

☒ Original.

☐ Additional attachment as following record:

| Report No.  | Issue Date   | Description   |
|-------------|--------------|---------------|
| DEFQ2203132 | May 12, 2022 | Initial Issue |
|             |              |               |
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## 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 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------|
| 15.203                                                                                                                                                                                                                                                                                                                            | . Antenna Requirement              | PASS   |
| 15.207                                                                                                                                                                                                                                                                                                                            | . AC Power Line Conducted Emission | PASS   |
| 15.209<br>15.205                                                                                                                                                                                                                                                                                                                  | . Radiated Spurious Emission       | PASS   |
| 15.247(d)                                                                                                                                                                                                                                                                                                                         | . Conducted Spurious Emission      | PASS   |
| 15.247(a)(2)                                                                                                                                                                                                                                                                                                                      | . 6dB Bandwidth                    | PASS   |
| 15.247(b)                                                                                                                                                                                                                                                                                                                         | . Maximum Peak Output Power        | PASS   |
| 15.247(e)                                                                                                                                                                                                                                                                                                                         | . Power Spectral Density           | PASS   |
| Note: Deviations    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>*The lab has reduced the uncertainty risk factor from test equipment,<br>environment and staff technicians which according to the standard on contract.<br>Therefore, the test result will only be determined by standard requirement. |                                    |        |



## 2. Test Configuration of Equipment under Test

### 2.1 Feature of Equipment under Test

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment         | Wireless module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Model Name        | AZ832-HN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Model Discrepancy | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Chipset           | RTL8852BU& RTL8811CU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Frequency Range   | RTL8852BU<br>BT/BLE/ WIFI 2.4G: 2400MHz-2483.5MHz<br>WIFI 5G: 5150MHz-5250MHz, 5725MHz -5850MHz<br>RTL8811CU<br>WIFI 2.4G: 2400MHz-2483.5MHz<br>WIFI 5G: 5150MHz-5250MHz, 5725MHz -5850MHz                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Modulation Type   | RTL8852BU<br>BT: GFSK, $\pi/4$ -DQPSK, 8DPSK<br>BLE: GFSK<br>2.4GHz<br>802.11b: CCK, DQPSK, DBPSK<br>802.11g/n: BPSK, QPSK, 16QAM, 64QAM<br>802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM<br>5GHz<br>802.11a/n: BPSK, QPSK, 16QAM, 64QAM<br>802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM<br>802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM<br>RTL8811CU<br>2.4GHz<br>802.11b: CCK, DQPSK, DBPSK<br>802.11g/n: BPSK, QPSK, 16QAM, 64QAM<br>5GHz<br>802.11a/n: BPSK, QPSK, 16QAM, 64QAM<br>802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM                                                                              |
| Data Rate         | RTL8852BU<br>BT:<br>GFSK:1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK:3Mbps<br>BLE:<br>GFSK: 1Mbps, 2Mbps, 125kbps, 500kbps<br>WIFI 2.4GHz:<br>802.11b: 1, 2 ,5.5,11Mbps<br>802.11g: 6,9,12,18,24,36,48,54Mbps<br>802.11n: MCS0-MCS15, HT20/HT40<br>802.11ax: MCS0-MCS11, HE20/HE40<br>WIFI 5GHz:<br>802.11a: 6,9,12,18,24,36,48,54Mbps<br>802.11n: MCS0-MCS15, HT20/HT40<br>802.11ac: MCS0-MCS9, VHT20/40/80<br>802.11ax: MCS0-MCS11, HE20/HE40/HE80<br>RTL8811CU<br>WIFI 2.4GHz:<br>802.11b: 1, 2 ,5.5,11Mbps<br>802.11g: 6,9,12,18,24,36,48,54Mbps<br>802.11n: HT20 reach up to 72.2Mbps, HT40 reach up to150Mbps<br>WIFI 5GHz: |



|                     |                                                                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | 802.11a: 6,9,12,18,24,36,48,54Mbps<br>802.11n: HT20 reach up to 72.2Mbps, HT40 reach up to 150Mbps<br>802.11ac: VHT20 reach up to 86.7Mbps, VHT40 reach up to 200Mbps, VHT80 reach up to 433.3Mbps |
| Antenna Type        | Dipole Antenna                                                                                                                                                                                     |
| Working Temperature | 0°C to +45°C                                                                                                                                                                                       |
| Storage Temperature | -40°C to +70°C                                                                                                                                                                                     |
| Operating Voltage   | DC 12V                                                                                                                                                                                             |

Note: 1) This report is for RTL8852BU. For other features of this EUT, test report will be issued separately.

2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



## 2.2 Carrier Frequency of Channels

| Channel    | Frequency (MHz) | Channel    | Frequency (MHz) | Channel    | Frequency (MHz) |
|------------|-----------------|------------|-----------------|------------|-----------------|
| <b>*00</b> | <b>2402</b>     | 14         | 2430            | 28         | 2458            |
| 01         | 2404            | 15         | 2432            | 29         | 2460            |
| 02         | 2406            | 16         | 2434            | 30         | 2462            |
| 03         | 2408            | 17         | 2436            | 31         | 2464            |
| 04         | 2410            | 18         | 2438            | 32         | 2466            |
| 05         | 2412            | <b>*19</b> | <b>2440</b>     | 33         | 2468            |
| 06         | 2414            | 20         | 2442            | 34         | 2470            |
| 07         | 2416            | 21         | 2444            | 35         | 2472            |
| 08         | 2418            | 22         | 2446            | 36         | 2474            |
| 09         | 2420            | 23         | 2448            | 37         | 2476            |
| 10         | 2422            | 24         | 2450            | 38         | 2478            |
| 11         | 2424            | 25         | 2452            | <b>*39</b> | <b>2480</b>     |
| 12         | 2426            | 26         | 2454            | --         | --              |
| 13         | 2428            | 27         | 2456            | --         | --              |

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 C63.10.
- The complete test system included Notebook, adapter and EUT for RF test.
- Run the test software "RTLBTAPP.exe (Ver.: 5.2.3.12) " under WIN 10 System was executed to transmit and receive data via Bluetooth.
- The following test modes were performed for the test:

| Conducted Emissions from the AC mains power ports                                              |                         |
|------------------------------------------------------------------------------------------------|-------------------------|
| Test Mode                                                                                      | Operating Description   |
| Mode 1                                                                                         | GFSK (1Mbps) for 120V   |
| Mode 2                                                                                         | GFSK (2Mbps) for 120V   |
| Mode 3                                                                                         | GFSK (125kbps) for 120V |
| Mode 4                                                                                         | GFSK (500kbps) for 120V |
| Mode 5                                                                                         | GFSK (2Mbps) for 240V   |
| caused "Test Mode 2 at CH00:2402" generated the worst case, it was reported as the final data. |                         |
| Radiation Emissions (30MHz ~ 1GHz)                                                             |                         |
| Test Mode                                                                                      | Operating Description   |
| Mode 1                                                                                         | GFSK (1Mbps)            |
| Mode 2                                                                                         | GFSK (2Mbps)            |
| Mode 3                                                                                         | GFSK (125kbps)          |
| Mode 4                                                                                         | GFSK (500kbps)          |
| caused "Test Mode 2 at CH39:2402" generated the worst case, it was reported as the final data. |                         |
| Radiation Emissions (1GHz ~ 25GHz)                                                             |                         |
| Test Mode                                                                                      | Operating Description   |
| Mode 1                                                                                         | GFSK (1Mbps)            |
| Mode 2                                                                                         | GFSK (2Mbps)            |
| Mode 3                                                                                         | GFSK (125kbps)          |
| Mode 4                                                                                         | GFSK (500kbps)          |
| caused "Test Mode 1~4" generated the worst case, it was reported as the final data.            |                         |

**2.4 Power Parameter Value of the test software**

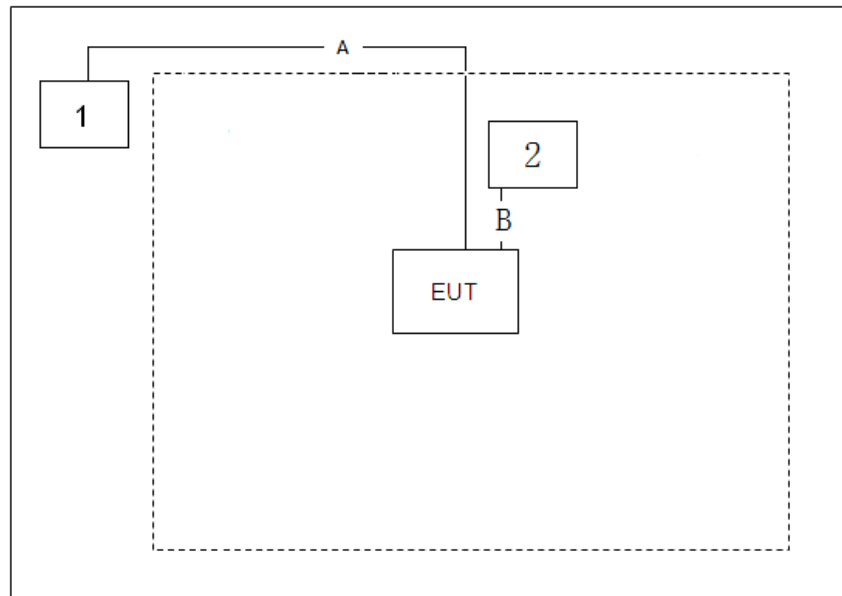
| Mode           | Frequency (MHz) | Power Setting |
|----------------|-----------------|---------------|
| GFSK (1Mbps)   | 2402            | Default       |
|                | 2440            | Default       |
|                | 2480            | Default       |
| GFSK (2Mbps)   | 2402            | Default       |
|                | 2440            | Default       |
|                | 2480            | Default       |
| GFSK (125kbps) | 2402            | Default       |
|                | 2440            | Default       |
|                | 2480            | Default       |
| GFSK (500kbps) | 2402            | Default       |
|                | 2440            | Default       |
|                | 2480            | Default       |



## 2.5 Description of Test System

| Product    | Manufacturer | Model No.  | Power Cord         |
|------------|--------------|------------|--------------------|
| 1 Notebook | SONY         | PCG-71811P | Non-Shielded, 1.8m |
| 2 Adapter  | Asian        | WA-36WFU   | N/A                |

### Connection Diagram



| Signal Cable Type | Quantity | Signal cable Description |
|-------------------|----------|--------------------------|
| A USB Cable       | 1        | 5.0m Shielding           |
| B DC Cable        | 1        | 1.5m Non-Shielding       |



## 2.6 General Information of Test

|                               |                                                                                                                                                                                                                |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site                     | <b>CerpPASS Technology Corporation(CerpPASS Laboratory)</b><br>Address: Room 102, No. 5, Xing'an Road, Chang'an Town,<br>Dongguan City, Guangdong Province<br>Tel: +86-769-8547-1212<br>Fax: +86-769-8547-1912 |
| FCC Designation No.:          | CN1288                                                                                                                                                                                                         |
| Frequency Range Investigated: | Conducted: from 150kHz to 30 MHz<br>Radiation: from 30 MHz to 25,000MHz                                                                                                                                        |
| Test Distance:                | The test distance of radiated emission from antenna to EUT is 3 M.                                                                                                                                             |

| Test Item                        | Test Site  | Test period         | Environmental Conditions | Tested By  |
|----------------------------------|------------|---------------------|--------------------------|------------|
| RF Conducted                     | RFCON01-DG | 2022/4/12~2022/5/11 | 23°C~24°C / 49%~52%      | Amos Zhang |
| Radiated Emissions               | 3M01-DG    | 2022/4/15~2022/5/11 | 22°C~24°C / 52%~53%      | Amos Zhang |
| AC Power Line Conducted Emission | CON01-DG   | 2022/04/20          | 23°C / 50%               | Amos Zhang |

## 2.7 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                         | Uncertainty |
|------------------------------------------|-------------|
| AC Power Line Conduction(150K~30MHz)     | ±2.88dB     |
| Radiated Spurious Emission(9KHz~30MHz)   | ±2.15dB     |
| Radiated Spurious Emission(30MHz~1GHz)   | ±4.95dB     |
| Radiated Spurious Emission(1GHz~18GHz)   | ±3.24dB     |
| Radiated Spurious Emission(18GHz~40GHz)  | ±5.43dB     |
| 6dB Bandwidth&26dB Bandwidth             | ±4.422%     |
| Occupied Bandwidth                       | ±4.244%     |
| Peak Output Power(Conducted Power Meter) | ±1.4 dB     |
| Power Spectral Density                   | ±1.387 dB   |
| Frequency Stability                      | ±0.6338Hz   |



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

| AC Power Line Conducted Emission    |              |             |            |                  |             |
|-------------------------------------|--------------|-------------|------------|------------------|-------------|
| Instrument/Ancillary                | Manufacturer | Model No.   | Serial No. | Calibration Date | Valid Date. |
| Test Receiver                       | R&S          | ESCI        | 100564     | 2022.01.08       | 2023.01.07  |
| LISN                                | SCHWARZBECK  | NSLK 8127   | 8127748    | 2022.01.08       | 2023.01.07  |
| LISN                                | R&S          | ENV216      | 100024     | 2022.01.08       | 2023.01.07  |
| ISN                                 | TESEQ        | ISN T800    | 42809      | 2021.05.10       | 2022.05.09  |
| Pulse Limiter with 10dB Attenuation | SCHWARZBECK  | VTSD 9561-F | 9561-F106  | 2022.01.08       | 2023.01.07  |
| Temperature/ Humidity Meter         | GEMLEAD      | STH200A     | N/A        | 2021.08.17       | 2022.08.16  |

| Radiated Emissions          |               |           |            |                  |            |
|-----------------------------|---------------|-----------|------------|------------------|------------|
| Test Site                   | 3M02-DG       |           |            |                  |            |
| Instrument                  | Manufacturer  | Model No. | Serial No. | Calibration Date | Valid Date |
| EMI Test Receiver           | R&S           | ESCI      | 100563     | 2021.05.14       | 2022.05.13 |
| H64 Preamplifier            | HP            | 8447F     | 3113A05582 | 2022.01.08       | 2023.01.07 |
| Loop Antenna                | R&S           | HFH2-Z2   | 100150     | 2020.06.08       | 2022.06.07 |
| Bilog Antenna               | Sunol Science | JB1       | A072414-1  | 2020.11.25       | 2022.11.24 |
| Preamplifier                | EMEC          | EM01G18G  | 060739     | 2021.06.29       | 2022.06.28 |
| Preamplifier                | COM-POWER     | PA-840    | 711885     | 2021.05.14       | 2022.05.13 |
| Horn Antenna                | Sunol         | DRH-118   | A072913    | 2021.08.22       | 2023.08.21 |
| Standard Gain Horn Antenna  | TRC           | HA-2640   | 18050      | 2020.06.08       | 2022.06.07 |
| Standard Gain Horn Antenna  | TRC           | HA-1726   | 18051      | 2020.06.08       | 2022.06.07 |
| FSQ Signal Analyzer         | R&S           | FSQ40     | 200012     | 2021.05.14       | 2022.05.13 |
| Temperature/ Humidity Meter | GEMLEAD       | STH200A   | N/A        | 2021.08.17       | 2022.08.16 |

| Test Item                   | RF Conducted |           |            |                  |            |
|-----------------------------|--------------|-----------|------------|------------------|------------|
| Instrument                  | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date |
| MXA Signal Analyzer         | KEYSIGHT     | N9020A    | US46220290 | 2021.05.14       | 2022.05.13 |
| ESG VECTOR SIGNAL GENERATOR | Agilent      | E4438C    | MY45092582 | 2021.05.14       | 2022.05.13 |
| MXG VECTOR SIGNAL GENERATOR | Agilent      | N5182B    | MY53050127 | 2021.05.14       | 2022.05.13 |
| USB Wideband Power Sensor   | Boonton      | 55006     | 9778       | 2022.01.08       | 2023.01.07 |
| Temperature/ Humidity Meter | mingle       | ETH529    | N/A        | 2022.01.08       | 2023.01.07 |



## 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

BT/BLE

|              |                |
|--------------|----------------|
| Antenna Type | Dipole Antenna |
| Antenna Gain | 3.82dBi        |



## 5. Test of 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<br>(MHz) | Quasi Peak<br>(dB $\mu$ V) | Average<br>(dB $\mu$ V) |
|--------------------|----------------------------|-------------------------|
| 0.15 – 0.5         | 66-56*                     | 56-46*                  |
| 0.5 – 5.0          | 56                         | 46                      |
| 5.0 – 30.0         | 60                         | 50                      |

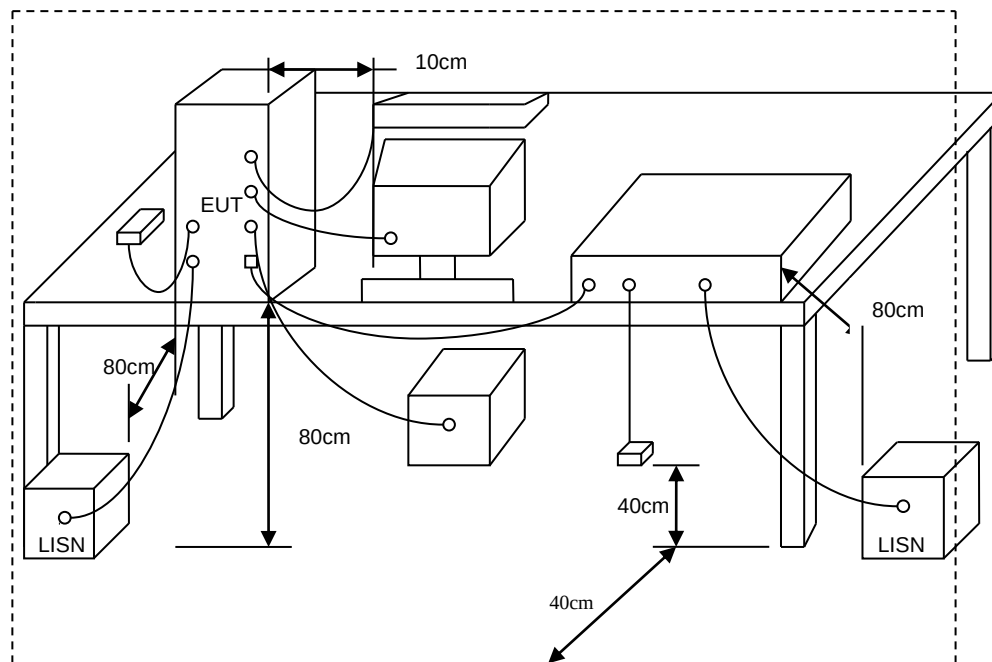
\*Decreases with the logarithm of the frequency.

### 5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

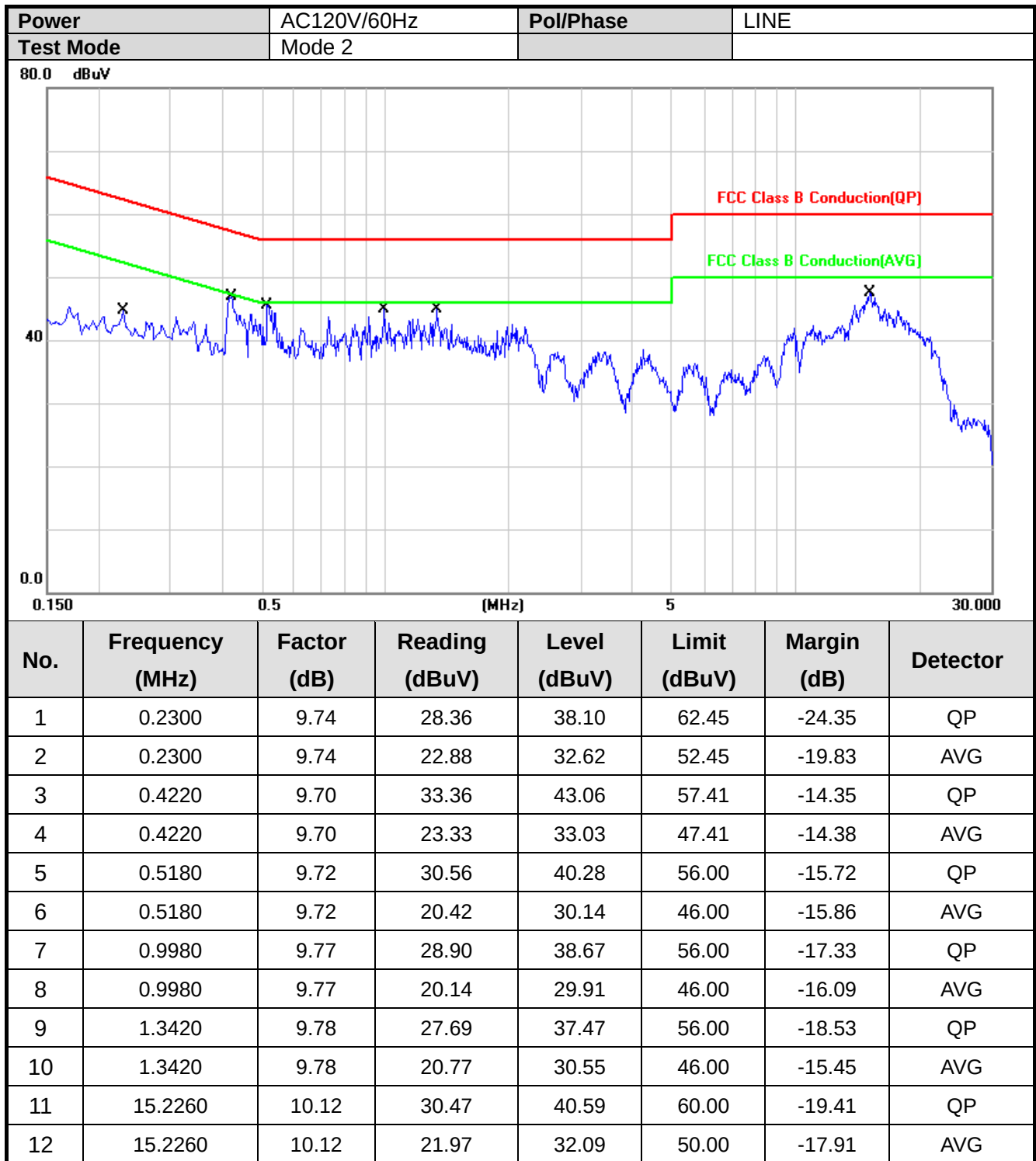


### 5.3 Typical Test Setup

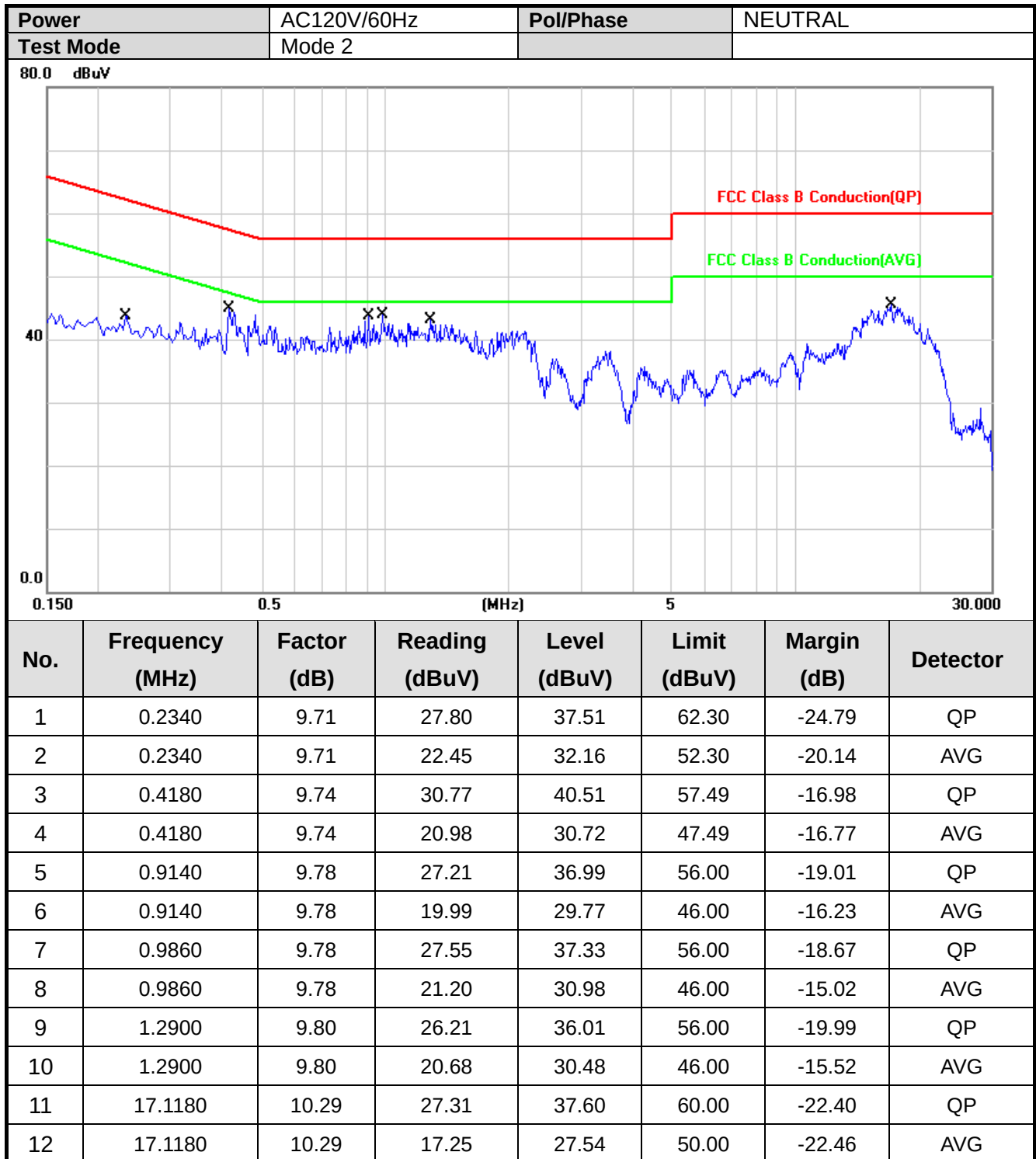




## 5.4 Test Result and Data



Note: Measurement Level = Reading Level + Correct Factor



Note: Measurement Level = Reading Level + Correct Factor



## 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).

| Frequency (MHz) | Field Strength (microvolt/meter) | Measurement Distance (meters) |
|-----------------|----------------------------------|-------------------------------|
| 0.009 ~ 0.490   | 2400/F(kHz)                      | 300                           |
| 0.490 ~ 1.705   | 24000/F(kHz)                     | 30                            |
| 1.705 ~ 30.0    | 30                               | 30                            |
| 30 ~ 88         | 100                              | 3                             |
| 88 ~ 216        | 150                              | 3                             |
| 216 ~ 960       | 200                              | 3                             |
| Above 960       | 500                              | 3                             |

### 6.2 Test Procedures

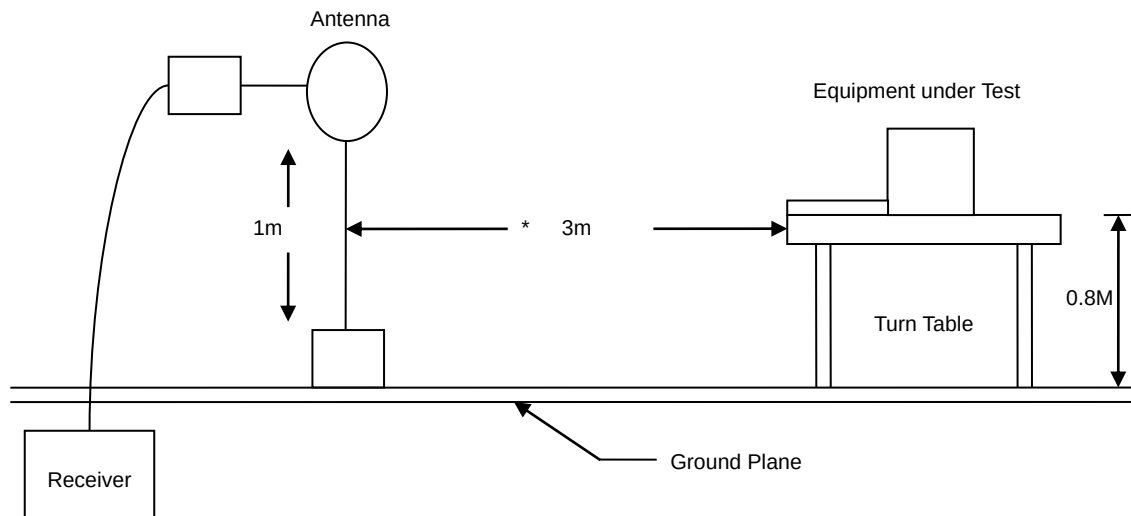
- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna 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 average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

Note: The supporting fixture shall permit orientation of the EUT in each of three orthogonal axis positions such that emissions from the EUT are maximized.(X AXIS is the worst.)

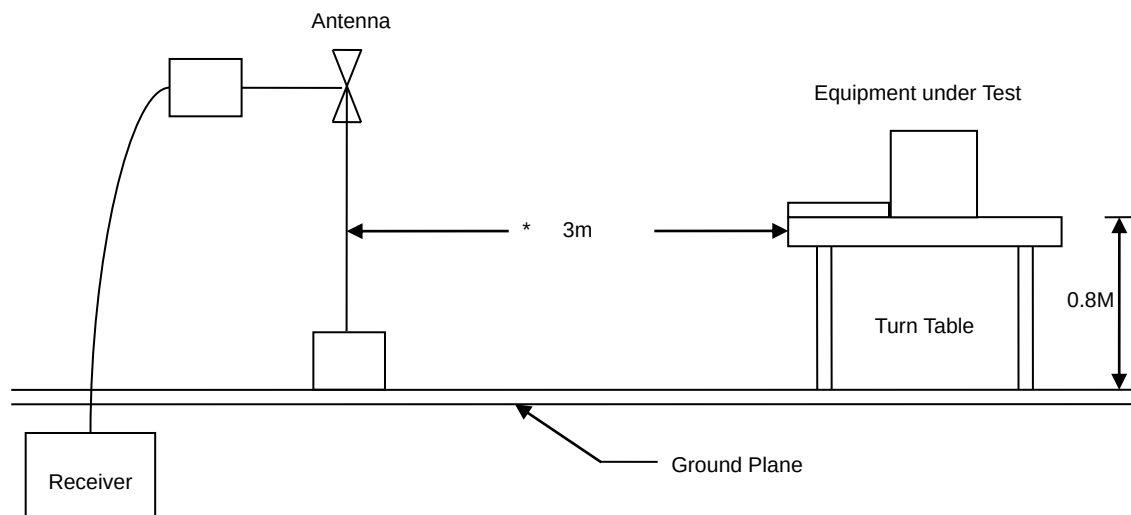


### 6.3 Typical Test Setup

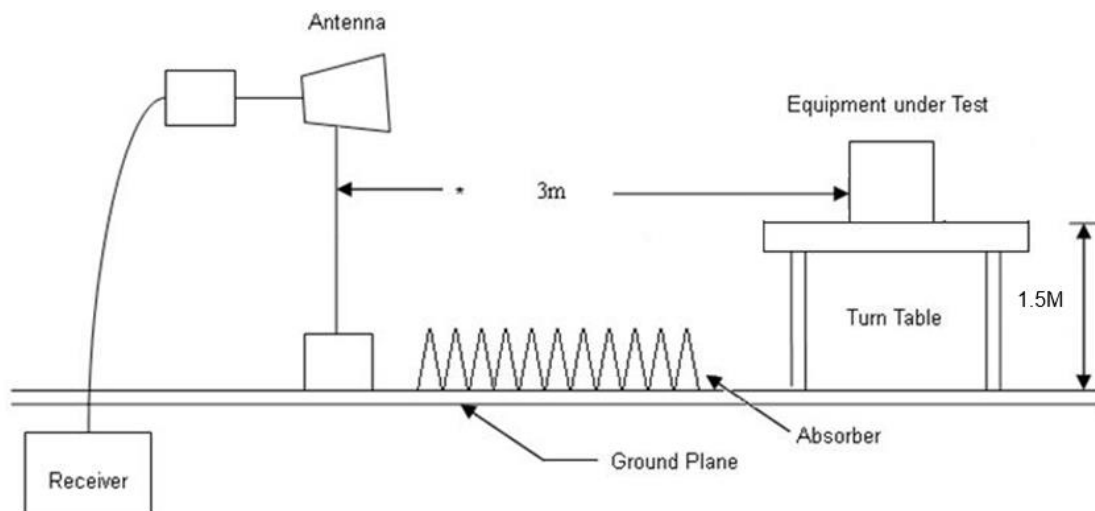
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup

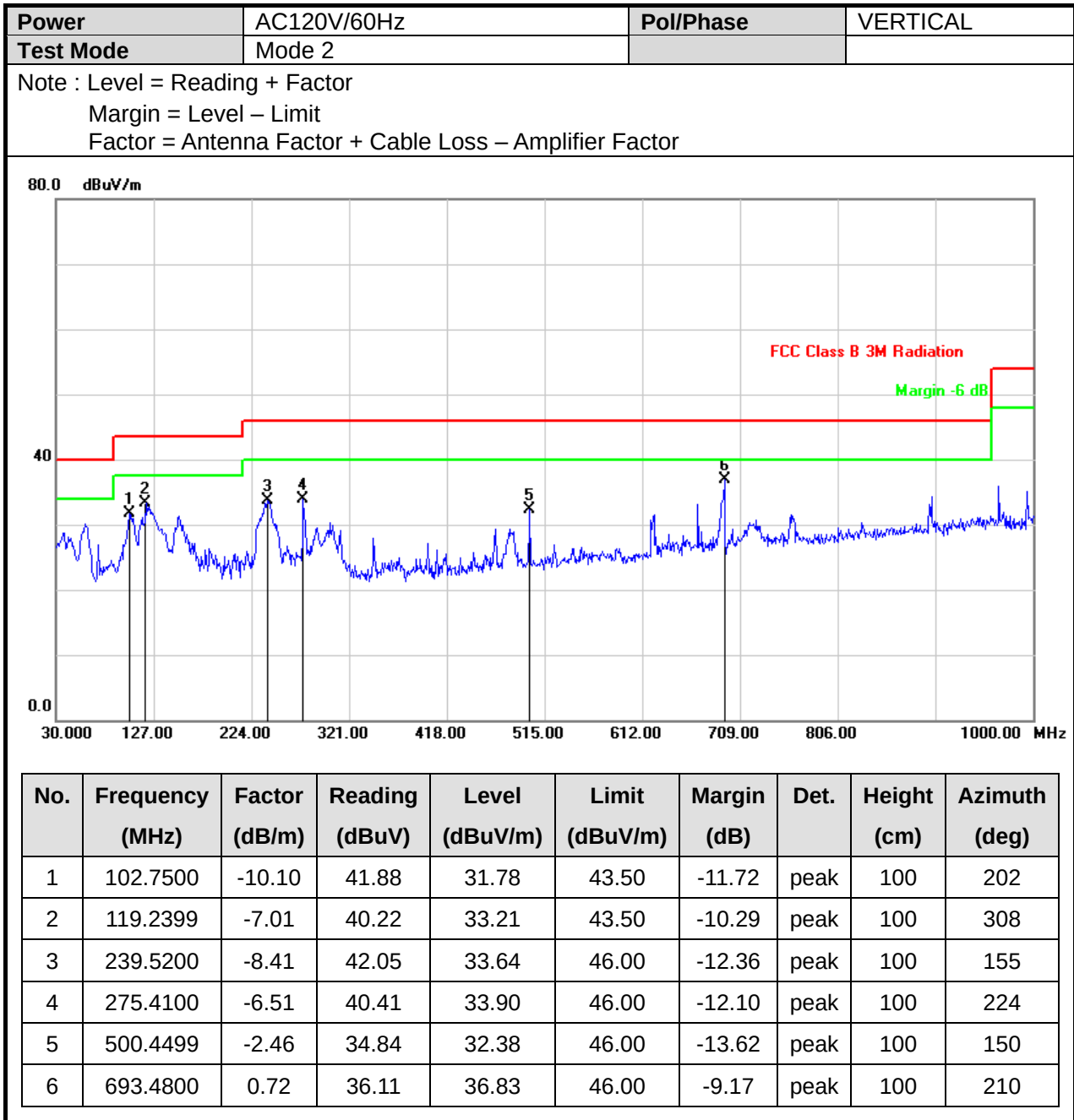


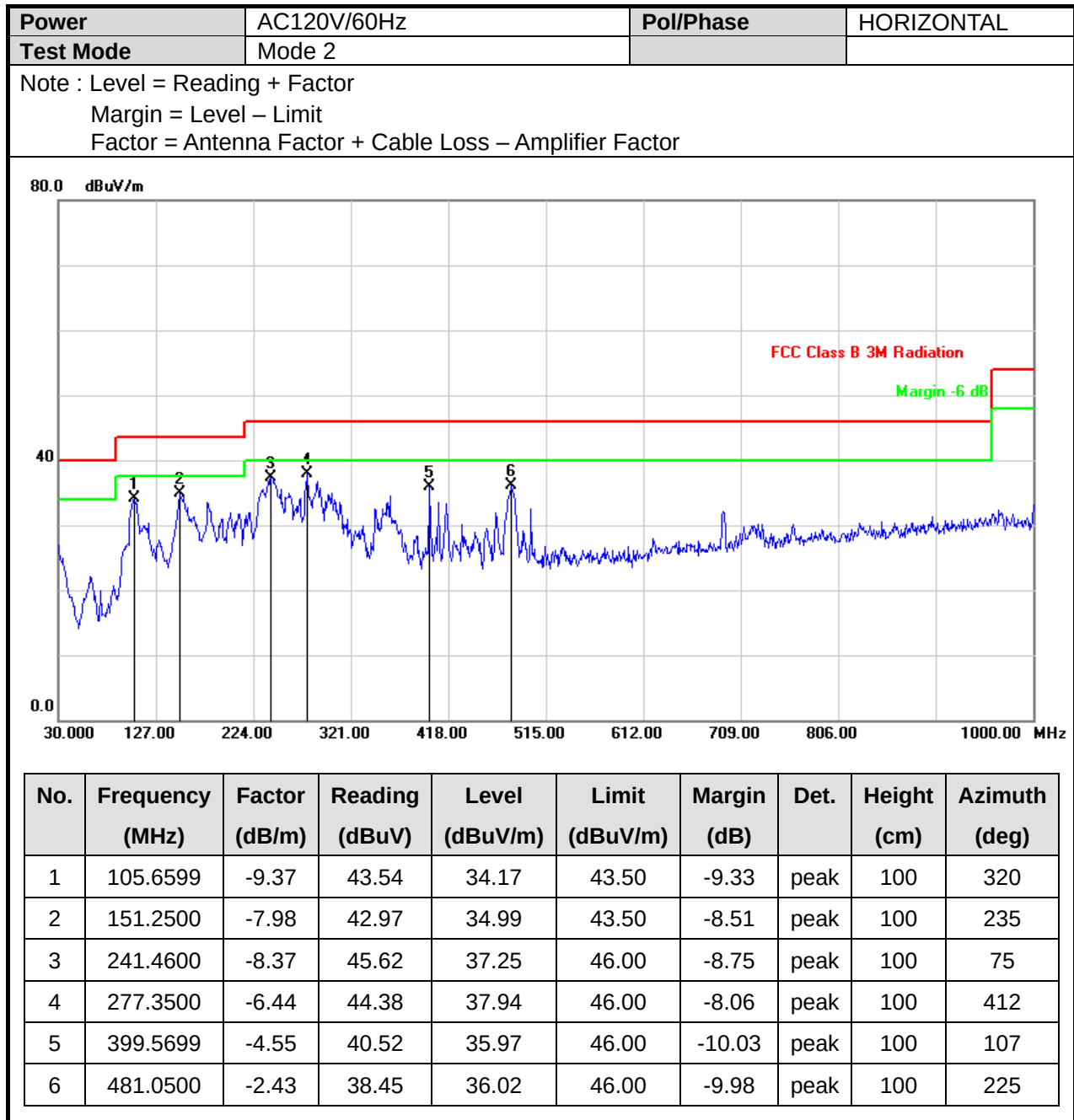


## 6.4 Test Result and Data (9kHz ~ 30MHz)

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)

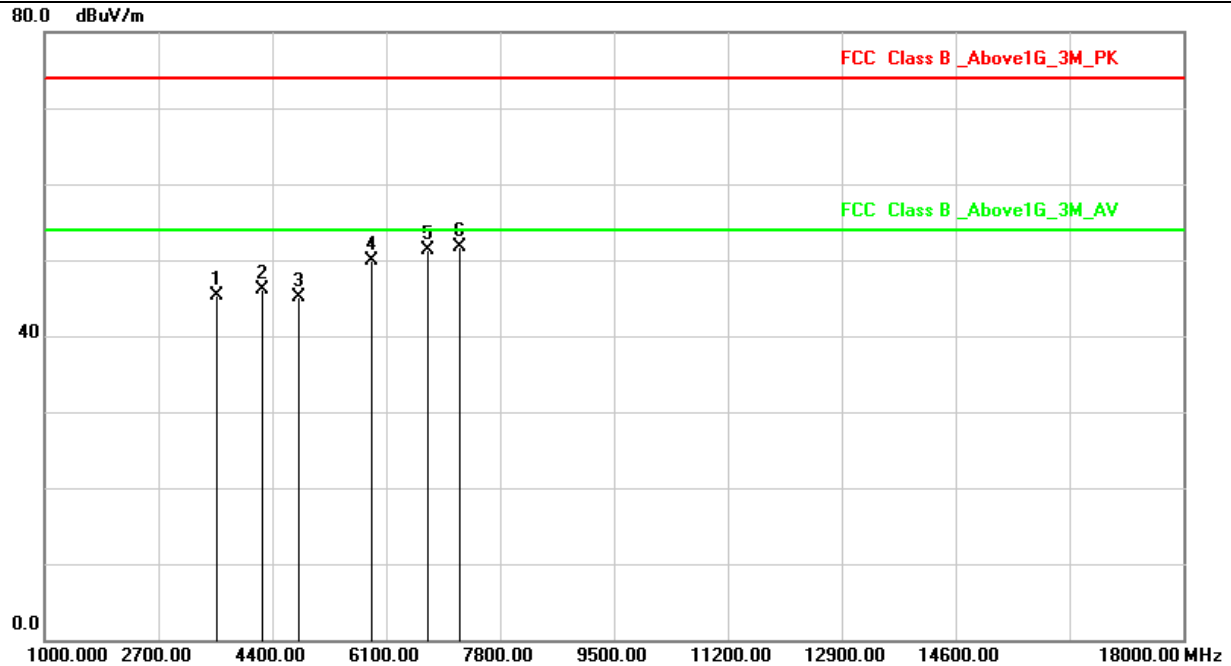
|           |               |                |          |
|-----------|---------------|----------------|----------|
| Power     | AC120V/60Hz   | Pol/Phase      | VERTICAL |
| Test Mode | Mode 1, CH 00 | Operation mode | TX       |

Note : Level = Reading + Factor

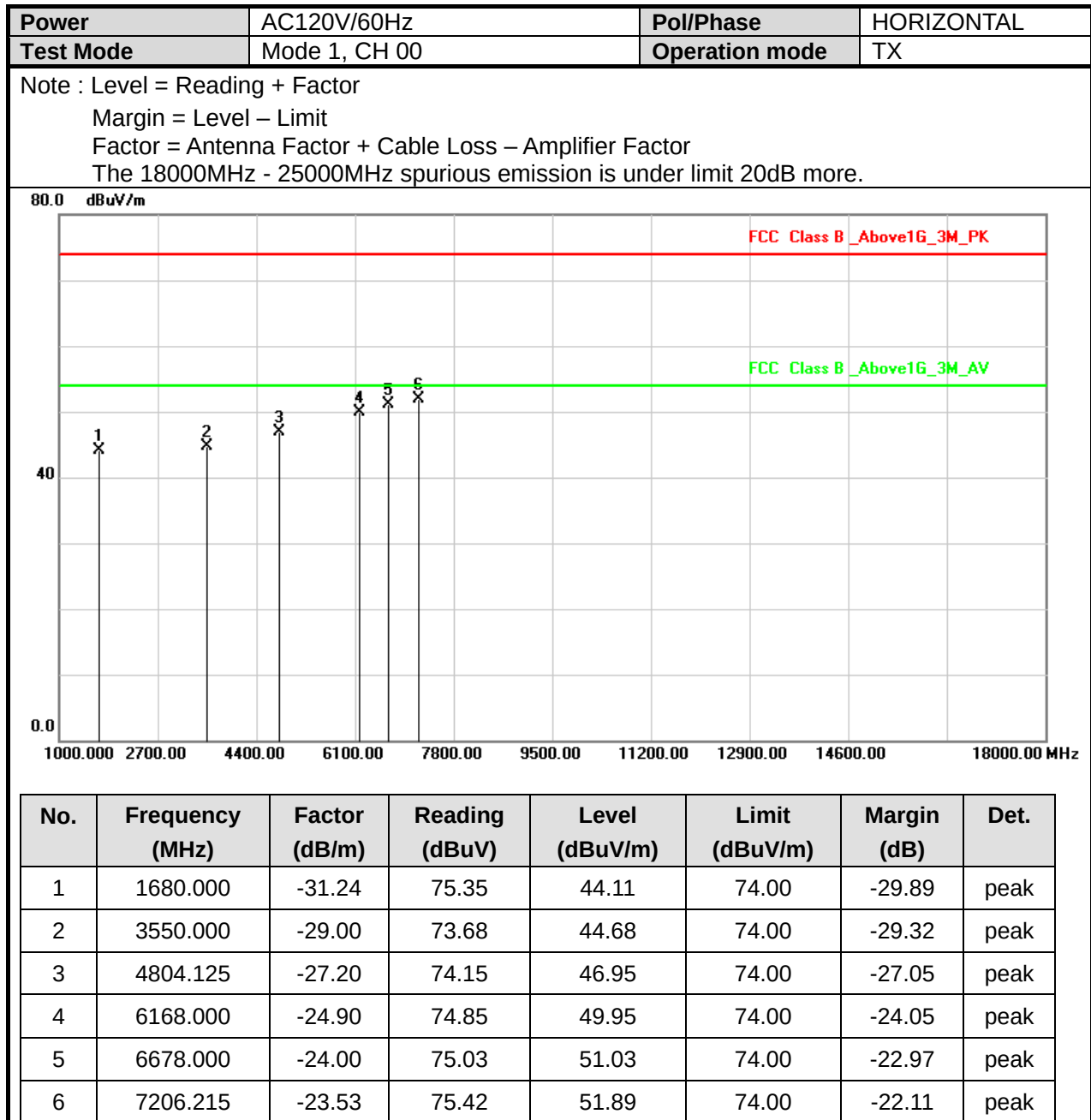
Margin = Level – Limit

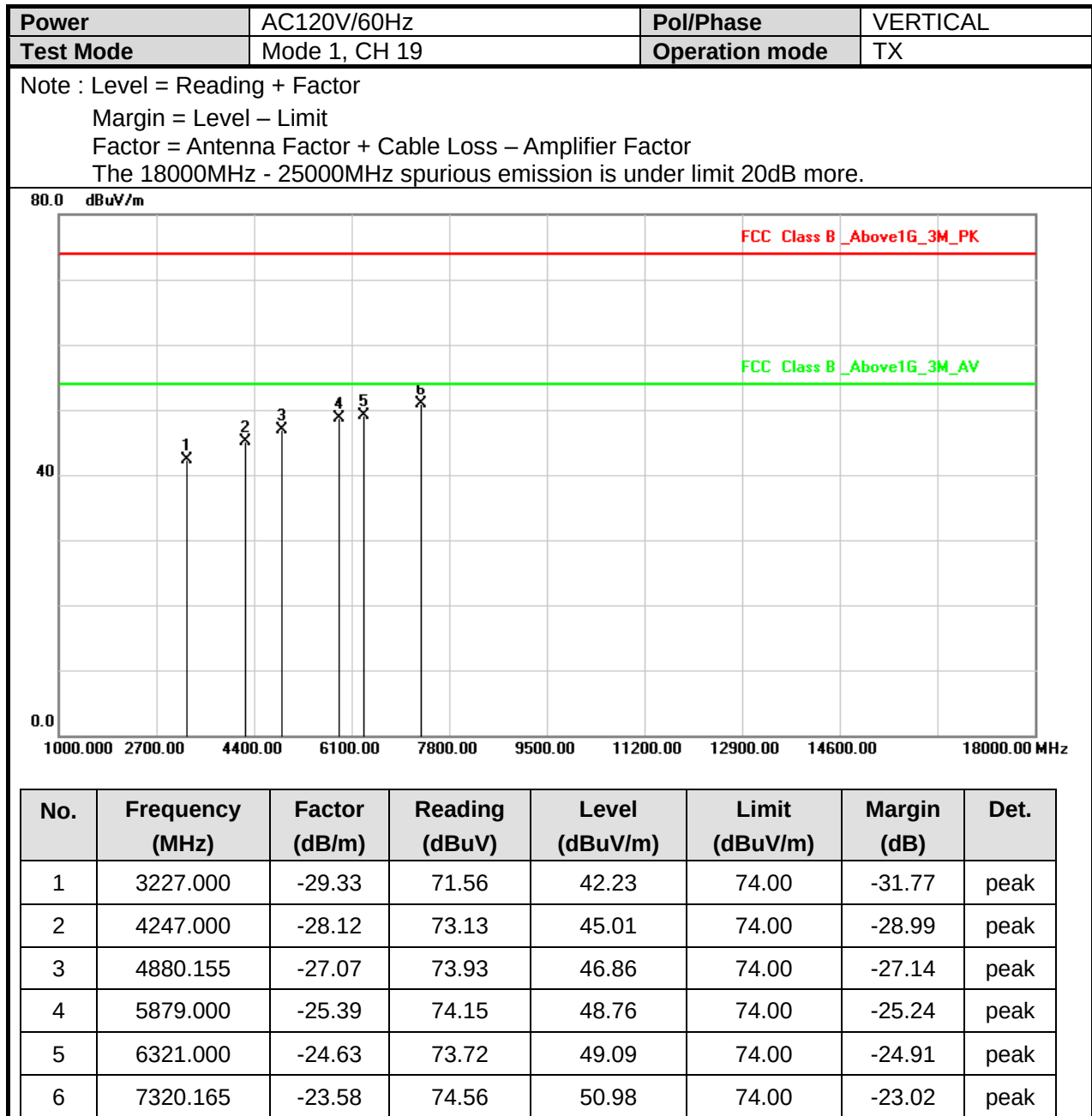
Factor = Antenna Factor + Cable Loss – Amplifier Factor

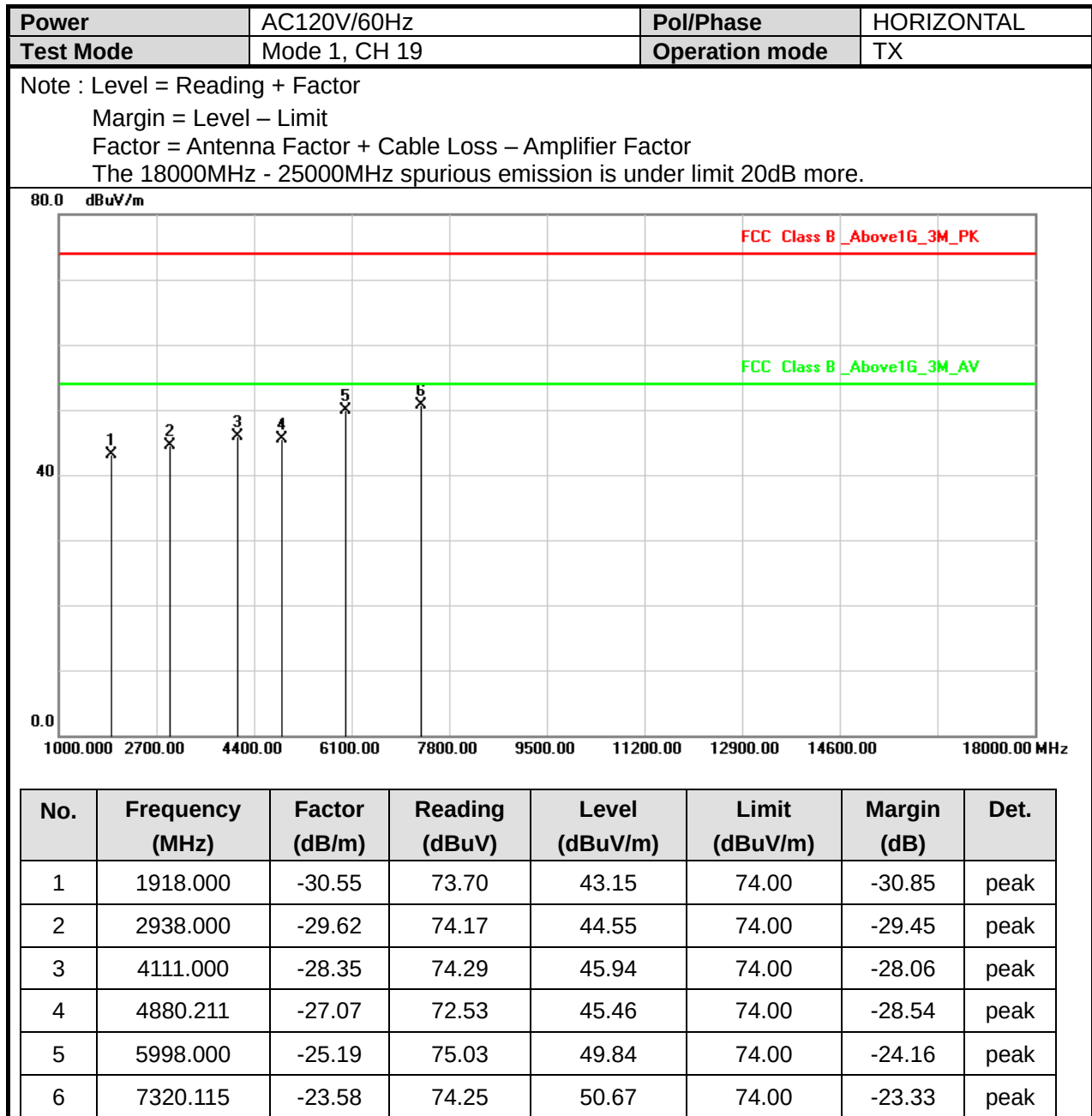
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

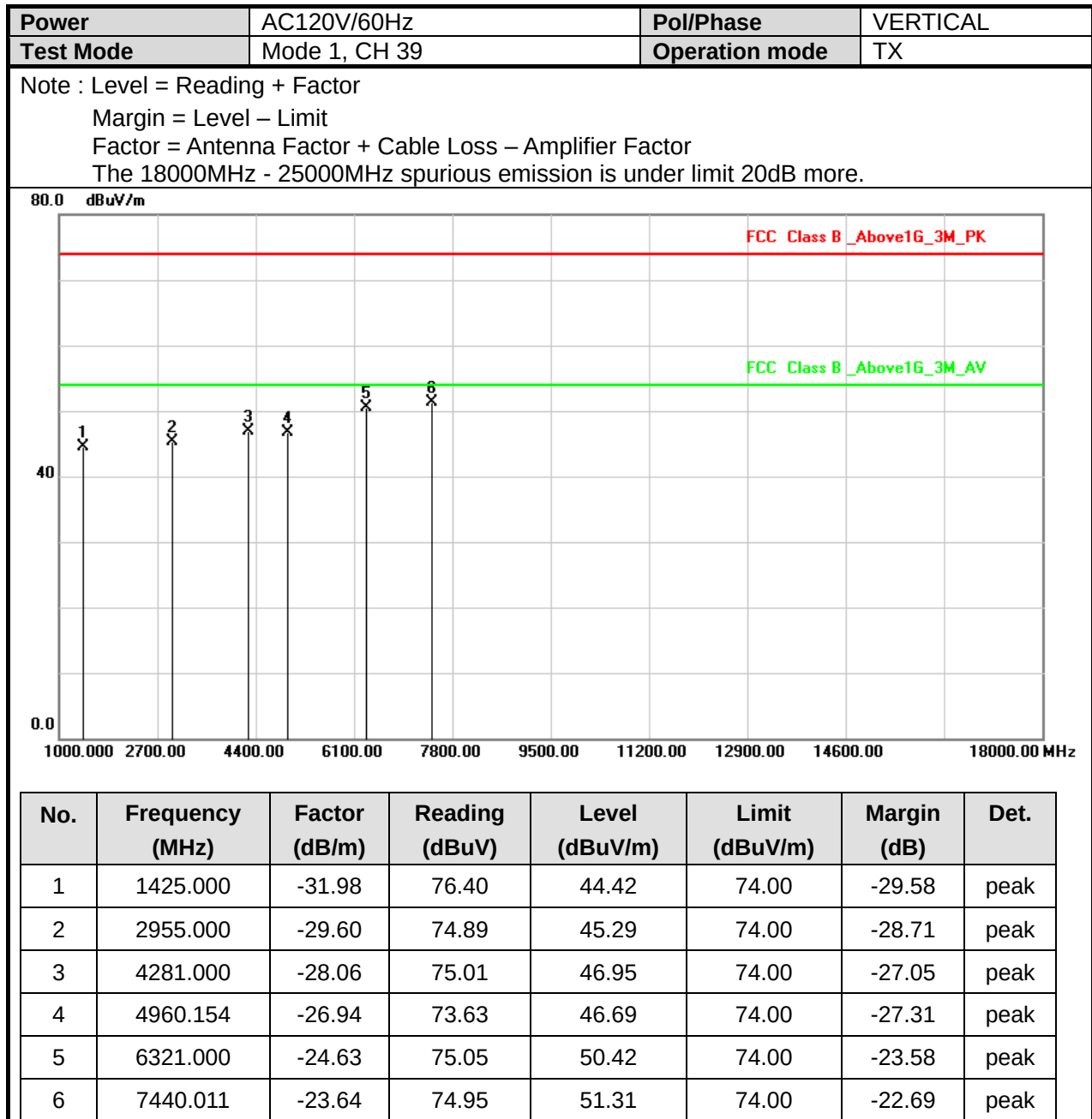


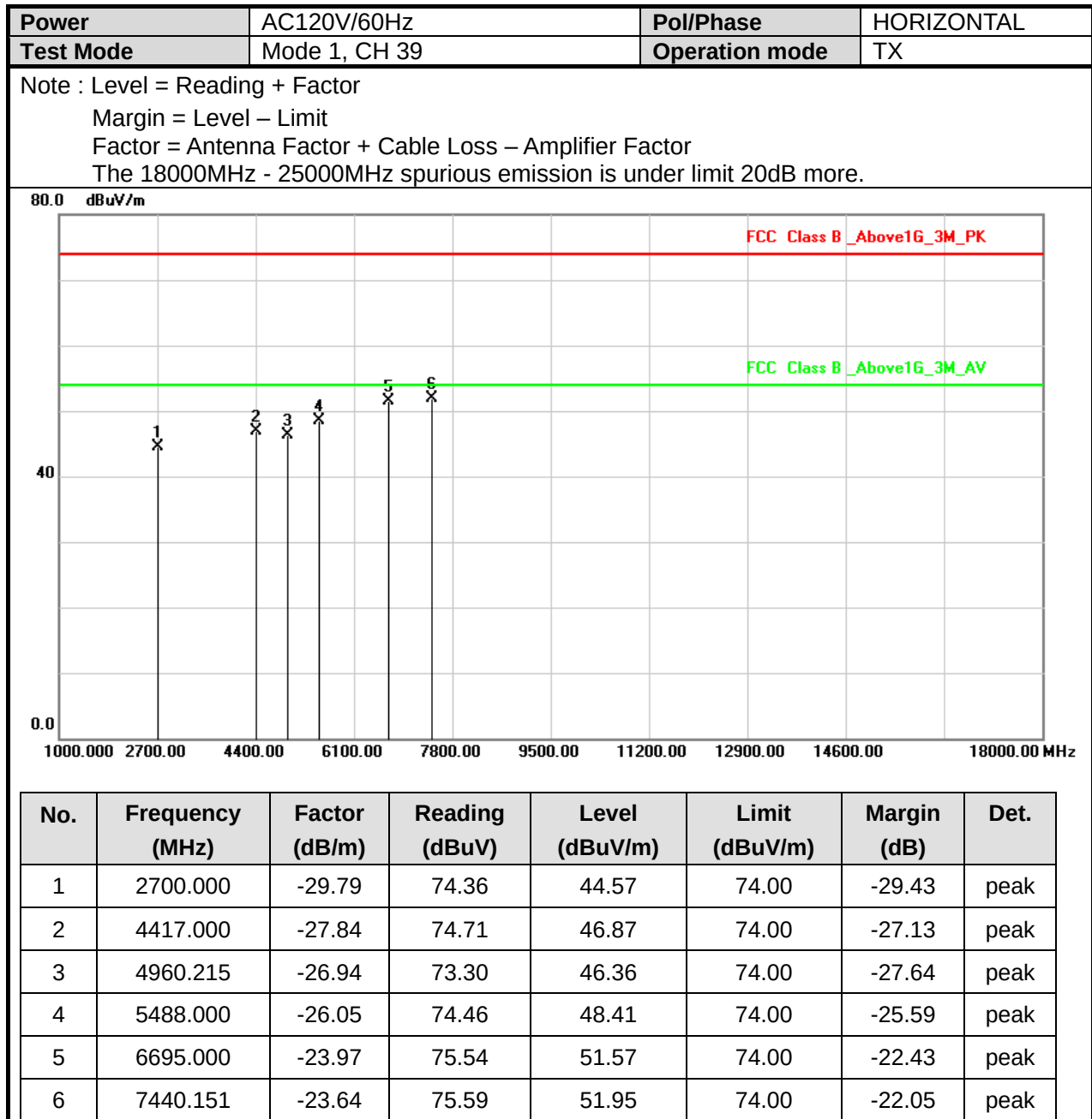
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|
| 1   | 3567.000        | -28.98        | 74.26          | 45.28          | 74.00          | -28.72      | peak |
| 2   | 4247.000        | -28.12        | 74.31          | 46.19          | 74.00          | -27.81      | peak |
| 3   | 4804.120        | -27.20        | 72.36          | 45.16          | 74.00          | -28.84      | peak |
| 4   | 5879.000        | -25.39        | 75.20          | 49.81          | 74.00          | -24.19      | peak |
| 5   | 6712.000        | -23.94        | 75.30          | 51.36          | 74.00          | -22.64      | peak |
| 6   | 7206.124        | -23.53        | 75.15          | 51.62          | 74.00          | -22.38      | peak |

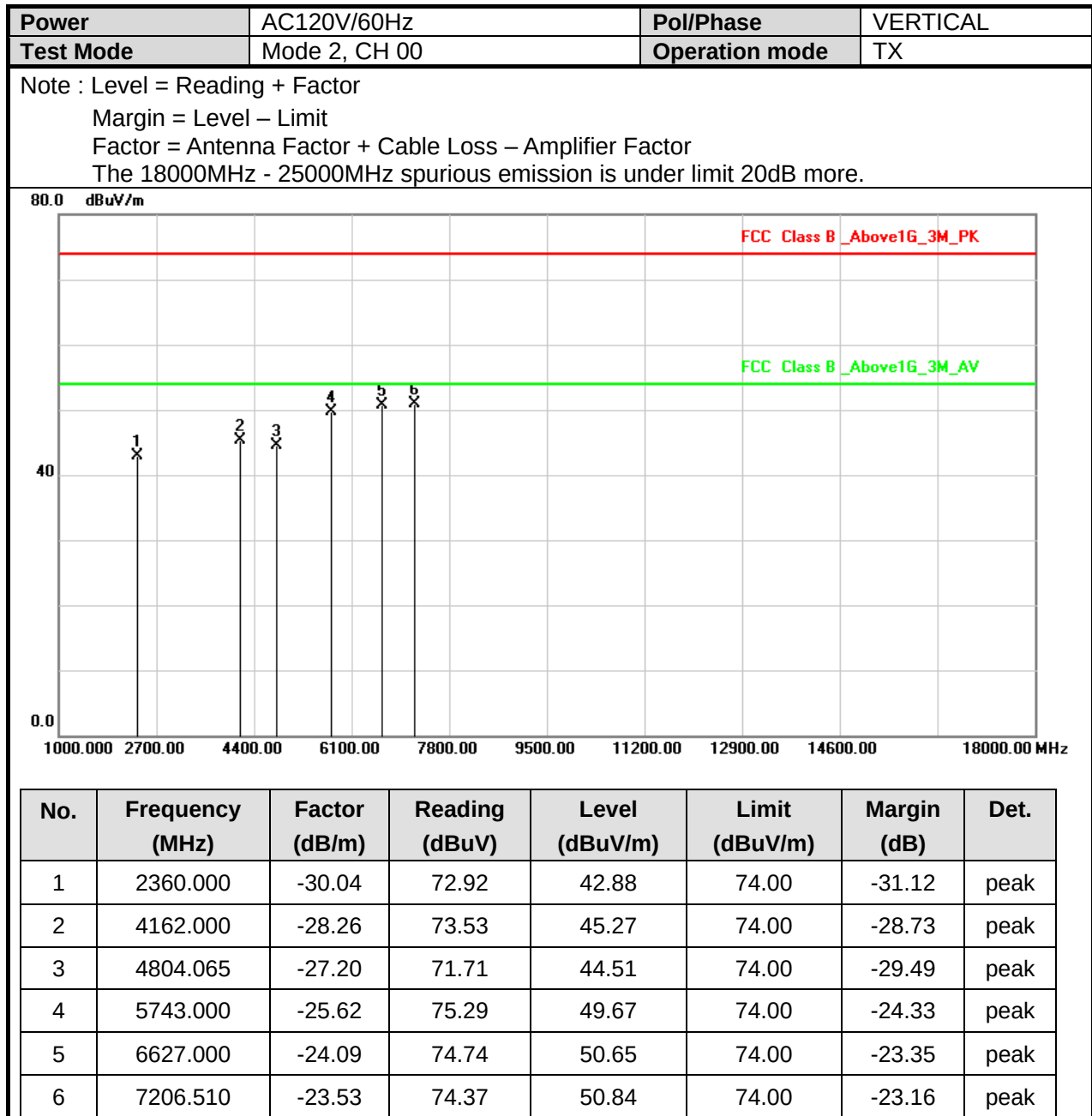


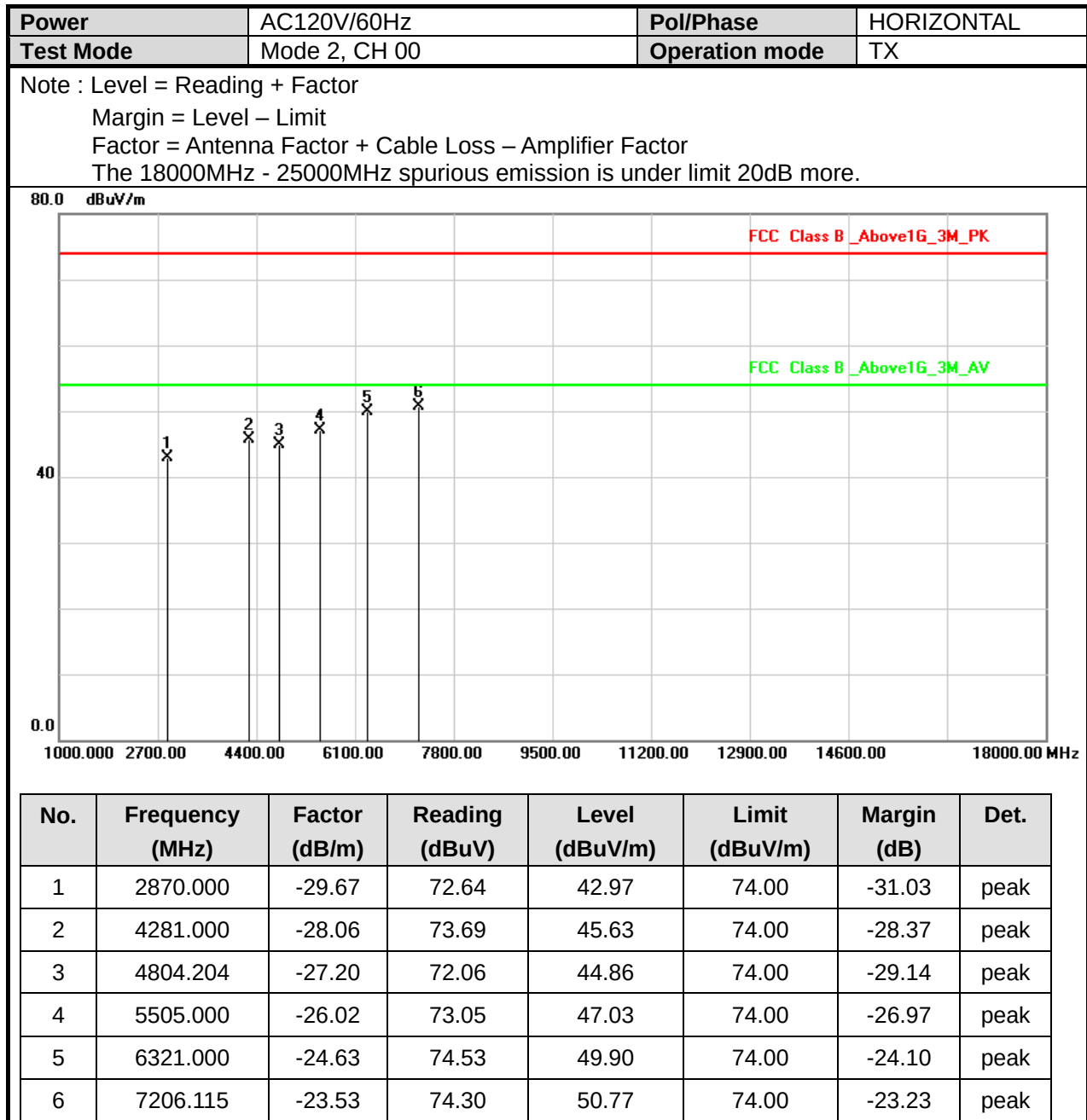


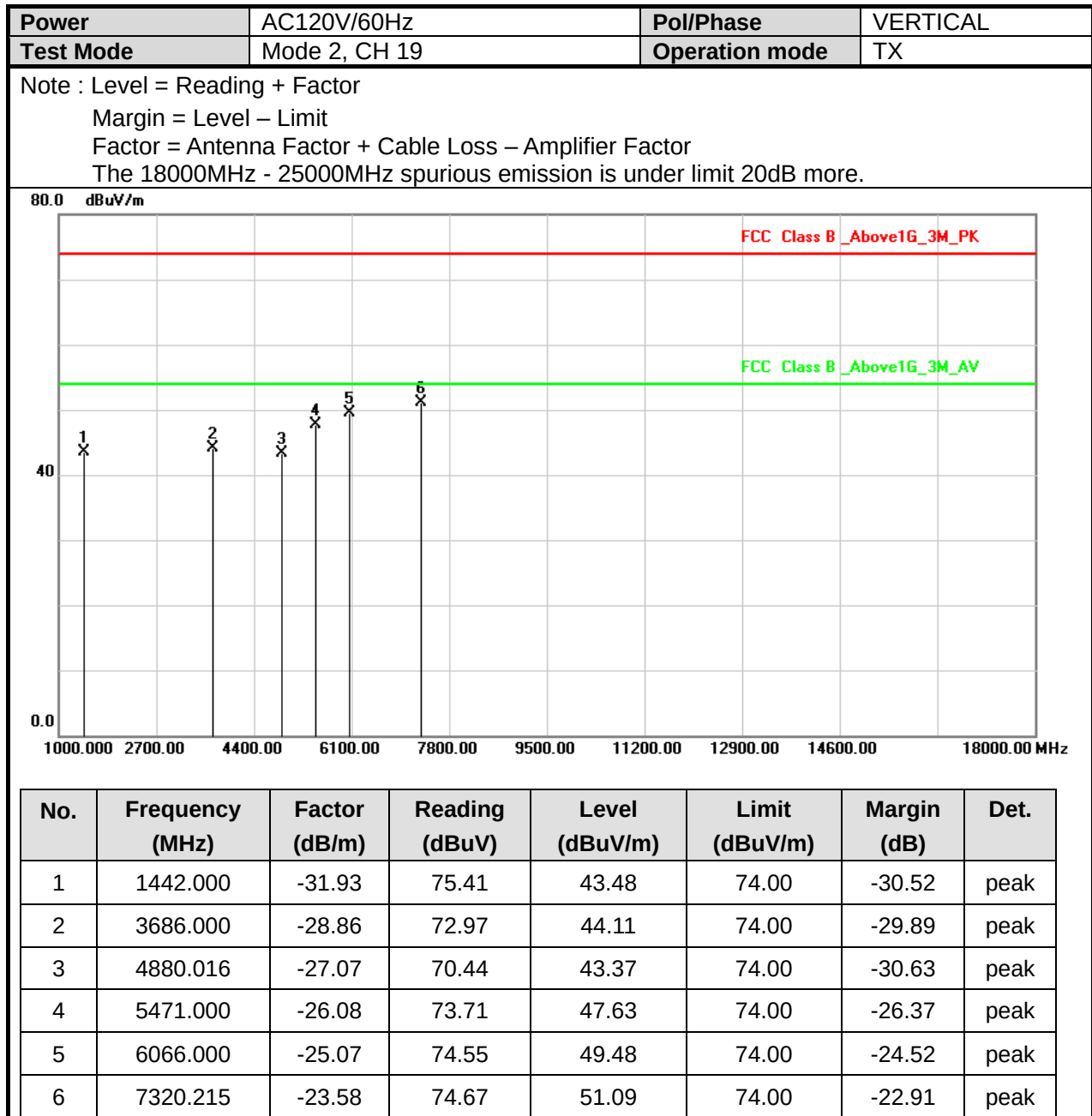


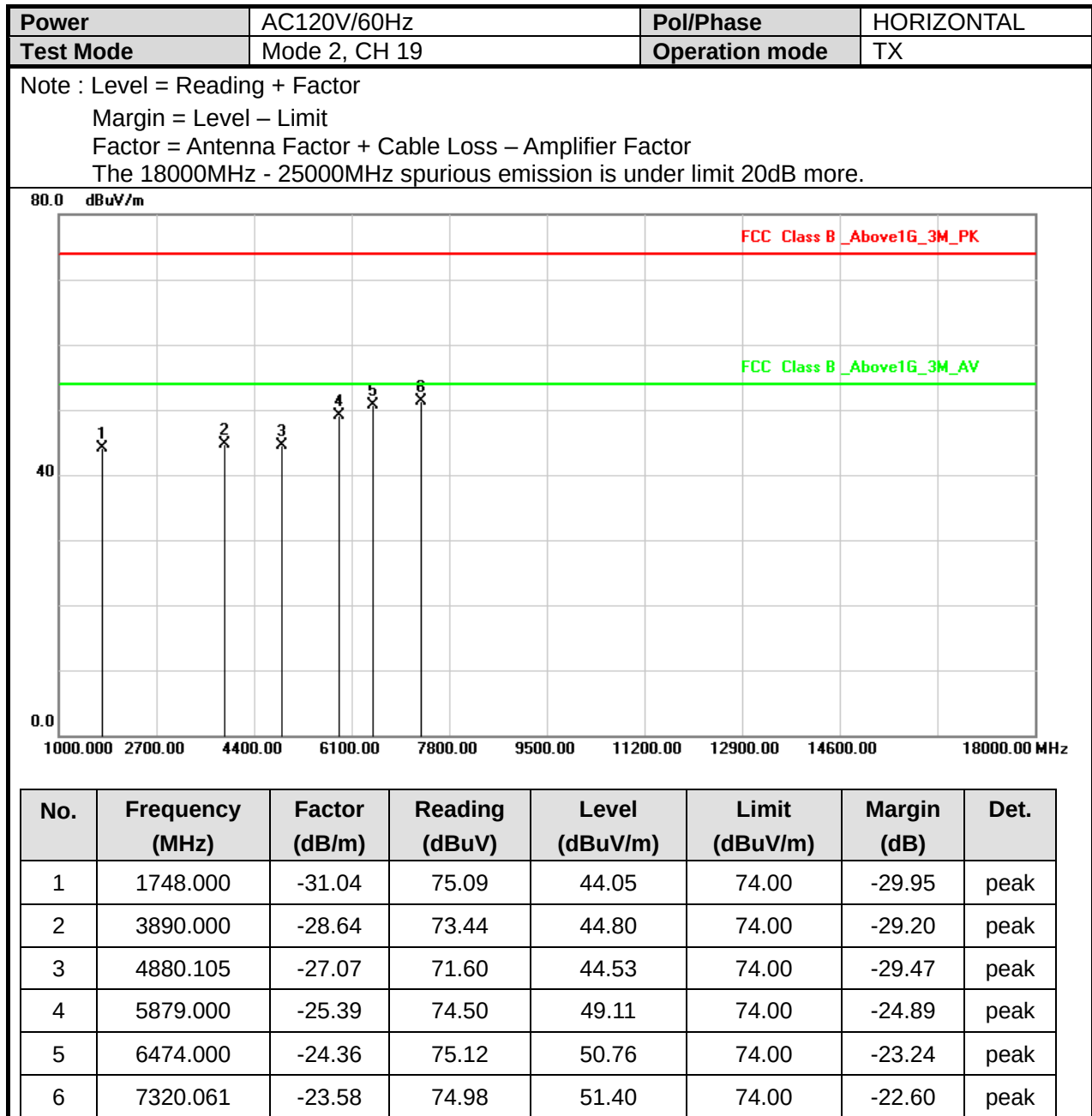


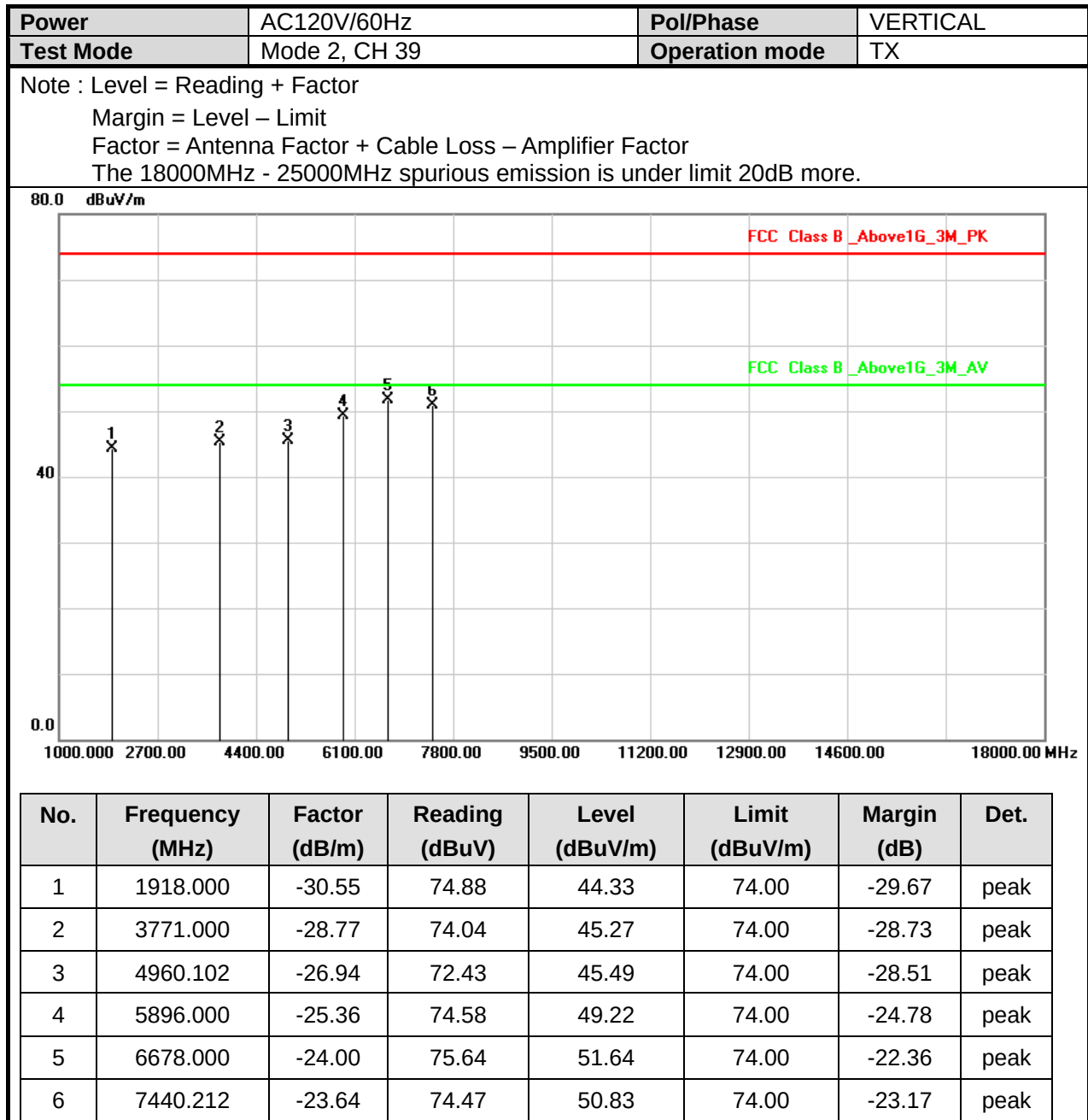


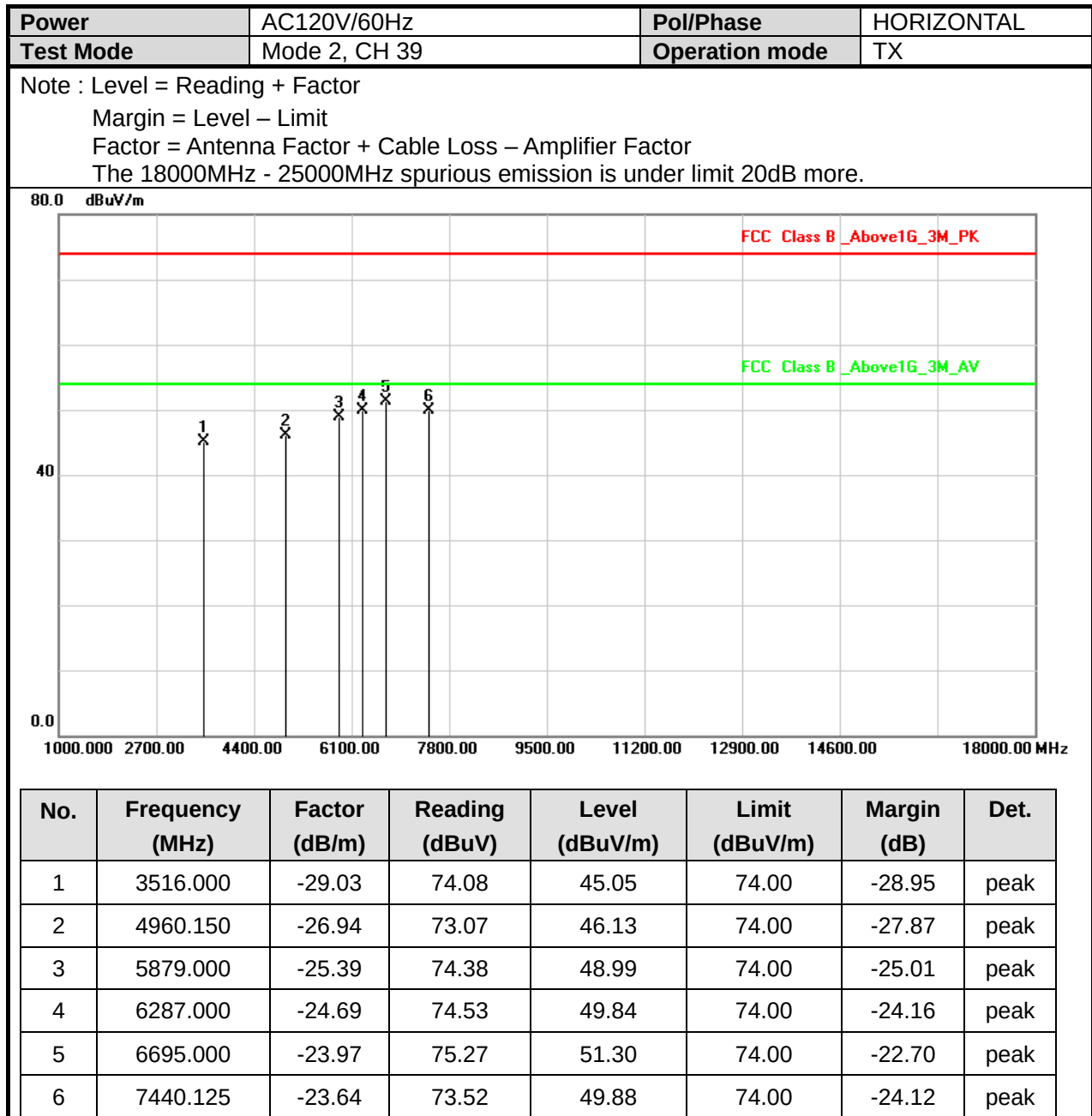


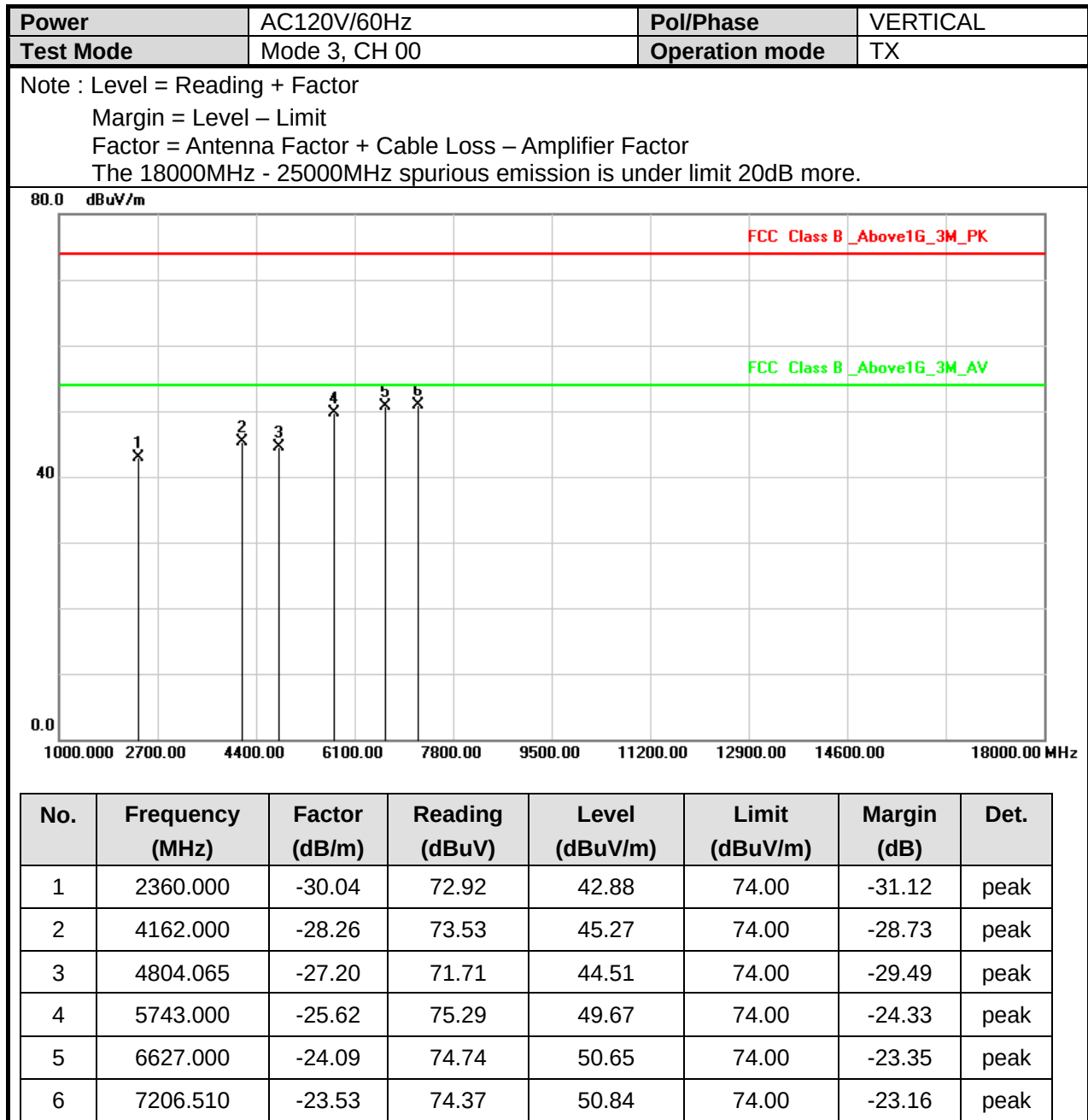


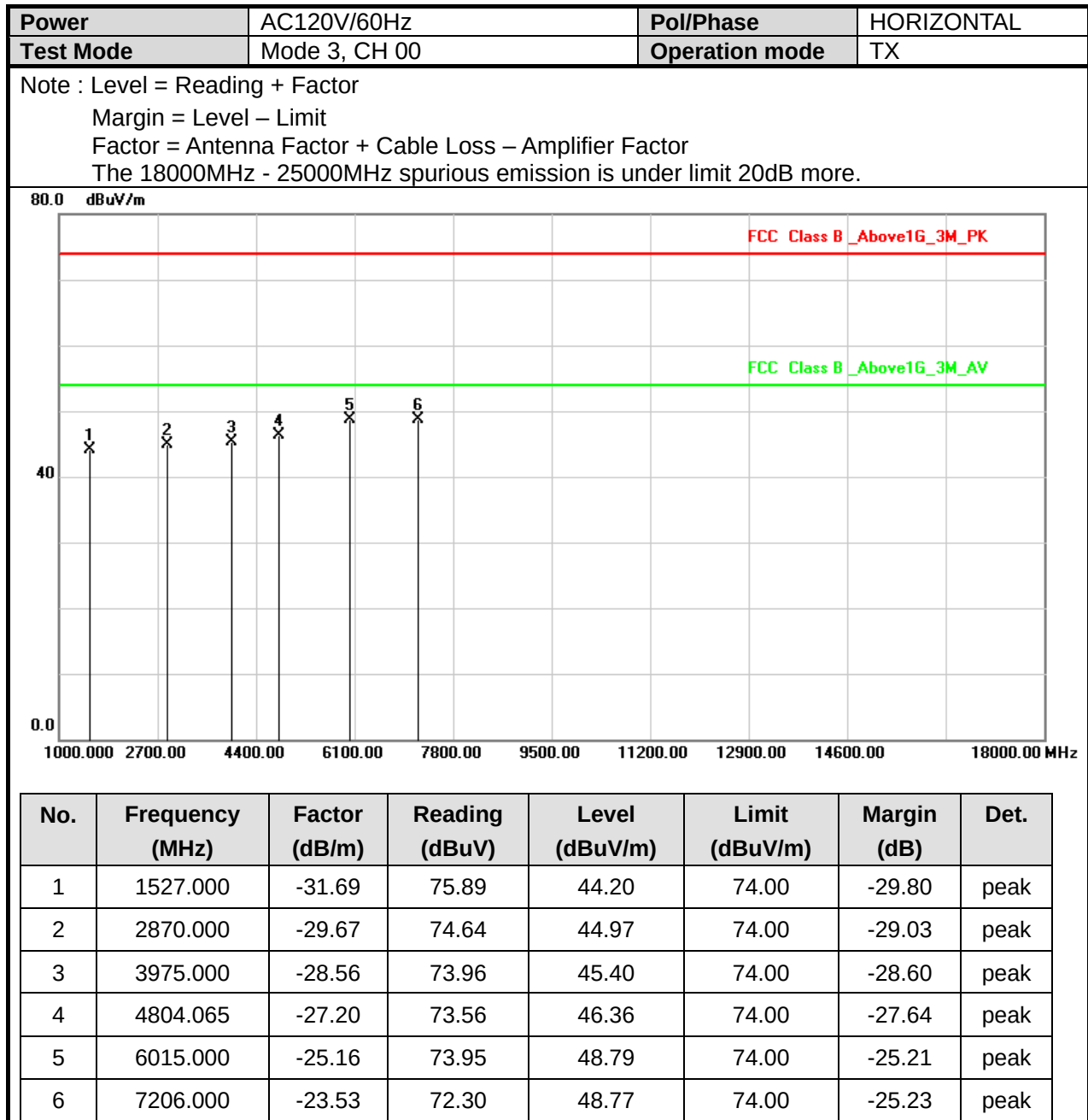


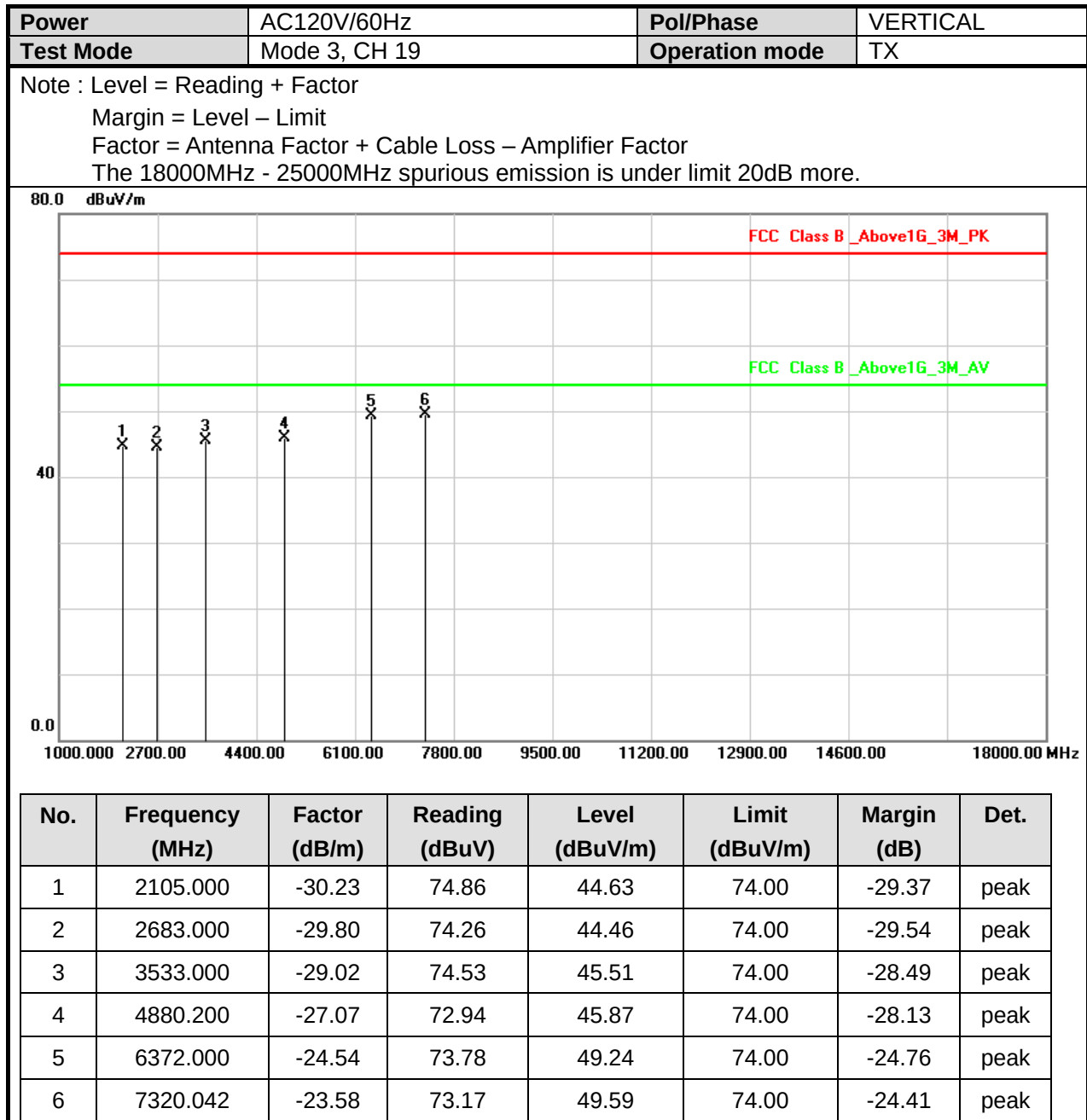


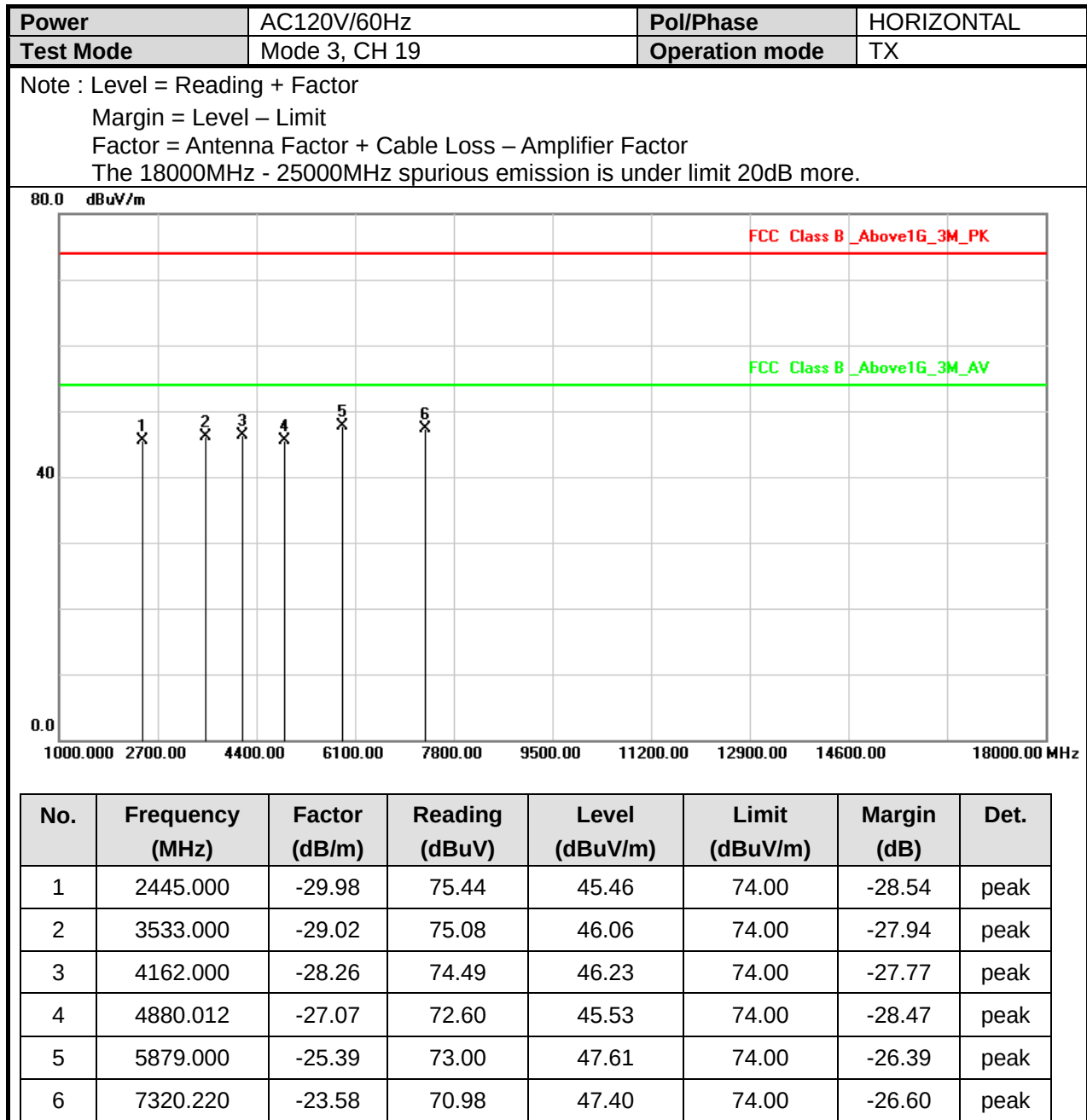


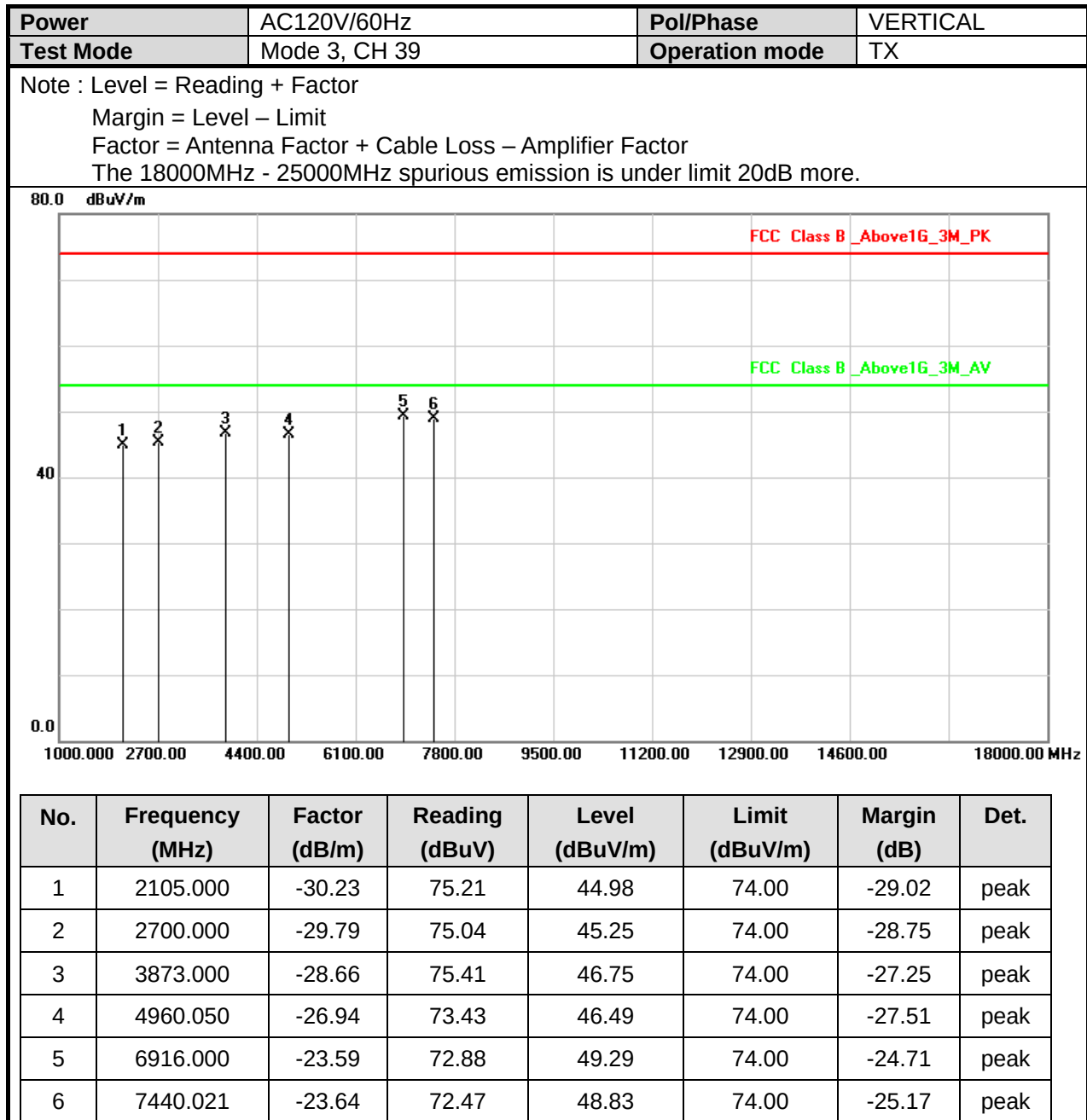


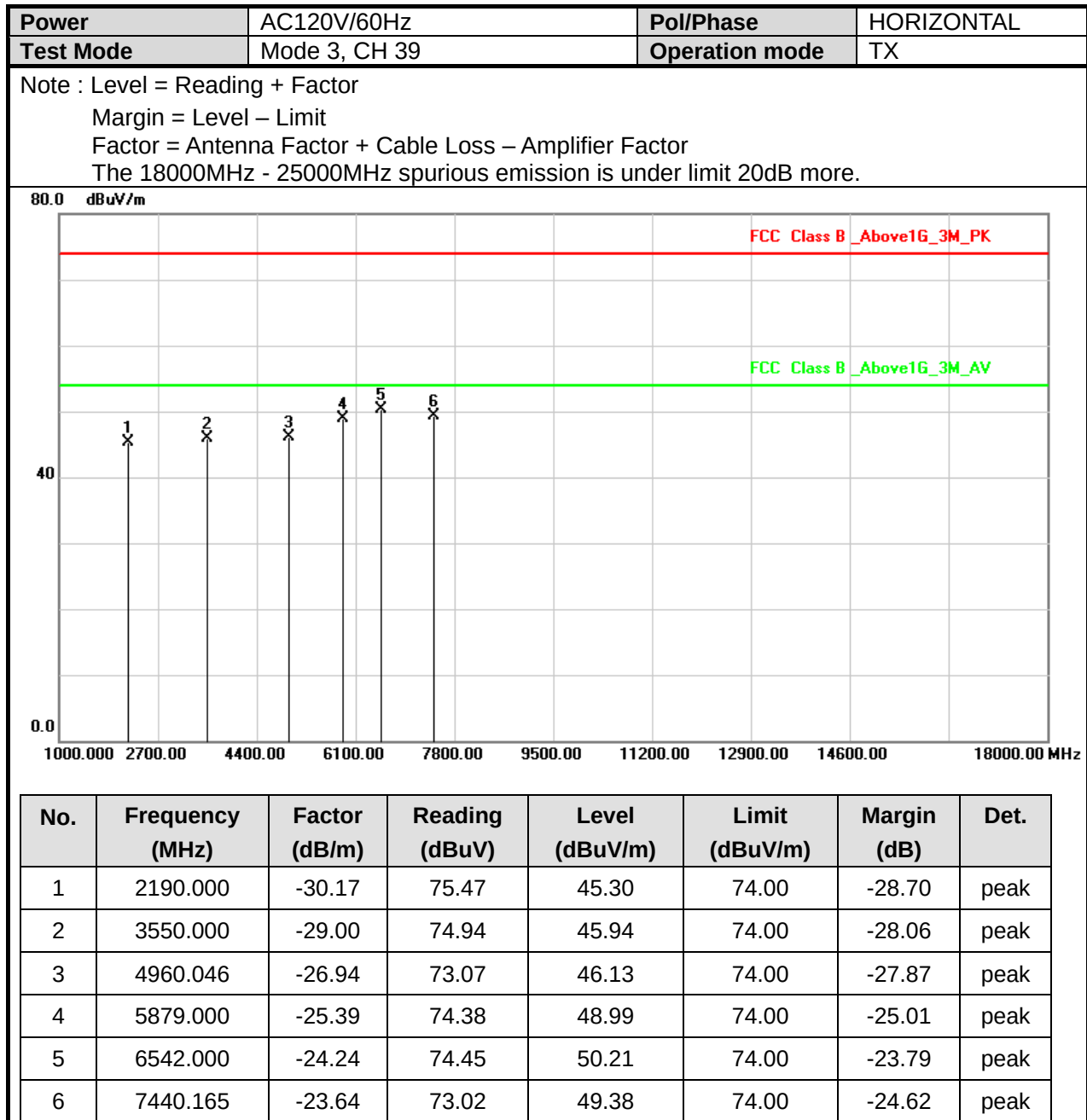


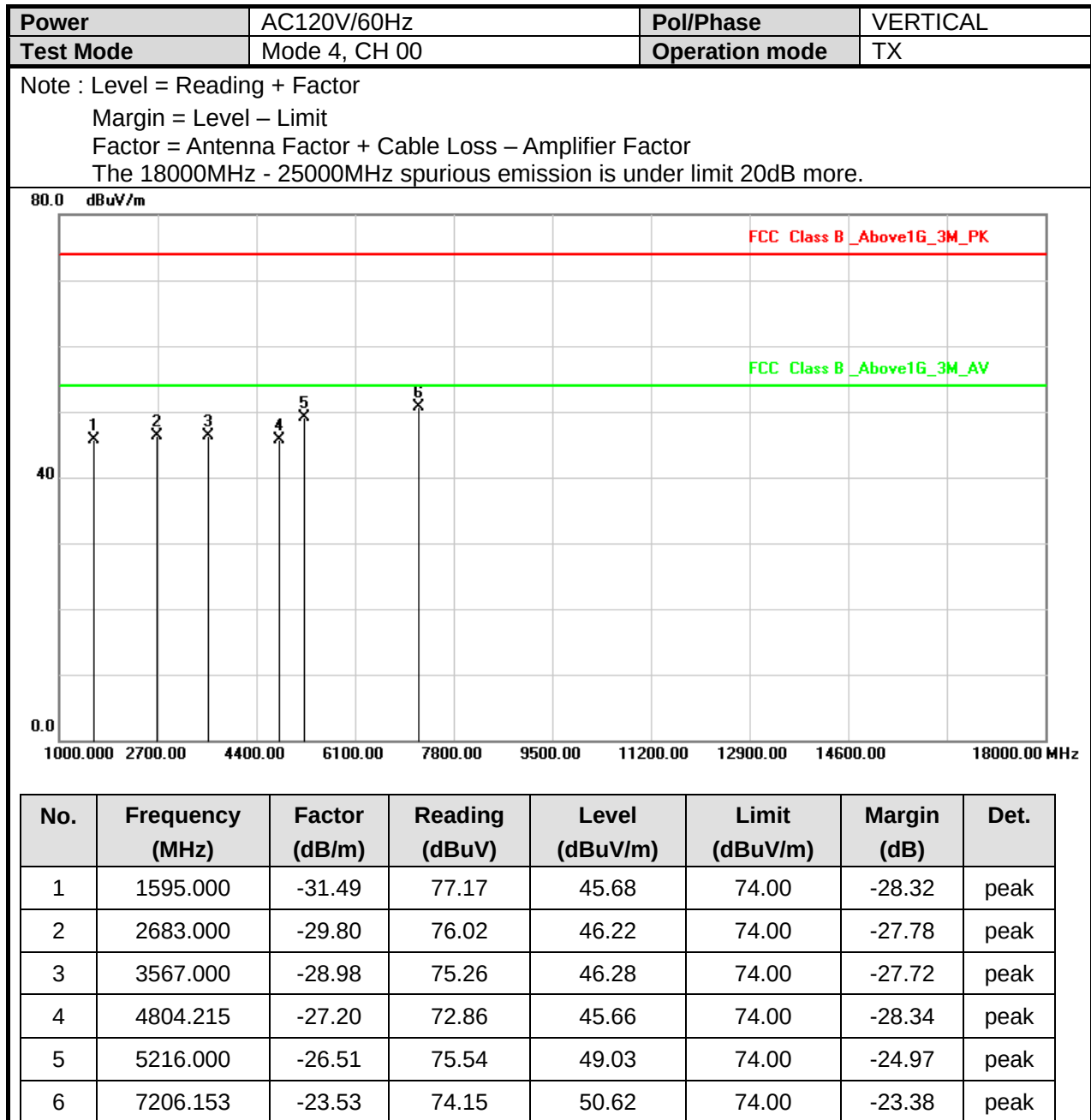


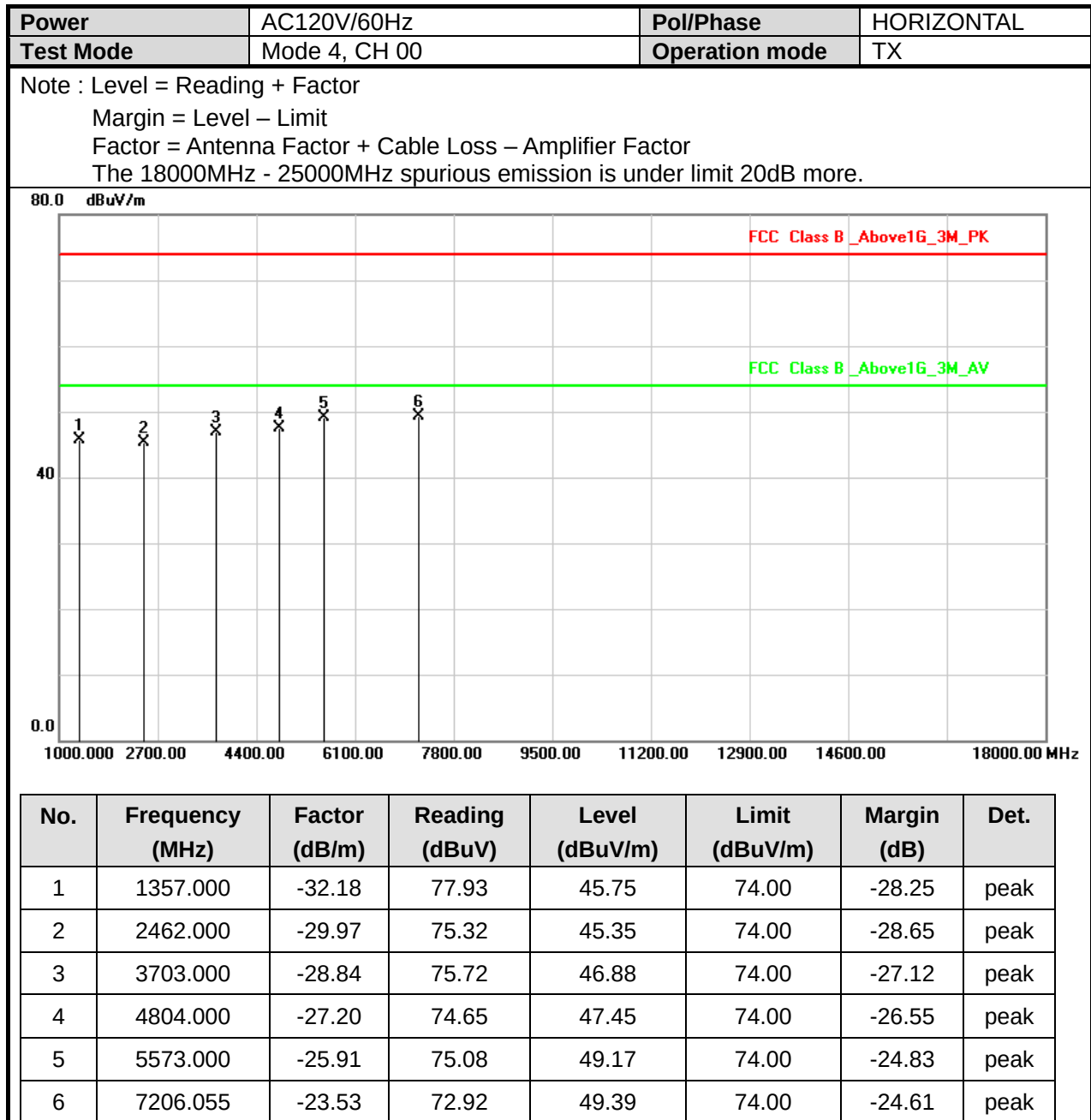


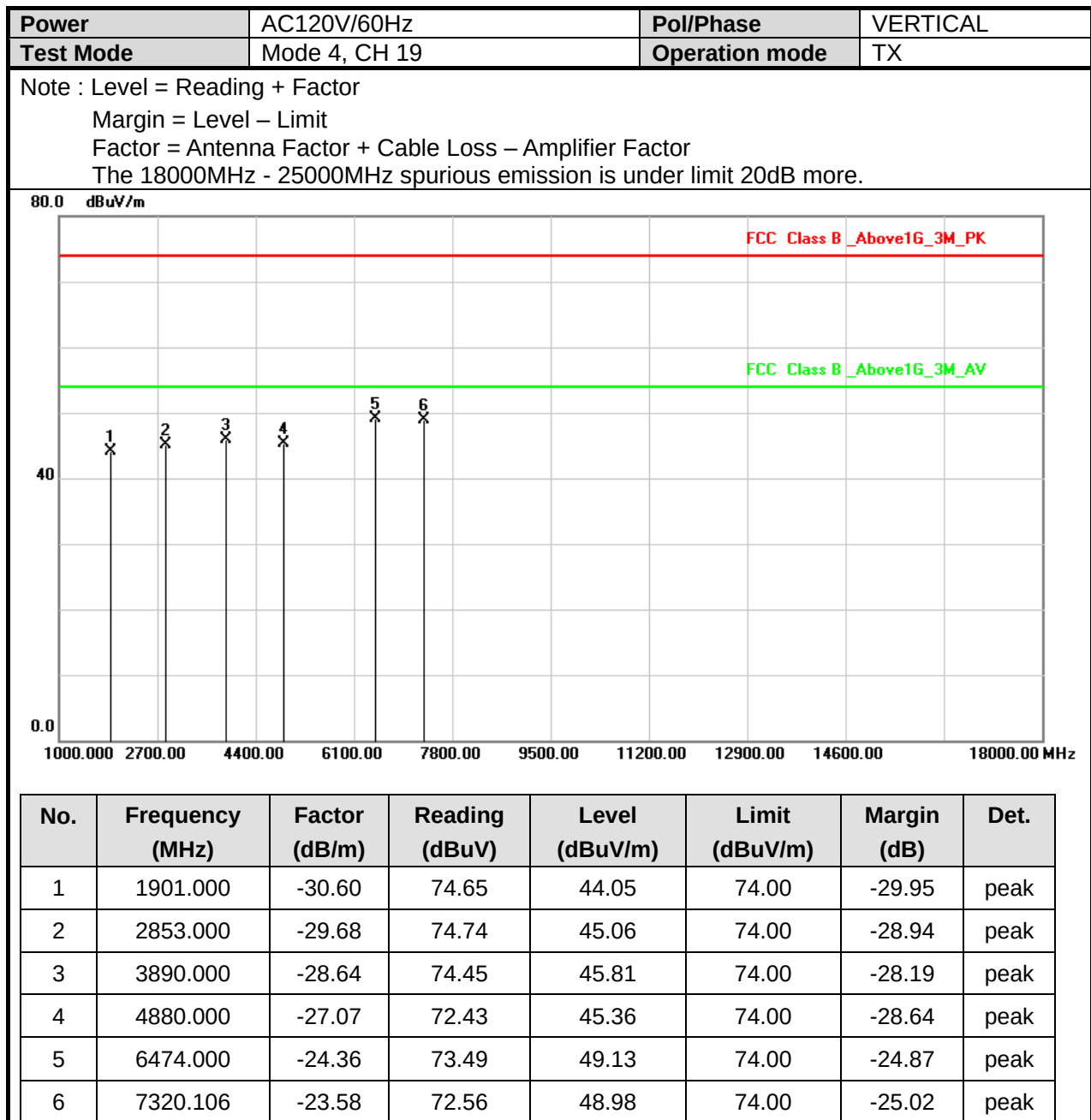


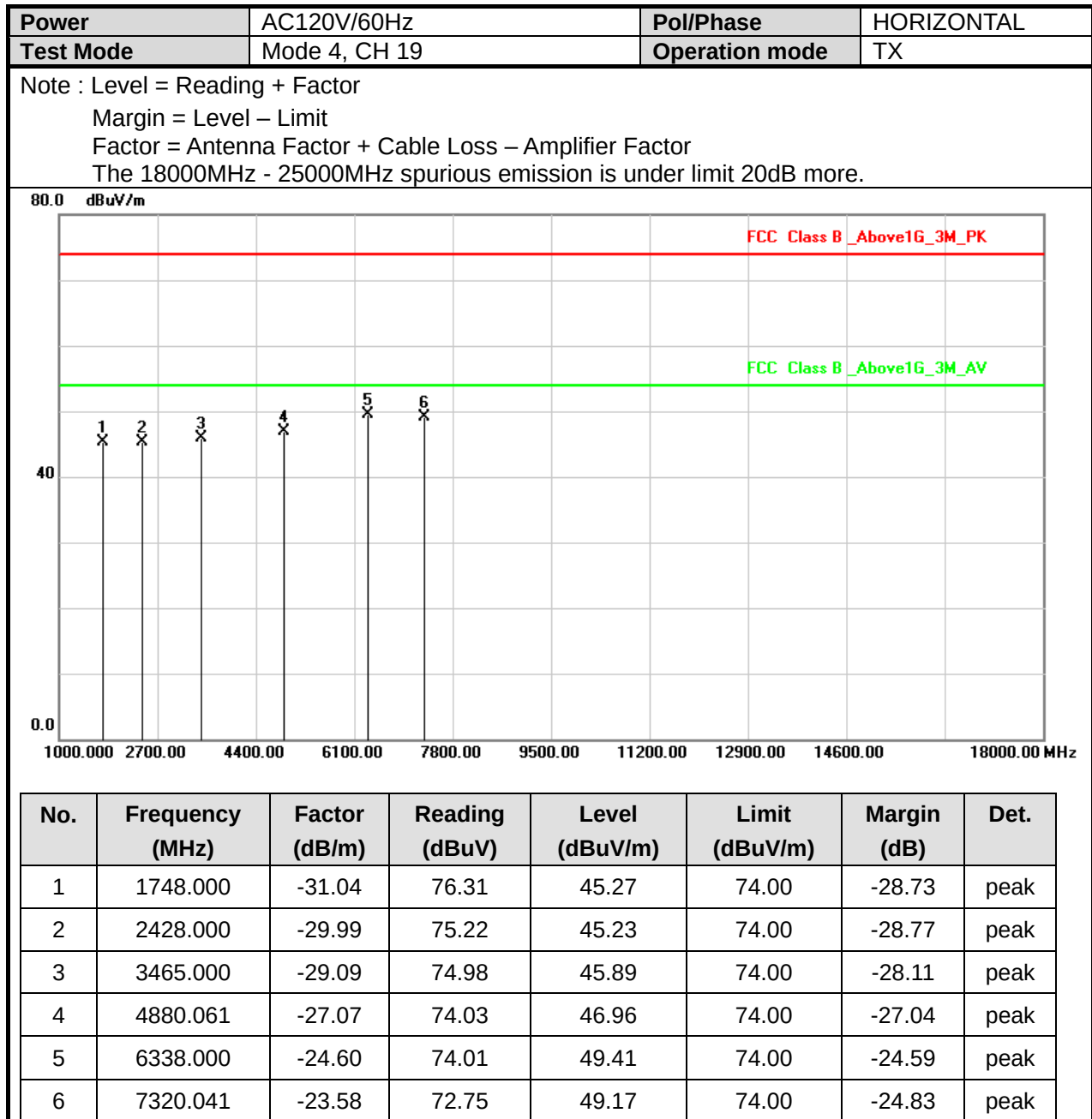


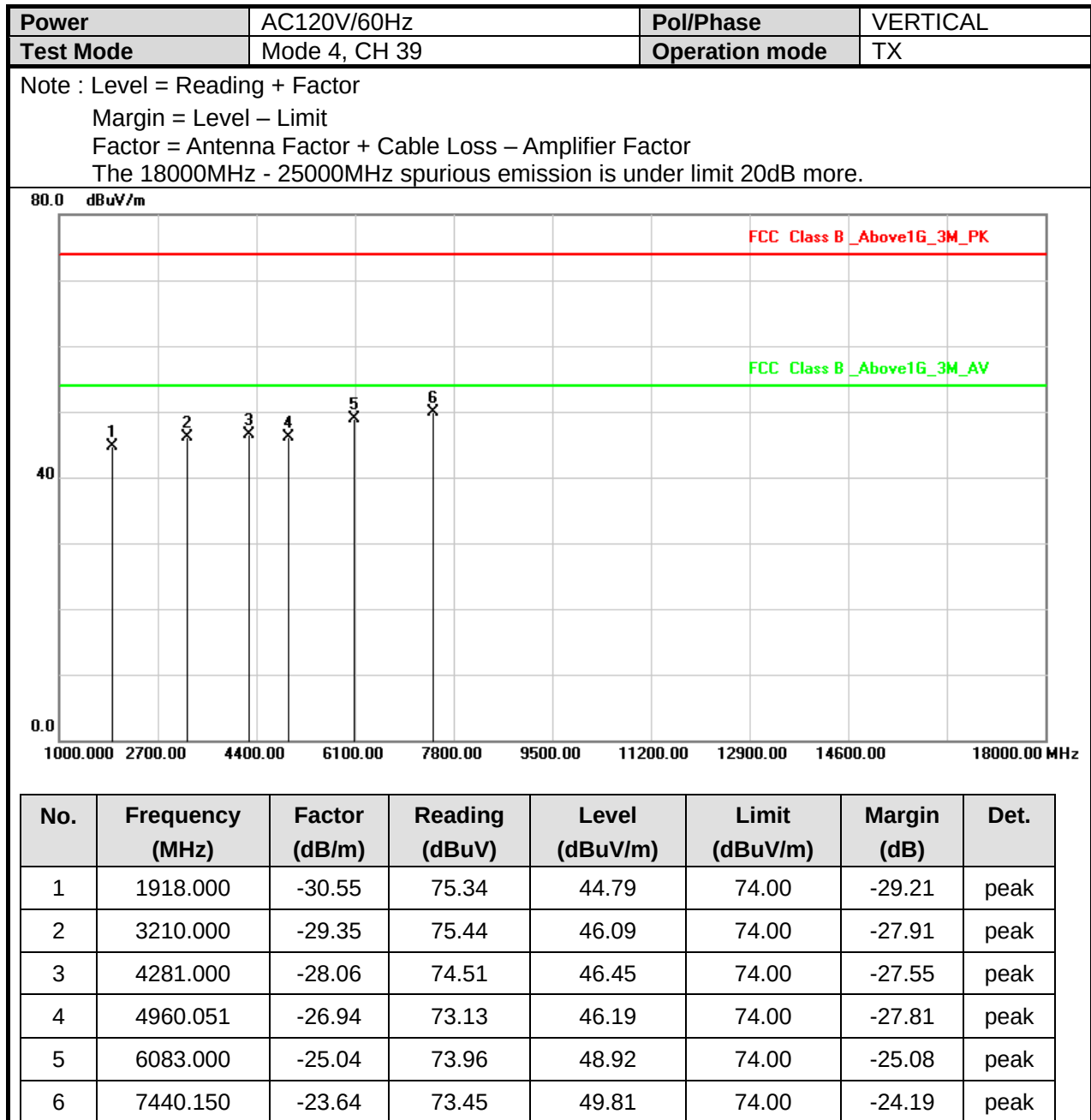


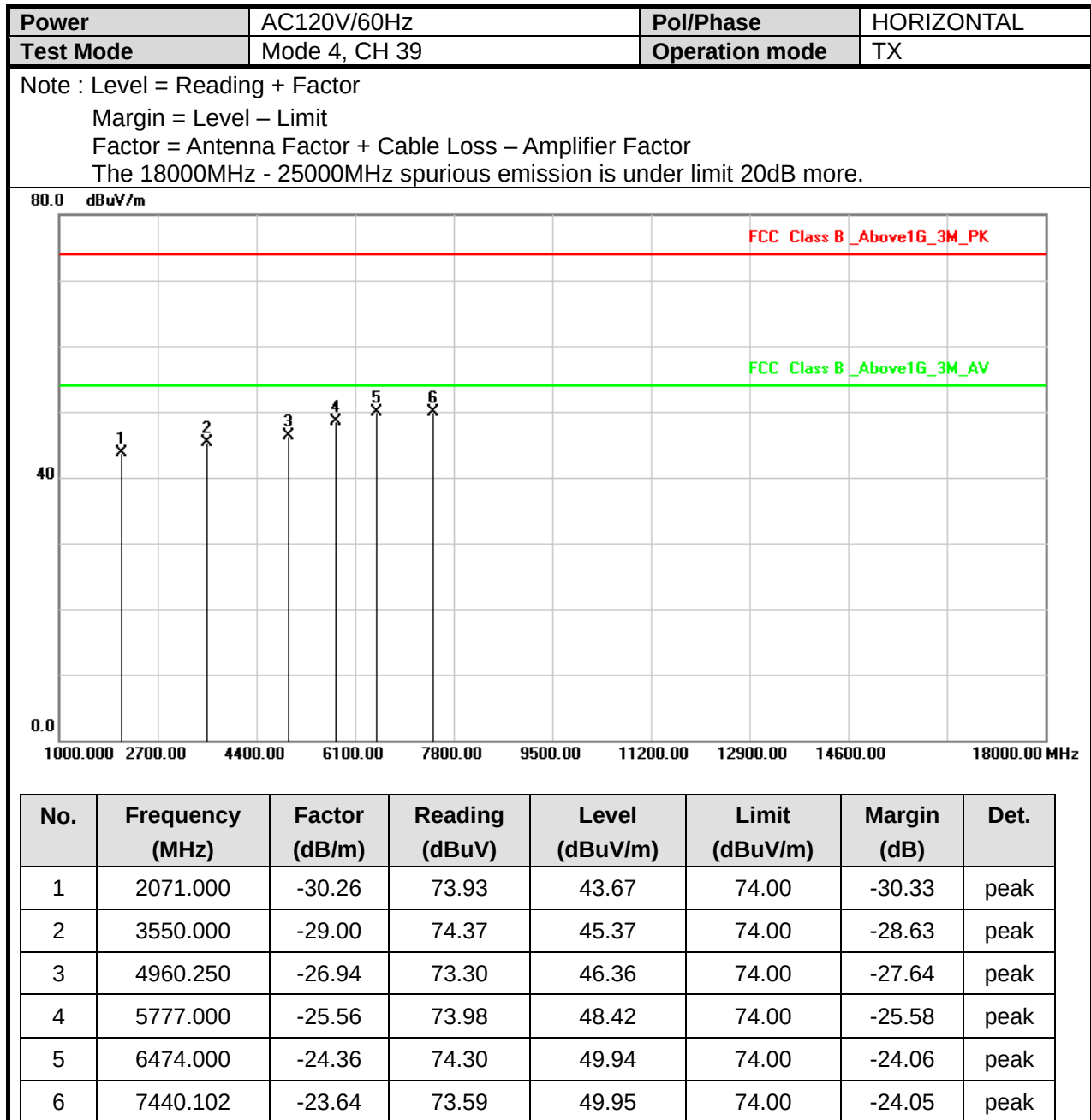












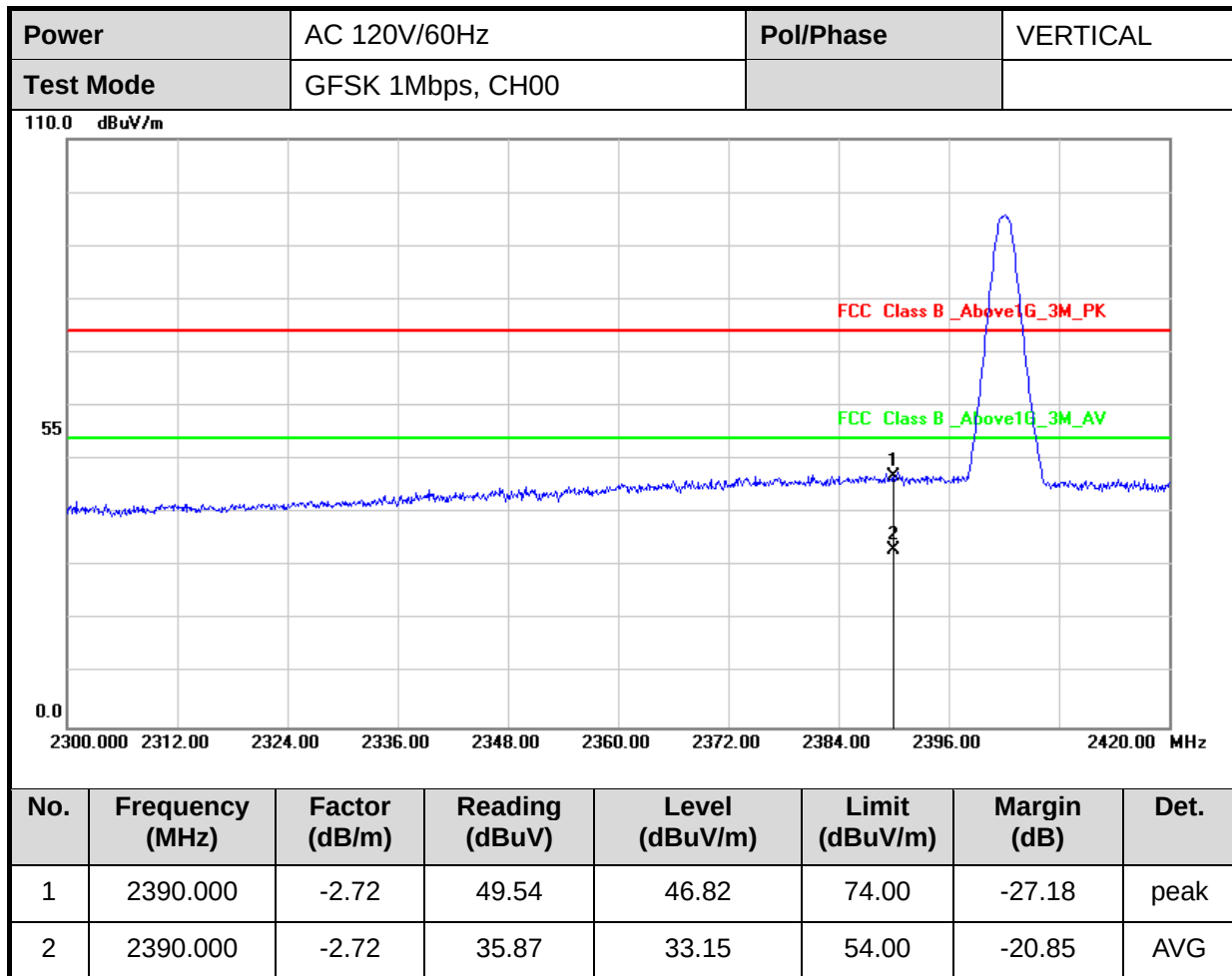


## 6.7 Restricted Bands of Operation

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

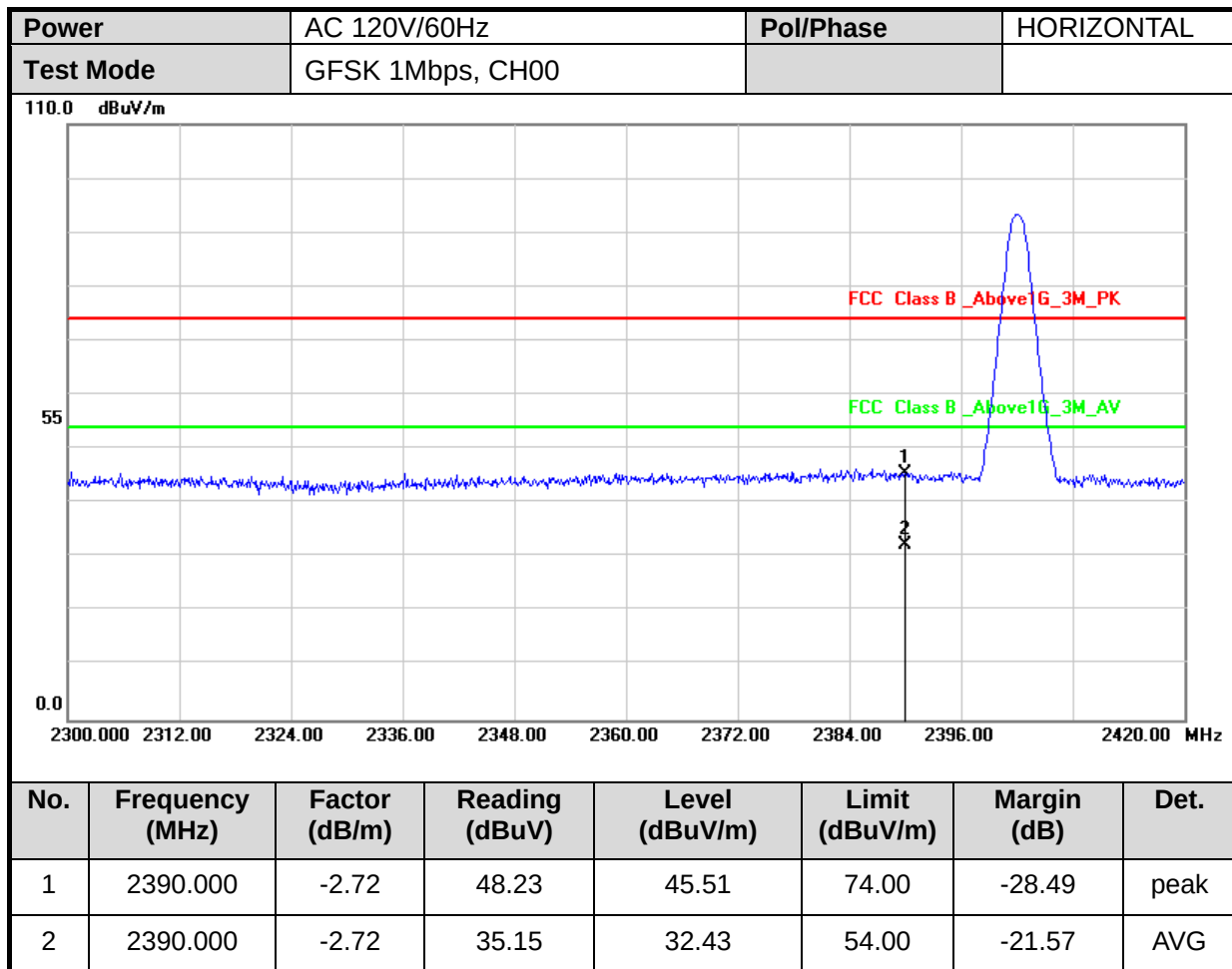
| MHz                 | MHz                   | MHz             | GHz             |
|---------------------|-----------------------|-----------------|-----------------|
| 0.09000 – 0.11000   | 16.42000 – 16.42300   | 399.9 – 410.0   | 4.500 – 5.250   |
| 0.49500 – 0.505**   | 16.69475 – 16.69525   | 608.0 – 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



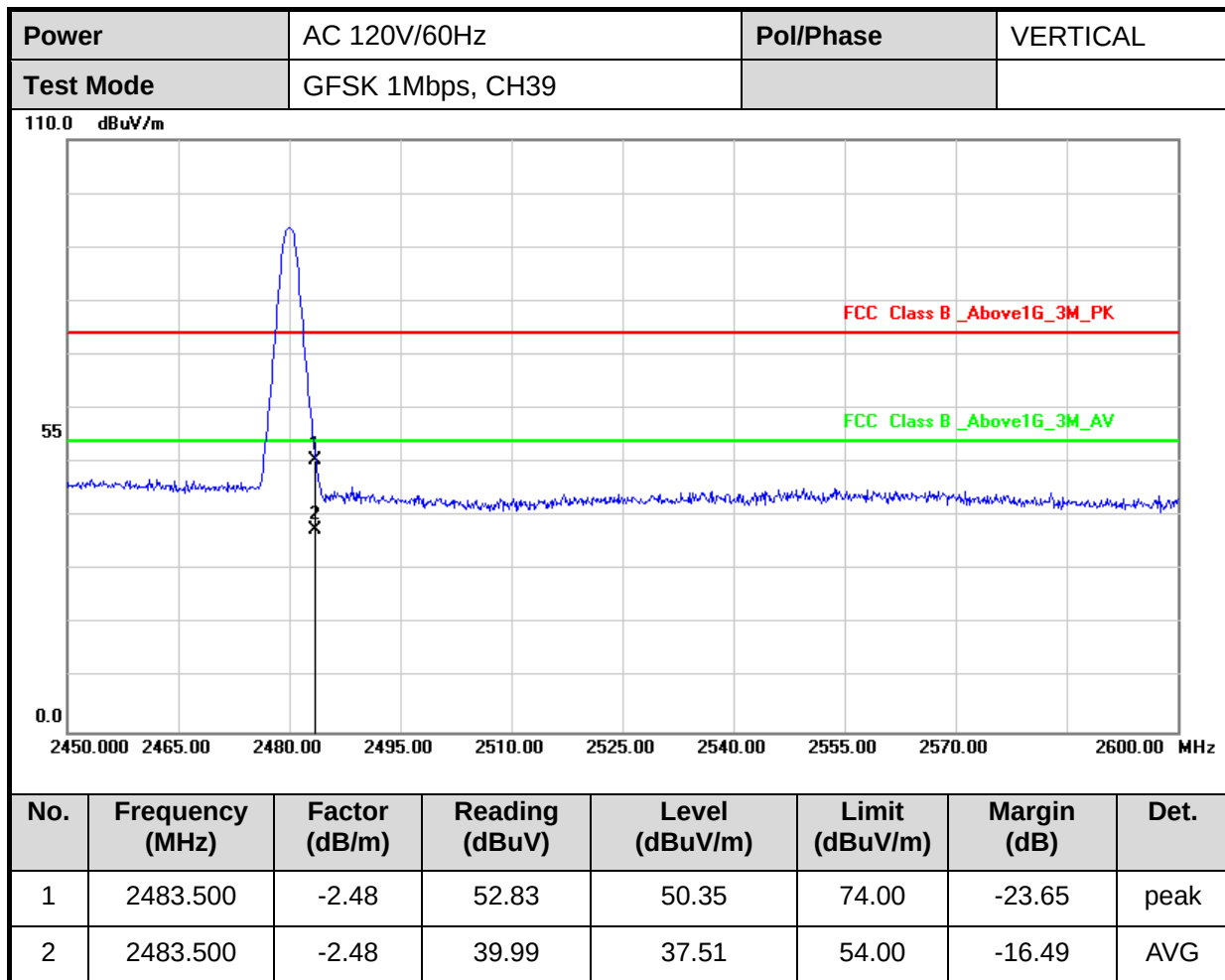
Note: Level = Reading + Factor

Margin = Level – Limit



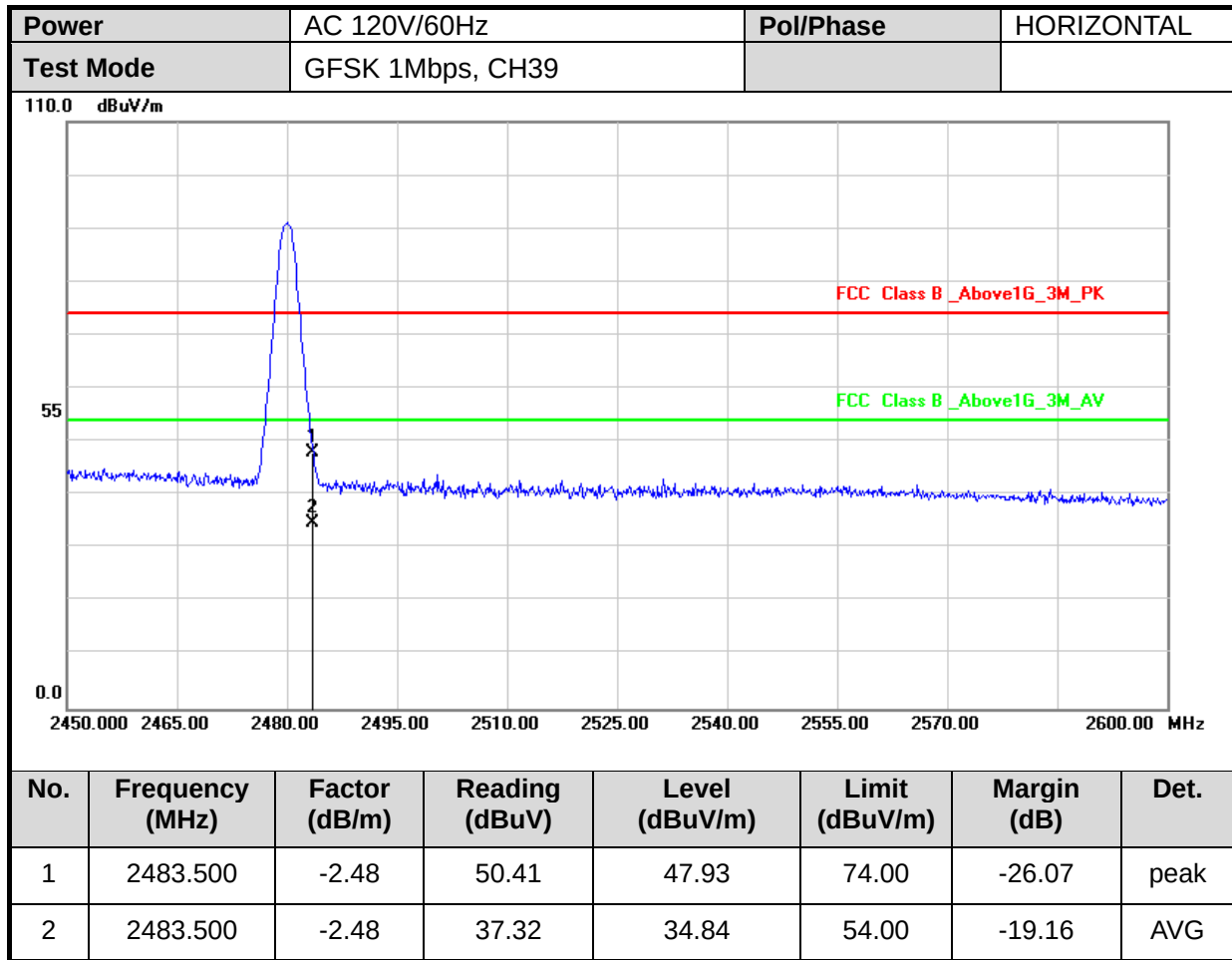
Note: Level = Reading + Factor

Margin = Level – Limit



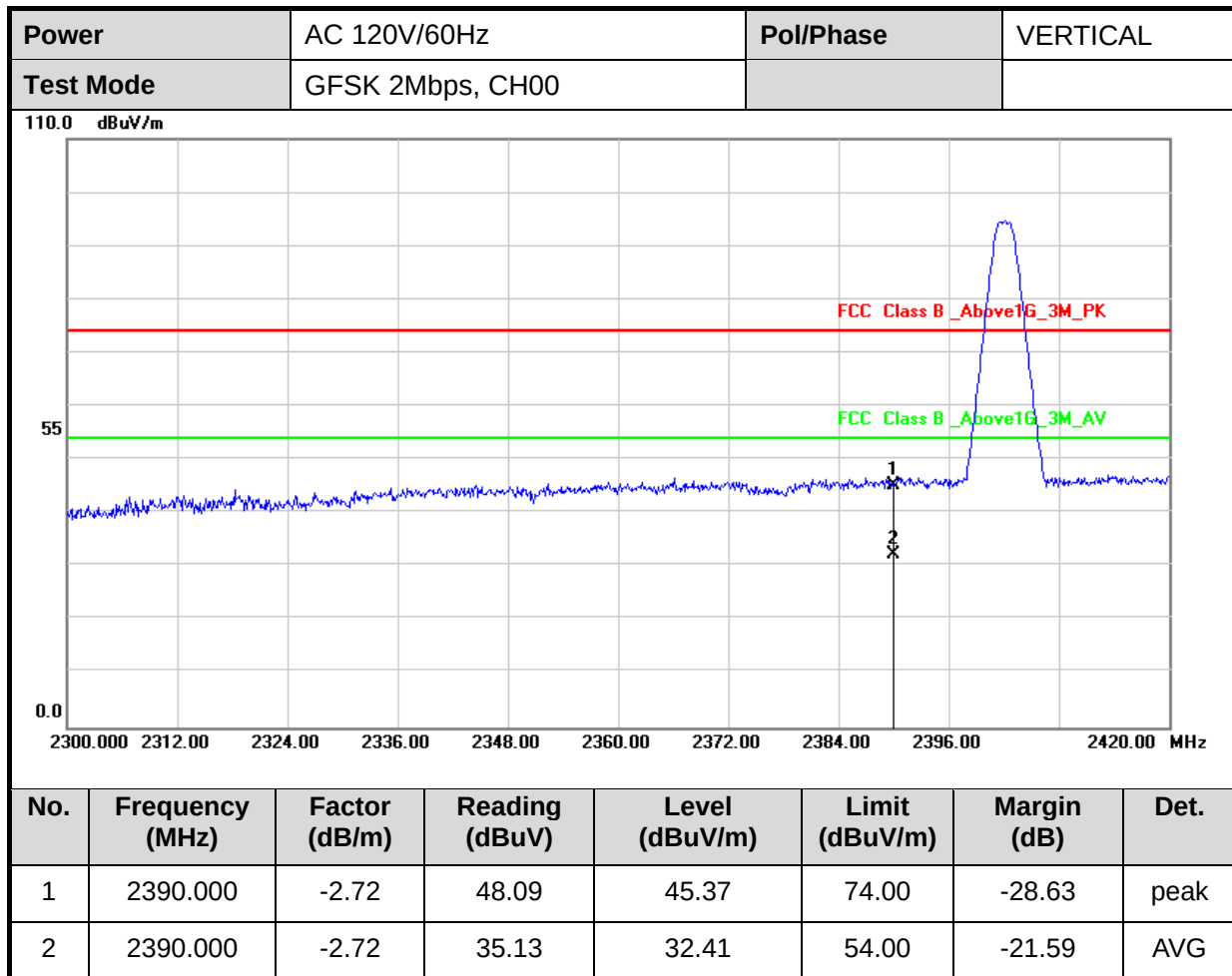
Note: Level = Reading + Factor

Margin = Level – Limit



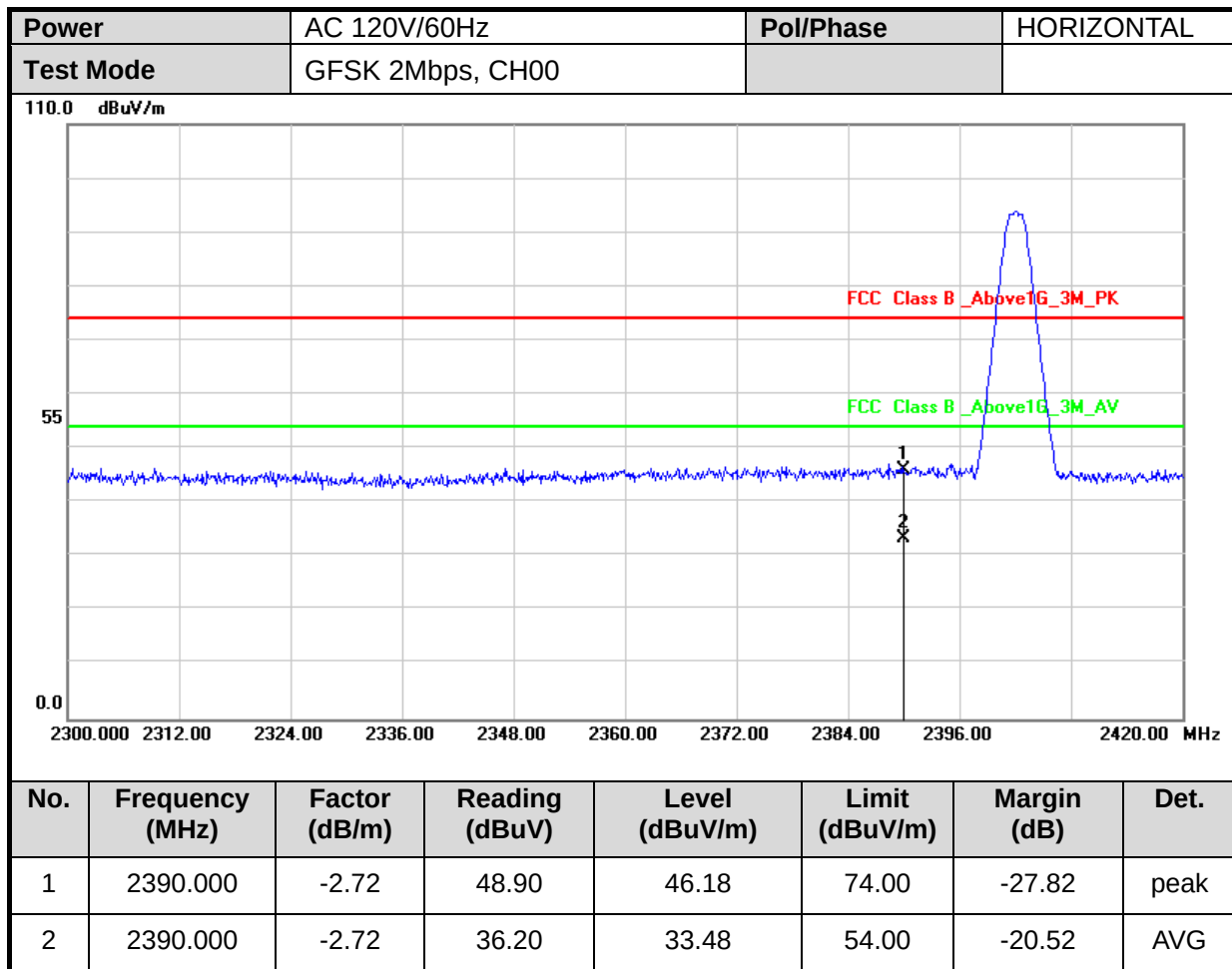
Note: Level = Reading + Factor

Margin = Level – Limit



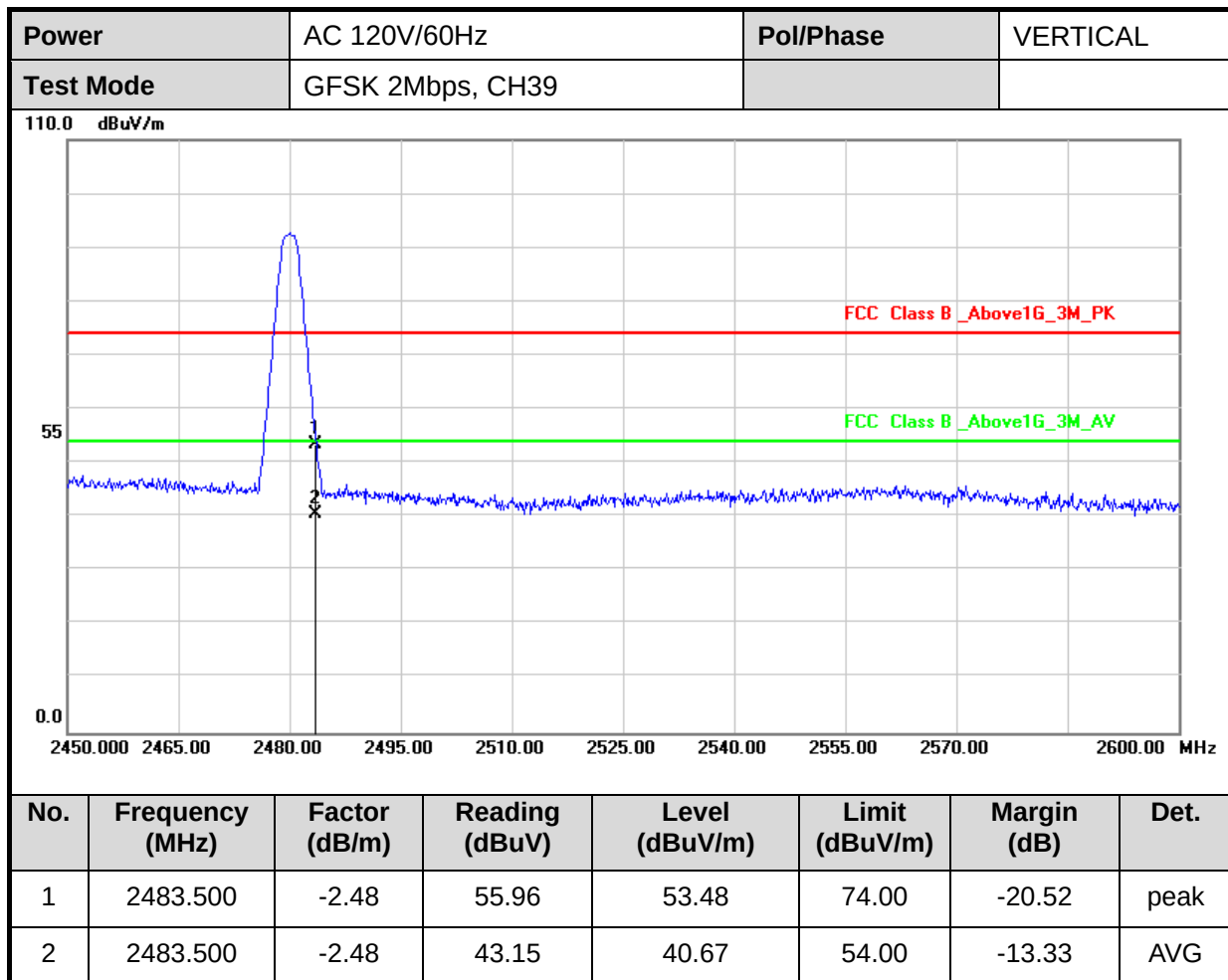
Note: Level = Reading + Factor

Margin = Level – Limit



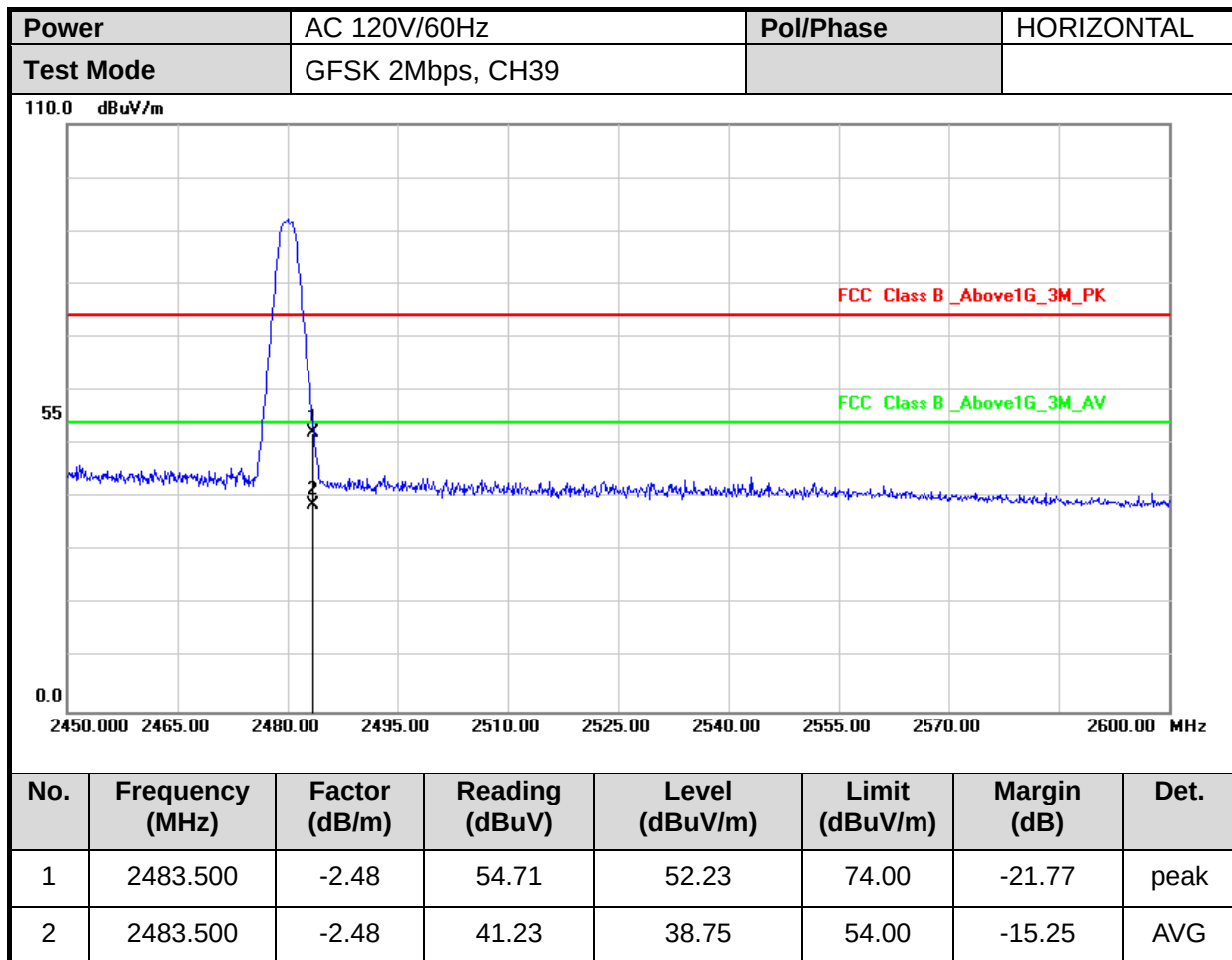
Note: Level = Reading + Factor

Margin = Level – Limit



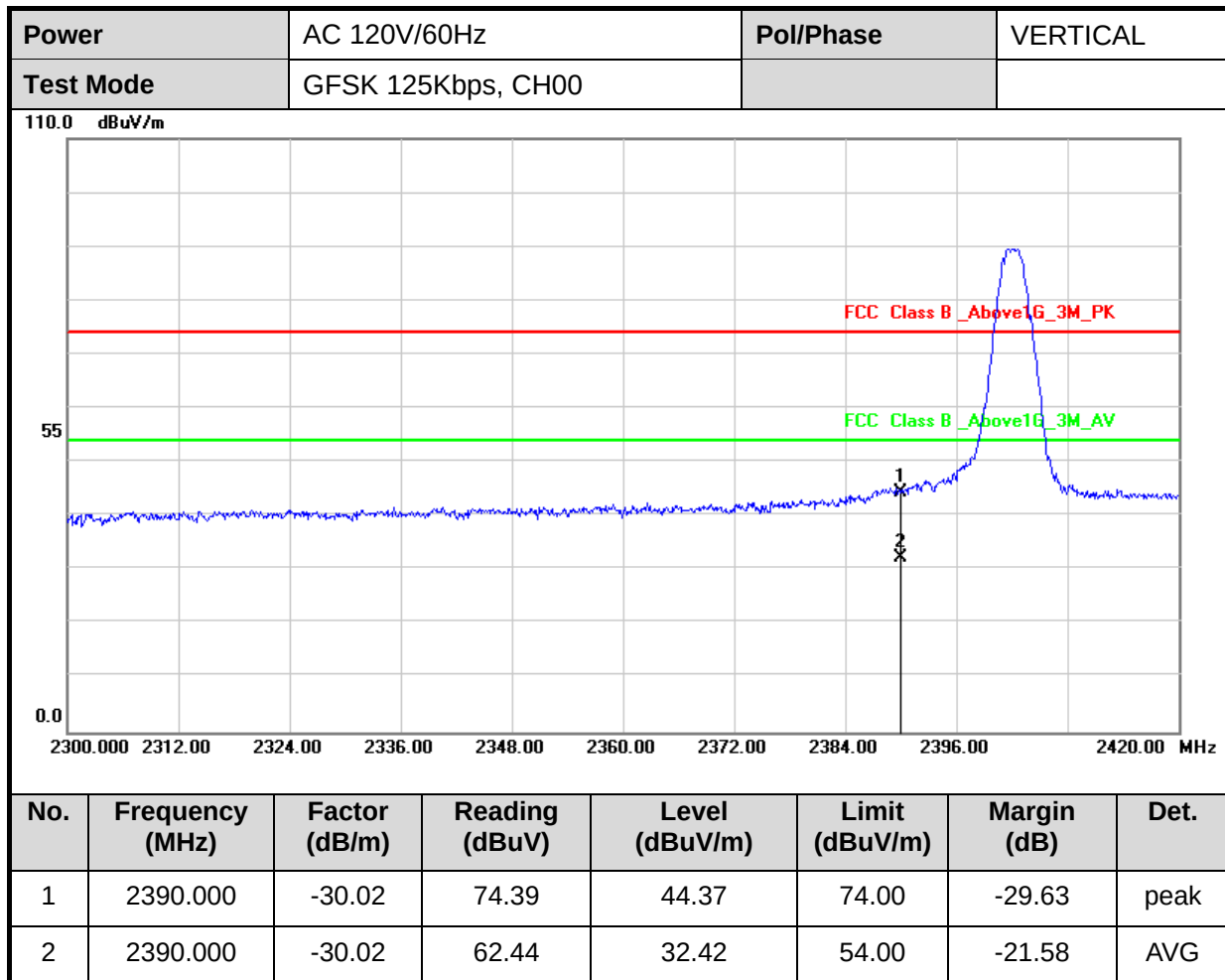
Note: Level = Reading + Factor

Margin = Level – Limit



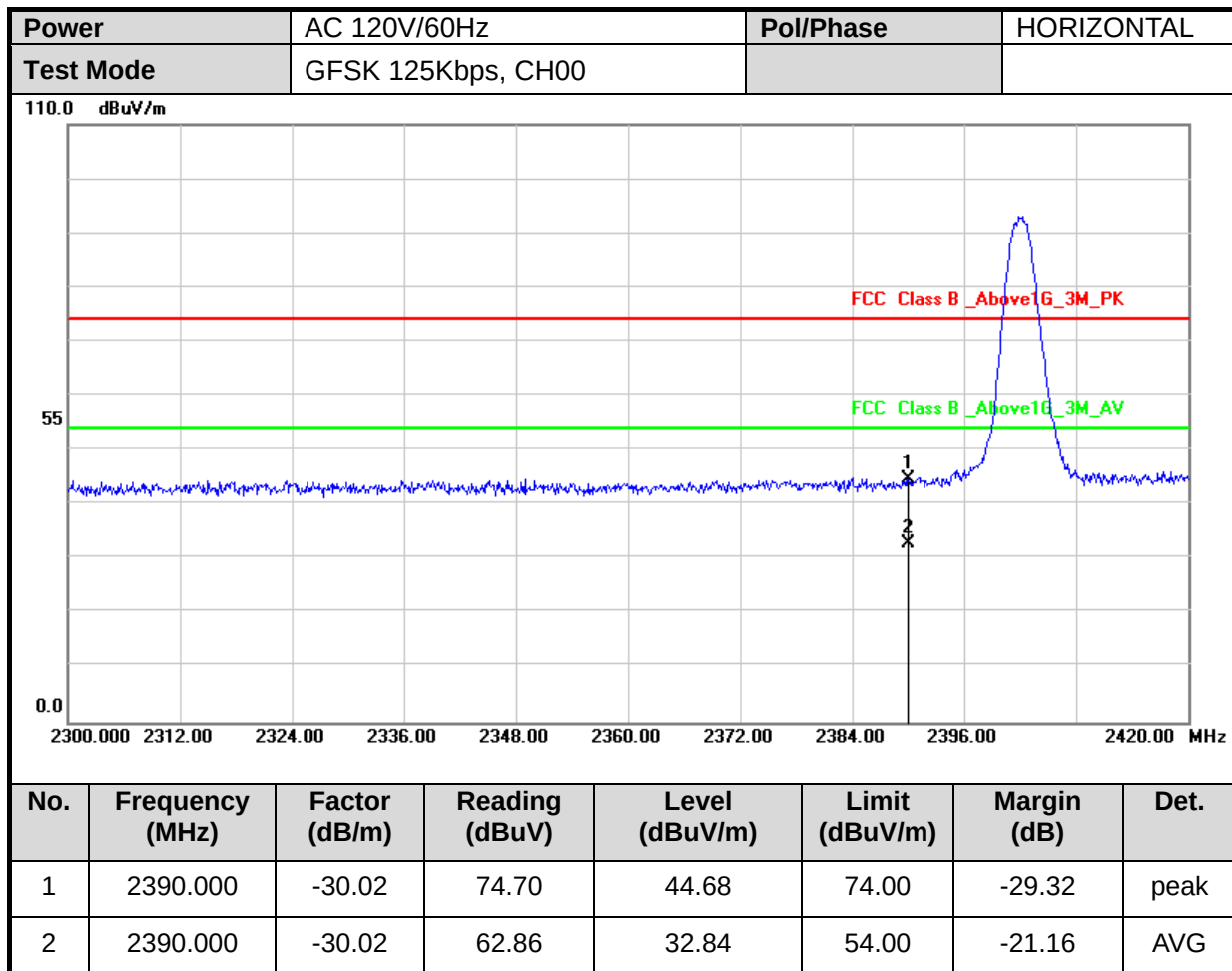
Note: Level = Reading + Factor

Margin = Level – Limit



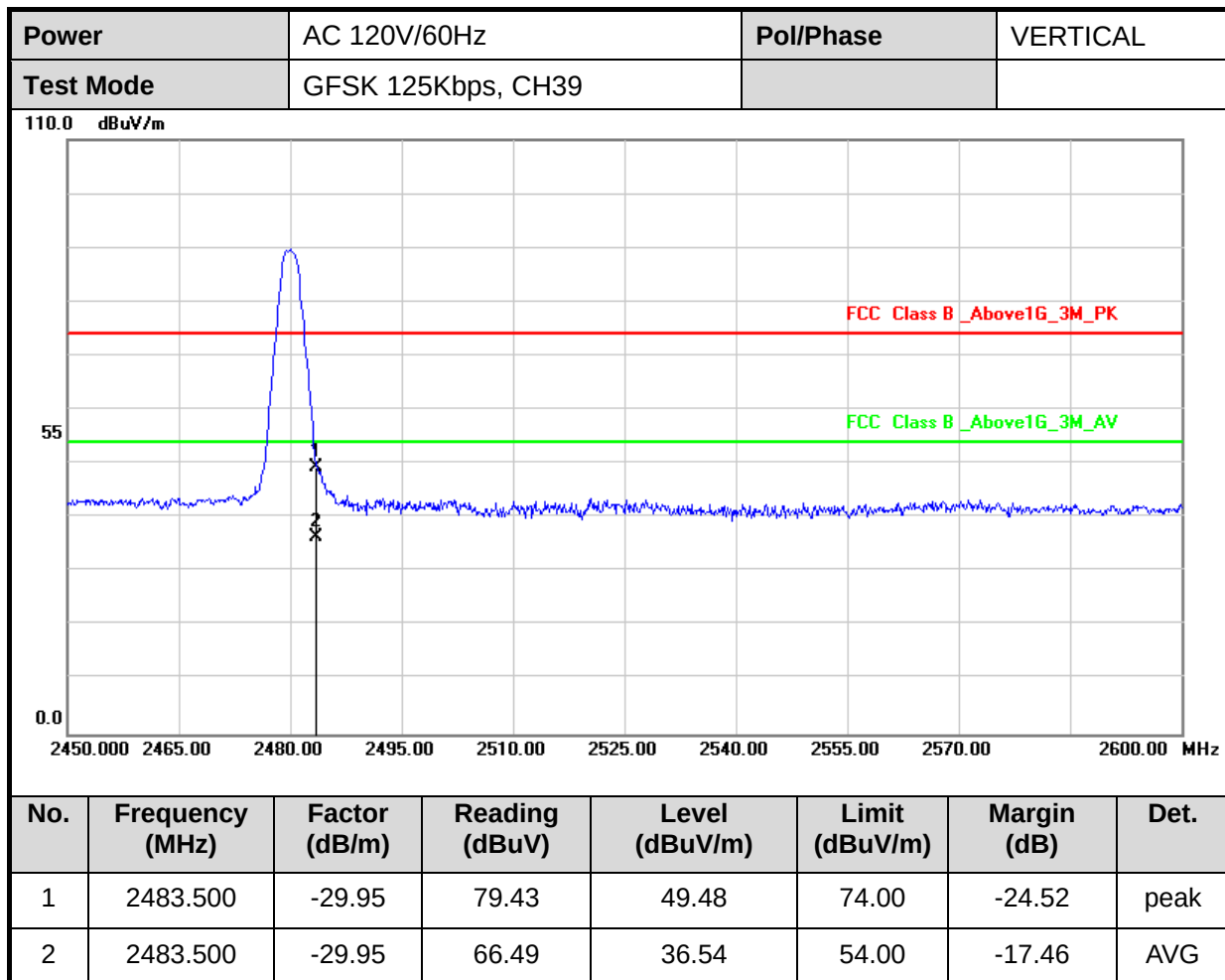
Note: Level = Reading + Factor

Margin = Level – Limit



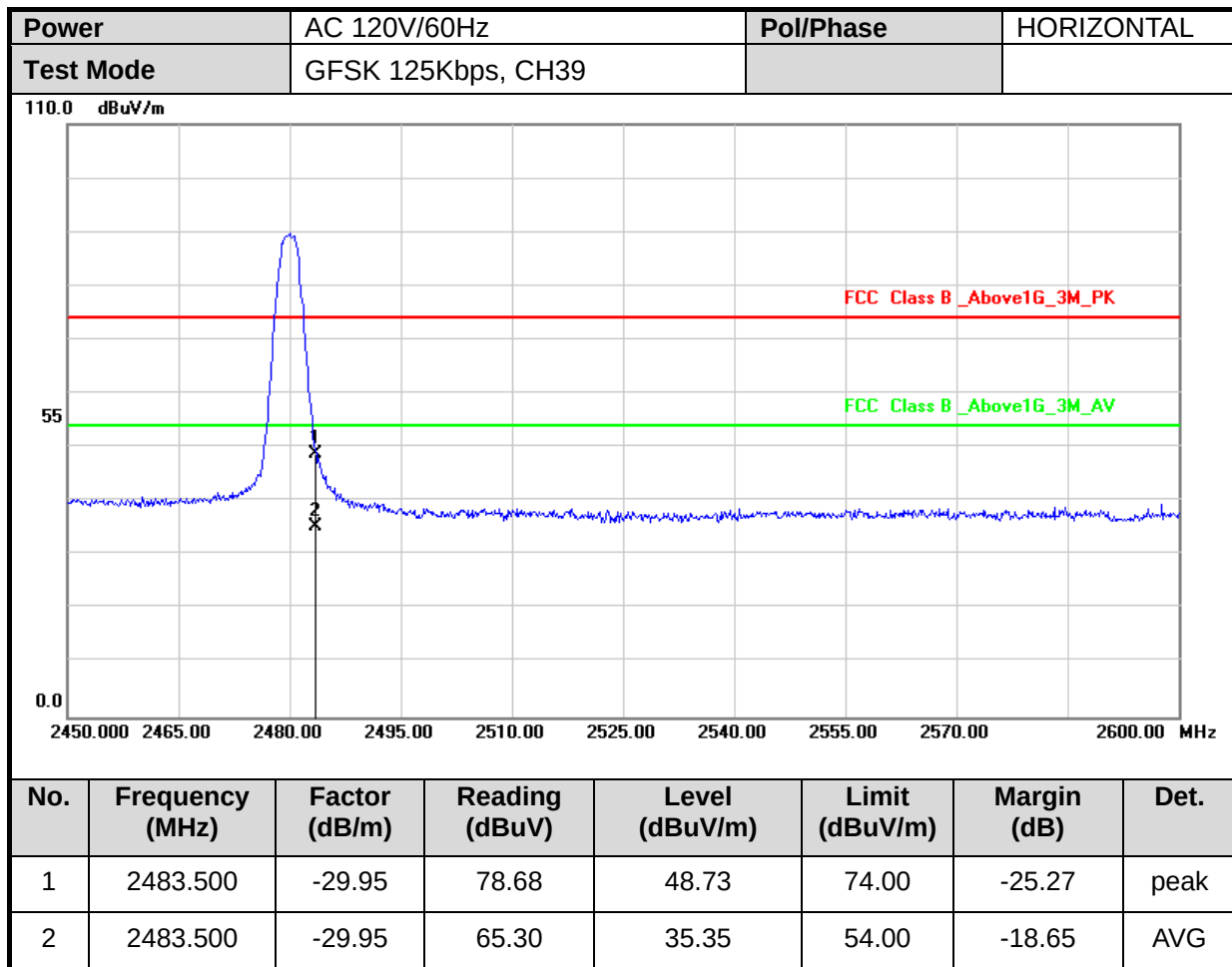
Note: Level = Reading + Factor

Margin = Level – Limit



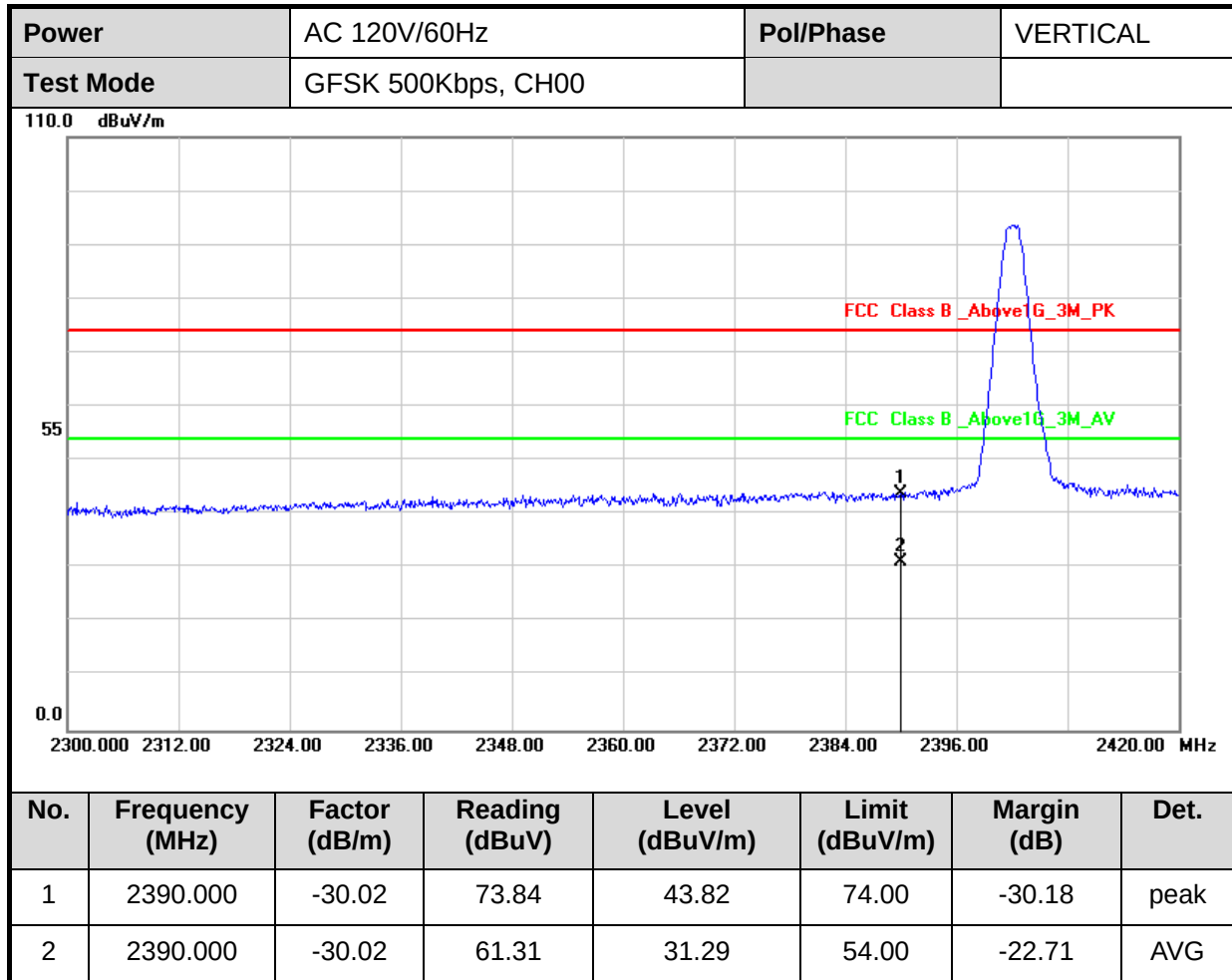
Note: Level = Reading + Factor

Margin = Level – Limit



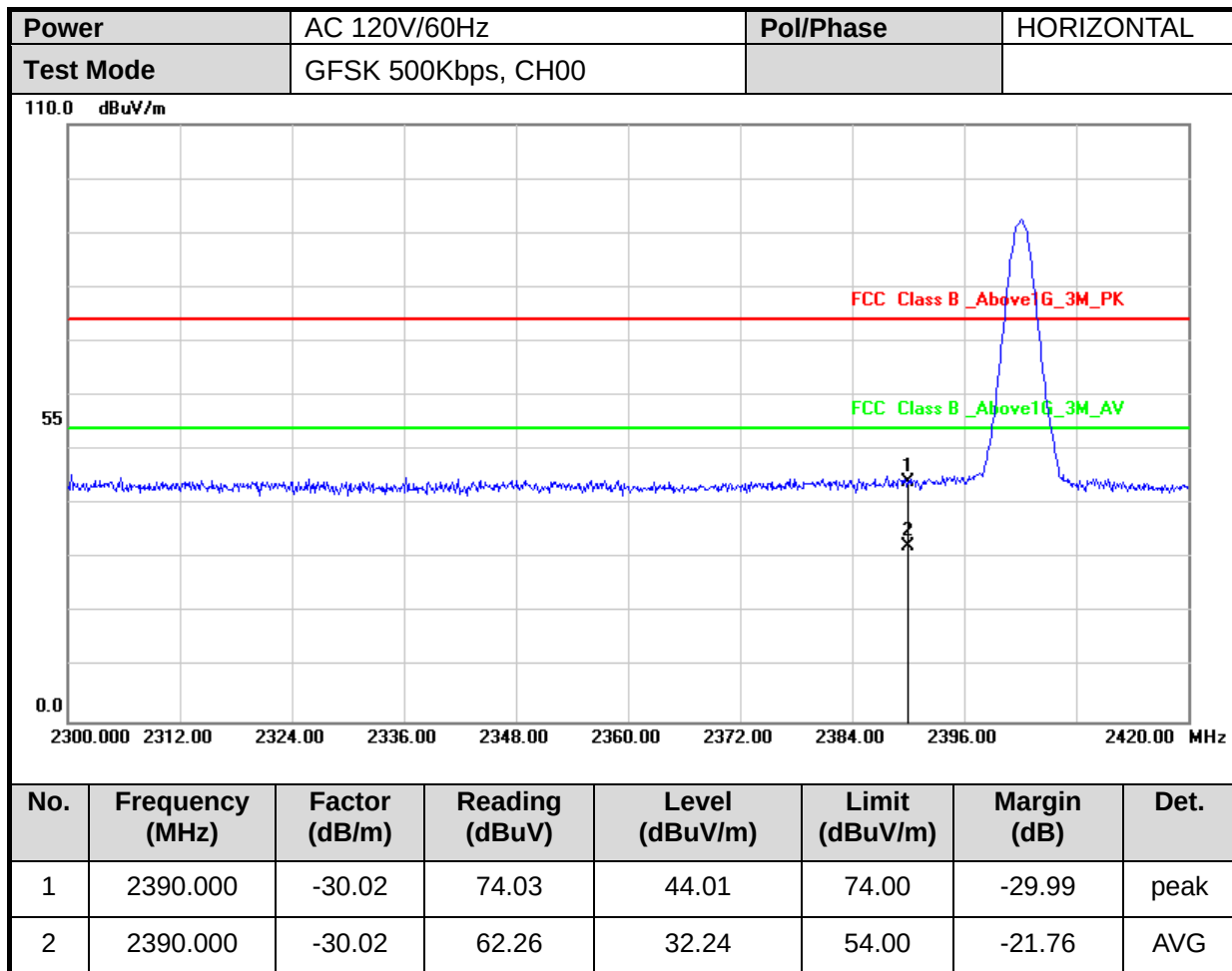
Note: Level = Reading + Factor

Margin = Level – Limit



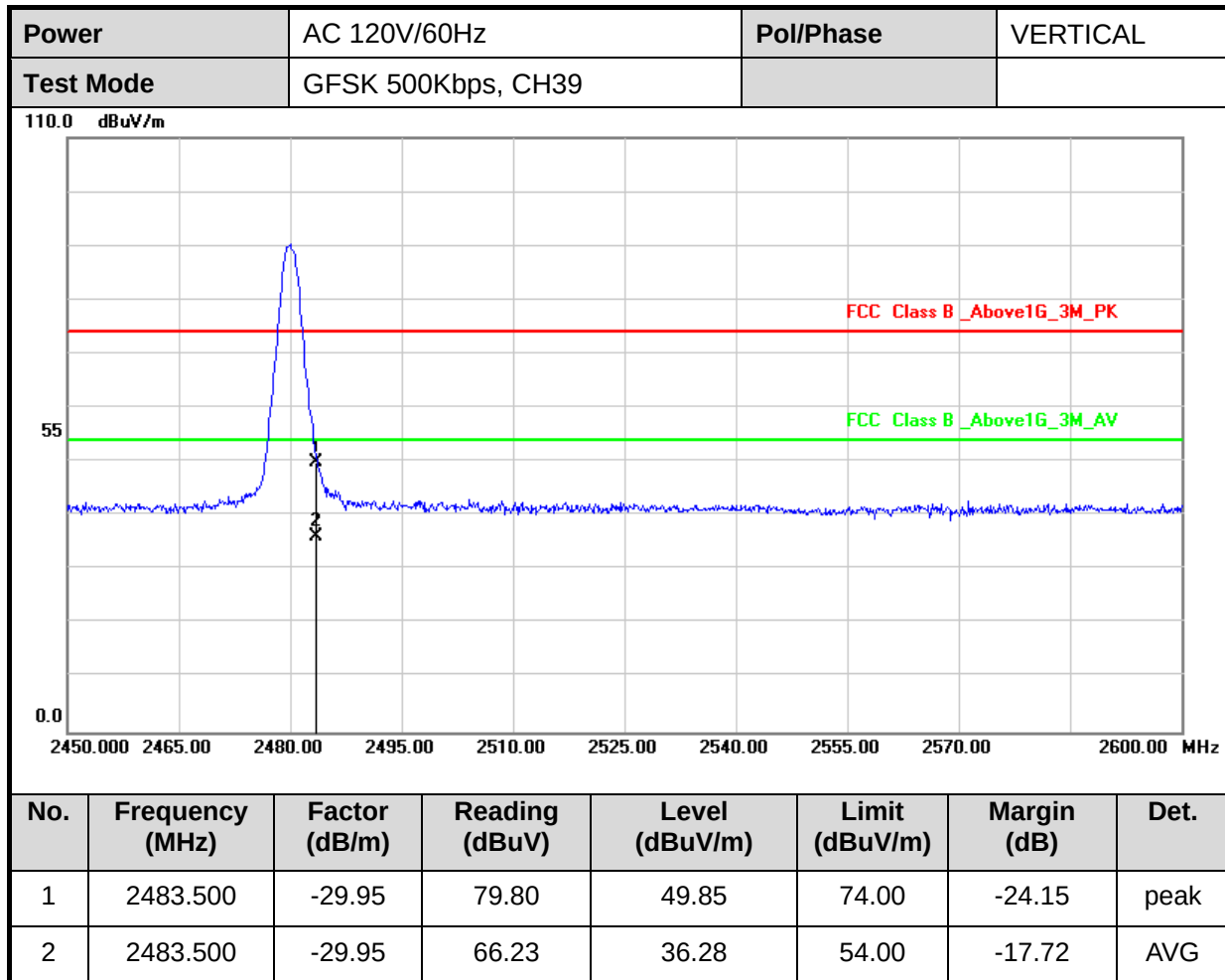
Note: Level = Reading + Factor

Margin = Level – Limit



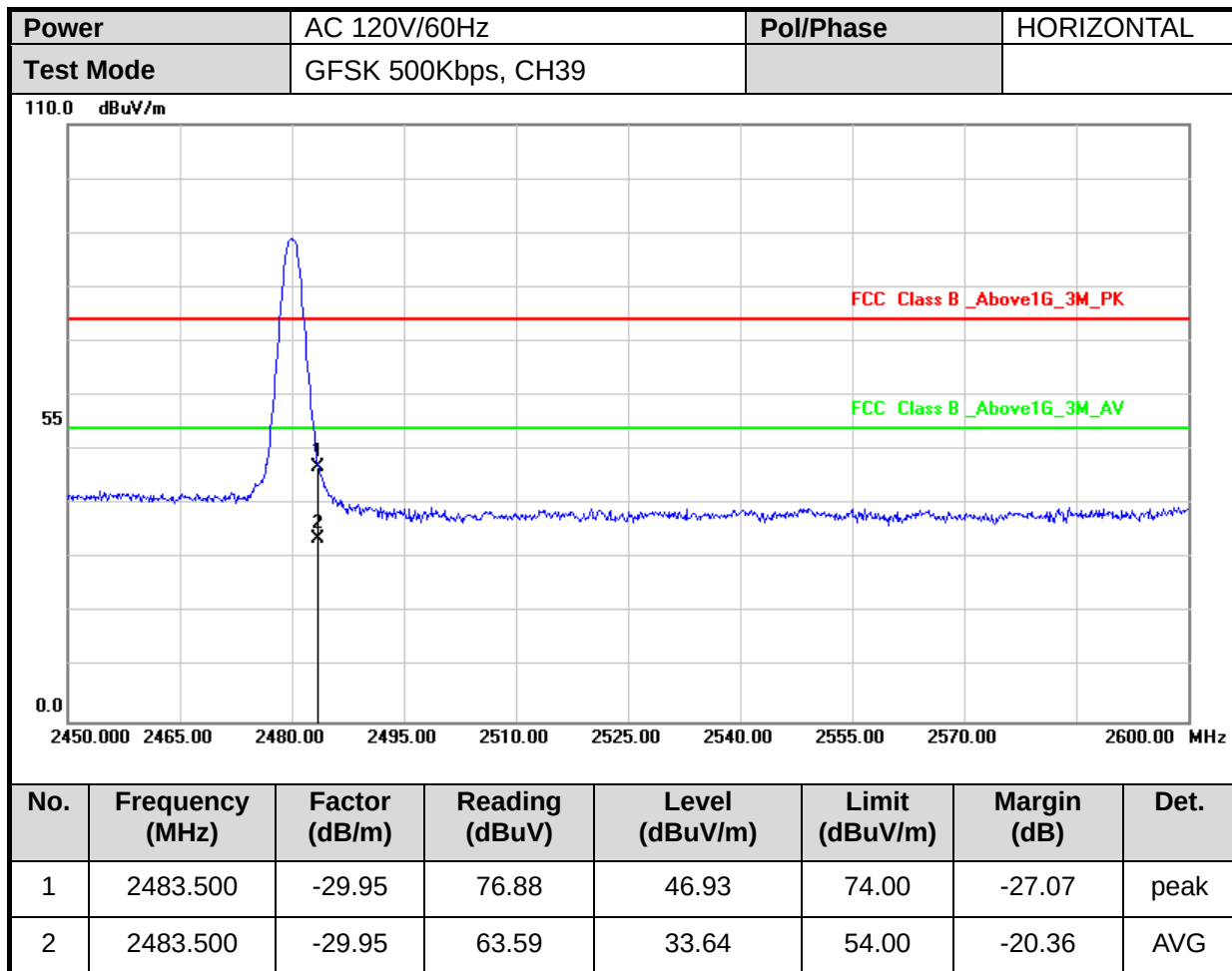
Note: Level = Reading + Factor

Margin = Level – Limit



Note: Level = Reading + Factor

Margin = Level – Limit



Note: Level = Reading + Factor

Margin = Level – Limit



## 7. Test of Spurious Emission (Conducted)

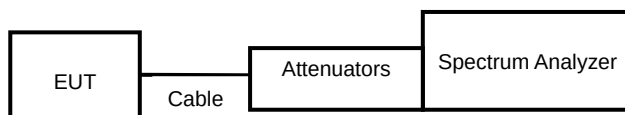
### 7.1 Test Limit

Below –20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

### 7.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer via a low loss cable.
- Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
- The band edges was measured and recorded.

### 7.3 Test Setup Layout

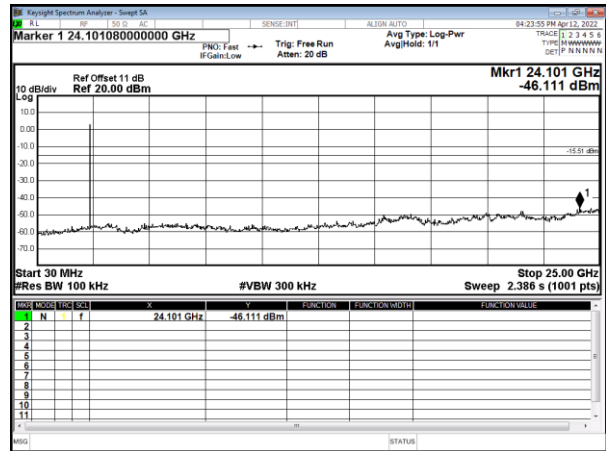
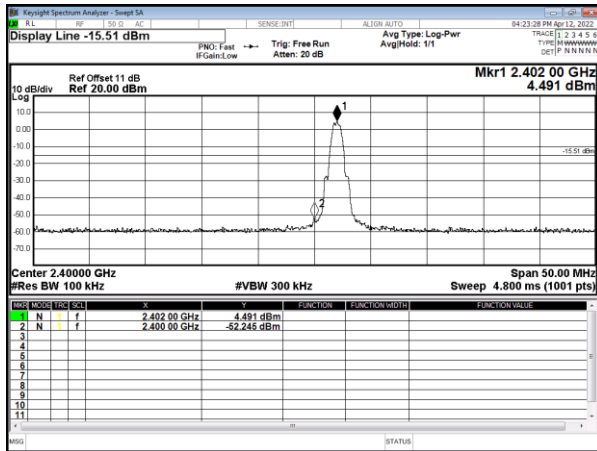


### 7.4 Test Result and Data

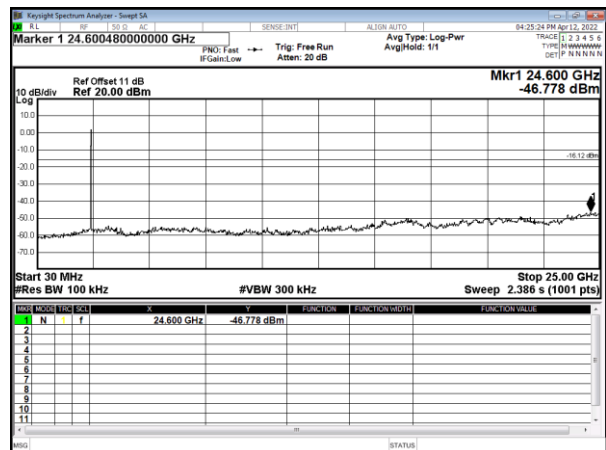
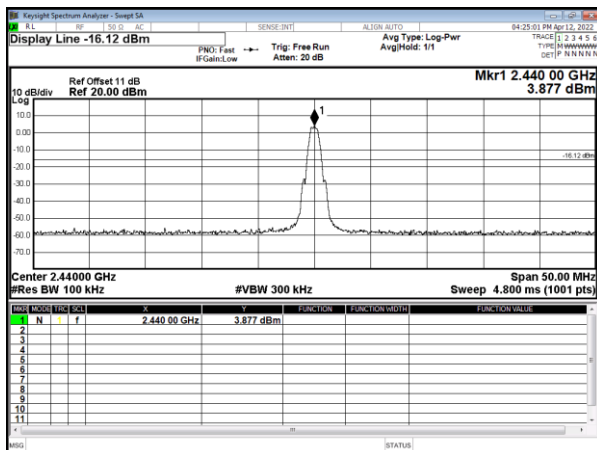
Note: Test plots refer to the following pages.



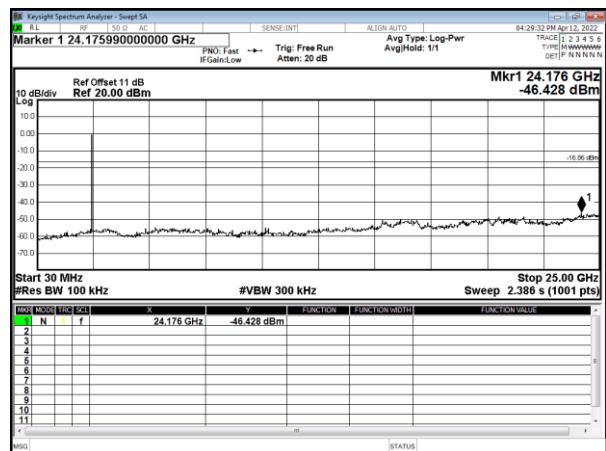
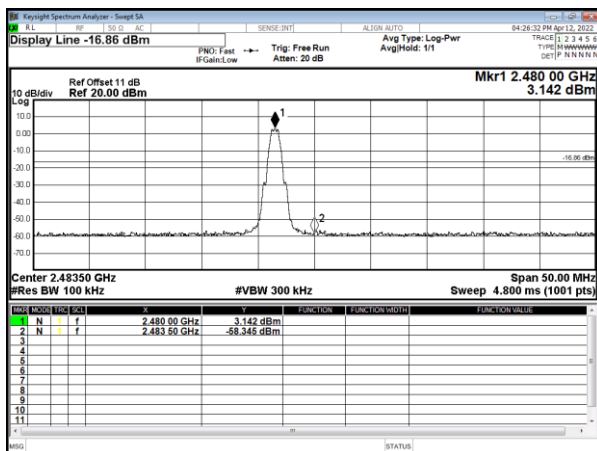
Modulation Type: GFSK 1Mbps  
CH00



Modulation Type: GFSK 1Mbps  
CH19

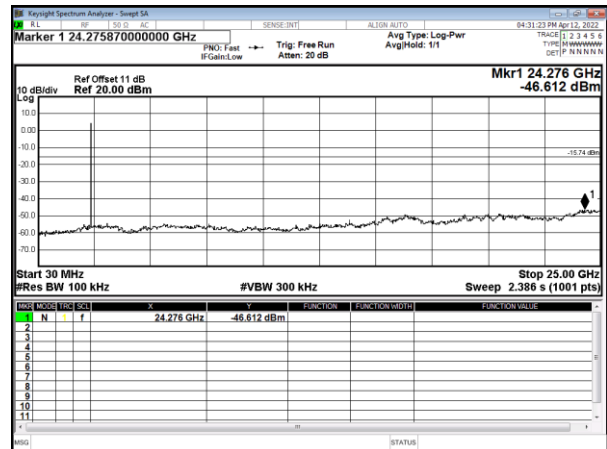
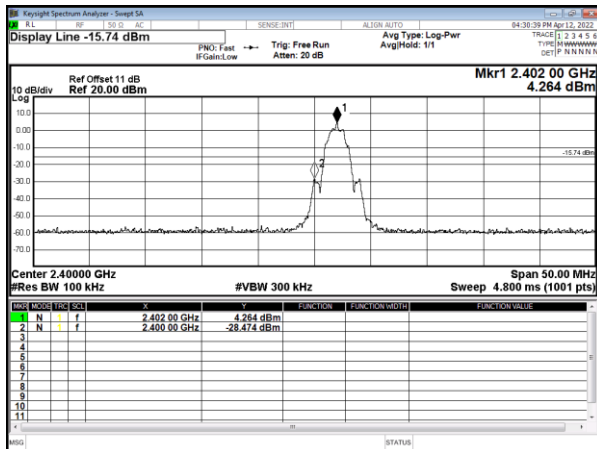


Modulation Type: GFSK 1Mbps  
CH39

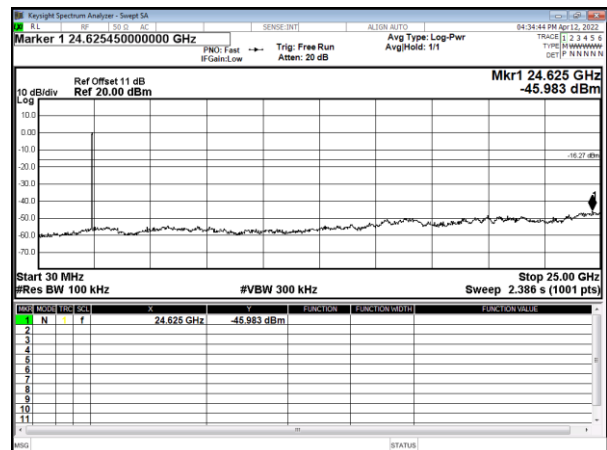
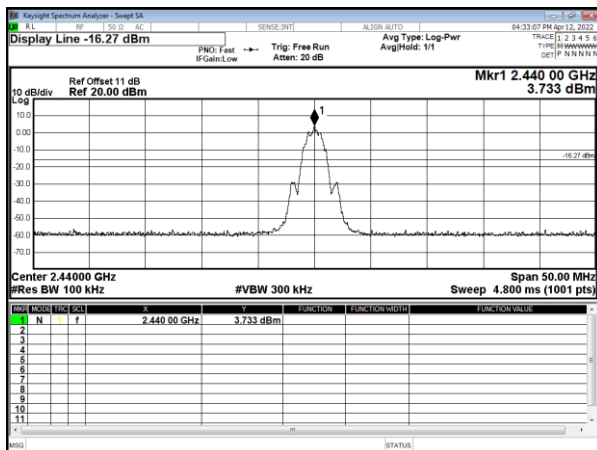




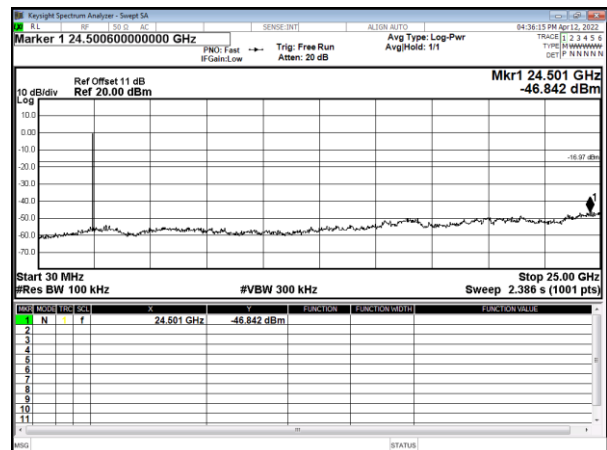
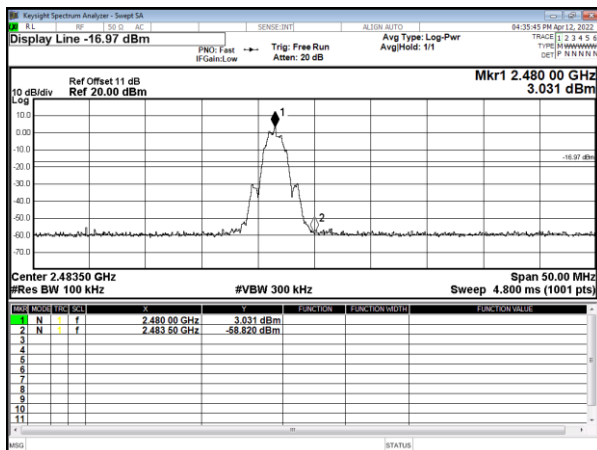
### Modulation Type: GFSK 2Mbps CH00

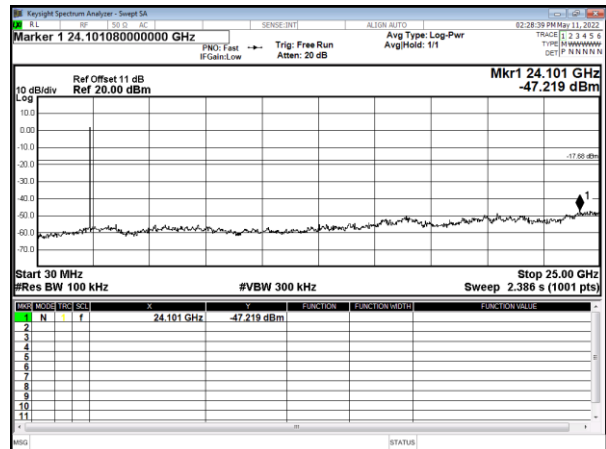
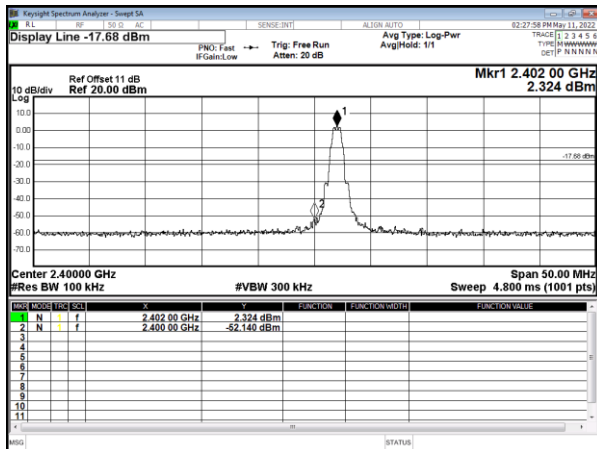
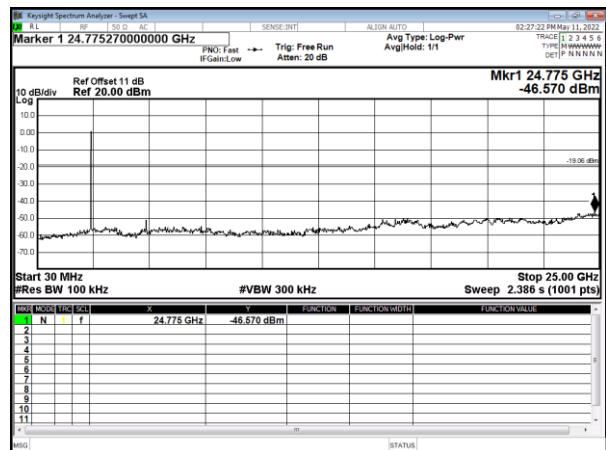
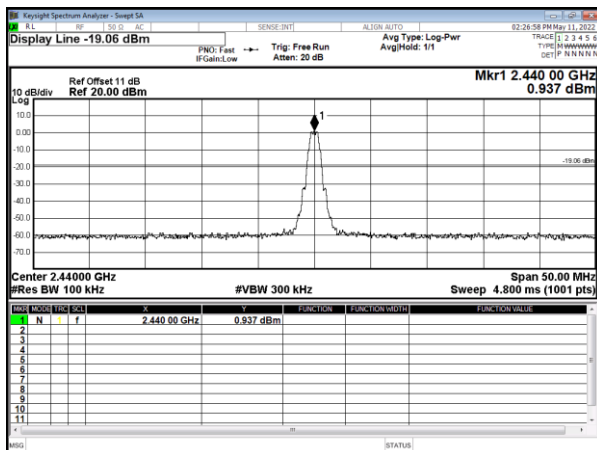
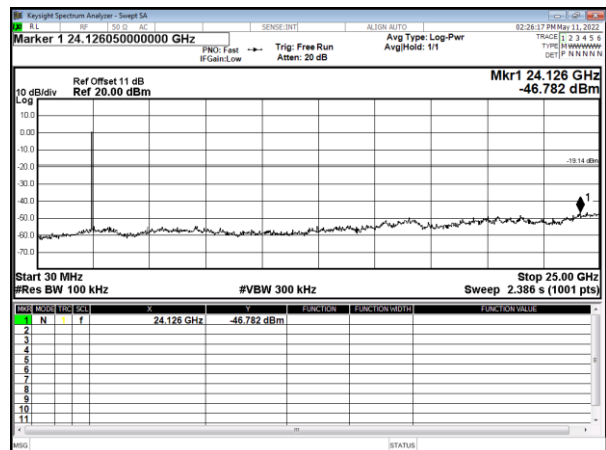
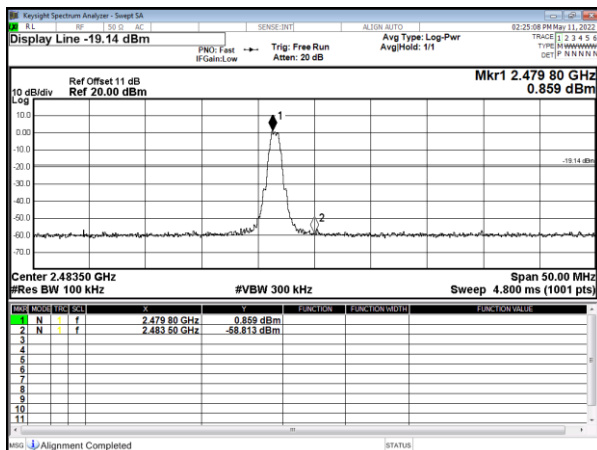


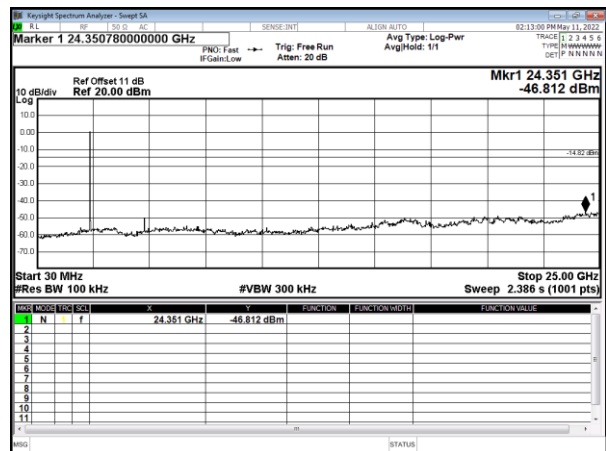
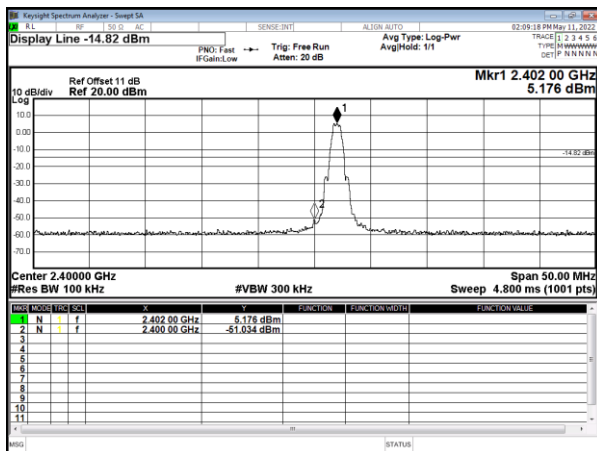
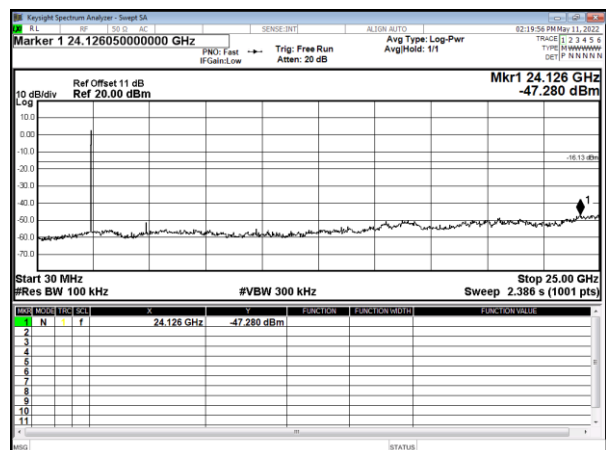
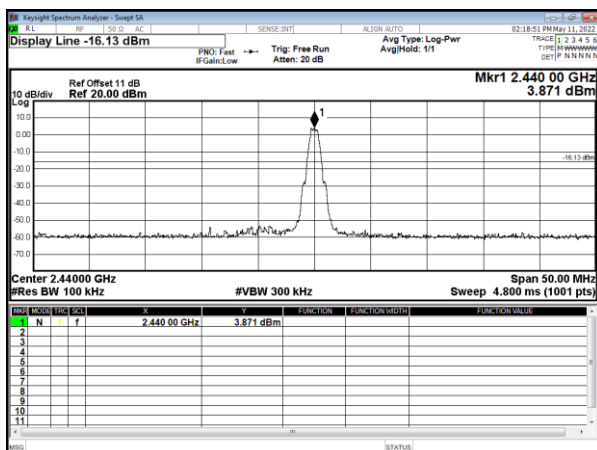
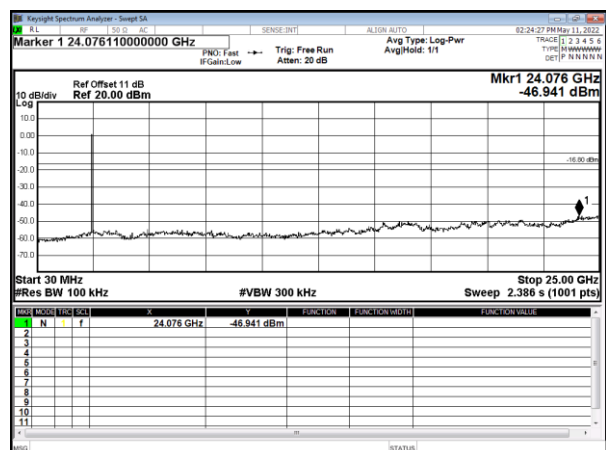
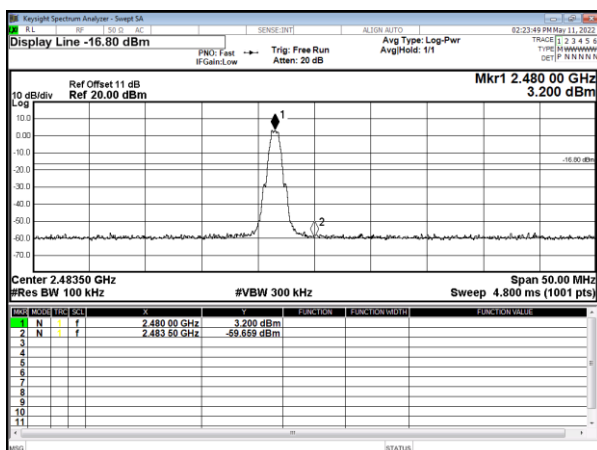
### Modulation Type: GFSK 2Mbps CH19



### Modulation Type: GFSK 2Mbps CH39



Modulation Type: GFSK 125Kbps  
CH00Modulation Type: GFSK 125Kbps  
CH19Modulation Type: GFSK 125Kbps  
CH39

Modulation Type: GFSK 500Kbps  
CH00Modulation Type: GFSK 500Kbps  
CH19Modulation Type: GFSK 500Kbps  
CH39



## 8. On Time, Duty Cycle and Measurement methods

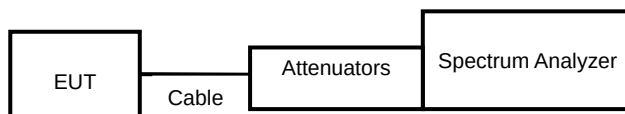
### 8.1 Test Limit

None; for reporting purposes only.

### 8.2 Test Procedure

Zero-Span Spectrum Analyzer Method.

### 8.3 Test Setup Layout



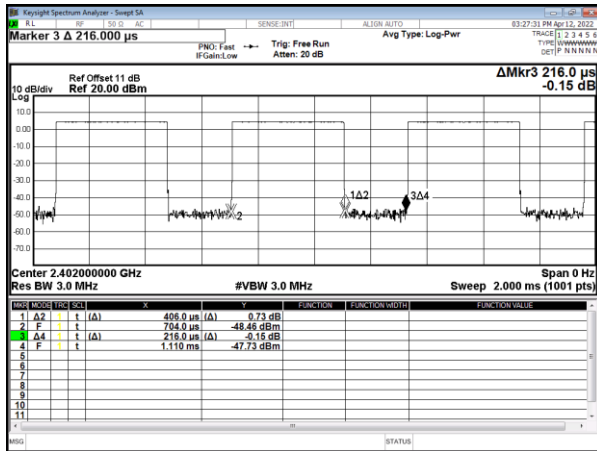
### 8.4 Test Result and Data

| Modulation Type | On Time (msec) | Period Time (msec) | Duty Cycle (%) |
|-----------------|----------------|--------------------|----------------|
| GFSK (1Mbps)    | 0.41           | 0.62               | 65.27%         |
| GFSK (2Mbps)    | 0.22           | 0.63               | 35.09%         |
| GFSK (125Kbps)  | 3.13           | 3.76               | 83.36%         |
| GFSK (500Kbps)  | 1.09           | 1.88               | 58.13%         |

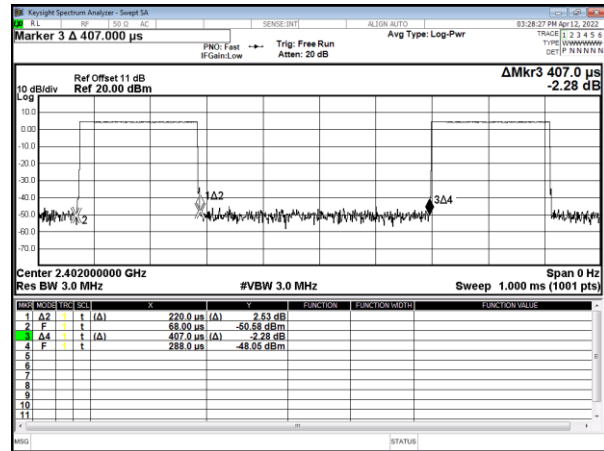
Note: Test plots refer to the following pages.



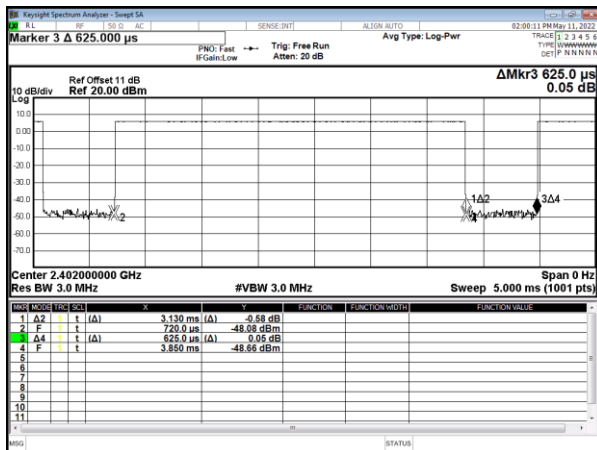
Modulation Type: GFSK 1Mbps



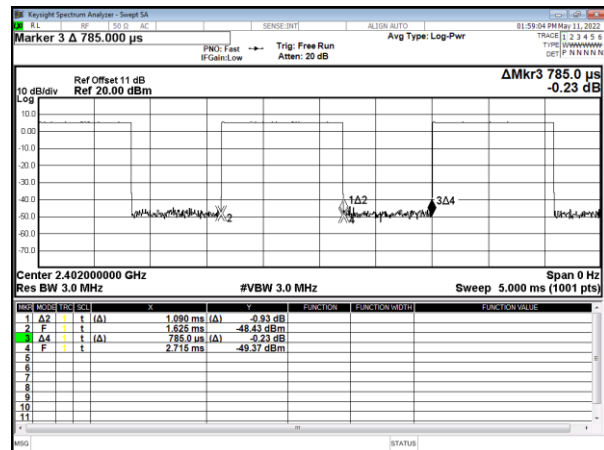
Modulation Type: GFSK 2Mbps



Modulation Type: GFSK 125Kbps



Modulation Type: GFSK 500Kbps





## 9. 6dB Bandwidth Measurement Data

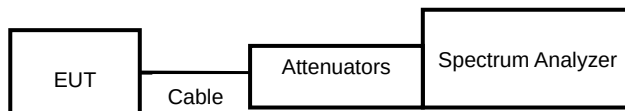
### 9.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 9.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and VBW  $\geq 3 \times$  RBW.
- The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
- The 6dB Bandwidth was measured and recorded.

### 9.3 Test Setup Layout

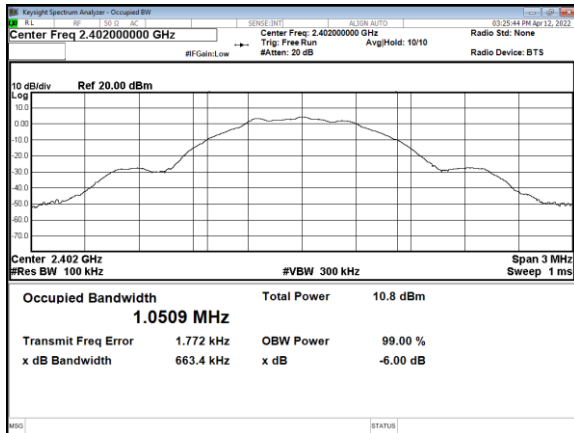


### 9.4 Test Result and Data

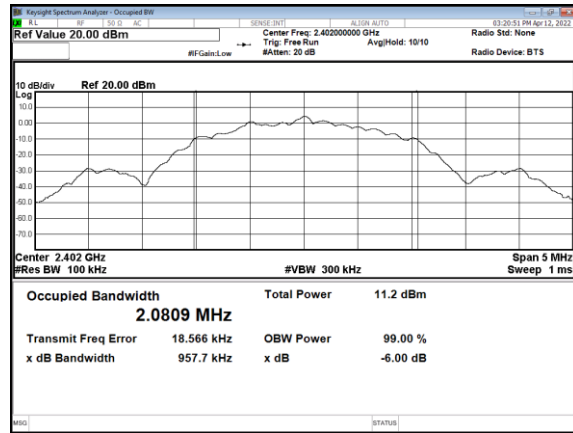
| Modulation Type | Channel | Frequency (MHz) | 6dB Bandwidth (KHz) | Limit (KHz) |
|-----------------|---------|-----------------|---------------------|-------------|
| GFSK (1Mbps)    | 00      | 2402            | 663.40              | 500         |
|                 | 19      | 2440            | 653.40              | 500         |
|                 | 39      | 2480            | 667.50              | 500         |
| GFSK (2Mbps)    | 00      | 2402            | 957.70              | 500         |
|                 | 19      | 2440            | 1134.00             | 500         |
|                 | 39      | 2480            | 1137.00             | 500         |
| GFSK (125Kbps)  | 00      | 2402            | 595.80              | 500         |
|                 | 19      | 2440            | 601.30              | 500         |
|                 | 39      | 2480            | 607.40              | 500         |
| GFSK (500Kbps)  | 00      | 2402            | 663.30              | 500         |
|                 | 19      | 2440            | 654.80              | 500         |
|                 | 39      | 2480            | 655.20              | 500         |



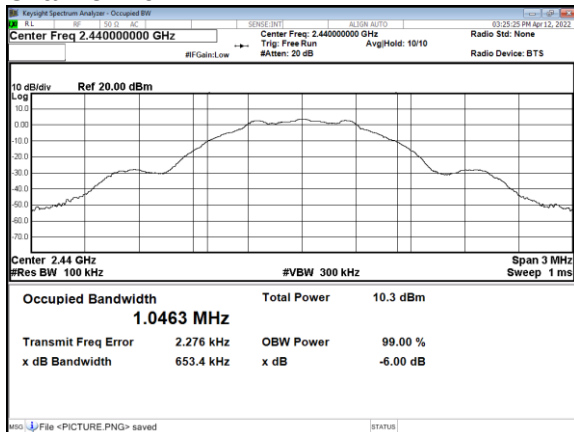
Modulation Standard: GFSK (1Mbps)  
Channel: 00



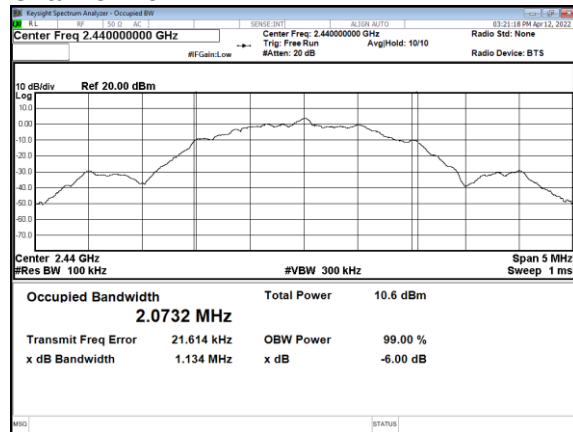
Modulation Standard: GFSK (2Mbps)  
Channel: 00



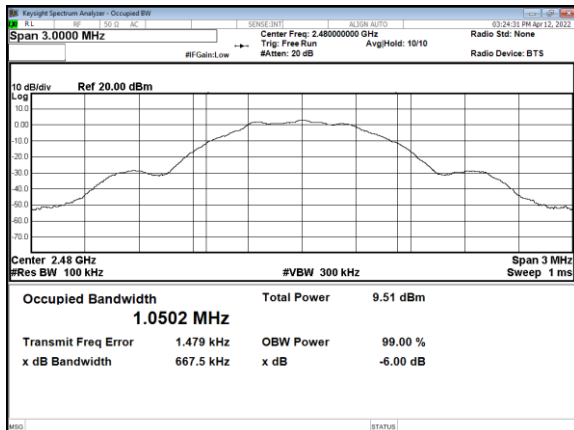
Modulation Standard: GFSK (1Mbps)  
Channel: 19



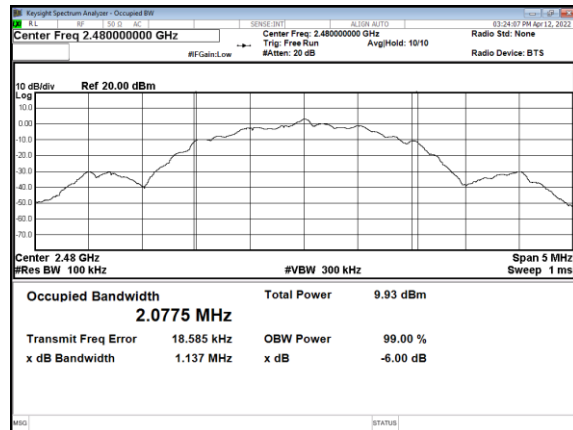
Modulation Standard: GFSK (2Mbps)  
Channel: 19



Modulation Standard: GFSK (1Mbps)  
Channel: 39

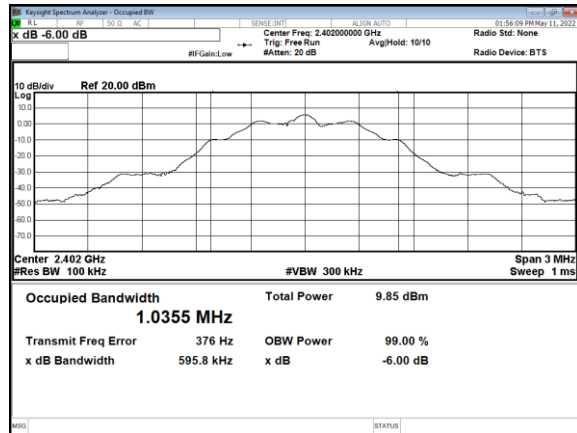


Modulation Standard: GFSK (2Mbps)  
Channel: 39

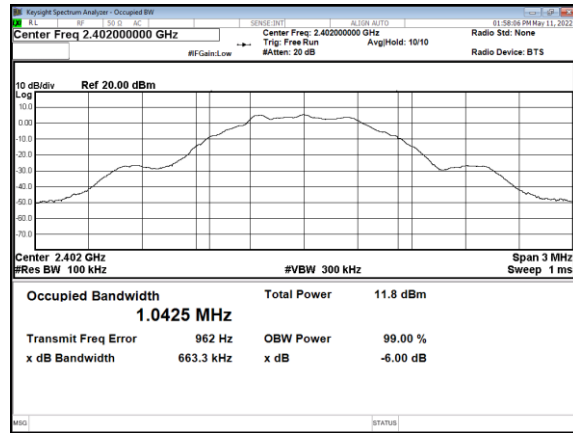




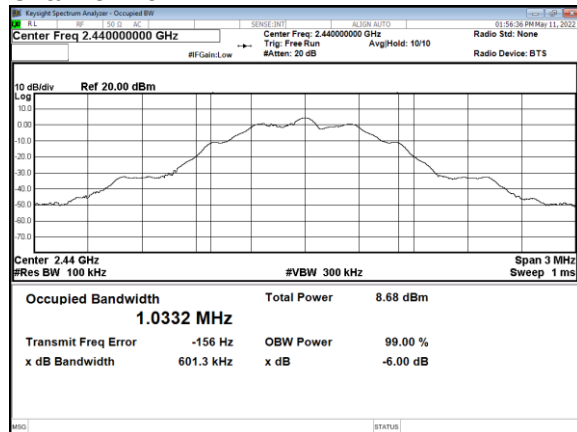
Modulation Standard: GFSK (125Kbps)  
Channel: 00



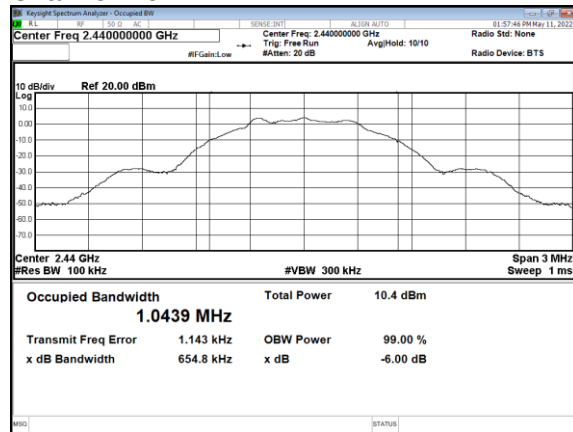
Modulation Standard: GFSK (500Kbps)  
Channel: 00



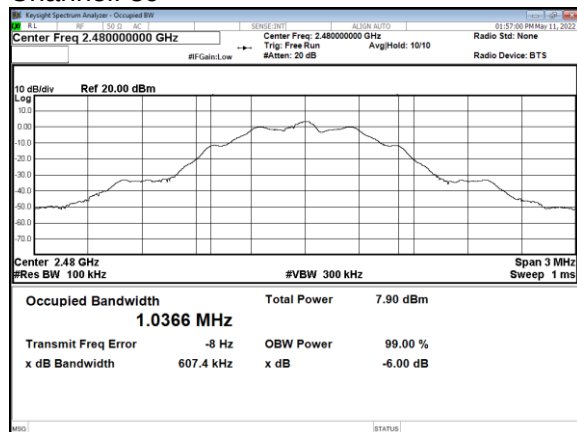
Modulation Standard: GFSK (125Kbps)  
Channel: 19



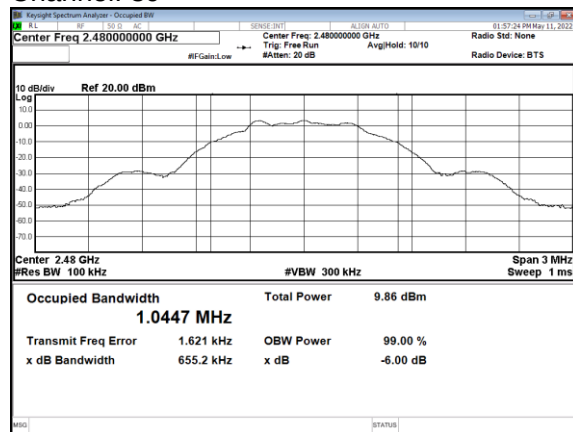
Modulation Standard: GFSK (500Kbps)  
Channel: 19



Modulation Standard: GFSK (125Kbps)  
Channel: 39



Modulation Standard: GFSK (500Kbps)  
Channel: 39





## 10. Maximum Peak and Average Output Power

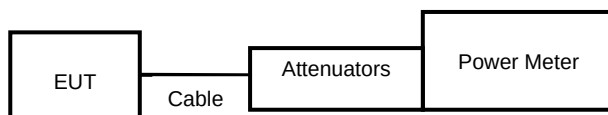
### 10.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

### 10.2 Test Procedures

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.

### 10.3 Test Setup Layout



### 10.4 Test Result and Data

| Modulation Standard | Channel | Frequency (MHz) | Power Output (dBm) | Peak Power Output (mW) |
|---------------------|---------|-----------------|--------------------|------------------------|
| GFSK (1Mbps)        | 00      | 2402            | 5.55               | 3.589                  |
|                     | 19      | 2440            | 4.97               | 3.141                  |
|                     | 39      | 2480            | 4.26               | 2.667                  |
| GFSK (2Mbps)        | 00      | 2402            | 6.39               | 4.355                  |
|                     | 19      | 2440            | 5.54               | 3.581                  |
|                     | 39      | 2480            | 4.97               | 3.141                  |
| GFSK (125Kbps)      | 00      | 2402            | 6.39               | 4.355                  |
|                     | 19      | 2440            | 5.54               | 3.581                  |
|                     | 39      | 2480            | 4.97               | 3.141                  |
| GFSK (500Kbps)      | 00      | 2402            | 6.42               | 4.385                  |
|                     | 19      | 2440            | 5.12               | 3.251                  |
|                     | 39      | 2480            | 4.55               | 2.851                  |



## 11. Power Spectral Density

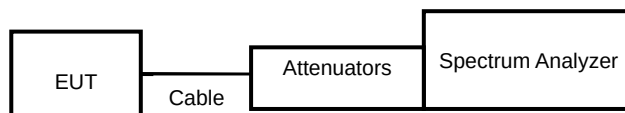
### 11.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

### 11.2 Test Procedures

- The transmitter output was connected to spectrum analyzer.
- The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 10KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- The power spectral density was measured and recorded.

### 11.3 Test Setup Layout



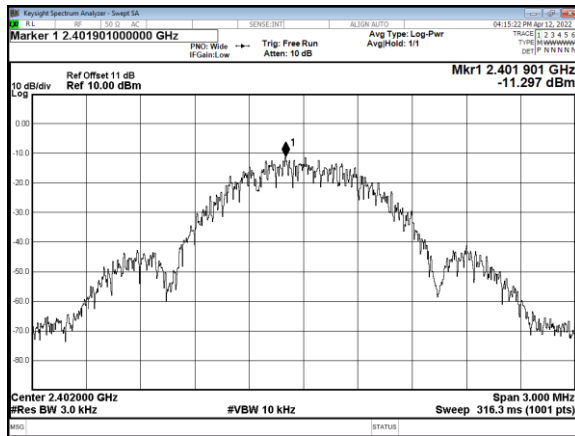
**11.4 Test Result and Data**

| Modulation Standard | Channel | Frequency (MHz) | Maximum Power Density of 3 kHz Bandwidth (dBm) | Limit |
|---------------------|---------|-----------------|------------------------------------------------|-------|
| GFSK (1Mbps)        | 00      | 2402            | -11.297                                        | 8.00  |
|                     | 19      | 2440            | -10.601                                        | 8.00  |
|                     | 39      | 2480            | -13.217                                        | 8.00  |
| GFSK (2Mbps)        | 00      | 2402            | -13.808                                        | 8.00  |
|                     | 19      | 2440            | -12.668                                        | 8.00  |
|                     | 39      | 2480            | -14.144                                        | 8.00  |
| GFSK (125Kbps)      | 00      | 2402            | -0.612                                         | 8.00  |
|                     | 19      | 2440            | -1.967                                         | 8.00  |
|                     | 39      | 2480            | -2.577                                         | 8.00  |
| GFSK (500Kbps)      | 00      | 2402            | -1.146                                         | 8.00  |
|                     | 19      | 2440            | -2.457                                         | 8.00  |
|                     | 39      | 2480            | -3.066                                         | 8.00  |

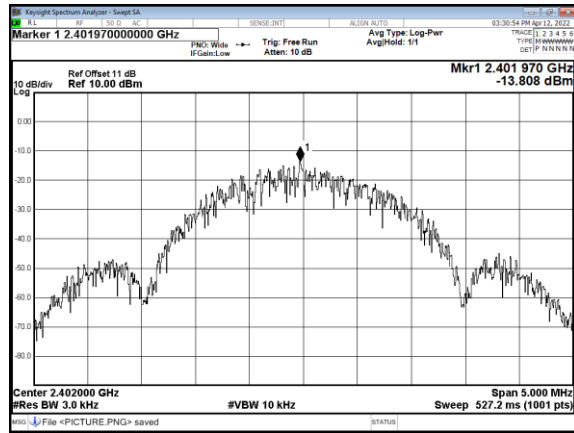
Note: Test plots refer to the following pages.



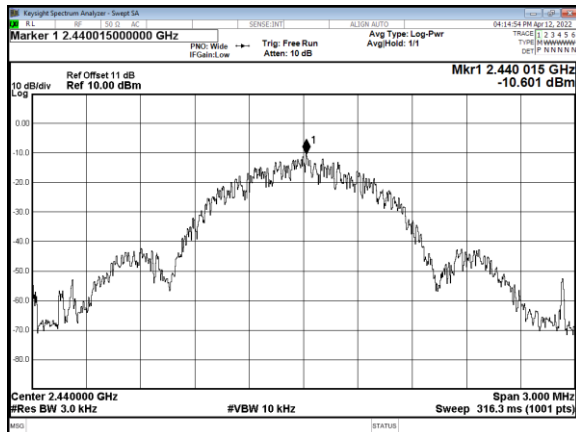
Modulation Standard: GFSK (1Mbps)  
Channel: 00



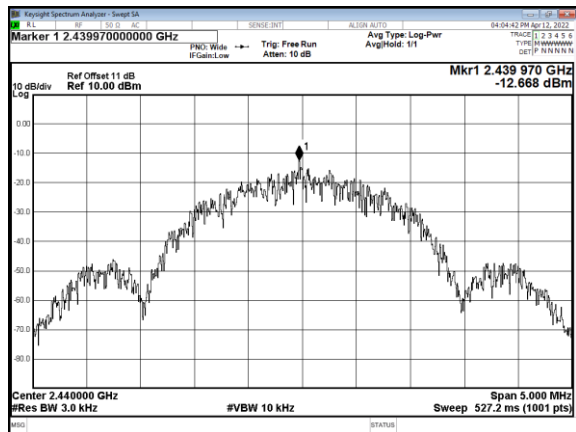
Modulation Standard: GFSK (2Mbps)  
Channel: 00



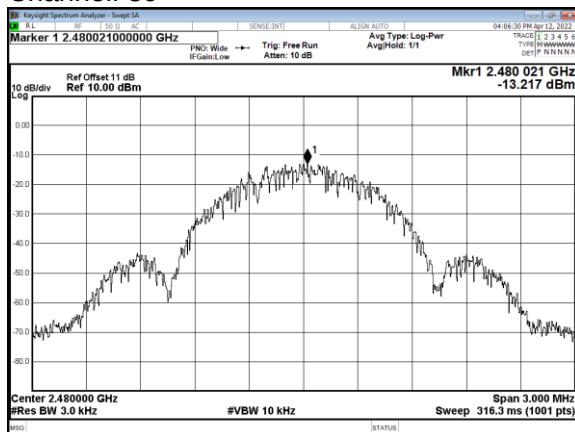
Modulation Standard: GFSK (1Mbps)  
Channel: 19



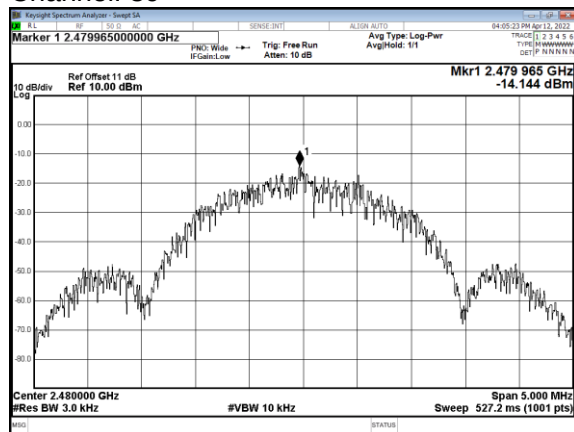
Modulation Standard: GFSK (2Mbps)  
Channel: 19



Modulation Standard: GFSK (1Mbps)  
Channel: 39

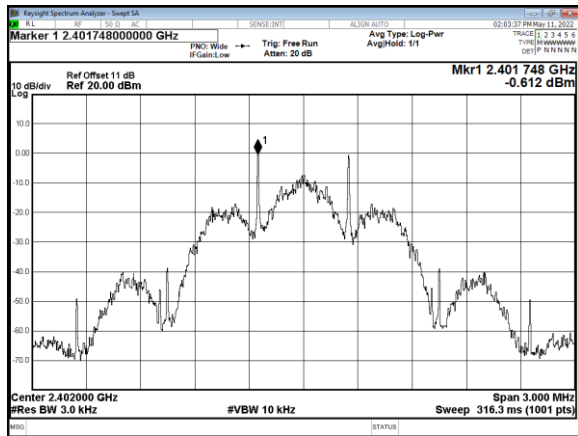


Modulation Standard: GFSK (2Mbps)  
Channel: 39

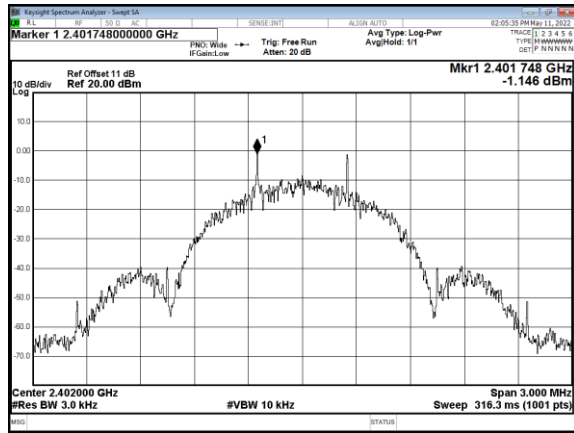




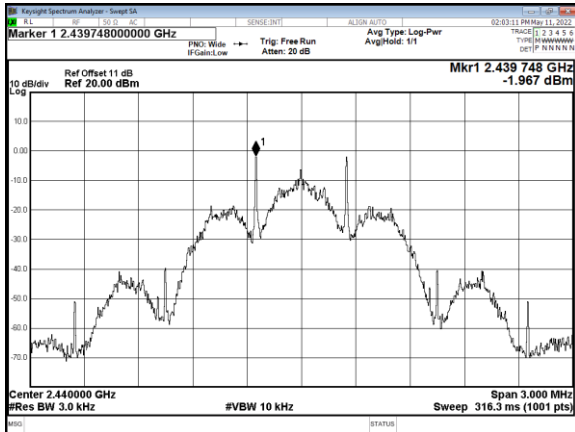
Modulation Standard: GFSK (125Kbps)  
Channel: 00



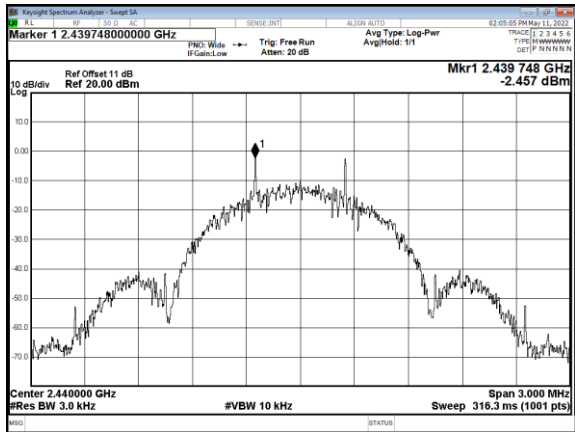
Modulation Standard: GFSK (500Kbps)  
Channel: 00



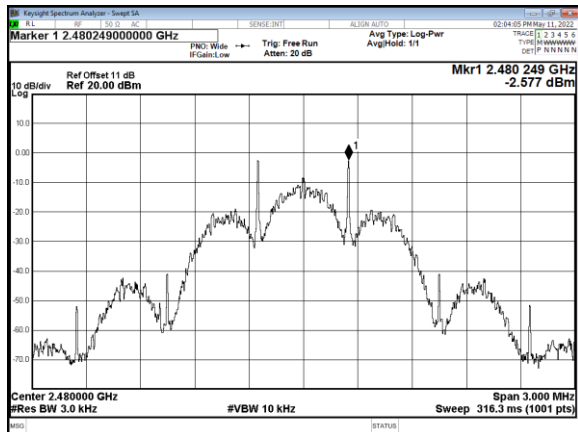
Modulation Standard: GFSK (125Kbps)  
Channel: 19



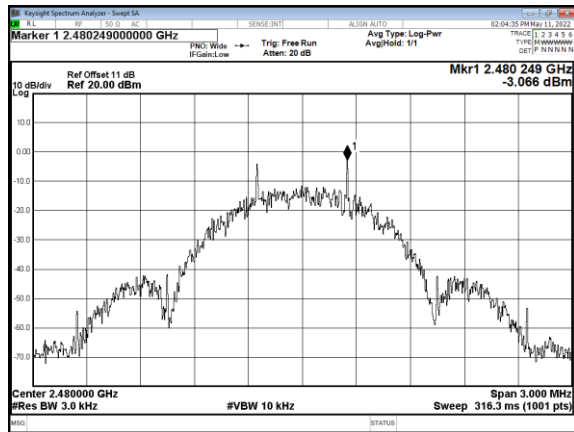
Modulation Standard: GFSK (500Kbps)  
Channel: 19



Modulation Standard: GFSK (125Kbps)  
Channel: 39



Modulation Standard: GFSK (500Kbps)  
Channel: 39



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