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TEST REPORT

Report No.: **CTC20201660E02**
FCC ID.....: **2ASWH-NC7**
Applicant.....: **Shenzhen Worgo Technology Limited**
Address.....: 26th Floor, Building 1, COFCO Innovation R&D Center, 69 District, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen, China
Manufacturer: JIANGXI TAIDE INTELLIGENCE TECHNOLOGY CO., LTD
Address.....: NO.5 Wenzhou Road, Dongsheng industrial park, Economic development zone, Dongxiang County, Fuzhou city, Jiangxi Province.
Product Name.....: **Headphones**
Trade Mark.....: TOZO
Model/Type reference.....: NC7
Listed Model(s): /
Standard.....: **FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample...: Nov. 03, 2020
Date of testing.....: Nov. 03, 2020 to Nov. 18, 2020
Date of issue.....: Nov. 19, 2020
Result.....: **PASS**

Compiled by:

(Printed name+signature)

Jim Jiang

Jim Jiang

Supervised by:

(Printed name+signature)

Miller Ma

Miller Ma

Approved by:

(Printed name+signature)

Walter Chen

Walter Chen

Testing Laboratory Name.....: **CTC Laboratories, Inc.**

Address.....:

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, 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.

[RSS 247 Issue 2](#): Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSS) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report Version

| Revised No. | Date of issue | Description |
|-------------------|---------------|-------------|
| 01 ⁽¹⁾ | Nov. 19, 2020 | Original |
| | | |
| | | |
| | | |



1.3. Test Description

| FCC Part 15 Subpart C (15.247)/ RSS 247 Issue 2 | | | | |
|-------------------------------------------------|------------------|--------------------------|--------|---------------|
| Test Item | Standard Section | | Result | Test Engineer |
| | FCC | IC | | |
| Antenna Requirement | 15.203 | / | Pass | Lucy Lan |
| Conducted Emission | 15.207 | RSS-Gen 8.8 | Pass | Lucy Lan |
| Restricted Bands | 15.205 | RSS-Gen 8.10 | Pass | Jim Jiang |
| Hopping Channel Separation | 15.247(a)(1) | RSS 247 5.1 (b) | Pass | Lucy Lan |
| Dwell Time | 15.247(a)(iii) | RSS 247 5.1 (d) | Pass | Lucy Lan |
| Peak Output Power | 15.247(b)(1) | RSS 247 5.4 (b) | Pass | Lucy Lan |
| Number of Hopping Frequency | 15.247(a)(iii) | RSS 247 5.1 (d) | Pass | Lucy Lan |
| Conducted Band Edge and Spurious Emissions | 15.247(d) | RSS 247 5.5 | Pass | Lucy Lan |
| Radiated Band Edge and Spurious Emissions | 15.247(d)&15.209 | RSS 247 5.5& RSS-Gen 8.9 | Pass | Jim Jiang |
| 99% Occupied Bandwidth & 20dB Bandwidth | 15.247(a) | RSS 247 5.1 (b) | Pass | Lucy Lan |

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



1.4. Test Facility

Address of the report laboratory

CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

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

CNAS-Lab Code: L5365

CTC Laboratories, Inc. 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.: 4340.01

CTC Laboratories, Inc. 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.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug. 26, 2017.

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 CTC Laboratories, Inc. quality 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 CTC Laboratories, Inc.



| 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 | ----- | (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: | 23~24°C |
| Relative Humidity: | 55~57%RH |
| Air Pressure: | 101kPa |



2. GENERAL INFORMATION

2.1. Client Information

| | |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Applicant: | Shenzhen Worgo Technology Limited |
| Address: | 26th Floor, Building 1, COFCO Innovation R&D Center, 69 District, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen, China |
| Manufacturer: | JIANGXI TAIDE INTELLIGENCE TECHNOLOGY CO., LTD |
| Address: | NO.5 Wenzhou Road, Dongsheng industrial park, Economic development zone, Dongxiang County, Fuzhou city, Jiangxi Province. |

2.2. General Description of EUT

| | |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name: | Headphones |
| Trade Mark: | TOZO |
| Model/Type reference: | NC7 |
| Listed Model(s): | / |
| Model Difference: | / |
| Power supply: | Wireless Case: 5Vdc/0.5A from External adapter 3.8Vdc/500mAh from Battery Headphones: 5Vdc/0.2A from Wireless Case 3.7Vdc/70mAh from Battery |
| Hardware version: | V2 |
| Software version: | V1.5.1 |
| Bluetooth 5.0 + BR/EDR | |
| Modulation: | GFSK, $\pi/4$ -DQPSK, 8-DPSK |
| Operation frequency: | 2402MHz~2480MHz |
| Channel number: | 79 |
| Channel separation: | 1MHz |
| Antenna type: | FPC Antenna |
| Antenna gain: | -1.06dBi Max |



2.3. 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. BT EDR, 79 channels are provided to the EUT. Channels 00/39/78 were selected for testing.

Operation Frequency List:

| Channel | Frequency (MHz) |
|-----------|-----------------|
| 00 | 2402 |
| 01 | 2403 |
| : | : |
| 38 | 2440 |
| 39 | 2441 |
| 40 | 2442 |
| : | : |
| 77 | 2479 |
| 78 | 2480 |

Note: 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 |
| For AC power line conducted emissions: |
| The EUT was set to connect with the Bluetooth instrument under large package sizes transmission. |
| For Radiated spurious emissions test item: |
| The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report. |



2.4. Measurement Instruments List

| Tonscend JS0806-2 Test system | | | | | |
|-------------------------------|-------------------------------------|-----------------|-----------|------------|------------------|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | Rohde & Schwarz | FSU26 | 100105 | Dec. 27, 2020 |
| 2 | Spectrum Analyzer | Rohde & Schwarz | FUV40-N | 101331 | Mar. 15, 2020 |
| 3 | MXG Vector Signal Generator | Agilent | N5182A | MY47420864 | Dec. 27, 2020 |
| 4 | Signal Generator | Agilent | E8257D | MY46521908 | Dec. 27, 2020 |
| 5 | Power Sensor | Agilent | U2021XA | MY5365004 | Dec. 27, 2020 |
| 6 | Power Sensor | Agilent | U2021XA | MY5365006 | Dec. 27, 2020 |
| 7 | Simultaneous Sampling DAQ | Agilent | U2531A | TW54493510 | Dec. 27, 2020 |
| 8 | Climate Chamber | TABAI | PR-4G | A8708055 | Dec. 27, 2020 |
| 9 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | 116410 | Dec. 27, 2020 |
| 10 | Climate Chamber | ESPEC | MT3065 | / | Dec. 27, 2020 |
| 11 | 300328 v2.1.1 test system | TONSCEND | v2.6 | / | / |

| Radiated Emission and Transmitter spurious emissions | | | | | |
|------------------------------------------------------|-------------------------|------------------------------|-------------|------------|------------------|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
| 1 | EMI Test Receiver | Rohde & Schwarz | ESCI | 100658 | Dec. 27, 2020 |
| 2 | High pass filter | micro-tranics | HPM50111 | 142 | Dec. 27, 2020 |
| 3 | Log-Bicon Antenna | Schwarzbeck | CBL6141A | 4180 | Dec. 27, 2020 |
| 4 | Ultra-Broadband Antenna | ShwarzBeck | BBHA9170 | 25841 | Dec. 27, 2020 |
| 5 | Loop Antenna | LAPLAC | RF300 | 9138 | Dec. 27, 2020 |
| 6 | Spectrum Analyzer | Rohde & Schwarz | FSU26 | 100105 | Dec. 27, 2020 |
| 7 | Horn Antenna | Schwarzbeck | BBHA 9120D | 647 | Dec. 27, 2020 |
| 8 | Pre-Amplifier | HP | 8447D | 1937A03050 | Dec. 27, 2020 |
| 9 | Pre-Amplifier | EMCI | EMC051835 | 980075 | Dec. 27, 2020 |
| 10 | Antenna Mast | UC | UC3000 | N/A | N/A |
| 11 | Turn Table | UC | UC3000 | N/A | N/A |
| 12 | Cable Below 1GHz | Schwarzbeck | AK9515E | 33155 | Dec. 27, 2020 |
| 13 | Cable Above 1GHz | Hubersuhner | SUCOFLEX102 | DA1580 | Dec. 27, 2020 |
| 14 | Splitter | Mini-Circuit | ZAPD-4 | 400059 | Dec. 27, 2020 |
| 15 | RF Connection Cable | HUBER+SUHNER | RE-7-FL | N/A | Dec. 27, 2020 |
| 16 | RF Connection Cable | Chengdu E-Microwave | --- | --- | Dec. 27, 2020 |
| 17 | High pass filter | Compliance Direction systems | BSU-6 | 34202 | Dec. 27, 2020 |

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| | | | | | |
|----|---------------------------------|------------------------|--------------------|----------|---------------|
| 18 | Attenuator | Chengdu E-Microwave | EMCAXX-10 RNZ-3 | --- | Dec. 27, 2020 |
| 19 | High and low temperature box | ESPEC | MT3065 | 12114019 | Dec. 27, 2020 |

| Conducted Emission | | | | | |
|--------------------|-------------------|--------------|-----------|------------|------------------|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
| 1 | LISN | R&S | ENV216 | 101112 | Dec. 27, 2020 |
| 2 | LISN | R&S | ENV216 | 101113 | Dec. 27, 2020 |
| 3 | EMI Test Receiver | R&S | ESCI | 100658 | Dec. 27, 2020 |

Note:1. The Cal. Interval was one year.

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

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

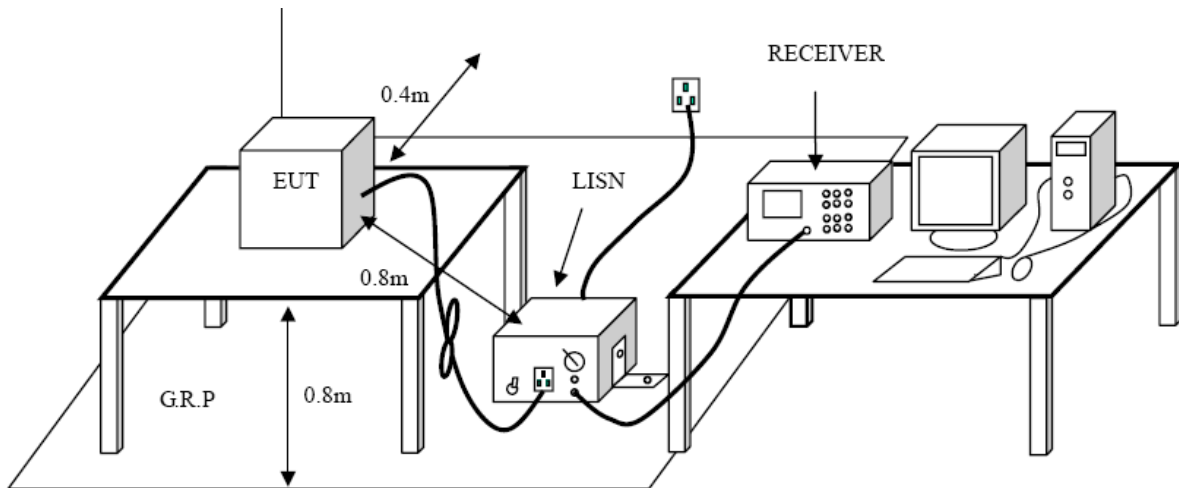
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS – Gen 8.8

| Frequency range (MHz) | Limit (dBuV) | |
|-----------------------|--------------|-----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

Test Configuration



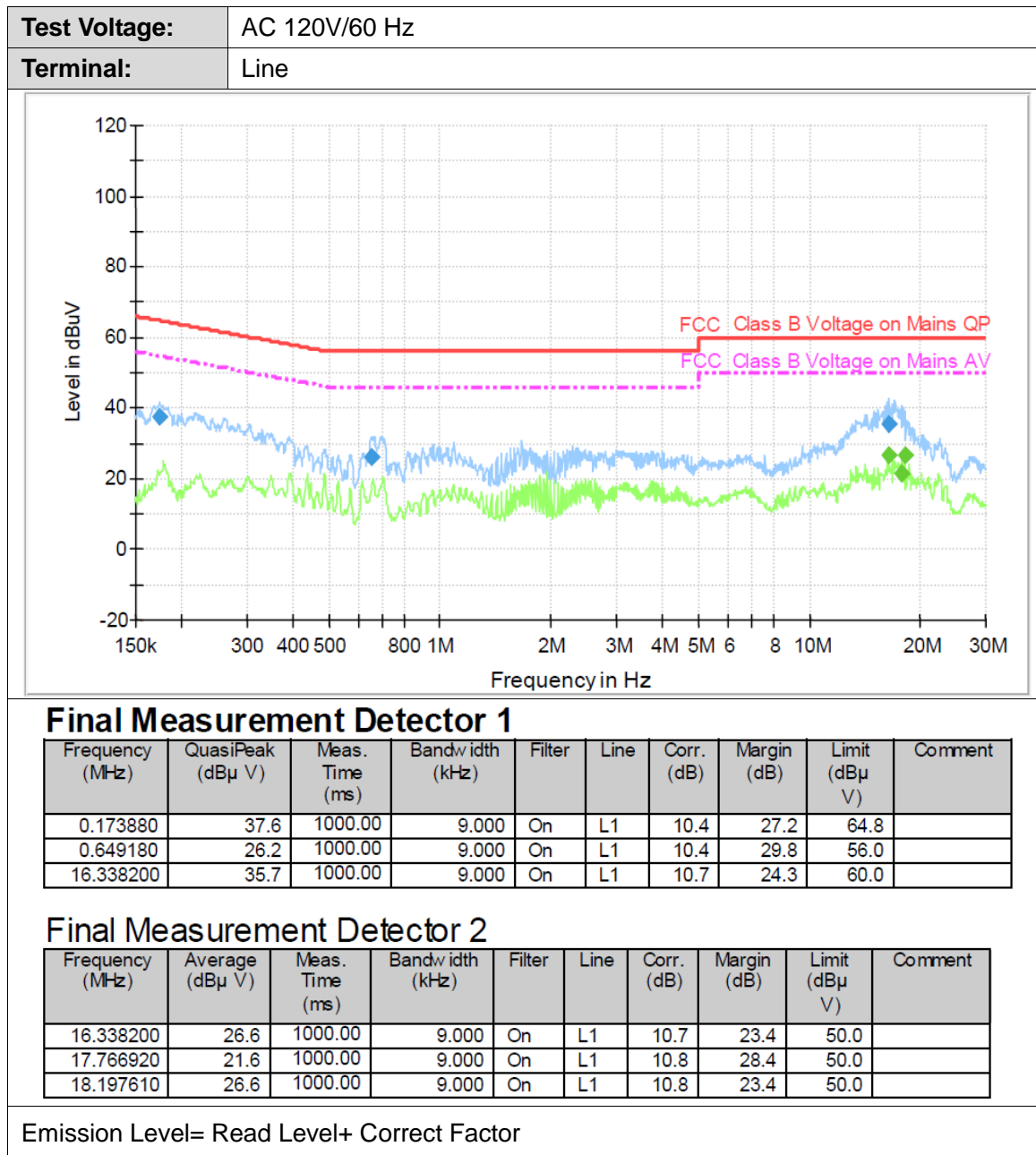
Test Procedure

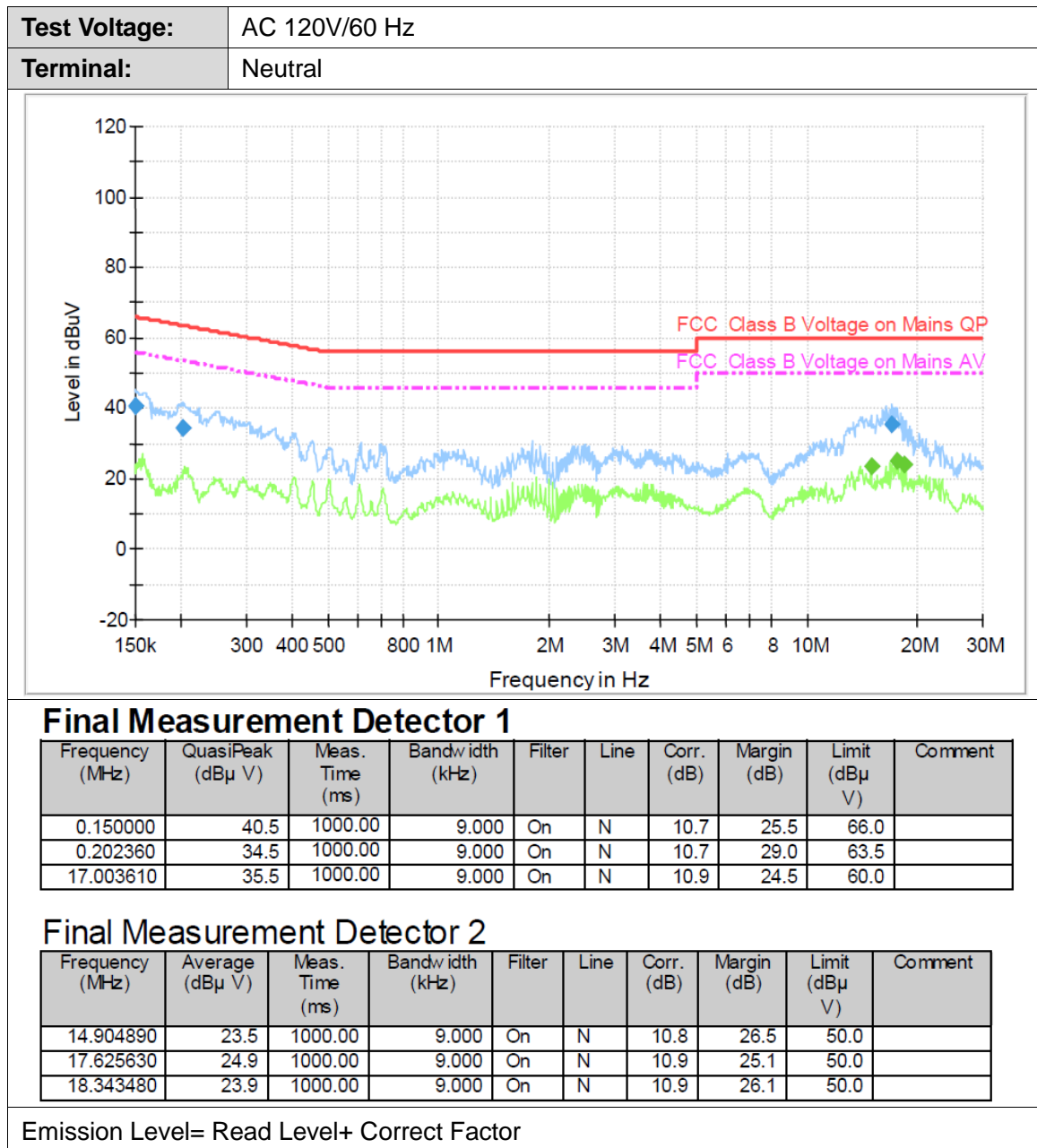
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
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 2.3.

Test Results





3.2. Radiated Emission

Limit

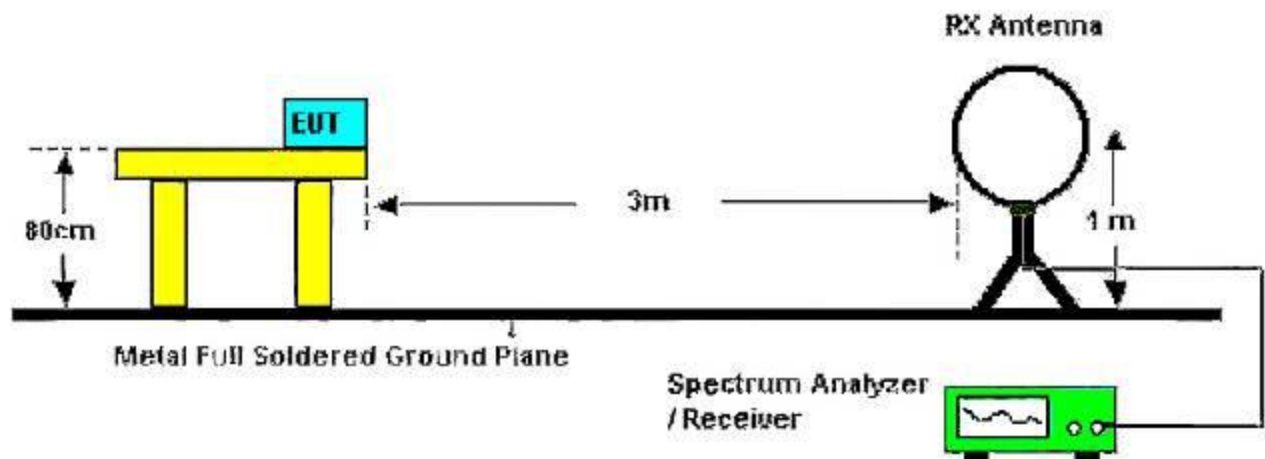
FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS – Gen 8.9

| Frequency | Limit (dBuV/m @3m) | Value |
|-------------------|--------------------|------------|
| 30 MHz ~ 88 MHz | 40.00 | Quasi-peak |
| 88 MHz ~ 216 MHz | 43.50 | Quasi-peak |
| 216 MHz ~ 960 MHz | 46.00 | Quasi-peak |
| 960 MHz ~ 1 GHz | 54.00 | Quasi-peak |
| Above 1 GHz | 54.00 | Average |
| | 74.00 | Peak |

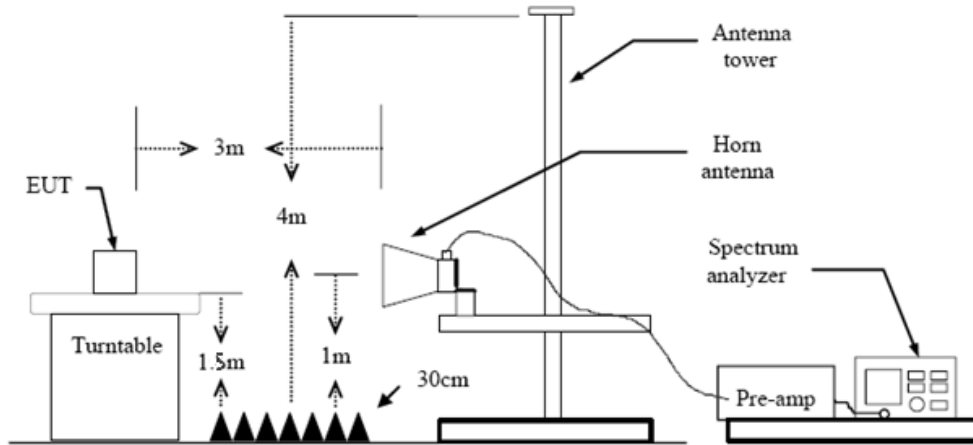
Note:

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

Test Configuration



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=3MHz Peak detector for Peak value.
RBW=1MHz, VBW=3MHz RMS detector for Average value.

Test Mode

Please refer to the clause 2.3.

Test Result

9 KHz~30 MHz

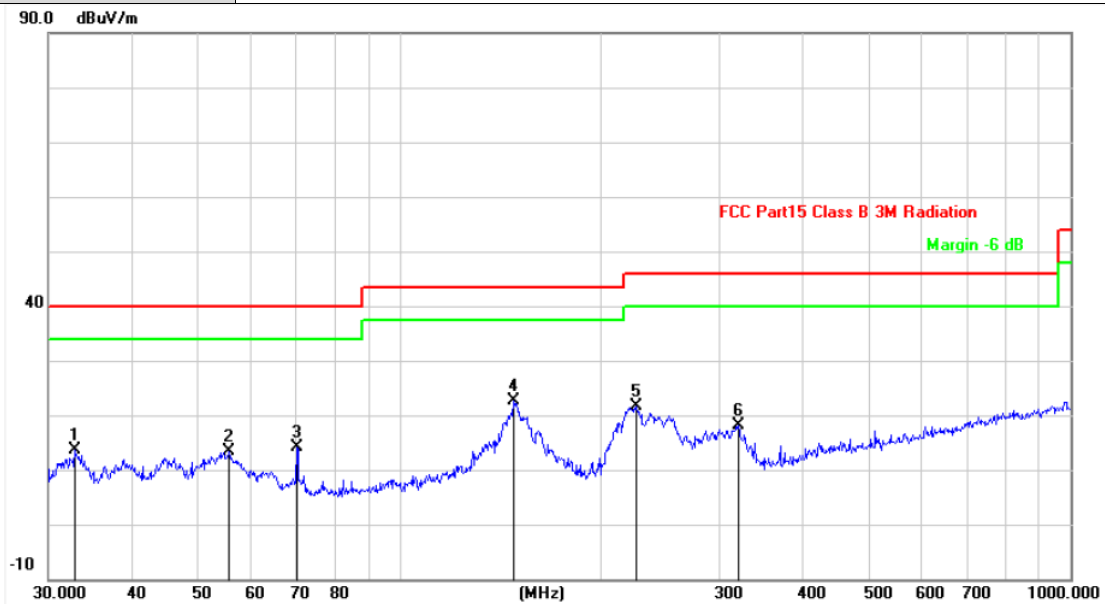
From 9 KHz to 30 MHz: Conclusion: PASS

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



30MHz-1GHz

| | |
|------------|-----------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX GFSK Mode 2402MHz |
| Remark: | Only worse case is reported |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 32.8637 | -18.07 | 31.78 | 13.71 | 40.00 | -26.29 | QP |
| 2 | 55.8047 | -18.20 | 31.69 | 13.49 | 40.00 | -26.51 | QP |
| 3 | 70.3365 | -20.46 | 34.62 | 14.16 | 40.00 | -25.84 | QP |
| 4 | 147.9214 | -16.95 | 39.47 | 22.52 | 43.50 | -20.98 | QP |
| 5 | 225.3080 | -20.01 | 41.60 | 21.59 | 46.00 | -24.41 | QP |
| 6 | 319.9370 | -17.42 | 35.46 | 18.04 | 46.00 | -27.96 | QP |

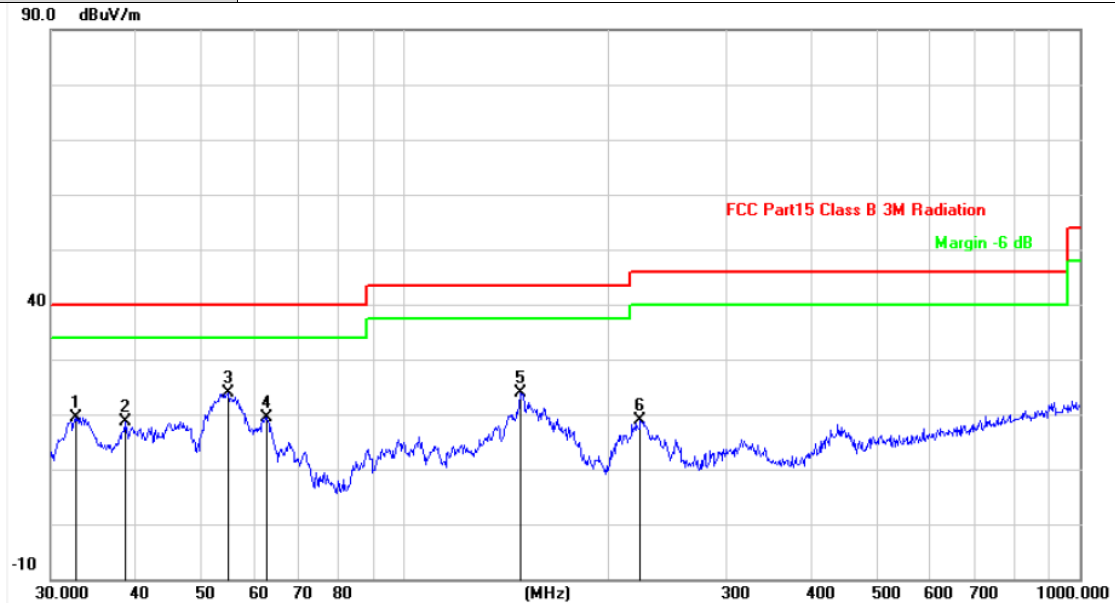
Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



| | |
|------------|-----------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX GFSK Mode 2402MHz |
| Remark: | Only worse case is reported |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 32.6340 | -18.08 | 37.49 | 19.41 | 40.00 | -20.59 | QP |
| 2 | 38.6160 | -17.49 | 36.12 | 18.63 | 40.00 | -21.37 | QP |
| 3 | 55.0274 | -18.15 | 42.10 | 23.95 | 40.00 | -16.05 | QP |
| 4 | 62.6506 | -19.01 | 38.50 | 19.49 | 40.00 | -20.51 | QP |
| 5 | 148.4410 | -16.91 | 40.74 | 23.83 | 43.50 | -19.67 | QP |
| 6 | 223.7333 | -20.06 | 39.00 | 18.94 | 46.00 | -27.06 | QP |

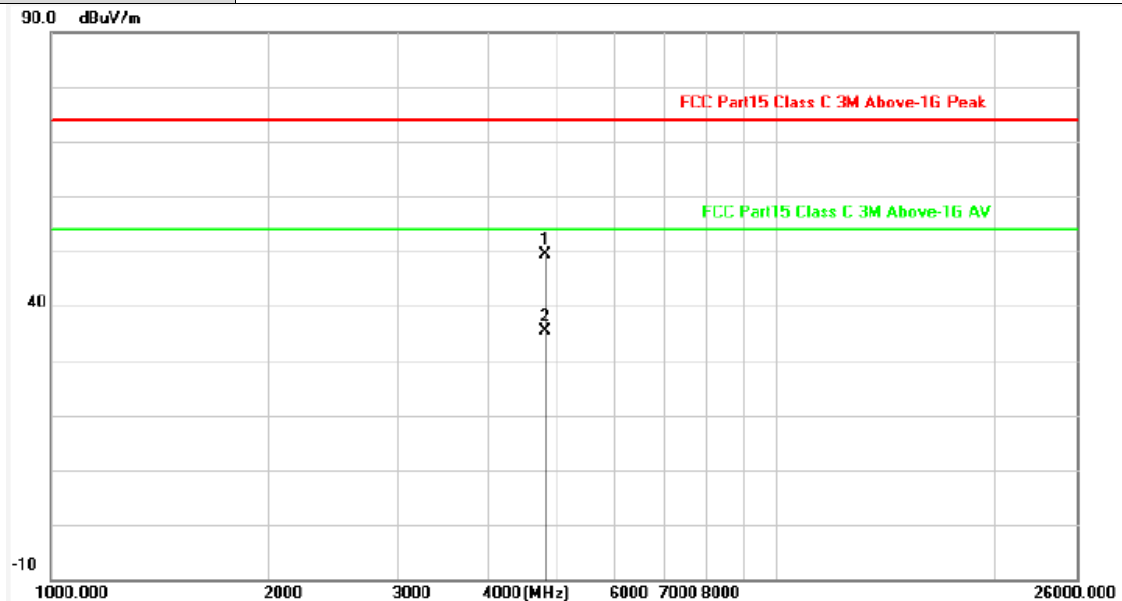
Remarks:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value



Above 1GHz

| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX GFSK Mode 2402MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4804.166 | -2.82 | 52.12 | 49.30 | 74.00 | -24.70 | peak |
| 2 | 4804.332 | -2.82 | 38.32 | 35.50 | 54.00 | -18.50 | AVG |

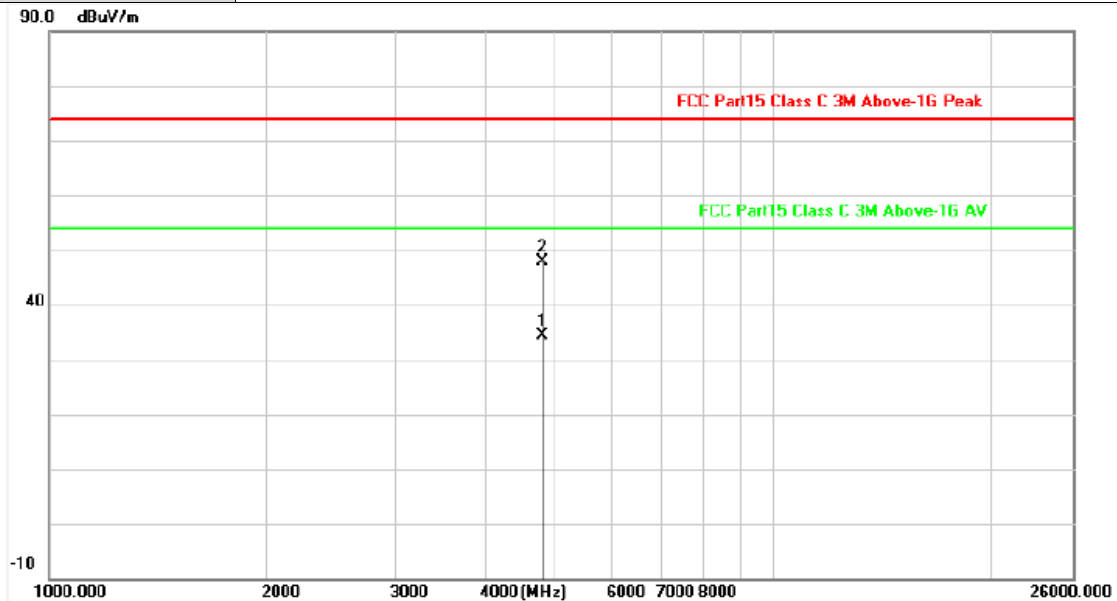
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX GFSK Mode 2402MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



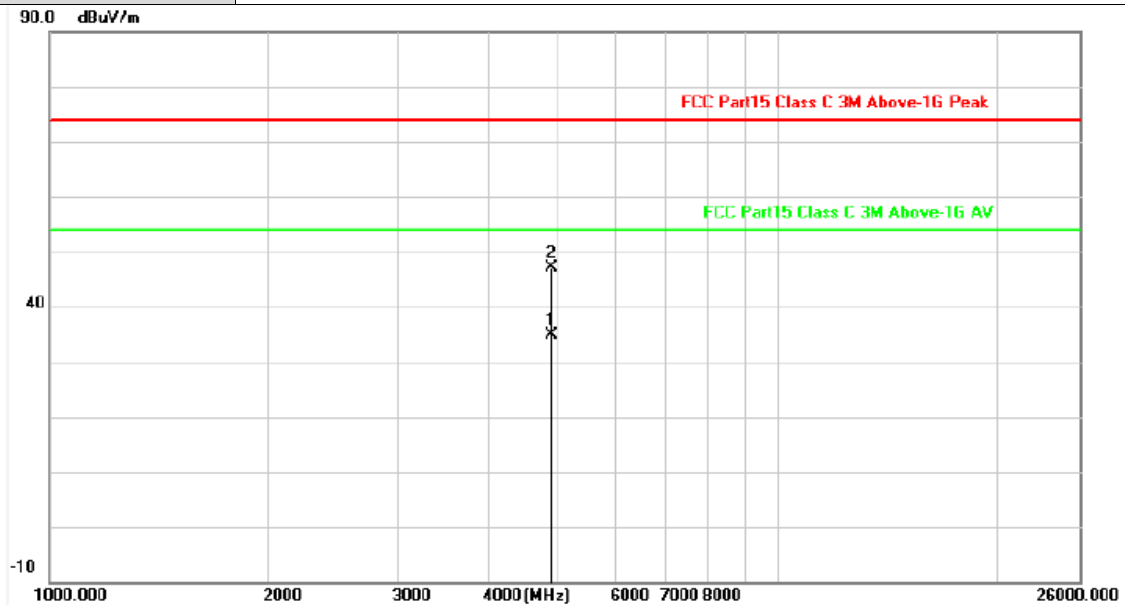
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4804.218 | -2.82 | 37.21 | 34.39 | 54.00 | -19.61 | AVG |
| 2 | 4804.318 | -2.82 | 50.78 | 47.96 | 74.00 | -26.04 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX GFSK Mode 2441MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



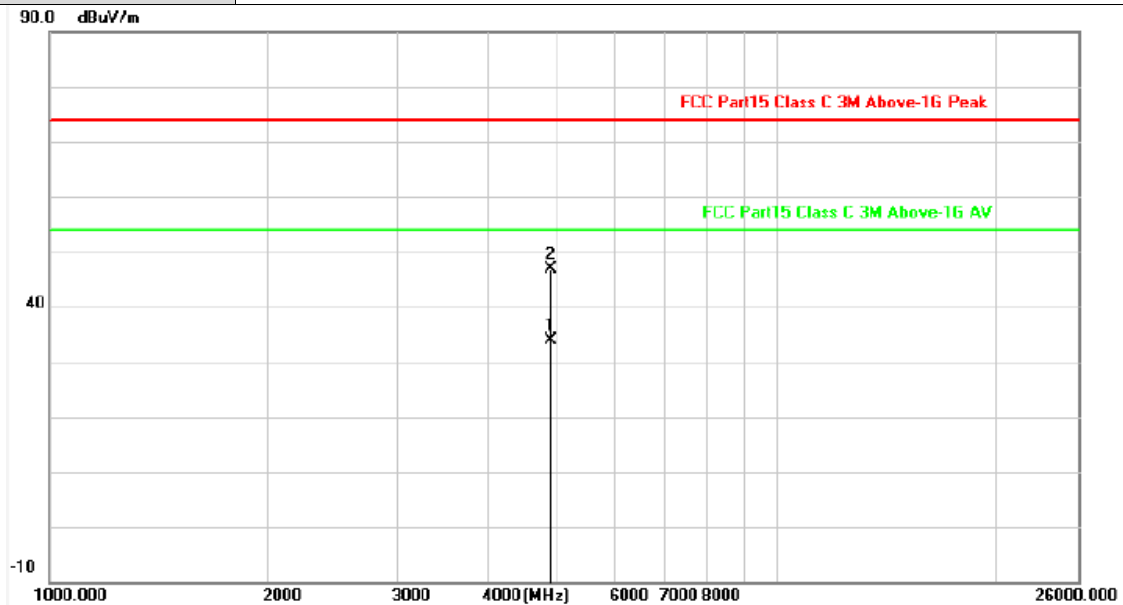
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4882.219 | -2.60 | 37.59 | 34.99 | 54.00 | -19.01 | AVG |
| 2 | 4882.277 | -2.60 | 49.76 | 47.16 | 74.00 | -26.84 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX GFSK Mode 2441MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4881.806 | -2.60 | 36.53 | 33.93 | 54.00 | -20.07 | AVG |
| 2 | 4882.438 | -2.60 | 49.40 | 46.80 | 74.00 | -27.20 | peak |

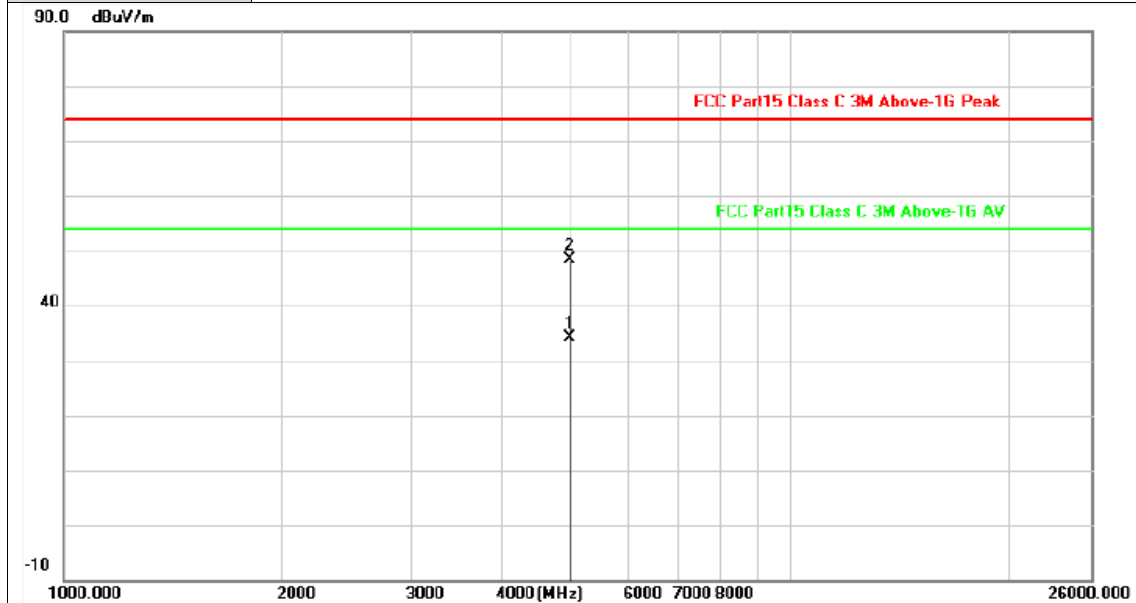
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX GFSK Mode 2480MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



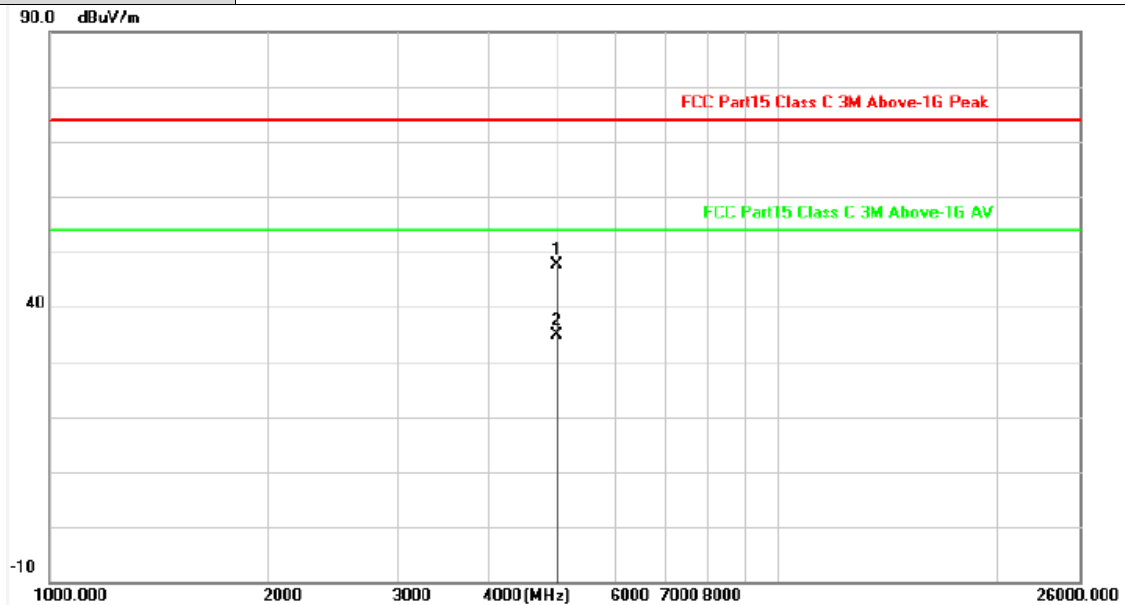
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4960.282 | -2.38 | 36.55 | 34.17 | 54.00 | -19.83 | AVG |
| 2 | 4960.313 | -2.38 | 50.88 | 48.50 | 74.00 | -25.50 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX GFSK Mode 2480MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4959.766 | -2.38 | 50.04 | 47.66 | 74.00 | -26.34 | peak |
| 2 | 4960.022 | -2.38 | 37.33 | 34.95 | 54.00 | -19.05 | AVG |

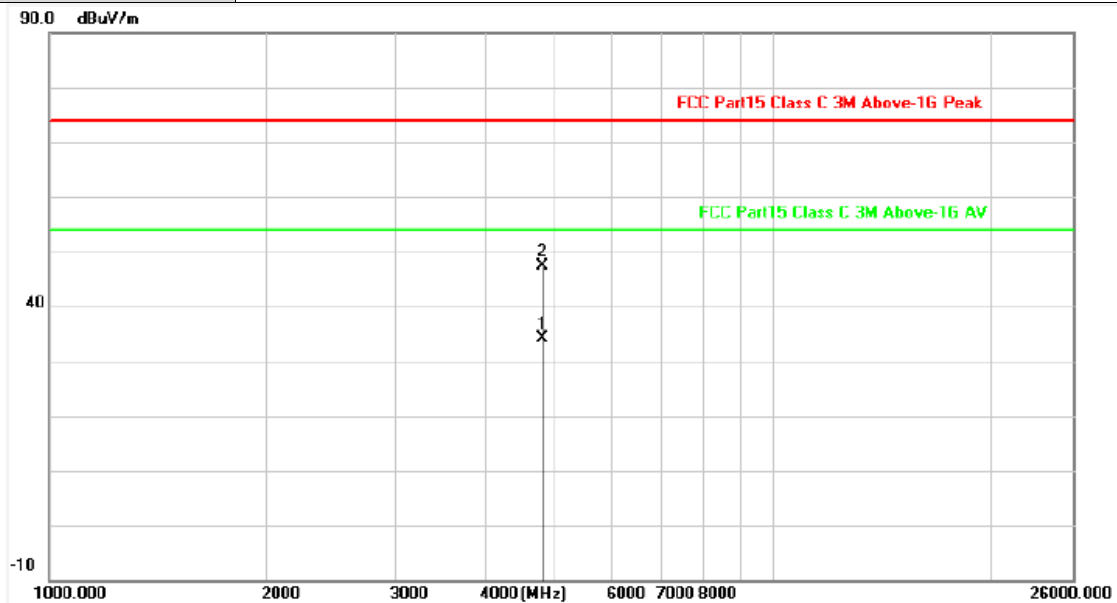
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



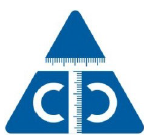
| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX $\pi/4$ -DQPSK Mode 2402MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



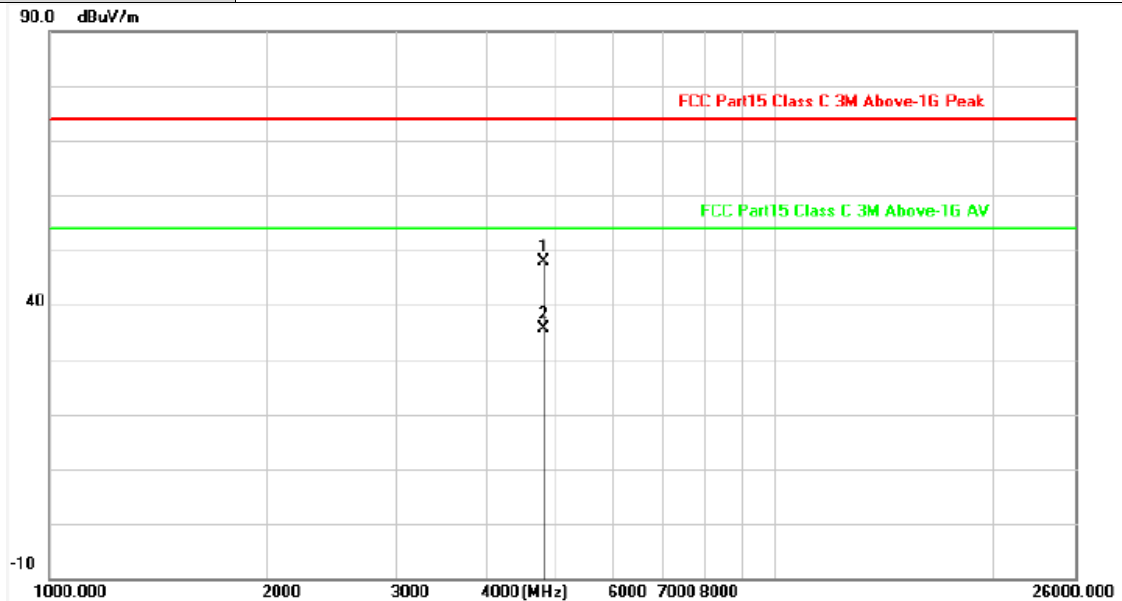
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4803.988 | -2.82 | 36.83 | 34.01 | 54.00 | -19.99 | AVG |
| 2 | 4804.183 | -2.82 | 50.26 | 47.44 | 74.00 | -26.56 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX $\pi/4$ -DQPSK Mode 2402MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



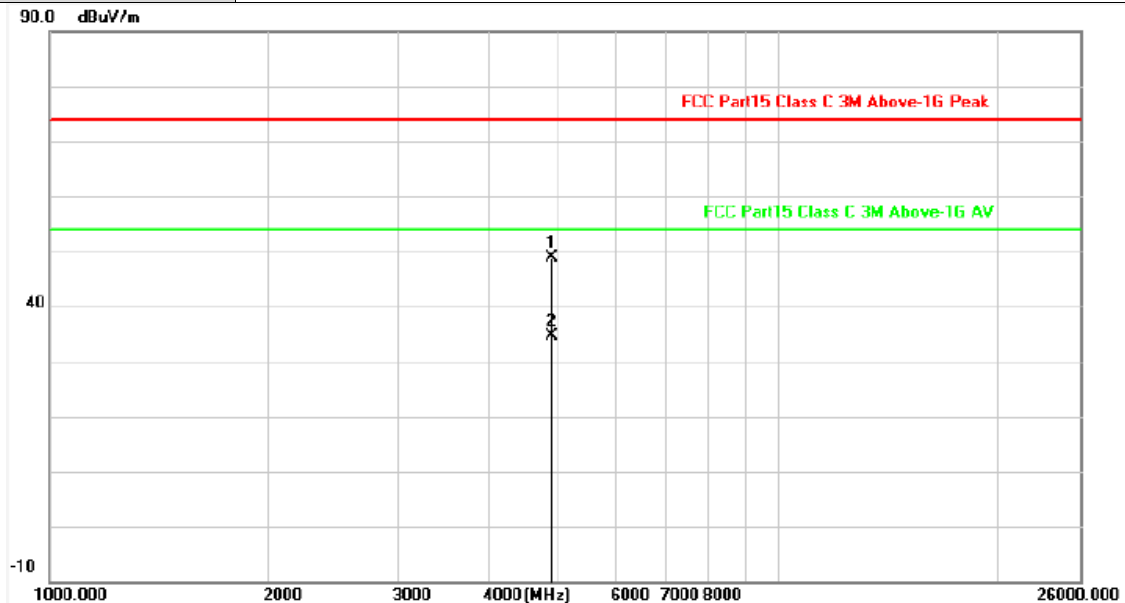
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4804.104 | -2.82 | 50.79 | 47.97 | 74.00 | -26.03 | peak |
| 2 | 4804.273 | -2.82 | 38.46 | 35.64 | 54.00 | -18.36 | AVG |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX $\pi/4$ -DQPSK Mode 2441MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4882.198 | -2.60 | 51.49 | 48.89 | 74.00 | -25.11 | peak |
| 2 | 4882.202 | -2.60 | 37.14 | 34.54 | 54.00 | -19.46 | AVG |

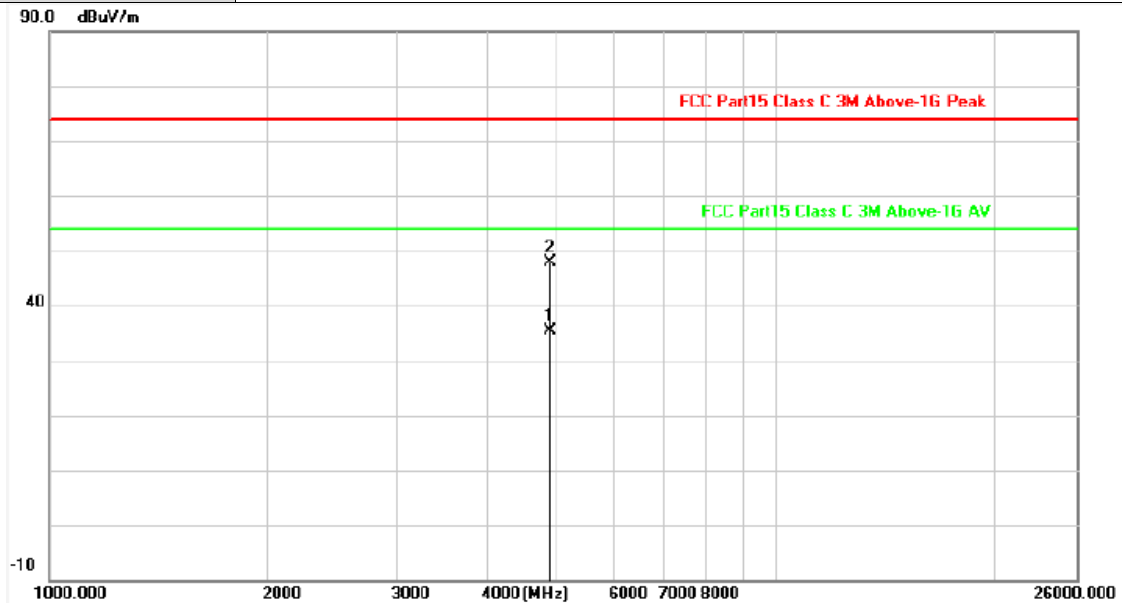
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX $\pi/4$ -DQPSK Mode 2441MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4881.727 | -2.60 | 37.93 | 35.33 | 54.00 | -18.67 | AVG |
| 2 | 4882.542 | -2.59 | 50.39 | 47.80 | 74.00 | -26.20 | peak |

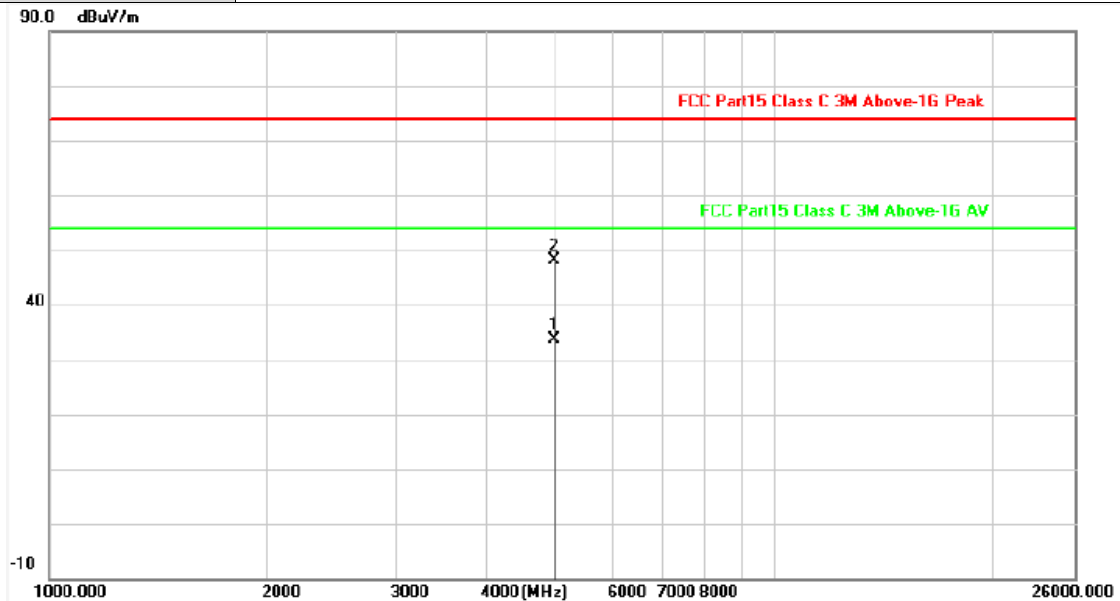
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX $\pi/4$ -DQPSK Mode 2480MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4959.238 | -2.38 | 35.91 | 33.53 | 54.00 | -20.47 | AVG |
| 2 | 4960.122 | -2.38 | 50.40 | 48.02 | 74.00 | -25.98 | peak |

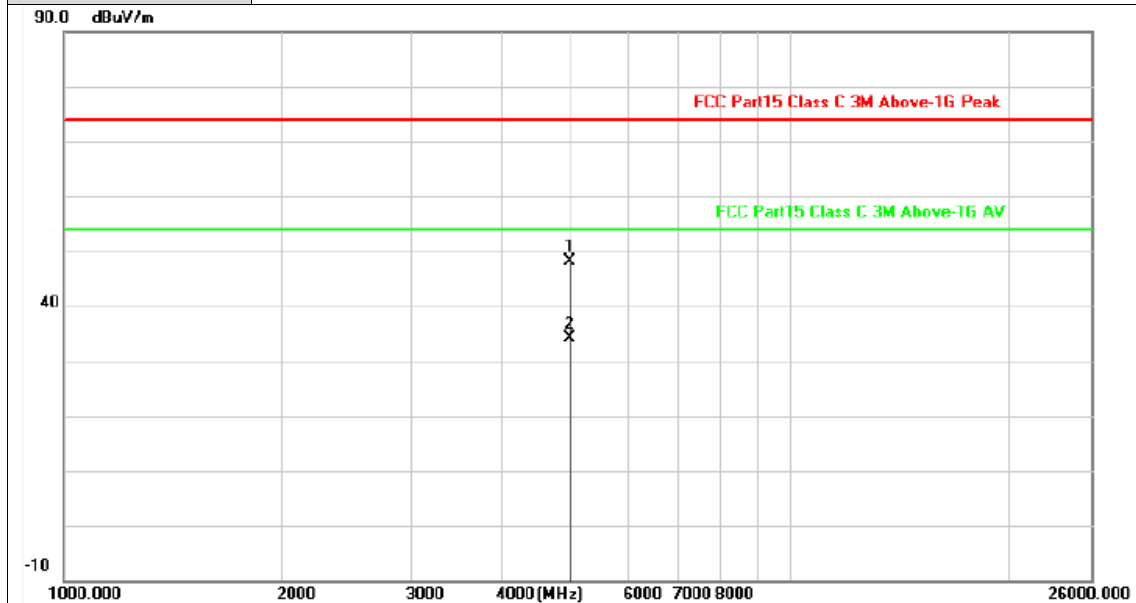
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX $\pi/4$ -DQPSK Mode 2480MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4959.620 | -2.38 | 50.48 | 48.10 | 74.00 | -25.90 | peak |
| 2 | 4960.378 | -2.38 | 36.51 | 34.13 | 54.00 | -19.87 | AVG |

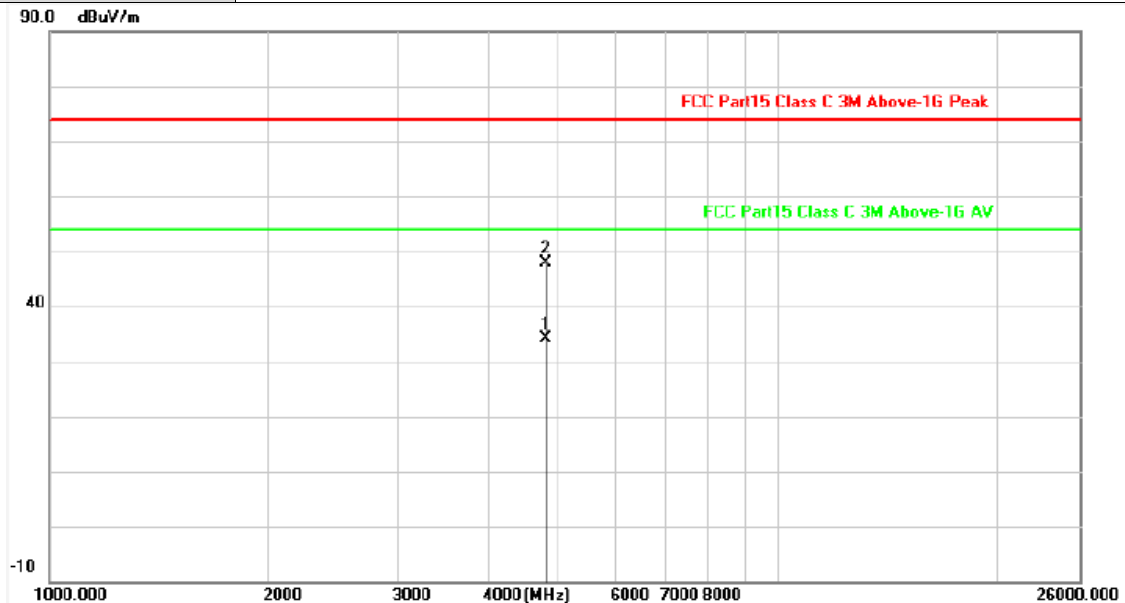
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX 8-DPSK Mode 2402MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



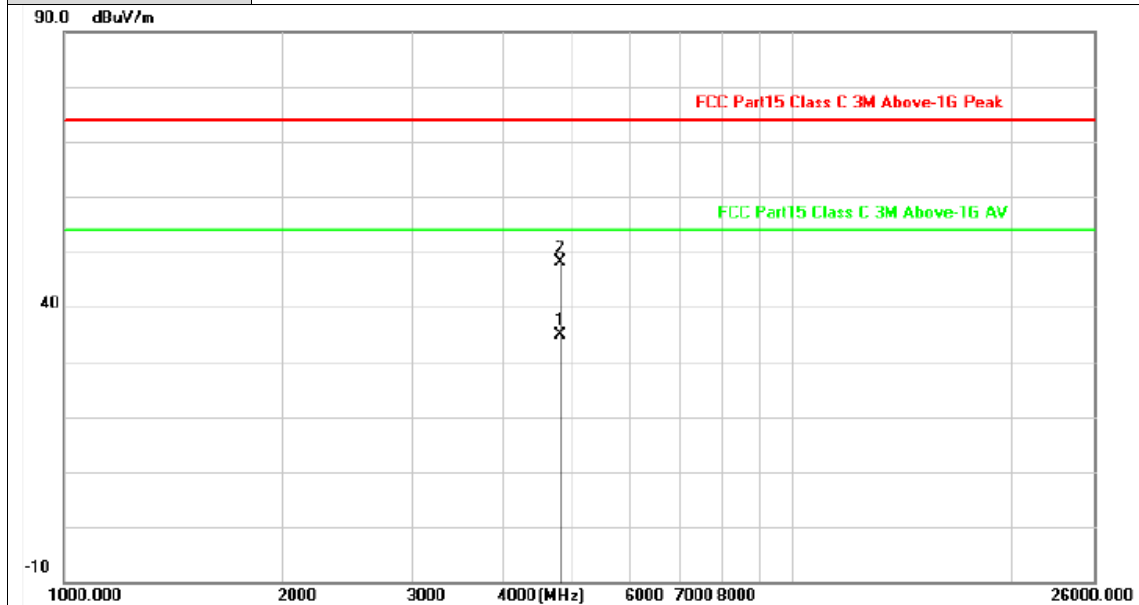
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4803.881 | -2.82 | 37.05 | 34.23 | 54.00 | -19.77 | AVG |
| 2 | 4804.028 | -2.82 | 50.69 | 47.87 | 74.00 | -26.13 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX 8-DPSK Mode 2402MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



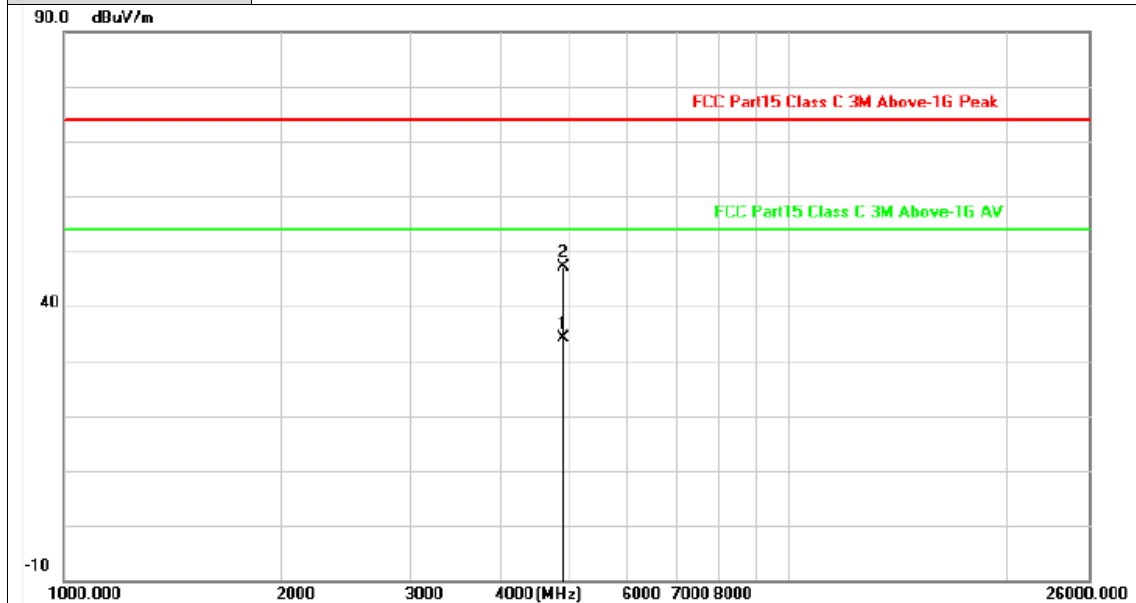
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4804.237 | -2.82 | 37.60 | 34.78 | 54.00 | -19.22 | AVG |
| 2 | 4804.324 | -2.82 | 51.03 | 48.21 | 74.00 | -25.79 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX 8-DPSK Mode 2441MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4882.030 | -2.60 | 36.71 | 34.11 | 54.00 | -19.89 | AVG |
| 2 | 4882.246 | -2.60 | 49.74 | 47.14 | 74.00 | -26.86 | peak |

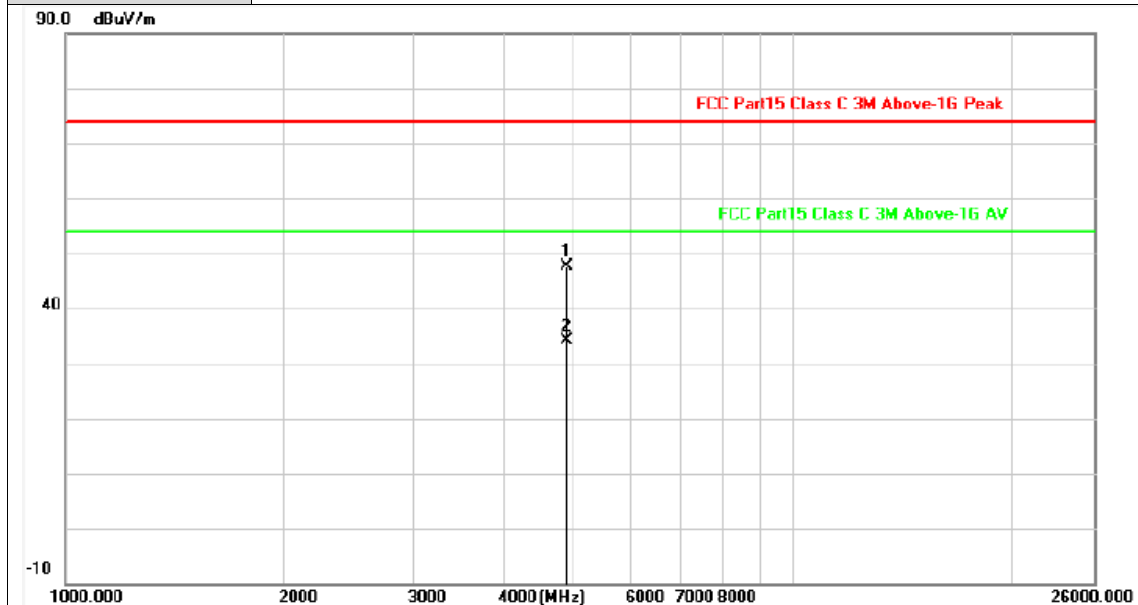
Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor

2. Margin value = Level - Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX 8-DPSK Mode 2441MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



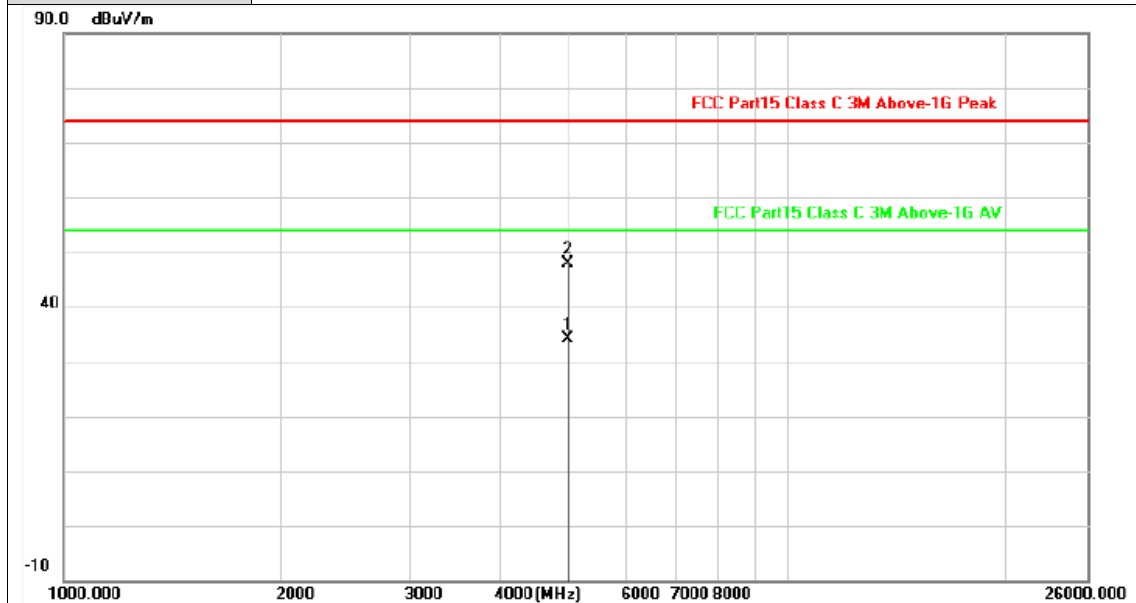
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4881.754 | -2.60 | 50.19 | 47.59 | 74.00 | -26.41 | peak |
| 2 | 4882.529 | -2.59 | 36.76 | 34.17 | 54.00 | -19.83 | AVG |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Horizontal |
| Test Mode: | TX 8-DPSK Mode 2480MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



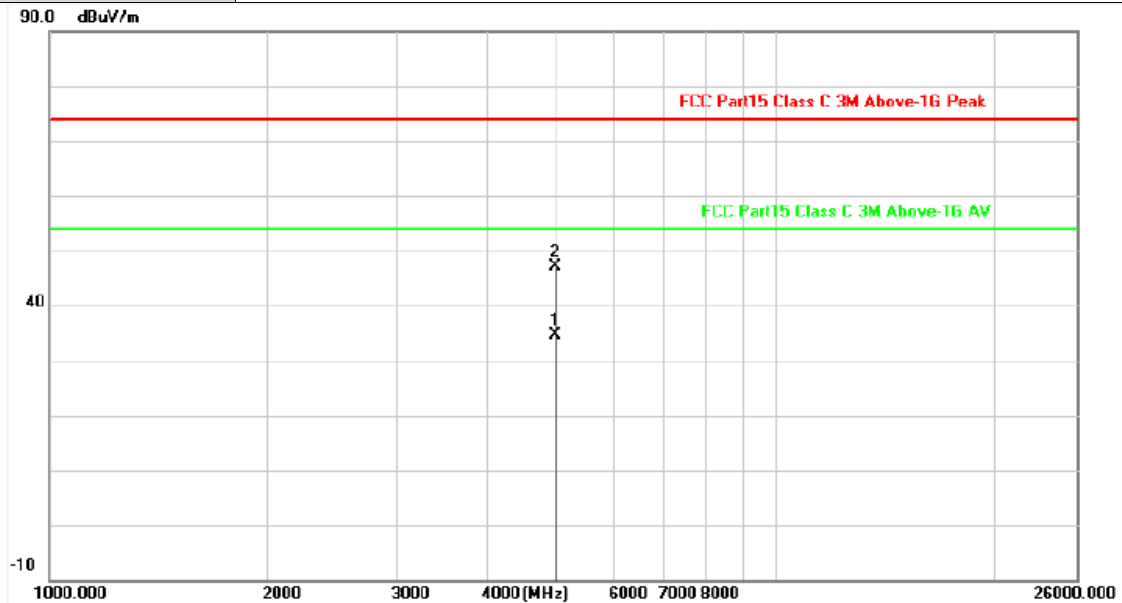
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4960.345 | -2.38 | 36.48 | 34.10 | 54.00 | -19.90 | AVG |
| 2 | 4960.763 | -2.38 | 50.15 | 47.77 | 74.00 | -26.23 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



| | |
|------------|------------------------------------------------------------------------------|
| Ant. Pol. | Vertical |
| Test Mode: | TX 8-DPSK Mode 2480MHz |
| Remark: | No report for the emission which more than 10 dB below the prescribed limit. |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|
| 1 | 4959.768 | -2.38 | 36.91 | 34.53 | 54.00 | -19.47 | AVG |
| 2 | 4960.116 | -2.38 | 49.55 | 47.17 | 74.00 | -26.83 | peak |

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value

3.3. Band Edge Emissions

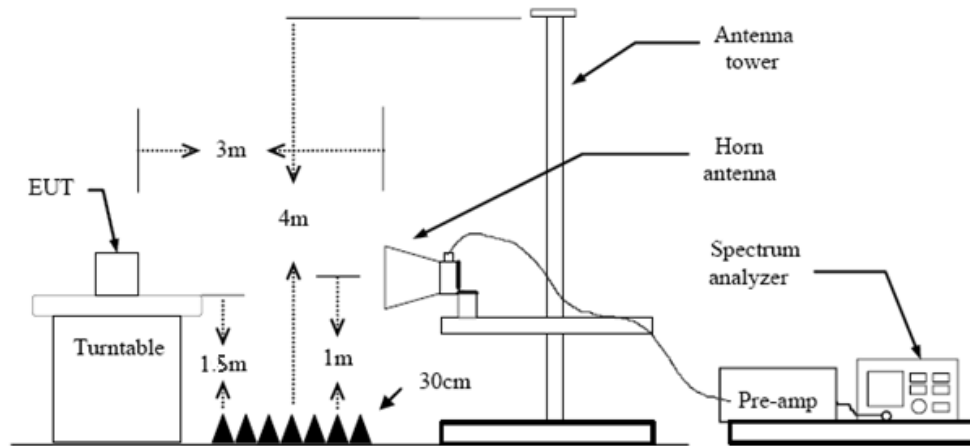
Limit

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

| Restricted Frequency Band (MHz) | (dBuV/m)(at 3m) | |
|---------------------------------|-----------------|---------|
| | Peak | Average |
| 2310 ~2390 | 74 | 54 |
| 2483.5 ~2500 | 74 | 54 |

Conducted Band Edge and Conducted Spurious Emissions limit: The highest point of the operating frequency waveform down 20dB

Test Configuration

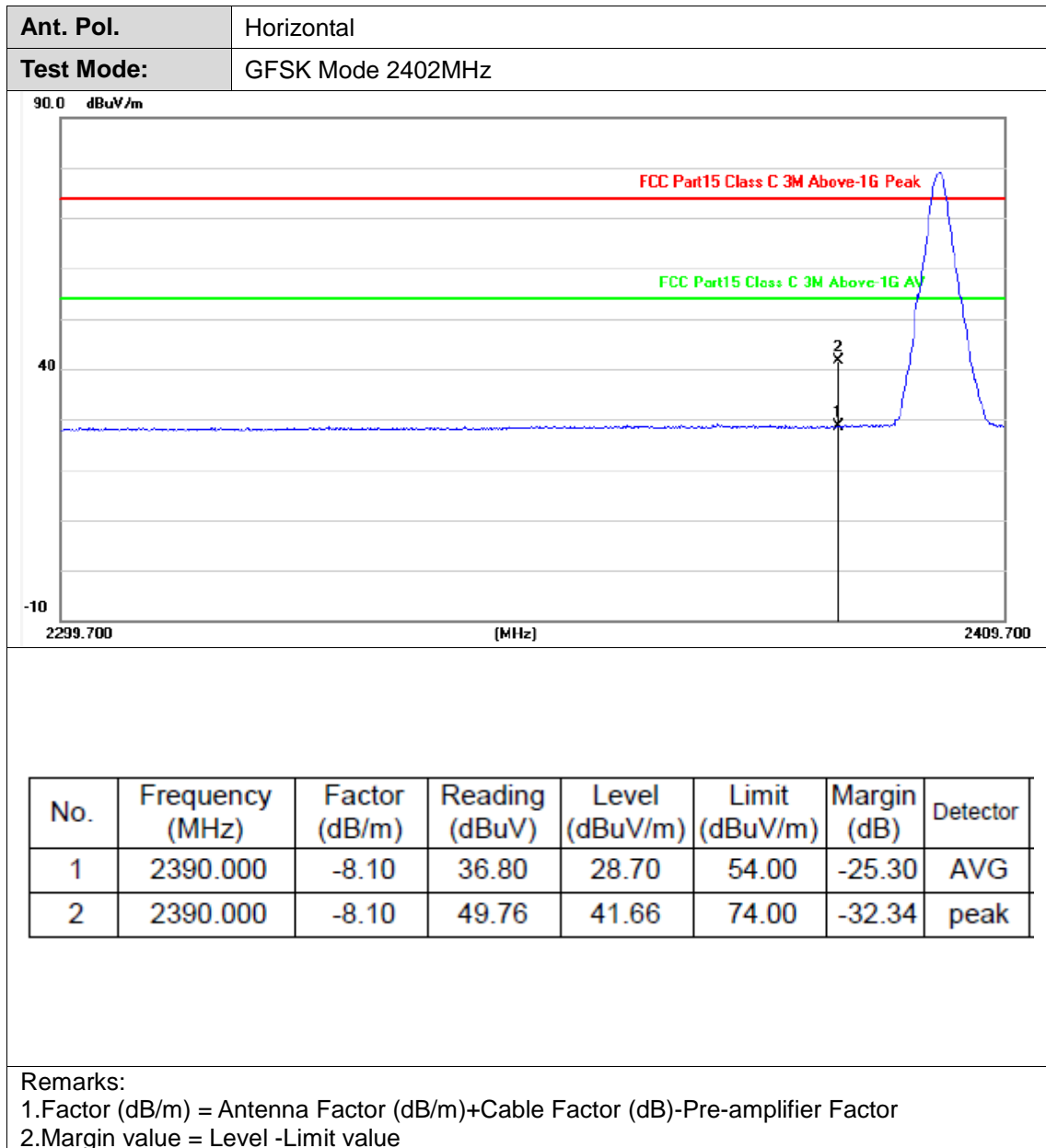


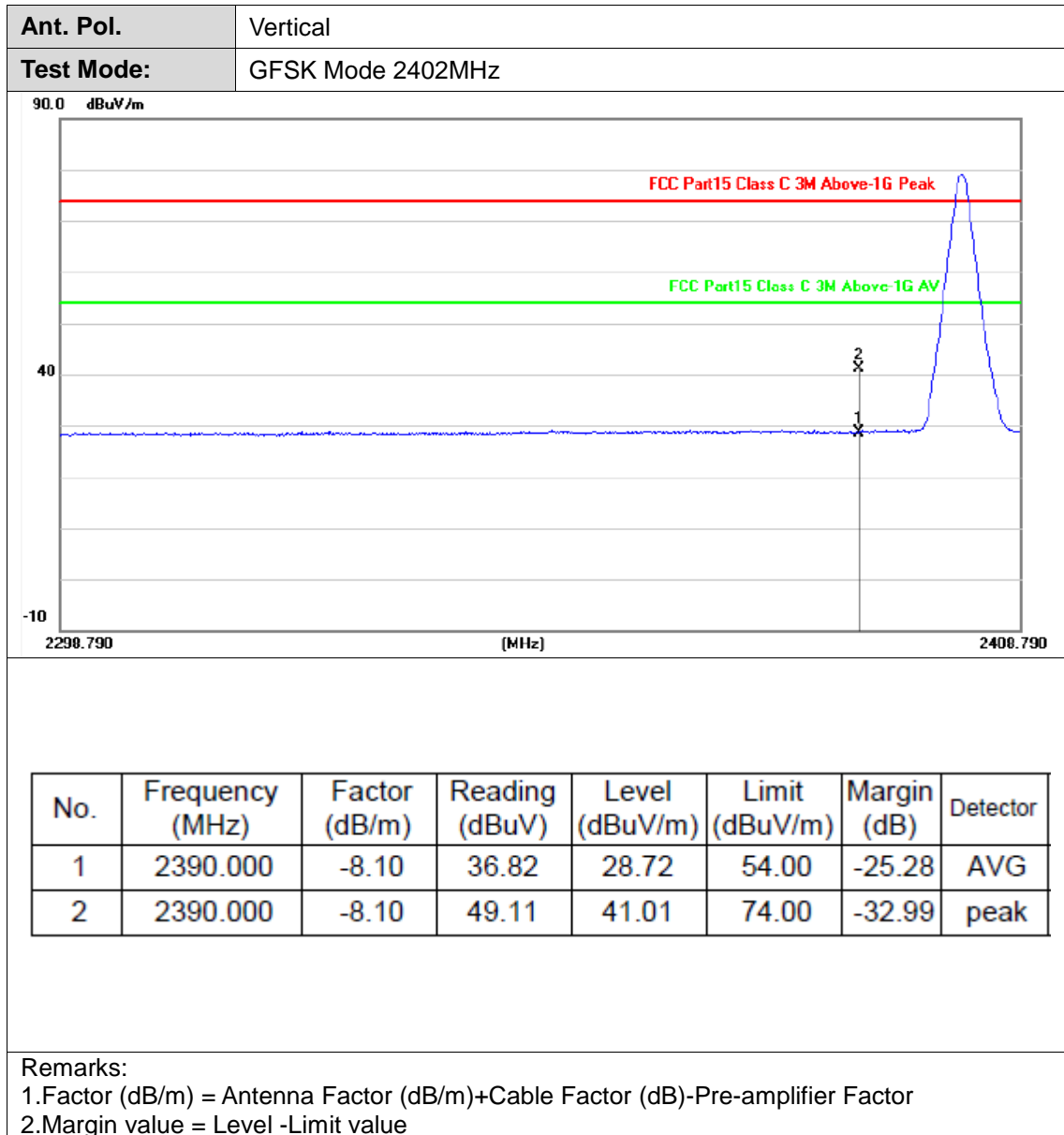
Test Procedure

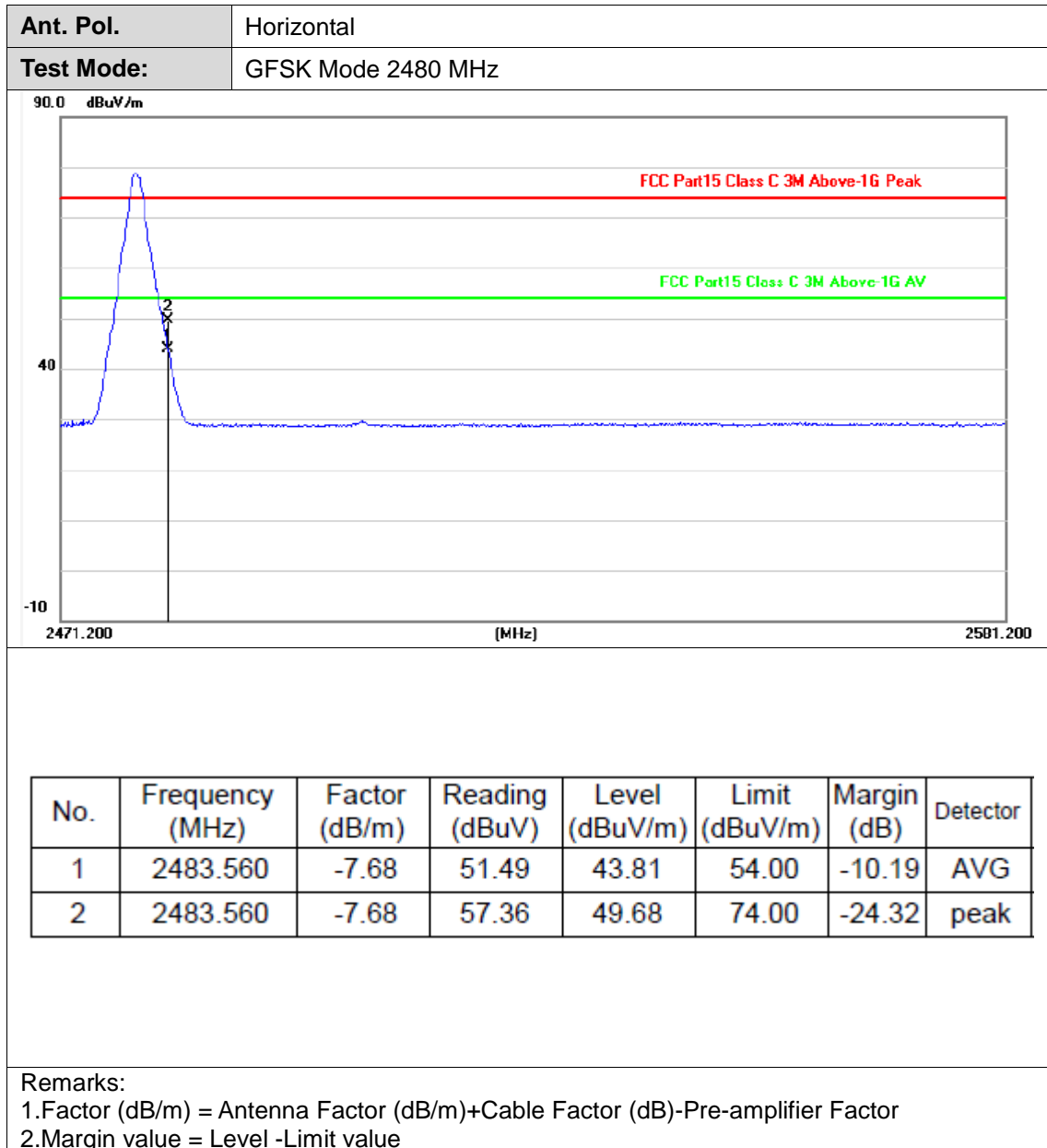
- The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- The EUT was positioned such that the distance from antenna to 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.
The conducted spurious emissions set as follow:
 - Set RBW = 100 kHz.
 - Set the video bandwidth (VBW) ≥ 3 RBW.
 - Detector = Peak.
 - Trace mode = Max hold.
 - Sweep = Auto couple.

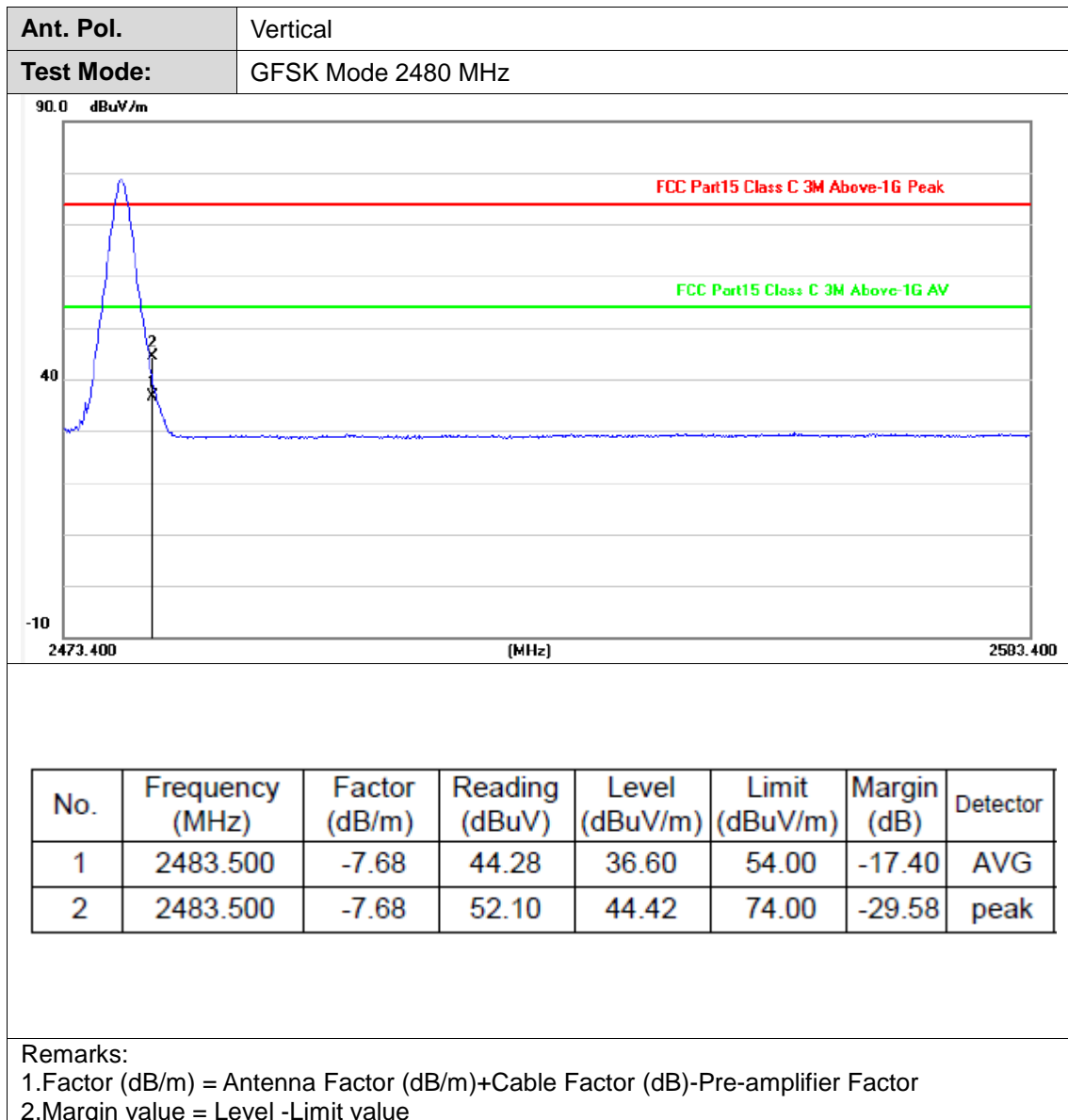
Test Mode

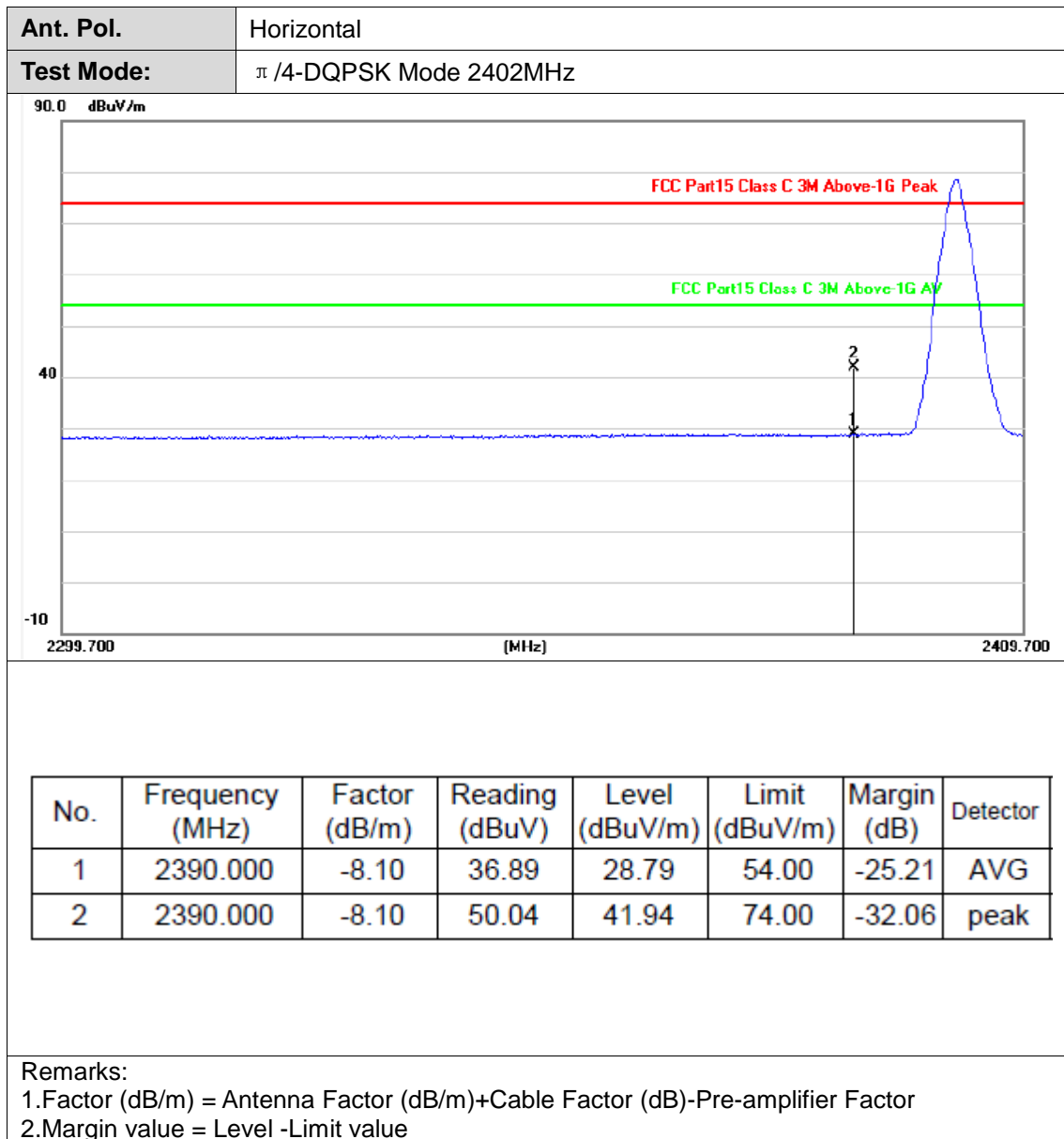
Please refer to the clause 2.3.

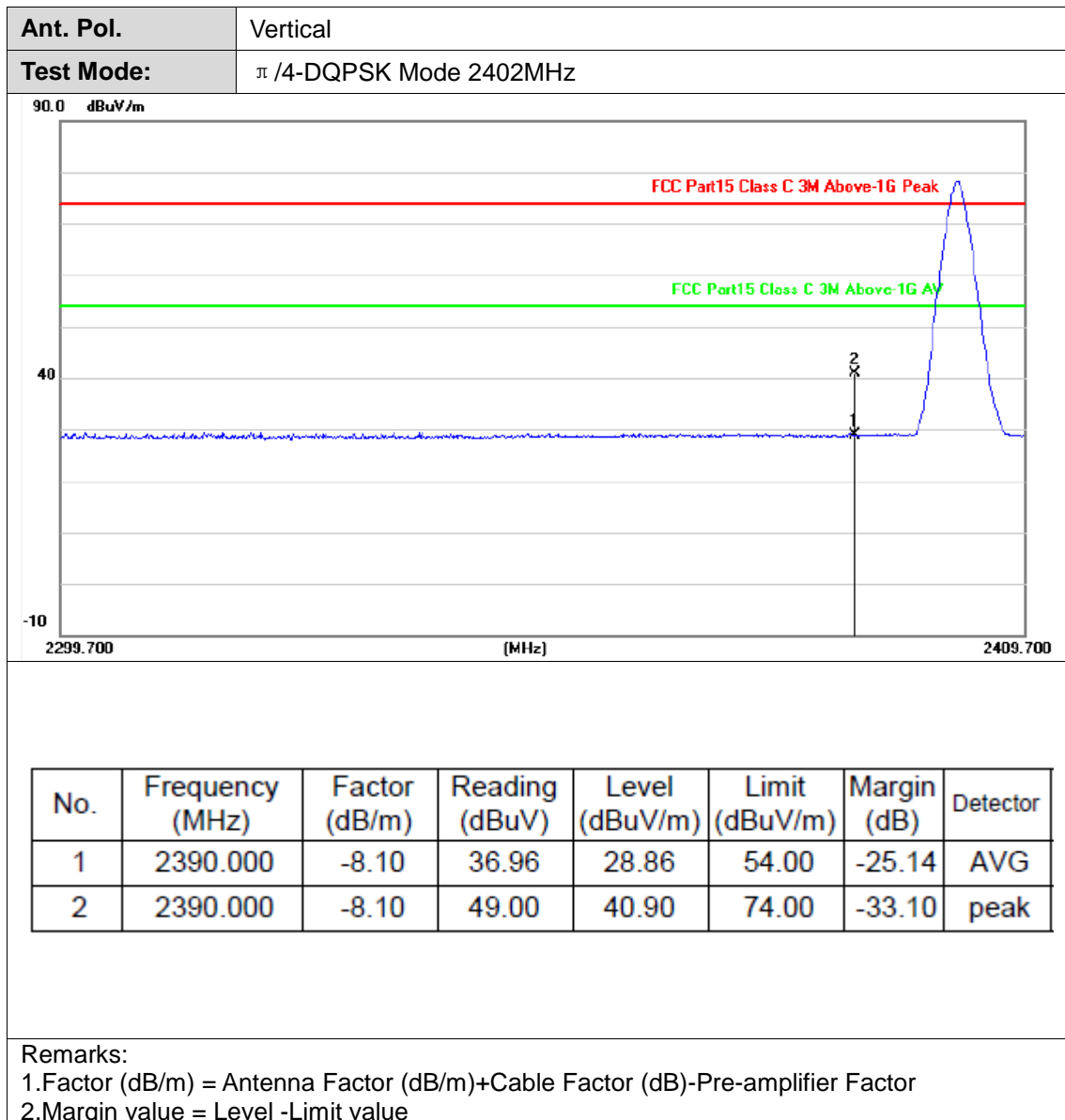
**Test Results****(1) Radiation Test**

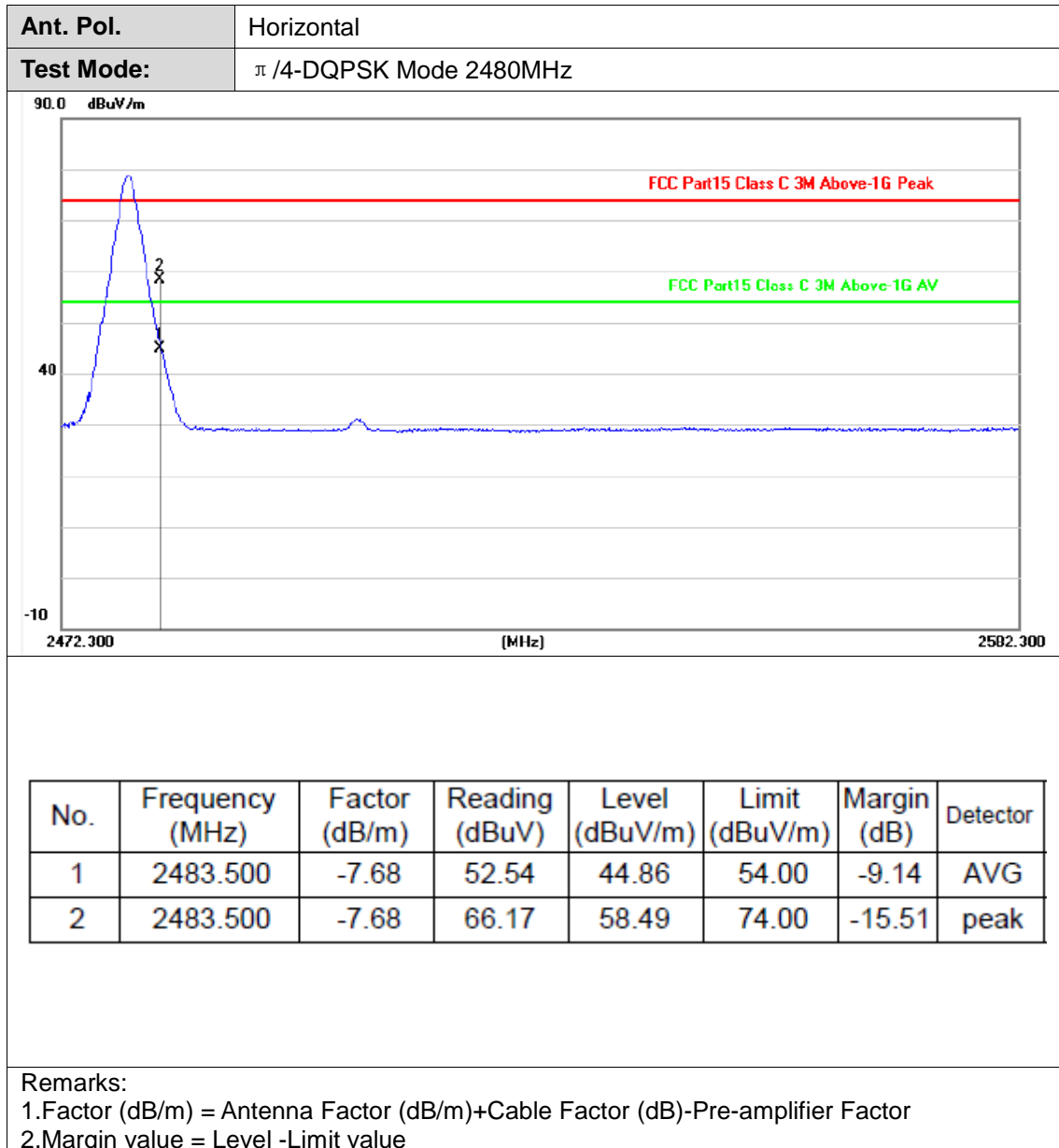


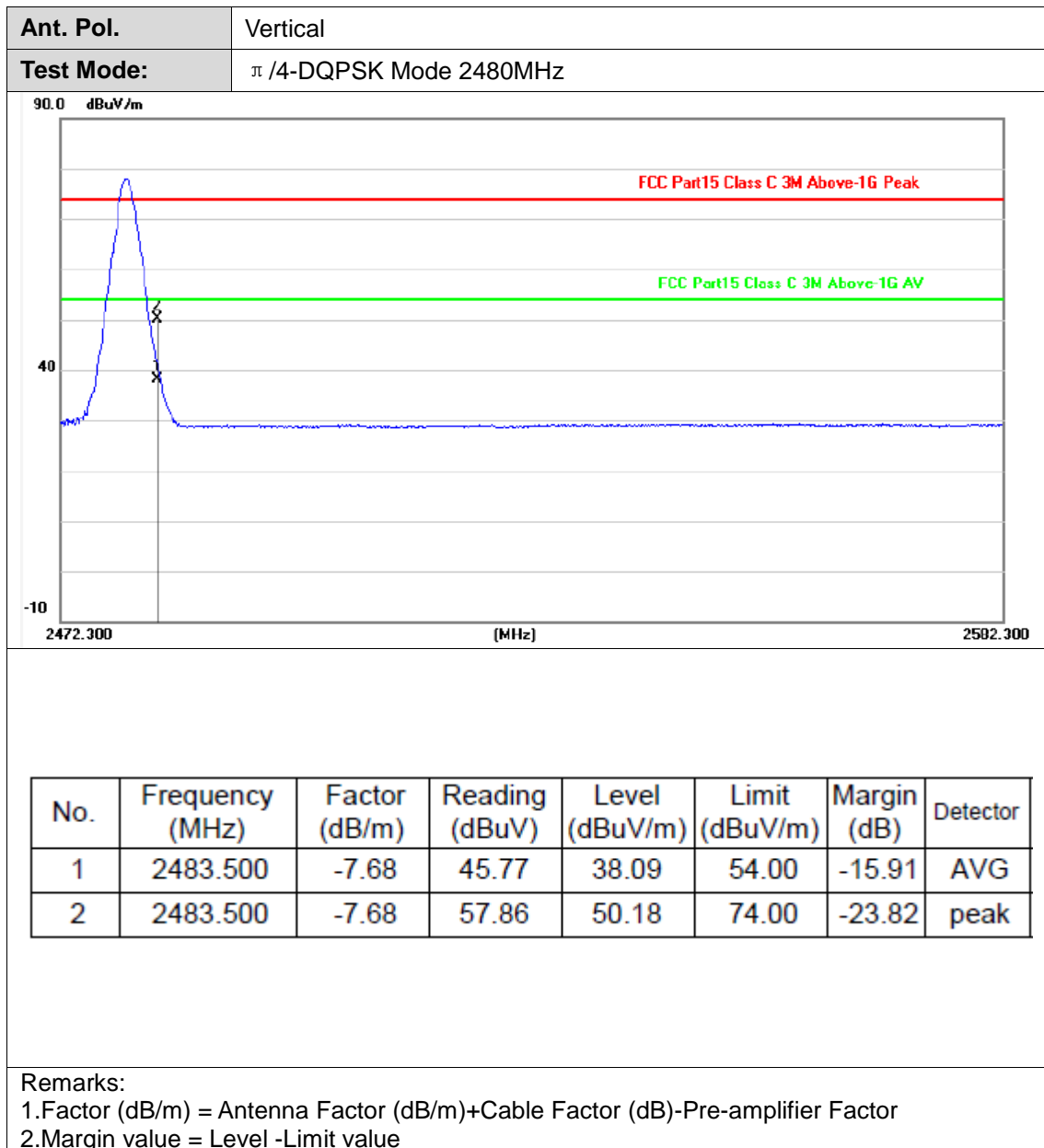


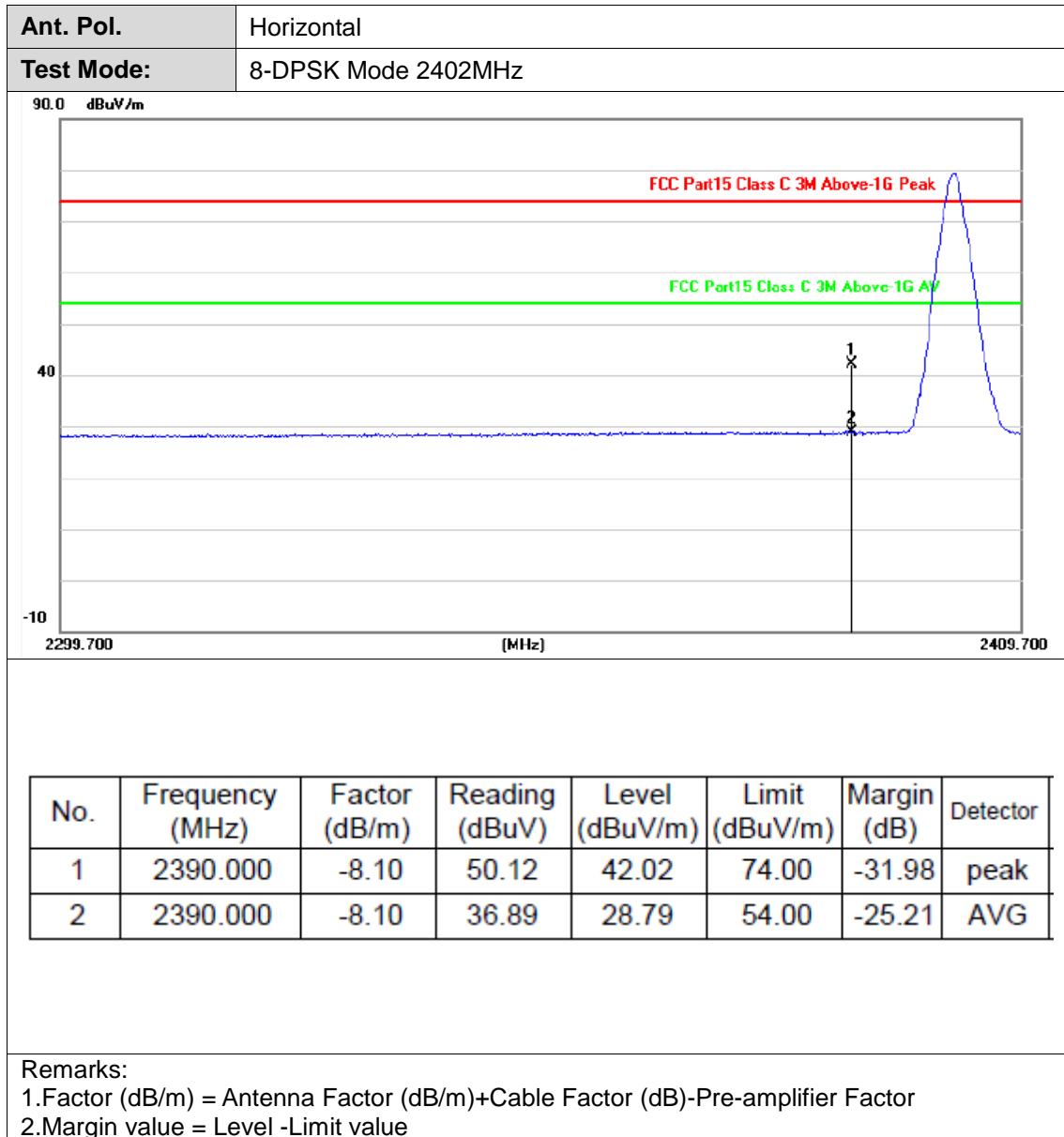


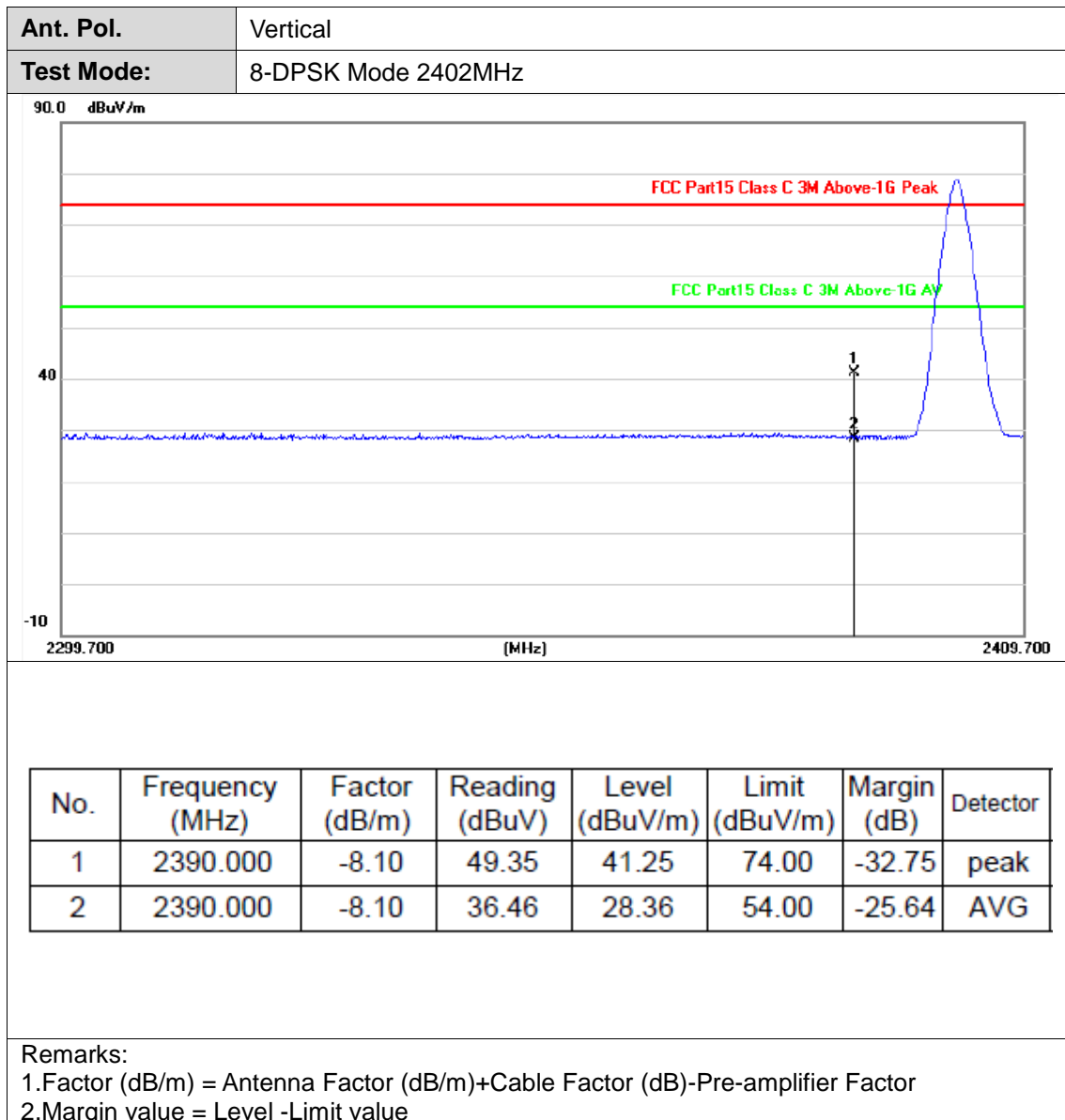


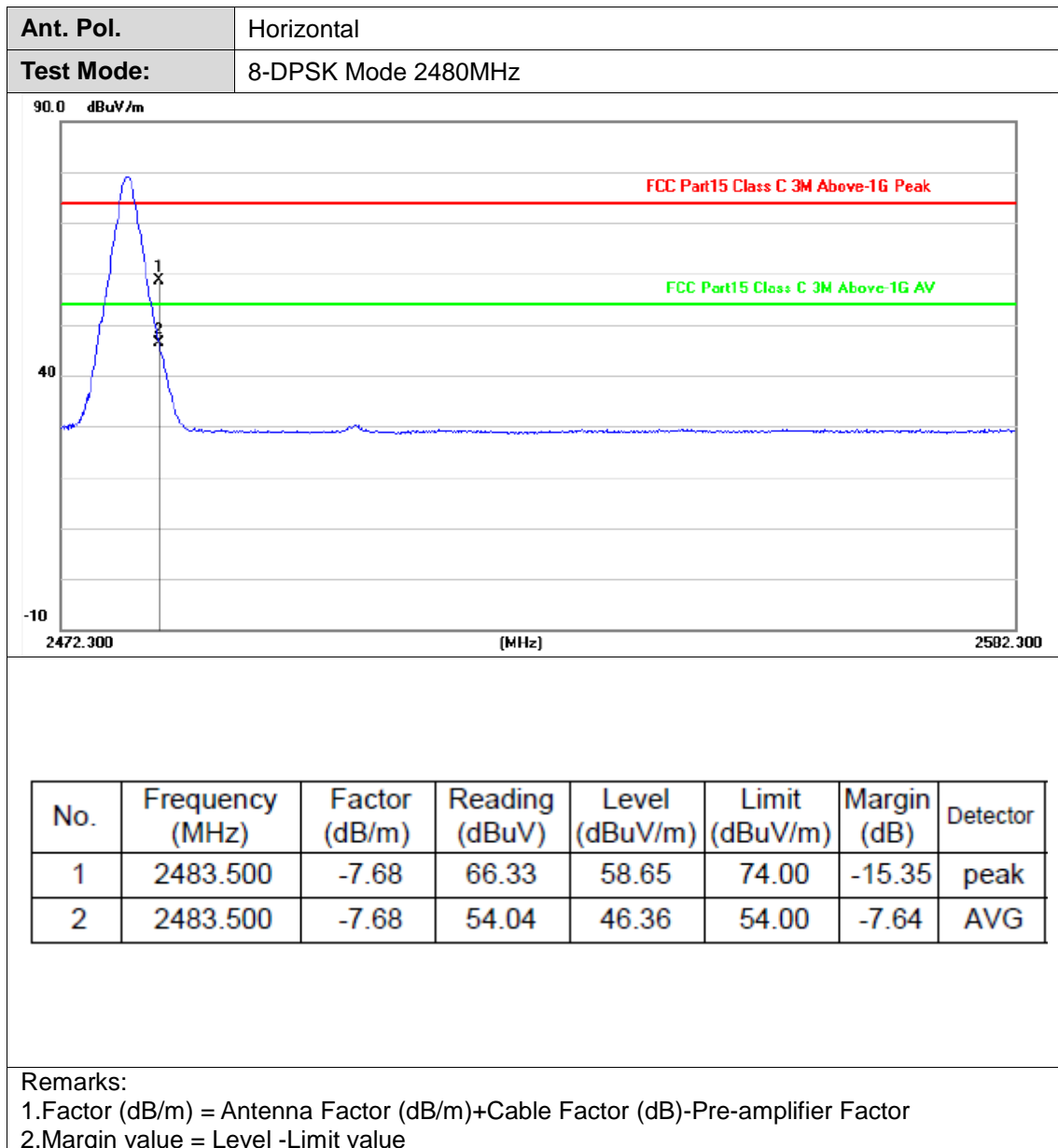


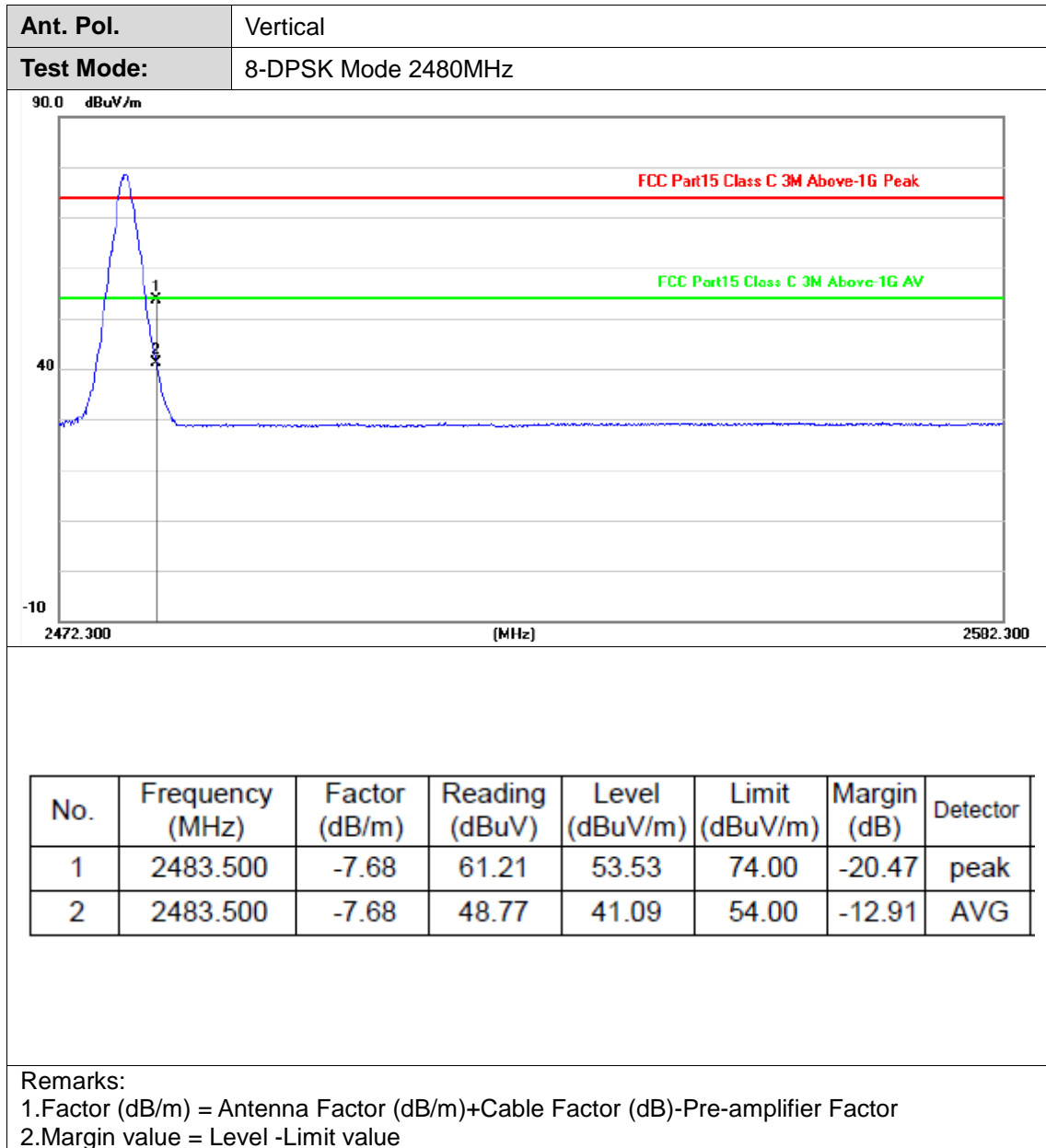








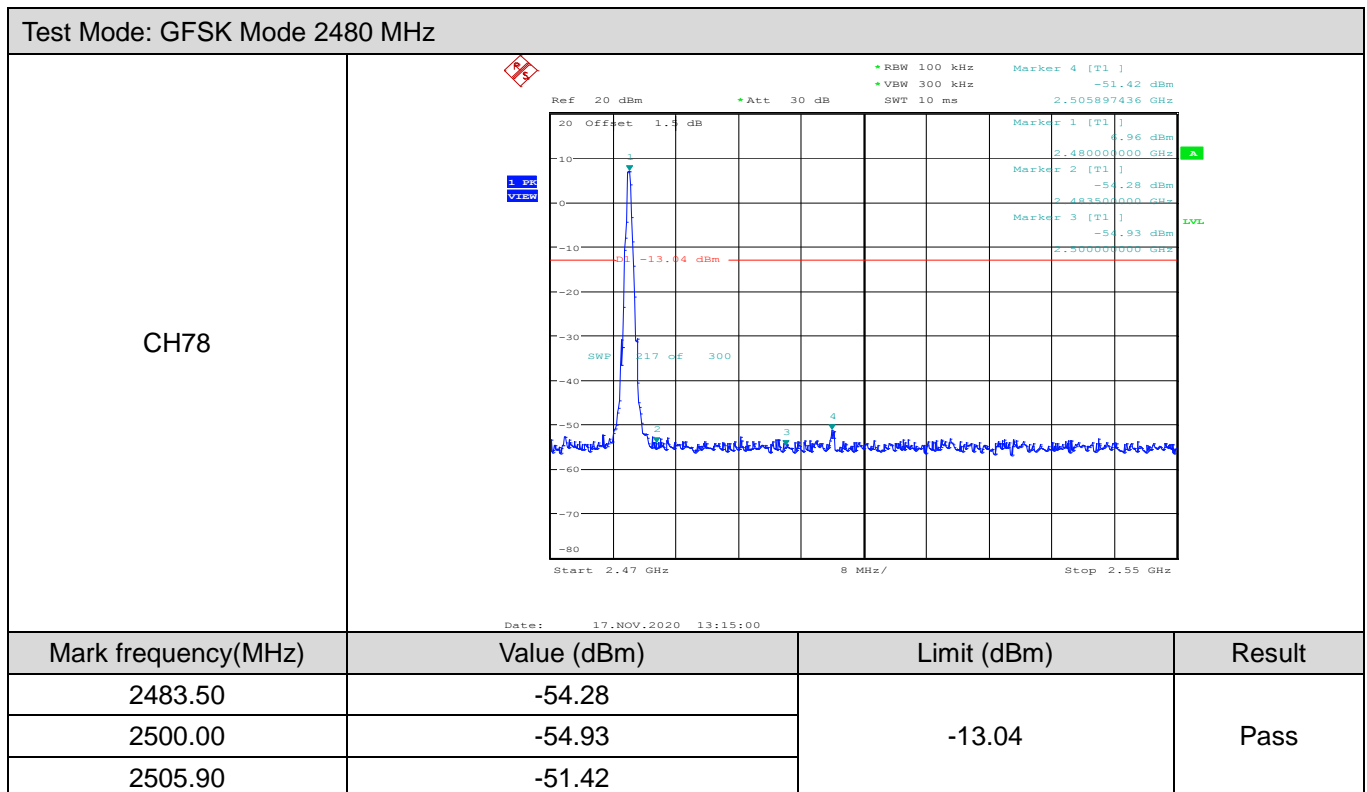
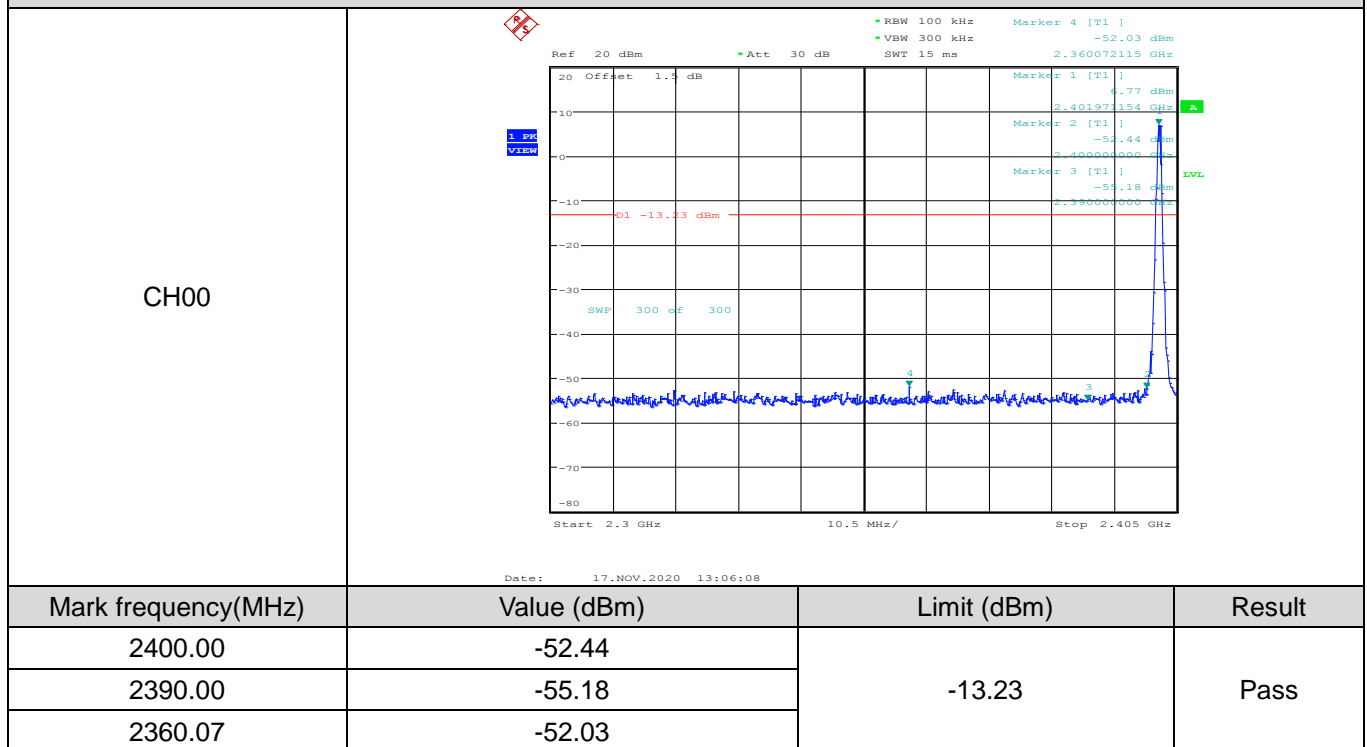


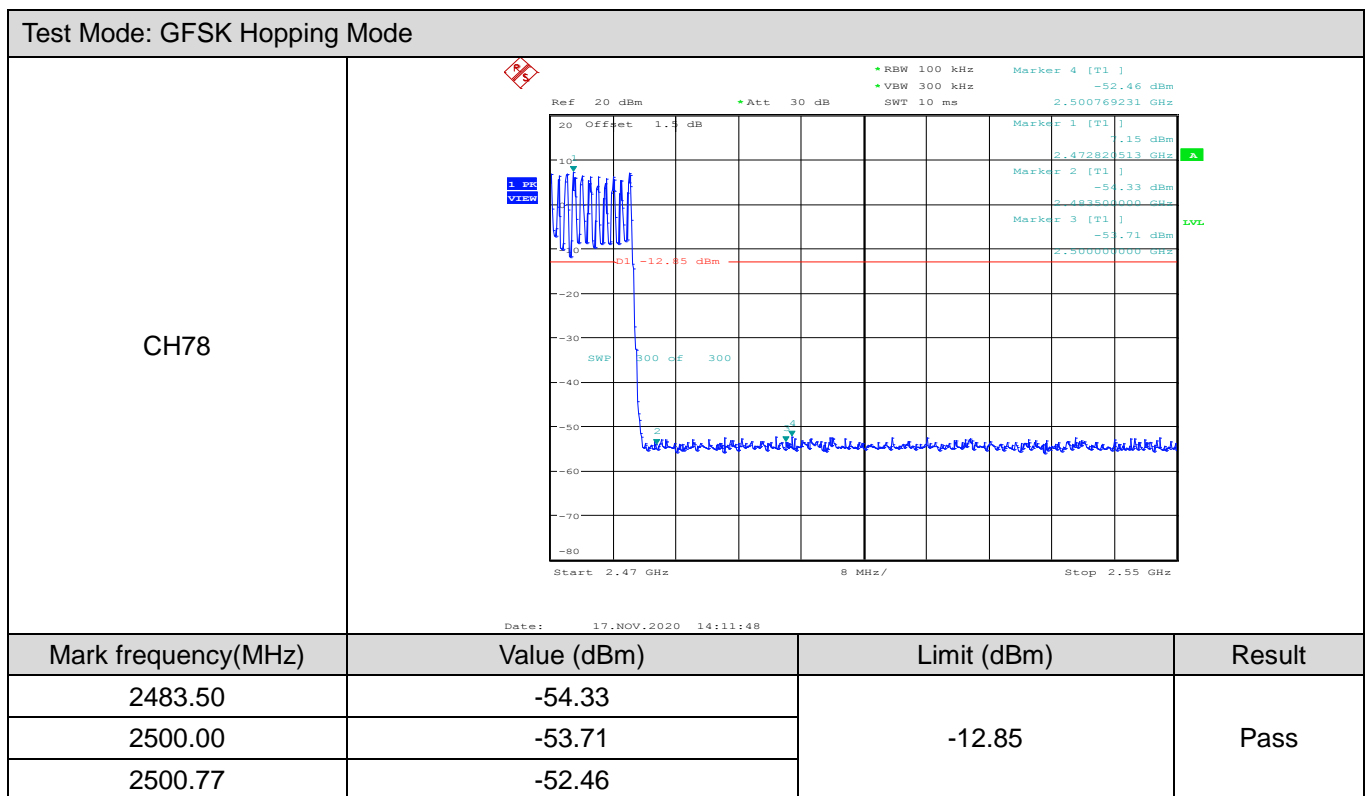
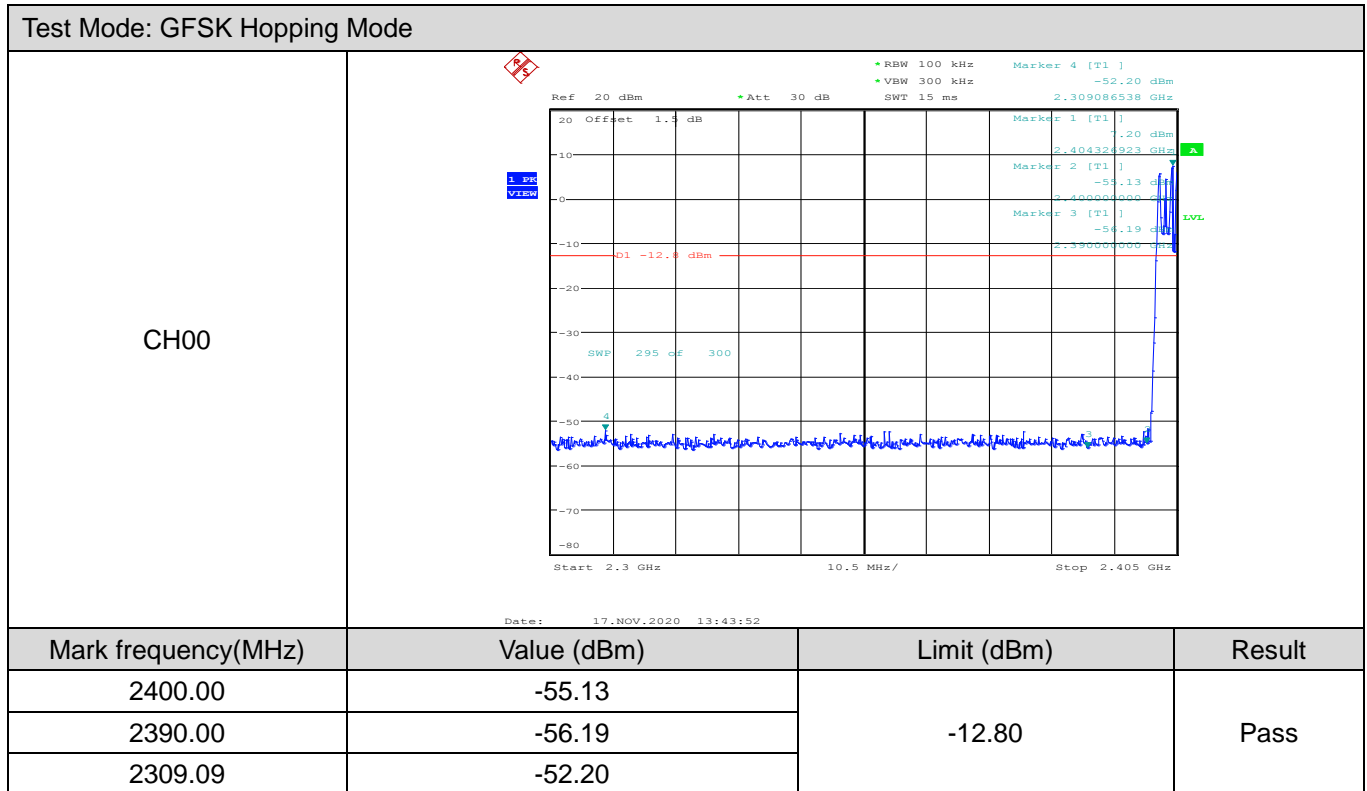


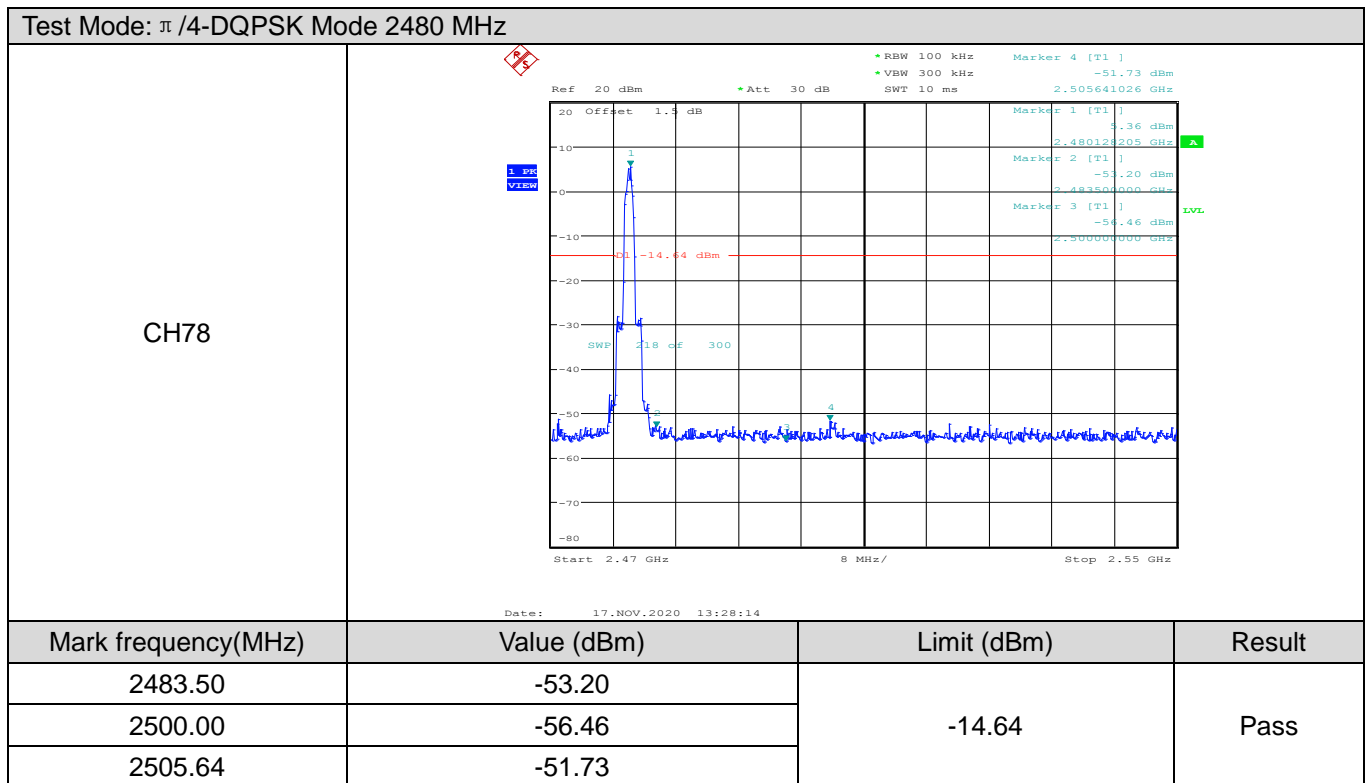
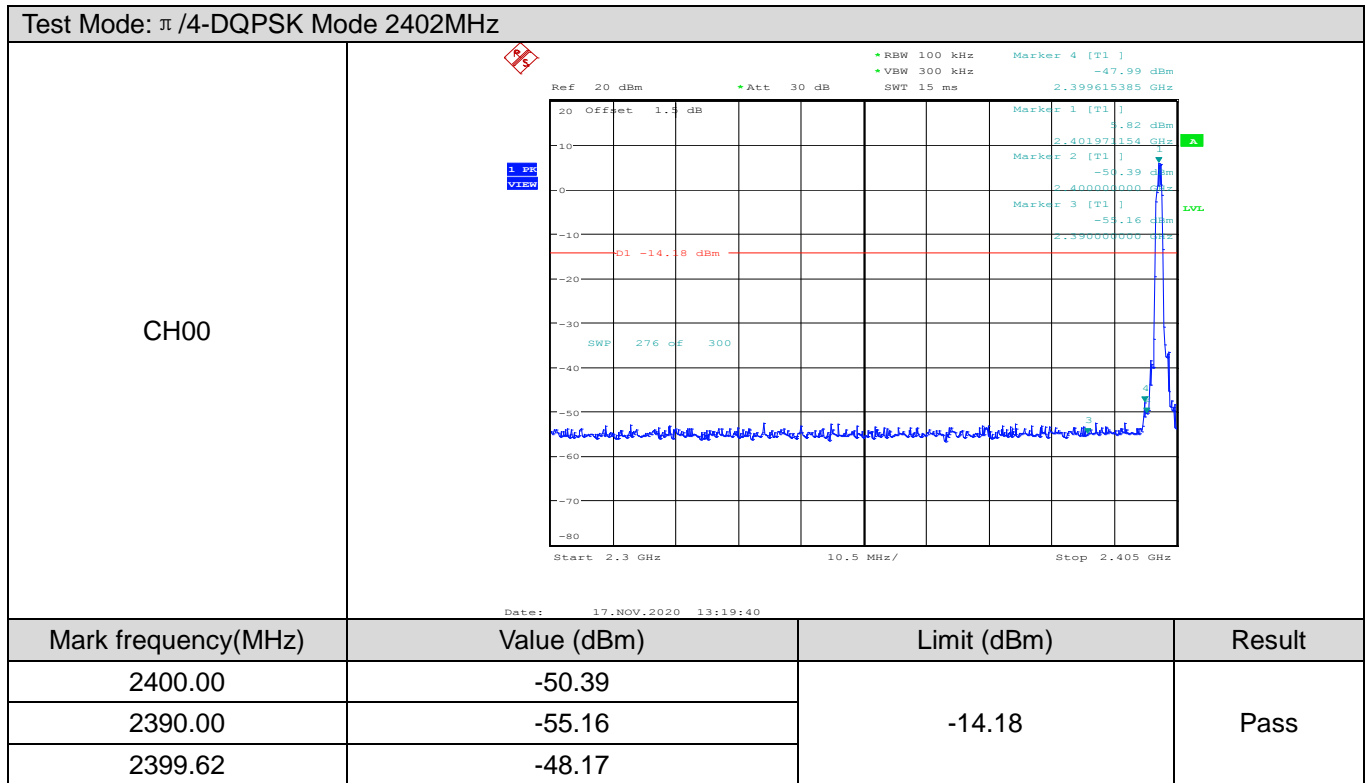


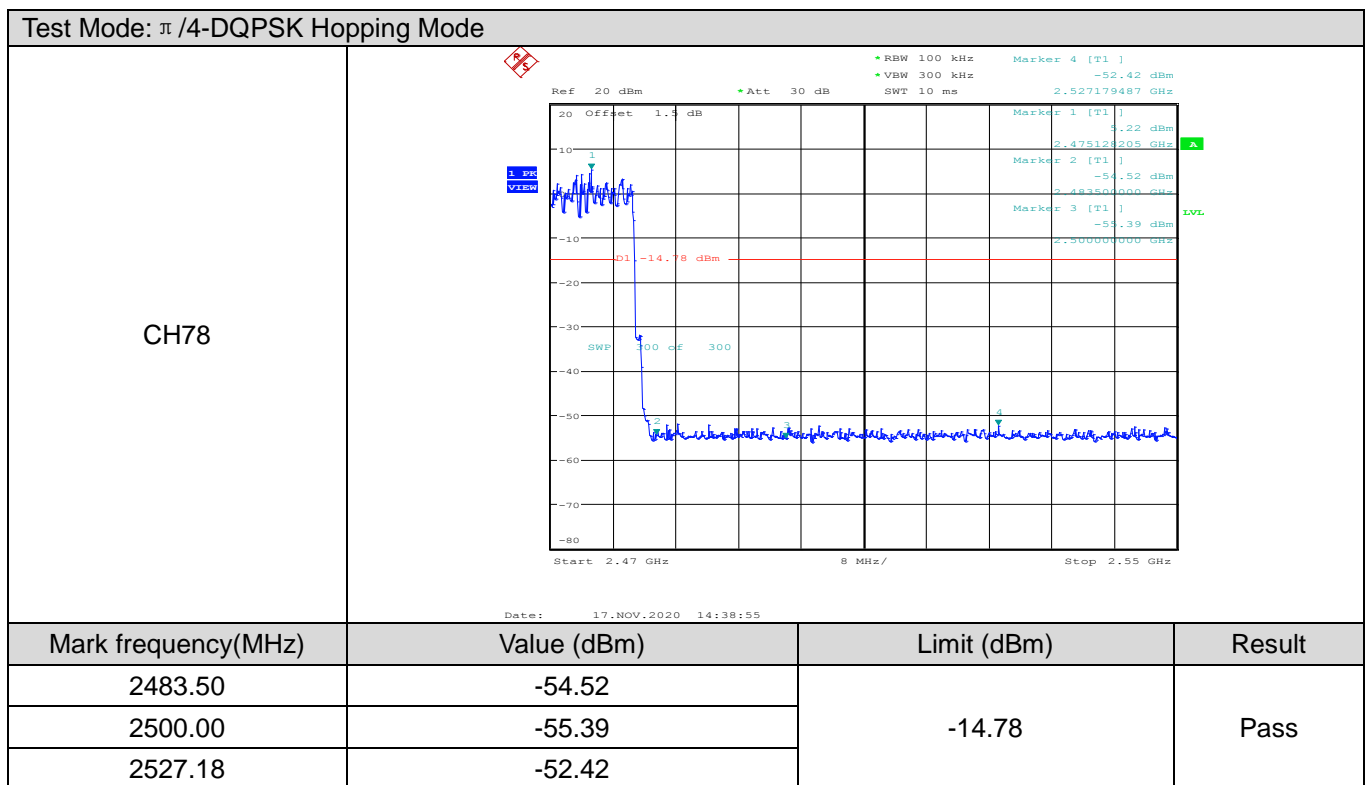
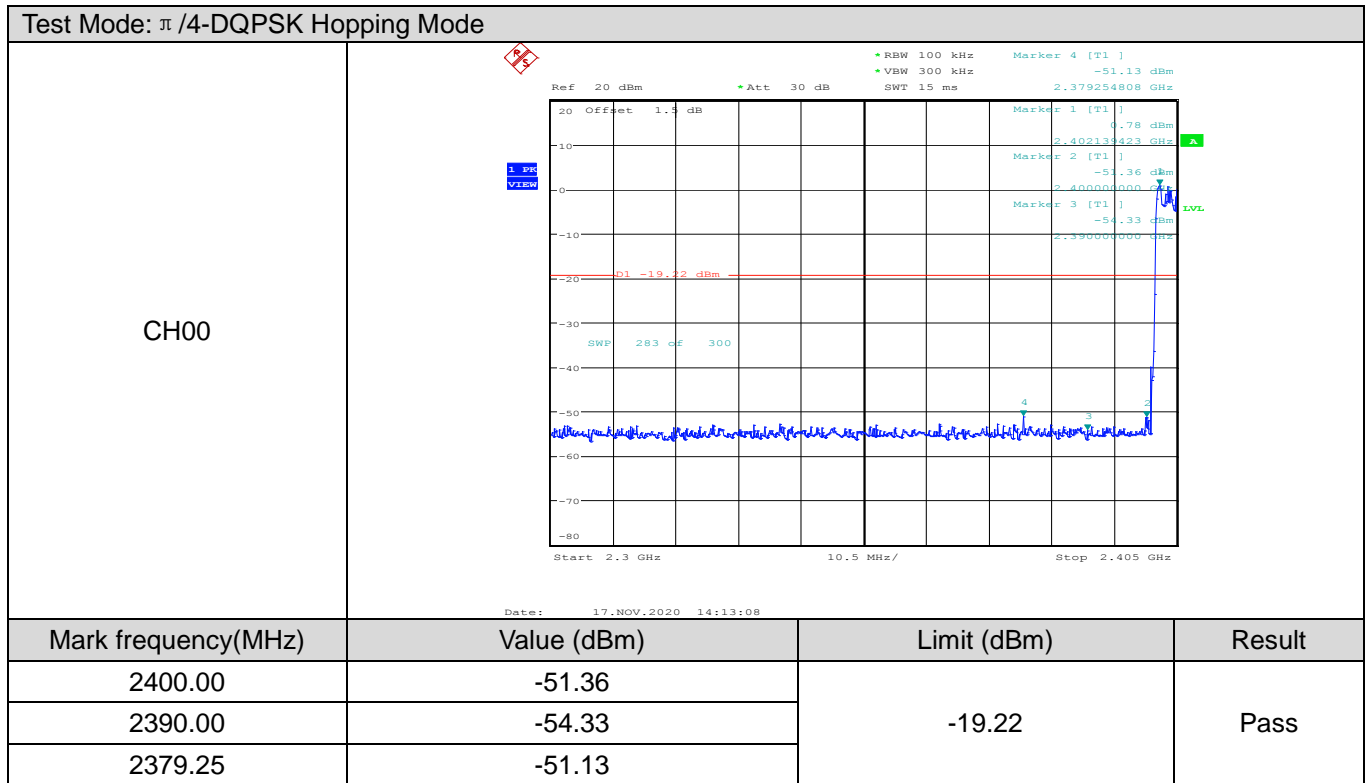
(2) Conducted Band Edge Test

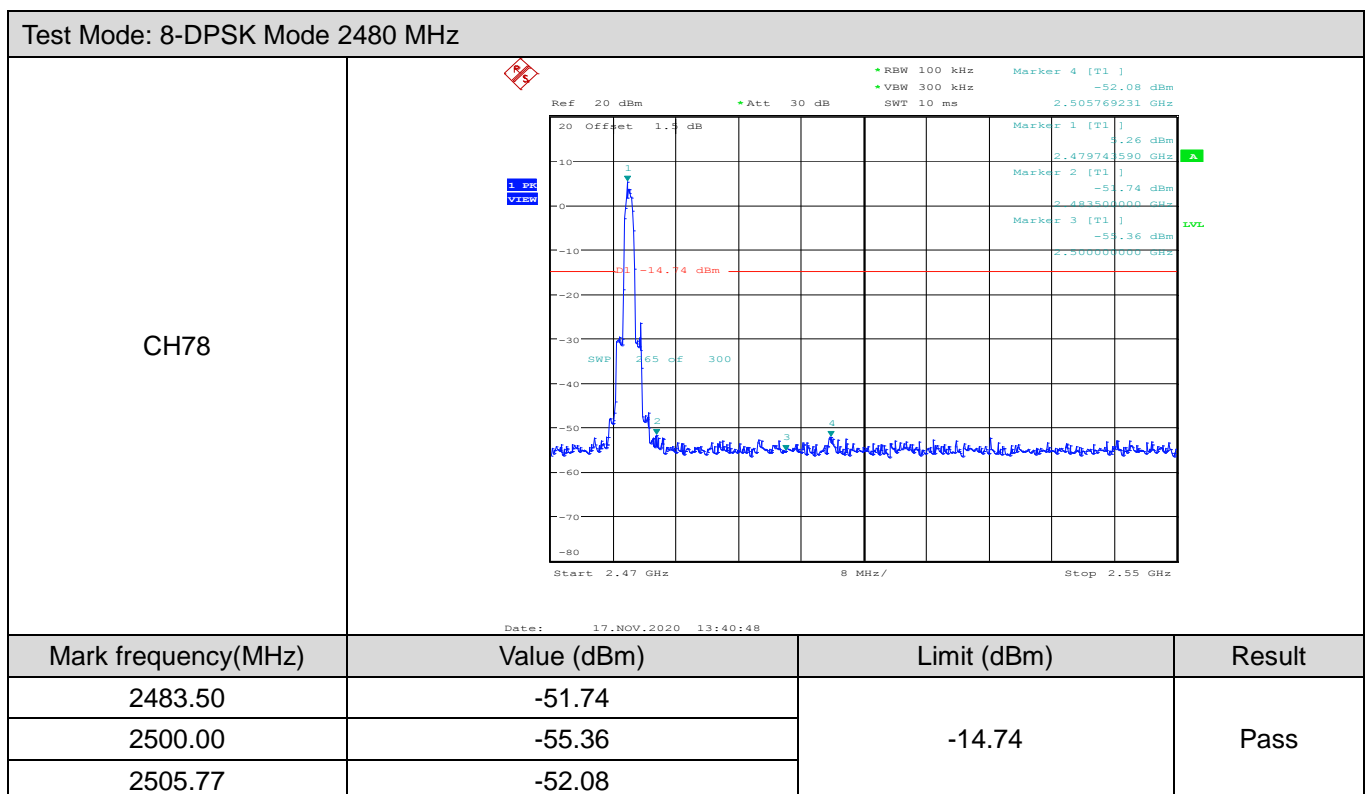
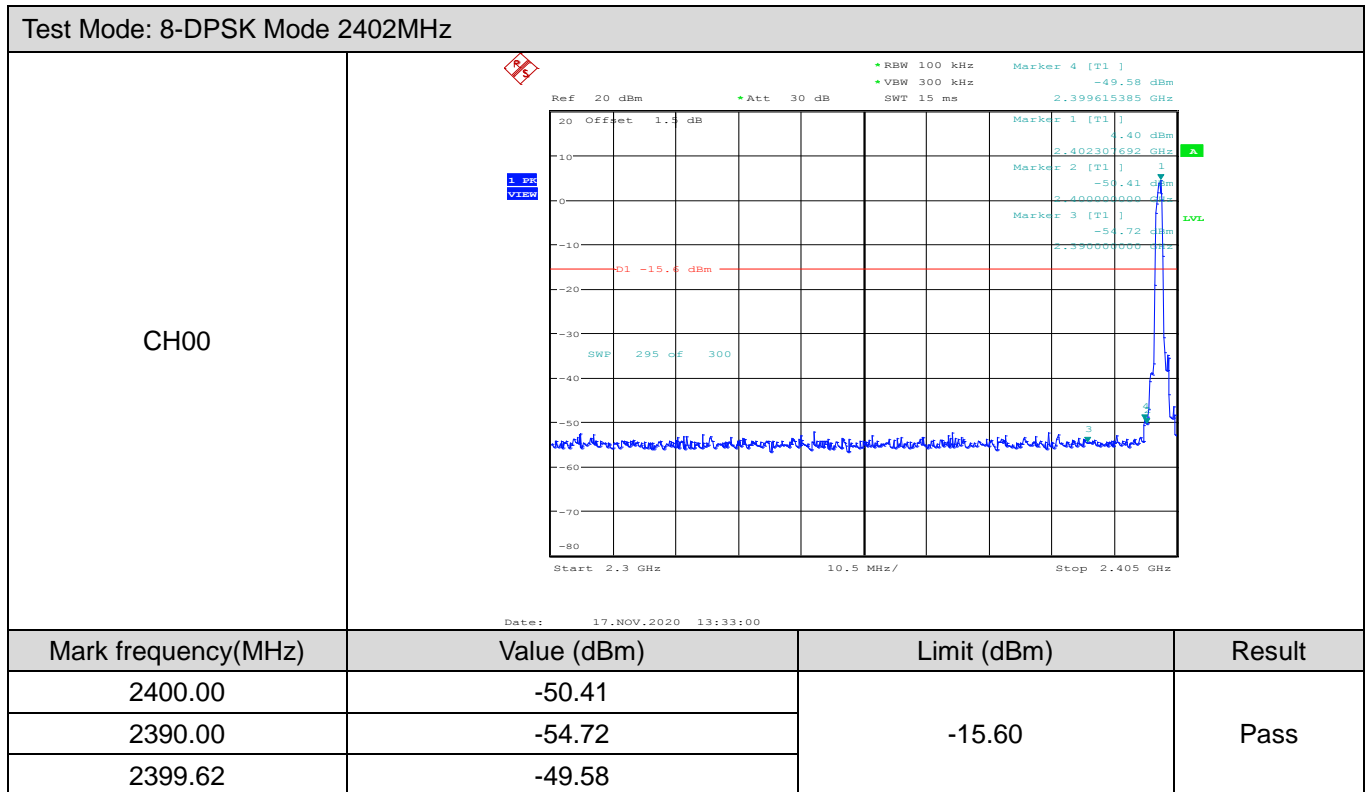
Test Mode: GFSK Mode 2402MHz

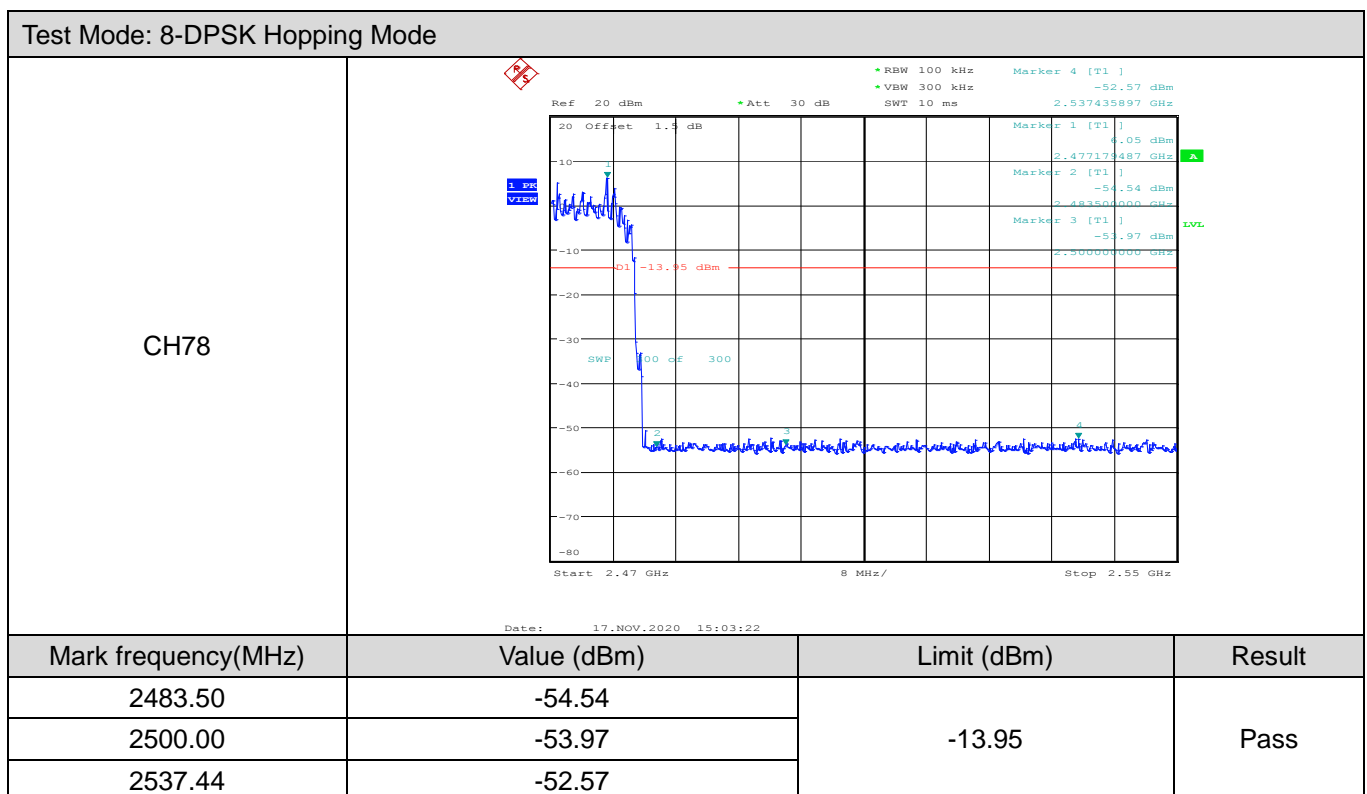
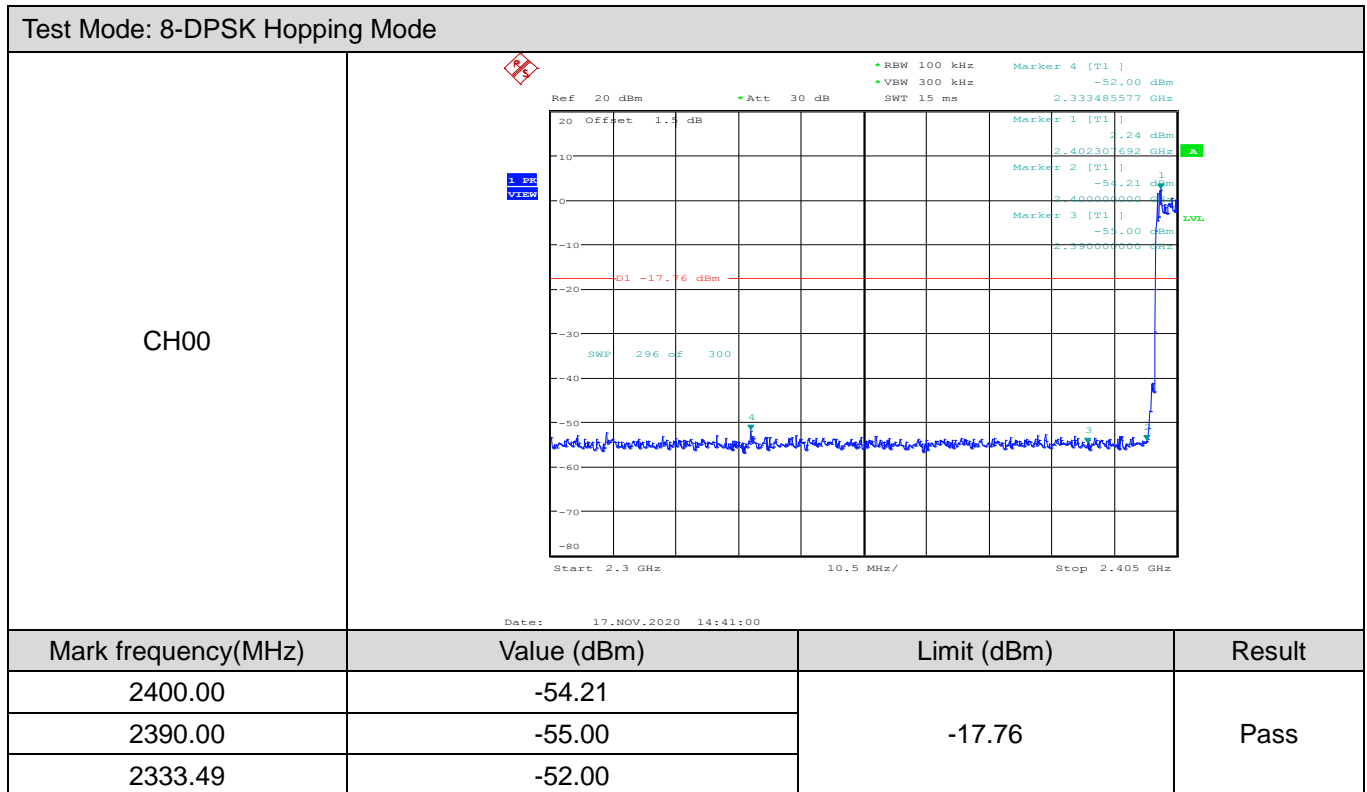










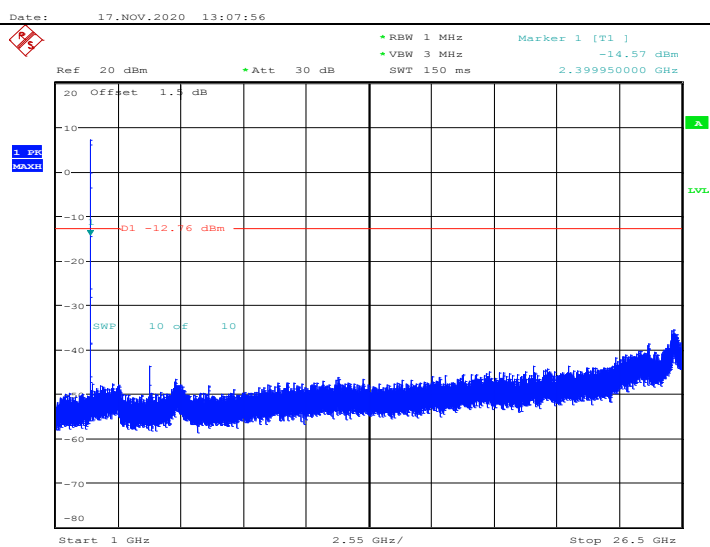
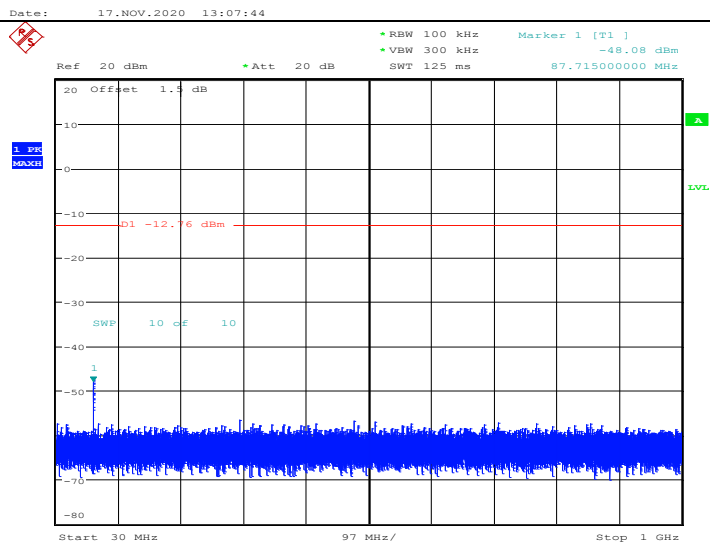
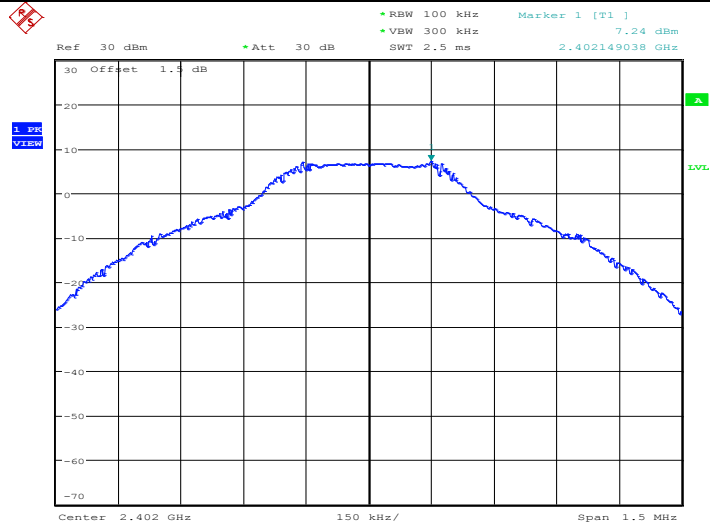




(3) Conducted Spurious Emissions Test

Test Mode: GFSK Mode 2402MHz

CH00



CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

Fax: (86)755-27521011

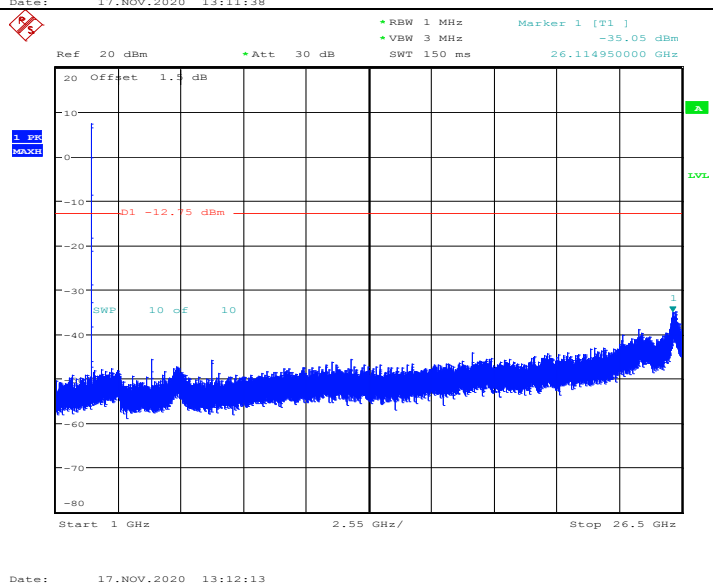
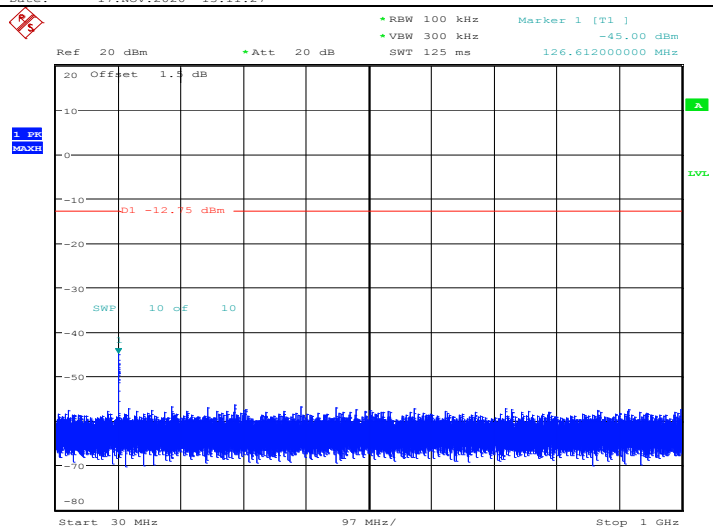
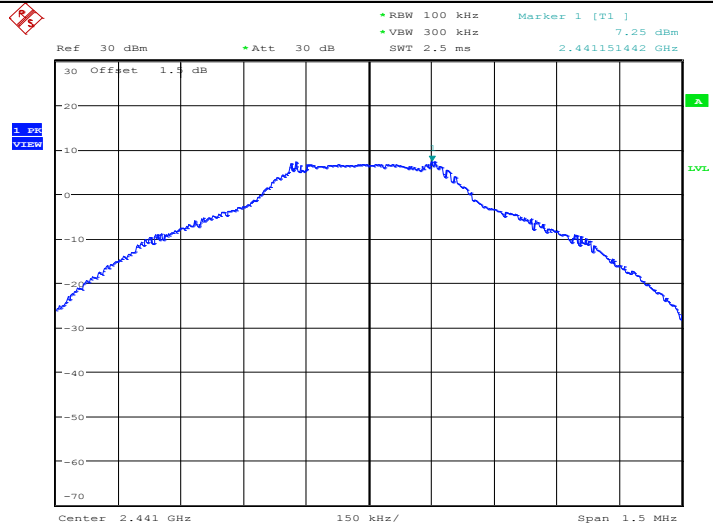
Http://www.sz-ctc.org.cn

For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn



Test Mode: GFSK Mode 2441 MHz

CH39



CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

Fax: (86)755-27521011

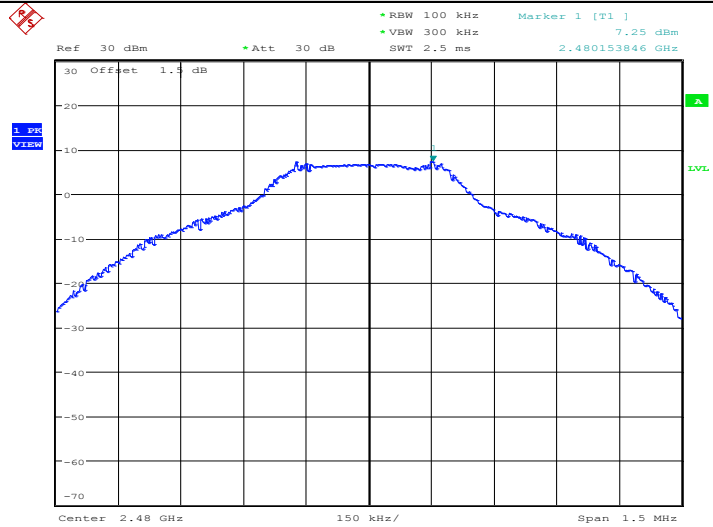
Http://www.sz-ctc.org.cn

For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn

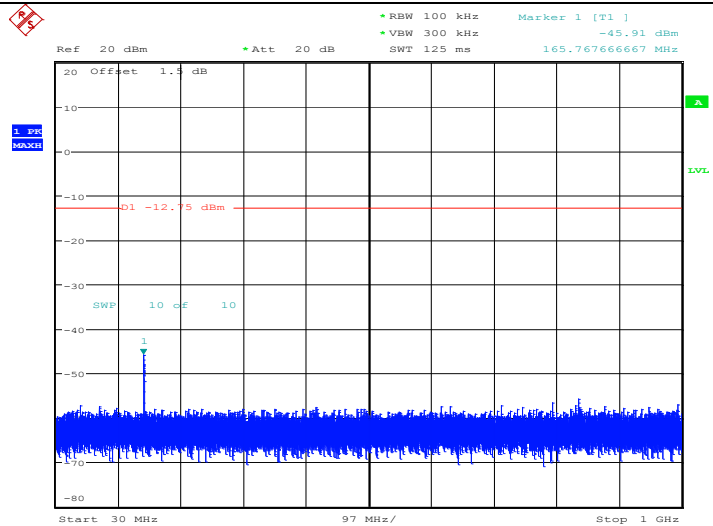


Test Mode: GFSK Mode 2480 MHz

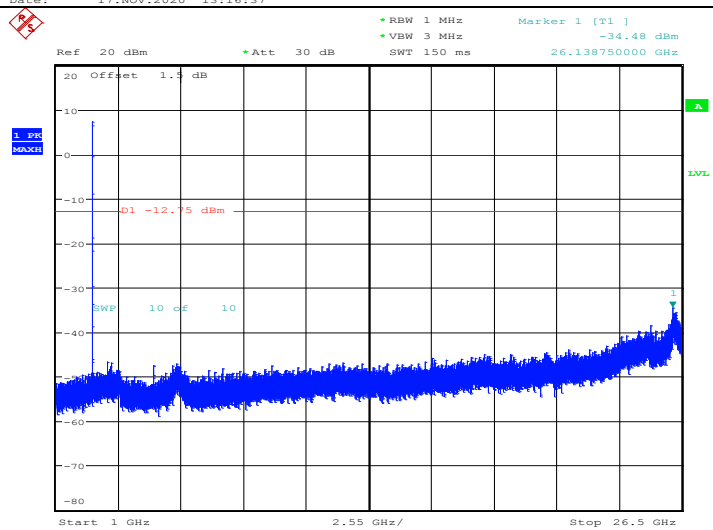
CH78



Date: 17.NOV.2020 13:16:26



Date: 17.NOV.2020 13:16:37



Date: 17.NOV.2020 13:17:12

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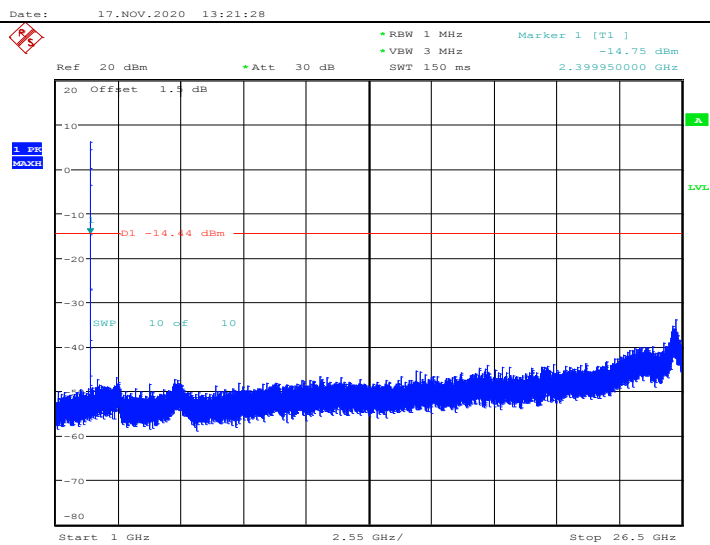
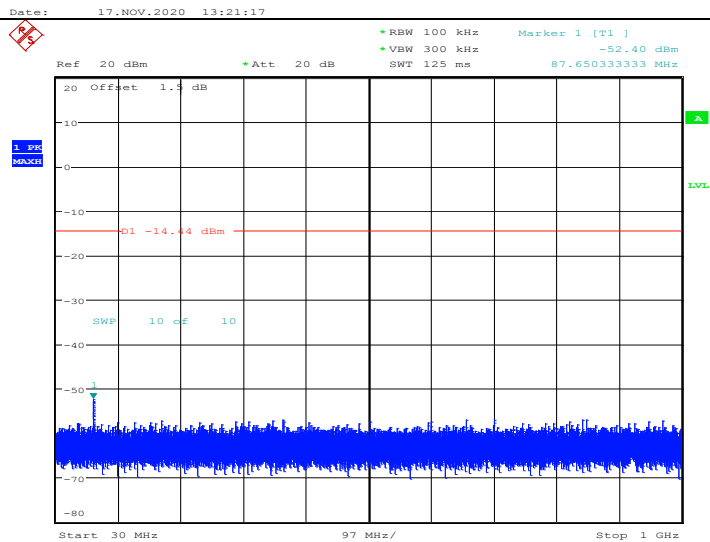
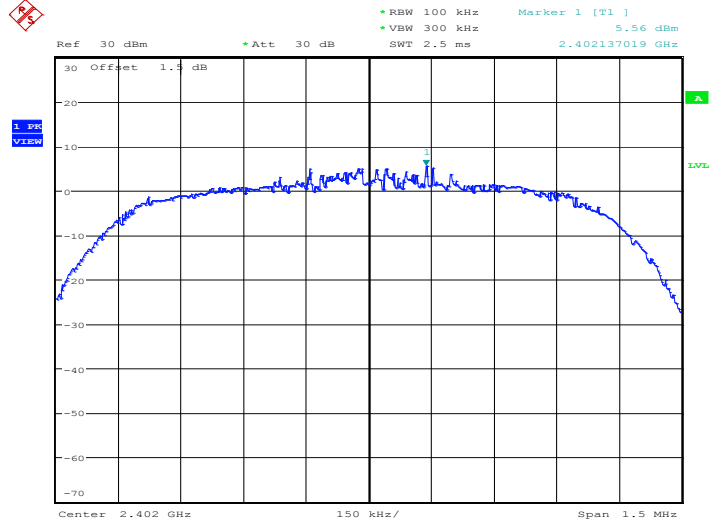
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Test Mode: $\pi/4$ -DQPSK Mode 2402MHz

CH00



Date: 17.NOV.2020 13:22:02

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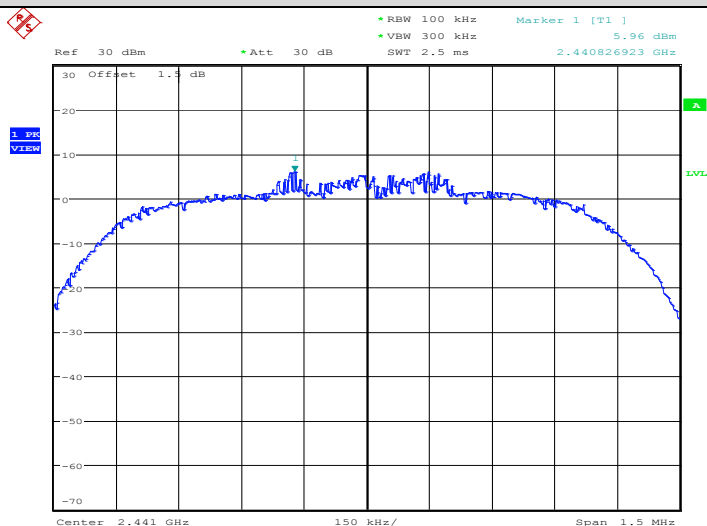
1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

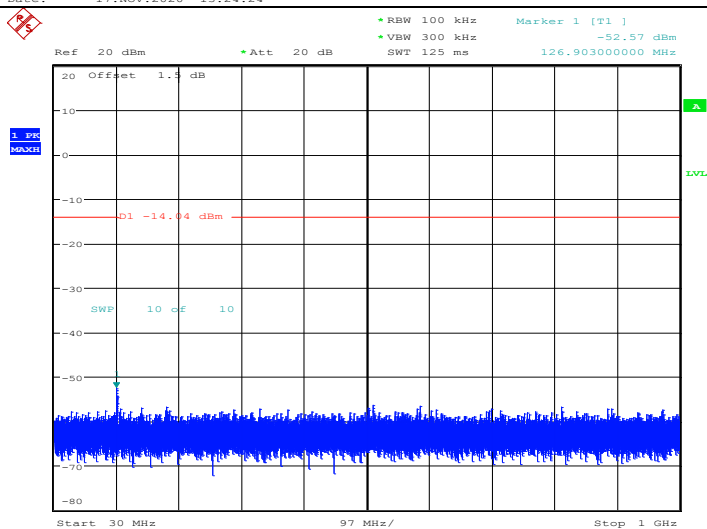
Fax: (86)755-27521011

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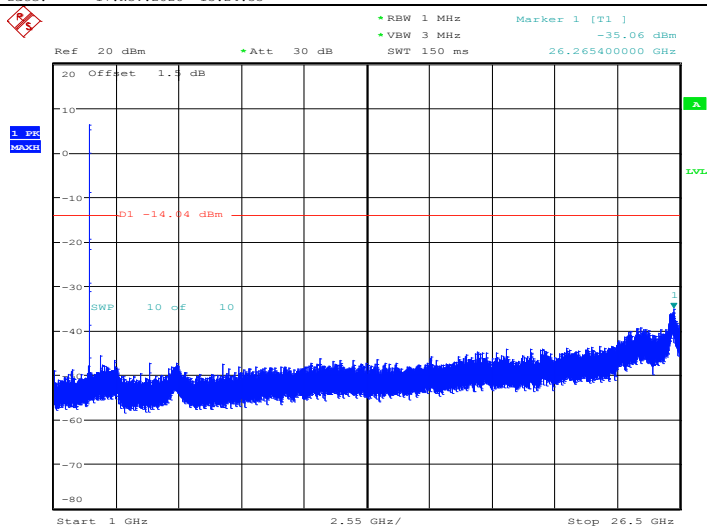
For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China: yz.cnca.cn

Test Mode: π /4-DQPSK Mode 2441 MHz

Date: 17.NOV.2020 13:24:24



Date: 17.NOV.2020 13:24:35

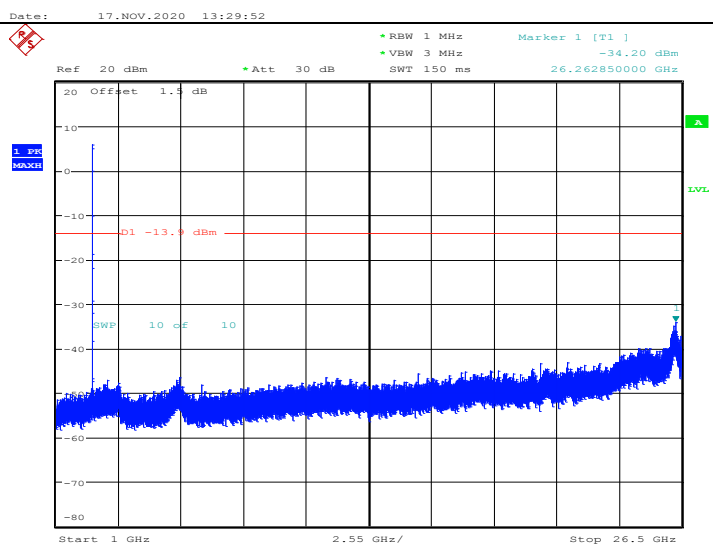
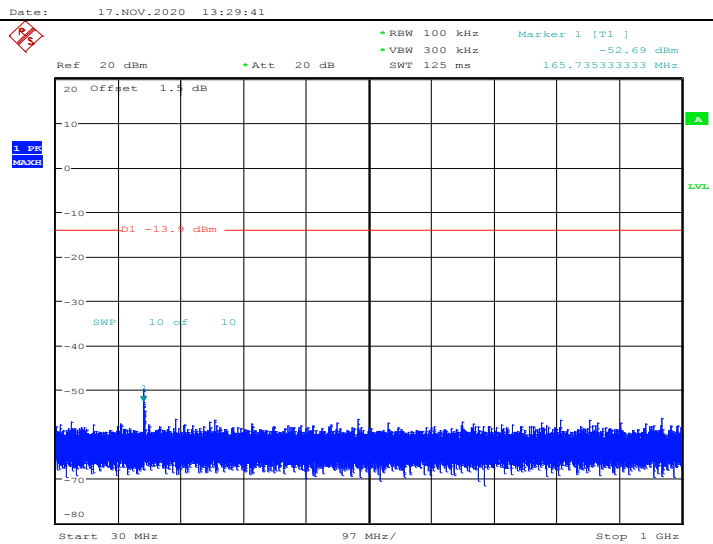
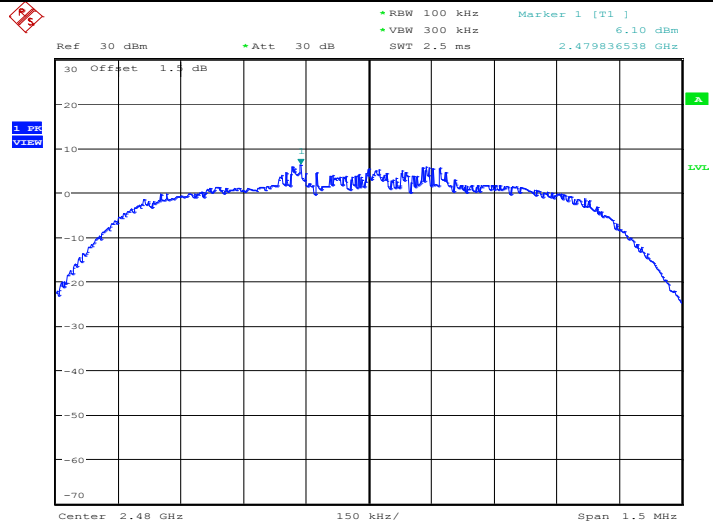


Date: 17.NOV.2020 13:25:10

CH39

Test Mode: $\pi/4$ -DQPSK Mode 2480 MHz

CH78



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