

TEST REPORT

Report No.: KS2202S0530E03

FCC ID.....: 2AXDU-X1-HUB

Applicant.....: ShenZhen Furrykid Technology Co., Ltd.

Address.....: Room 1705B, Zhenye Business Center,3101 Qianhai Road,Shenzhen

Manufacturer.....: Shenzhen Yongjia Electronic Technology Co.,Ltd.

Address.....: Shenzhen Pngshan Longtian Street Longtian Community Yingzhan
Electronic Technology(Shenzhen)CO.,Ltd.Park B5B Building 301
East,P.R

Product Name.....: Sofabaton X1 Smart Remote

Trade Mark.....: Sofabaton

Model/Type reference.....: X1-Hub,X1S-Hub,X1 PRO-Hub

Standard.....: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of receipt of test sample...: Feb 17, 2022

Date of testing.....: Feb 17,2022~July 15,2022

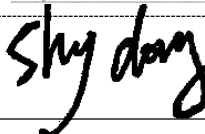
Date of issue.....: July 18,2022

Result.....: PASS

Prepared by: Pai Zheng
(Printed name+ signature)



Approved by: Sky Dong
(Printed Name + Signature)



Testing Laboratory Name.....: KSIGN(Guangdong) Testing Co., Ltd.

Address.....: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu
Industrial Park, Minzhu,Shatou, Shajing, Bao'an District, Shenzhen,
Guangdong, People's Republic of China

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1.TEST SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

KDB 558074 D01 15.247 Meas Guidance v05r02 : The measurement guidance provided herein is applicable only to Digital Transmission System (DTS) devices operating in the 902-928 MHz. 2400-2483.5 MHz and/or 5725-5850 MHz bands under §15.247 of the FCC rules (Title 47 of the Code of Federal Regulations).

1.2. REPORT VERSION

| Revised No. | Date of issue | Description |
|-------------|---------------|-------------|
| 01 | July 18,2022 | Original |

1.3. TEST DESCRIPTION

| FCC Part 15 Subpart C(15.247) | | | |
|--|------------------|--------|---------------|
| Test Item | Standard Section | Result | Test Engineer |
| | FCC | | |
| Antenna Requirement | 15.203 | Pass | Pai Zheng |
| Conducted Emission | 15.207 | Pass | Pai Zheng |
| 6dB&99% Bandwidth | 15.247(a)(2) | Pass | Pai Zheng |
| Peak Output Power | 15.247(b) | Pass | Pai Zheng |
| Power Spectral Density | 15.247(e) | Pass | Pai Zheng |
| Restricted Band | 15.247(d)/15.205 | Pass | Pai Zheng |
| Band Edge and Spurious Emission(Conducted) | 15.247(d) | Pass | Pai Zheng |
| Spurious Emission(Radiated) | 15.247(d)&15.209 | Pass | Pai Zheng |

Note: The measurement uncertainty is not included in the test result.

1.4. TEST FACILITY

Address of the report laboratory

KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED#: 25693 CAB identifier.: CN0096

KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

FCC-Registration No.: 294912 Designation Number: CN1328

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

1.5. MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the KSIGN(Guangdong) Testing Co., Ltd. system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device. Below is the best measurement capability for KSIGN(Guangdong) Testing Co., Ltd.

| Test Items | Measurement Uncertainty | Notes |
|---|-------------------------|-------|
| Transmitter power conducted | 0.42 dB | (1) |
| Transmitter power Radiated | 2.14 dB | (1) |
| Conducted spurious emissions 9kHz~40GHz | 1.60 dB | (1) |
| Radiated spurious emissions 9kHz~40GHz | 2.20 dB | (1) |
| Conducted Emissions 9kHz~30MHz | 3.20 dB | (1) |
| Radiated Emissions 30~1000MHz | 4.70 dB | (1) |
| Radiated Emissions 1~18GHz | 5.00 dB | (1) |
| Radiated Emissions 18~40GHz | 5.54 dB | (1) |
| Occupied Bandwidth | 2.80 dB | (1) |

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

1.6. ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

| | |
|--------------------|-------------|
| Temperature: | 15~35°C |
| Relative Humidity: | 30~60 % |
| Air Pressure: | 950~1050mba |

2. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

| | |
|------------------------|--|
| Test Sample Number: | 1-1-1(Normal Sample),1-1-2(Engineering Sample) |
| Product Name: | Sofabaton X1 Smart Remote |
| Trade Mark: | Sofabaton |
| Model/Type reference: | X1-Hub,X1S-Hub,X1 PRO-Hub |
| Model Different: | The only difference between product models is model name. Different model names are available to meet market demands. Other power supply methods, internal structures, circuits and key components are the same, and do not affect safety and electromagnetic compatibility performance. |
| Power supply(Adapter): | DC 5V |
| Hardware version: | V1.3 |
| Software version: | V7 |
| 2.4GHz WIFI | |
| Modulation: | 802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,16QAM,64QAM) |
| Operation frequency: | 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz |
| Max Peak Output Power: | 802.11b: 21.33 dBm |
| Channel number: | 802.11b/g/n(HT20):11 channels 802.11n(HT40):7 channels |
| Test frequency: | CH01/03: 2412MHz/2422MHz; CH06: 2437MHz; CH09/11: 2452MHz/2462MHz |
| Channel separation: | 5MHz |
| Antenna type: | PCB Antenna |
| Antenna gain: | 2.5dBi |

2.2. OPERATION STATE

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

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

Note:

- 1.CH 01~CH 11 for 802.11b/g/n(HT20), CH03~CH09 for 802.11n(HT40).
- 2.The display in grey were the channel selected for testing.

Test mode

| |
|--|
| For RF test items |
| The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%). |
| For AC power line conducted emissions: |
| The EUT was set to connect with the WLAN AP under large package sizes transmission. |
| For Radiated spurious emissions test item: |
| The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report. |

2.3. MEASUREMENT INSTRUMENTS LIST

| Tonscend JS0806-2 Test system | | | | | |
|-------------------------------|-------------------------------------|--------------|-----------|------------|------------|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Until |
| 1 | Spectrum Analyzer | R&S | FSV40-N | 101798 | 03/04/2023 |
| 2 | Vector Signal Generator | Agilent | N5182A | MY50142520 | 03/04/2023 |
| 3 | Analog Signal Generator | HP | 83752A | 3344A00337 | 03/04/2023 |
| 4 | Power Sensor | Agilent | E9304A | MY50390009 | 03/04/2023 |
| 5 | Power Sensor | Agilent | E9300A | MY41498315 | 03/04/2023 |
| 6 | Wideband Radio Communication Tester | R&S | CMW500 | 157282 | 03/04/2023 |
| 7 | Climate Chamber | Angul | AGNH80L | 1903042120 | 03/04/2023 |
| 8 | Dual Output DC Power Supply | Agilent | E3646A | MY40009992 | 03/04/2023 |
| 9 | RF Control Unit | Tonscend | JS0806-2 | / | 03/04/2023 |

| Transmitter spurious emissions & Receiver spurious emissions | | | | | |
|--|--|---------------------|--------------|------------|------------|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Until |
| 1 | EMI Test Receiver | R&S | ESR | 102525 | 03/04/2023 |
| 2 | High Pass Filter | Chengdu E-Microwave | OHF-3-18-S | 0E01901038 | 03/04/2023 |
| 3 | High Pass Filter | Chengdu E-Microwave | OHF-6.5-18-S | 0E01901039 | 03/04/2023 |
| 4 | Spectrum Analyzer | HP | 8593E | 3831U02087 | 03/04/2023 |
| 5 | Ultra-Broadband logarithmic period Antenna | Schwarzbeck | VULB 9163 | 01230 | 12/04/2023 |
| 6 | Loop Antenna | Beijin ZHINAN | ZN30900C | 18050 | 03/04/2023 |
| 7 | Spectrum Analyzer | R&S | FSV40-N | 101798 | 03/04/2023 |
| 8 | Horn Antenna | Schwarzbeck | BBHA 9120 D | 2023 | 03/29/2023 |
| 9 | Pre-Amplifier | Schwarzbeck | BBV 9745 | 9745#129 | 03/04/2023 |
| 10 | Pre-Amplifier | EMCI | EMC051835 SE | 980662 | 03/04/2023 |
| 11 | Pre-Amplifier | Schwarzbeck | BBV-9721 | 57 | 03/04/2023 |
| 12 | Horn Antenna | Schwarzbeck | BBHA 9170 | 00939 | 03/04/2023 |

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|------|-------------------|--------------|-----------|--------------|------------------|
| 1 | LISN | R&S | ENV432 | 1326.6105.02 | 03/04/2023 |
| 2 | EMI Test Receiver | R&S | ESR | 102524 | 03/04/2023 |
| 3 | Manual RF Switch | JS TOYO | / | MSW-01/002 | 03/04/2023 |

Note:

1)The Cal. Interval was one year.

2)The cable loss has calculated in test result which connection between each test instruments.

TRF No. FCC Part 15.247_R1

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2.4. TEST SOFTWARE

| Software name | Model | Version |
|---|----------|---------------|
| Conducted emission Measurement Software | EZ-EMC | EMC-Con 3A1.1 |
| Radiated emission Measurement Software | EZ-EMC | FA-03A.2.RE |
| Bluetooth and WIFI Test System | JS1120-3 | 2.5.77.0418 |

3. TEST ITEM AND RESULTS

3.1. ANTENNA REQUIREMENT

Requirement

FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

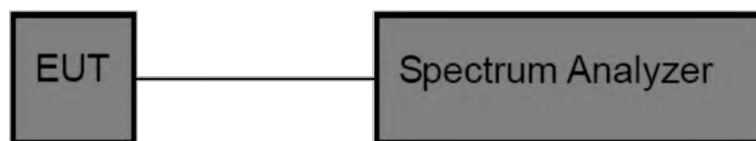
Note: The antenna is permanently fixed to the EUT

3.2. PEAK OUTPUT POWER

Limit

| Test Item | Limit | Frequency Range(MHz) |
|-------------------|------------------|----------------------|
| Peak Output Power | 1 Watt or 30 dBm | 2400~2483.5 |

Test Configuration



Test Procedure

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
2. The measurement is according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.
3. Spectrum Setting:
Set analyser center frequency to DTS channel center frequency.
Set the RBW to: 1MHz
Set the VBW to: 3MHz
Detector: peak
Sweep time: auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.
4. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

Test Mode

Please refer to the clause 2.2

Test Result

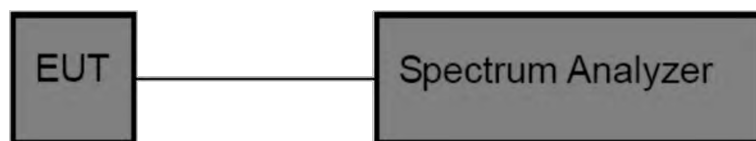
| Mode | Channel frequency (MHz) | Test Result (dBm) | Limit (dBm) |
|----------------|-------------------------|-------------------|-------------|
| 802.11b | 2412 | 20.83 | 30 |
| | 2437 | 20.94 | |
| | 2462 | 21.33 | |
| 802.11g | 2412 | 20.93 | |
| | 2437 | 20.88 | |
| | 2462 | 21.19 | |
| 802.11n (HT20) | 2412 | 20.02 | |
| | 2437 | 20.06 | |
| | 2462 | 20.24 | |
| 802.11n (HT40) | 2422 | 19.11 | |
| | 2437 | 19.26 | |
| | 2452 | 19.49 | |
| Result : PASS | | | |

3.3. POWER SPECTRAL DENSITY

Limit

| FCC Part 15 Subpart C(15.247) | | |
|-------------------------------|--------------------|----------------------|
| Test Item | Limit | Frequency Range(MHz) |
| Power Spectral Density | 8dBm(in any 3 kHz) | 2400~2483.5 |

Test Configuration



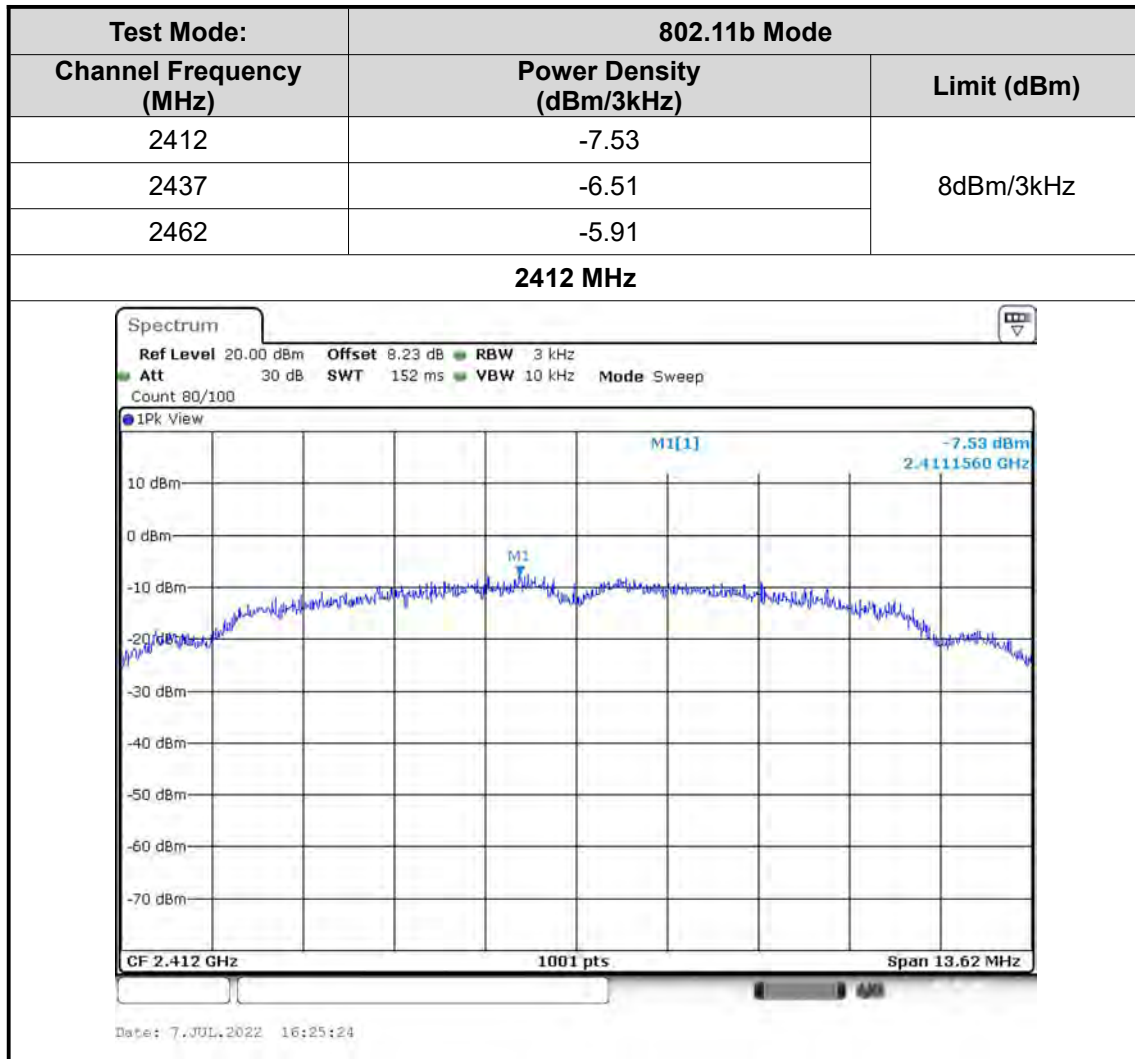
Test Procedure

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.
3. Spectrum Setting:
 Set analyser center frequency to DTS channel center frequency.
 Set the span to 1.5 times the DTS bandwidth.
 Set the RBW to: 3 kHz
 Set the VBW to: 10 kHz
 Detector: peak
 Sweep time: auto
 Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.2

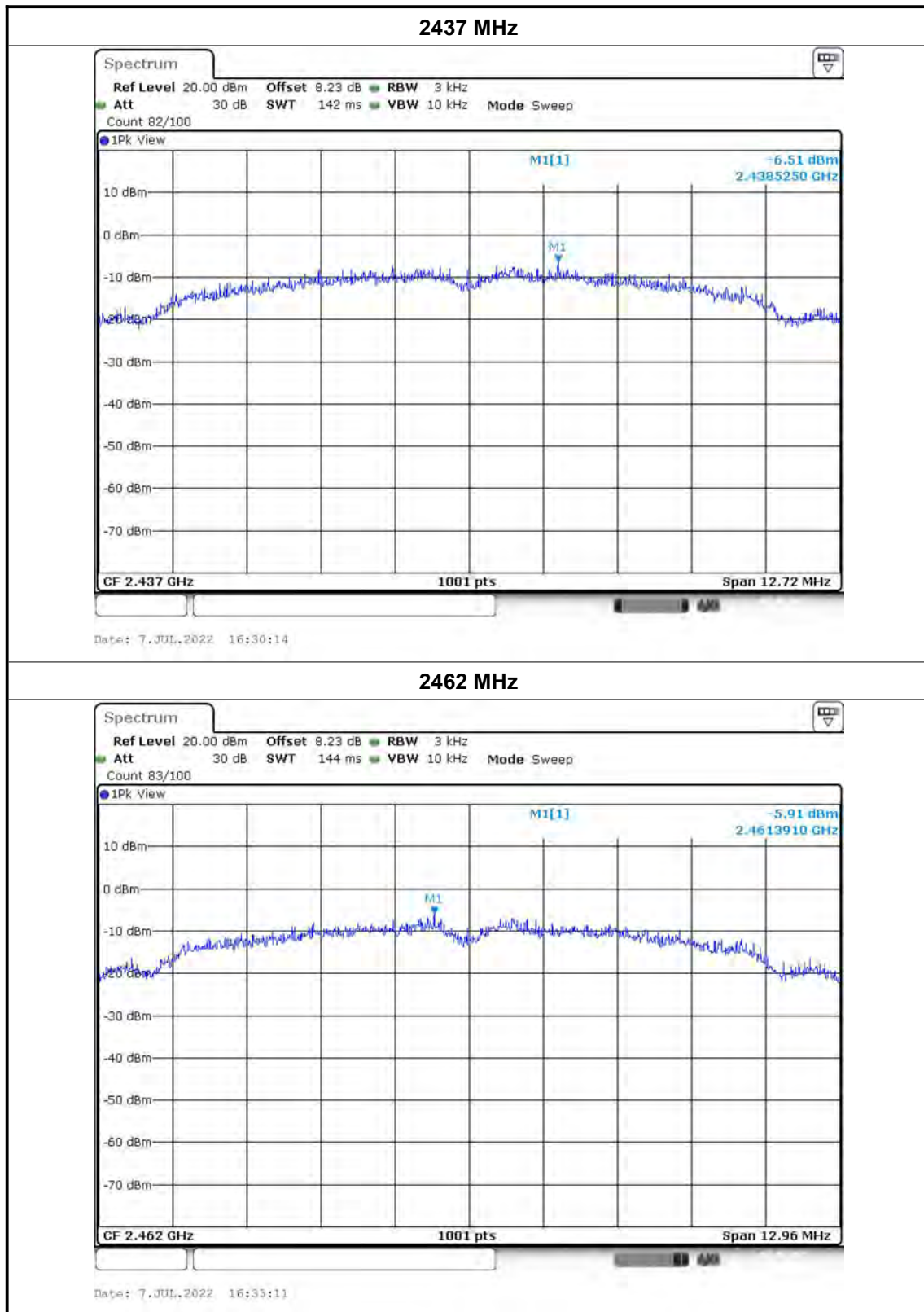
Test Result



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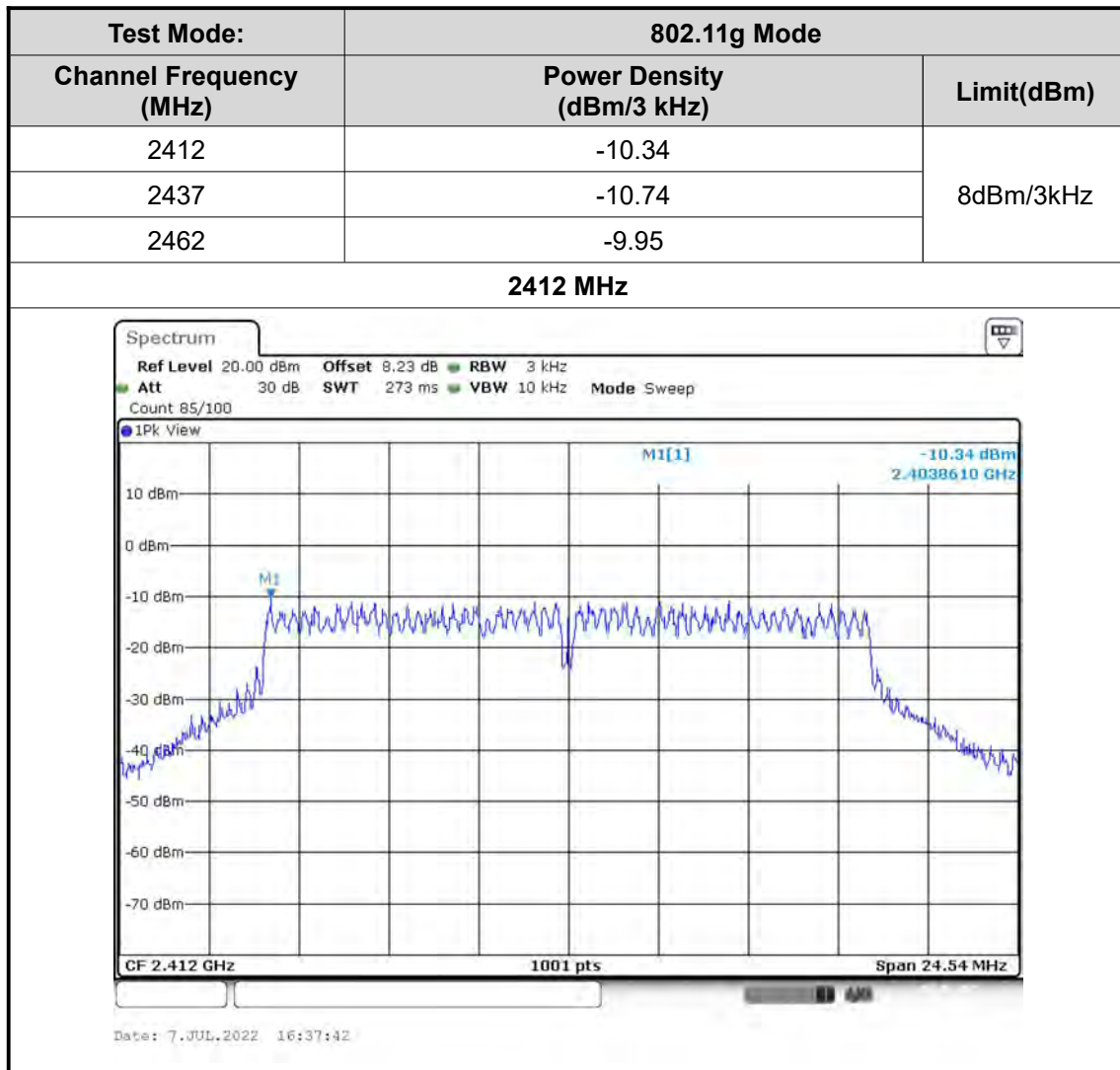
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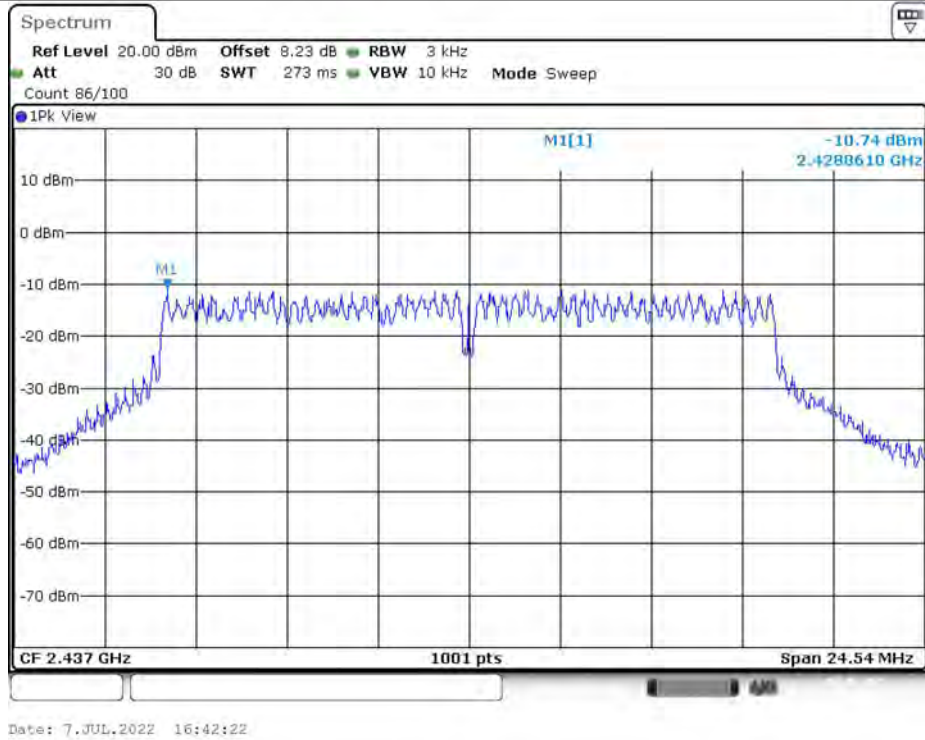
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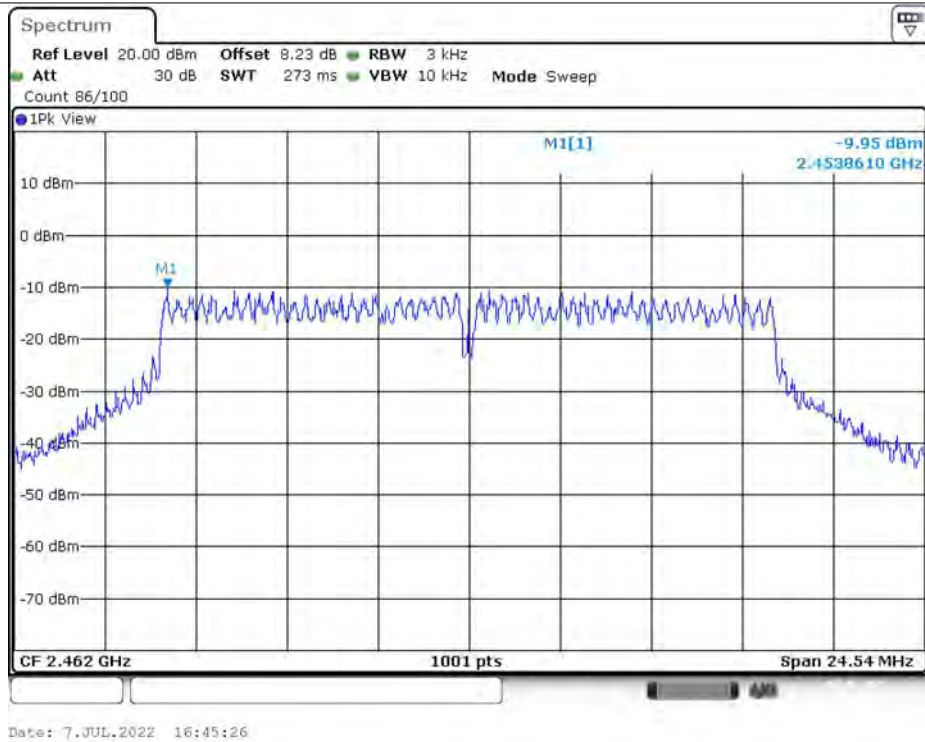
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2437 MHz



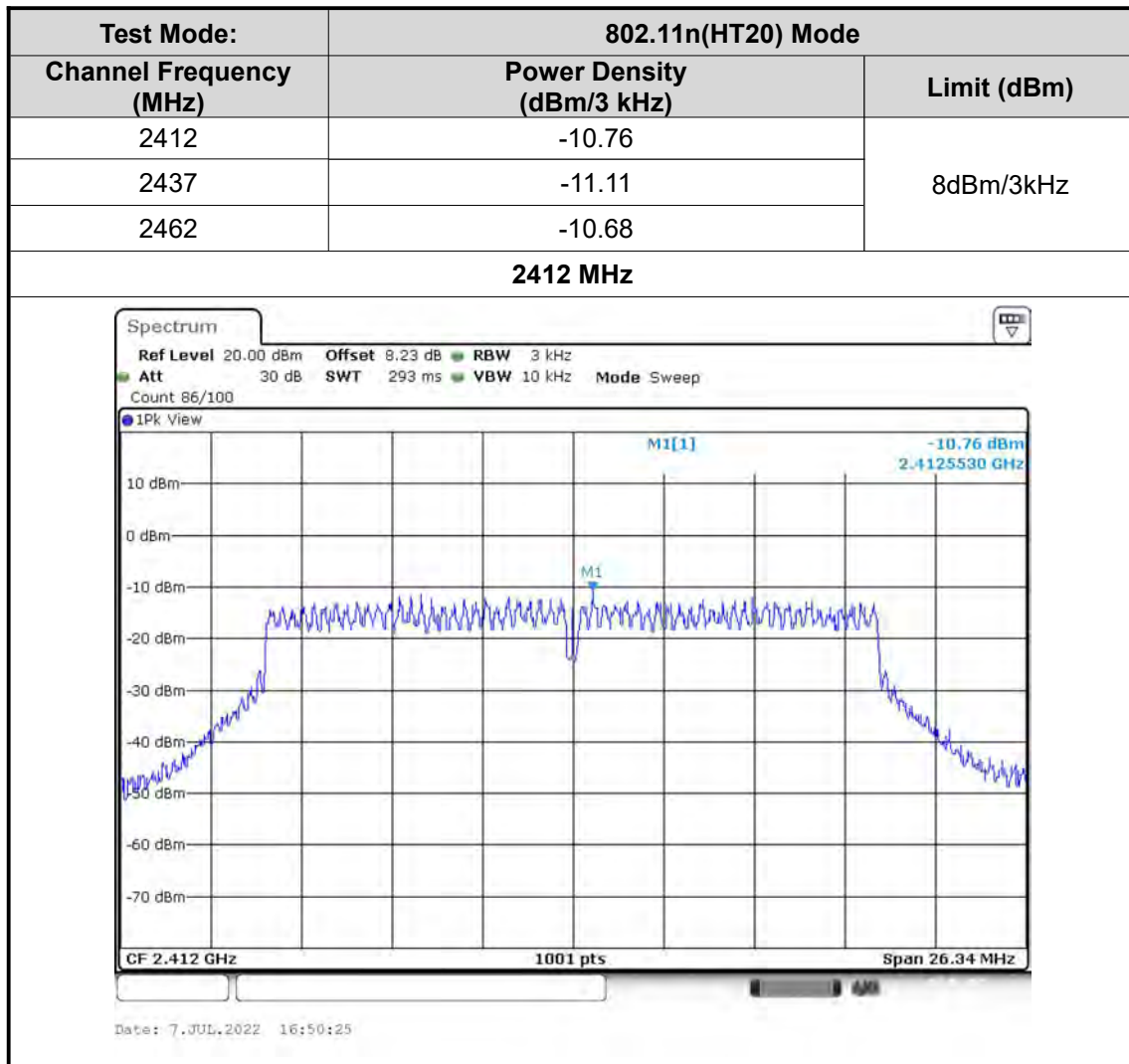
2462 MHz

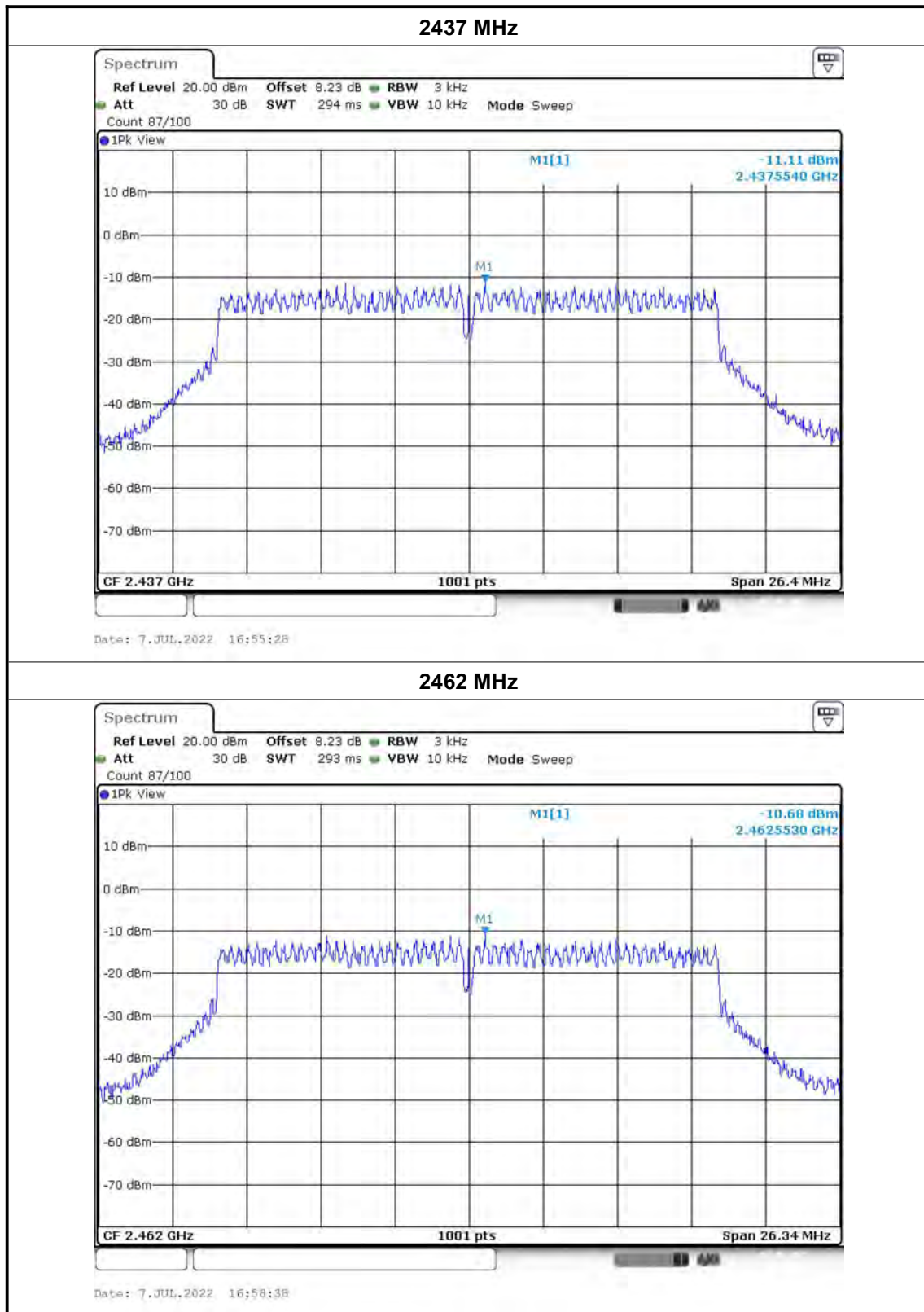


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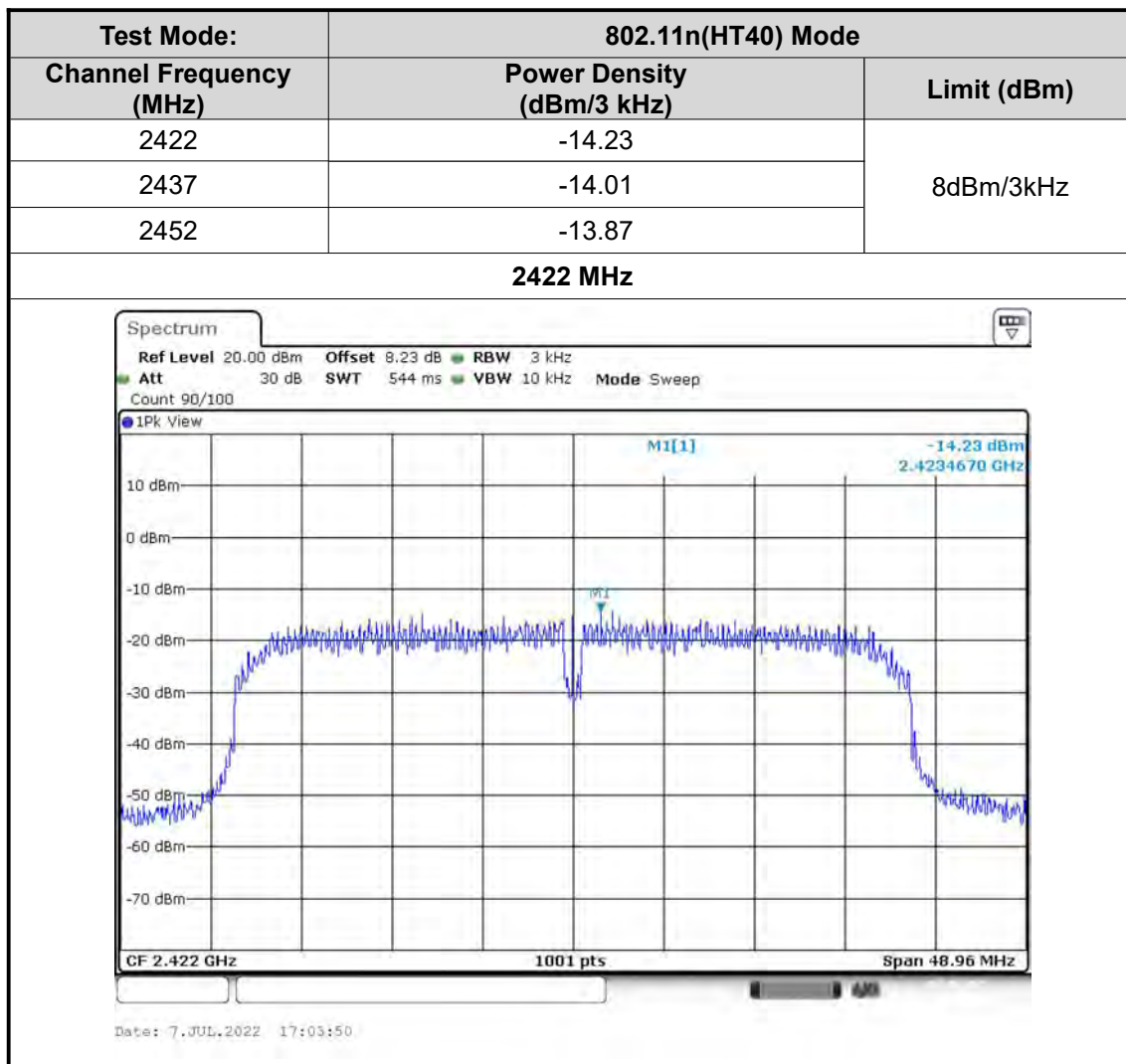


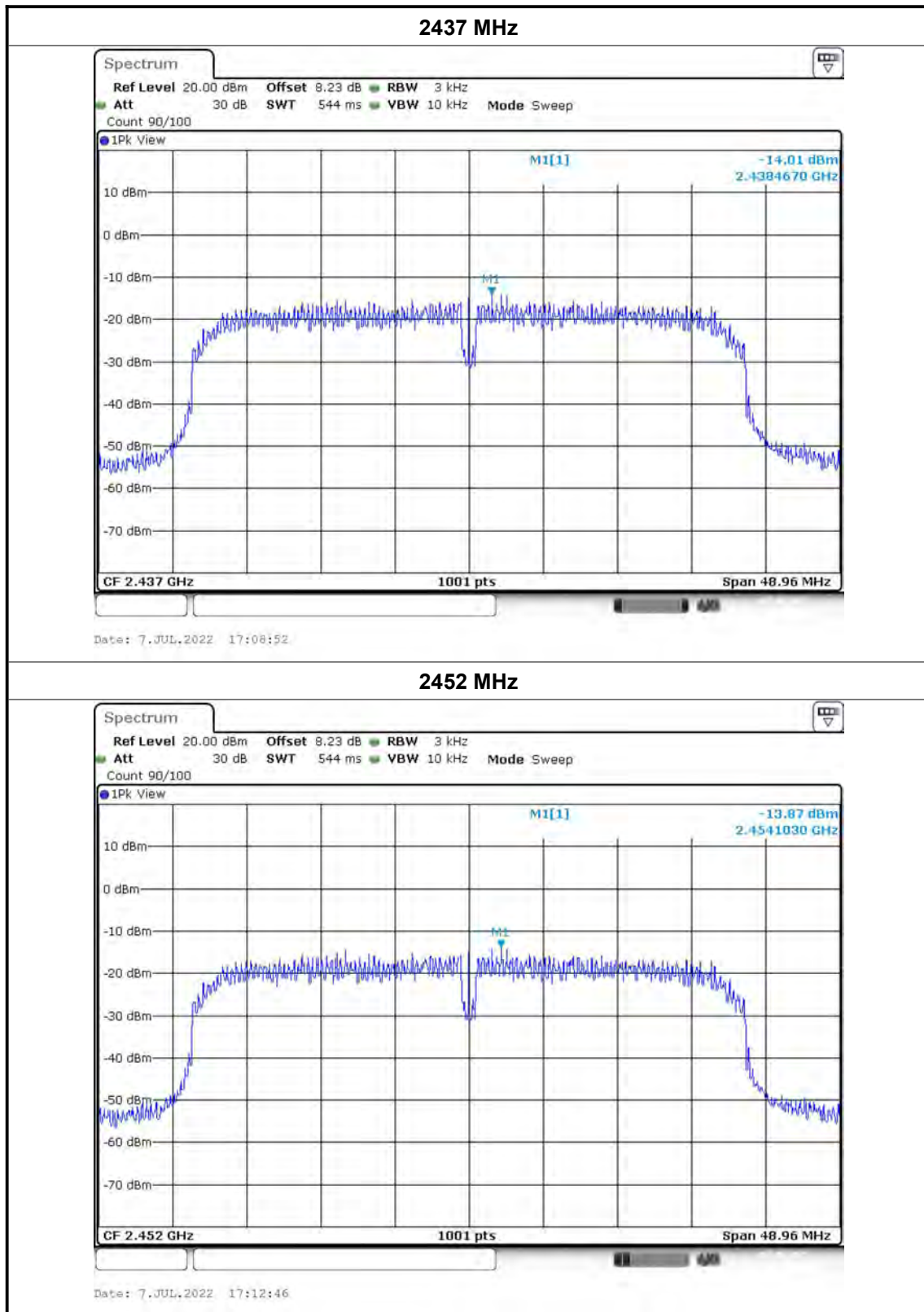


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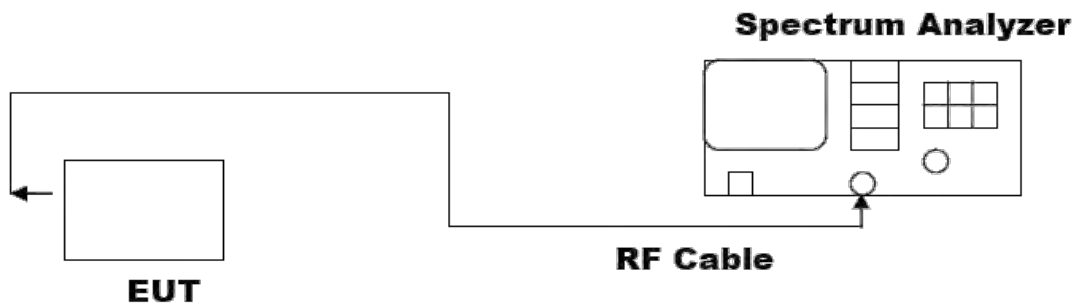
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3.4. BANDWIDTH

Limit

| Test Item | Limit | Frequency Range(MHz) |
|-----------|-----------------------------------|----------------------|
| Bandwidth | ≥ 500 KHz (6dB bandwidth) | 2400~2483.5 |

Test Configuration



Test Procedure

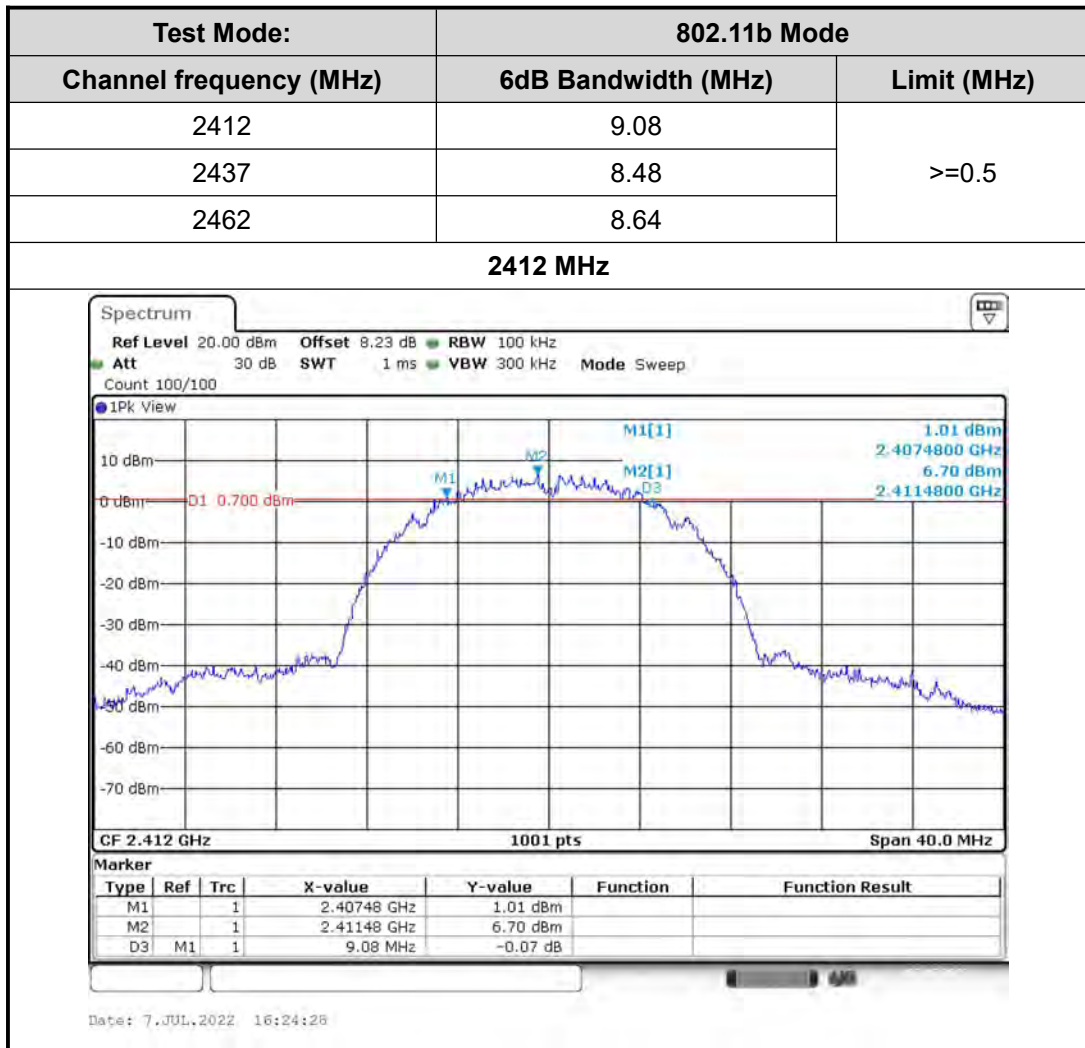
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator:
6db Bandwidth
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

Please refer to the clause 2.2.

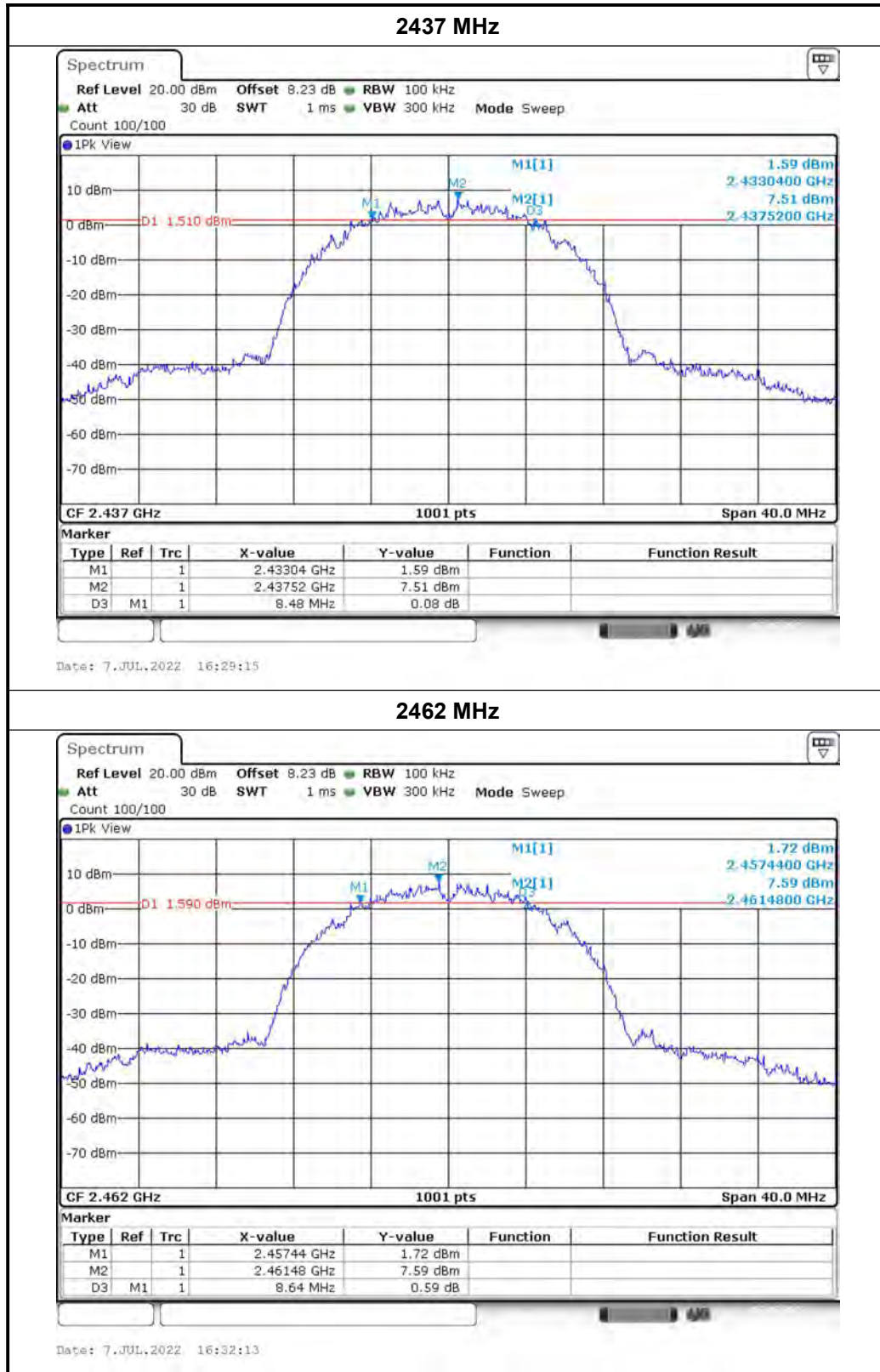
Test Results



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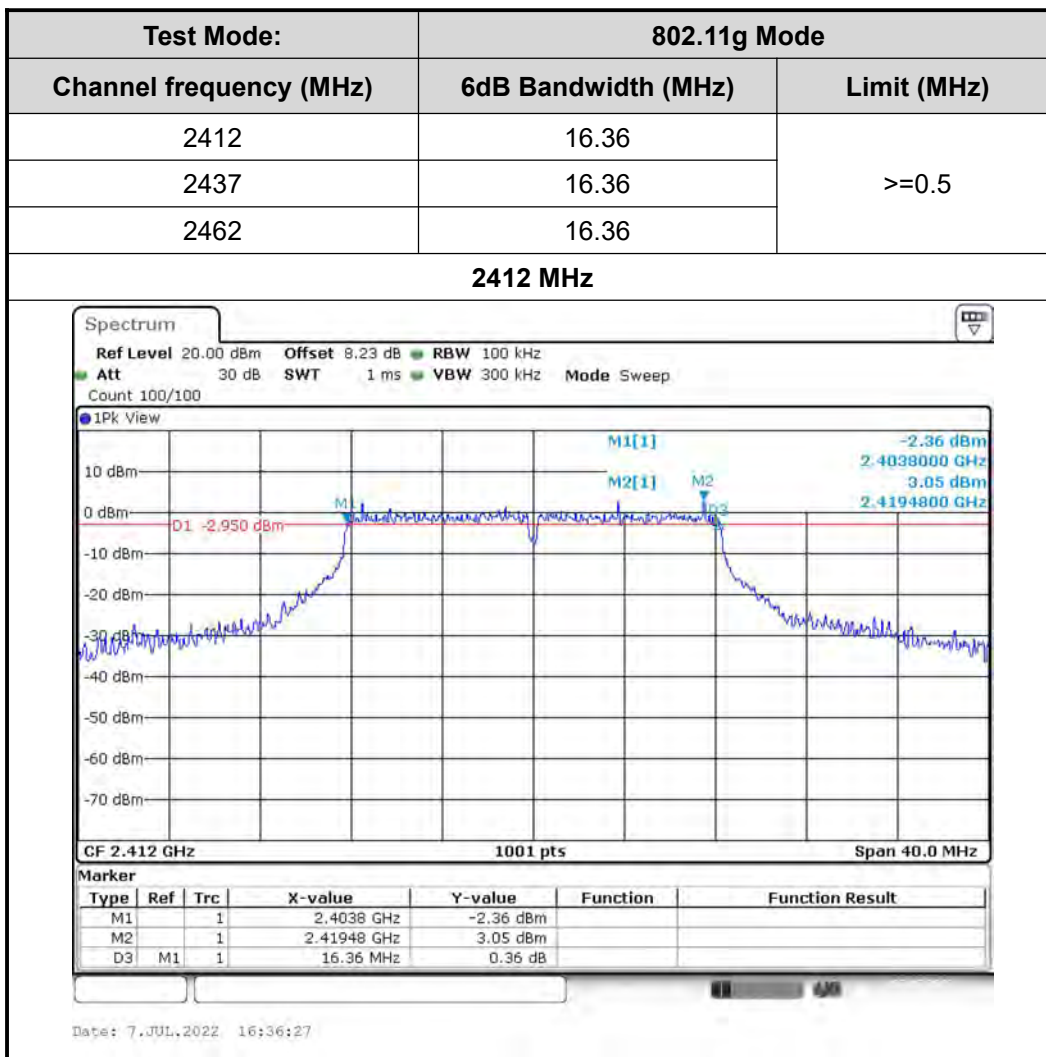
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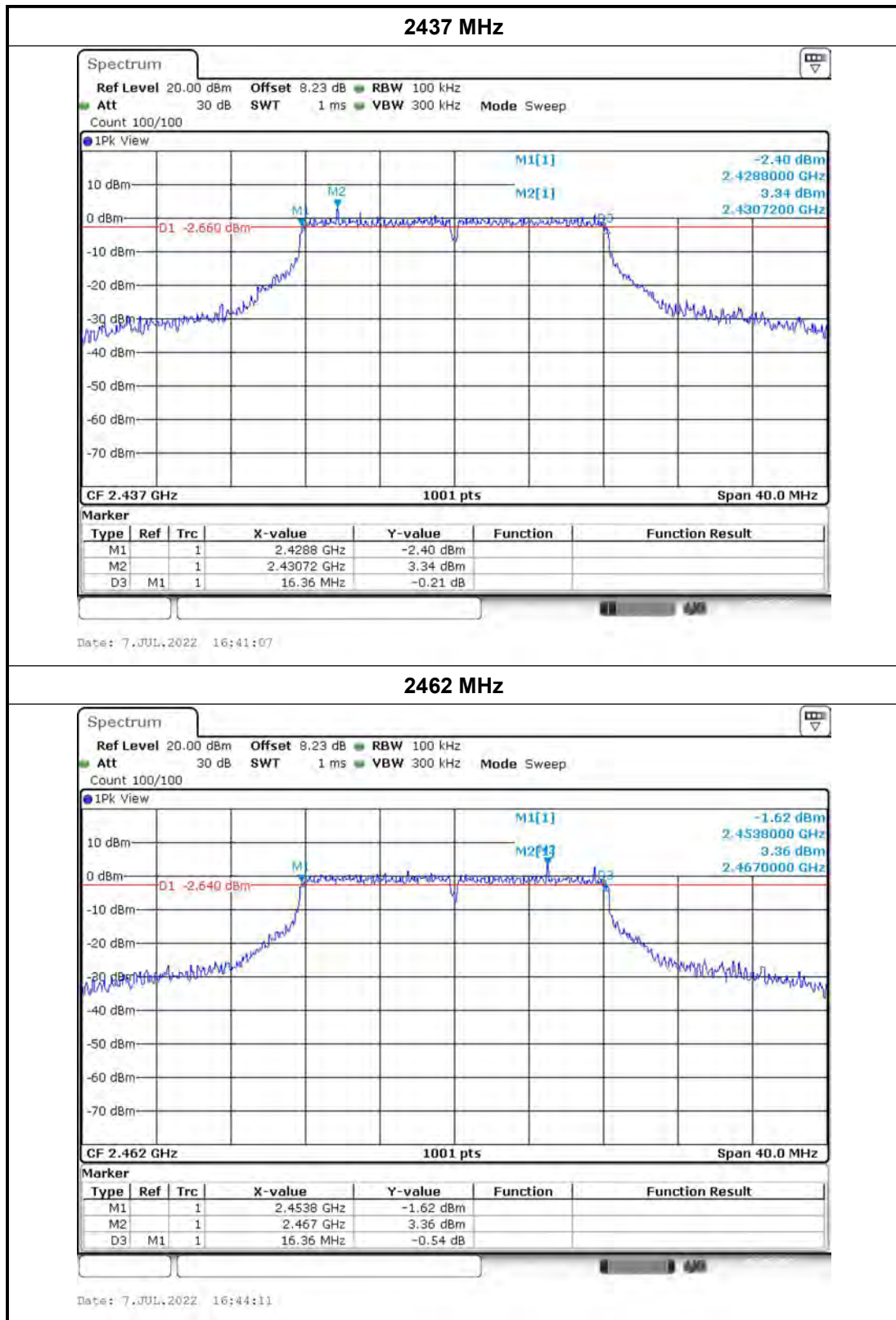


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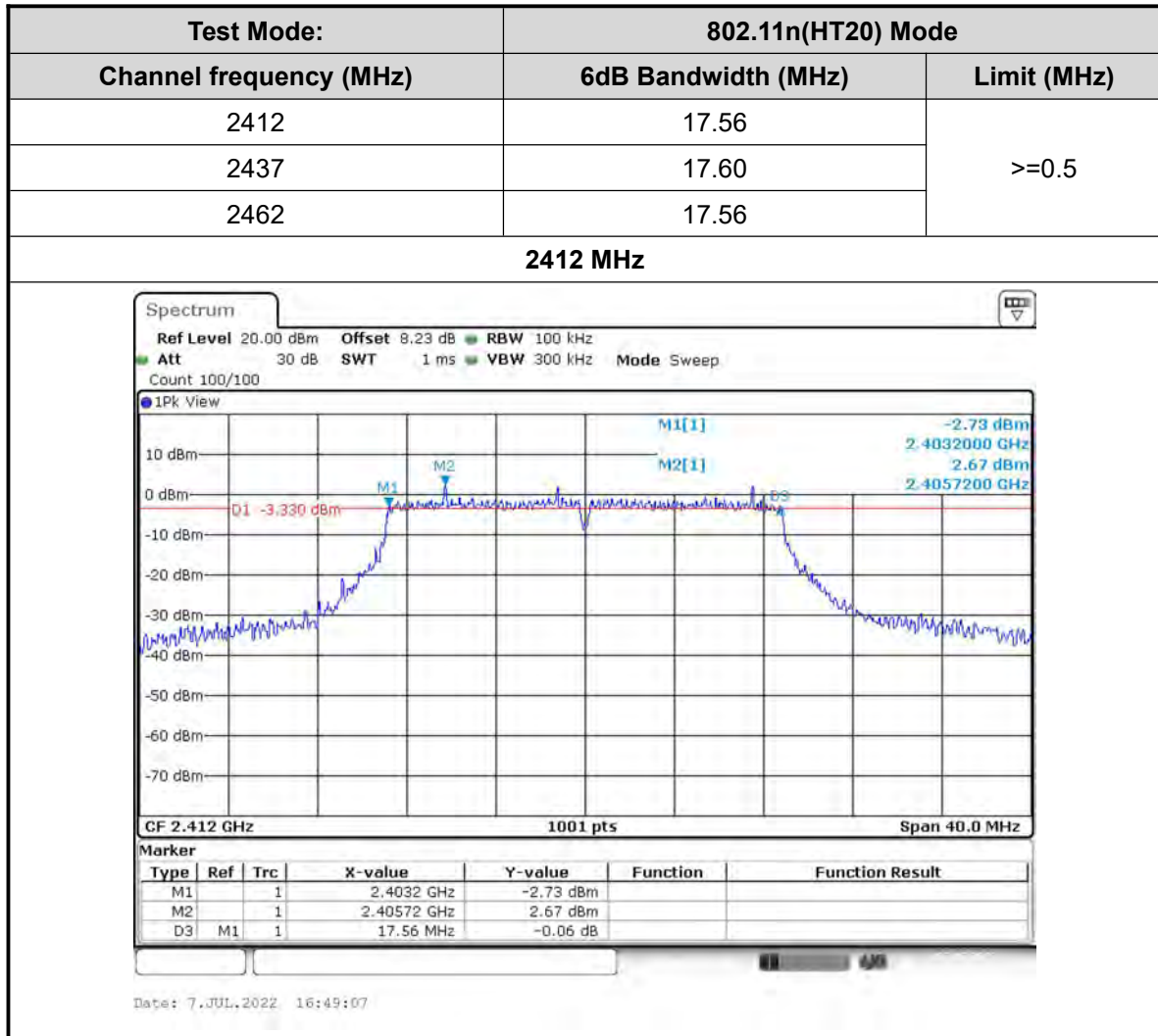


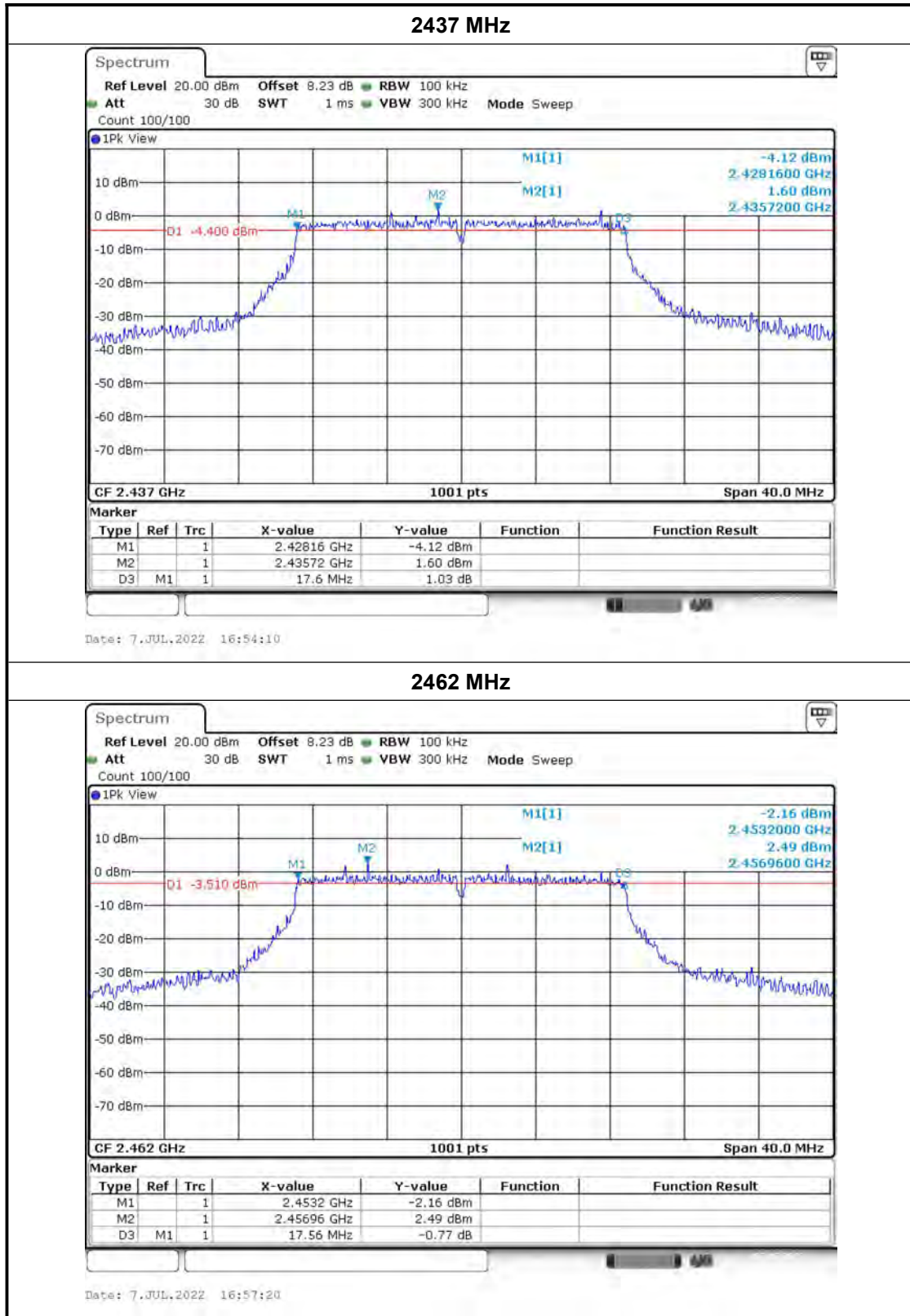


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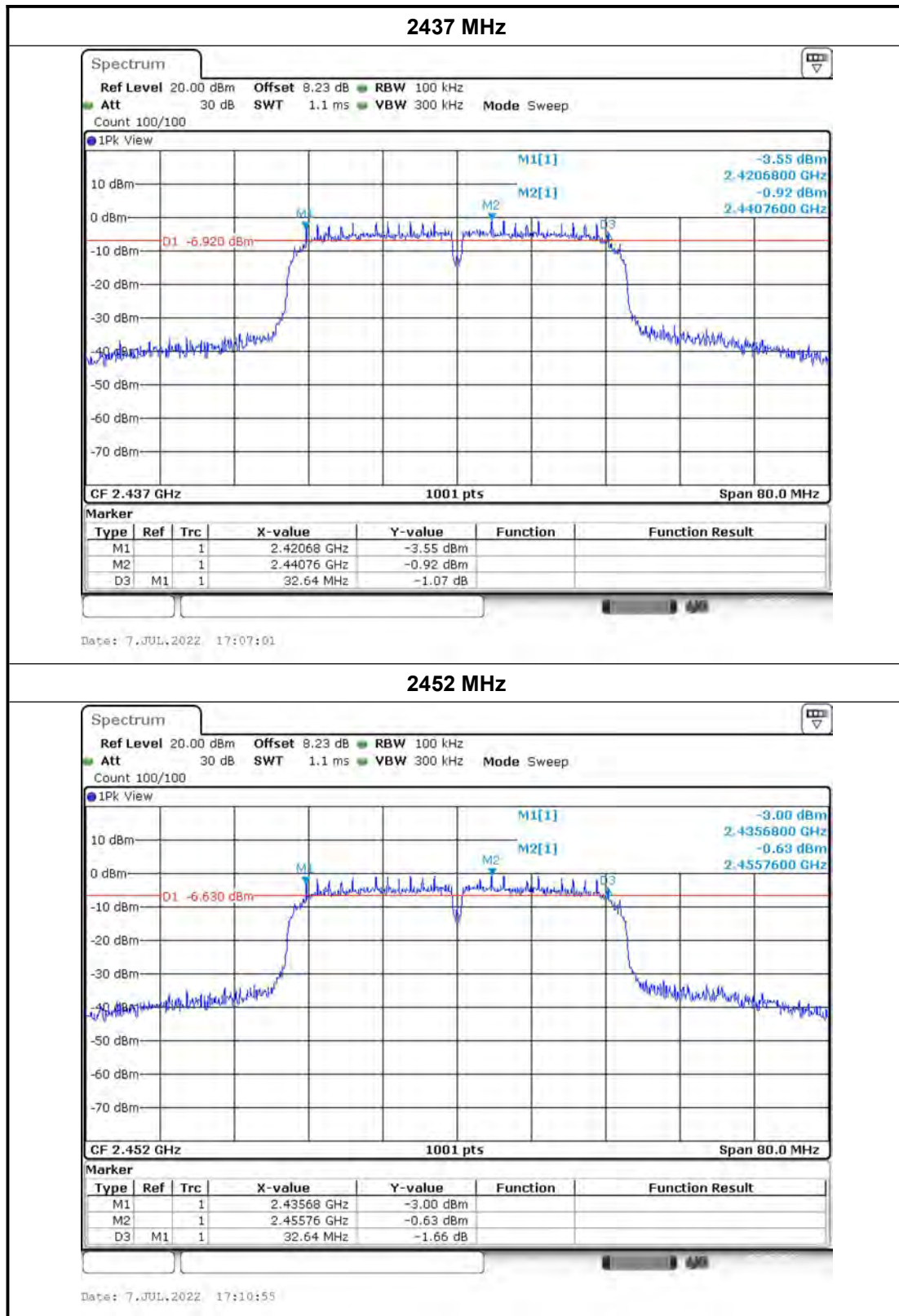
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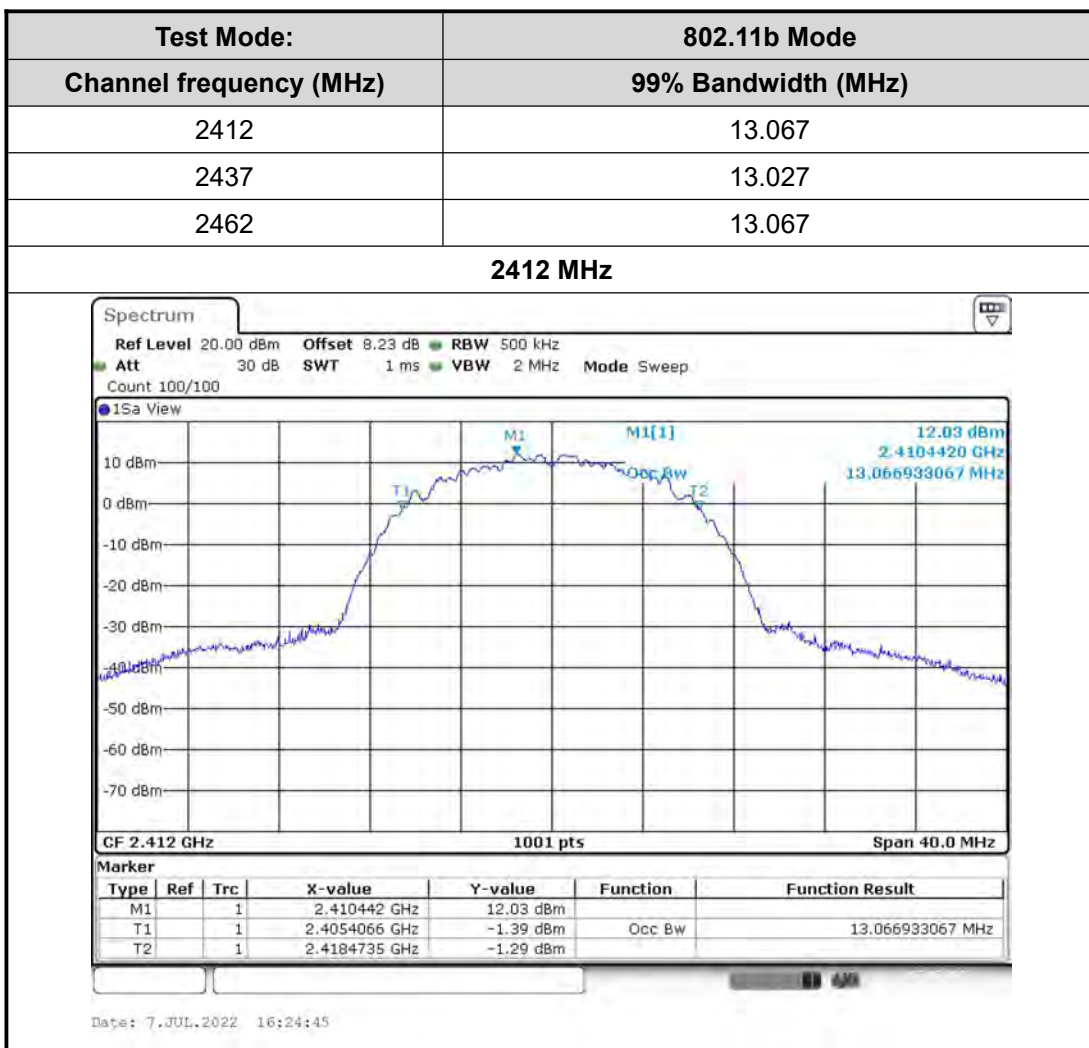
Date: 7.JUL.2022 17:01:59



TRF No. FCC Part 15.247_R1

Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

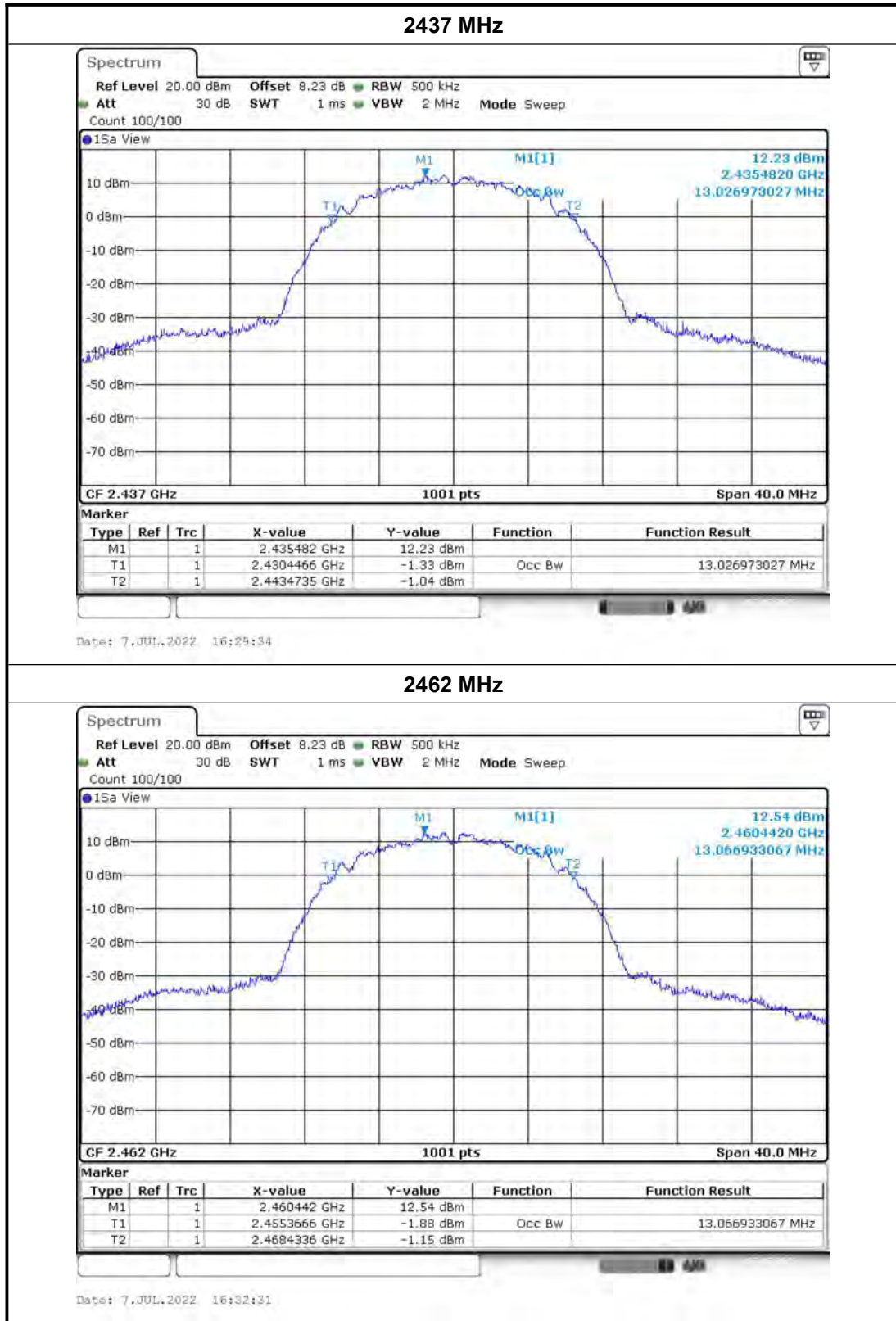
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TRF No. FCC Part 15.247_R1

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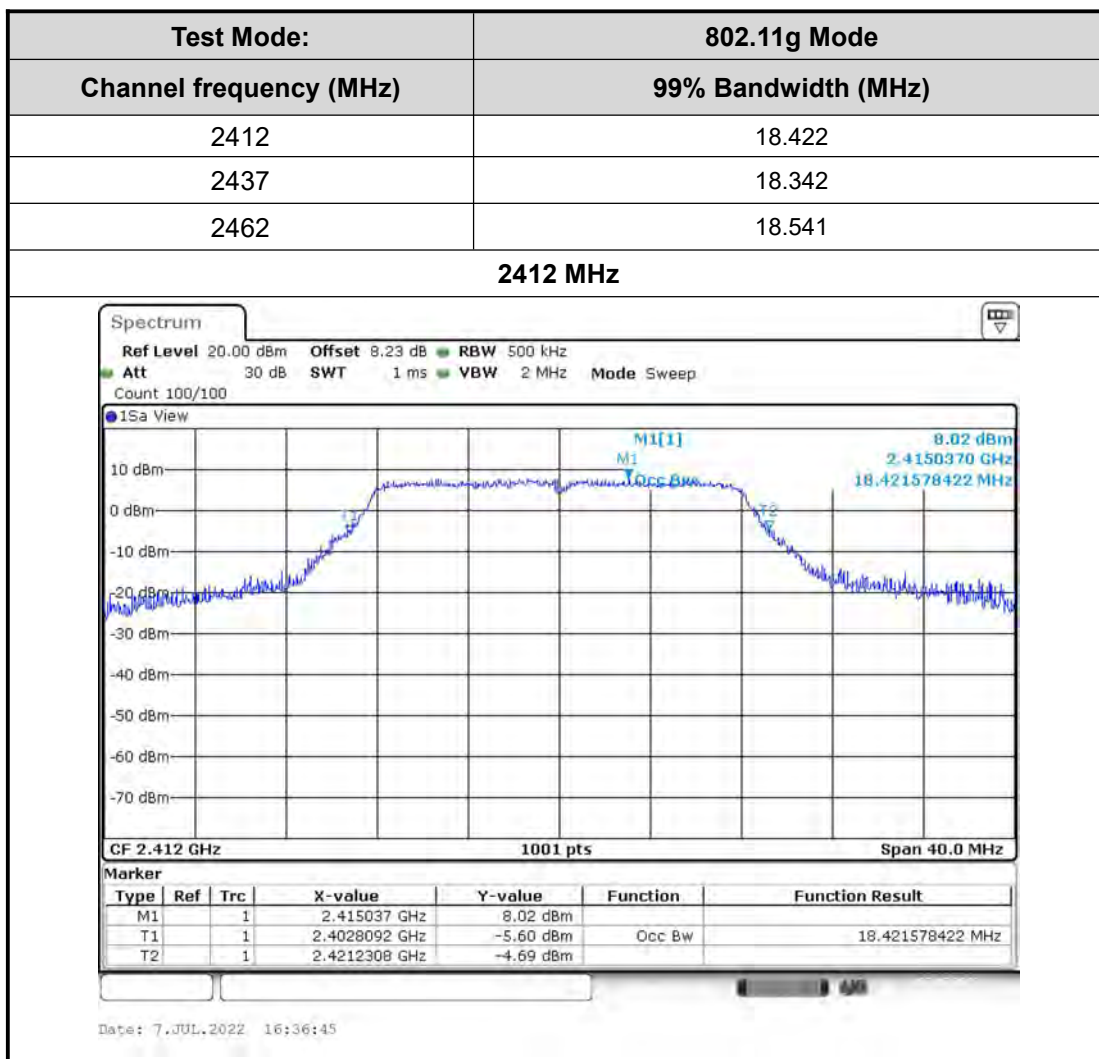
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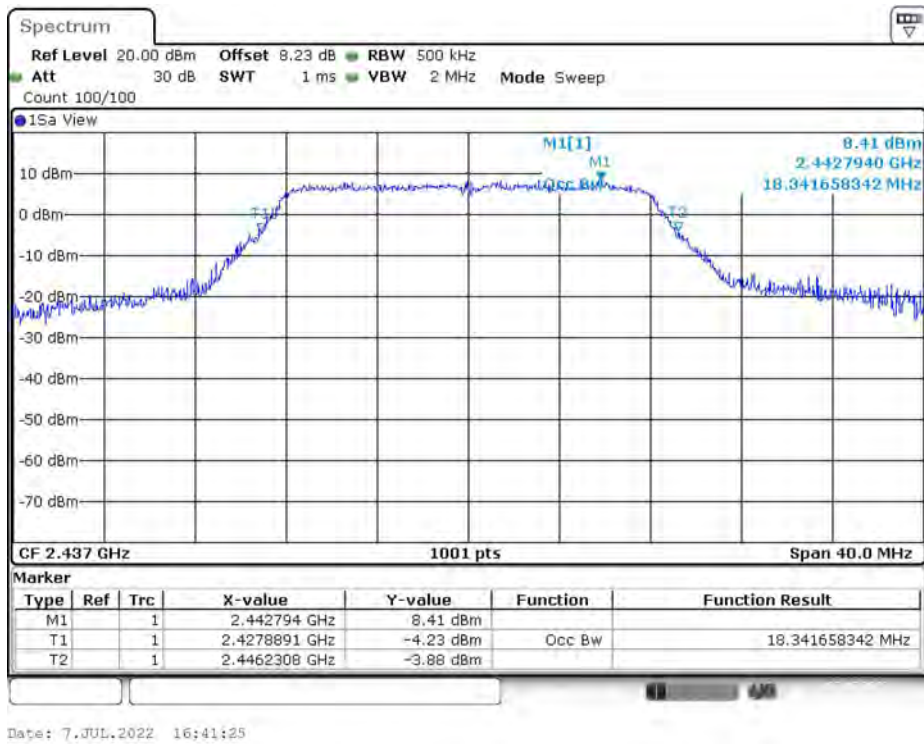
TRF No. FCC Part 15.247_R1

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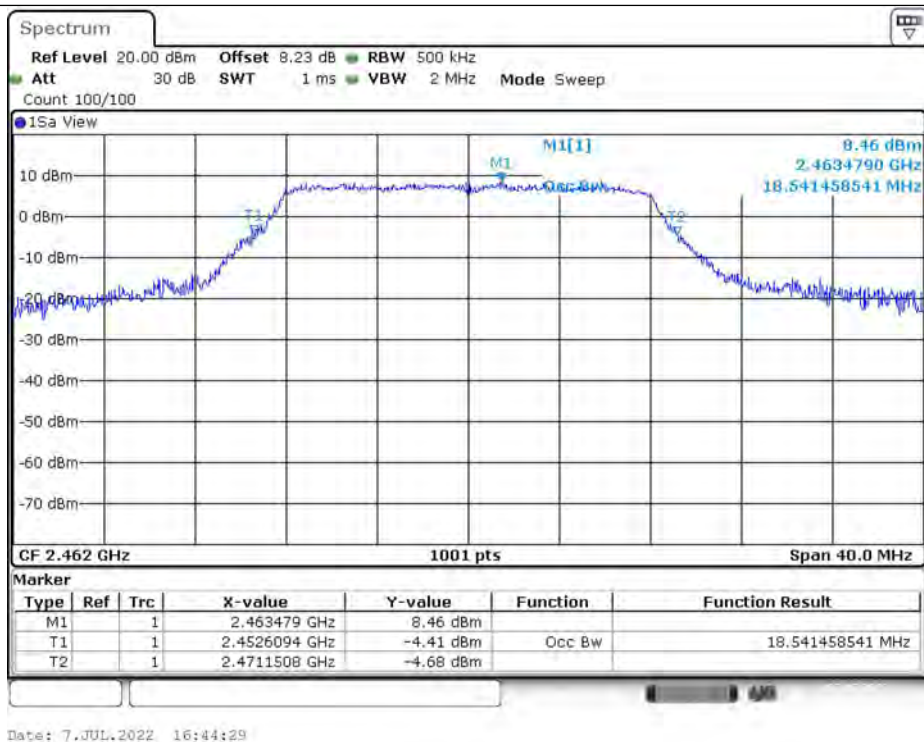
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2437 MHz



2462 MHz



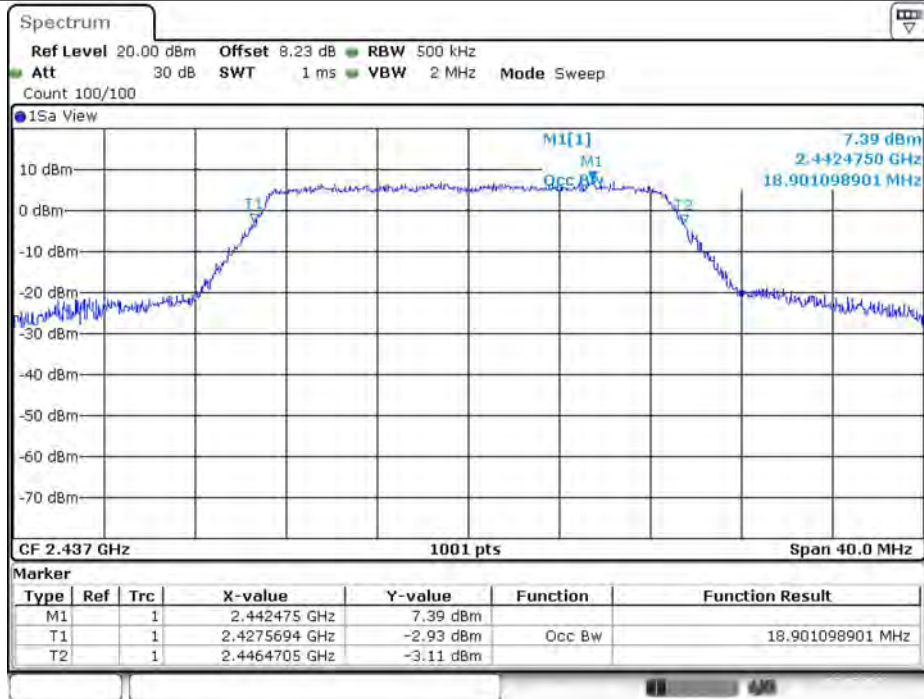
TRF No. FCC Part 15.247_R1

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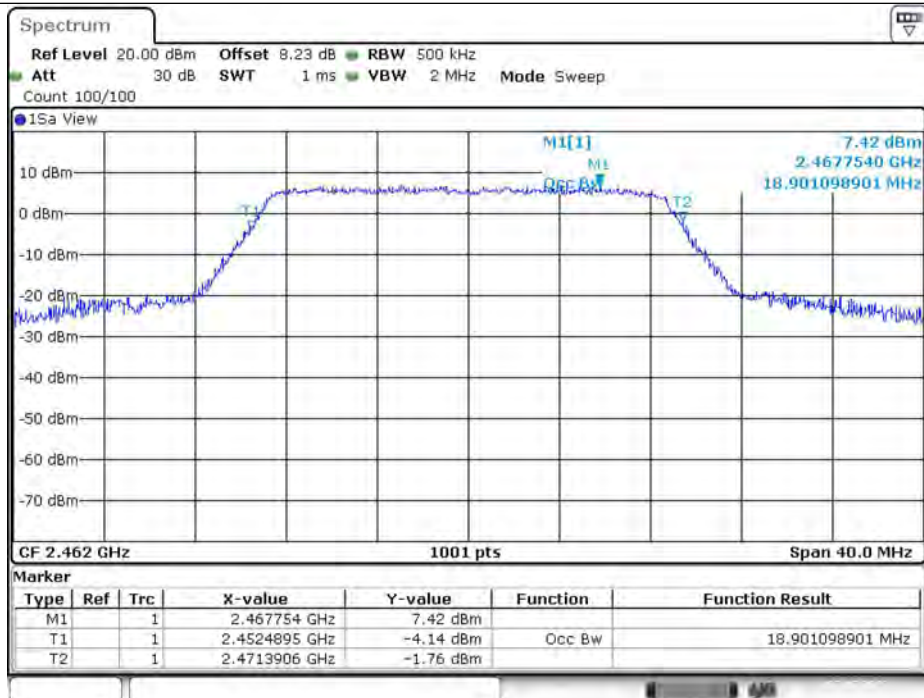


2437 MHz



Date: 7.JUL.2022 16:54:29

2462 MHz

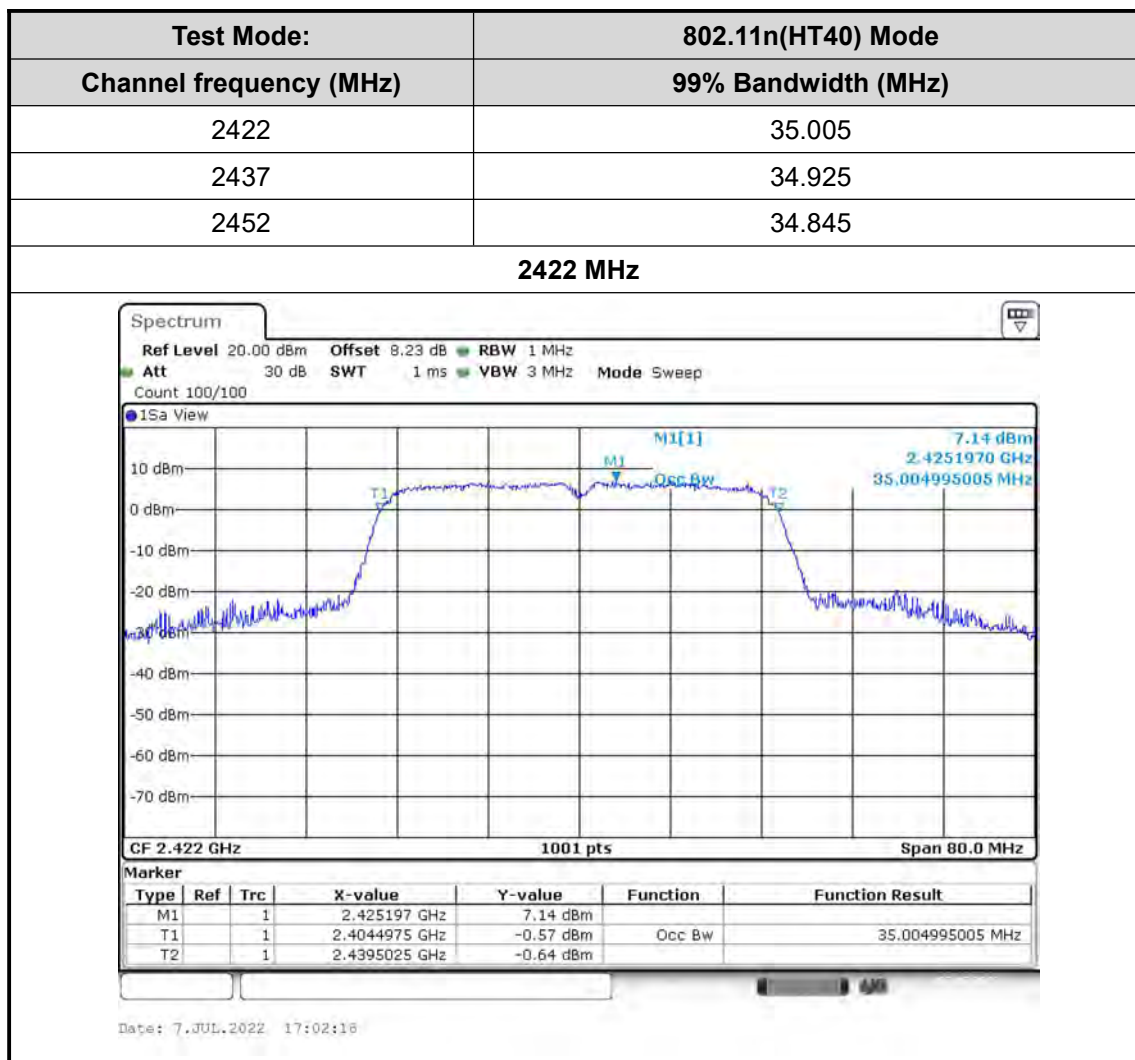


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TRF No. FCC Part 15.247_R1

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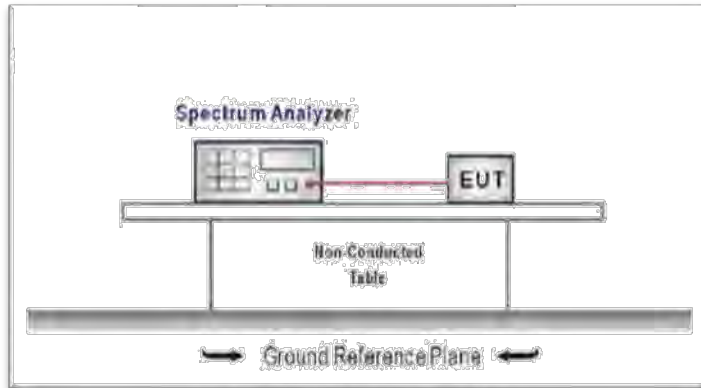
3.5. BAND EDGE AND SPURIOUS EMISSION (CONDUCTED)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Configuration



Test Procedure

1. Connect EUT RF Output port to the Spectrum Analyzer through an RF attenuator.
2. Spectrum Setting:
 - RBW=100KHz
 - VBW=300KHz.
 - Detector function: Peak.
 - Trace: Max hold.
 - Sweep = Auto couple.

Allow the trace to stabilize.

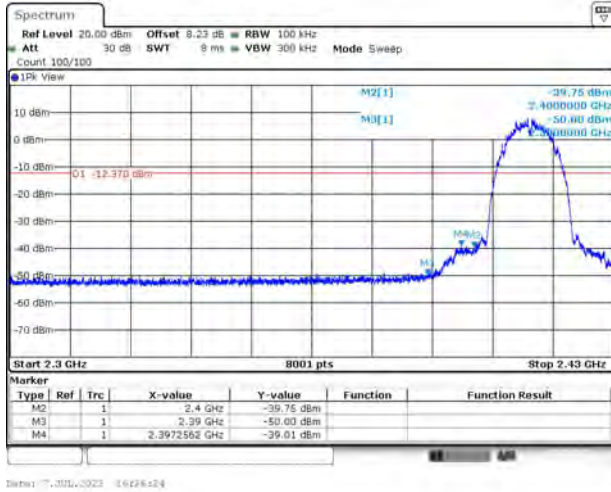
Test Mode

Please refer to the clause 2.2.

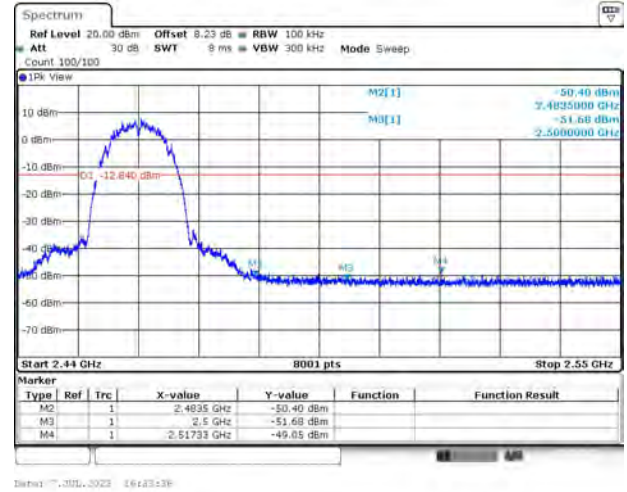
Test Results

802.11b

CH01-Bandedge

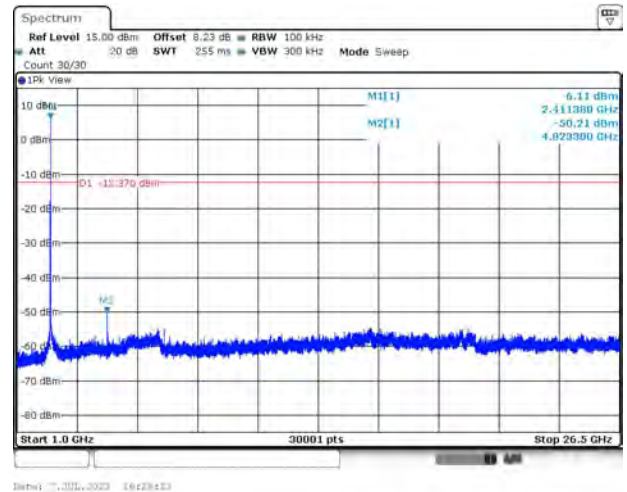
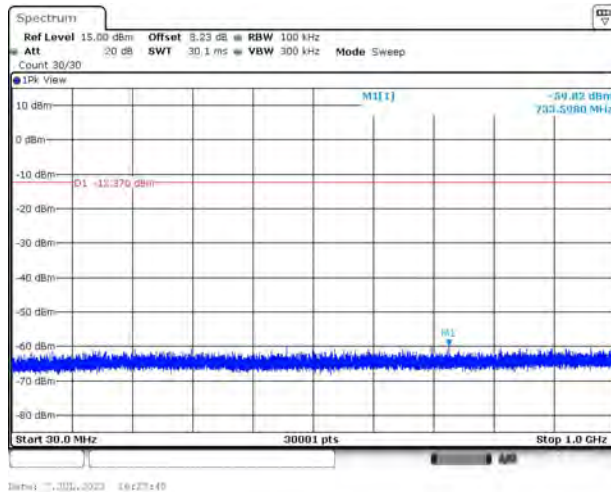


CH11-Bandedge

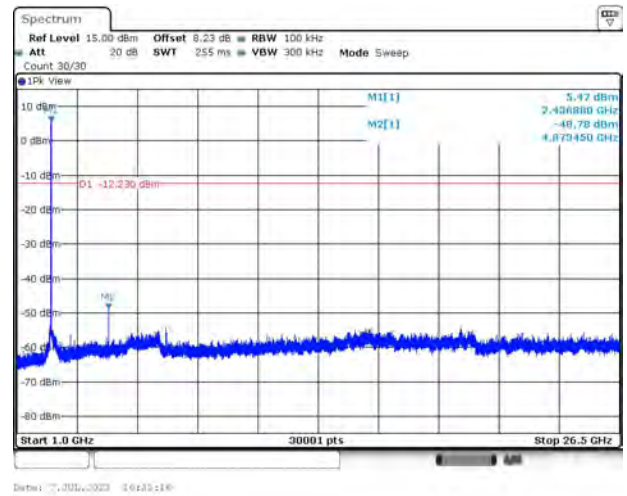
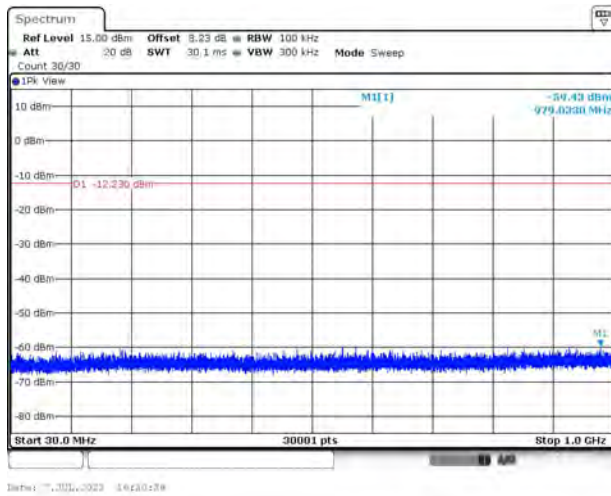


802.11b

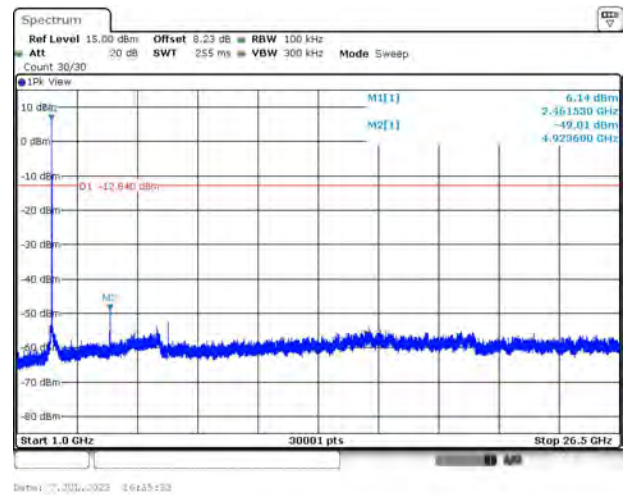
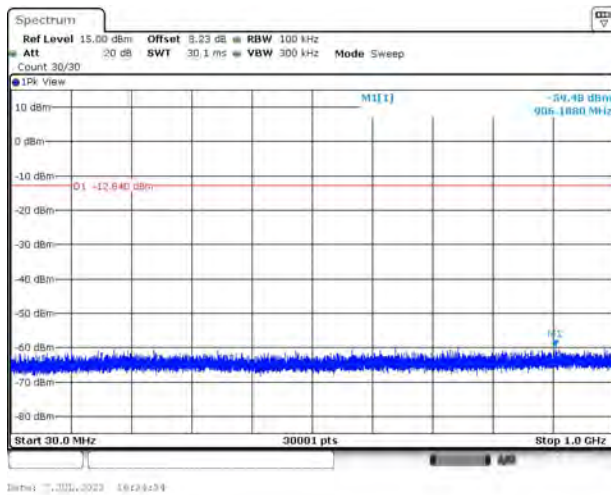
CH01-SE



CH06-SE

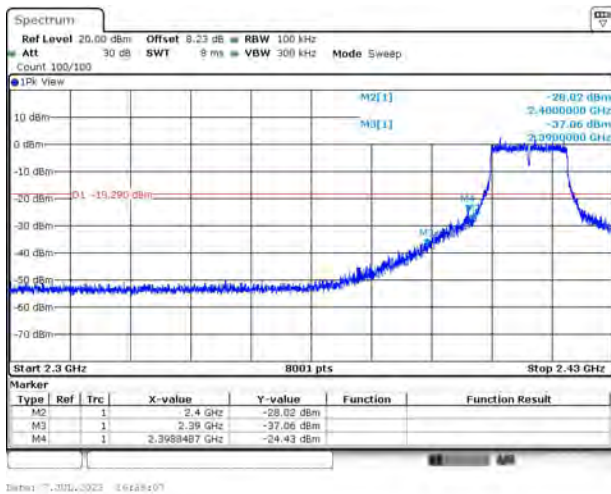


CH11-SE

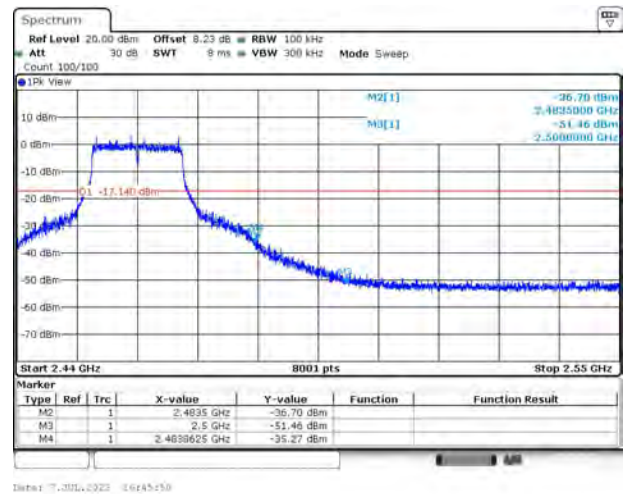


802.11g

CH01-Bandedge



CH11-Bandedge



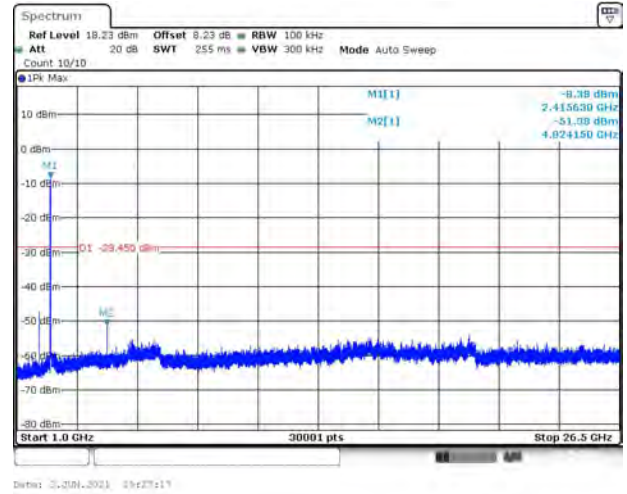
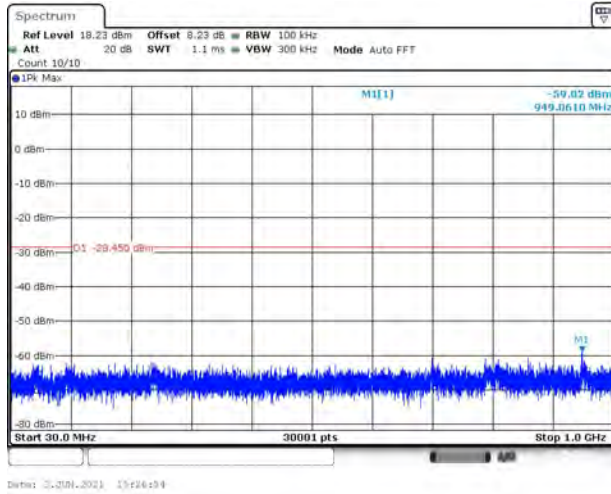
TRF No. FCC Part 15.247_R1

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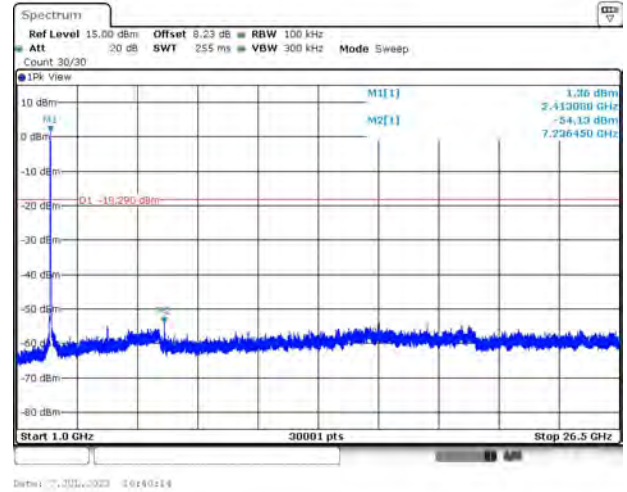
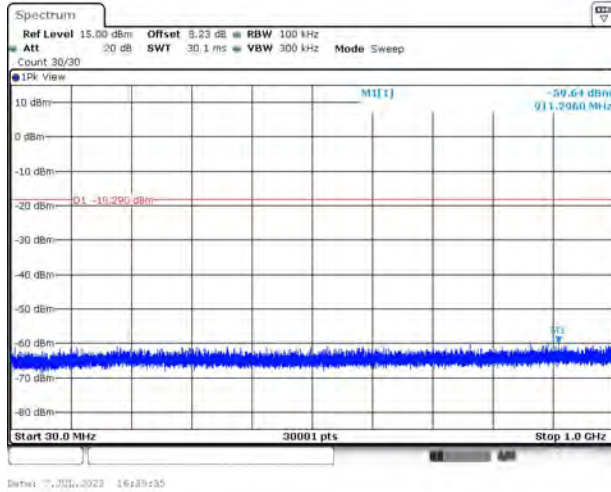
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802.11g

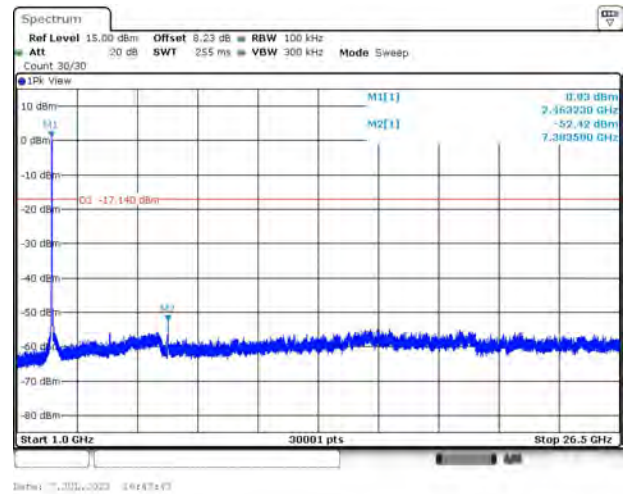
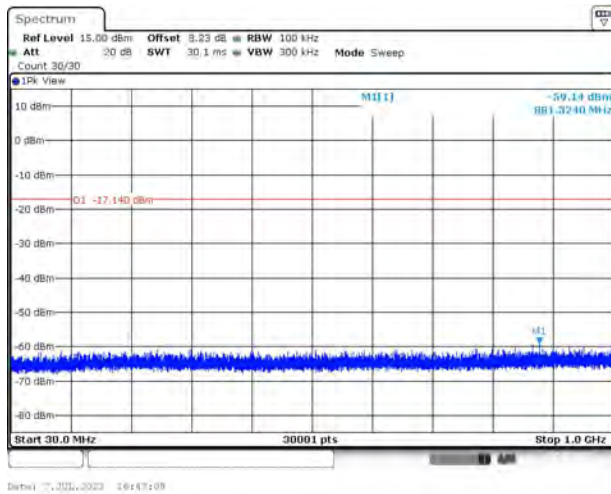
CH01-SE



CH06-SE



CH11-SE



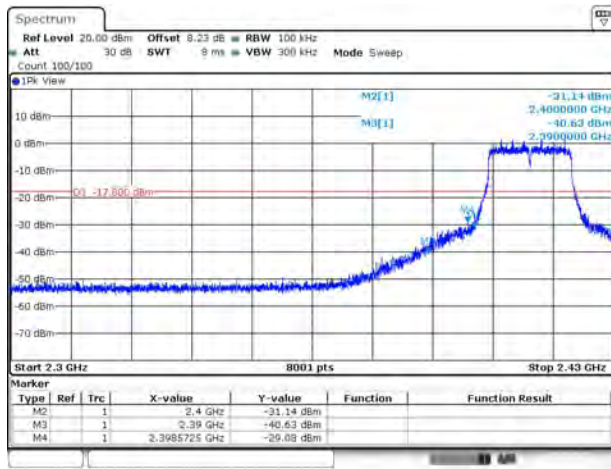
TRF No. FCC Part 15.247_R1

Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

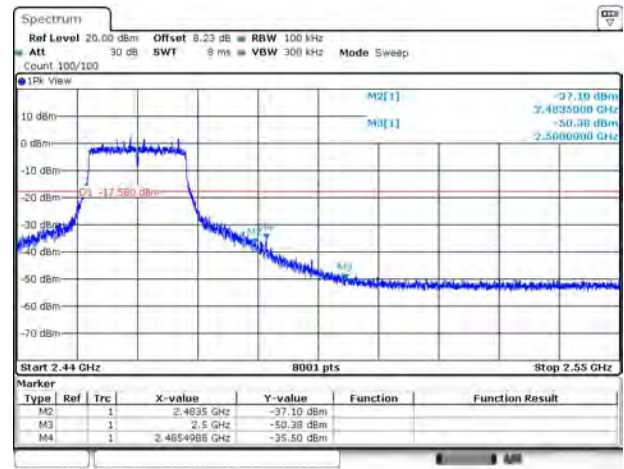
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802.11n(HT20)

CH01-Bandedge

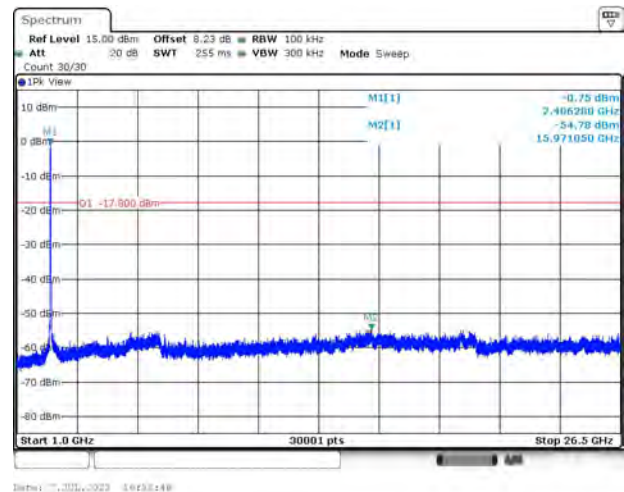
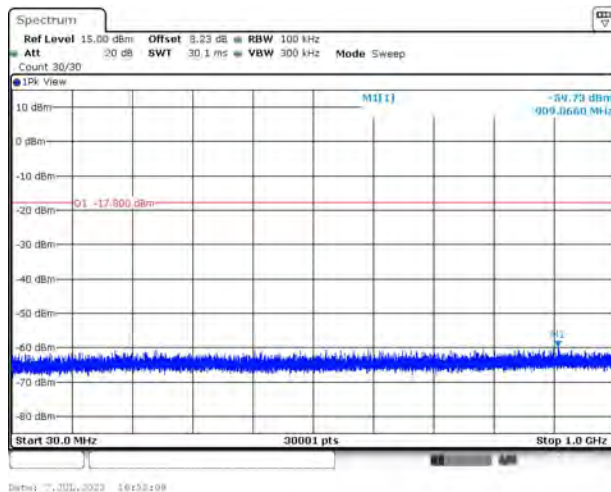


CH11-Bandedge

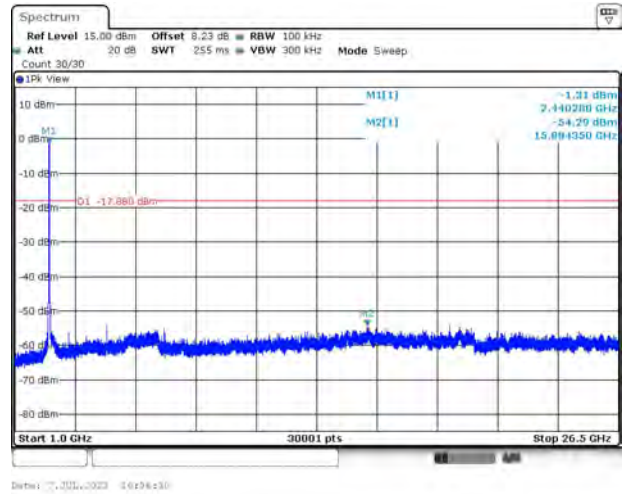
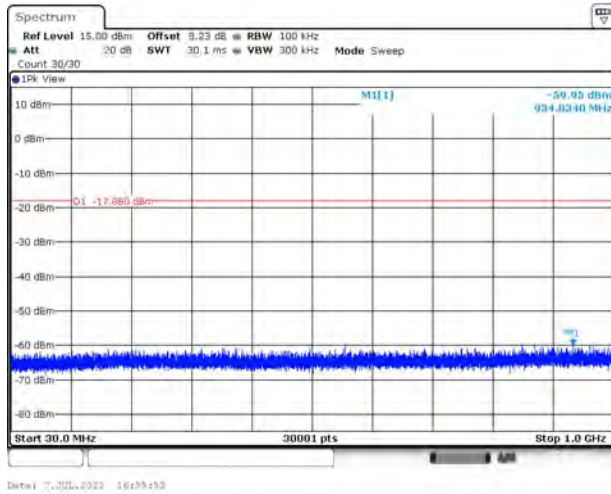


802.11n(HT20)

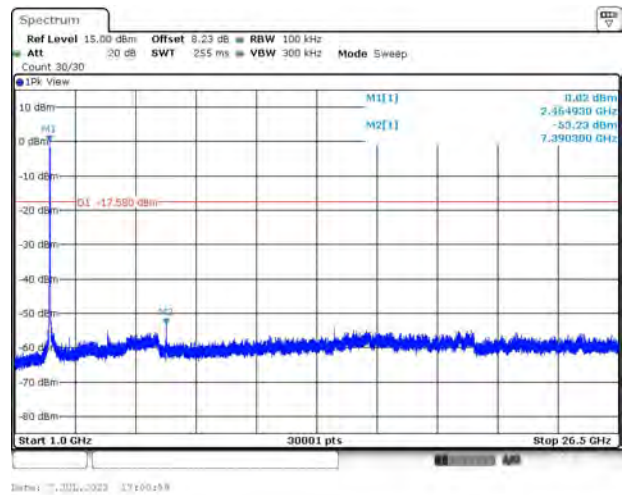
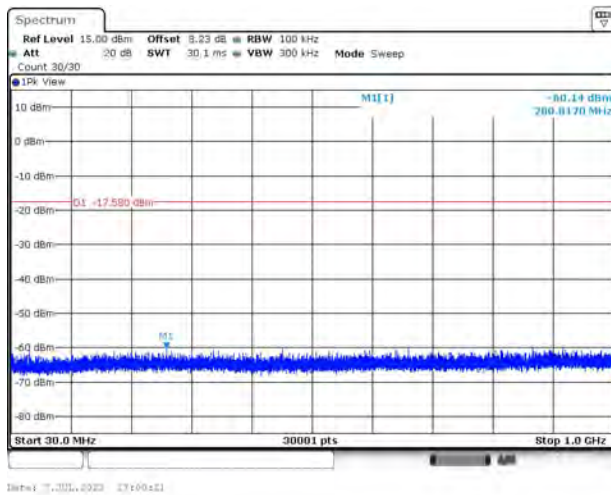
CH01-SE



CH06-SE

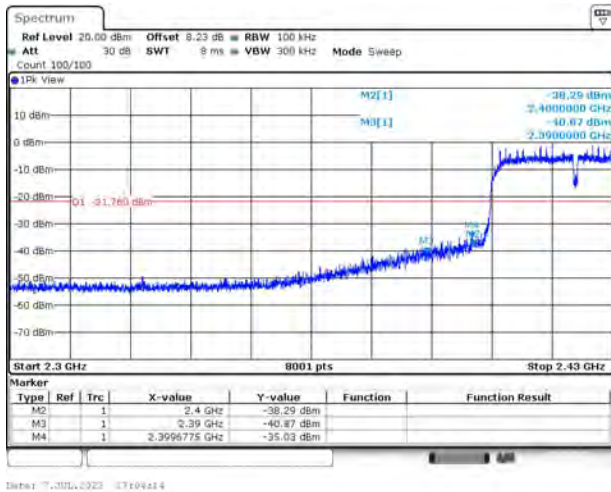


CH11-SE

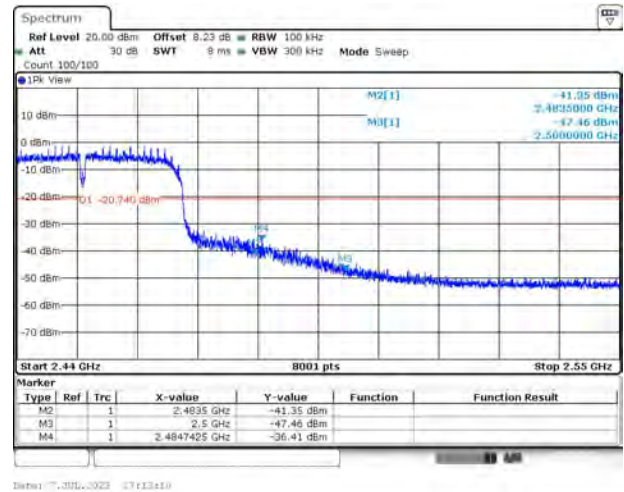


802.11n(HT40)

CH01-Bandedge



CH11-Bandedge



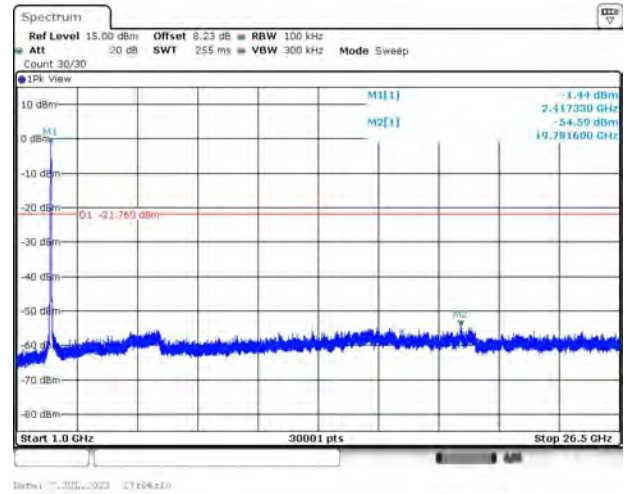
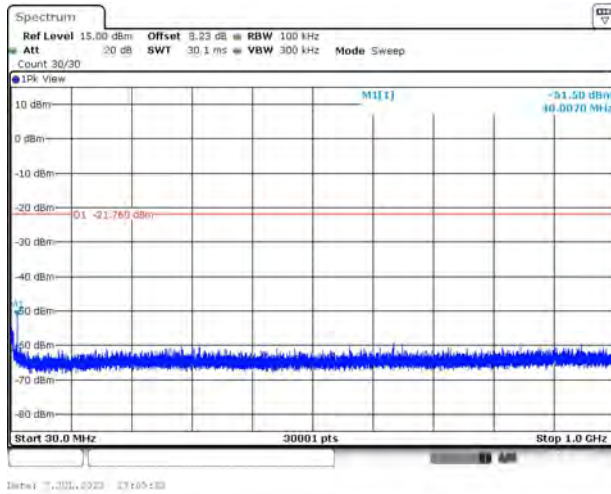
TRF No. FCC Part 15.247_R1

Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

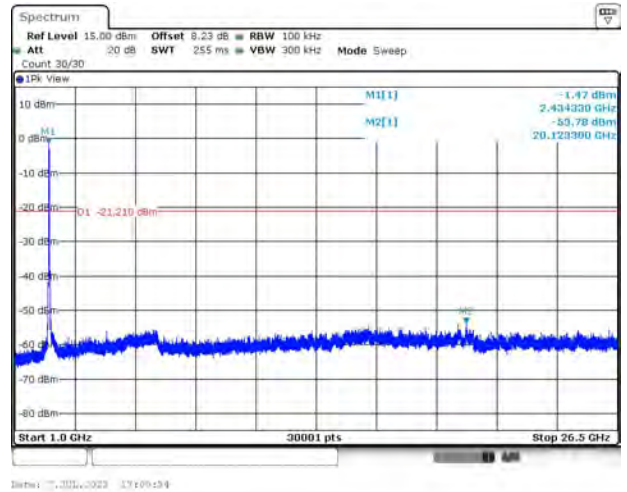
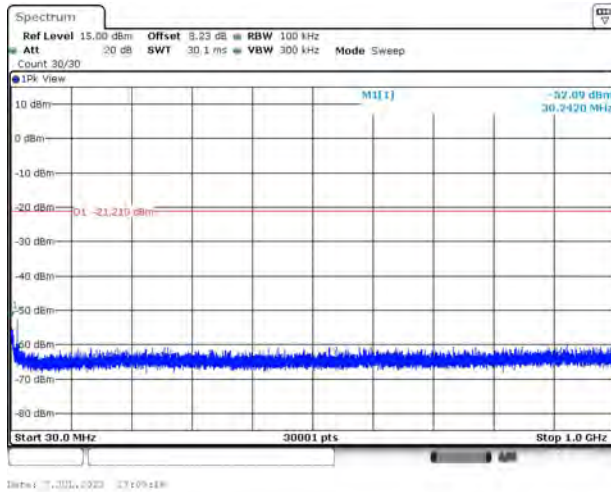
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802.11n(HT40)

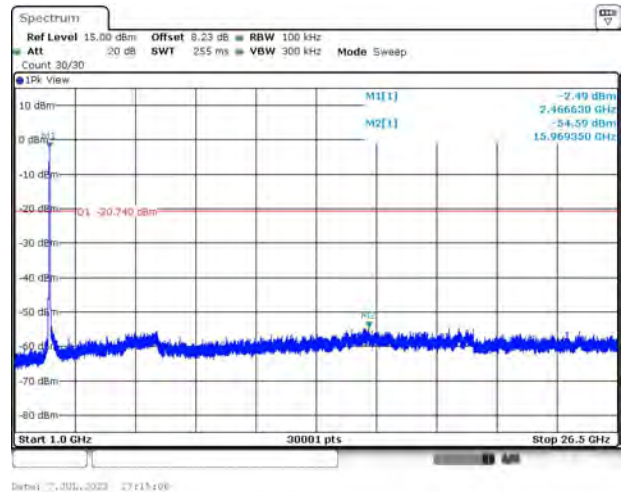
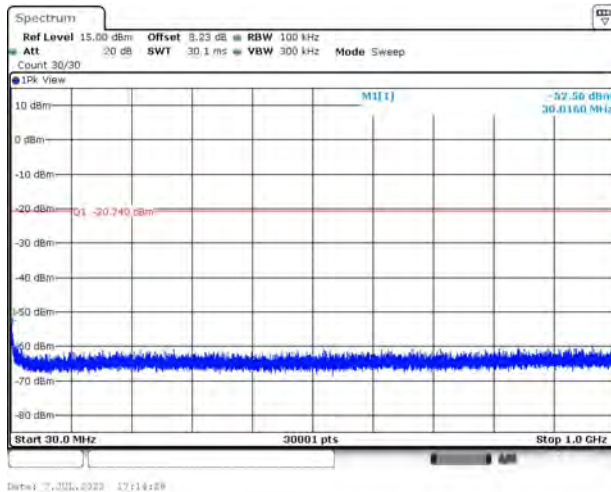
CH03-SE



CH06-SE



CH09-SE



TRF No. FCC Part 15.247_R1

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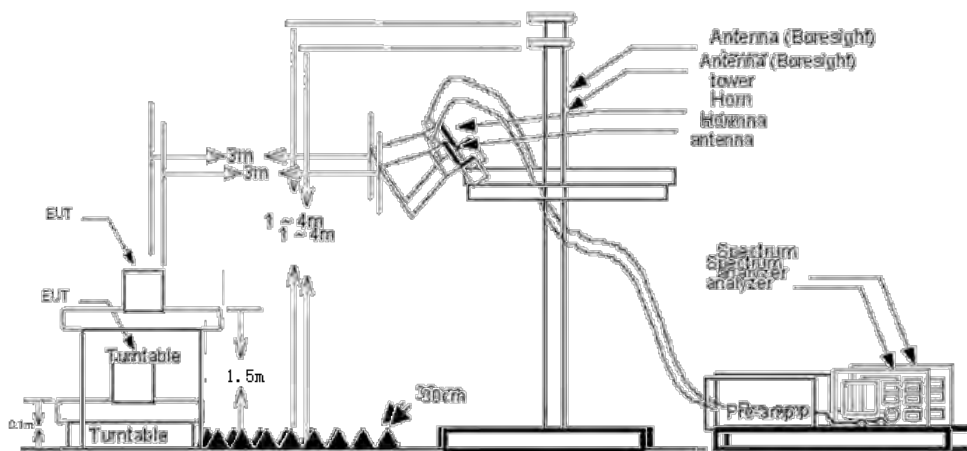
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3.6. BAND EDGE EMISSIONS(RADIATED)

Limit

| Restricted Frequency Band (MHz) | (dBuV/m)(at 3m) | |
|--|-----------------|---------|
| | Peak | Average |
| 2310 ~2390 | 74 | 54 |
| 2483.5 ~2500 | 74 | 54 |
| Note: All restriction bands have been tested, only the worst case is reported. | | |

Test Configuration



Test Procedure

- The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- The receiver set as follow:
RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
RBW=1MHz, VBW=10Hz with PEAK detector for Average Value.

Test Mode

Please refer to the clause 2.2.

Test Results

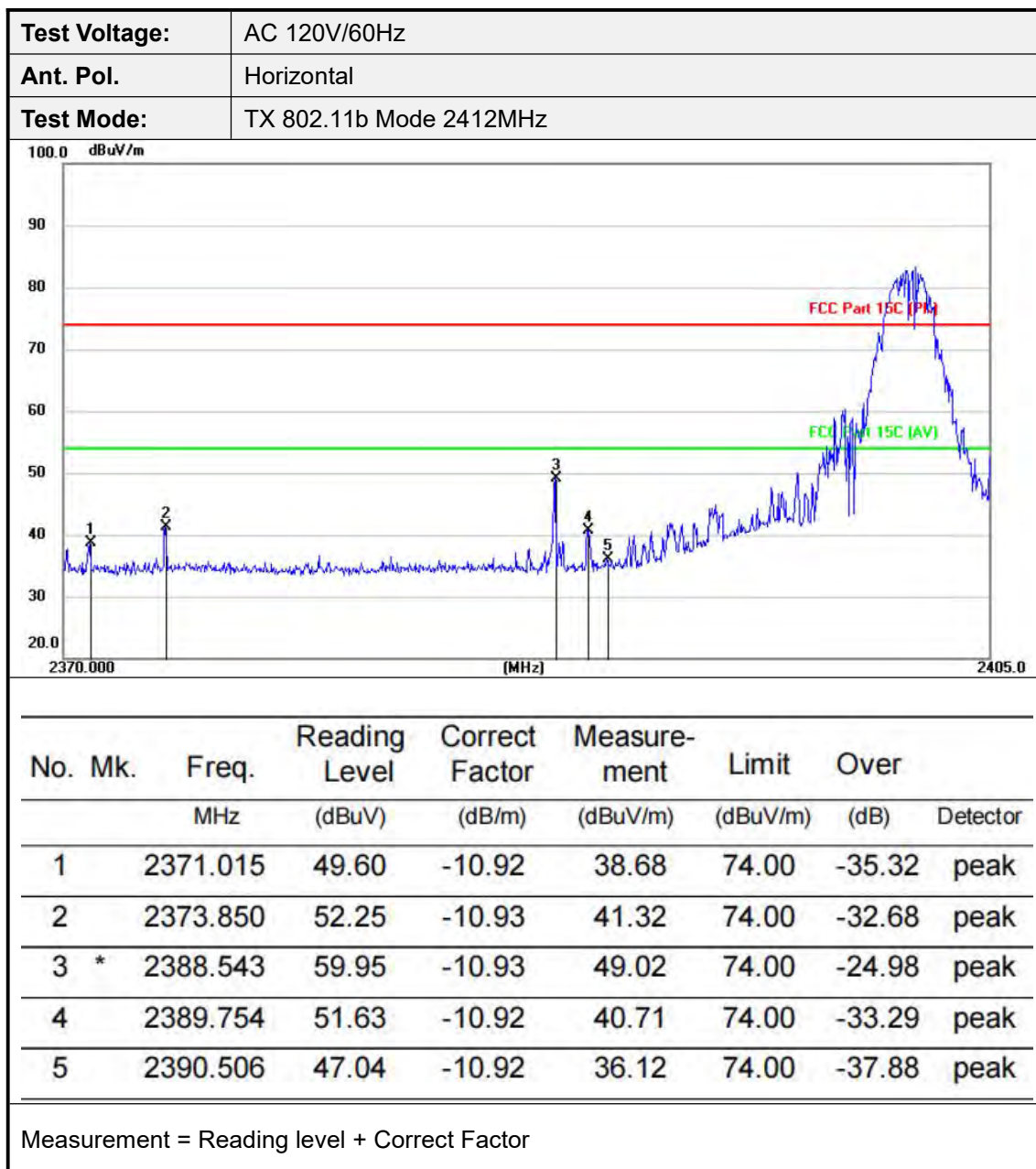
Note:

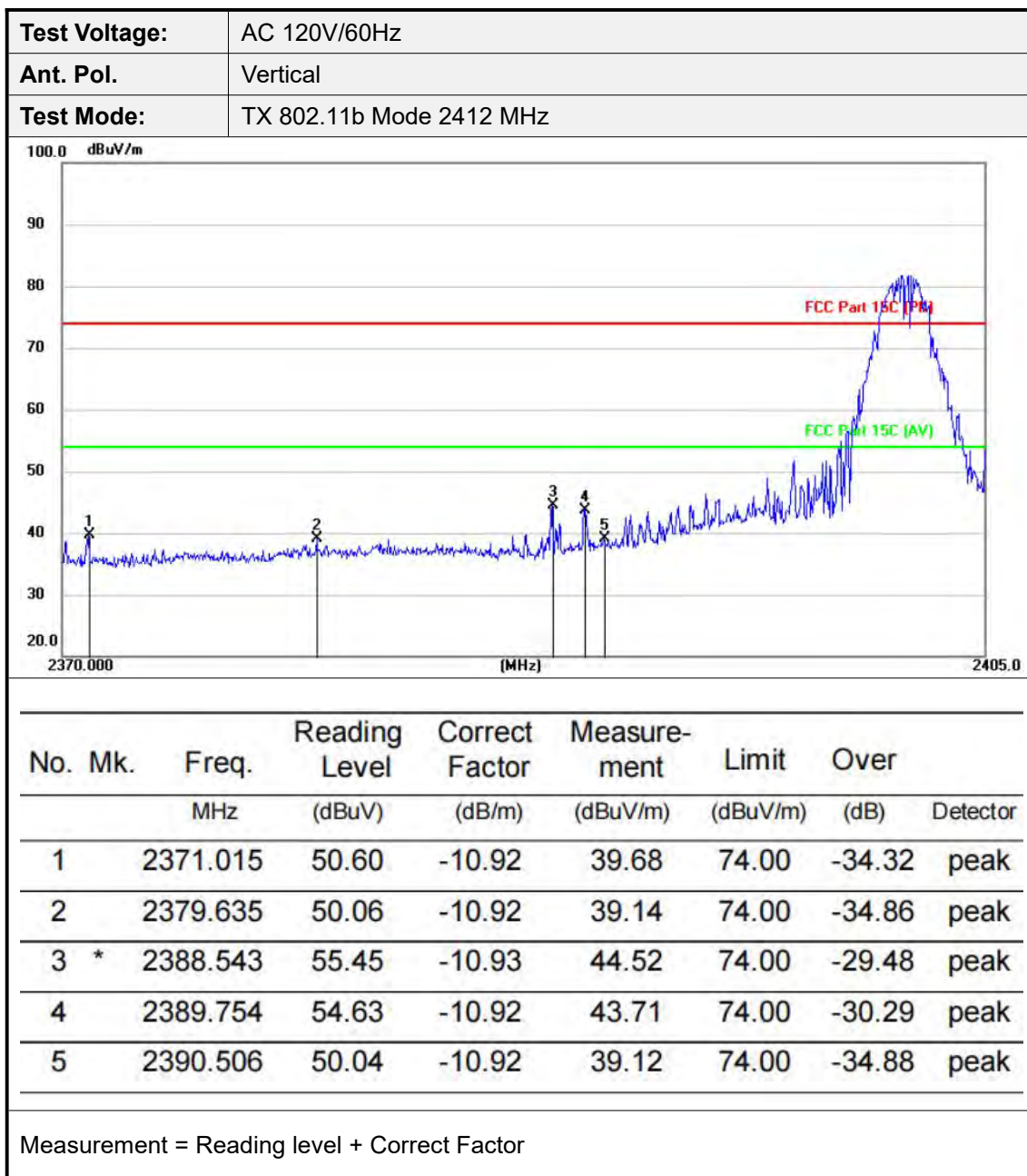
- Measurement = Reading level + Correct Factor
Correct Factor=Antenna Factor + Cable Loss - Preamplifier Factor
- Pre-scan 802.11b, 802.11g, 802.11n(HT20) and 802.11n (HT40) mode, and found the 802.11b mode which it is worse case, so only show the test data for worse case.

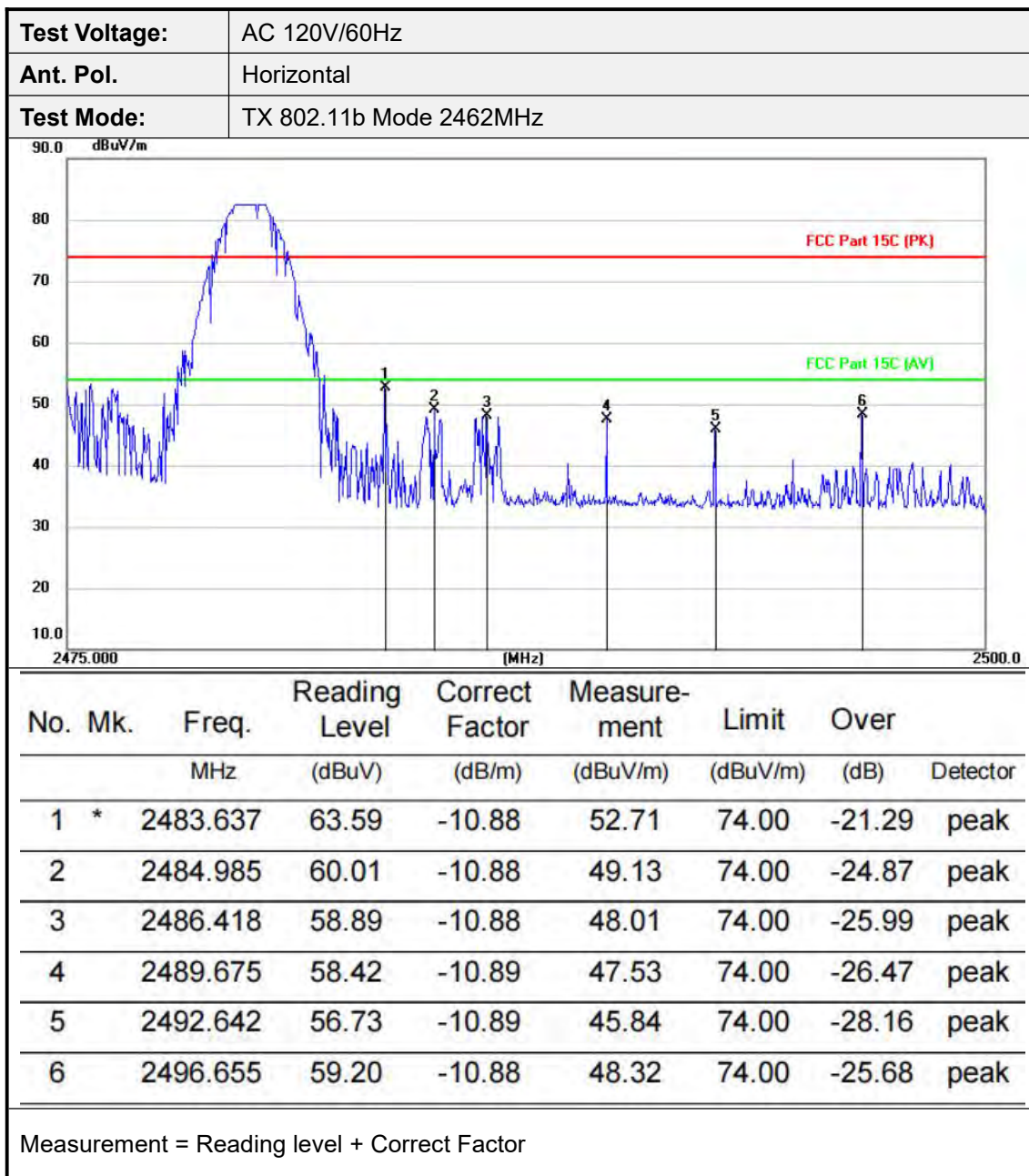
TRF No. FCC Part 15.247_R1

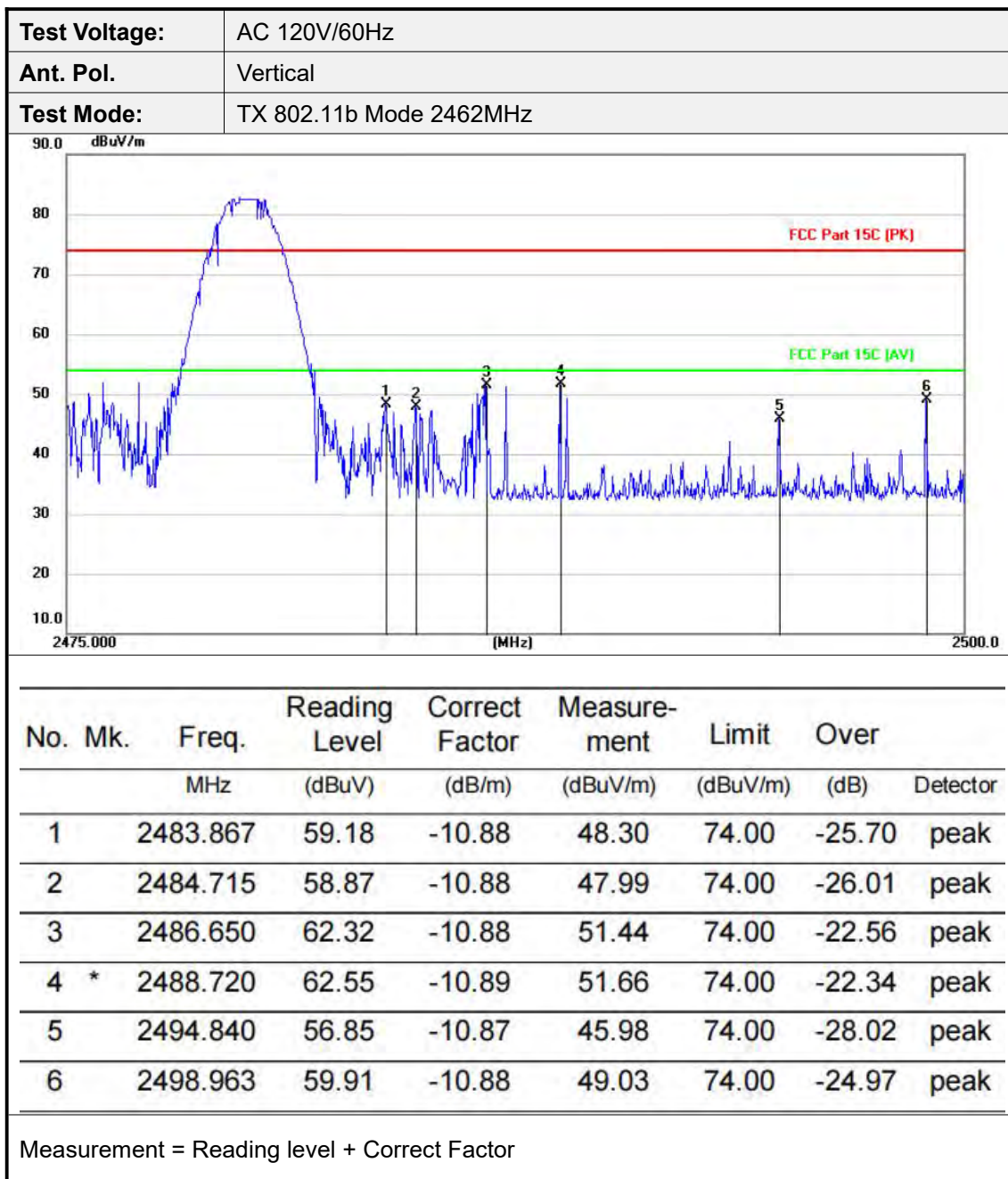
Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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3.7. SPURIOUS EMISSION (RADIATED)

Limit

Radiated Emission Limits (9 kHz~1000 MHz)

| 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 |

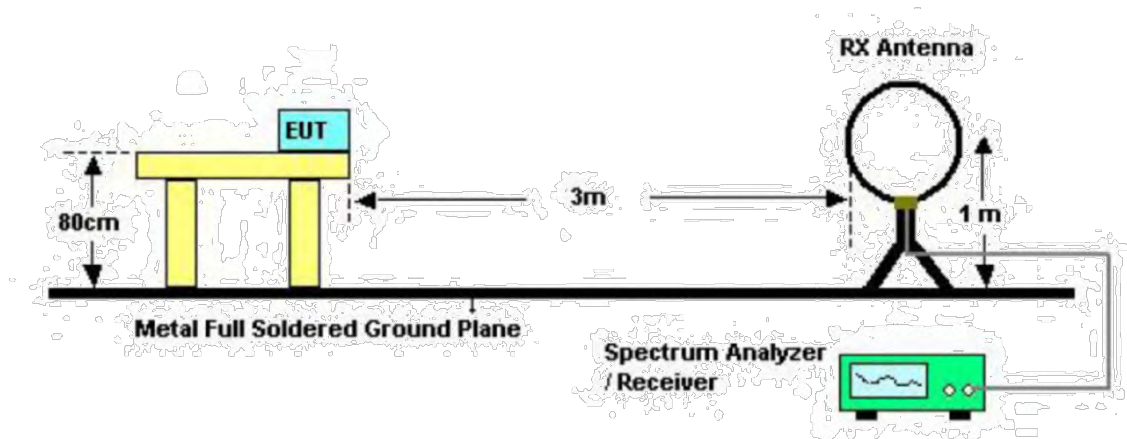
Radiated Emission Limit (Above 1000MHz)

| Frequency (MHz) | Distance Meters(at 3m) | |
|-----------------|------------------------|---------|
| | Peak | Average |
| Above 1000 | 74 | 54 |

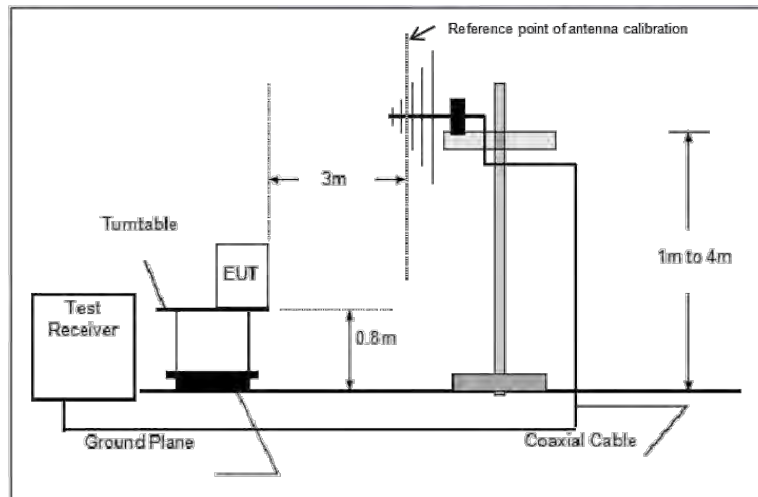
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

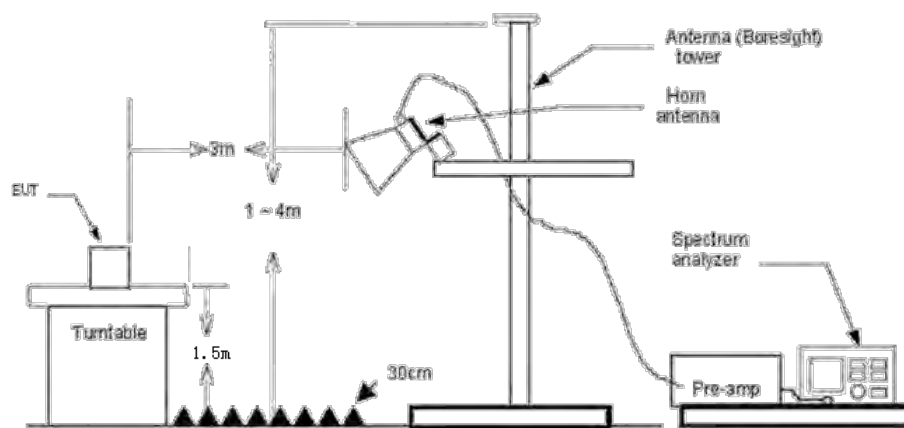
Test Configuration



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. 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 turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;

(2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

(3) From 1 GHz to 10th harmonic:

RBW=1MHz, VBW=1MHz Peak detector for Peak value.

RBW=1MHz, VBW=10Hz Peak detector for Peak value.

Test Mode

Please refer to the clause 2.2.

Test Result

Pass

Note:

1) Measurement = Reading level + Correct Factor

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

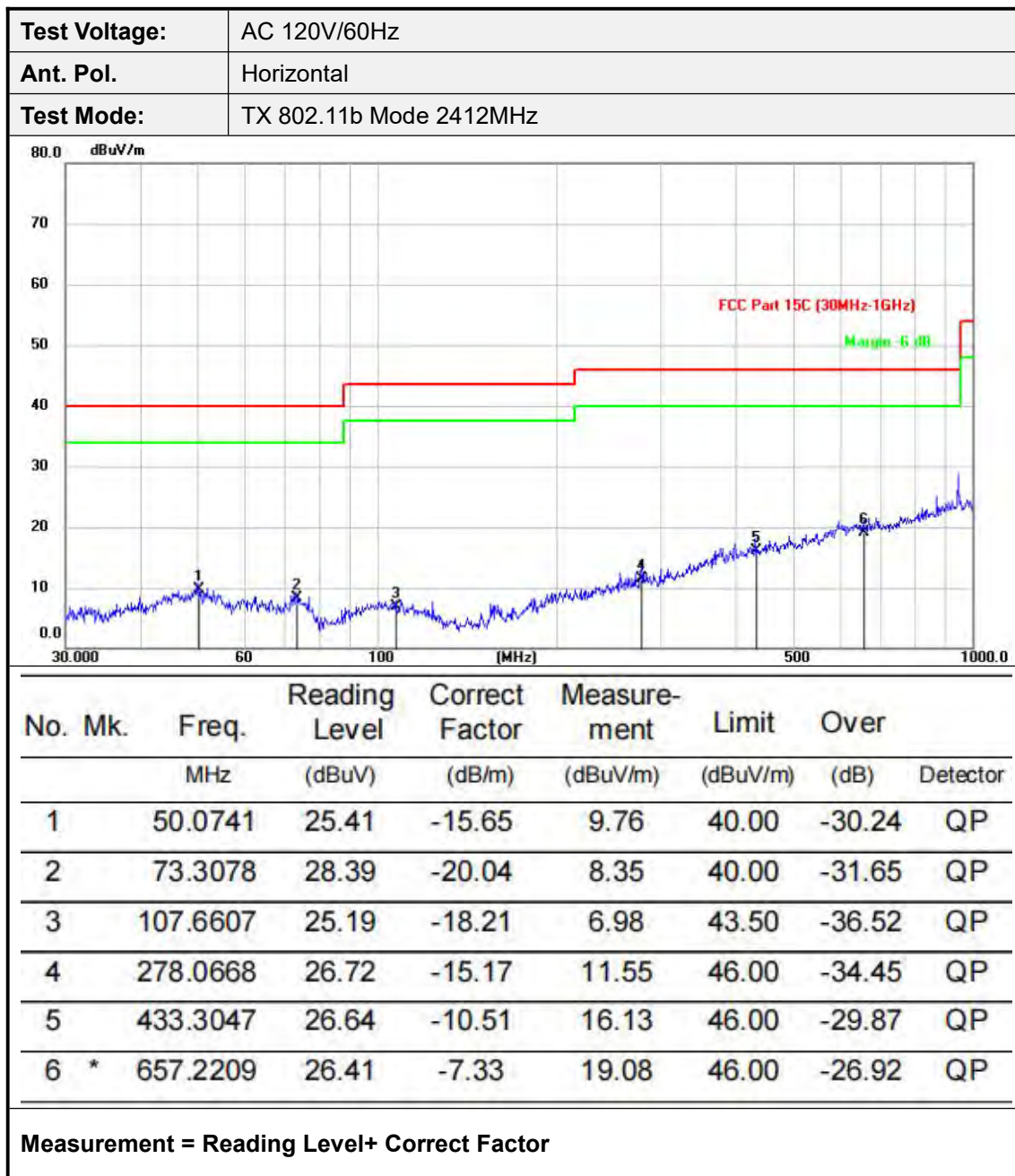
2) From 9 KHz~30 MHz and 18GHz~25GHz,the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3) Pre-scan 802.11b/g/n(HT20,HT40) modulation, and found the 802.11b modulation which it is worse case for above 1GHz, 2412MHz channel which it is worse case for below 1GHz, so only show the test data for worse case.

BELOW 30MHz

the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

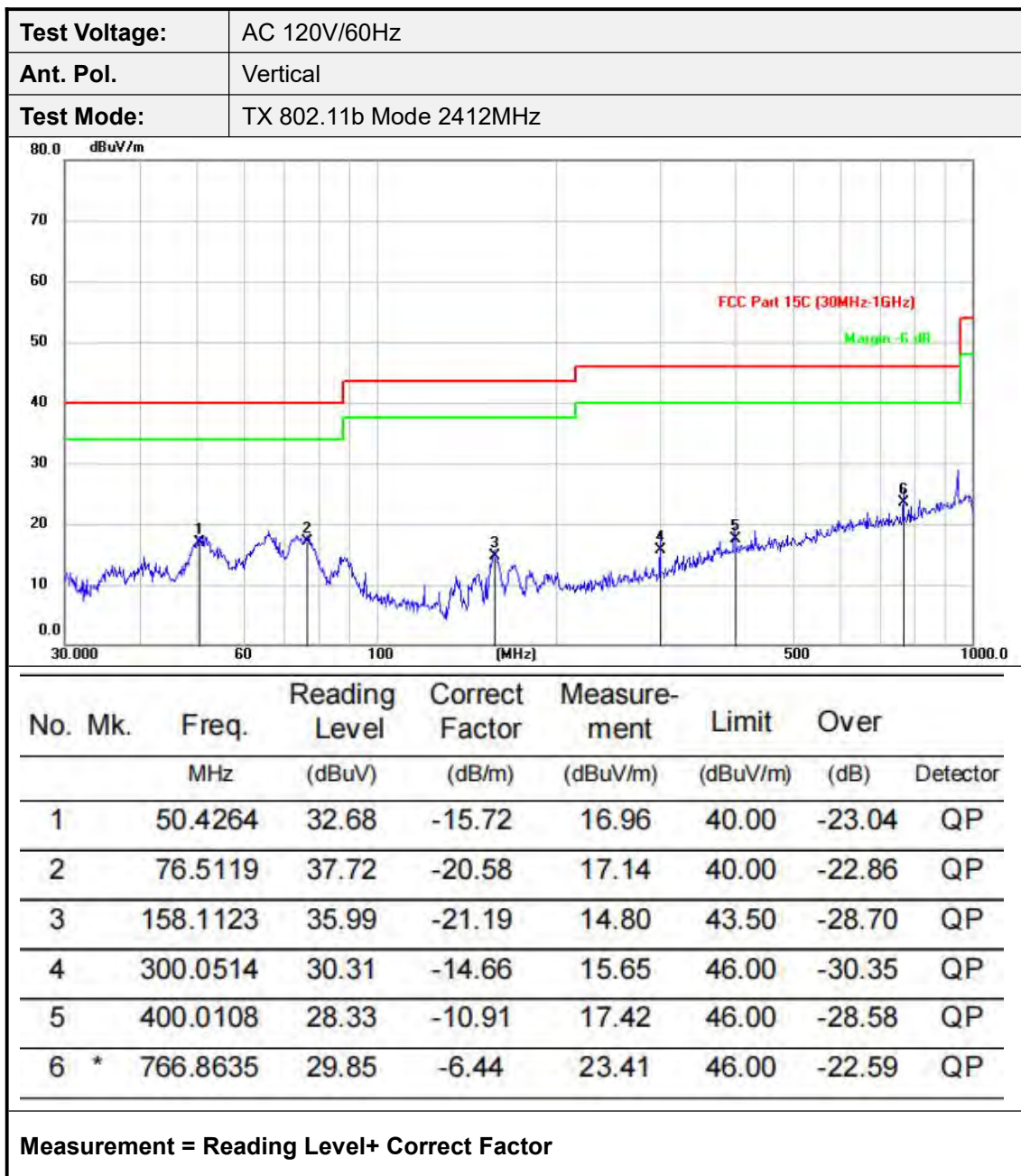
30MHz-1GHz



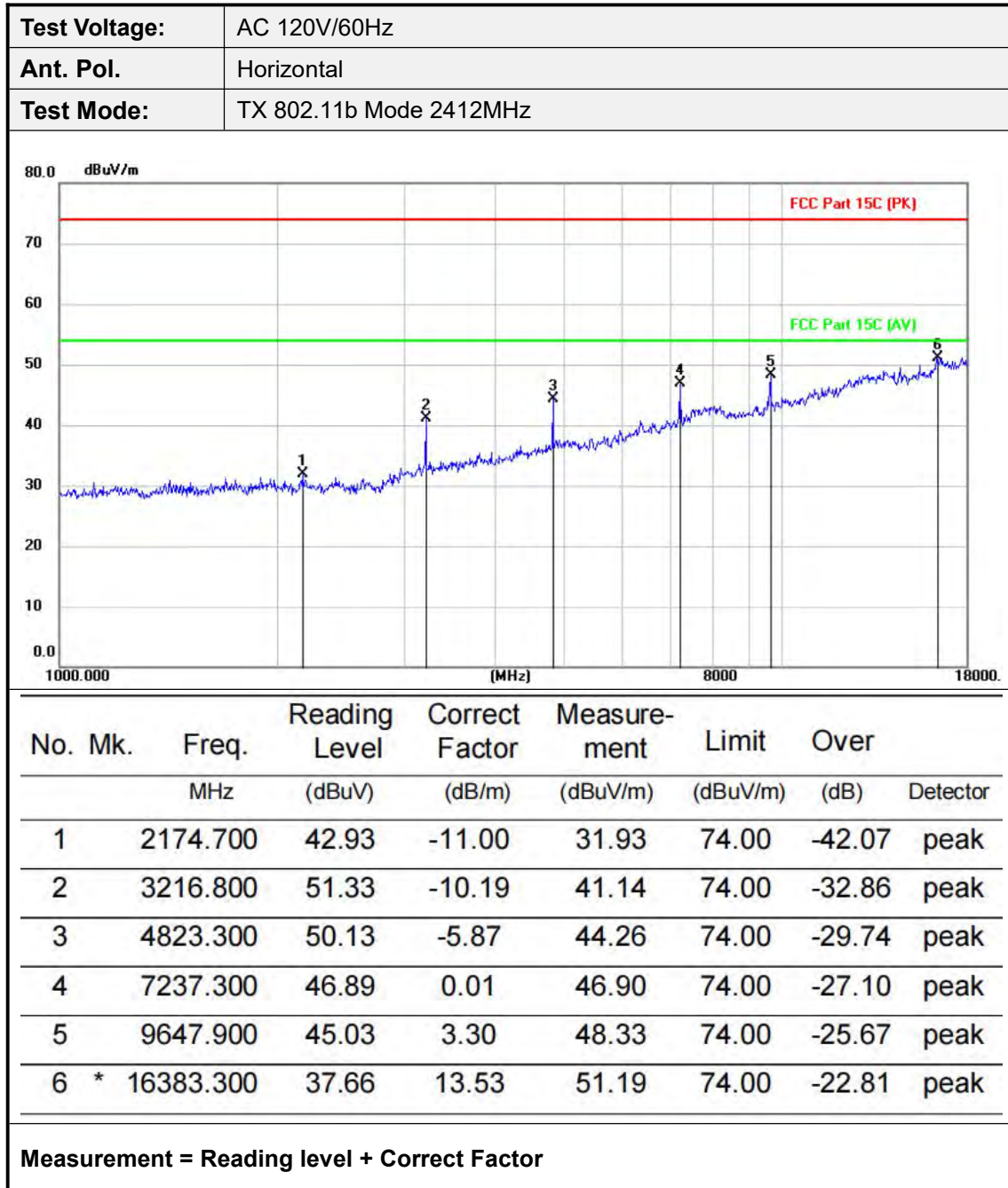
TRF No. FCC Part 15.247_R1

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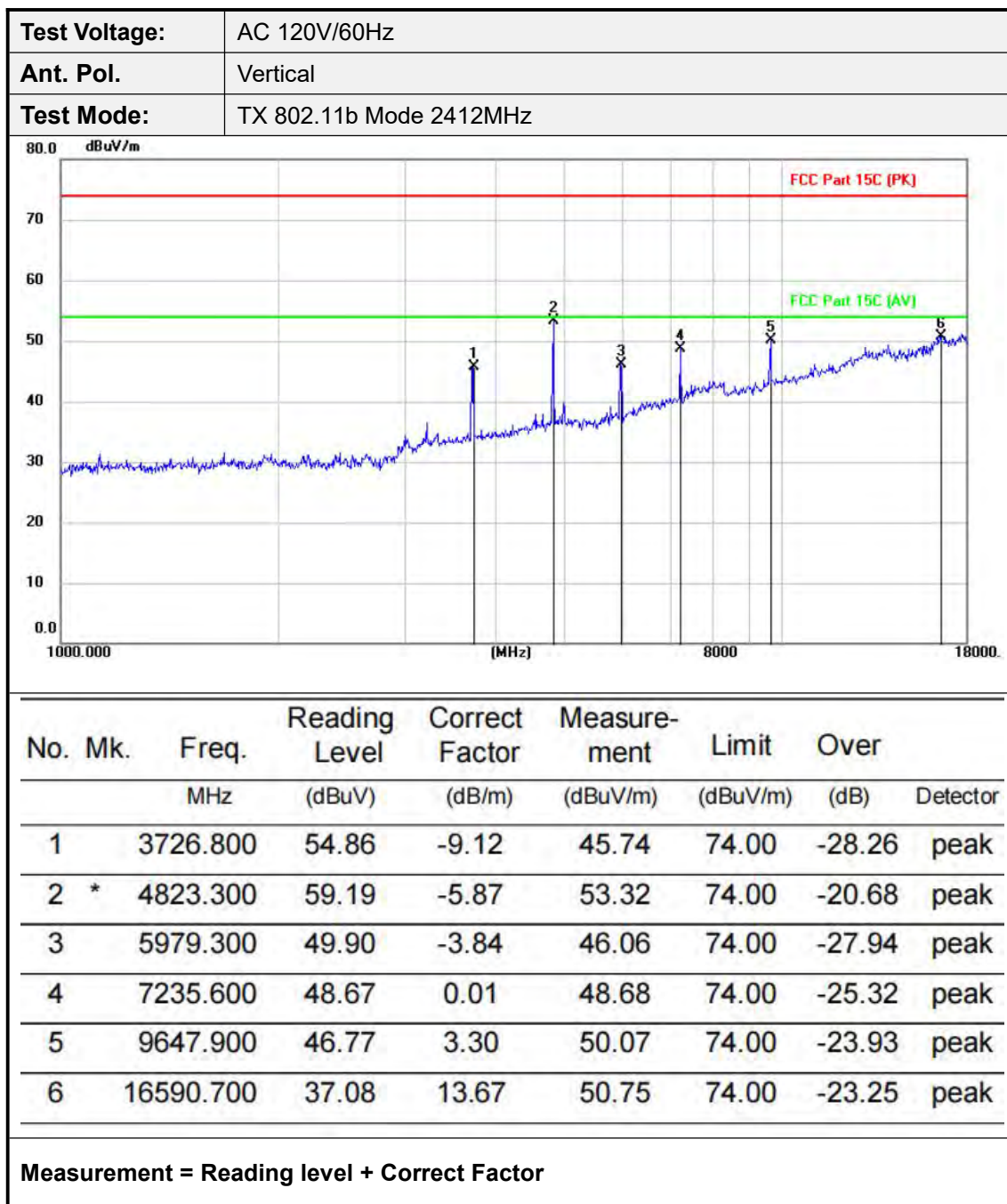
Above 1GHz

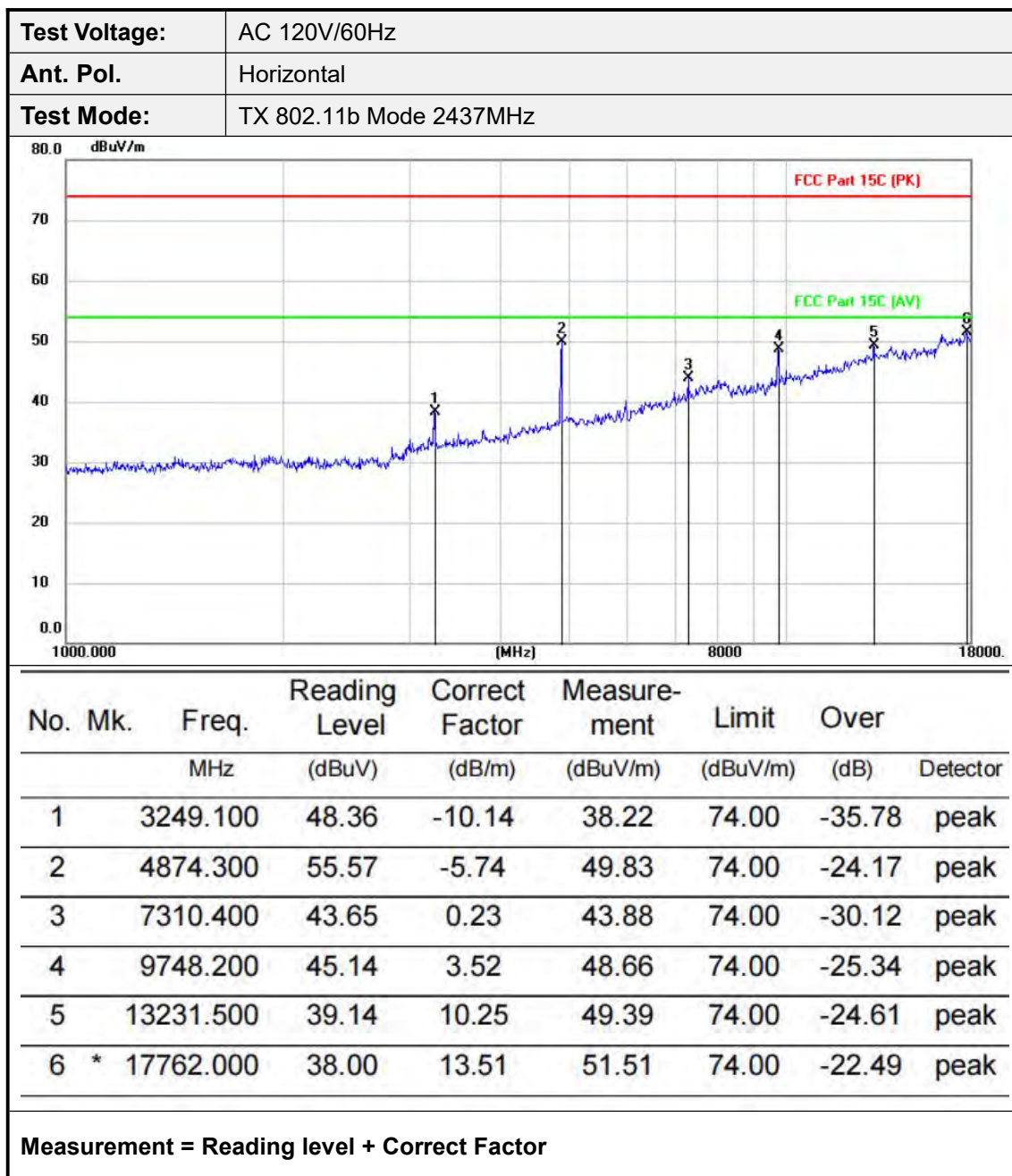


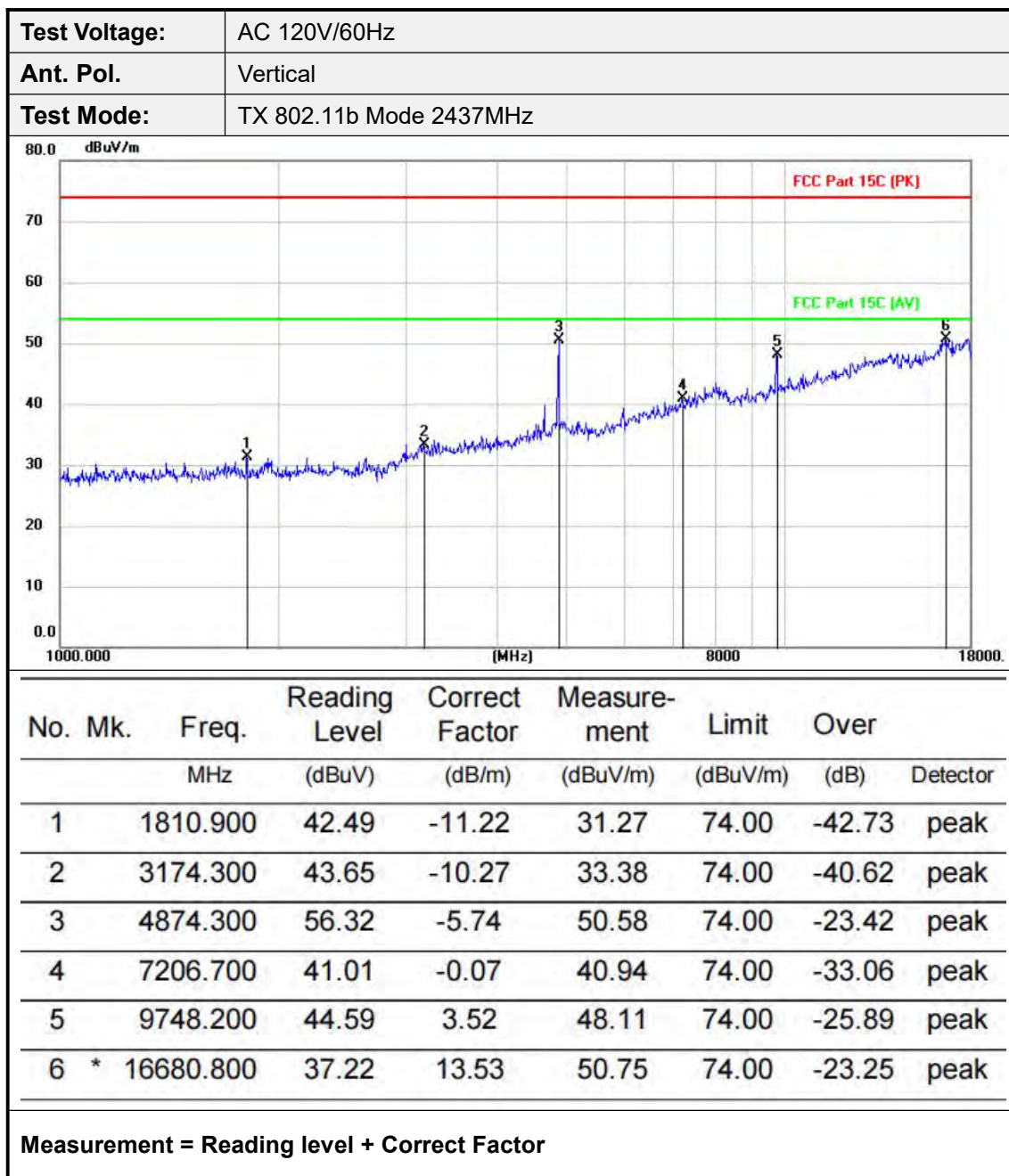
TRF No. FCC Part 15.247_R1

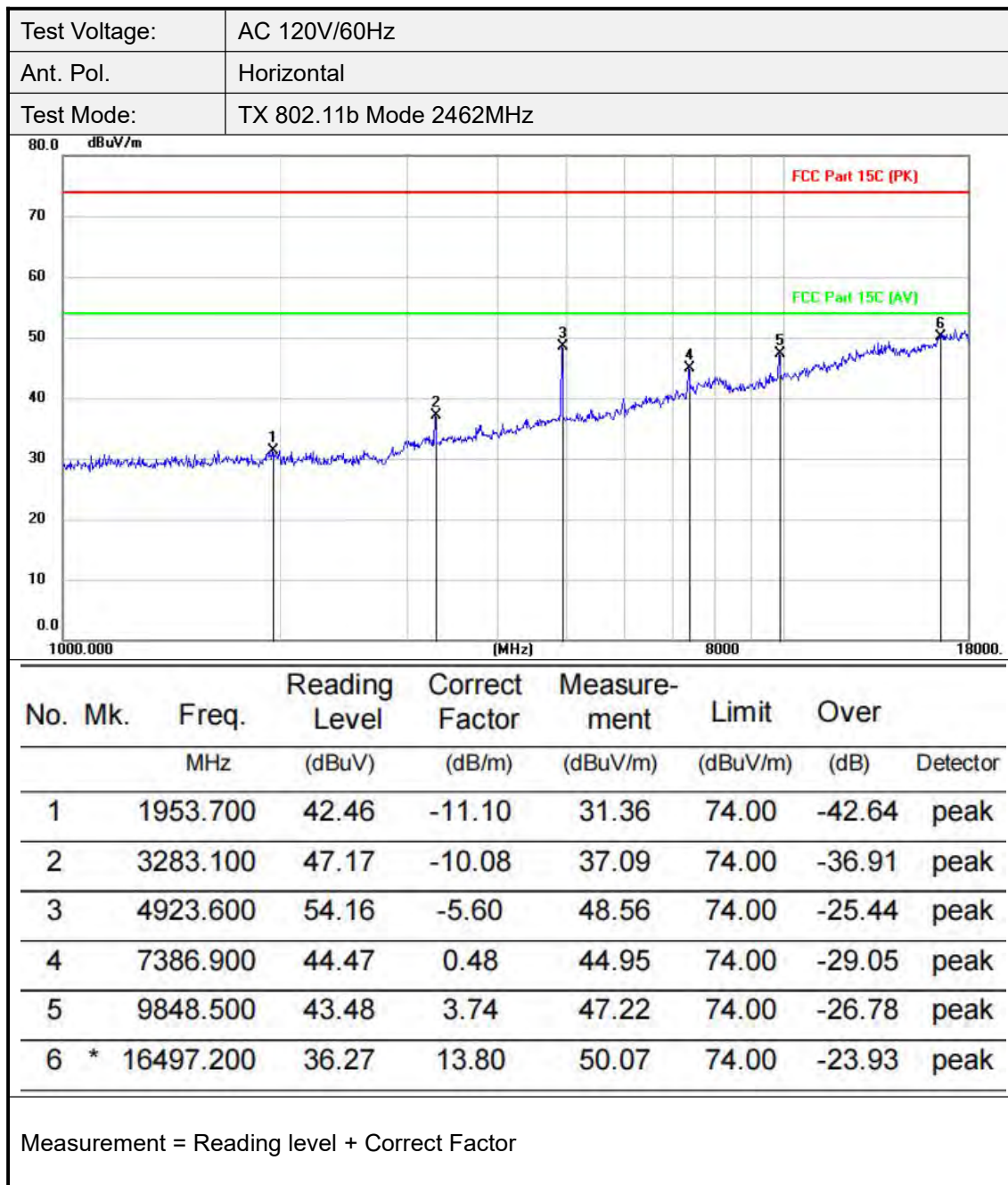
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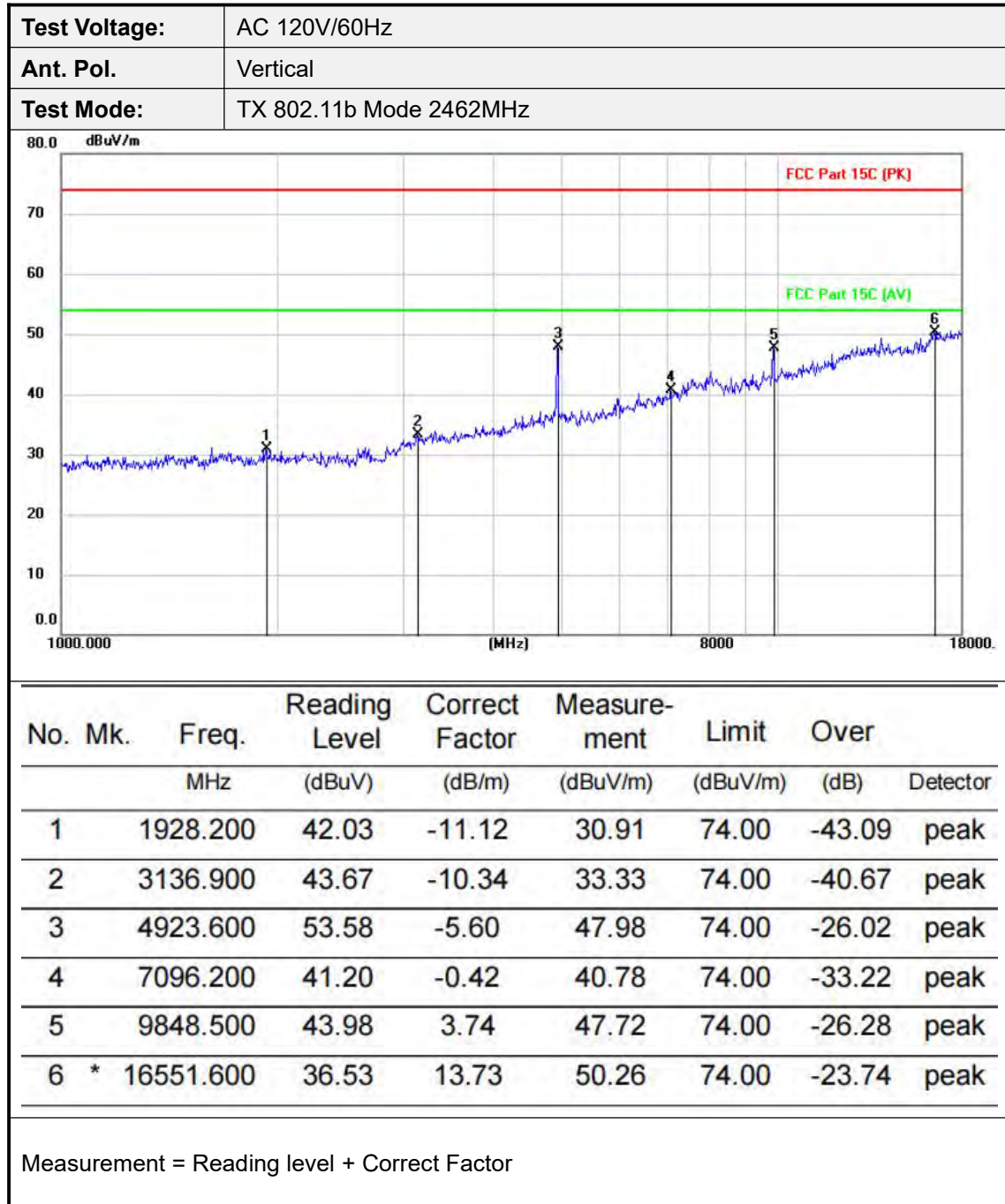
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3.8. CONDUCTED EMISSION

Limit

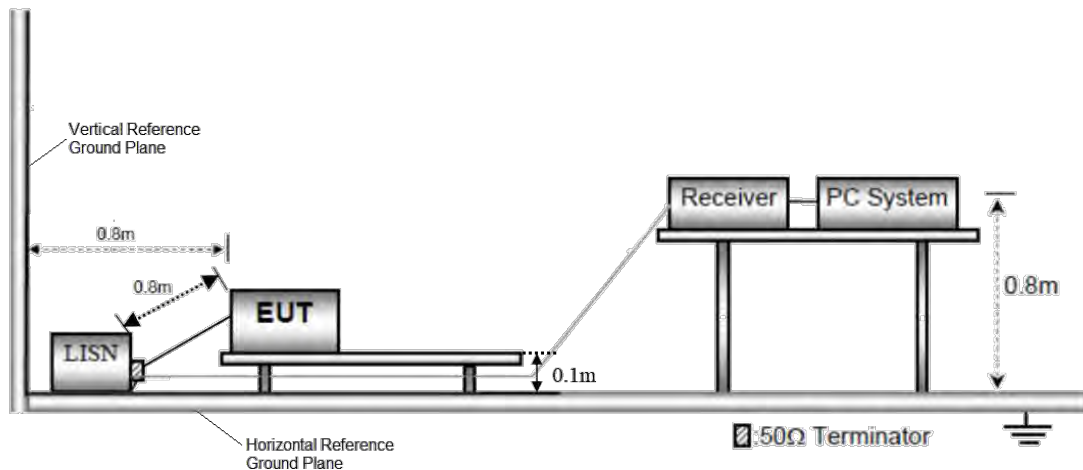
Conducted Emission Test Limit

| Frequency | Maximum RF Line Voltage (dB μ V) | |
|---------------|--------------------------------------|---------------|
| | Quasi-peak Level | Average Level |
| 150kHz~500kHz | 66 ~ 56 * | 56 ~ 46 * |
| 500kHz~5MHz | 56 | 46 |
| 5MHz~30MHz | 60 | 50 |

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Configuration



Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 0.1m above the conducting ground plane. The vertical conducting plane was located 80 cm to the rear of the EUT. All other surfaces of EUT were at least 0.8m from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /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)
4. 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.
5. 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.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode:

Please refer to the clause 2.2.

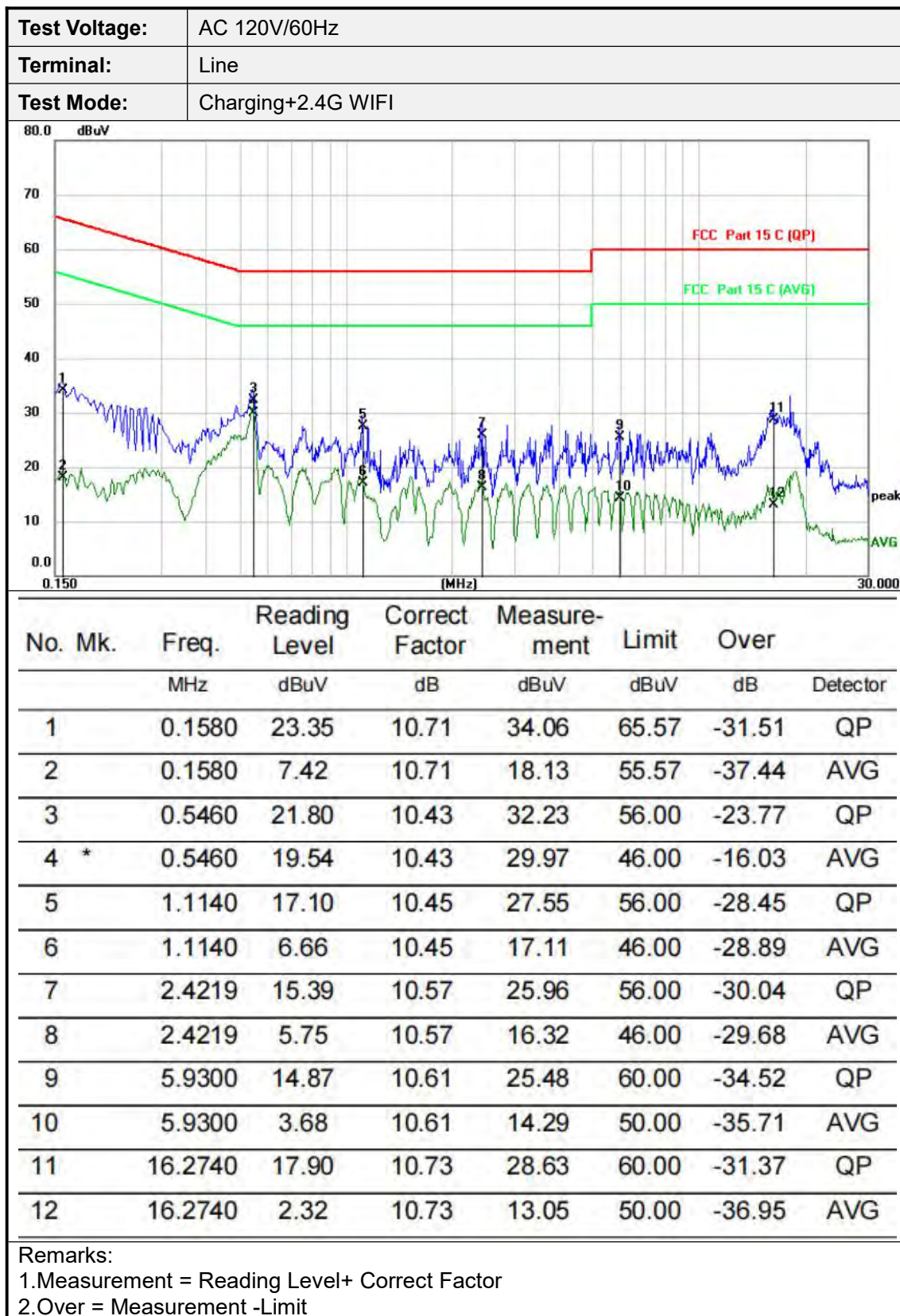
TRF No. FCC Part 15.247_R1

Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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Test Results

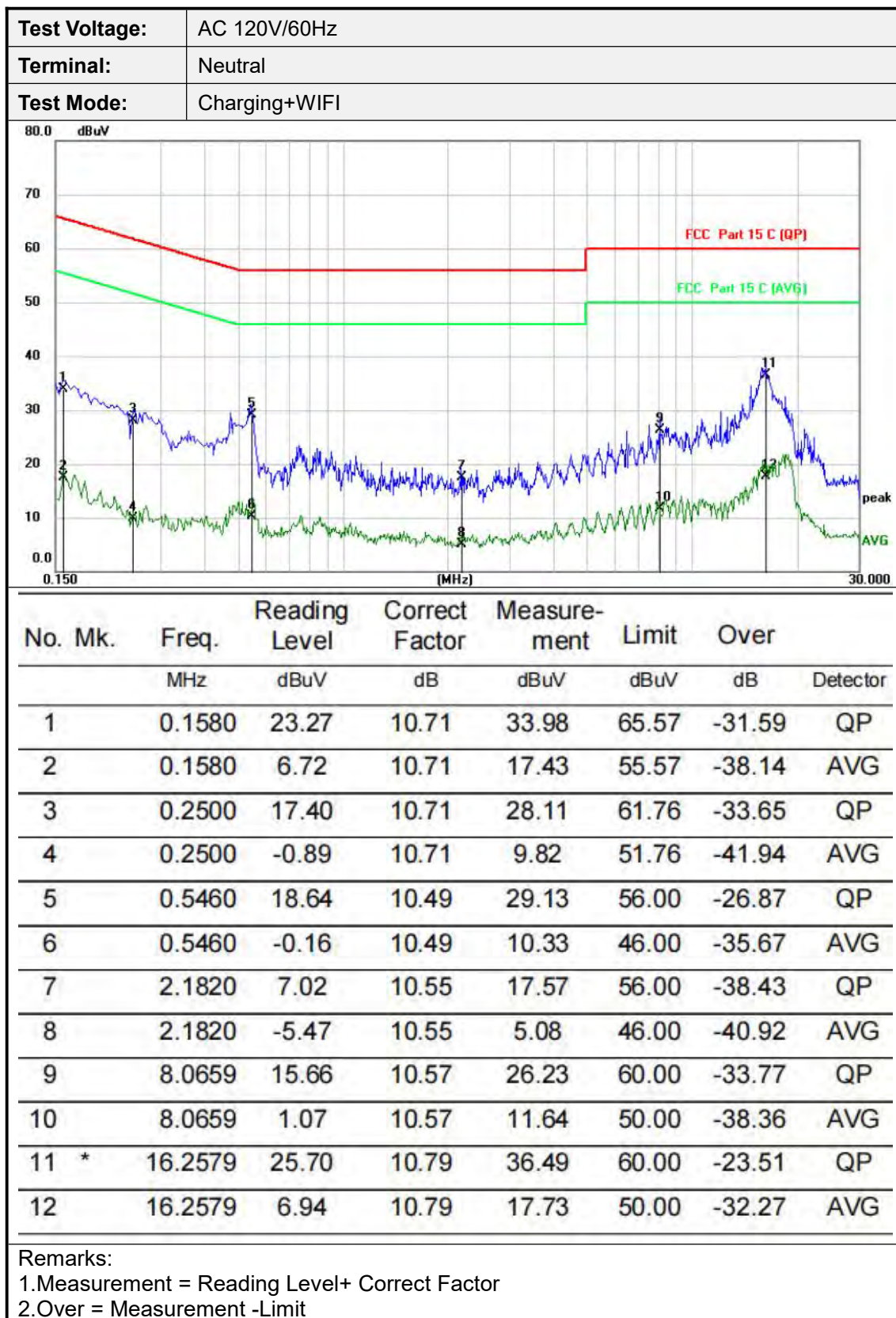
Pre-scan 802.11b/g/n(HT20,HT40) modulation, and found the 802.11b modulation 2412MHz which it is worse case, so only show the test data for worse case.



TRF No. FCC Part 15.247_R1

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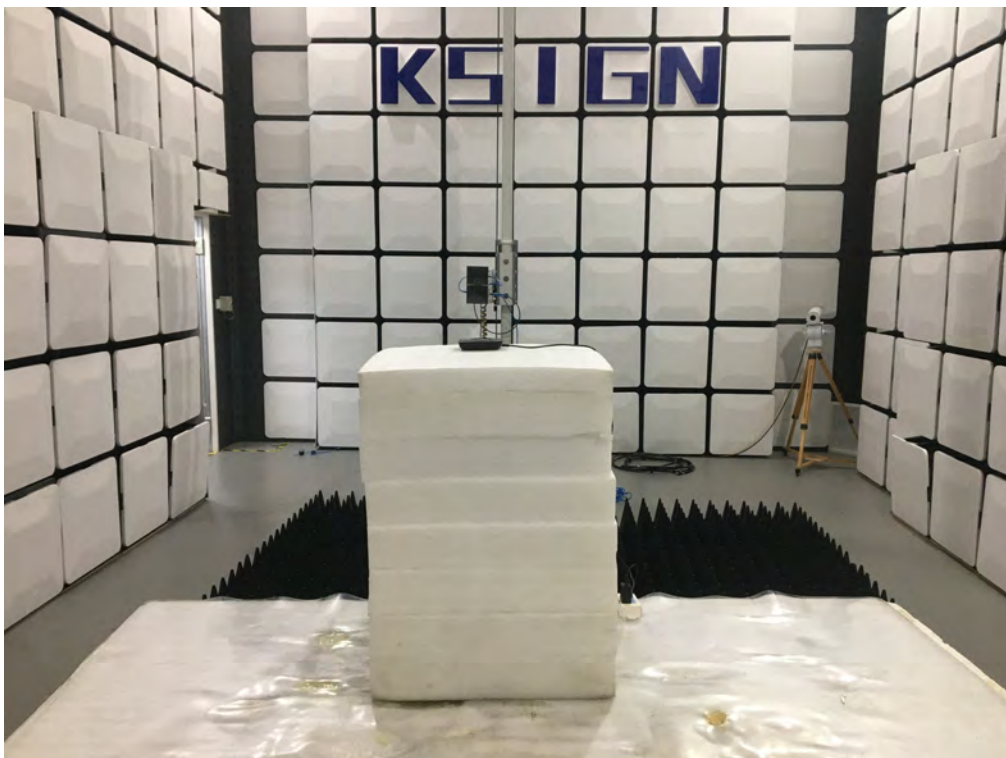


4.EUT TEST PHOTOS

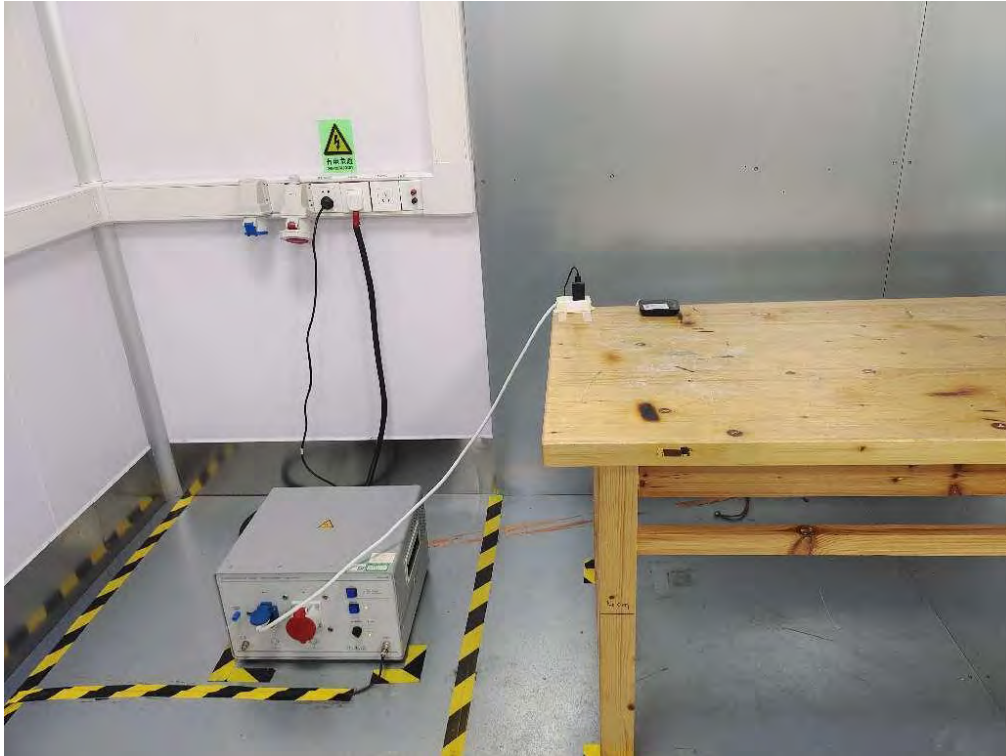
Radiated Emissions (30MHz~1000MHz)



Radiated Emissions (Above 1GHz)



Conducted Emission



5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please refer to the report Report No.:KS2202S0530E01

--THE END--