# FCC TEST REPORT

For

**EMV Android Validator**

**Model Number: FX925SF-ING-VWDC-PRE, 011P; FX925SF-ING-VPDC-PRE, 011P; FX925SF-ING-VWDC-PRE, 010P; FX925SF-ING-VPDC-PRE, 010P**

**FCC ID: 2AGQIFX925F**

**Report Number : WT218003688**


| | | |
|---|---|---|
| Test Laboratory | : | Shenzhen Academy of Metrology and Quality Inspection |
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# TEST REPORT DECLARATION

| | | |
|---|---|---|
| Applicant | : | FAMOCO SAS |
| Address | : | 59 avenue Victor Hugo Paris, France |
| Manufacturer | : | FAMOCO SAS |
| Address | : | 59 avenue Victor Hugo Paris, France |
| EUT Description | : | EMV Android Validator |
| Model No. | : | FX925SF-ING-VWDC-PRE, 011P;<br>FX925SF-ING-VPDC-PRE, 011P;<br>FX925SF-ING-VWDC-PRE, 010P;<br>FX925SF-ING-VPDC-PRE, 010P |
| Trade mark | : | Famoco |
| Serial Number | : | / |
| FCC ID | : | 2AGQIFX925F |

Test Standards:

**FCC Part 15 Subpart E 15.407 (2020)**

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

| | | | |
|---|---|---|---|
| Project Engineer: | 周芳媛 | Date: | Jan.12, 2022 |
| | (Zhou Fangai 周芳媛) | | |
| Checked by: | 施昌达 | Date: | Jan.12, 2022 |
| | (Shi Changda 施昌达) | | |
| Approved by: | 林奕翔 | Date: | Jan.12, 2022 |
| | (Lin Yixiang 林奕翔) | | |

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# 1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

| Test Items | FCC Rules | Test Results |
|---|---|---|
| 26dB Bandwidth | FCC §15.407 (a) | Pass |
| Maximum Conducted Output Power | FCC §15.407 (a) | Pass |
| Maximum Power Spectral Density Level | FCC §15.407 (a) | Pass |
| Radiated Bandedge and Spurious | FCC §15.407 (b)<br>FCC §15.209<br>FCC §15.205 | Pass |
| Automatic Discontinue Transmission | FCC §15.407 (c) | Pass |
| Frequency stability | FCC §15.407 (g) | Pass |
| Conducted emission test for AC power port | 15.207 | Pass |
| Antenna Requirements | 15.203 | Pass |

Remark: “N/A” means “Not applicable.”

# 2. GENERAL INFORMATION

## 2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

## 2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

## 2.3. Measurement Uncertainty

Conducted Emission
9 kHz~150 kHz U=3.7dB k=2
150 kHz~30MHz U=3.3dB k=2

Radiated Emission
30MHz~1000MHz U=4.3dB k=2
1GHz~6GHz U=4.6 dB k=2
6GHz~40GHz U=5.1dB k=2

# 3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

## 3.1. EUT Description

| | | |
|---|---|---|
| Description | : | EMV Android Validator |
| Manufacturer | : | FAMOCO SAS |
| Model Number | : | FX925SF-ING-VWDC-PRE, 011P;<br>FX925SF-ING-VPDC-PRE, 011P;<br>FX925SF-ING-VWDC-PRE, 010P;<br>FX925SF-ING-VPDC-PRE, 010P |
| Operate Frequency | : | U-NII 1(5180~5240 MHz) |
| Antenna Designation | : | PIFA Antenna 1.3dBi |
| Operating voltage | : | 10.8V (Low)/12V (Nominal)/ 13.2V (Max) |
| Software Version | : | MOLY.LR12A.R2.MP.V44.1.P1 |
| Hardware Version | : | FX925F-P |

Remark: This is test report is for application of FCC ID: 2AGQIFX925F, which consists of reuse data of FCC ID: 2AGQIFX205. This report updates the standard FCC Part 15 15.209, 15.407(2018) to FCC Part 15 Subpart E 15.407 (2020). See the APPENDIX I Product Equality Declaration for the differences between the new model (FX925SF-ING-VWDC-PRE, 011P; FX925SF-ING-VPDC-PRE, 011P; FX925SF-ING-VWDC-PRE, 010P; FX925SF-ING-VPDC-PRE, 010P) and the original model (FX925F PM, FX925F WM).
Considering above changes, in this test report, only the worst case of Conducted emission, Radiated Bandedge and Radiated spurious emission was re-tested, the other test data were reused the original test report No.: WT198005842.

Table 2 Working Frequency List U-NII 1 (802.11a, 802.11n HT20)

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 36 | 5180MHz | 44 | 5220MHz |
| 40 | 5200MHz | 48 | 5240MHz |

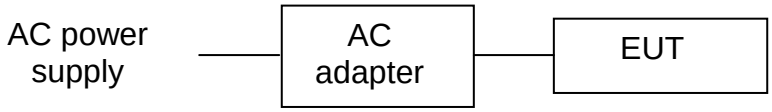
Table 3 Working Frequency List U-NII 1,( 802.11n HT40)

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 38 | 5190MHz | 46 | 5230MHz |

### 3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2AGQIFX925F** filing to comply with Section 15.209，15.407 of the FCC Part 15, Subpart E .

### 3.3. Block Diagram of EUT Configuration




Setup of test

### 3.4. Operating Condition of EUT

The Radiated spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).
Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.
Worst-case data rates as provided by the client were:
802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11a operates in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.
802.11n operate in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.
802.11ac operate in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.

### 3.5. Directional Antenna Gain

The EUT does NOT support a WIFI MIMO function.
Directional gain need NOT to be considered.

### 3.6. Support Equipment List

Table 4 Support Equipment List

| Name | Model No | S/N | Manufacturer |
|---|---|---|---|
| Adapter for EUT | LST-S72U12-A | --- | ShenZhen GoldLister Power Source Co.,Ltd |
| Rechargeable Li-ion Polymer Battery for EUT | FX205 Series | --- | Zhuhai Greaton Electronic Technology.Co., Ltd |
| DC Battery | --- | --- | --- |
| Keyboard | SK-2015 | --- | HP |
| Mouse | MSU1465 | --- | HP |

### 3.7. Test Conditions

Date of re-test：Dec.29, 2021- Dec.30, 2021
Date of EUT Receive：Dec.10, 2021
Temperature: 20℃
Relative Humidity: 46%-52%

Date of test：Oct.15, 2019 - Nov.07, 2019
Date of EUT Receive：Oct.15, 2019
Temperature: 21 ~ 25 ℃
Relative Humidity: 42-53%

### 3.8. Special Accessories

Not available for this EUT intended for grant.

### 3.9. Equipment Modifications

Not available for this EUT intended for grant.

# 4. TEST EQUIPMENT USED

Table 5 Test Equipment

| No. | Equipment | Manufacturer | Model No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| SB9058/05 | Test Receiver | R&S | ESCI 3 | Sep.24,2021 | 1 Year |
| SB4357 | AMN | R&S | ENN216 | Aug.25,2021 | 1 Year |
| SB9549 | Shielded Room | Albatross | SR | Sep.24,2021 | 1 Year |
| SB15044/01 | Test Receiver | R&S | ESW8 | Sep.14,2021 | 1 Year |
| SB12944 | Broadband Antenna | R&S | VULB9163 | Jan.08,2021 | 1 Year |
| SB18844 | Semi Anechoic Chamber | Albatross | 9×6×6(m) | Mar.23,2021 | 1 Year |
| SB8501/09 | Test Receiver | R&S | ESU40 | Feb.05,2021 | 1 Year |
| SB3435 | Horn Antenna | R&S | HF906 | Dec.16,2020 | 1 Year |
| SB9058/03 | Pre-Amplifier | R&S | SCU 18 | Feb.05,2021 | 1 Year |
| SB8501/10 | Horn Antenna | R&S | 3160-09 | Mar.10,2020 | 3 Years |
| SB8501/11 | Horn Antenna | R&S | 3160-09 | Mar.09,2020 | 3 Years |
| SB8501/12 | Horn Antenna | R&S | 3160-10 | Mar.17,2020 | 3 Years |
| SB8501/13 | Horn Antenna | R&S | 3160-10 | Mar.10,2020 | 3 Years |
| SB8501/14 | Pre-Amplifier | R&S | SCU-03 | Feb.05,2021 | 1 Year |
| SB8501/15 | Pre-Amplifier | R&S | SCU-03 | Feb.05,2021 | 1 Year |
| SB8501/16 | Pre-Amplifier | R&S | SCU 26 | Feb.05,2021 | 1 Year |
| SB8501/17 | Pre-Amplifier | R&S | SCU-18 | Feb.05,2021 | 1 Year |
| SB9059 | Preamplifier | R&S | SCU-40 | Aug.25,2021 | 1 Year |
| SB9555/02 | Fully Anechoic Chamber | Albatross | 10.0×5.2×5.4(m) | Aug.25,2021 | 1 Year |
| SB12943 | Test Receiver | R&S | ESR7 | Dec.06,2018 | 1 Year |
| SB5472/02 | Broadband Antenna | Schwarzbeck | VULB9163 | May.31,2019 | 1 Year |
| SB8501/09 | Test Receiver | R&S | ESU40 | Mar.11,2019 | 1 Year |
| SB3435 | Horn Antenna | R&S | HF906 | Jan.01,2019 | 1 Year |
| SB9058/03 | Pre-Amplifier | R&S | SCU 18 | Feb.18,2019 | 1 Year |
| SB8501/10 | Horn Antenna | R&S | 3160-09 | Mar.21,2017 | 3 Years |
| SB8501/11 | Horn Antenna | R&S | 3160-09 | Mar.21,2017 | 3 Years |
| SB8501/12 | Horn Antenna | R&S | 3160-10 | Mar.21,2017 | 3 Years |
| SB8501/13 | Horn Antenna | R&S | 3160-10 | Mar.21,2017 | 3 Years |
| SB3345 | Loop Antenna | Schwarzbeck | FMZB1516-113 | Feb.20,2019 | 1 Year |
| SB8501/14 | Pre-Amplifier | R&S | SCU-03 | Feb.20,2019 | 1 Year |
| SB8501/15 | Pre-Amplifier | R&S | SCU-03 | Feb.20,2019 | 1 Year |
| SB8501/16 | Pre-Amplifier | R&S | SCU 26 | Feb.18,2019 | 1 Year |
| SB8501/17 | Pre-Amplifier | R&S | SCU-18 | Feb.20,2019 | 1 Year |
| SB9059 | Preamplifier | R&S | SCU-40 | Aug.27,2019 | 1 Year |
| SB7941/02 | Signal Analyzer | R&S | FSU26 | May.29,2019 | 1 Year |
| SB9721/07 | DC Power Supply | Agilent | 66319D | --- | --- |

Table 6 Test software

| Name | Manufacturer | Version |
|---|---|---|
| Bluetooth and WiFi Test System | Shenzhen JS tonscend co.,ltd | 2.6.88.0330 |

# 5. DUTY CYCLE

## 5.1. LIMITS OF DUTY CYCLE

None; for reporting purposes only

## 5.2. TEST PROCEDURE

1. Set span = Zero
2. RBW = 20MHz
3. VBW = 30MHz,
4. Detector = Peak

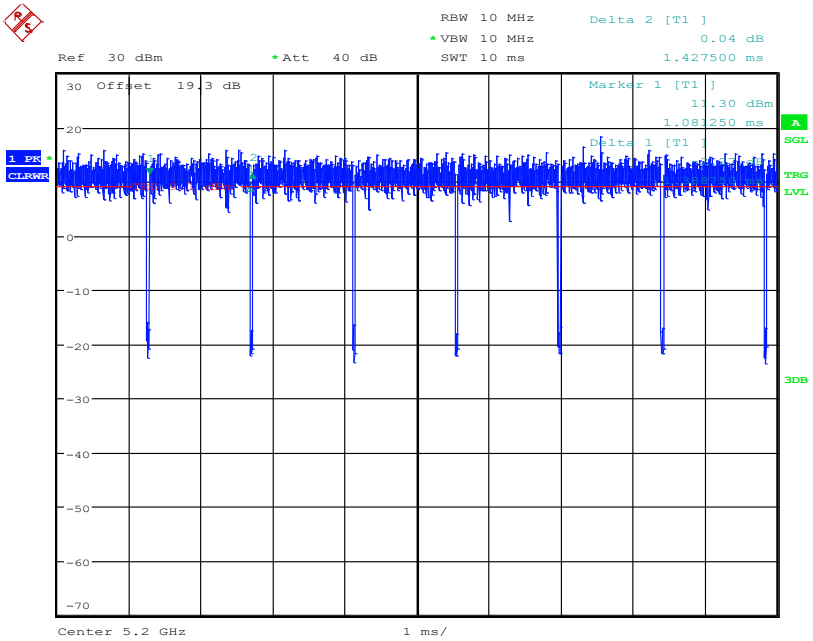
## 5.3. TEST SETUP


## 5.4. TEST DATA

Table 7 Duty Cycle Test Data

| Test Mode | On Time (ms) | Duty Cycle (%) | Duty Factor | 1/T Minimum VBW (kHz) |
|---|---|---|---|---|
| 802.11a | 1.39 | 97.29 | 0.12 | 1 |
| 802.11n HT20 | 1.30 | 97.19 | 0.12 | 1 |
| 802.11n HT40 | 0.65 | 94.51 | 0.25 | 1.5 |

## 802.11a

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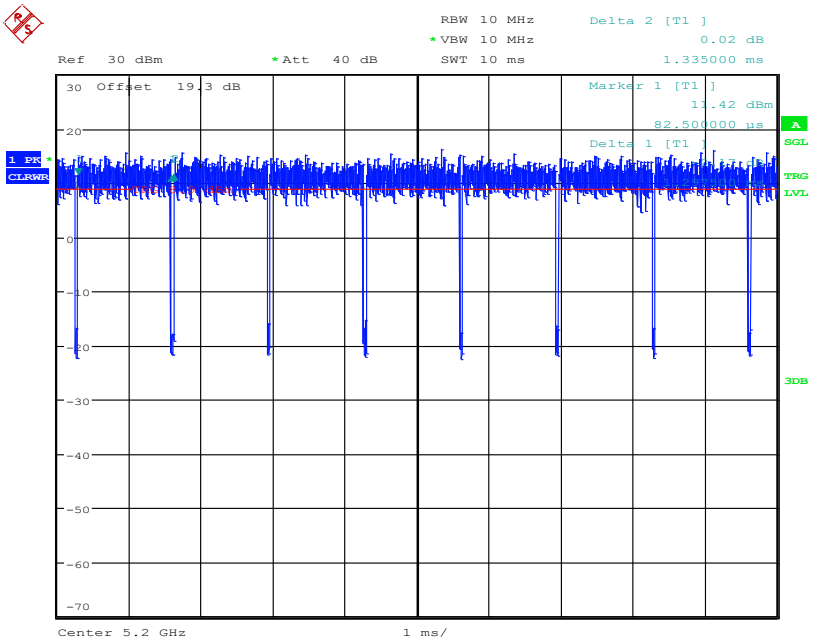
## 802.11n HT20

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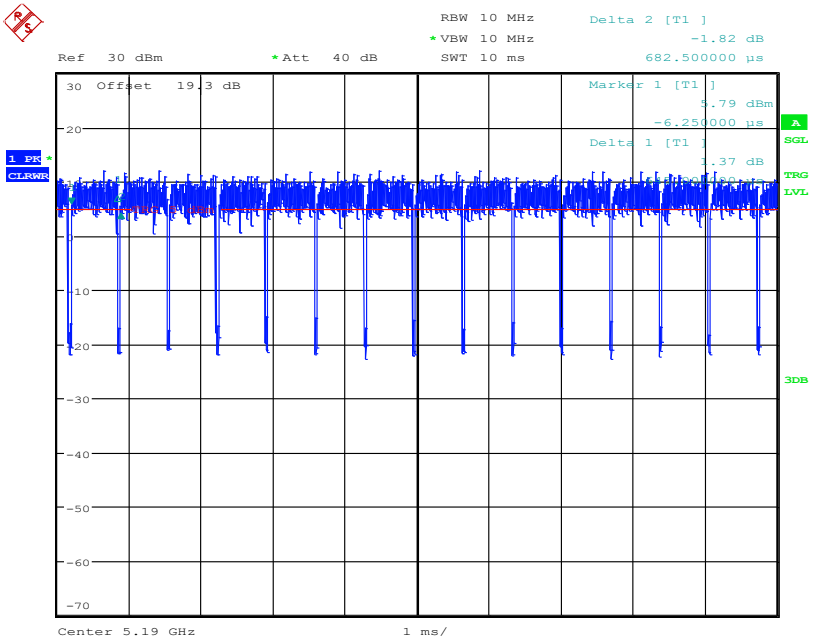
## 802.11n HT40




Date: 4.NOV.2019 11:19:02

# 6. 26DB BANDWIDTH MEASUREMENT

## 6.1. LIMITS OF 26dB BANDWIDTH MEASUREMENT

None; for reporting purposes only..

## 6.2. TEST PROCEDURE

ANSI C63.10-2013 Clause 12.4
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

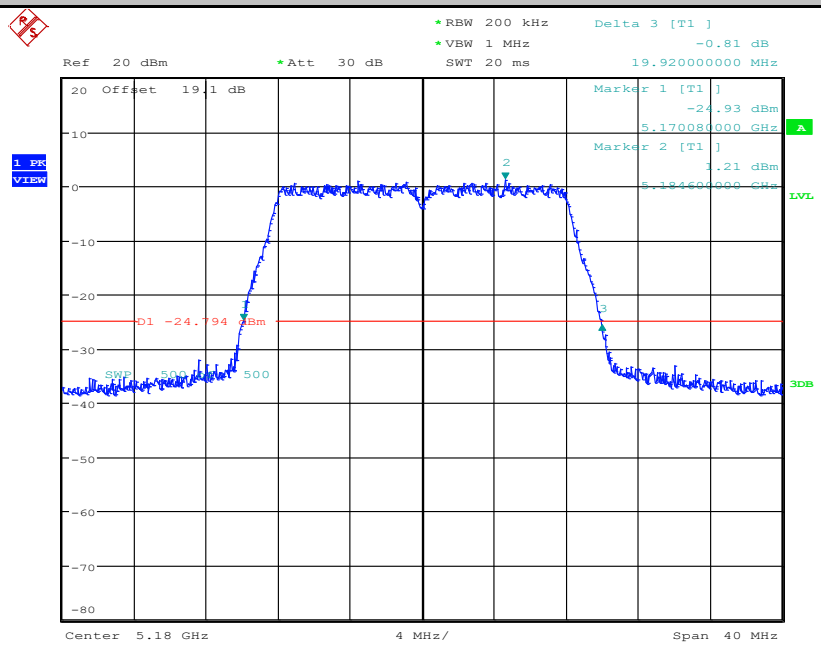
## 6.3. TEST SETUP


## 6.4. Test Data

Table 8 26dB Bandwidth Test Data

| Test Mode | Test Channel | 26dB Bandwidth [MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|
| 802.11a | 5180 | 19.920 | --- | PASS |
| 802.11a | 5200 | 20.000 | --- | PASS |
| 802.11a | 5240 | 19.960 | --- | PASS |
| 802.11n HT20 | 5180 | 20.280 | --- | PASS |
| 802.11n HT20 | 5200 | 20.240 | --- | PASS |
| 802.11n HT20 | 5240 | 20.160 | --- | PASS |
| 802.11n HT40 | 5190 | 40.800 | --- | PASS |
| 802.11n HT40 | 5230 | 40.560 | --- | PASS |

## 26dB Bandwidth Measurement_11A_5180

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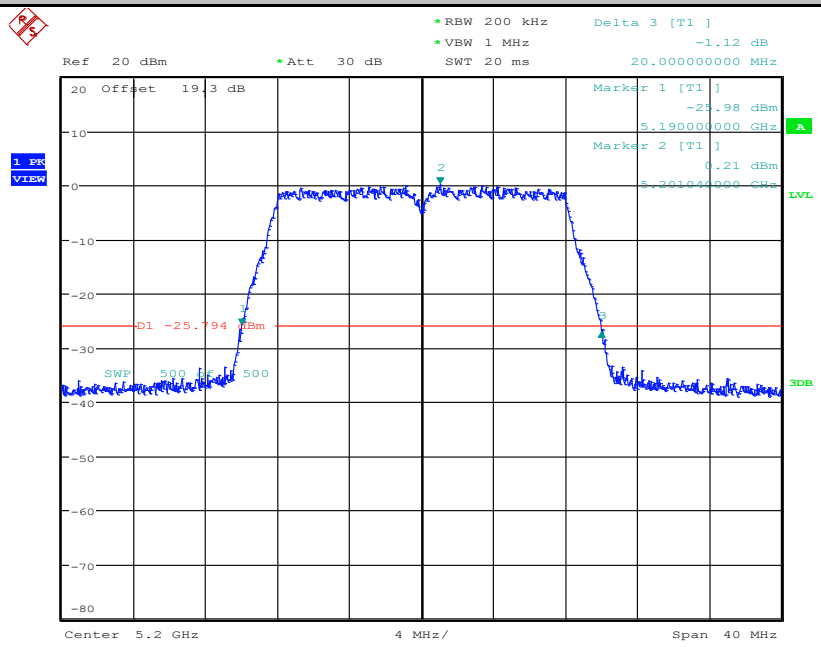
## 26dB Bandwidth Measurement_11A_5200

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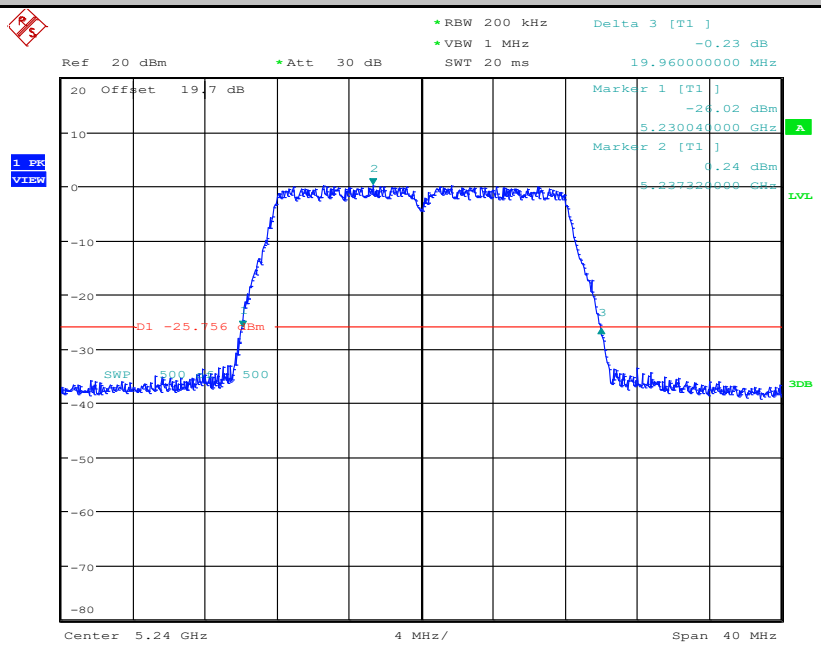
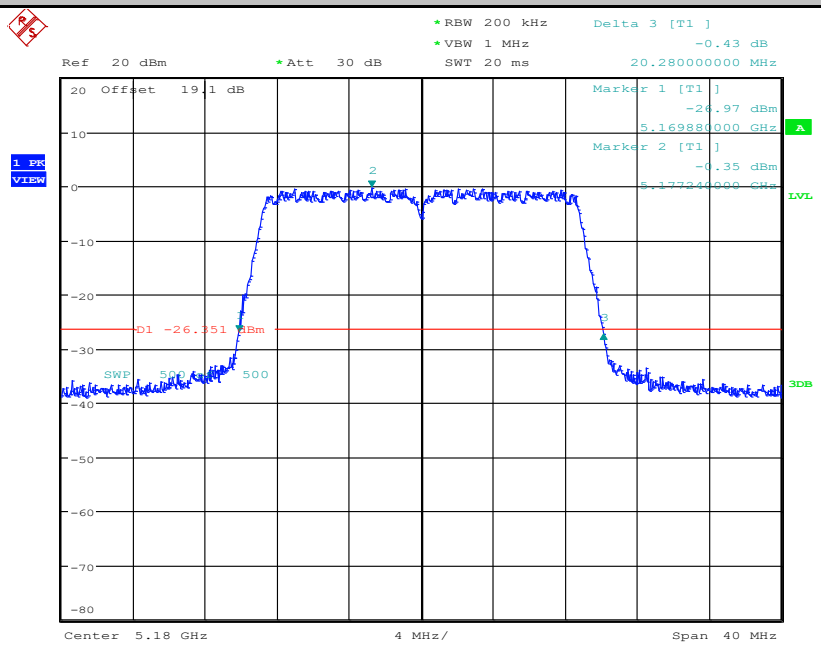
## 26dB Bandwidth Measurement_11A_5240




Date: 4.NOV.2019 10:51:51

## 26dB Bandwidth Measurement_11N20_5180

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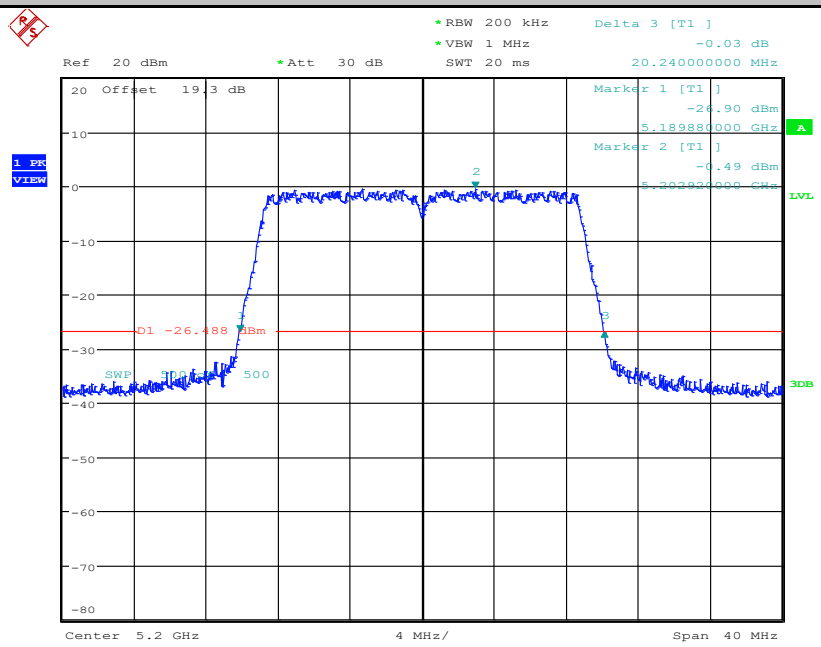
## 26dB Bandwidth Measurement_11N20_5200

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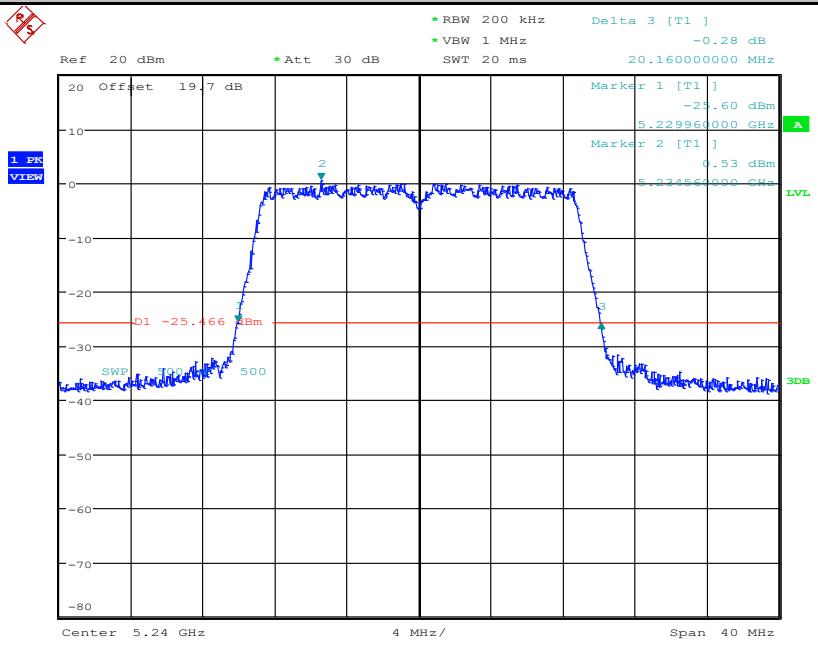
## 26dB Bandwidth Measurement_11N20_5240

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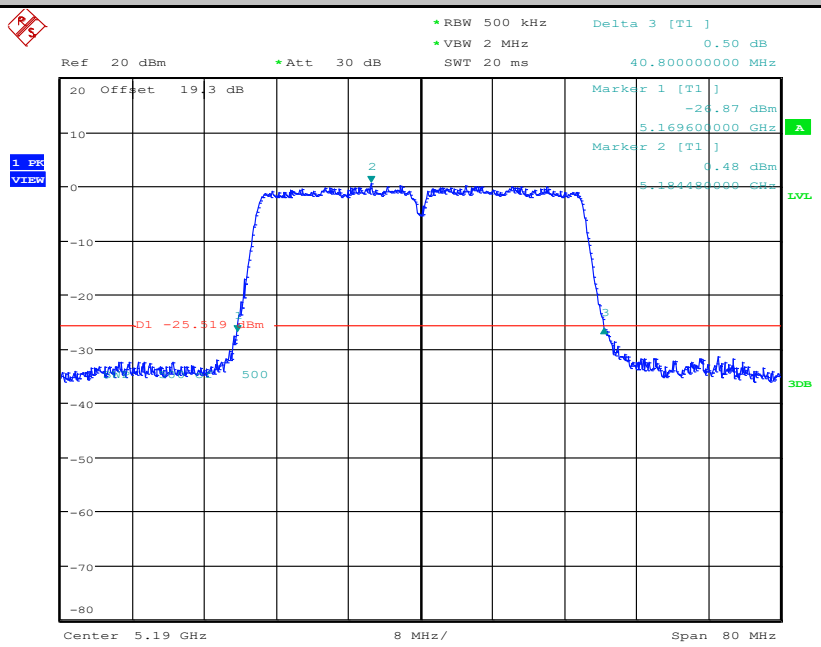
## 26dB Bandwidth Measurement_11N40SISO_5190

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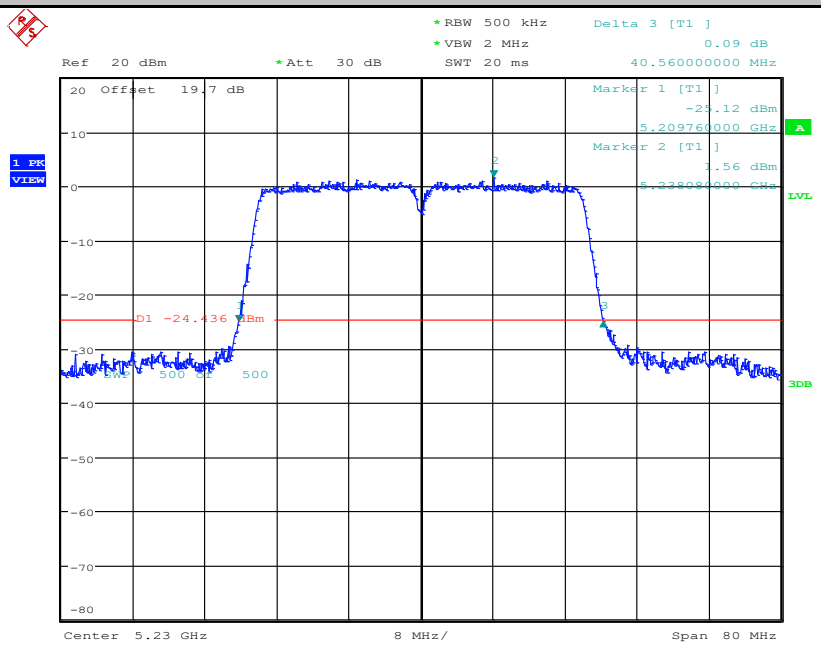
## 26dB Bandwidth Measurement_11N40SISO_5230

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# 7. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

## 7.1. LIMITS OF Maximum Conducted Output Power Measurement

CFR 47 (FCC) part 15.407 (a)
For the band 5.15–5.25 GHz.
For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the max-imum antenna gain does not exceed 6 dBi.

## 7.2. TEST PROCEDURE

ANSI C63.10-2013 Clause 12.3
a) Measure the duty cycle D
b) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
c) Set RBW = 1 MHz.
d) Set VBW ≥ 3 MHz.
e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
f) Manually set sweep time ≥ [10 × (number of points in sweep) × (total ON / OFF period of the transmitted signal)].
g) Set detector = RMS (power averaging).
h) Perform a single sweep.
i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument's band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW of the spectrum.
j) Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1 / 0.25)] = 6 dB if the duty cycle is 25%..

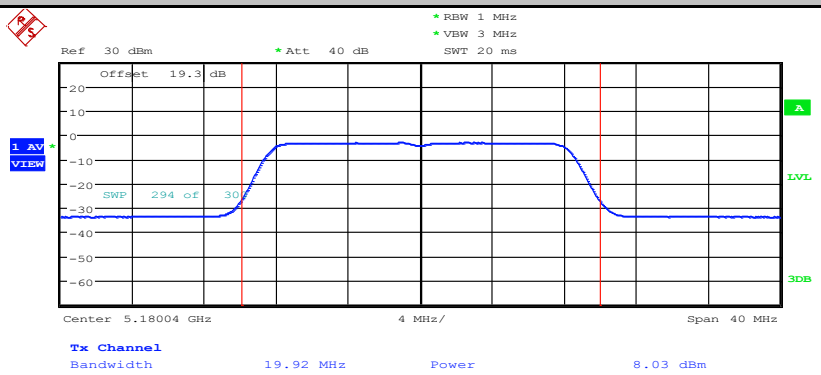
## 7.3. TEST SETUP


## 7.4. TEST DATA

Table 9 Maximum Conducted Output Power Test Data

| Test Mode | Test Channel | Level [dBm] | 10log(1/x) Factor [dB] | Power [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|
| 802.11a | 5180 | 8.03 | 0.12 | 8.15 | 23.98 | PASS |
| 802.11a | 5200 | 8.44 | 0.12 | 8.56 | 23.98 | PASS |
| 802.11a | 5240 | 7.69 | 0.12 | 7.81 | 23.98 | PASS |
| 802.11n HT20 | 5180 | 8.40 | 0.12 | 8.52 | 23.98 | PASS |
| 802.11n HT20 | 5200 | 8.31 | 0.12 | 8.43 | 23.98 | PASS |
| 802.11n HT20 | 5240 | 8.57 | 0.12 | 8.69 | 23.98 | PASS |
| 802.11n HT40 | 5190 | 8.11 | 0.25 | 8.36 | 23.98 | PASS |
| 802.11n HT40 | 5230 | 8.16 | 0.25 | 8.41 | 23.98 | PASS |

Maximum Conduct Output Power_11A_5180

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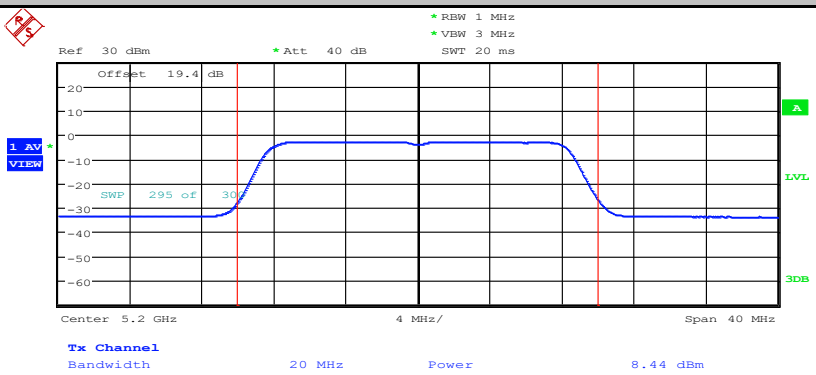
## Maximum Conduct Output Power_11A_5200




**Tx Channel**

| Bandwidth | 20 MHz | Power | 8.44 dBm |
|---|---|---|---|

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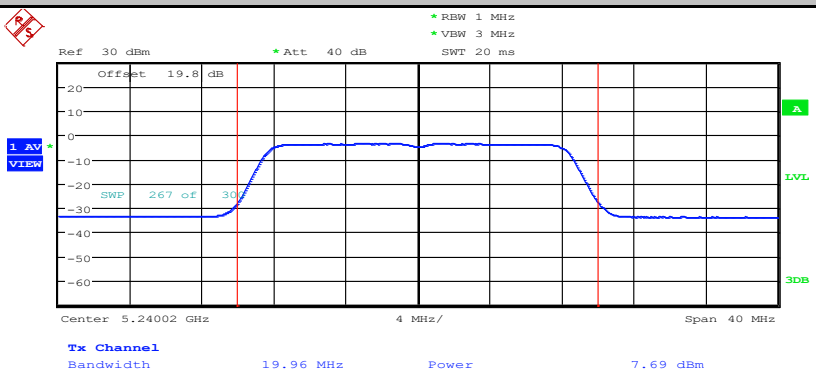
## Maximum Conduct Output Power_11A_5240

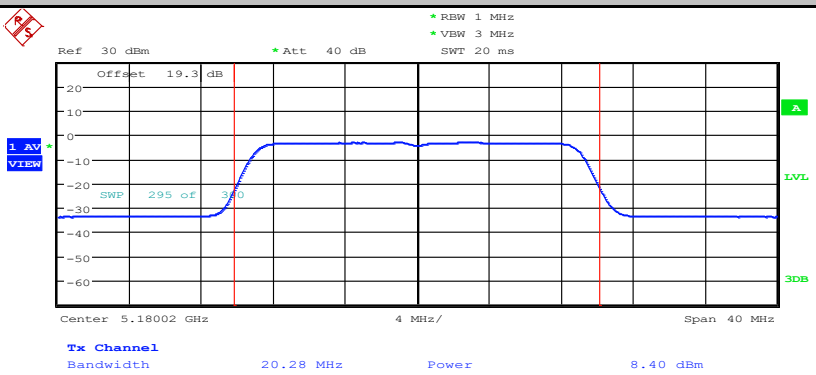



**Tx Channel**

| Bandwidth | 19.96 MHz | Power | 7.69 dBm |
|---|---|---|---|

Date: 4.NOV.2019 10:53:35

## Maximum Conduct Output Power_11N20_5180

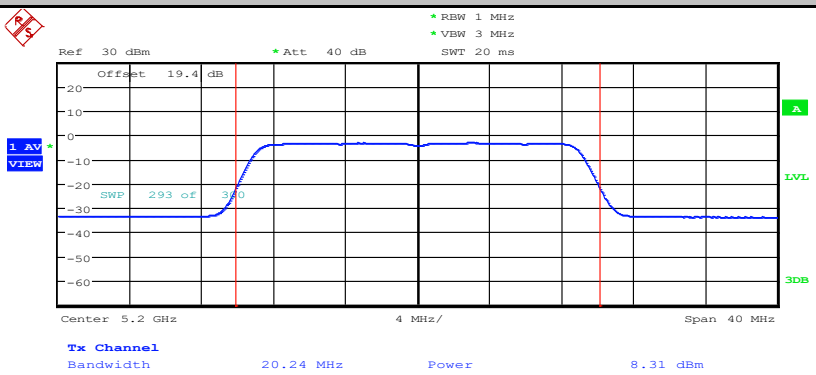



**Tx Channel**

| Bandwidth | 20.28 MHz | Power | 8.40 dBm |
|---|---|---|---|

Date: 4.NOV.2019 10:59:19

## Maximum Conduct Output Power_11N20_5200

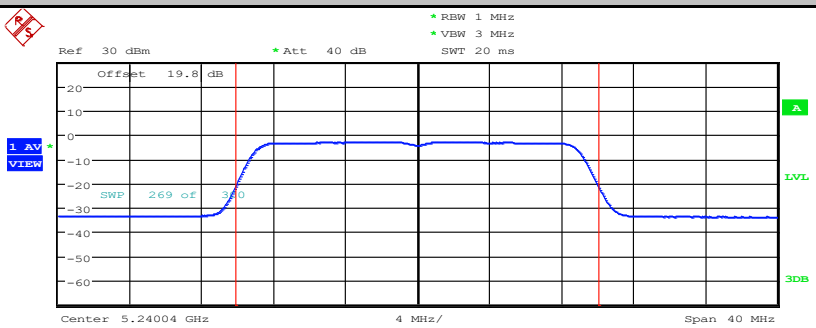



**Tx Channel**

| Bandwidth | 20.24 MHz | Power | 8.31 dBm |
|---|---|---|---|

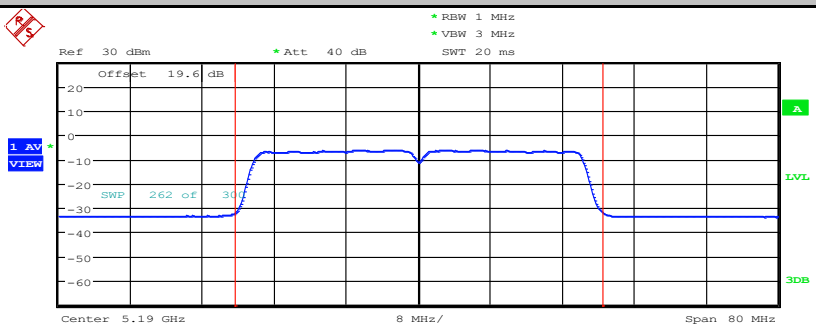
Date: 4.NOV.2019 11:06:36

## Maximum Conduct Output Power_11N20_5240



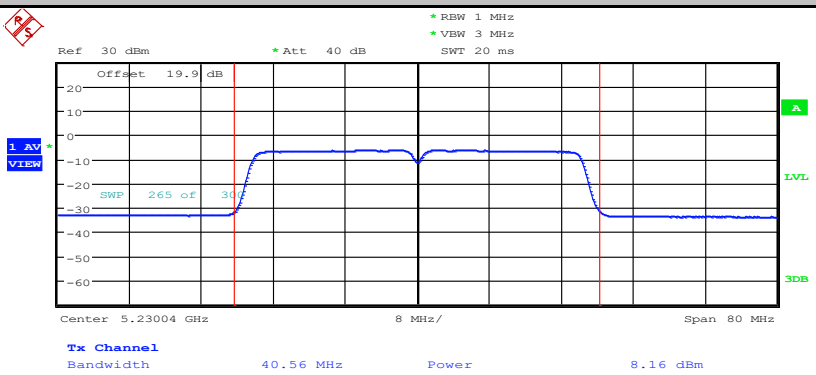

Date: 4.NOV.2019 11:12:53

## Maximum Conduct Output Power_11N40_5190




Date: 4.NOV.2019 11:19:13

## Maximum Conduct Output Power_11N40_5230




**Tx Channel**

| Bandwidth | 40.56 MHz | Power | 8.16 dBm |
|---|---|---|---|

Date: 4.NOV.2019 11:26:16

# 8. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT

## 8.1. LIMITS OF Maximum Power Spectral Density Level Measurement

CFR 47 (FCC) part 15.407 (a)
For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both
the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

## 8.2. TEST PROCEDURE

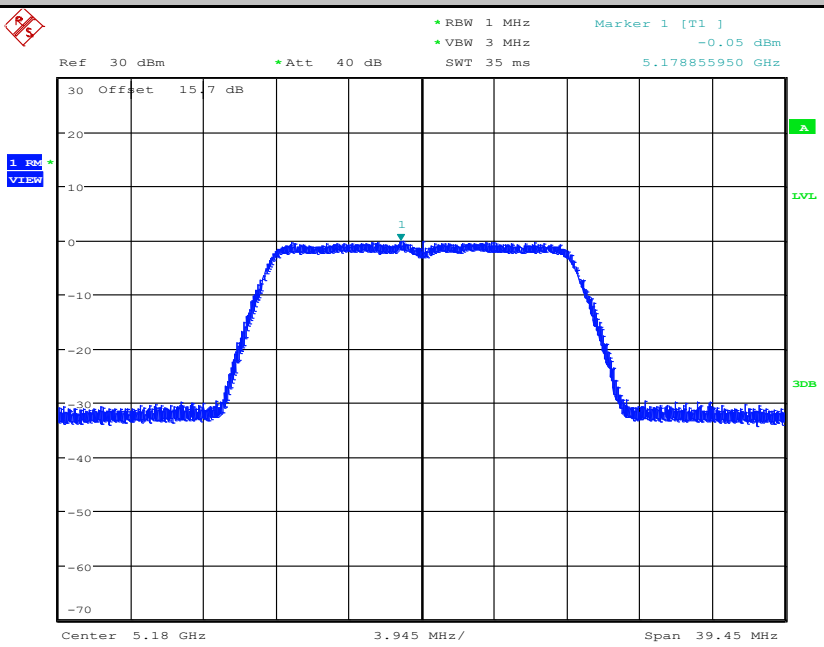
1.Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed
using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
a) If Method SA-2 or SA-2 Alternative was used, add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)

## 8.3. TEST DATA

Table 10 Maximum Power Spectral Density Level Test Data

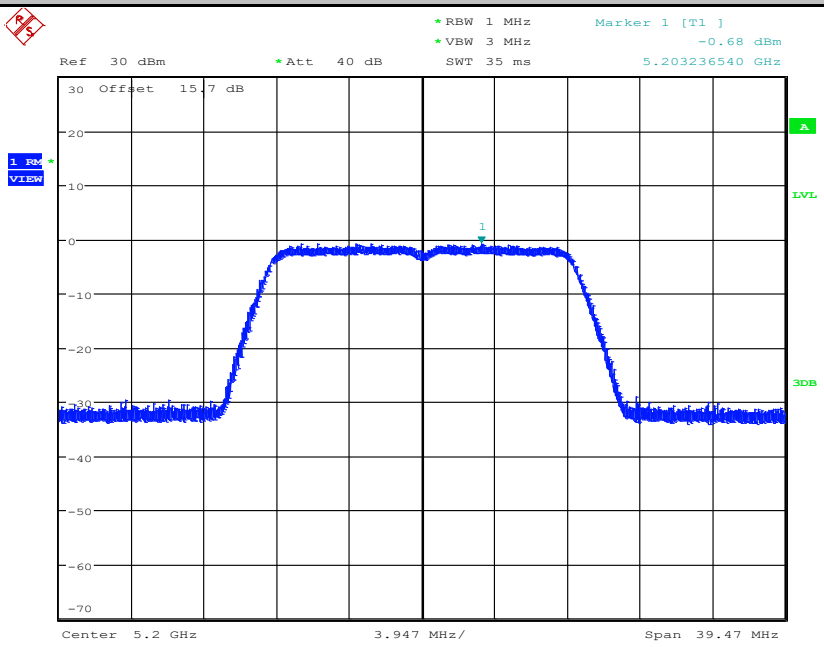
| Test Mode | Test Channel | Level [dBm/MHz] | 10log(1/x) Factor [dB] | PSD [dBm/MHz] | Limit [dBm/MHz] | Verdict |
|---|---|---|---|---|---|---|
| 802.11a | 5180 | -0.05 | 0.13 | 0.08 | 11.00 | PASS |
| 802.11a | 5200 | -0.68 | 0.13 | -0.55 | 11.00 | PASS |
| 802.11a | 5240 | -0.75 | 0.13 | -0.62 | 11.00 | PASS |
| 802.11n HT20 | 5180 | -0.48 | 0.13 | -0.35 | 11.00 | PASS |
| 802.11n HT20 | 5200 | -0.90 | 0.13 | -0.77 | 11.00 | PASS |
| 802.11n HT20 | 5240 | -1.24 | 0.13 | -1.11 | 11.00 | PASS |
| 802.11n HT40 | 5190 | -3.37 | 0.26 | -3.11 | 11.00 | PASS |
| 802.11n HT40 | 5230 | -3.64 | 0.26 | -3.38 | 11.00 | PASS |

## Maximum Power Spectral Density_11A_5180



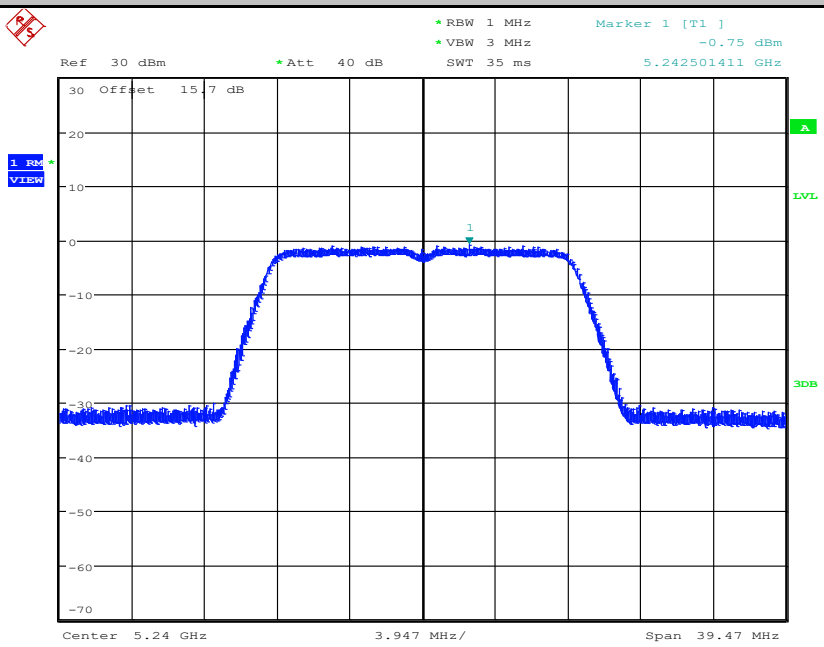

Date: 5.JUL.2019 16:19:46

## Maximum Power Spectral Density_ 11A_5200



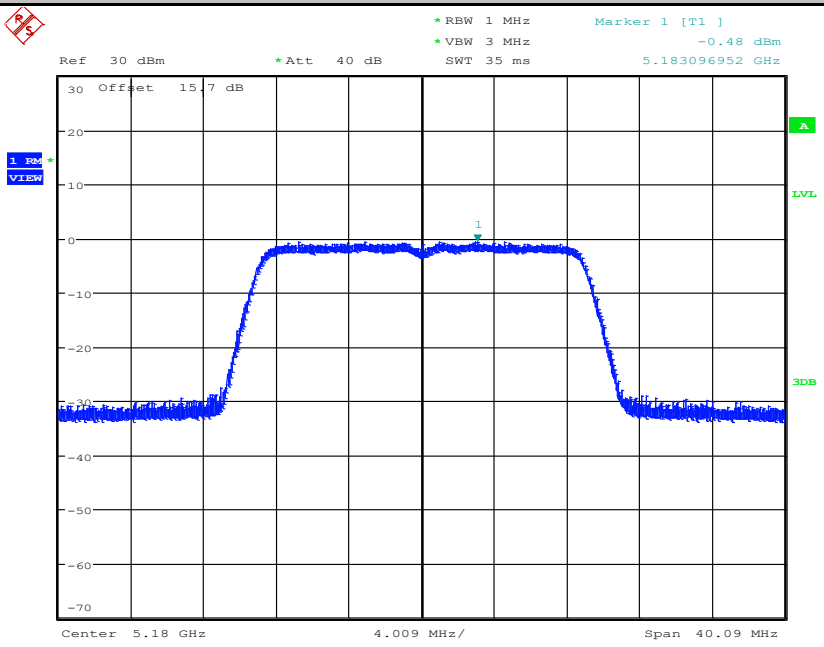

Date: 5.JUL.2019 16:28:18

## Maximum Power Spectral Density _11A_5240



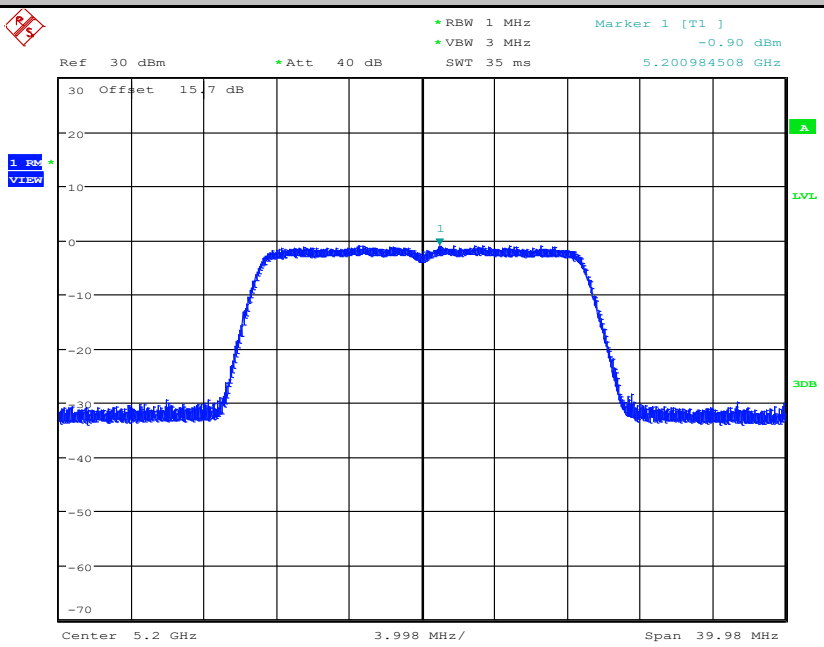

Date: 5.JUL.2019 16:35:27

## Maximum Power Spectral Density _11N20_5180



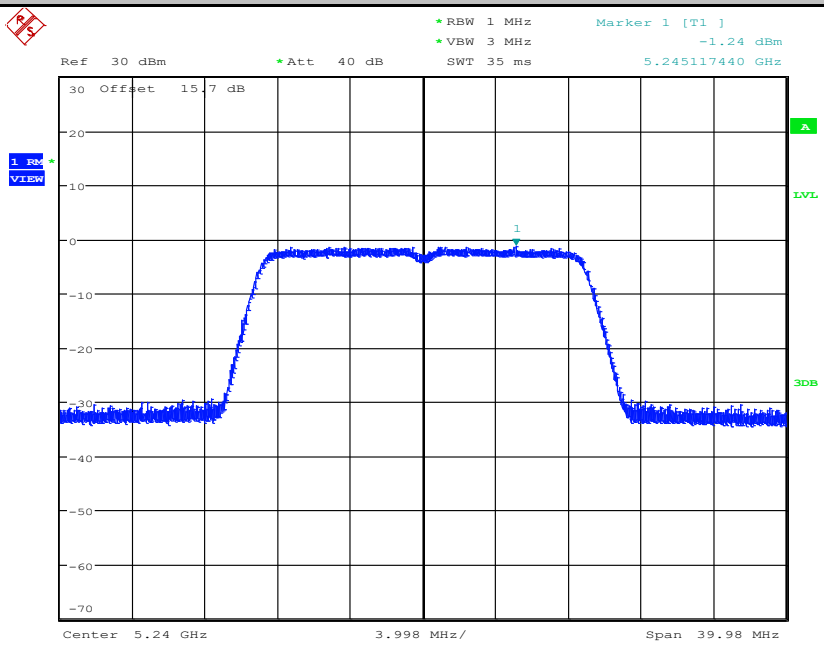

Date: 5.JUL.2019 16:40:21

## Maximum Power Spectral Density _11N20_5200



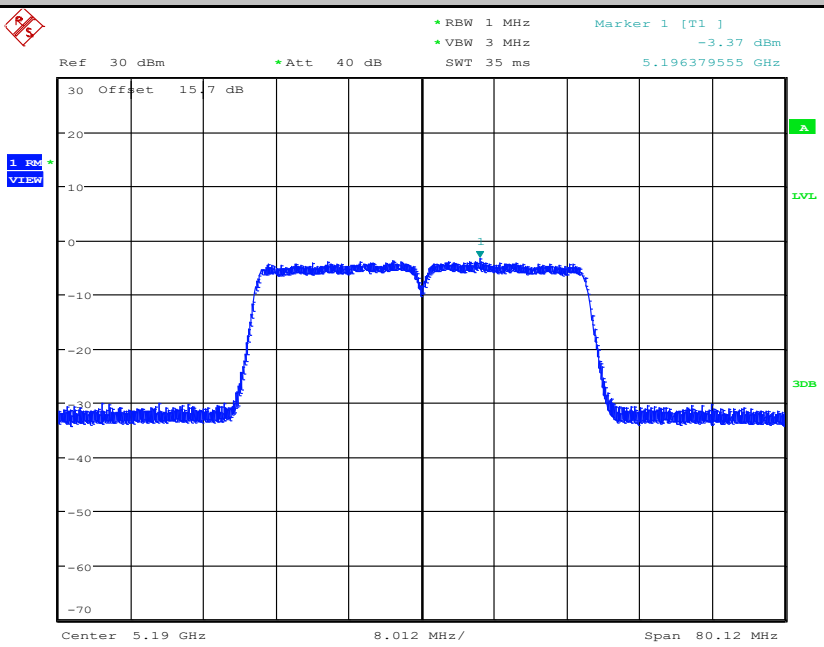

Date: 5.JUL.2019 16:45:08

## Maximum Power Spectral Density _11N20_5240



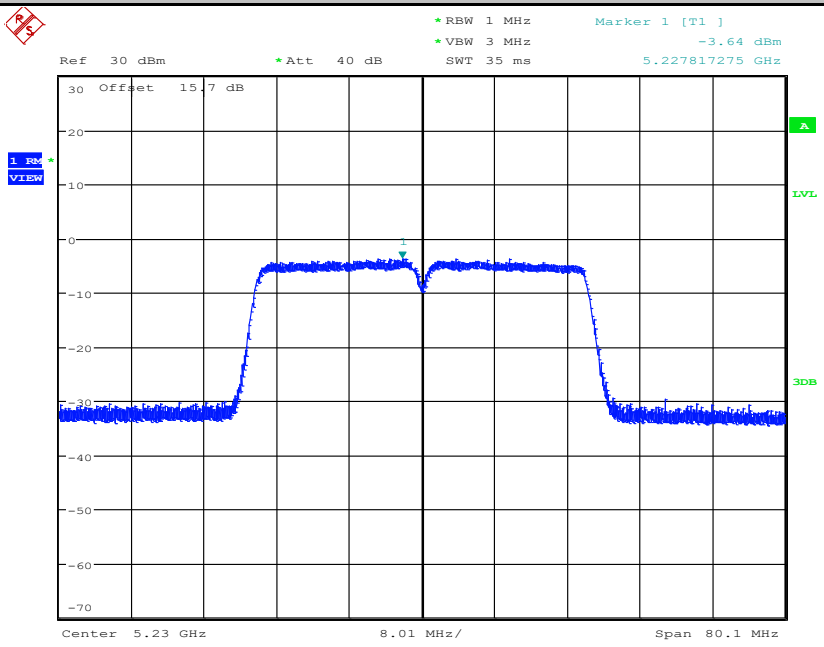

Date: 5.JUL.2019 16:51:17

## Maximum Power Spectral Density _11N40_5190




Date: 5.JUL.2019 16:55:47

## Maximum Power Spectral Density _11N40_5230




Date: 5.JUL.2019 17:01:35

# 9. RADIATED BANDEDGE AND SPURIOUS MEASUREMENT

## 9.1. LIMITS OF Radiated Bandedge and Spurious Measurement

FCC Part 15.205 and 15.209

Table 11 Radiation Emission Test Limit for FCC (9KHz-1GHz)

| Frequency (MHz) | Field Strength (microvolts/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 |
| 960~1000 | 500 | 3 |

Table 12 Radiation Emission Test Limit for FCC (Above 1G)

| Frequency (MHz) | (dBuV/m) (at 3 meters) | |
|---|---|---|
| | PEAK | AVERAGE |
| Above 1000 | 74 | 54 |

* The lower limit shall apply at the transition frequency.

* The test distance is 3m.

FCC Part 15.407(b)

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

## 9.2. TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.10-2013.
2. 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.
3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8 meter, above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, 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.
7. Use the following spectrum analyzer settings:

(1) Span shall wide enough to fully capture the emission being measured;
(2) Set RBW=100 kHz for f < 1 GHz; VBW >= RBW; Sweep = auto; Detector function = peak; Trace = max hold;
(3) Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.
Set RBW = 1 MHz, and 1/T (on time) for average measurement.

## 9.3. TEST DATA

9 kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Table 13 Radiated Emission Test Data 9k Hz-30MHz

| Frequency (MHz) | Cable Loss +preamp (dB) | Antenna Factor (dB) | Readings (dBμV/m) | Level (dBμV/m) | Polarity (H/V) | Limits (dBμV/m) | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- |

30MHz-1GHz

Worst case is shown below for 30MHz-1GHz only.

The emissions don't show in following result tables are more than 20dB below the limits.

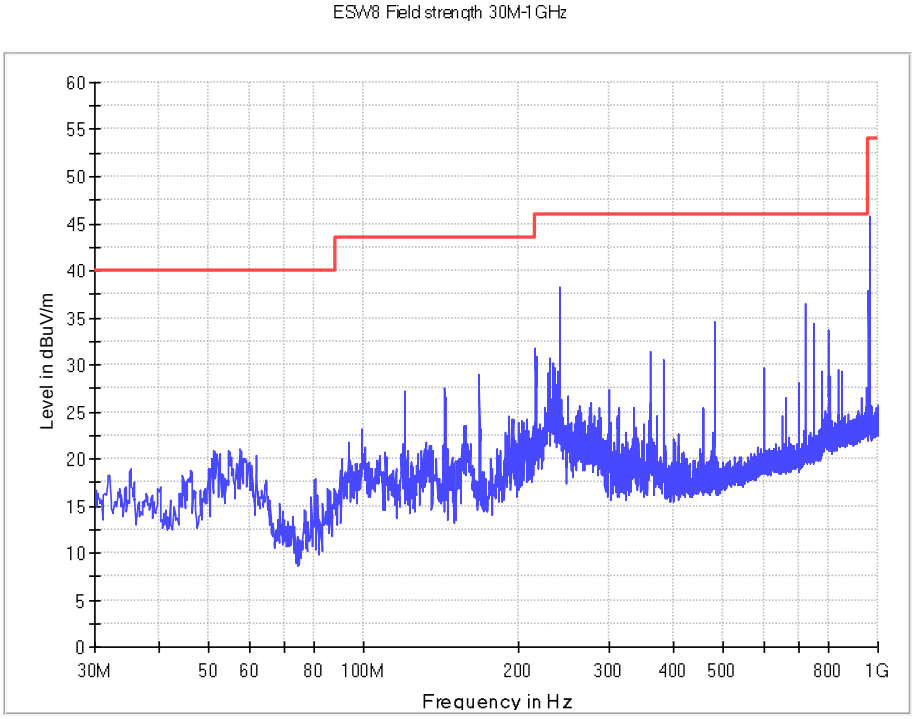
Table 14 Radiated Emission Test Data 30MHz-1GHz

| Frequency (MHz) | Cable Loss +preamp (dB) | Antenna Factor (dB) | Readings (dBμV/m) | Level (dBμV/m) | Polarity (H/V) | Limits (dBμV/m) | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|
| 34.627 | 0.6 | 12.3 | 8.3 | 21.2 | Vertical | 40 | 18.8 | QP |
| 240.101 | 1.9 | 12.1 | 16.2 | 30.2 | Vertical | 46 | 15.8 | QP |
| 384.056 | 2.4 | 14.6 | 7.9 | 24.9 | Vertical | 46 | 21.1 | QP |
| 479.958 | 2.6 | 15.6 | 11.4 | 29.6 | Vertical | 46 | 16.4 | QP |
| 804.063 | 3.6 | 20.1 | 10.0 | 33.7 | Vertical | 46 | 12.3 | QP |
| 960.397 | 3.9 | 21.1 | 18.6 | 43.6 | Vertical | 54 | 10.4 | QP |
| 215.997 | 1.7 | 10.6 | 18.7 | 31.0 | Horizontal | 43.5 | 12.5 | QP |
| 240.126 | 1.9 | 12.1 | 22.0 | 36.0 | Horizontal | 46 | 10.0 | QP |
| 480.201 | 2.6 | 16.1 | 15.5 | 34.2 | Horizontal | 46 | 11.8 | QP |
| 720.397 | 3.4 | 18.8 | -0.2 | 22.0 | Horizontal | 46 | 24.0 | QP |
| 749.982 | 3.5 | 18.8 | 11.0 | 33.3 | Horizontal | 46 | 12.7 | QP |
| 960.398 | 3.9 | 21.1 | 18.3 | 43.3 | Horizontal | 54 | 10.7 | QP |

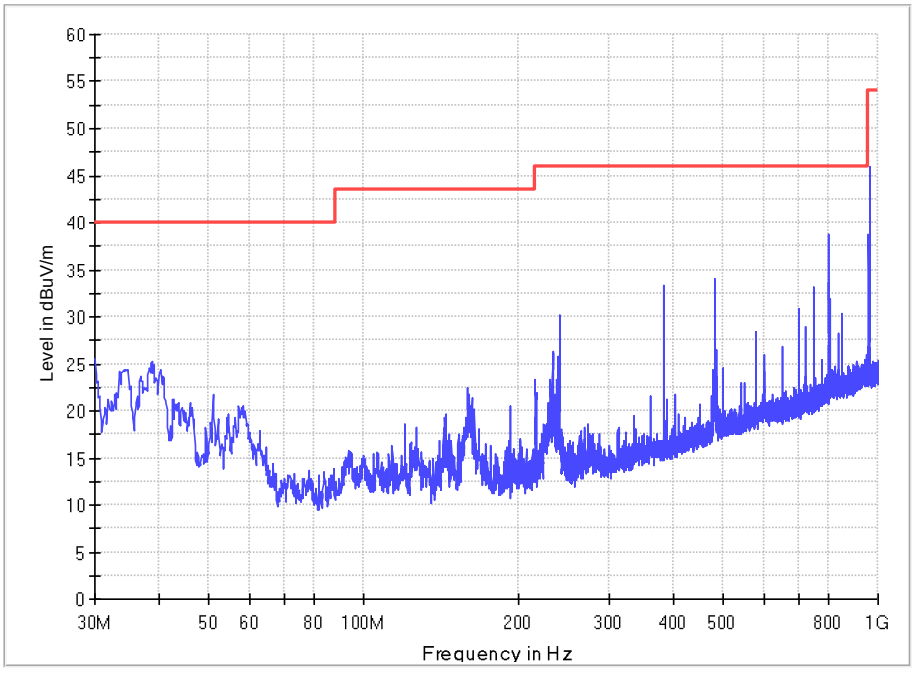
Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

30MHz-1GHz

Horizontal

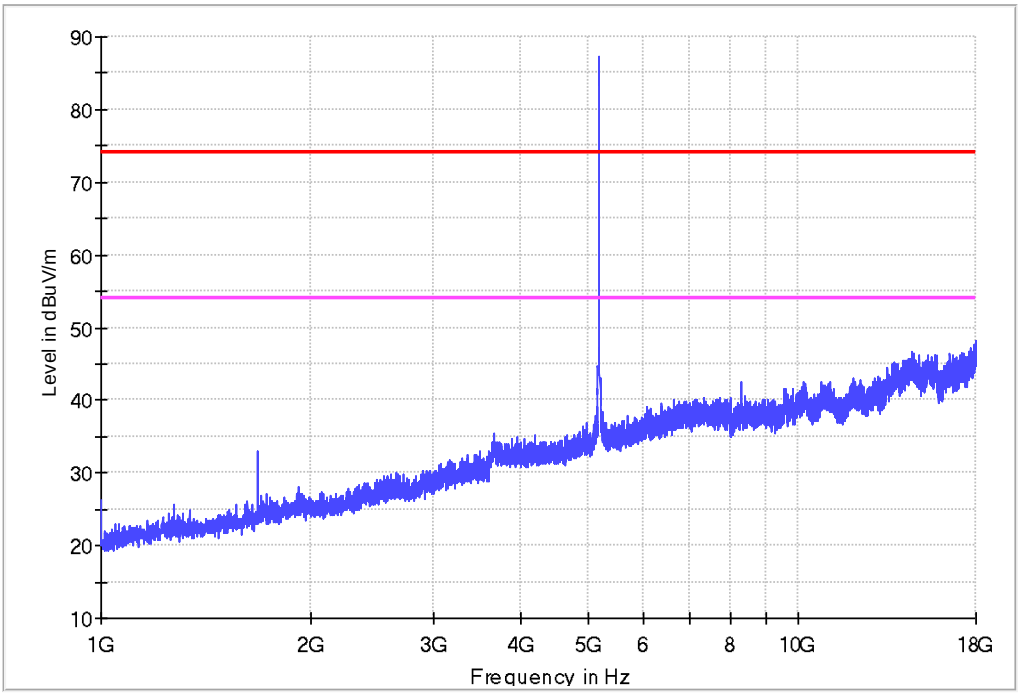



Vertical

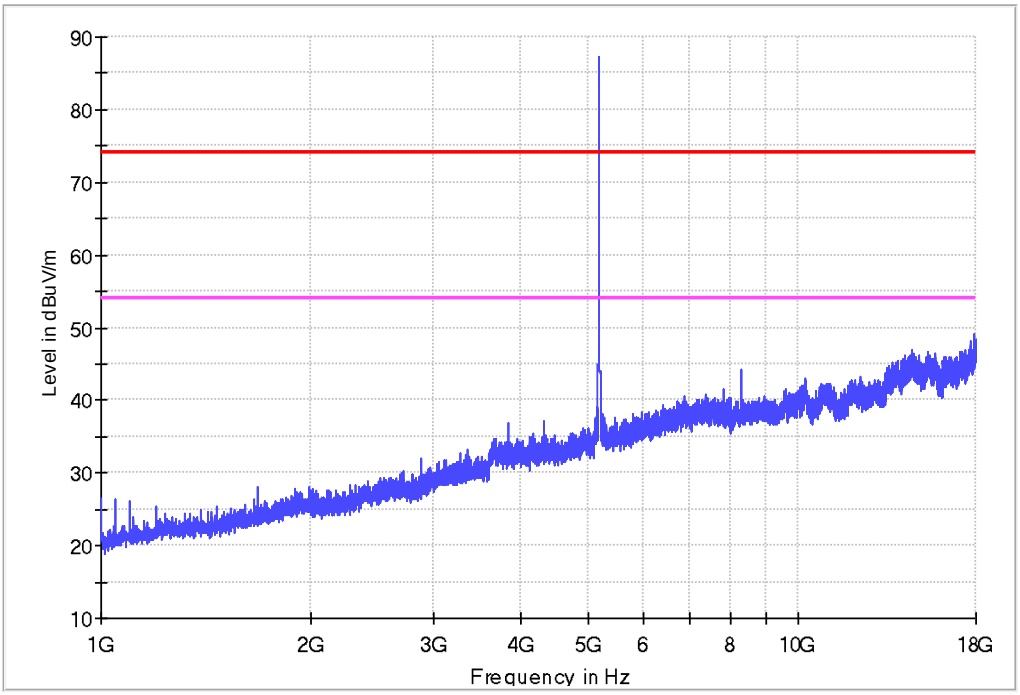


1-18G
11a IN THE 5.2GHz BAND
Ch36

Horizontal

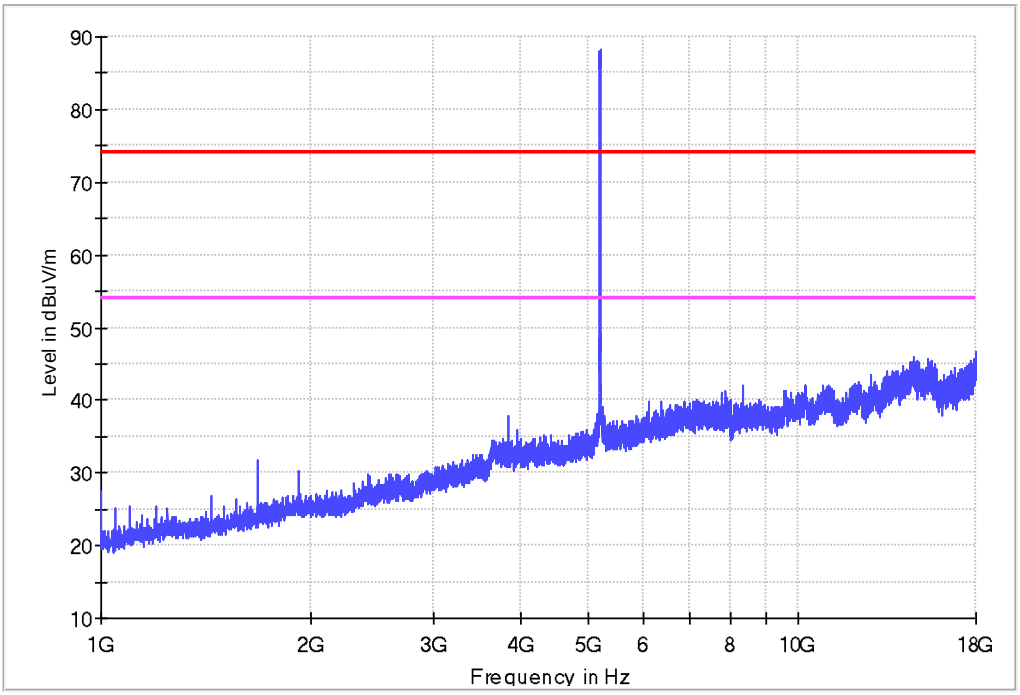



Vertical

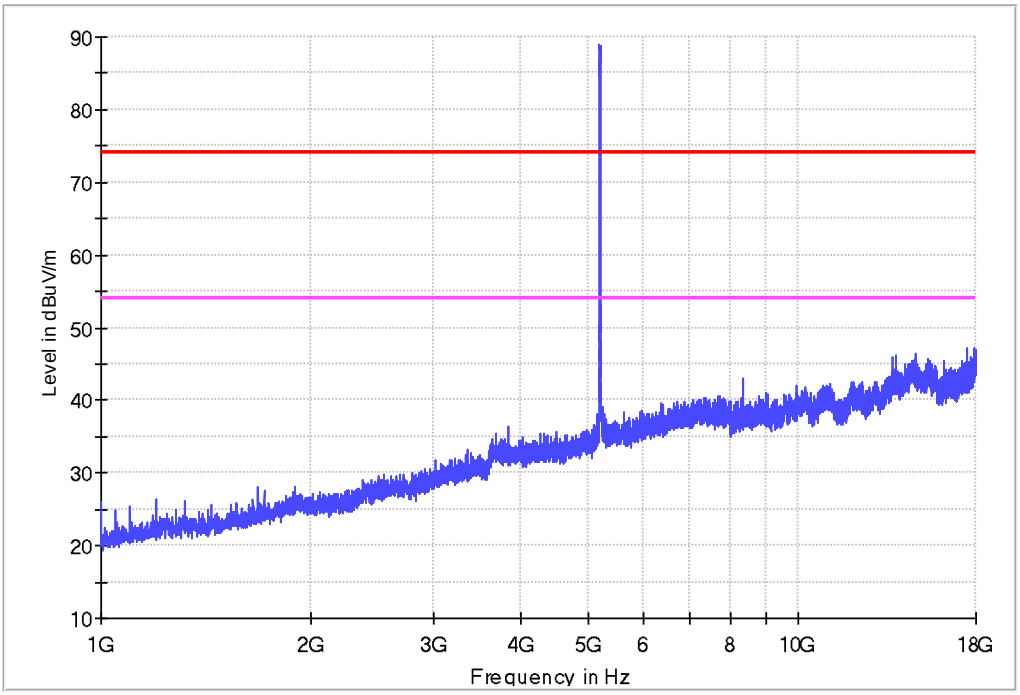


1-18G
11a IN THE 5.2GHz BAND
CH40

Horizontal

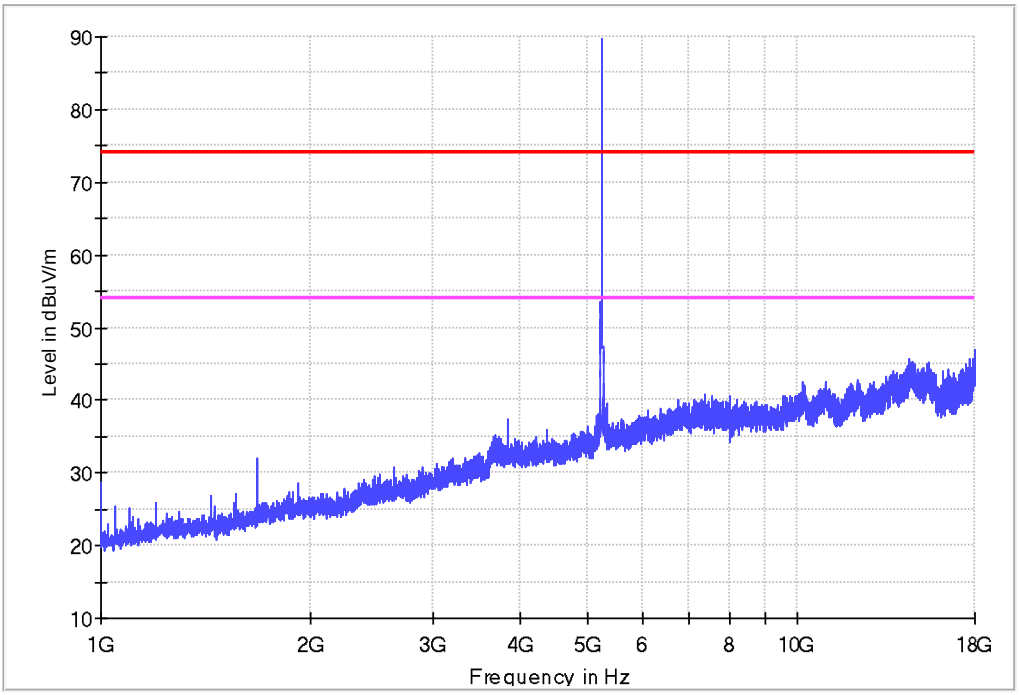



Vertical

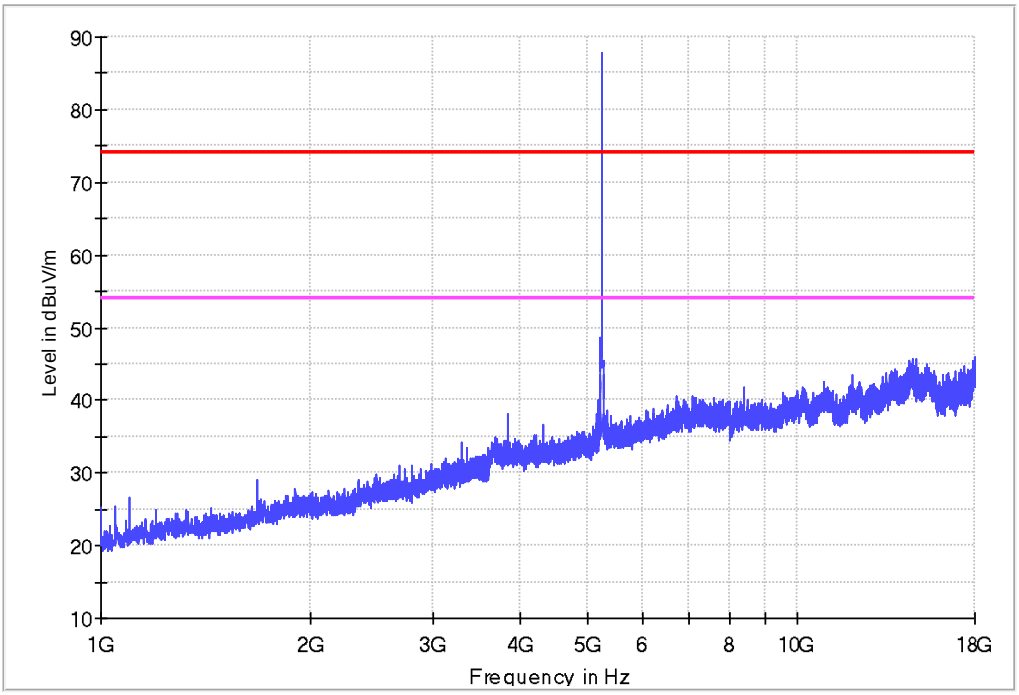


1-18G
11a IN THE 5.2GHz BAND
CH48

Horizontal

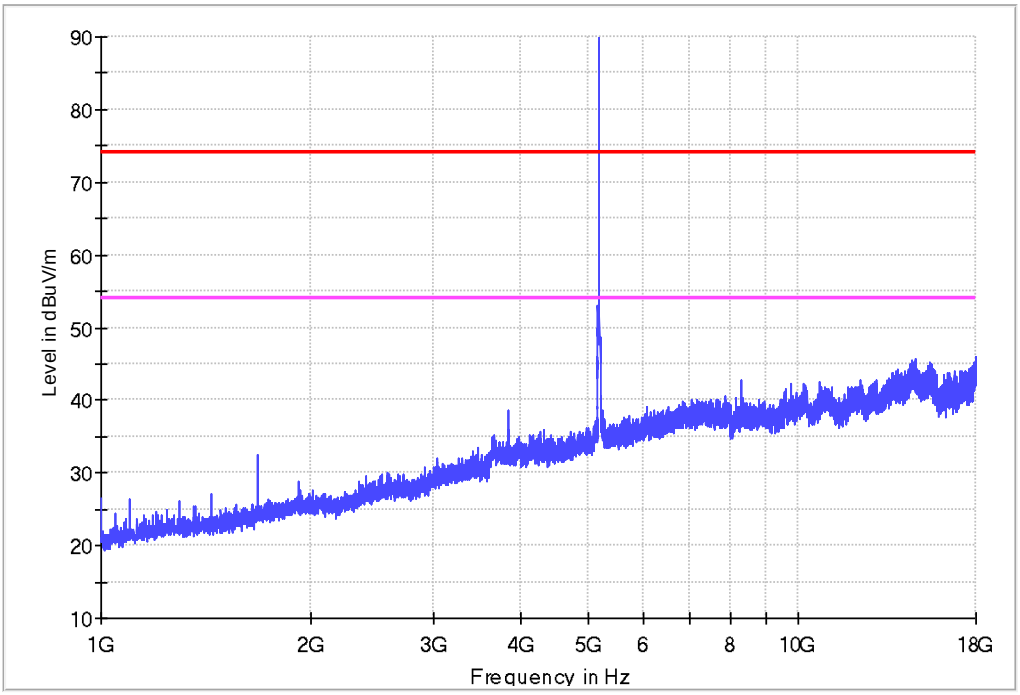



Vertical

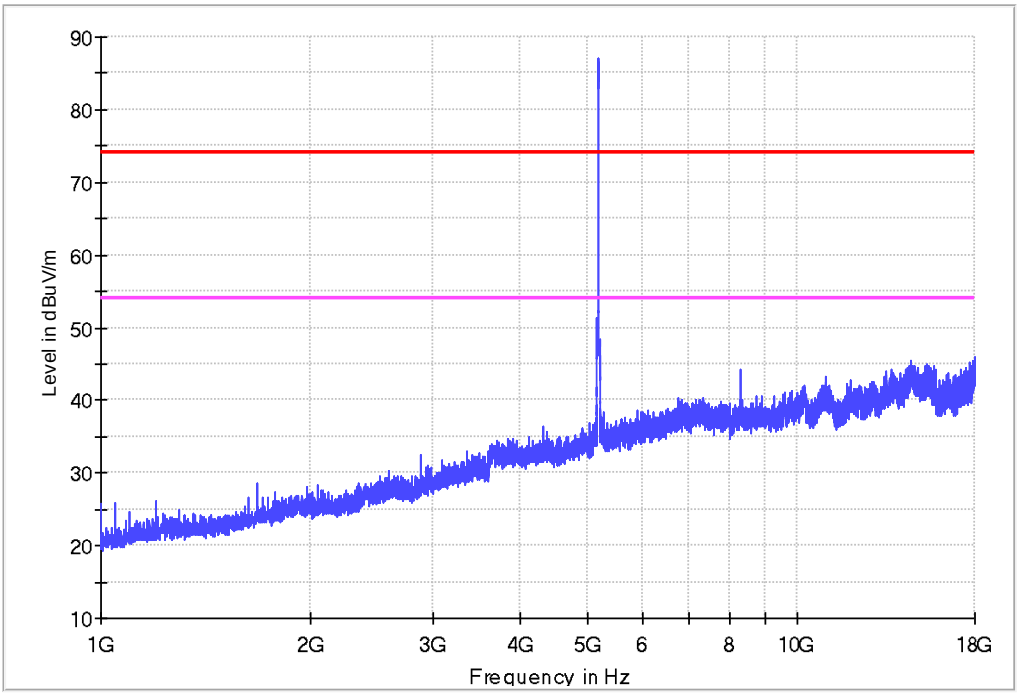


1-18G
11n HT20 IN THE 5.2GHz BAND
CH36

Horizontal

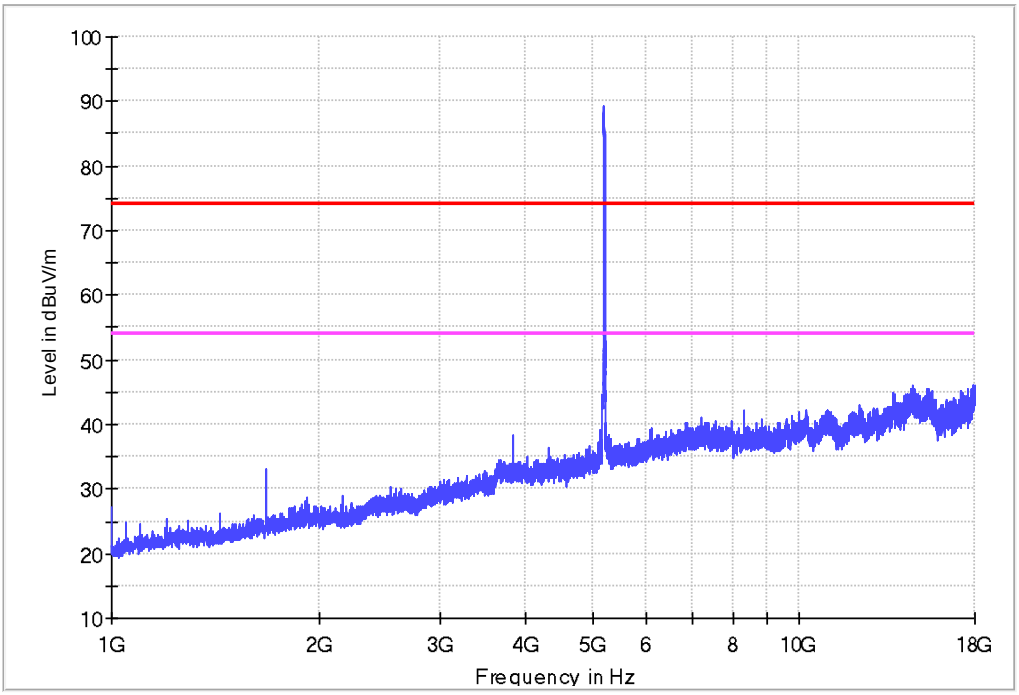



Vertical

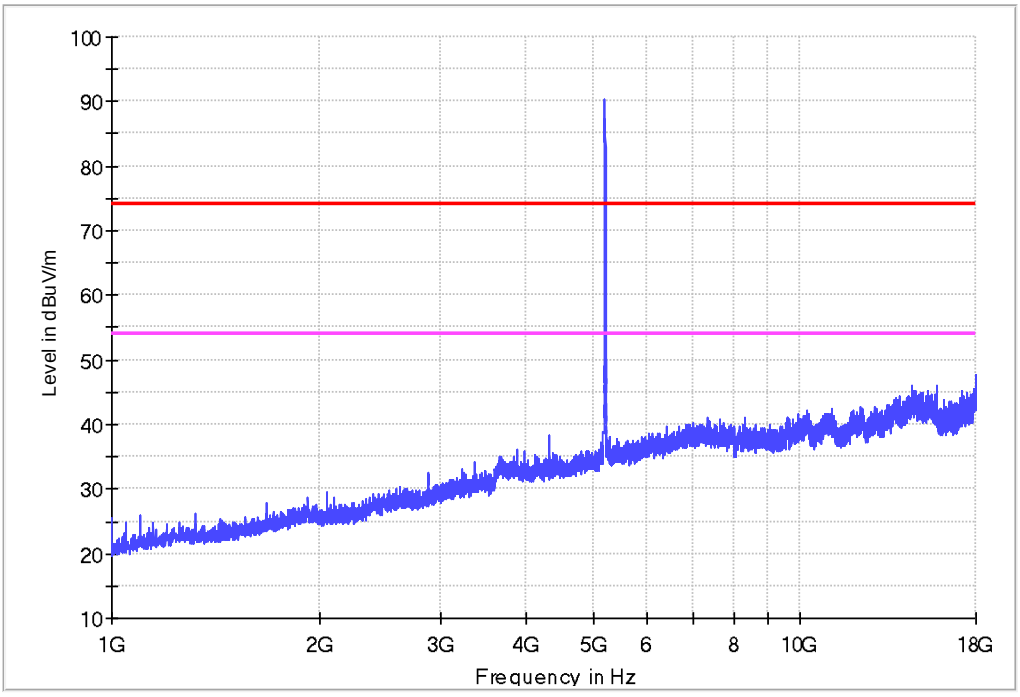


1-18G
11n HT20 IN THE 5.2GHz BAND
CH40

Horizontal

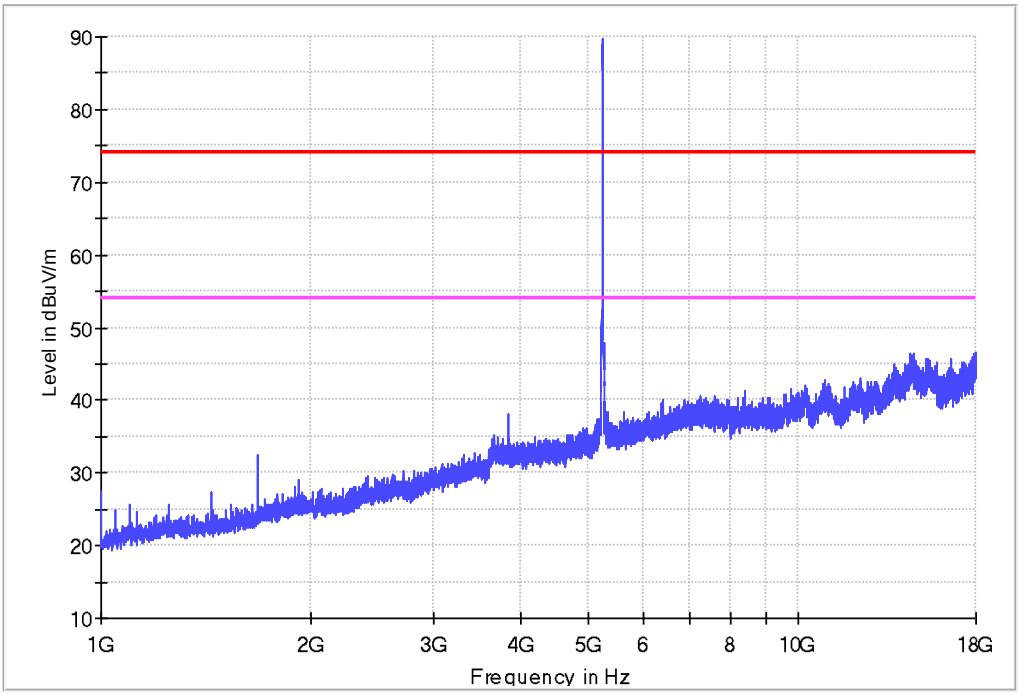



Vertical

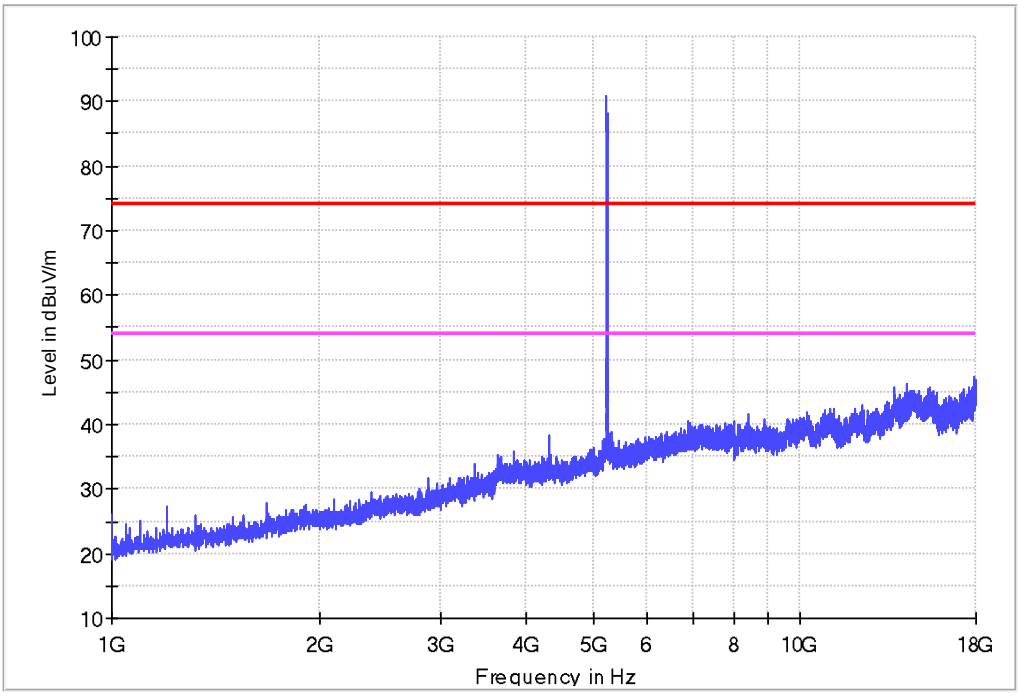


1-18G
11n HT20 IN THE 5.2GHz BAND
CH48

Horizontal

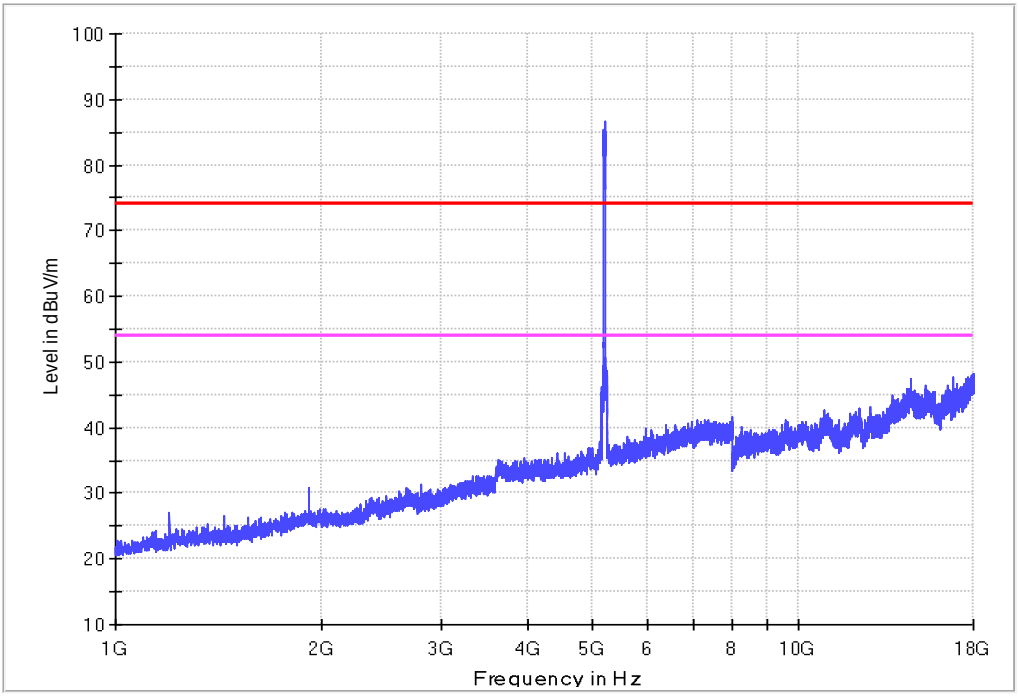



Vertical

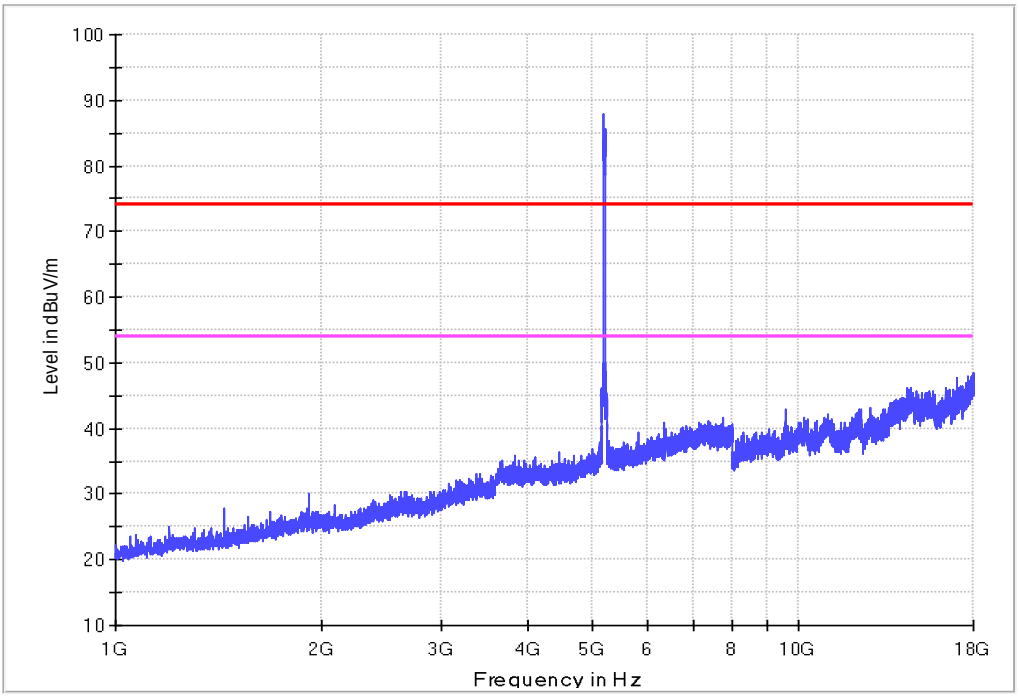


1-18G
11n HT40 IN THE 5.2GHz BAND
CH38

Horizontal

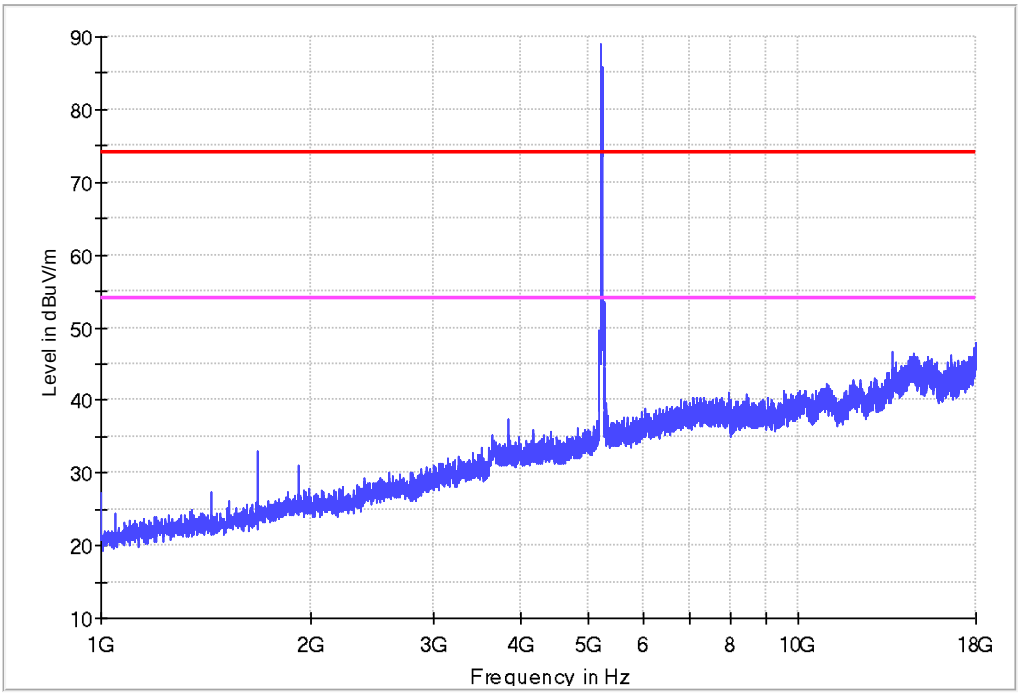



Vertical

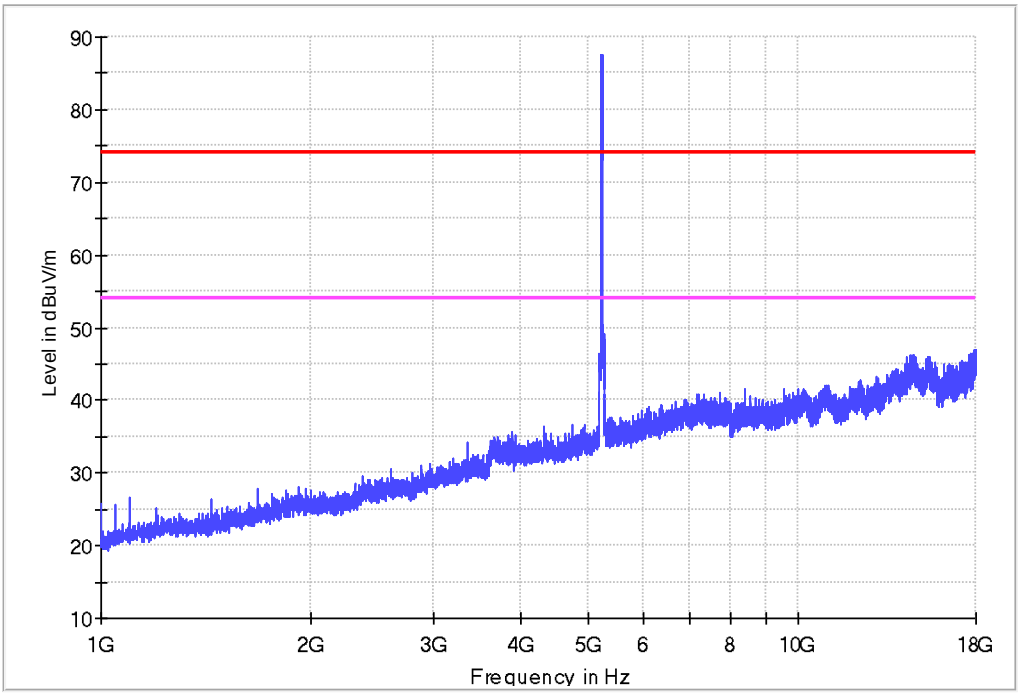


1-18G
11n HT40 IN THE 5.2GHz BAND
CH46

Horizontal

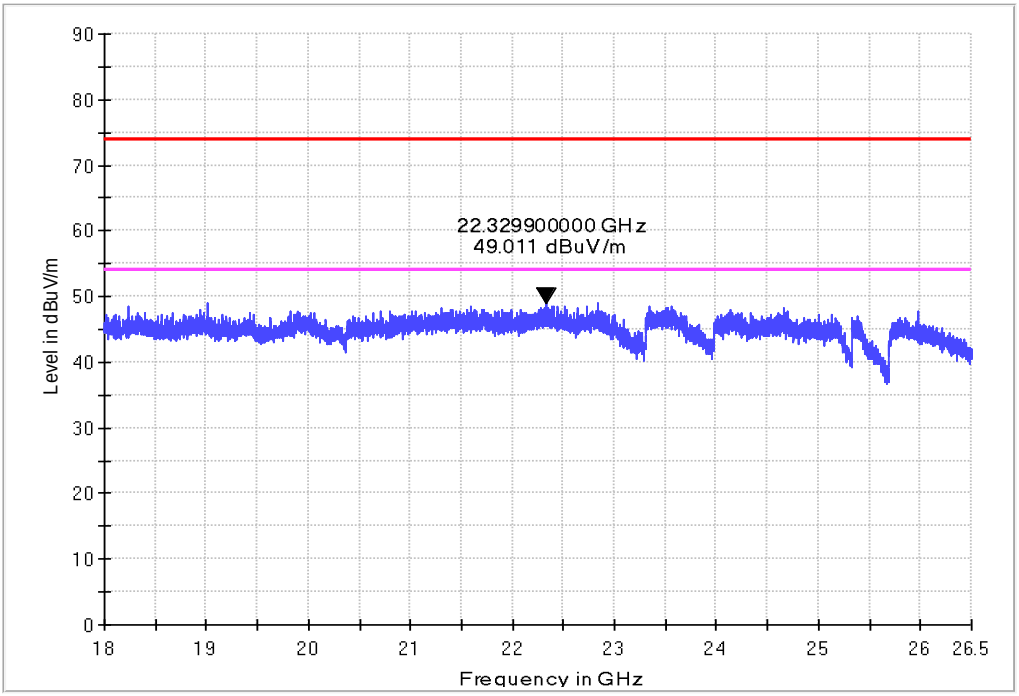



Vertical

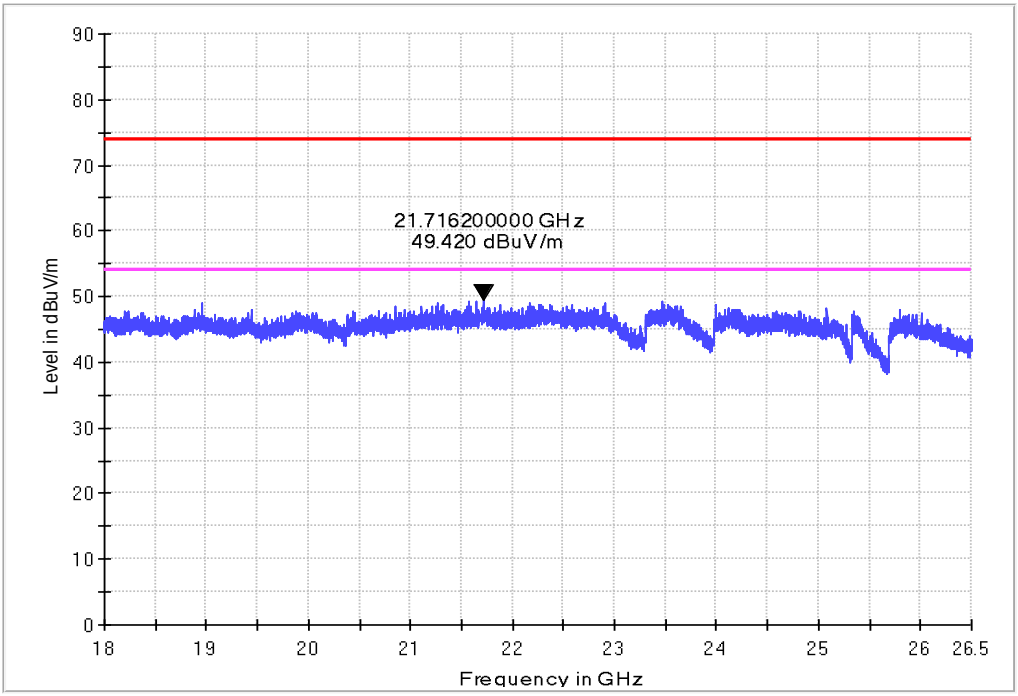


18-26.5G
No Peak found in pre-scan, only worst case result is listed in this report.

Horizontal

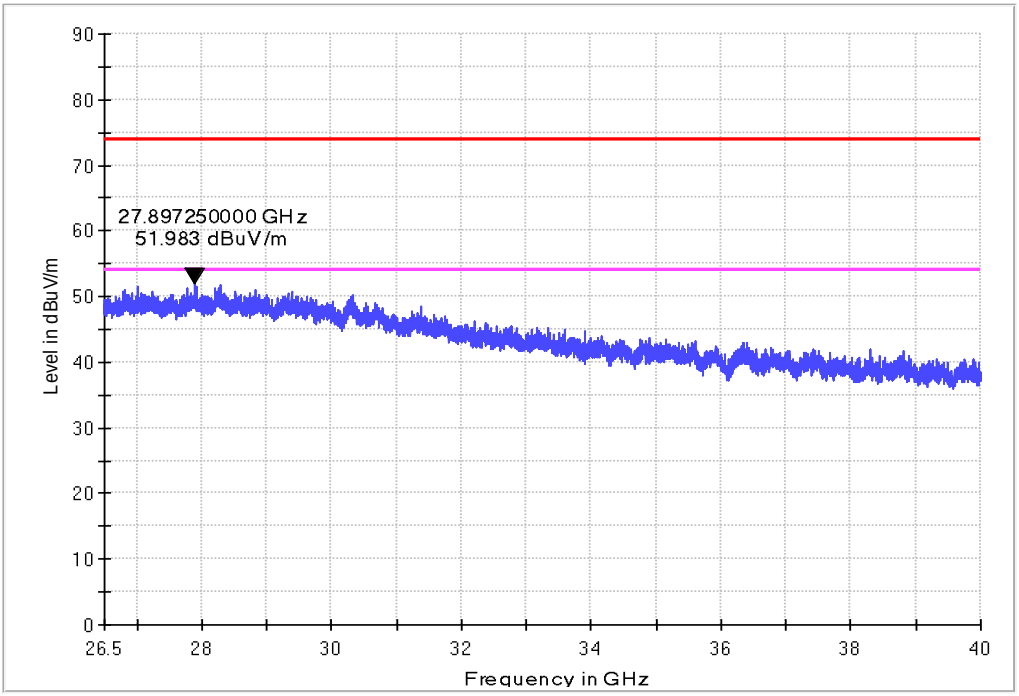



Vertical

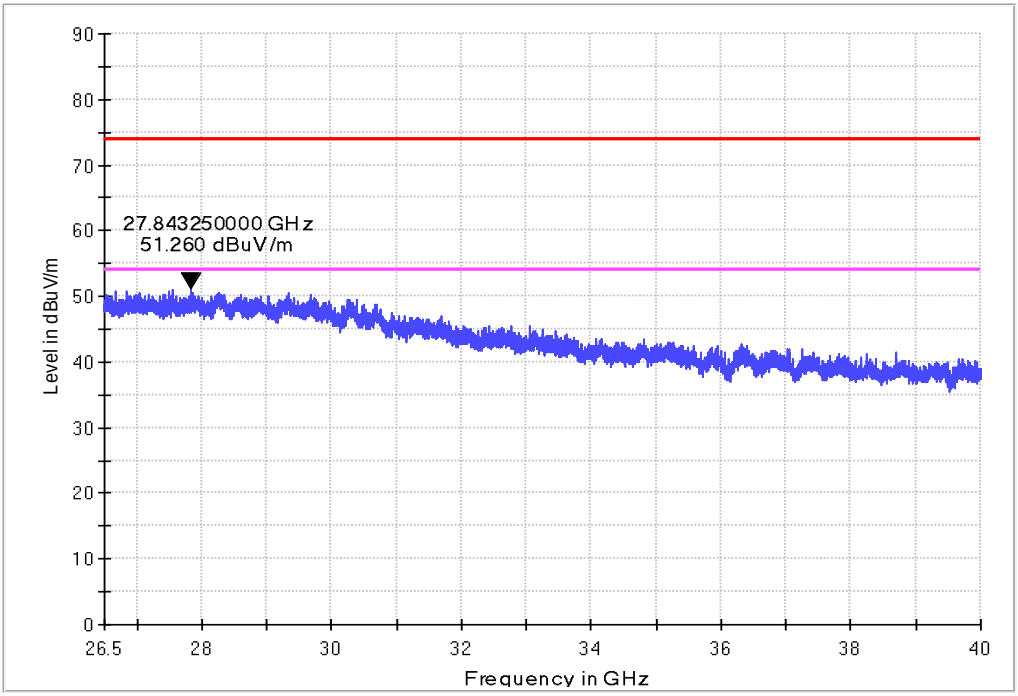


26.5-40G
No Peak found in pre-scan, only worst case result is listed in this report.

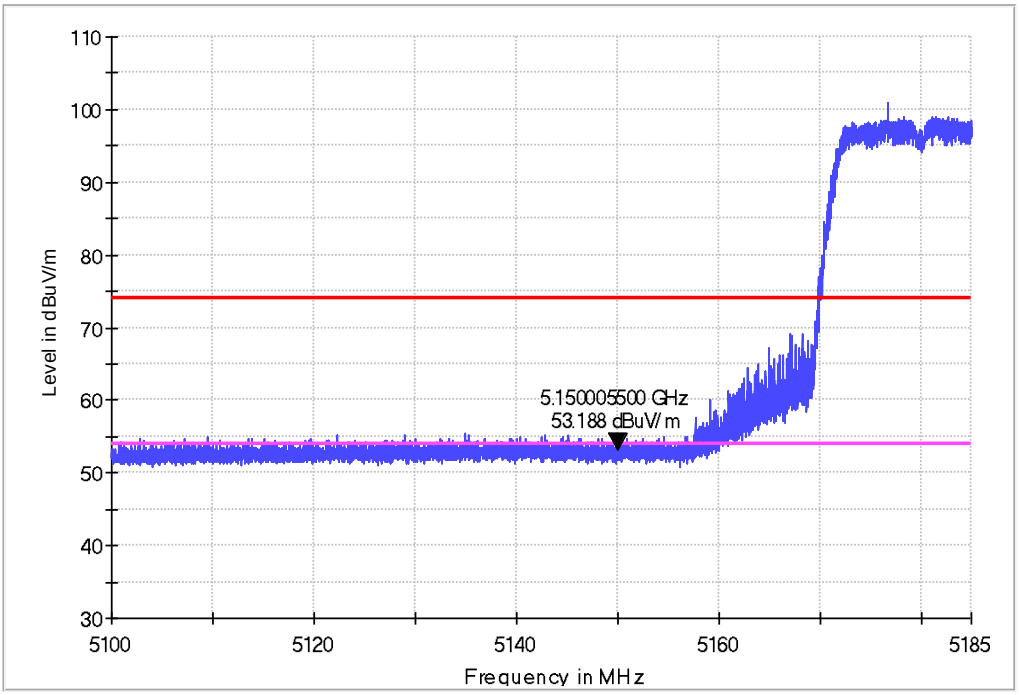
Horizontal



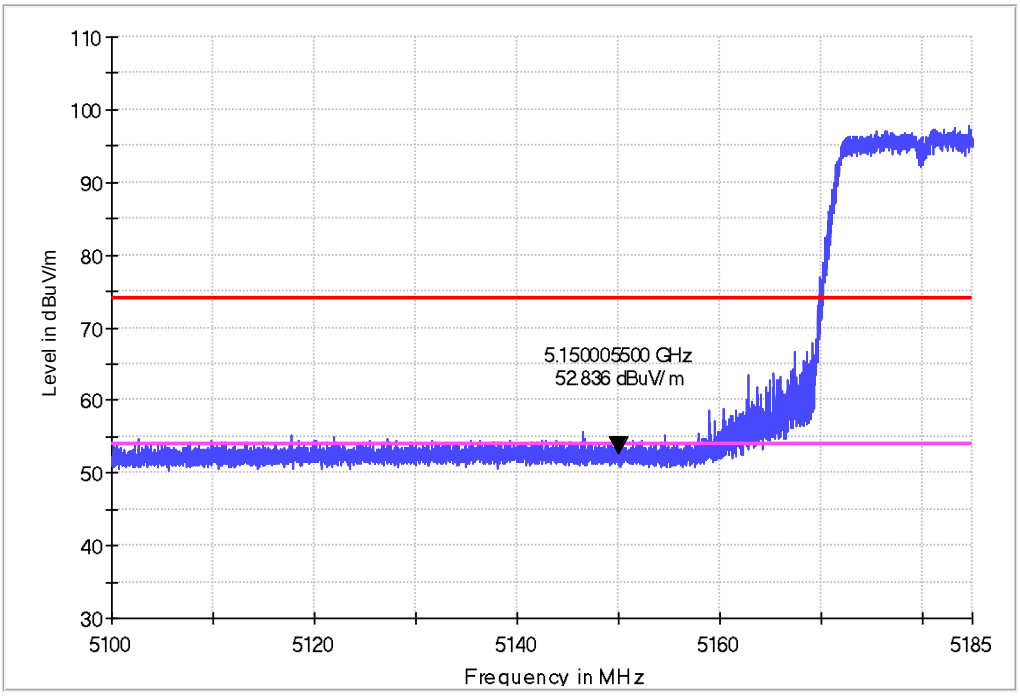

Vertical



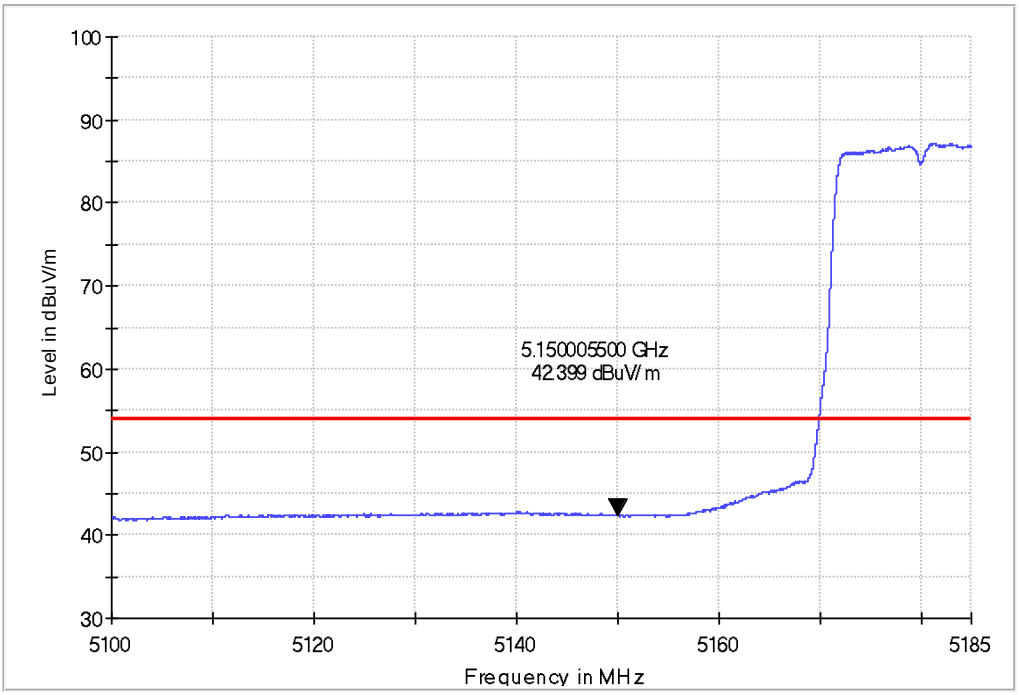
Band edge
11a IN THE 5.2GHz BAND
CH36
PK
Horizontal



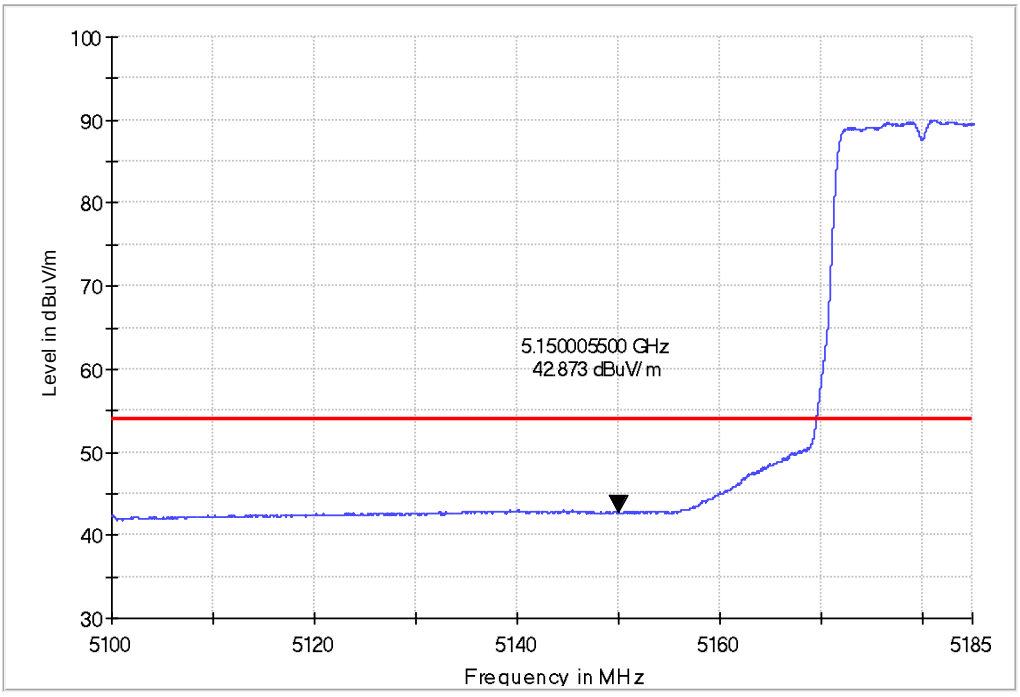

Vertical



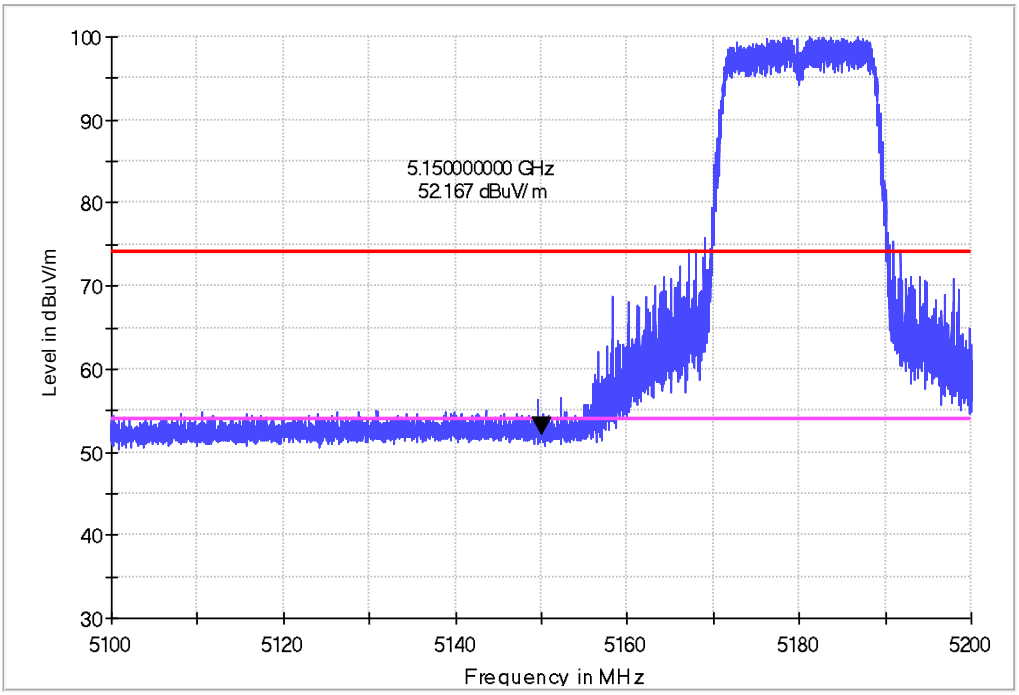
Band edge
11a IN THE 5.2GHz BAND
CH36
AV
Horizontal



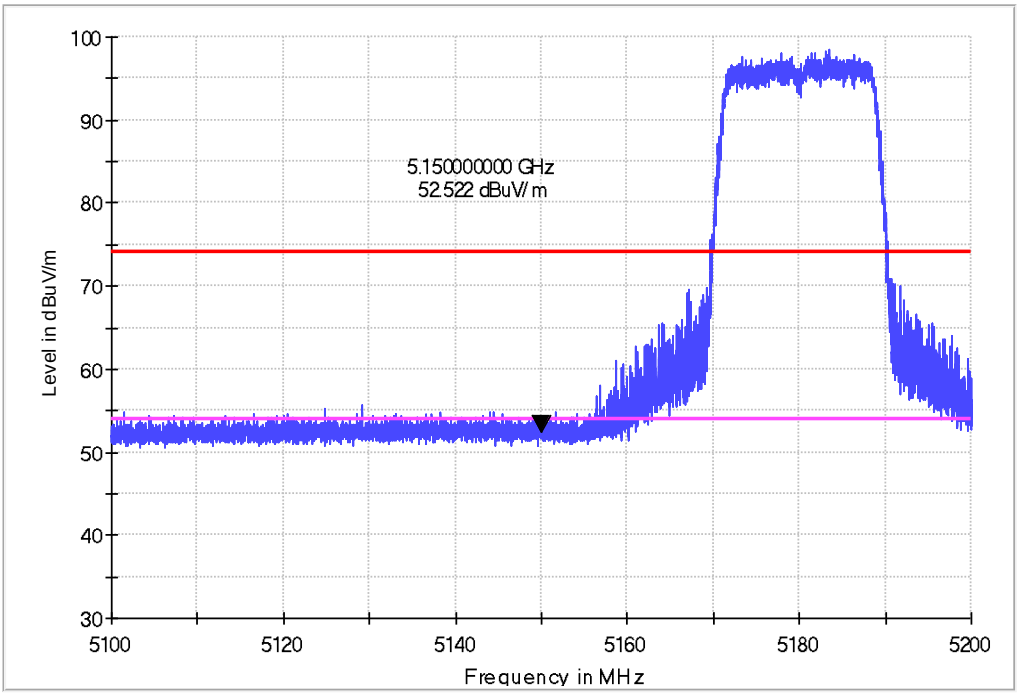

Vertical



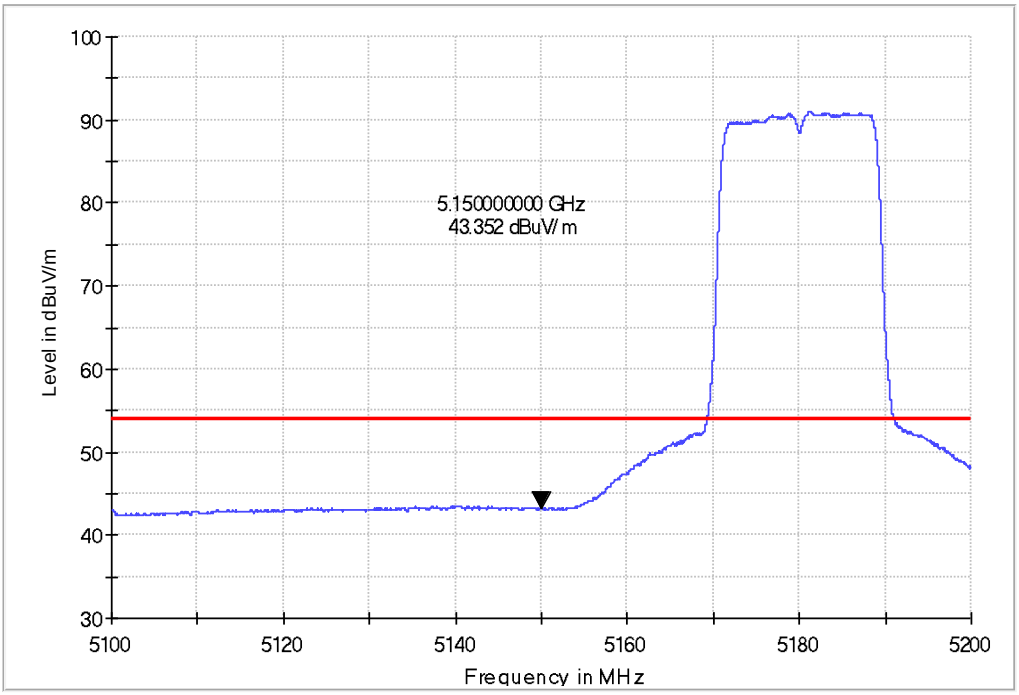
Band edge
11n HT20 IN THE 5.2GHz BAND
CH36
PK
Horizontal



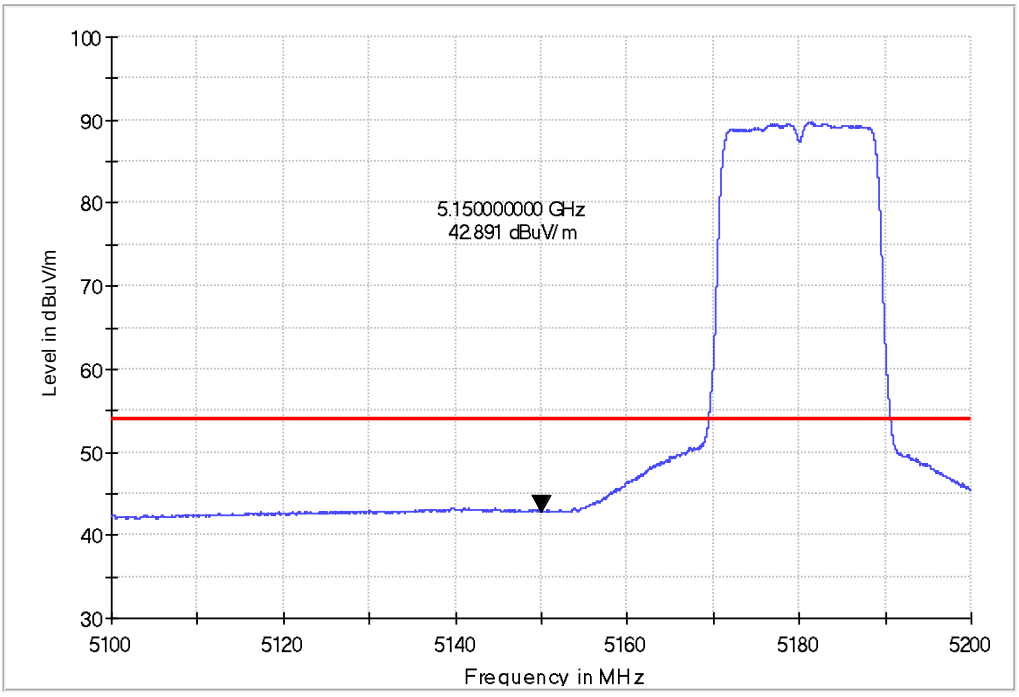

Vertical



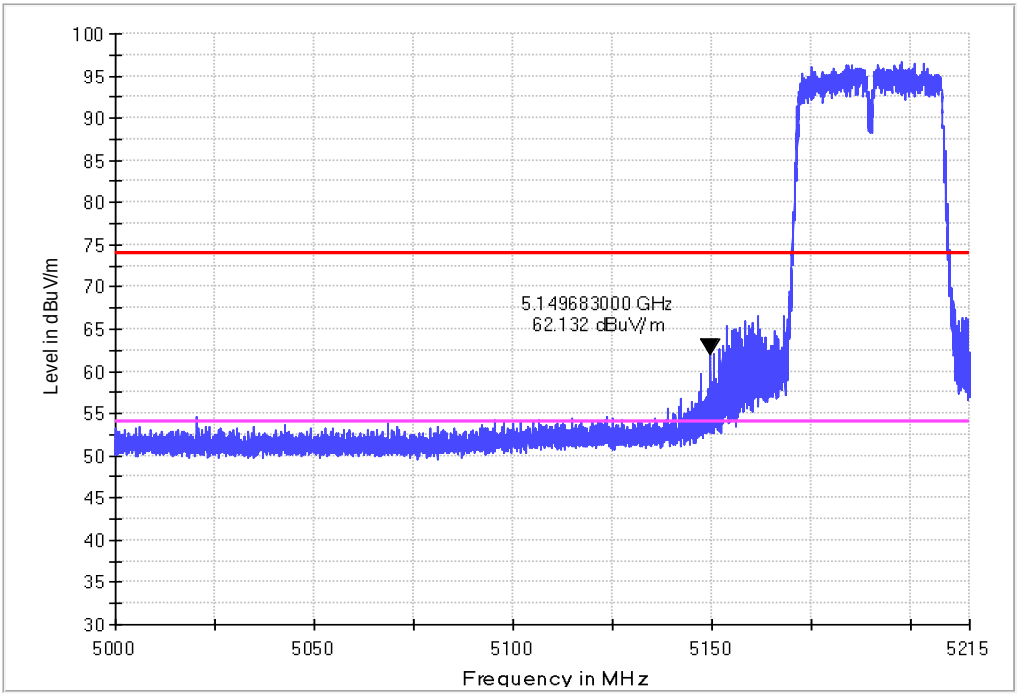
Band edge
11n HT20 IN THE 5.2GHz BAND
CH36
AV
Horizontal




Vertical



Band edge
11n HT40 IN THE 5.2GHz BAND
CH38
PK
Horizontal

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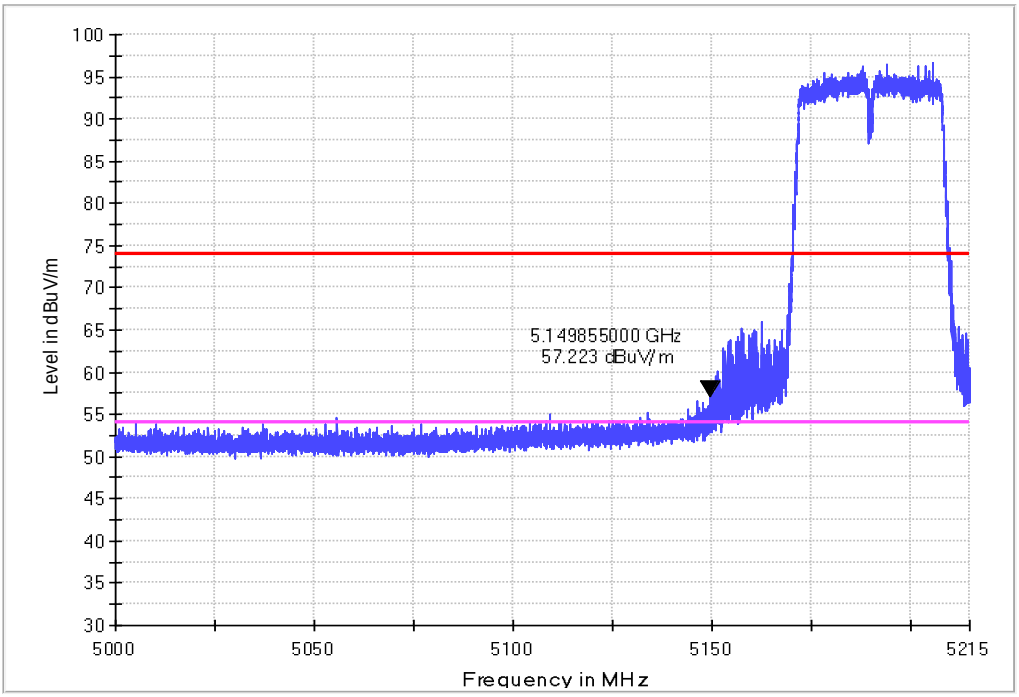
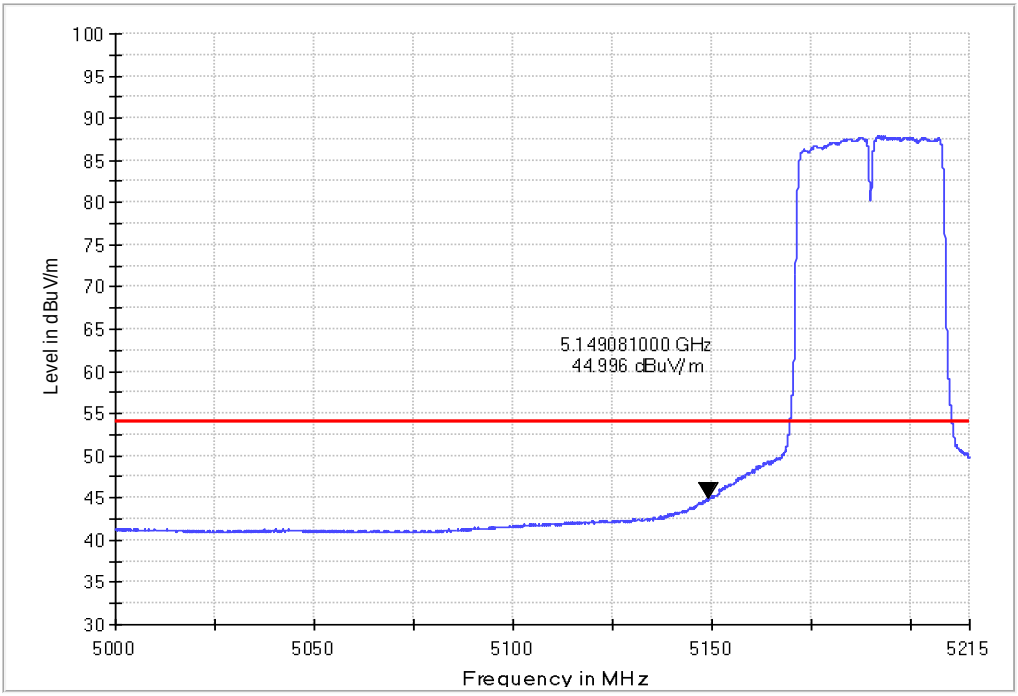
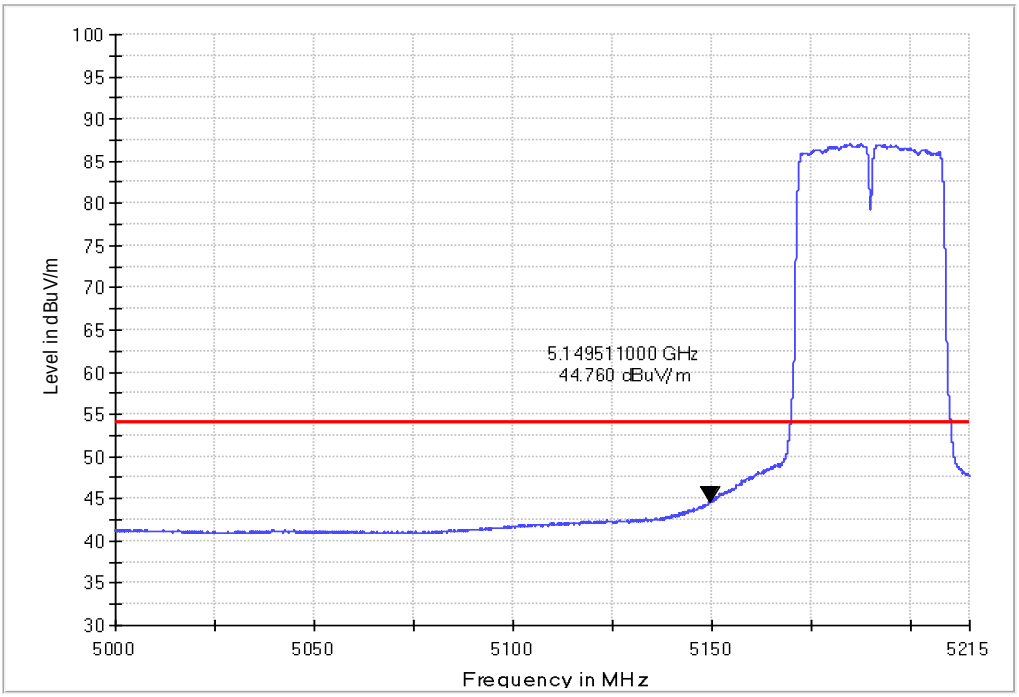


Band edge
11n HT40 IN THE 5.2GHz BAND
CH38
AV
Horizontal




Vertical



# 10. AUTOMATIC DISCONTINUE TRANSMISSION

## 10.1. Test Standard

FCC Part 15.407

(c) The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

## 10.2. Test Data

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting for remote device and verify whether it shall resend or discontinue transmission.

# 11. FREQUENCY STABILITY

## 11.1. LIMITS OF Frequency Stability

FCC Part 15.407

（g）Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

## 11.2. TEST PROCEDURE

The EUT was placed inside of an environmental chamber as the temperrature in chamber was varied between -30℃ and +50℃.The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transimitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

## 11.3. TEST DATA

Table 15 Measurement Results vs. Variation of Temperature—UNII Band1 (CH 36)

| Voltage | Temperature | Frequency | Deviation |
|---|---|---|---|
| DC 3.8V | -30 °C | 5179.97 | -5.79151 |
| | -20 °C | 5180.03 | 5.79151 |
| | -10 °C | 5180.00 | 0.00000 |
| | 0 °C | 5179.99 | -2.89575 |
| | +10 °C | 5180.00 | 0.00000 |
| | +20 °C | 5180.00 | 0.00000 |
| | +30 °C | 5180.00 | 0.00000 |
| | +40 °C | 5180.02 | 2.88462 |
| | +50 °C | 5180.00 | 0.00000 |
| DC 3.5V | +20 °C | 5180.00 | 0.00000 |
| DC 4.35V | +20 °C | 5180.02 | 2.89575 |

# 12. CONDUCTED EMISSION TEST

## 12.1.Test Standard and Limit

12.1.1.Test Standard

FCC Part 15 15.207

12.1.2.Test Limit

Table 16 Conducted Emission Test Limit

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

* Decreasing linearly with logarithm of the frequency

* The lower limit shall apply at the transition frequency.

## 12.2.Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line. According to the requirements of ANSI C63.10-2020.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

The bandwidth of EMI test receiver is set at 9 kHz.

## 12.3.Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

## 12.4.Test Data

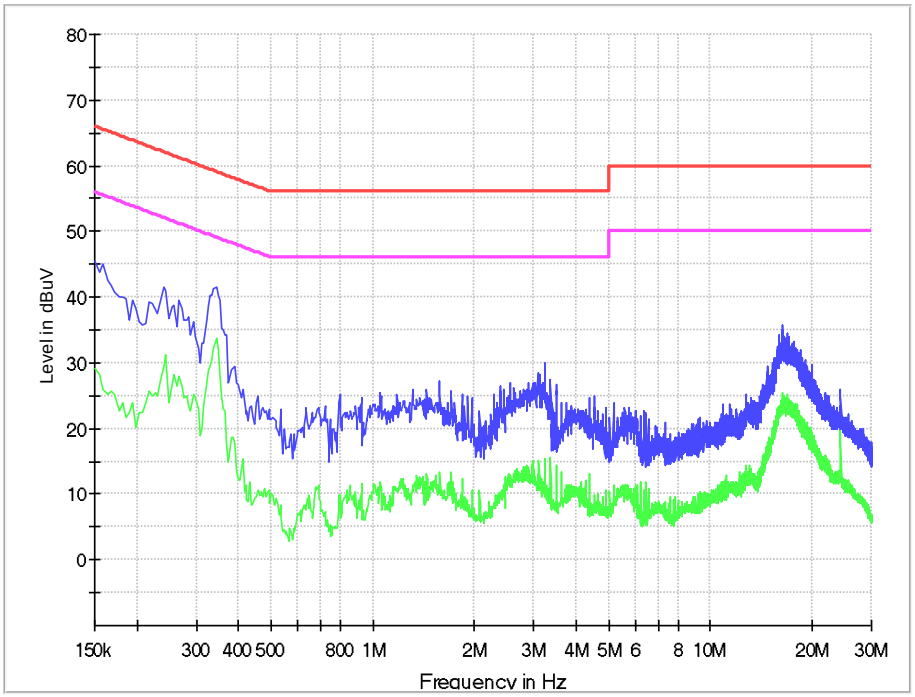
The emissions don’t show in below are too low against the limits. Refer to the test curves.

Table 17 Conducted Emission Test Data

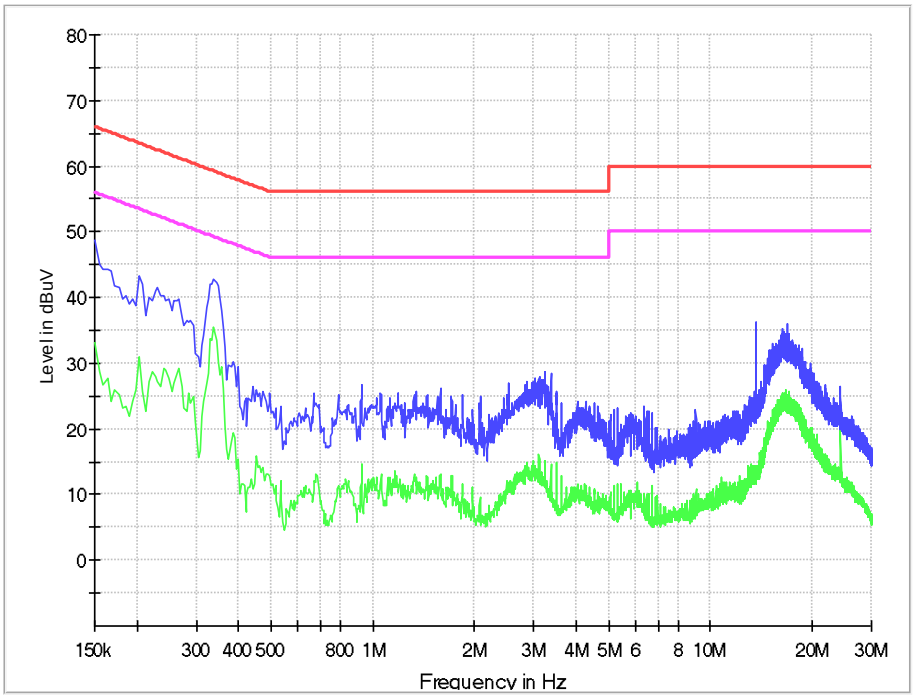
| Test mode: Charging and Transmitting | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency (MHz) | Correction Factor (dB) | Quasi-Peak | | | Average | | |
| | | | Reading (dBμV) | Emission Level (dBμV) | Limit (dBμV) | Reading (dBμV) | Emission Level (dBμV) | Limit (dBμV) |
| Line | 0.150 | 9.7 | 33.9 | 43.6 | 66 | 18.1 | 27.8 | 56 |
| | 0.244 | 9.7 | 26.4 | 36.1 | 62.0 | 16.5 | 26.2 | 52.0 |
| | 0.343 | 9.7 | 29.7 | 39.4 | 59.1 | 23.2 | 32.9 | 49.1 |
| | 1.572 | 9.8 | 10.3 | 20.1 | 56 | 1.5 | 11.3 | 46 |
| | 3.228 | 9.9 | 12.1 | 22.0 | 56 | 1.0 | 10.9 | 46 |
| | 16.395 | 9.9 | 18.7 | 28.6 | 60 | 13.3 | 23.2 | 50 |
| Neutral | 0.150 | 9.7 | 34.3 | 44.0 | 66 | 18.4 | 28.1 | 56 |
| | 0.204 | 9.7 | 28.1 | 37.8 | 63.4 | 15.3 | 25.0 | 53.4 |
| | 0.262 | 9.7 | 26.4 | 36.1 | 61.4 | 17.4 | 27.1 | 51.4 |
| | 0.339 | 9.7 | 31.1 | 40.8 | 59.2 | 23.7 | 33.4 | 49.2 |
| | 2.980 | 9.9 | 11.8 | 21.7 | 56 | 3.1 | 13.0 | 46 |
| | 16.660 | 9.9 | 19.0 | 28.9 | 60 | 13.6 | 23.5 | 50 |

REMARKS: 1. Emission level (dBμV) =Read Value (dBμV) + Correction Factor (dB)
2. Correction Factor (dB) =LISN Factor (dB) + Cable Factor (dB) +Limiter Factor (dB)
3. The other emission levels were very low against the limit.

Line




Neutral



# 13. ANTENNA REQUIREMENTS

15.203 requirements:
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 shall be considered sufficient to comply with the provisions of this section. 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.
15.247(b) (4) requirements:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 13.1. Antenna Connector

Antenna Connector is on the PCB within enclosure and not accessible to user.

## 13.2. Antenna Gain

The antenna gain of EUT is less than 6 dBi.

# 14. APPENDIX I PRODUCT EQUALITY DECLARATION

## Product Equality Declaration

We: FAMOCO SAS, declare on our sole responsibility the differences between the hardware revision of **NFC Android Validator** products.

The new models of **NFC Android Validator** are:

- FX925SF-ING-VWDC-PRE,011P
- FX925SF-ING-VPDC-PRE,011P
- FX925SF-ING-VWDC-PRE,010P
- FX925SF-ING-VPDC-PRE,010P

All parts of hardware revision: FX925F-P.

**NFC Android Validator** models are made of two parts, a Front Casing, and a Back Casing. The composition of each model is described below.

| Models | Front Casing Models | Back Casing Models |
|---|---|---|
| FX925SF-ING-VWDC-PRE,011P | FC-FX925SF-ING-PRE,0112 | BC-VWDC-P366C,4 |
| FX925SF-ING-VPDC-PRE,011P | FC-FX925SF-ING-PRE,0112 | BC-VPDC-P366C,4 |
| FX925SF-ING-VWDC-PRE,010P | FC-FX925SF-ING-PRE,0102 | BC-VWDC-P366C,4 |
| FX925SF-ING-VPDC-PRE,010P | FC-FX925SF-ING-PRE,0102 | BC-VPDC-P366C,4 |

The original models of **NFC Android Validator** are:

- FX925F PM
- FX925F WM

All parts of hardware revision: FX925F,1

They are also made of two parts, a Front Casing and a Back Casing. The composition of each model is described below.

| Models | Front Casing Models | Back Casing Models |
|---|---|---|
| FX925F WM | FC-FX925SF-ING-PRE,0112 | BC-VWDC-P366C,2 |
| FX925F PM | FC-FX925SF-ING-PRE,0112 | BC-VPDC-P366C,2 |

Differences between **NFC Android Validator** hardware revisions FX925F,1 and FX925F-P are listed below.

To identify product pieces described below products exploded views are at the end of this document.

*Table 1: List of differences between the two Front Casing versions of NFC Android Validators* FC-FX925SF-ING-PRE,0112 *and* FC-FX925SF-ING-PRE,0102*:*

| # | Differences | FC-FX925SF-ING-PRE,0112 | FC-FX925SF-ING-PRE,0102 |
|---|---|---|---|
| #1 | Battery | • 1 Smartphone battery | • No smartphone battery |

*Table 2: List of differences between the two Back Casing versions of NFC Android Validators BC-VWDC-P447C,4 and BC-VPDC-P447C,4:*

| # | Differences | BC-VWDC-P366C,4 | BC-VPDC-P366C,4 |
|---|---|---|---|
| #1 | Mechanical parts | • Wall mount | • Pole mount |

*Table 3:List of differences between the NFC Android Validator Back Casings Wall* BC-VWDC-P366C,2 *and* BC-VWDC-P366C,4*:*

| # | Differences | NFC Android Validator BC-VWDC-P366C,2 | NFC Android Validator BC-VWDC-P366C,4 |
|---|---|---|---|
| #1 | PCBA POWER | • PCBA PWR V18 with ferrites on cables | • PCBA PWR V07 |

*Table 4:List of differences between the NFC Android Validator Back Casing Pole* BC-VPDC-P366C,4 *and* BC-VPDC-P366C,4*:*

| # | Differences | NFC Android Validator BC-VPDC-P366C,2 | NFC Android Validator BC-VPDC-P366C,4 |
|---|---|---|---|
| #1 | PCBA PWR | • PCBA PWR V18 with ferrites on cables | • PCBA PWR V07 |

*Table 5:List of differences between the* FX925SF-ING-VWDC-PRE,011P,FX925SF-ING-VWDC-PRE,010P FX925SF-ING-VPDC-PRE,011P,FX925SF-ING-VPDC-PRE,010P,and FX925F WM,FX925F PM

| Models | Software version |
|---|---|
| FX925SF-ING-VWDC-PRE,011P,FX925SF-ING-VWDC-PRE,010P FX925SF-ING-VPDC-PRE,011P,FX925SF-ING-VPDC-PRE,010P | MOLY.LR12A.R2.MP.V44.1.P1 |
| FX925F WM,FX925F PM | MOLY.LR12A.R2.MP.V44.1 |

----------End of Report----------