



## Regulatory Test Report

Prepared for Harman International Industries, Inc.

This report presents detailed information on

### INFO3.6 CSM

Prepared by

Aravind Buddana

Engineer II

Approved by

Jason Kanakry

General Manager

Issue date: 07/21/2023

Report No: AH22100701-HAR-053-TR2 v5

This test result relates only to the described test object.

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Customer must not use this test report as the product certification of each accreditation body or each national organization.

The test is traceable to national standard or related international standard

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## 1. TEST REQUEST INFORMATION

|                            |                                                                                                                                                                                     |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Request #:            | 7700182604                                                                                                                                                                          |
| Test Requested By:         | Mark Bowman<br>Harman International Industries, Inc.<br>30001 Cabot Drive, Novi, MI 48377                                                                                           |
| Test item Description:     | INFO3.6 CSM                                                                                                                                                                         |
| Part Number:               | 8457687                                                                                                                                                                             |
| DUT Sample Number:         | AH22100701-HAR-053#1, AH22100701-HAR-053#4,<br>AH22100701-HAR-053#5                                                                                                                 |
| Hardware Version of DUT:   | PV                                                                                                                                                                                  |
| Software Version of DUT:   | 17.80.200.219                                                                                                                                                                       |
| Component Category of DUT: | N/A                                                                                                                                                                                 |
| FCC ID:                    | 2AHPN-BE2866                                                                                                                                                                        |
| ISED ID:                   | 6434C-BE2866                                                                                                                                                                        |
| Type of Test:              | FCC/ISED Certification                                                                                                                                                              |
| Test Method:               | CFR Title 47 FCC Part 15.407, ISED Canada RSS-247 Issue 2,<br>ISED Canada RSS-Gen Issue 5, FCC KDB 789033 D02 General UNII Test Procedures New<br>Rules v02r01 and ANSI C63.10-2013 |
| Deviations from standard:  | None                                                                                                                                                                                |
| Approved Test Plan Number: | N/A                                                                                                                                                                                 |
| Test Plan Revision:        | N/A                                                                                                                                                                                 |
| Date Test Sample Received: | 10-07-2022                                                                                                                                                                          |
| Date Test Started:         | 10-13-2022                                                                                                                                                                          |
| Date Test Finished:        | 01-13-2023                                                                                                                                                                          |

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## 2. TEST LABORATORY INFORMATION

|                                   |                                                                                                                                                                                                                           |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Location of Test Lab:</b>      | The radiated and conducted emissions test sites are located at<br>Bureau Veritas<br>815 N. Opdyke Rd #100,<br>Auburn Hills, MI 48326,<br>Phone: +1-248-836-4700                                                           |
| <b>Key Contact:</b>               | Jason Kanakry (General Manager)<br><a href="mailto:Jason.Kanakry@BureauVeritas.com">Jason.Kanakry@BureauVeritas.com</a><br>Phone: +1-248-836-4747                                                                         |
| <b>Laboratory Accreditations:</b> | BUREAU VERITAS CONSUMER PRODUCTS SERVICES, INC is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. |
| <b>ISO/IEC 17025:2017:</b>        | 5678.01                                                                                                                                                                                                                   |
| <b>FCC Test Site Number:</b>      | US1278 (242530)                                                                                                                                                                                                           |
| <b>IC Test Site Number:</b>       | US0229 (26240)                                                                                                                                                                                                            |

### 3. STATEMENT OF CONFORMITY

| RSS-GEN | RSS 247 | Part 15          | Comments                                                                                                                                                                               |
|---------|---------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.4     |         | 15.15(b)         | There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.                                                      |
|         |         | 15.19            | The label shown in the label exhibit.                                                                                                                                                  |
|         |         | 15.21            | Information to the user shown in the instruction manual exhibit.                                                                                                                       |
|         |         | 15.27            | No special accessories are required for compliance.                                                                                                                                    |
| 3.2     |         | 15.31            | The EUT tested in accordance with the measurement standards in this section.                                                                                                           |
| 6.13.2  |         | 15.33            | Frequency range investigated according to this section, unless noted in specific rule section under which the equipment operates.                                                      |
| 6.13.1  |         | 15.35            | The EUT emissions measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.           |
| 6.8     |         | 15.203           | EUT employs integrated PCB antenna with 4.39dBi (UNII-1) and 5.05dBi (UNII-3)                                                                                                          |
| 8.10    |         | 15.205<br>15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable |
| 8.8     |         | 15.207           | N/A. EUT is vehicle battery powered only.                                                                                                                                              |

## 4. CONDUCTED TESTING

### 4.1 Test Summary

This test report supports an application for certification of a transmitter operating pursuant to:

**CFR Title 47 FCC Part 15.407, ISED Canada RSS-247 Issue 2, ISED Canada RSS-Gen Issue 5, FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 and ANSI C63.10-2013**

The product is **INFO3.6 CSM** transmitter that operates in UNII-1 (5.15GHz – 5.25GHz) and UNII-3 (5.725GHz – 5.85GHz)

| Details                   | Description                                                                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Range (MHz)     | UNII-1 (5.15GHz – 5.25GHz)<br>UNII-3 (5.725GHz – 5.85GHz)                                                                                                           |
| Tested Modes              | 802.11a<br>802.11n(HT20, HT40)<br>802.11ac (VHT20, VHT40, VHT80).                                                                                                   |
| Tested Channels           | UNII-1 (36-48)<br>UNII-3 (149-165)                                                                                                                                  |
| DUT Antenna Type          | Integrated PCB antenna                                                                                                                                              |
| Number of transmit chains | 1                                                                                                                                                                   |
| Equipment Type            | Unlicensed National Information Infrastructure Device                                                                                                               |
| DUT Antenna Gain          | 4.39dBi (UNII-1)<br>5.05dBi (UNII-3)<br><input checked="" type="checkbox"/> Provided by Customer with Gain Report <input type="checkbox"/> Not Provided by Customer |

Test samples received in good condition, we found that the product met the above requirements with modification.

| Test Item                         | Sample #             | Result             |
|-----------------------------------|----------------------|--------------------|
| <a href="#">FCC 15.407 UNII-1</a> | AH22100701-HAR-053#1 | Meets Requirements |
| <a href="#">FCC 15.407 UNII-3</a> | AH22100701-HAR-053#1 | Meets Requirements |

Worst-case emission obtained on low data rates so Full Testing performed on lowest data rate.

## UNII-1 Test Results Summary

| Test                           | Frequency<br>(MHz) | 802.11a         | 802.11n(HT20) | 802.11ac<br>(VHT20) |
|--------------------------------|--------------------|-----------------|---------------|---------------------|
| RF Output Power                | 5180/5200/5240     | PASS            | PASS          | PASS                |
| Power Spectral Density         | 5180/5200/5240     | PASS            | PASS          | PASS                |
| DTS Bandwidth (6dB)            | 5180/5200/5240     | PASS            | PASS          | PASS                |
| Occupied Channel Bandwidth 99% | 5180/5200/5240     | PASS            | PASS          | PASS                |
| Emission Bandwidth 26 dB       | 5180/5200/5240     | PASS            | PASS          | PASS                |
|                                |                    | 802.11n(HT40)   |               | 802.11ac(VHT40)     |
| RF Output Power                | 5190/5230          | PASS            |               | PASS                |
| Power Spectral Density         | 5190/5230          | PASS            |               | PASS                |
| DTS Bandwidth (6dB)            | 5190/5230          | PASS            |               | PASS                |
| Occupied Channel Bandwidth 99% | 5190/5230          | PASS            |               | PASS                |
| Emission Bandwidth 26 dB       | 5190/5230          | PASS            |               | PASS                |
|                                |                    | 802.11ac(VHT80) |               |                     |
| RF Output Power                | 5210               | PASS            |               |                     |
| Power Spectral Density         | 5210               | PASS            |               |                     |
| DTS Bandwidth (6dB)            | 5210               | PASS            |               |                     |
| Occupied Channel Bandwidth 99% | 5210               | PASS            |               |                     |
| Emission Bandwidth 26 dB       | 5210               | PASS            |               |                     |

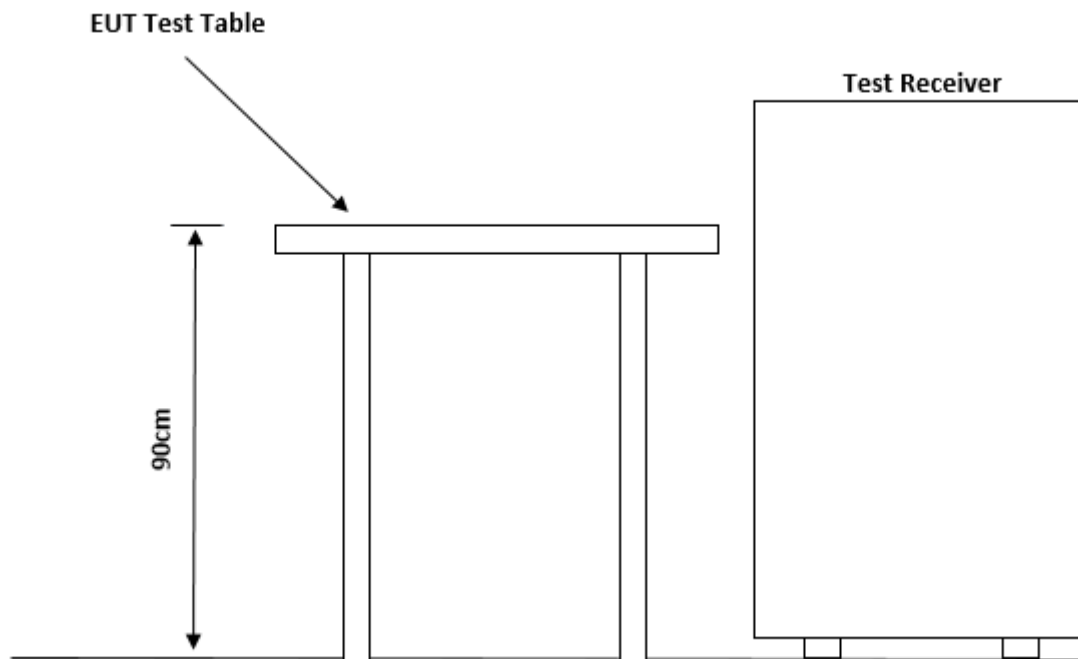
## UNII-3 Test Results Summary

| Test                           | Frequency<br>(MHz) | 802.11a         | 802.11n(HT20) | 802.11ac<br>(VHT20) |
|--------------------------------|--------------------|-----------------|---------------|---------------------|
| RF Output Power                | 5745/5785/5825     | PASS            | PASS          | PASS                |
| Power Spectral Density         | 5745/5785/5825     | PASS            | PASS          | PASS                |
| DTS Bandwidth (6dB)            | 5745/5785/5825     | PASS            | PASS          | PASS                |
| Occupied Channel Bandwidth 99% | 5745/5785/5825     | PASS            | PASS          | PASS                |
|                                |                    | 802.11n(HT40)   |               | 802.11ac(VHT40)     |
| RF Output Power                | 5755/5795          | PASS            |               | PASS                |
| Power Spectral Density         | 5755/5795          | PASS            |               | PASS                |
| DTS Bandwidth (6dB)            | 5755/5795          | PASS            |               | PASS                |
| Occupied Channel Bandwidth 99% | 5755/5795          | PASS            |               | PASS                |
|                                |                    | 802.11ac(VHT80) |               |                     |
| RF Output Power                | 5775               | PASS            |               |                     |
| Power Spectral Density         | 5775               | PASS            |               |                     |
| DTS Bandwidth (6dB)            | 5775               | PASS            |               |                     |
| Occupied Channel Bandwidth 99% | 5775               | PASS            |               |                     |

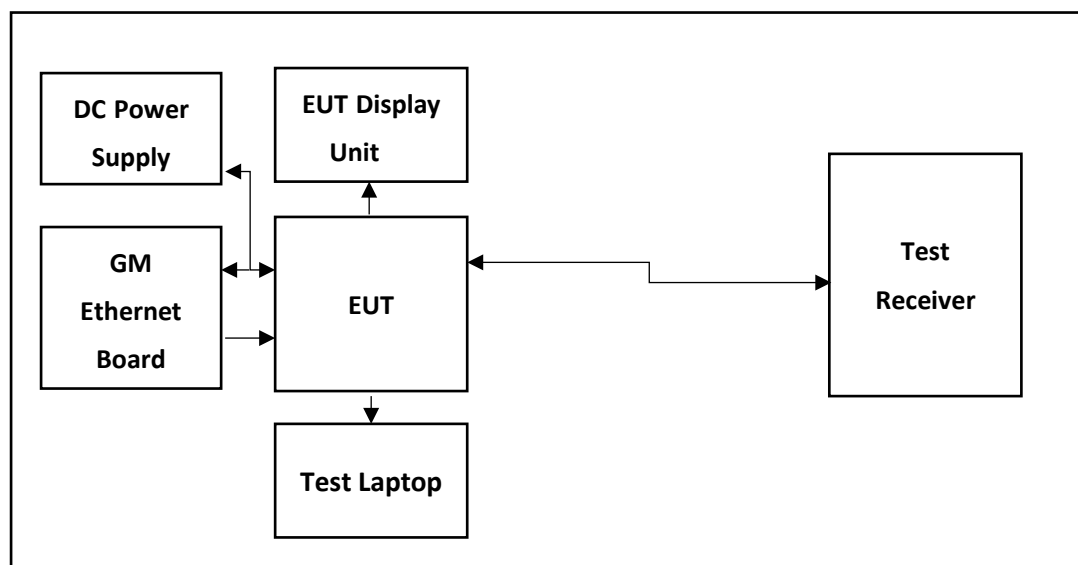
## 4.2 Test Setup

### Conducted Test Site Description

Test site is accommodated with test tabletop and floor standing test equipment.



TEST SETUP DIAGRAM





### 4.3 Test Equipment Used

| ID #    | Equipment                                           | Manufacturer    | Model #      | Serial #   | Cal Due    |
|---------|-----------------------------------------------------|-----------------|--------------|------------|------------|
| BVD0226 | Spectrum Analyzer 10Hz-44GHz                        | Rohde & Schwarz | FSV3044      | 101018     | 4/20/2024  |
| BVD0227 | 8 port switch unit for Wireless Test system         | Rohde & Schwarz | OSP150       | 101100     | 11/24/2025 |
| BVD0228 | 8 port switch unit for Wireless Test system         | Rohde & Schwarz | OSP220       | 101632     | 11/14/2025 |
| BVD0224 | Signal Generator 100kHz-40GHz                       | Rohde & Schwarz | SMB100A      | 181741     | 4/20/2024  |
| BVD0225 | Signal Generator 100k-6GHz with GPS simulator       | Rohde & Schwarz | SMW200A      | 107664     | 4/20/2023  |
| BVD0250 | Wireless Connectivity Tester 70M-6GHz               | Rohde & Schwarz | CMW270       | 102113     | 4/20/2024  |
| BVD0302 | DC power supply 1-15VDC 60A 110/220 11.5A max input | BK Precision    | 1693         | 257F17180  | N/A        |
| BVD0321 | Fixed Attenuator 2W 20dB -40GHz                     | Mini-Circuits   | BW-K20-2W44+ | 2103       | 3/21/2023  |
| BVD0430 | Multimeter                                          | Fluke           | 117          | 49710262SV | 11/11/2023 |
| BVD0229 | Temp and Humidity Meter                             | Fluke           | 971          | 12001009   | 5/1/2023   |
| N/A     | Test-PC                                             | Lenovo ThinkPad | E560         | PF0L0N9R   | N/A        |

Notes:- DC power supply verified before use with calibrated Multimeter.

### Customer Supplied Equipment

| ID # | Equipment                          | Manufacturer | Model        | Serial # | Version No.  |
|------|------------------------------------|--------------|--------------|----------|--------------|
| N/A  | Harness                            | Harman       | N/A          | N/A      | N/A          |
| N/A  | Display Unit                       | Innolux Corp | INFOMM-15524 | 0024     | N/A          |
| N/A  | Ethernet Board                     | GM           | N/A          | N/A      | CSMate rev.4 |
| N/A  | GM BT WLAN Test Tool NXP Chips S/W | Harman       | N/A          | N/A      | 2.4          |

### Equipment List (Software)

| ID # | Equipment         | Manufacturer    | Model | Version No |     |
|------|-------------------|-----------------|-------|------------|-----|
| N/A  | EMC Test Software | Rodhe & Schwarz | EMC32 | 11.20.00   | N/A |

## 4.4 UNII-1

| Mode                                        | Channel | Frequency |
|---------------------------------------------|---------|-----------|
| 802.11a<br>802.11n(HT20)<br>802.11ac(VHT20) | 36      | 5180      |
| 802.11n(HT40)<br>802.11ac(VHT40)            | 38      | 5190      |
| 802.11a<br>802.11n(HT20)<br>802.11ac(VHT20) | 40      | 5200      |
| 802.11ac(VHT80)                             | 42      | 5210      |
| 802.11n(HT40)<br>802.11ac(VHT40)            | 46      | 5230      |
| 802.11a<br>802.11n(HT20)<br>802.11ac(VHT20) | 48      | 5240      |

**Notes:** Channels and modes above were tested.

## Power settings

| 802.11a |               | 802.11n (HT20) |               | 802.11ac (VHT20) |               |
|---------|---------------|----------------|---------------|------------------|---------------|
| Channel | Power Setting | Channel        | Power Setting | Channel          | Power Setting |
| 36      | 15            | 36             | 15            | 36               | 15            |
| 40      | 15            | 40             | 15            | 40               | 15            |
| 48      | 15            | 48             | 15            | 48               | 15            |

| 802.11n (HT40) |               | 802.11ac (VHT40) |               |
|----------------|---------------|------------------|---------------|
| Channel        | Power Setting | Channel          | Power Setting |
| 38             | 15            | 38               | 12            |
| 46             | 15            | 46               | 12            |

| 802.11ac (VHT80) |               |
|------------------|---------------|
| Channel          | Power Setting |
| 42               | 12            |

#### 4.4.1 RF output power and Duty Cycle

##### FCC

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 II.E and ANSI C63.10-2013 (In Reference to KDB 789033 E.3.B)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Combined Uncertainty of absolute Level Measurement ( $K=2$ ) < 1 dB

Device has both client and access point modes and has identical RF characteristics and settings for both Limits are as follows:

15.407(a)(1)(i): 1W (30dBm) for outdoor access points with antenna gains less than 6dBi.

15.407(a)(1)(iv): 250mW (23.9dBm) for client devices with antenna gains less than 6dBi.

Since client devices are subject to more stringent limits, unit was tested against the limits for a client device.

##### 802.11a

| Data Rate | Gated RMS<br>(dBm)<br>5180 MHz | Gated RMS<br>(dBm)<br>5200 MHz | Gated RMS<br>(dBm)<br>5240 MHz | Limit<br>(dBm) | Duty Cycle<br>(%) | Power Setting<br>(dBm) |
|-----------|--------------------------------|--------------------------------|--------------------------------|----------------|-------------------|------------------------|
| 6 Mbps    | 12.969                         | 13.122                         | 13.428                         | 23.9           | 99.043            | 15                     |

##### 802.11n (HT20)

| Data Rate | Gated RMS<br>(dBm)<br>5180 MHz | Gated RMS<br>(dBm)<br>5200 MHz | Gated RMS<br>(dBm)<br>5240 MHz | Limit<br>(dBm) | Duty Cycle<br>(%) | Power Setting<br>(dBm) |
|-----------|--------------------------------|--------------------------------|--------------------------------|----------------|-------------------|------------------------|
| MCS0      | 12.944                         | 13.063                         | 13.370                         | 23.9           | 98.980            | 15                     |

##### 802.11ac (VHT20)

| Data Rate | Gated RMS<br>(dBm)<br>5180 MHz | Gated RMS<br>(dBm)<br>5200 MHz | Gated RMS<br>(dBm)<br>5240 MHz | Limit<br>(dBm) | Duty Cycle<br>(%) | Power Setting<br>(dBm) |
|-----------|--------------------------------|--------------------------------|--------------------------------|----------------|-------------------|------------------------|
| MCS0      | 12.909                         | 13.096                         | 13.374                         | 23.9           | 98.984            | 15                     |

##### 802.11n (HT40)

| Data Rate | Gated RMS<br>(dBm)<br>5190 MHz | Gated RMS<br>(dBm)<br>5230 MHz | Limit<br>(dBm) | Duty Cycle<br>(%) | Power Setting<br>(dBm) |
|-----------|--------------------------------|--------------------------------|----------------|-------------------|------------------------|
| MCS0      | 12.905                         | 13.297                         | 23.9           | 98.000            | 15                     |

802.11ac (VHT40)

| Data Rate | Gated RMS<br>(dBm)<br>5190 MHz | Gated RMS<br>(dBm)<br>5230 MHz | Limit<br>(dBm) | Duty Cycle<br>(%) | Power Setting<br>(dBm) |
|-----------|--------------------------------|--------------------------------|----------------|-------------------|------------------------|
| MCS0      | 9.290                          | 9.779                          | 23.9           | 97.810            | 12                     |

802.11ac (VHT80)

| Data Rate | Gated RMS<br>(dBm)<br>5210 MHz | Limit<br>(dBm) | Duty Cycle<br>(%) | Power Setting<br>(dBm) |
|-----------|--------------------------------|----------------|-------------------|------------------------|
| MCS0      | 10.028                         | 23.9           | 96.104            | 12                     |

## RSS-247

Per RSS-247 Issue 2 Section 6.2.1.1, limit for OEM devices installed in vehicles: Maximum EIRP shall not exceed 30mW or  $1.76+10*\log B$ , dBm, whichever is less (where B is 99% OBW in MHz). In addition, devices must be capable of reducing power by a least 3dB below the maximum permitted EIRP of 30mW, which is 11.77dBm.

For modulations with less than 20MHz 99% OBW; 802.11a, 802.11n (HT20) and 802.11ac (VHT20), worst case 99% OBW of 16.600MHz is assumed with resulting conservative limit of 13.96dBm. For modulations with more than 20MHz 99% OBW; 802.11n (HT40), 802.11ac (VHT40) and 802.11ac (VHT80), the limit is 30mW (14.77dBm)

### 802.11a

| Data Rate | Gated RMS with TPC<br>(dBm)<br>5180MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|----------------------------------------|----------------------|---------------|----------------|------------------------|
| 6 Mbps    | 7.925                                  | 4.39                 | 12.315        | 13.96          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5200MHz          | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| 6 Mbps    | 8.183                                  | 4.39                 | 12.573        | 13.96          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5240MHz          | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| 6 Mbps    | 8.756                                  | 4.39                 | 13.146        | 13.96          | 11                     |

### 802.11n (HT20)

| Data Rate | Gated RMS<br>(dBm)<br>5180MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|-------------------------------|----------------------|---------------|----------------|------------------------|
| MCS0      | 7.961                         | 4.39                 | 12.351        | 13.96          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5200MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| MCS0      | 8.203                         | 4.39                 | 12.593        | 13.96          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5240MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| MCS0      | 8.689                         | 4.39                 | 13.079        | 13.96          | 11                     |

#### 802.11ac (VHT20)

| Data Rate | Gated RMS<br>(dBm)<br>5180MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|-------------------------------|----------------------|---------------|----------------|------------------------|
| MCS0      | 7.902                         | 4.39                 | 12.292        | 13.96          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5200MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| MCS0      | 8.112                         | 4.39                 | 12.502        | 13.96          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5240MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| MCS0      | 8.565                         | 4.39                 | 12.955        | 13.96          | 11                     |

#### 802.11n (HT40)

| Data Rate | Gated RMS<br>(dBm)<br>5190MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|-------------------------------|----------------------|---------------|----------------|------------------------|
| MCS0      | 7.966                         | 4.39                 | 12.356        | 14.77          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5230MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| MCS0      | 8.571                         | 4.39                 | 12.961        | 14.77          | 11                     |

#### 802.11ac (VHT40)

| Data Rate | Gated RMS<br>(dBm)<br>5190MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|-------------------------------|----------------------|---------------|----------------|------------------------|
| MCS0      | 7.927                         | 4.39                 | 12.317        | 14.77          | 11                     |
| Data Rate | Gated RMS<br>(dBm)<br>5230MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) |                        |
| MCS0      | 8.507                         | 4.39                 | 12.897        | 14.77          | 11                     |

**802.11ac (VHT80)**

| Data Rate | Gated RMS<br>(dBm)<br>5210MHz | Antenna<br>Gain(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|-------------------------------|----------------------|---------------|----------------|------------------------|
| MCS0      | 8.365                         | 4.39                 | 12.755        | 14.77          | 11                     |

## 4.4.2 Power Spectral Density

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New

Rules v02r01 II.F with test method SA-1 and ANSI C63.10-2013.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

### FCC

Device has both client and access point modes and has identical RF characteristics and settings for both Limits are as follows:

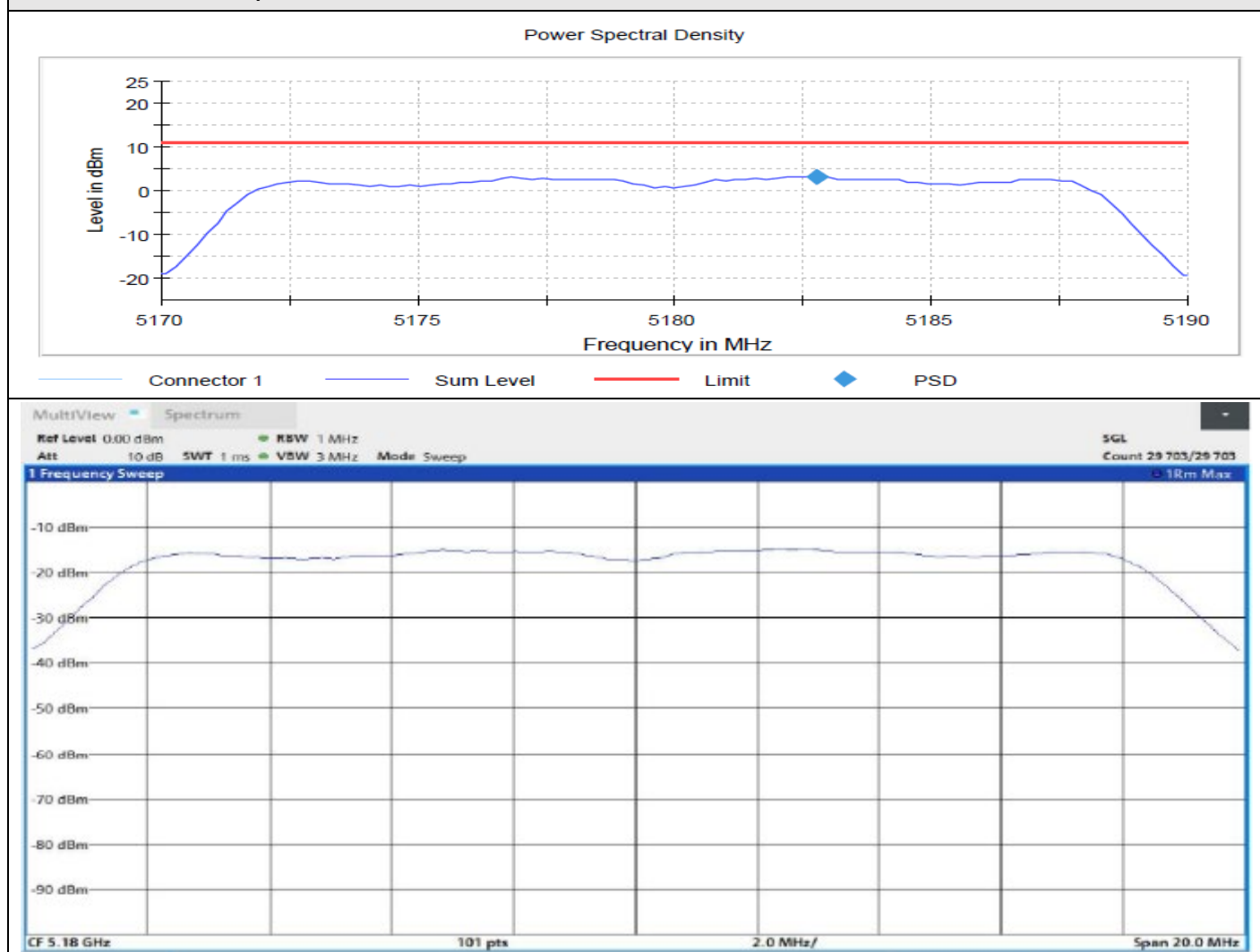
15.407(a)(1)(i): 17dBm for outdoor access points with antenna gains less than 6dBi.

15.407(a)(1)(iv):11dBm for client devices with antenna gains less than 6dBi.

Since client devices are subject to more stringent limits, unit tested against the limits for a client device.

| Mode    | Data Rate | PSD (dBm)<br>5180 MHz | PSD (dBm)<br>5200 MHz | PSD (dBm)<br>5240 MHz | Limit (dBm) | Power Setting<br>(dBm) |
|---------|-----------|-----------------------|-----------------------|-----------------------|-------------|------------------------|
| 802.11a | 6Mbps     | 3.186                 | 3.184                 | 3.596                 | 11.0        | 15                     |

#### 802.11a 5180 MHz 6Mbps

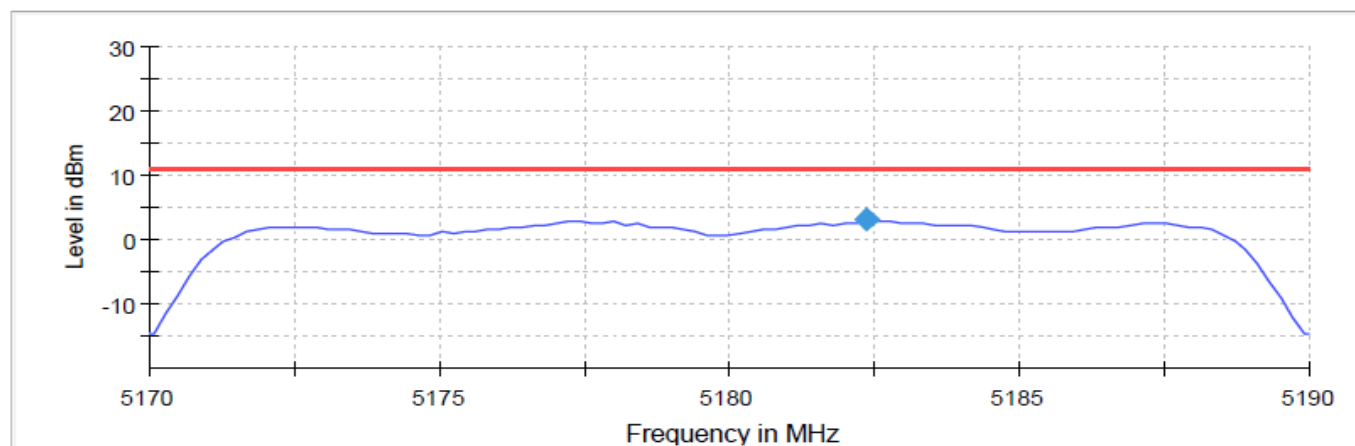




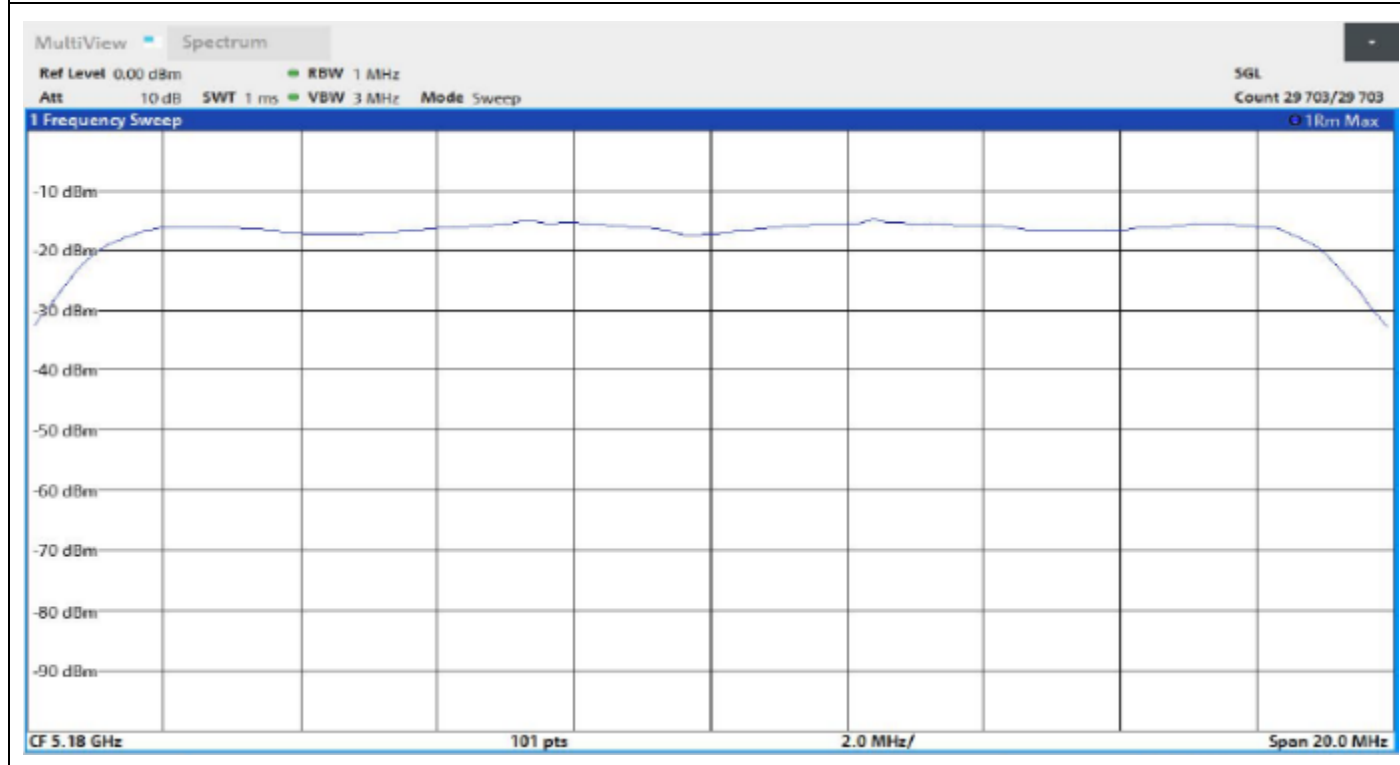
| Mode           | Data Rate | PSD (dBm)<br>5180 MHz | PSD (dBm)<br>5200 MHz | PSD (dBm)<br>5240 MHz | Limit (dBm) | Power Setting<br>(dBm) |
|----------------|-----------|-----------------------|-----------------------|-----------------------|-------------|------------------------|
| 802.11n (HT20) | MCS0      | 3.264                 | 3.237                 | 3.380                 | 11.0        | 15                     |

#### 802.11n (HT20) 5180 MHz MCS0

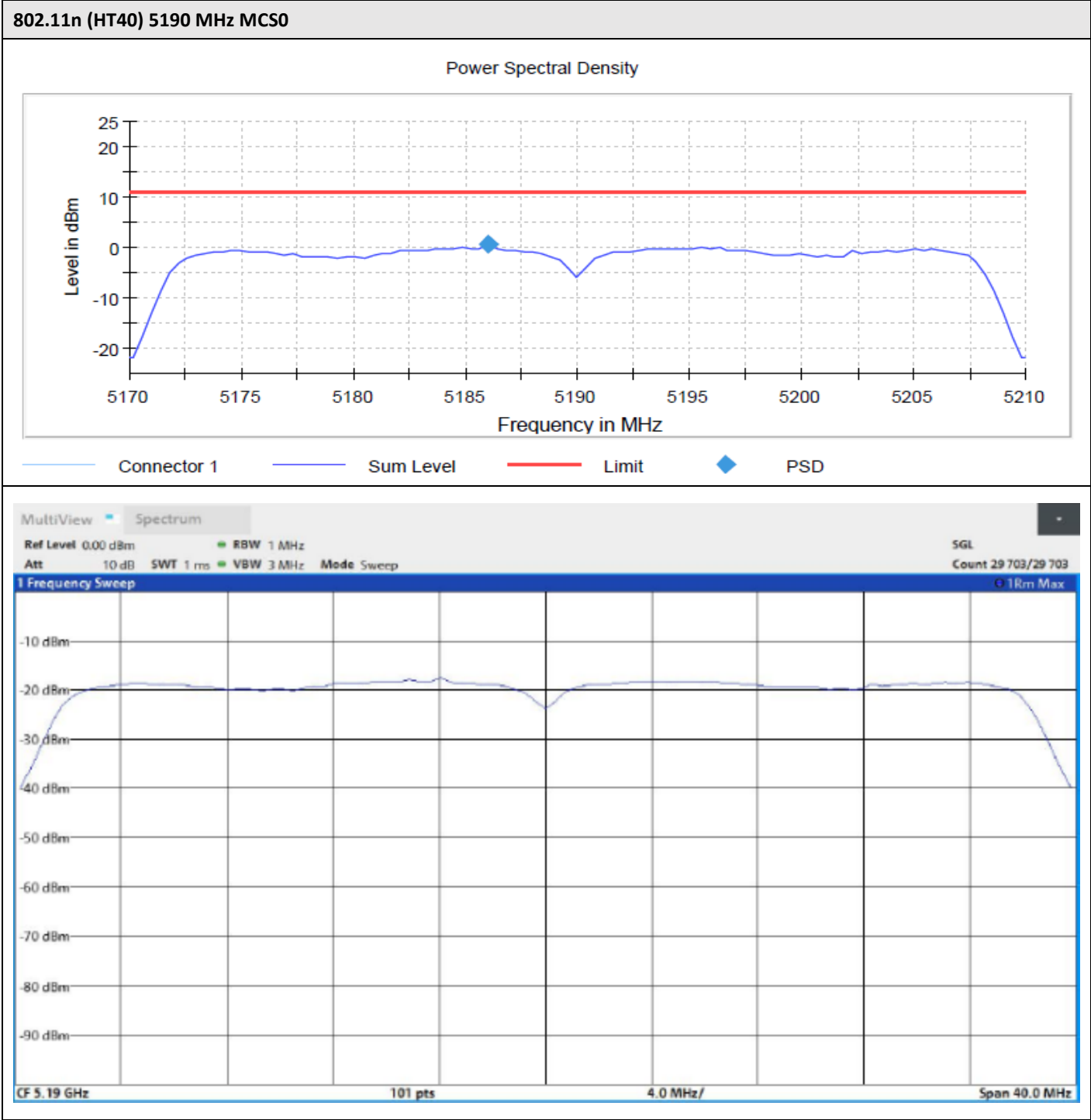
Power Spectral Density



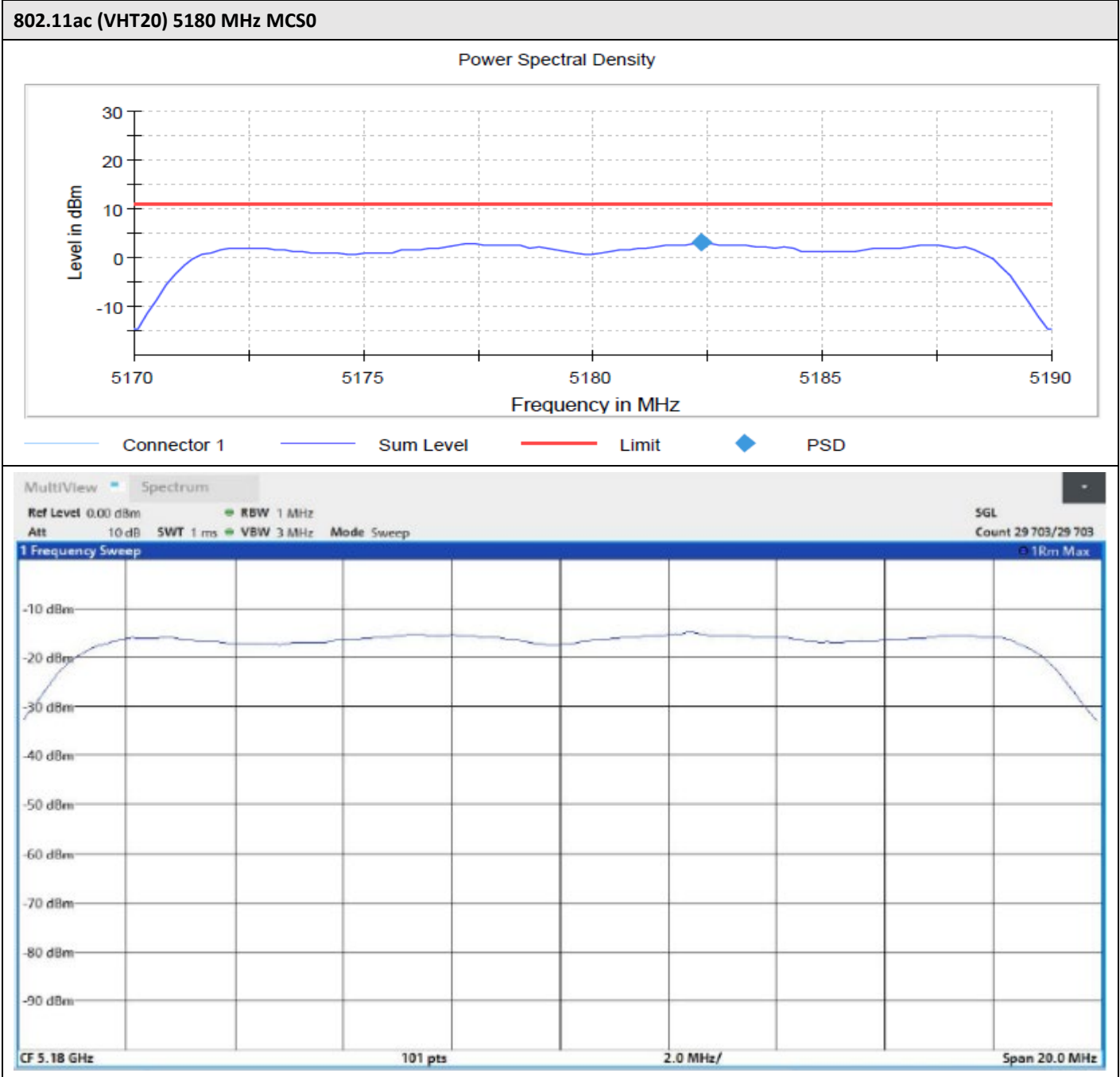
Connector 1 Sum Level Limit PSD



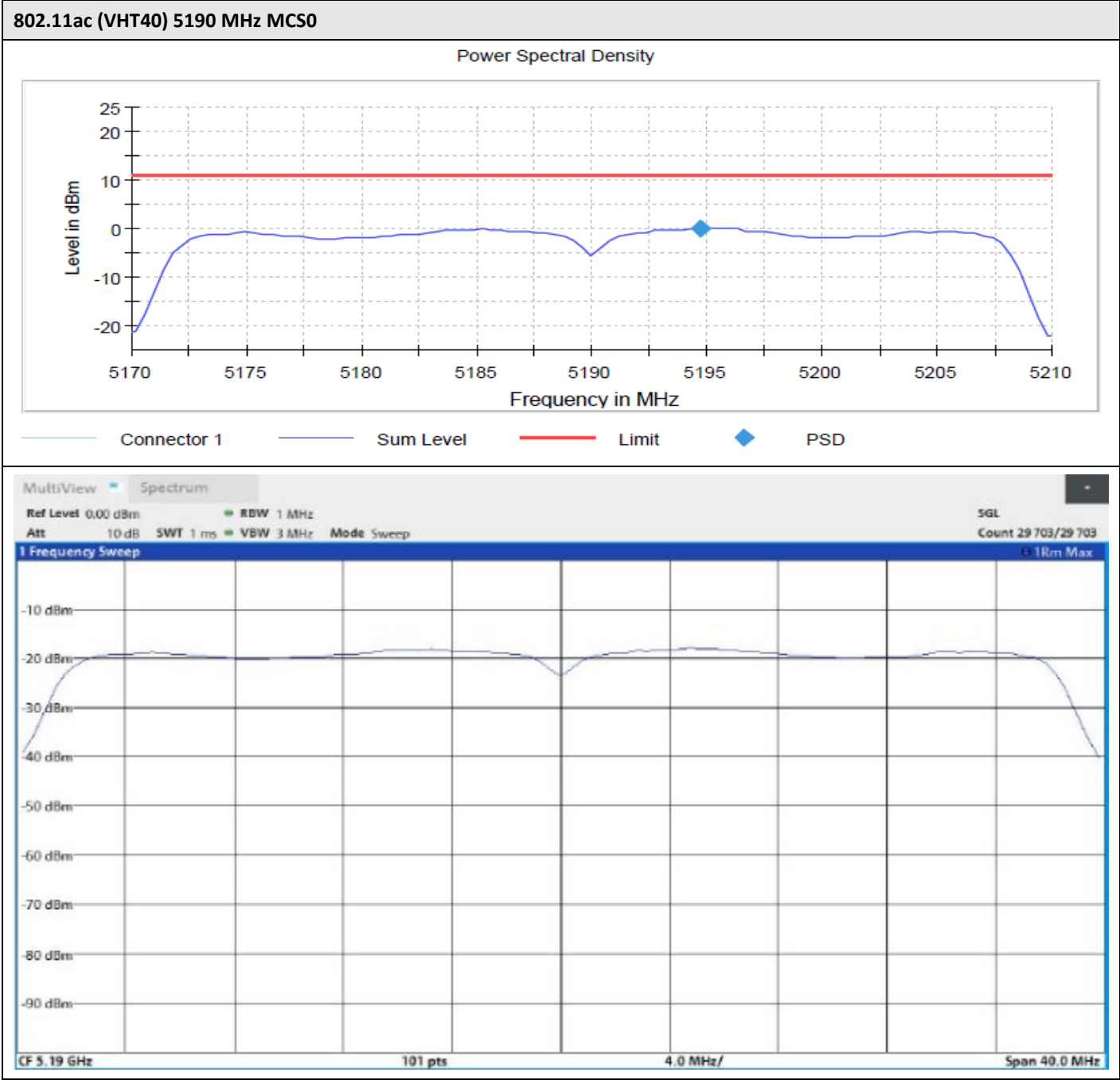
| Mode           | Data Rate | PSD (dBm)<br>5190 MHz | PSD (dBm)<br>5230 MHz | Limit (dBm) | Power Setting<br>(dBm) |
|----------------|-----------|-----------------------|-----------------------|-------------|------------------------|
| 802.11n (HT40) | MCS0      | 0.515                 | 0.572                 | 11.0        | 15                     |



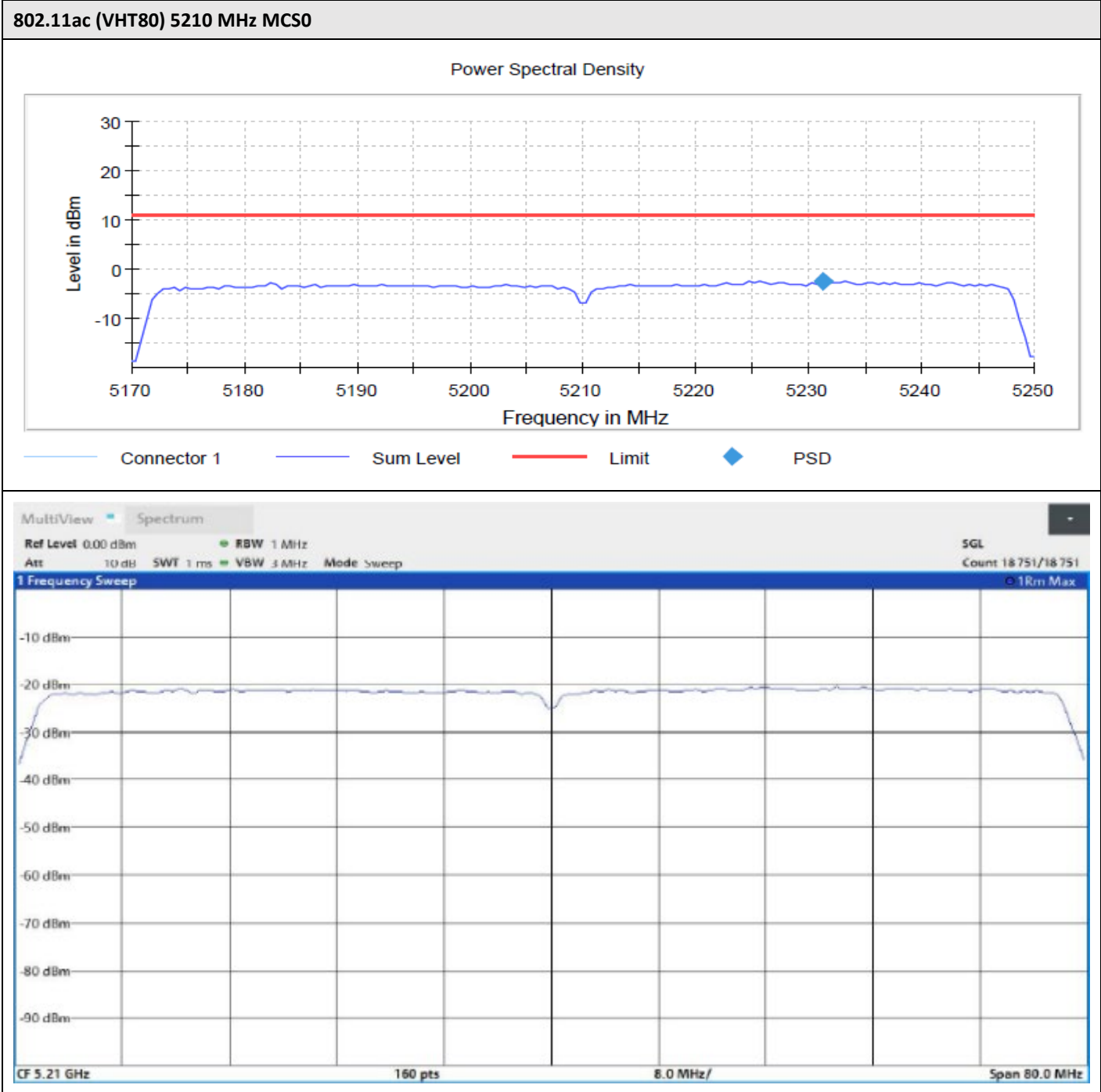
| Mode             | Data Rate | PSD (dBm)<br>5180 MHz | PSD (dBm)<br>5200 MHz | PSD (dBm)<br>5240 MHz | Limit (dBm) | Power Setting<br>(dBm) |
|------------------|-----------|-----------------------|-----------------------|-----------------------|-------------|------------------------|
| 802.11ac (VHT20) | MCS0      | 3.279                 | 3.057                 | 3.627                 | 11.0        | 15                     |



| Mode             | Data Rate | PSD (dBm)<br>5190 MHz | PSD (dBm)<br>5230 MHz | Limit (dBm) | Power Setting<br>(dBm) |
|------------------|-----------|-----------------------|-----------------------|-------------|------------------------|
| 802.11ac (VHT40) | MCS0      | 0.147                 | 0.705                 | 11.0        | 12                     |



| Mode             | Data Rate | PSD (dBm)<br>5210 MHz | Limit (dBm) | Power Setting<br>(dBm) |
|------------------|-----------|-----------------------|-------------|------------------------|
| 802.11ac (VHT80) | MCS0      | -2.483                | 11.0        | 12                     |



## RSS-247

### 802.11a

| Data Rate | PSD(dBm)<br>5180MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|---------------------|-----------------------|-------------------|----------------|------------------------|
| 6 Mbps    | -1.668              | 4.39                  | 2.722             | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5200MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| 6 Mbps    | -1.568              | 4.39                  | 2.822             | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5240MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| 6 Mbps    | -1.071              | 4.39                  | 3.319             | 10.0           | 11                     |

### 802.11n (HT20)

| Data Rate | PSD(dBm)<br>5180MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|---------------------|-----------------------|-------------------|----------------|------------------------|
| MCS0      | -1.658              | 4.39                  | 2.732             | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5200MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| MCS0      | -1.535              | 4.39                  | 2.855             | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5240MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| MCS0      | -0.960              | 4.39                  | 3.43              | 10.0           | 11                     |

### 802.11n (HT40)

| Data Rate | PSD(dBm)<br>5190MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|---------------------|-----------------------|-------------------|----------------|------------------------|
| MCS0      | -4.184              | 4.39                  | 0.206             | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5230MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| MCS0      | -4.132              | 4.39                  | 0.258             | 10.0           | 11                     |

**802.11ac (VHT20)**

| Data Rate | PSD(dBm)<br>5180MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|---------------------|-----------------------|-------------------|----------------|------------------------|
| MCS0      | -1.552              | 4.39                  | 2.838             | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5200MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| MCS0      | -1.510              | 4.39                  | 2.88              | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5240MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| MCS0      | -1.010              | 4.39                  | 3.38              | 10.0           | 11                     |

**802.11ac (VHT40)**

| Data Rate | PSD(dBm)<br>5190MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|---------------------|-----------------------|-------------------|----------------|------------------------|
| MCS0      | -4.545              | 4.39                  | -0.155            | 10.0           | 11                     |
| Data Rate | PSD(dBm)<br>5230MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
| MCS0      | -3.953              | 4.39                  | 0.437             | 10.0           | 11                     |

**802.11ac (VHT80)**

| Data Rate | PSD(dBm)<br>5210MHz | Antenna Gain<br>(dBi) | EIRP PSD<br>(dBm) | Limit<br>(dBm) | Power Setting<br>(dBm) |
|-----------|---------------------|-----------------------|-------------------|----------------|------------------------|
| MCS0      | -7.222              | 4.39                  | -2.832            | 10.0           | 11                     |

### 4.4.3 DTS Bandwidth 6dB

#### FCC and RSS-247

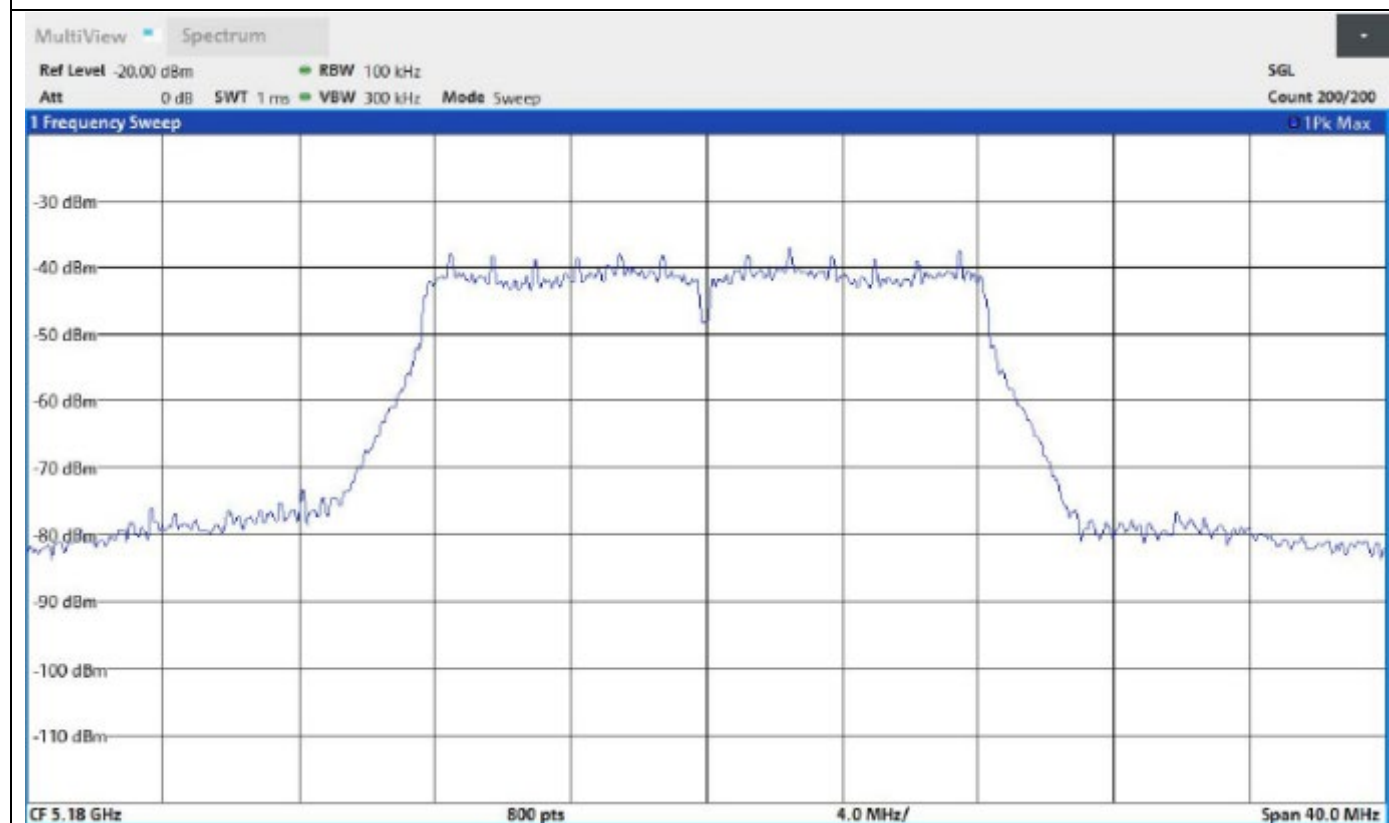
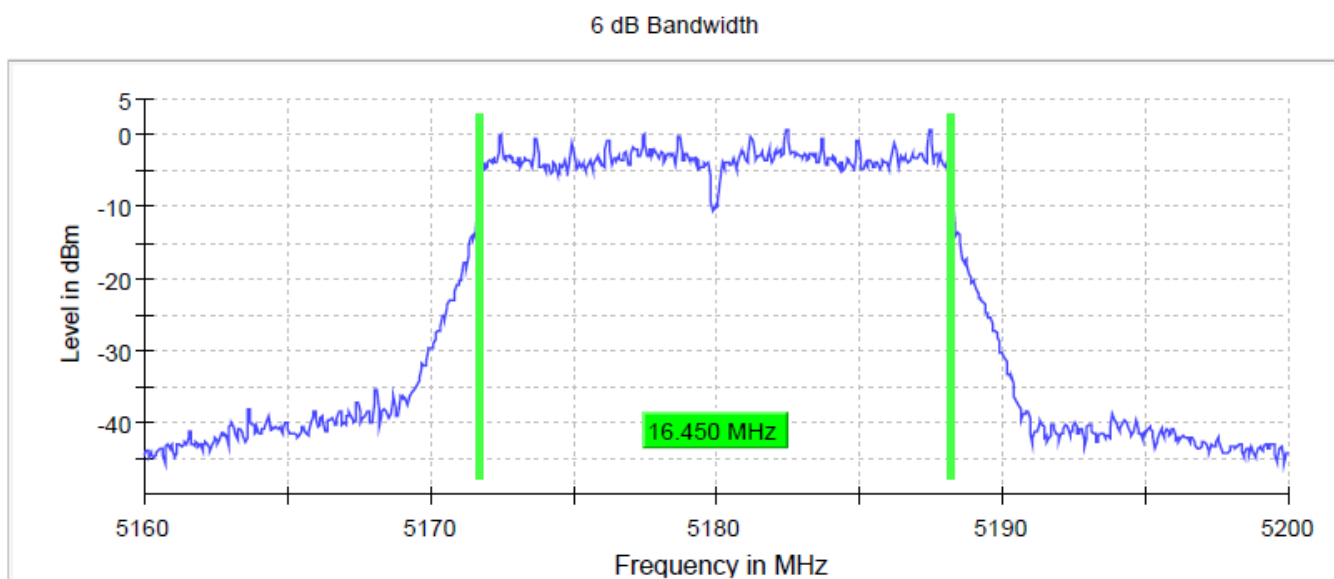
Test according to FCC title 47 part 15 §15.407(a) (e), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 Section C.2 and ANSI C63.10-2013, ISEDC RSS-247 6.2.4(1)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

| Data Rate             | DUT Frequency (MHz) | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Minimum Limit (MHz) |
|-----------------------|---------------------|-----------------|----------------------|-----------------------|---------------------|
| 802.11a 6Mbps         | 5180.000000         | 16.450000       | 5171.725000          | 5188.175000           | 0.5                 |
| 802.11n (HT20) MCS0   | 5180.000000         | 17.400000       | 5171.375000          | 5188.775000           | 0.5                 |
| 802.11ac (VHT20) MCS0 | 5180.000000         | 17.400000       | 5171.125000          | 5188.525000           | 0.5                 |
| 802.11n (HT40) MCS0   | 5190.000000         | 35.900000       | 5172.025000          | 5207.925000           | 0.5                 |
| 802.11ac (VHT40) MCS0 | 5190.000000         | 35.900000       | 5172.025000          | 5207.925000           | 0.5                 |
| 802.11ac (VHT80) MCS0 | 5210.000000         | 76.400000       | 5171.775000          | 5248.175000           | 0.5                 |
| 802.11a 6Mbps         | 5200.000000         | 16.450000       | 5191.725000          | 5208.175000           | 0.5                 |
| 802.11n (HT20) MCS0   | 5200.000000         | 17.600000       | 5191.125000          | 5208.725000           | 0.5                 |
| 802.11ac (VHT20) MCS0 | 5200.000000         | 17.400000       | 5191.325000          | 5208.725000           | 0.5                 |
| 802.11n (HT40) MCS0   | 5230.000000         | 35.750000       | 5212.175000          | 5247.925000           | 0.5                 |
| 802.11ac (VHT40) MCS0 | 5230.000000         | 35.900000       | 5212.025000          | 5247.925000           | 0.5                 |
| 802.11a 6Mbps         | 5240.000000         | 16.450000       | 5231.725000          | 5248.175000           | 0.5                 |
| 802.11n (HT20) MCS0   | 5240.000000         | 17.400000       | 5231.325000          | 5248.725000           | 0.5                 |
| 802.11ac (VHT20) MCS0 | 5240.000000         | 17.600000       | 5231.125000          | 5248.725000           | 0.5                 |

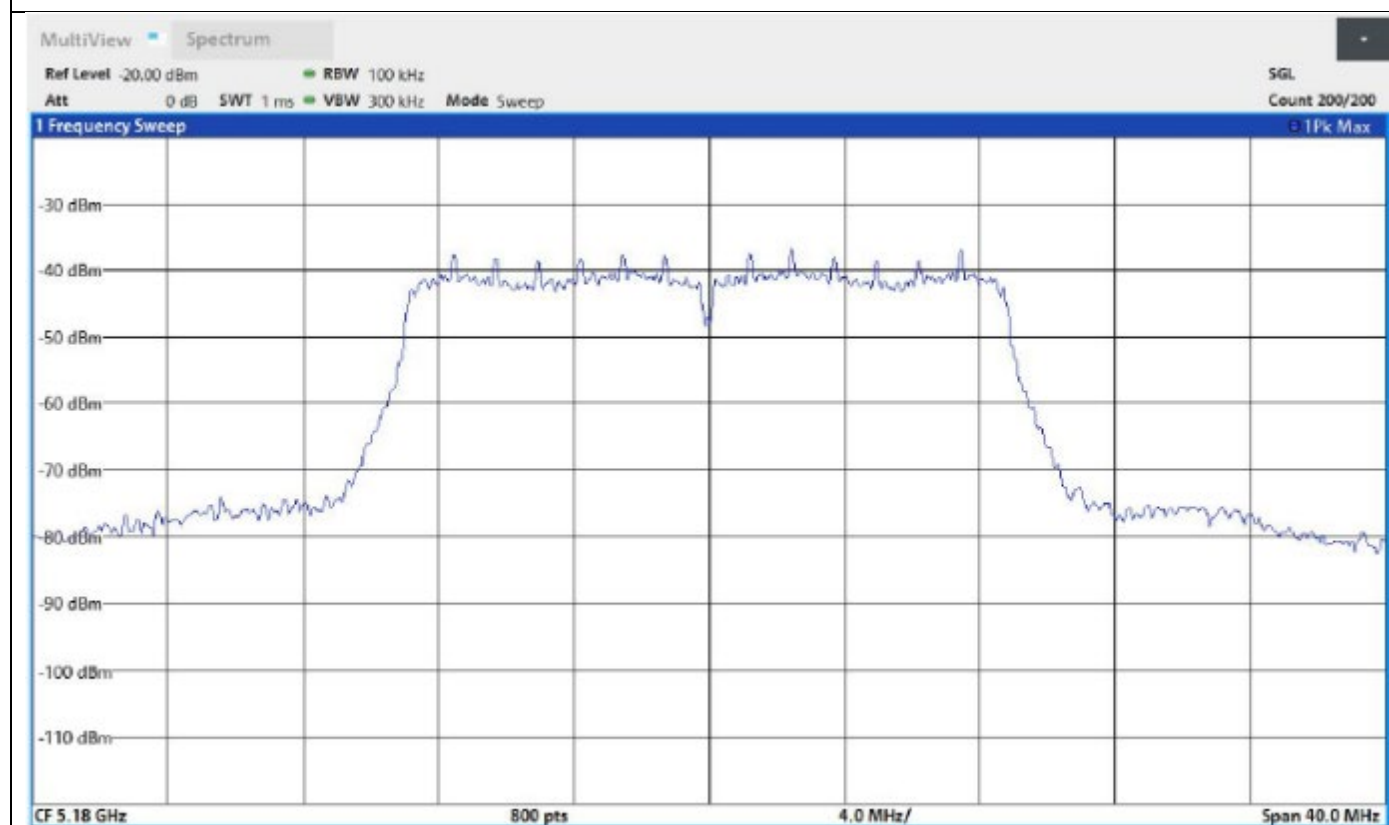
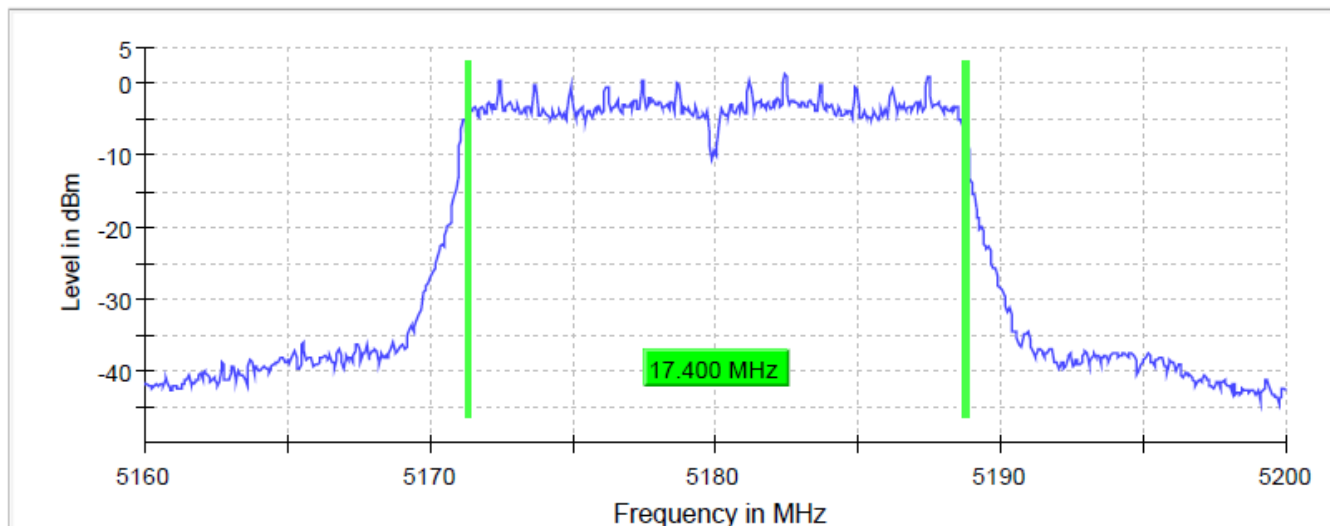


802.11a 5180MHz 6Mbps



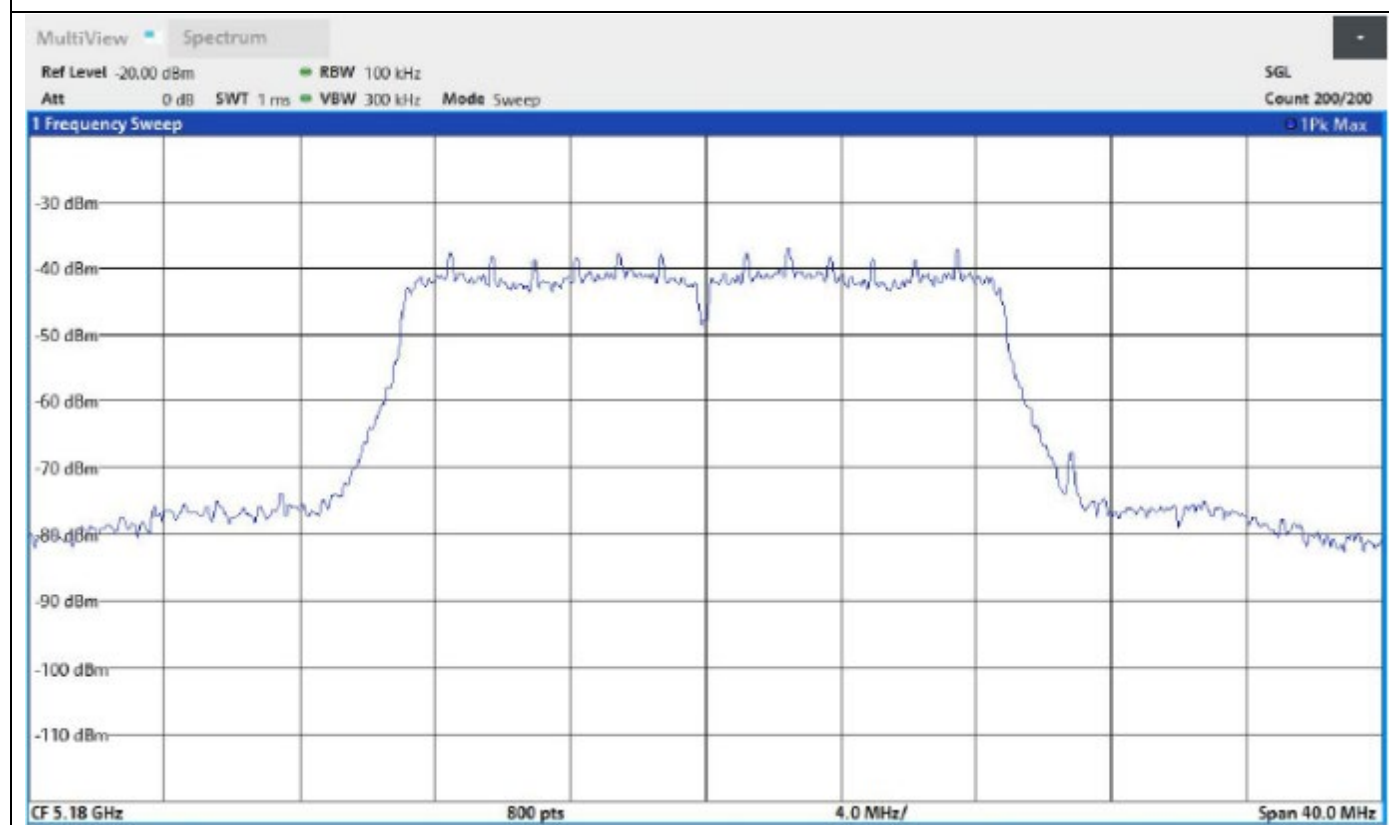
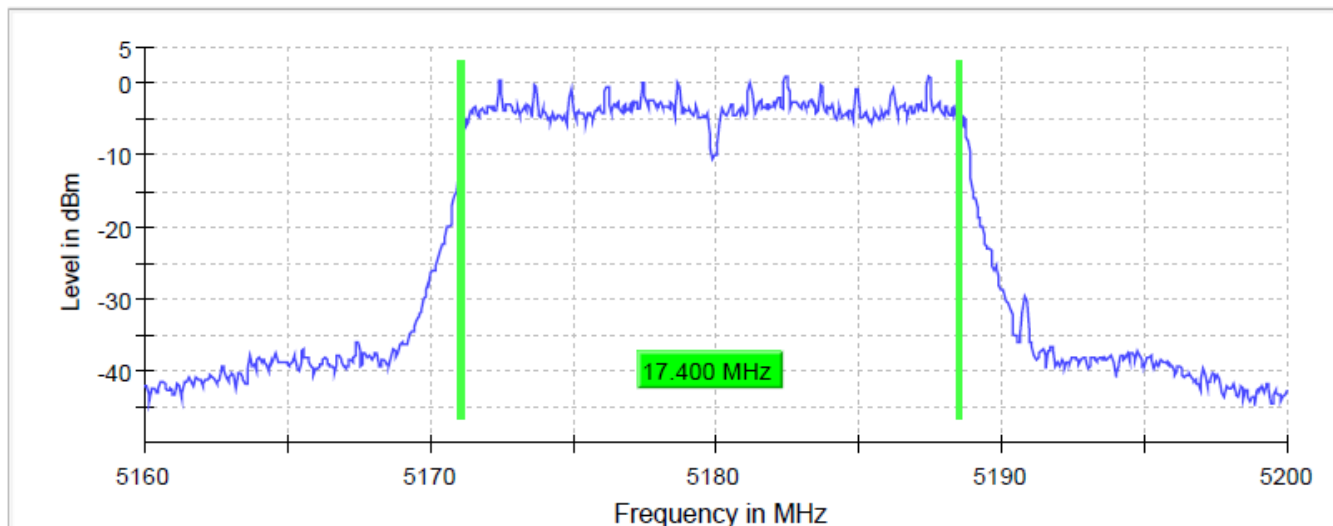
802.11n 5180MHz MCS0

6 dB Bandwidth



802.11ac 5180MHz MCS0

6 dB Bandwidth



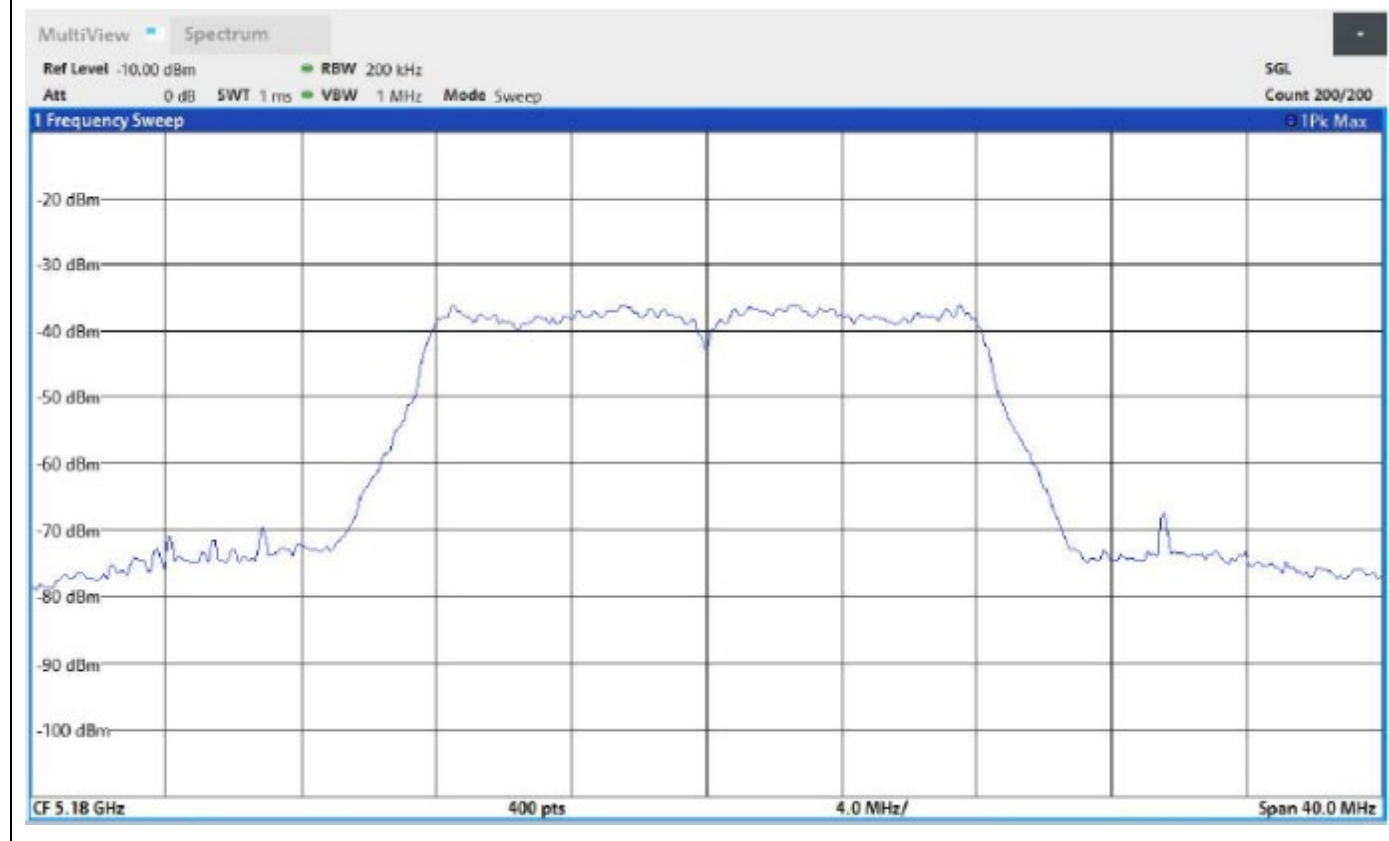
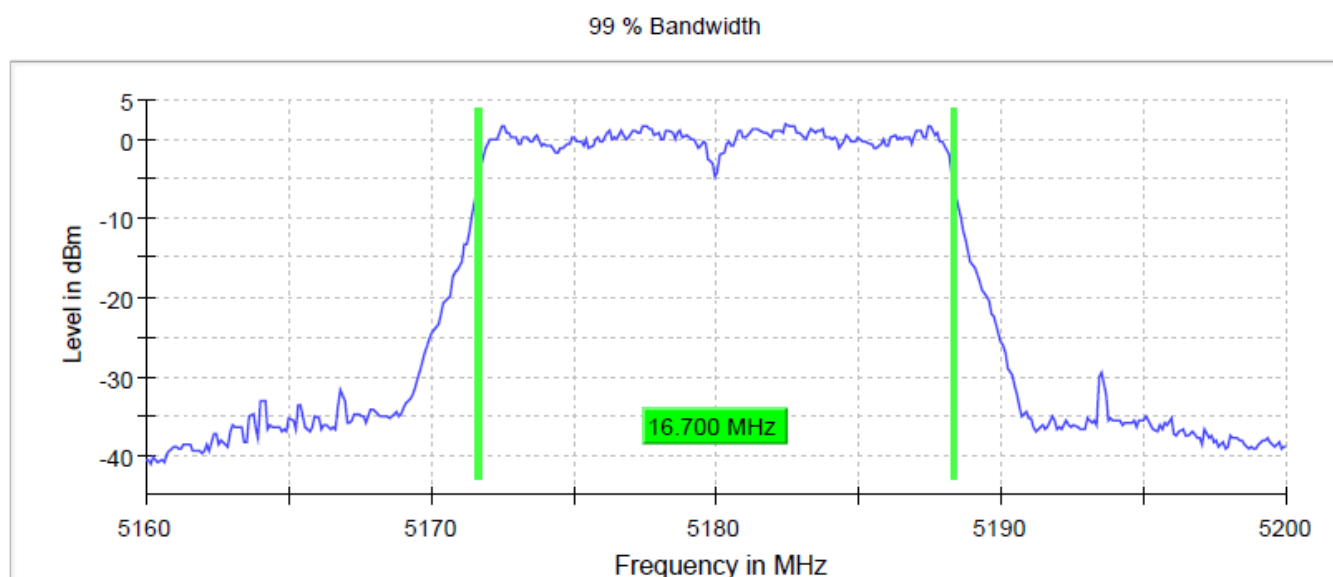
#### 4.4.4 Occupied Channel Bandwidth

Test according to RSS-GEN Section 6.7, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 D and ANSI C63.10-2013.

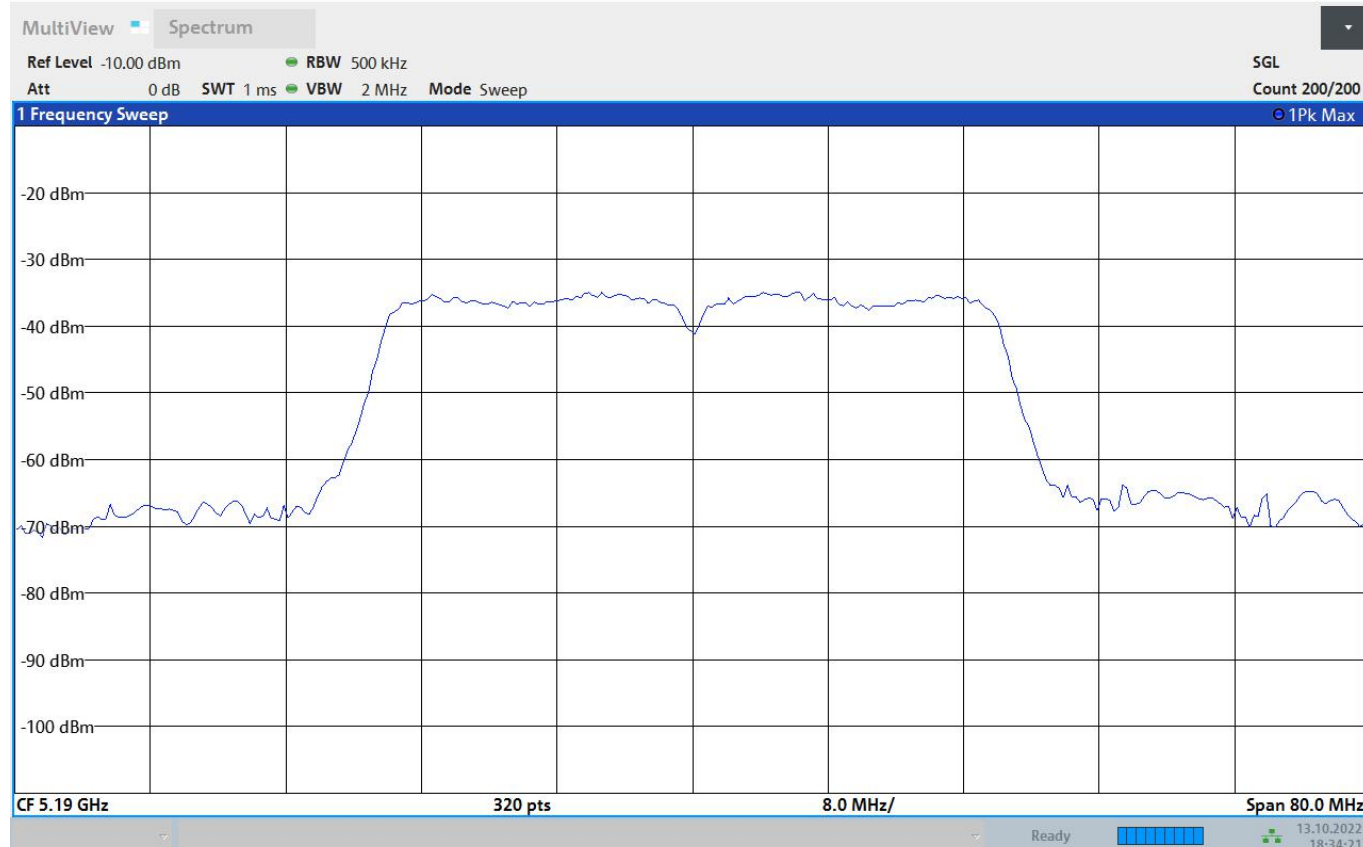
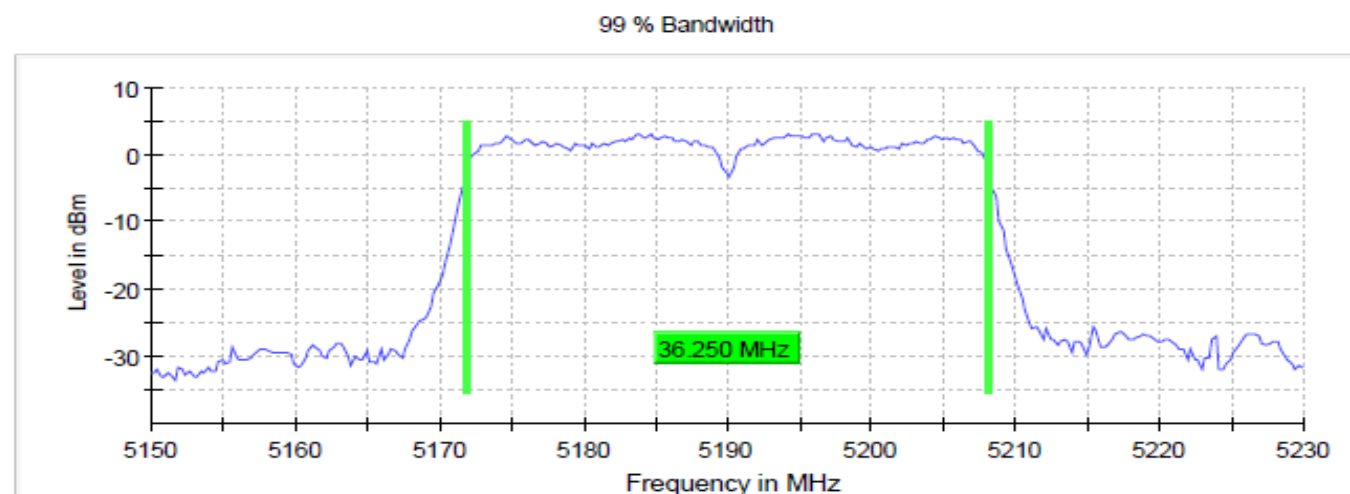
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

| Data Rate             | DUT Frequency (MHz) | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Band Limit (MHz) |
|-----------------------|---------------------|-----------------|----------------------|-----------------------|------------------|
| 802.11a 6Mbps         | 5180.000000         | 16.700000       | 5171.650000          | 5188.350000           | 5150-5250        |
| 802.11n (HT20) MCS0   | 5180.000000         | 17.700000       | 5171.150000          | 5188.850000           | 5150-5250        |
| 802.11ac (VHT20) MCS0 | 5180.000000         | 17.700000       | 5171.150000          | 5188.850000           | 5150-5250        |
| 802.11n (HT40) MCS0   | 5190.000000         | 36.250000       | 5171.875000          | 5208.125000           | 5150-5250        |
| 802.11ac (VHT40) MCS0 | 5190.000000         | 36.250000       | 5171.875000          | 5208.125000           | 5150-5250        |
| 802.11ac (VHT80) MCS0 | 5210.000000         | 77.000000       | 5171.750000          | 5248.750000           | 5150-5250        |
| 802.11a 6Mbps         | 5200.000000         | 16.700000       | 5191.650000          | 5208.350000           | 5150-5250        |
| 802.11n (HT20) MCS0   | 5200.000000         | 17.700000       | 5191.150000          | 5208.850000           | 5150-5250        |
| 802.11ac (VHT20) MCS0 | 5200.000000         | 17.700000       | 5191.150000          | 5208.850000           | 5150-5250        |
| 802.11n (HT40) MCS0   | 5230.000000         | 36.500000       | 5211.625000          | 5248.125000           | 5150-5250        |
| 802.11ac (VHT40) MCS0 | 5230.000000         | 36.250000       | 5211.875000          | 5248.125000           | 5150-5250        |
| 802.11a 6Mbps         | 5240.000000         | 16.600000       | 5231.650000          | 5248.250000           | 5150-5250        |
| 802.11n (HT20) MCS0   | 5240.000000         | 17.700000       | 5231.150000          | 5248.850000           | 5150-5250        |
| 802.11ac (VHT20) MCS0 | 5240.000000         | 17.600000       | 5231.150000          | 5248.750000           | 5150-5250        |

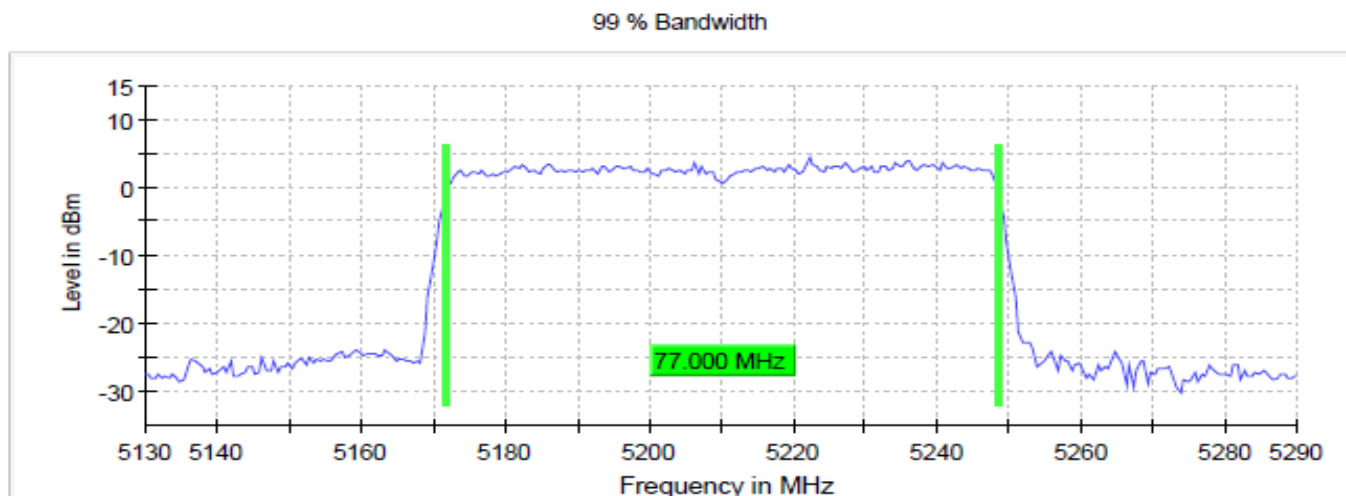
802.11a 5180MHz 6Mbps



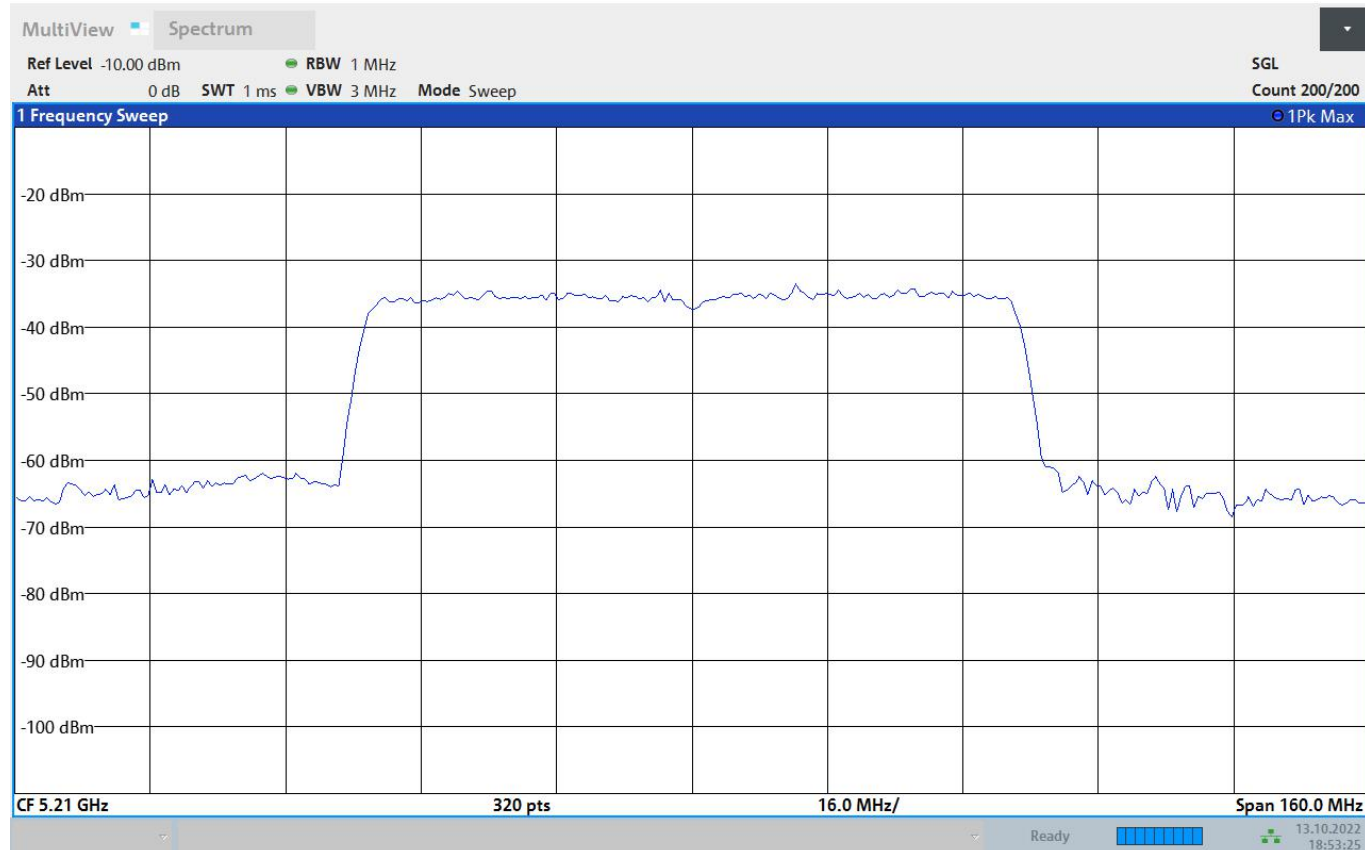
802.11n (HT40) 5190MHz MCS0



802.11ac (VHT80) 5210MHz MCS0



HAR-004 - HCH - DH1 - DFLTpwrSET - PWR



18:53:26 13.10.2022

#### 4.4.5 Emission Bandwidth 26 dB

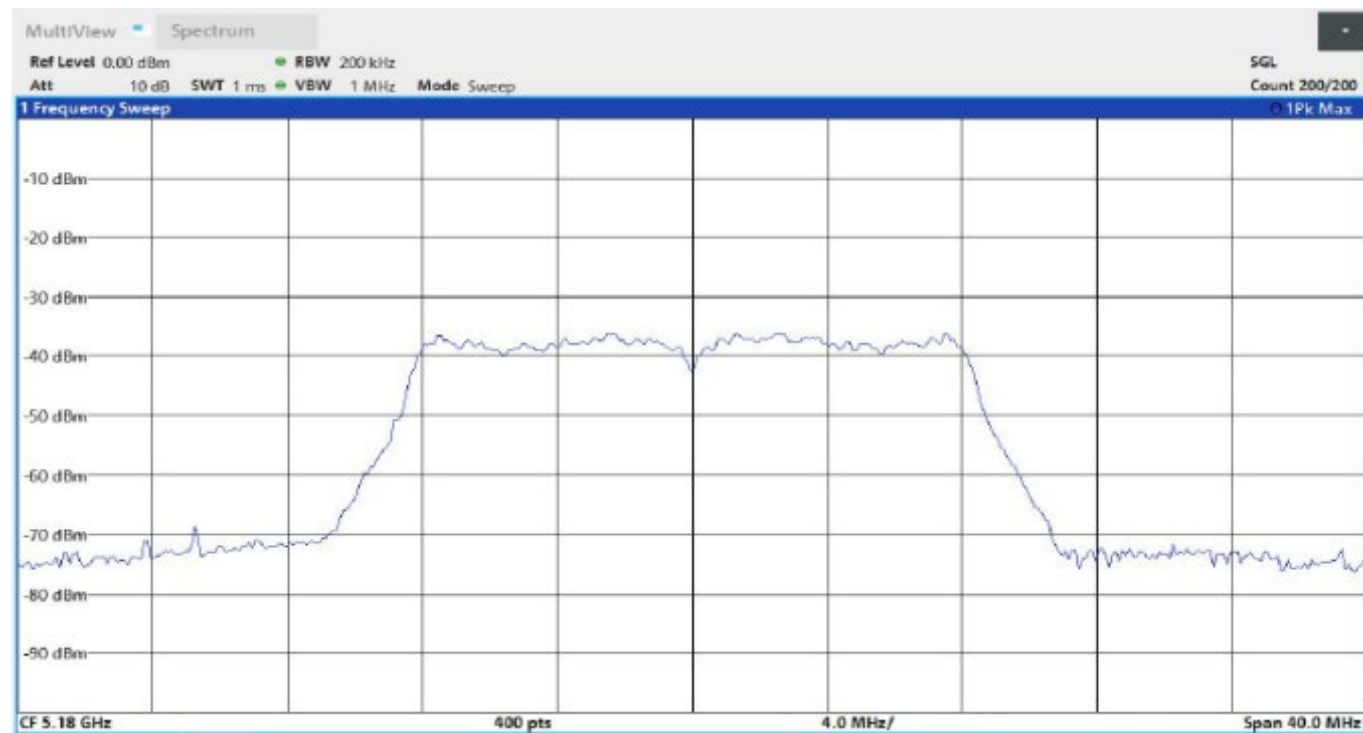
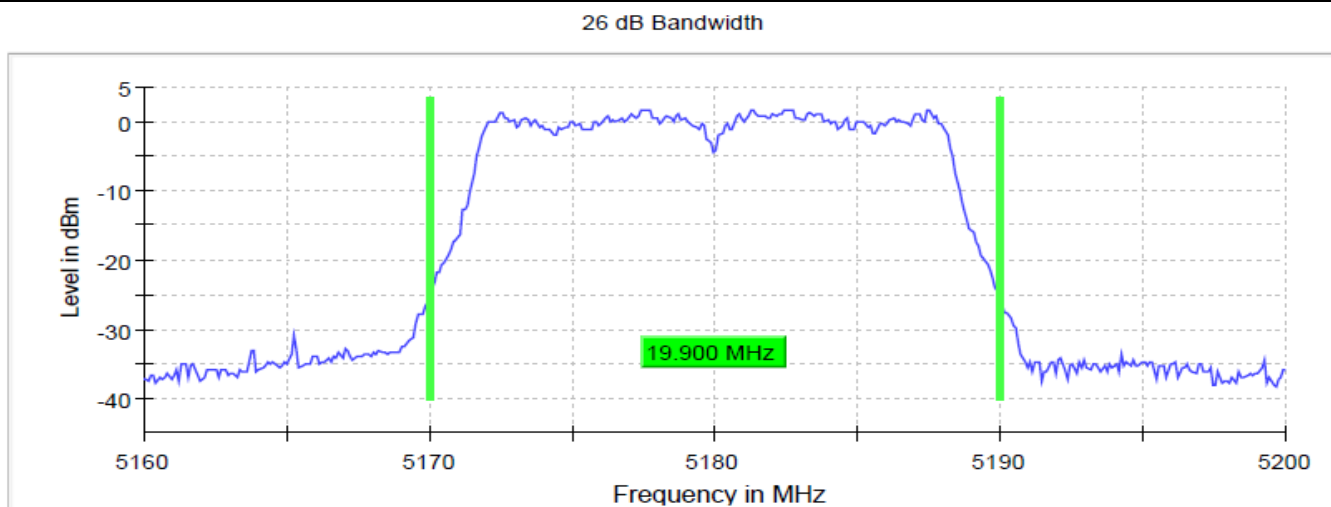
Test according to FCC title 47 part 15 §15.407(a) (e), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 D and ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

| Data Rate             | DUT Frequency (MHz) | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|-----------------------|---------------------|-----------------|----------------------|-----------------------|
| 802.11a 6Mbps         | 5180.000000         | 19.900000       | 5170.050000          | 5189.950000           |
| 802.11n (HT20) MCS0   | 5180.000000         | 20.300000       | 5169.850000          | 5190.150000           |
| 802.11ac (VHT20) MCS0 | 5180.000000         | 20.300000       | 5169.850000          | 5190.150000           |
| 802.11n (HT40) MCS0   | 5190.000000         | 40.675422       | 5169.587242          | 5210.262664           |
| 802.11ac (VHT40) MCS0 | 5190.000000         | 40.675422       | 5169.737336          | 5210.412758           |
| 802.11ac (VHT80) MCS0 | 5210.000000         | 83.500000       | 5168.250000          | 5251.750000           |
| 802.11a 6Mbps         | 5200.000000         | 19.800000       | 5190.150000          | 5209.950000           |
| 802.11n (HT20) MCS0   | 5200.000000         | 20.400000       | 5189.750000          | 5210.150000           |
| 802.11ac (VHT20) MCS0 | 5200.000000         | 20.300000       | 5189.850000          | 5210.150000           |
| 802.11n (HT40) MCS0   | 5230.000000         | 40.525328       | 5209.737336          | 5250.262664           |
| 802.11ac (VHT40) MCS0 | 5230.000000         | 40.825516       | 5209.587242          | 5250.412758           |
| 802.11a 6Mbps         | 5240.000000         | 19.900000       | 5230.050000          | 5249.950000           |
| 802.11n (HT20) MCS0   | 5240.000000         | 20.200000       | 5229.950000          | 5250.150000           |
| 802.11ac (VHT20) MCS0 | 5240.000000         | 20.200000       | 5229.850000          | 5250.050000           |

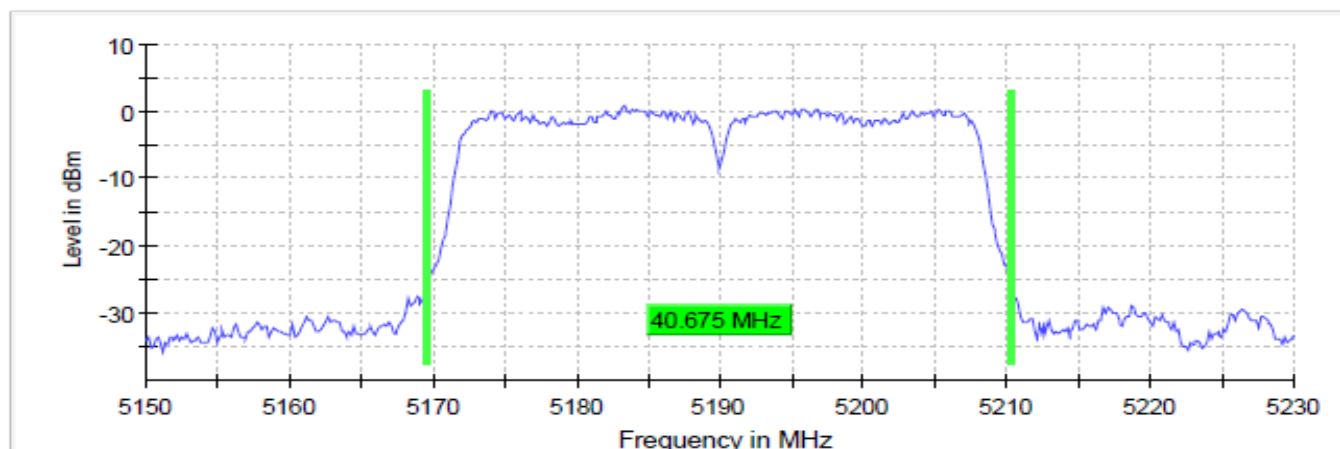


802.11a 5180MHz 6Mbps

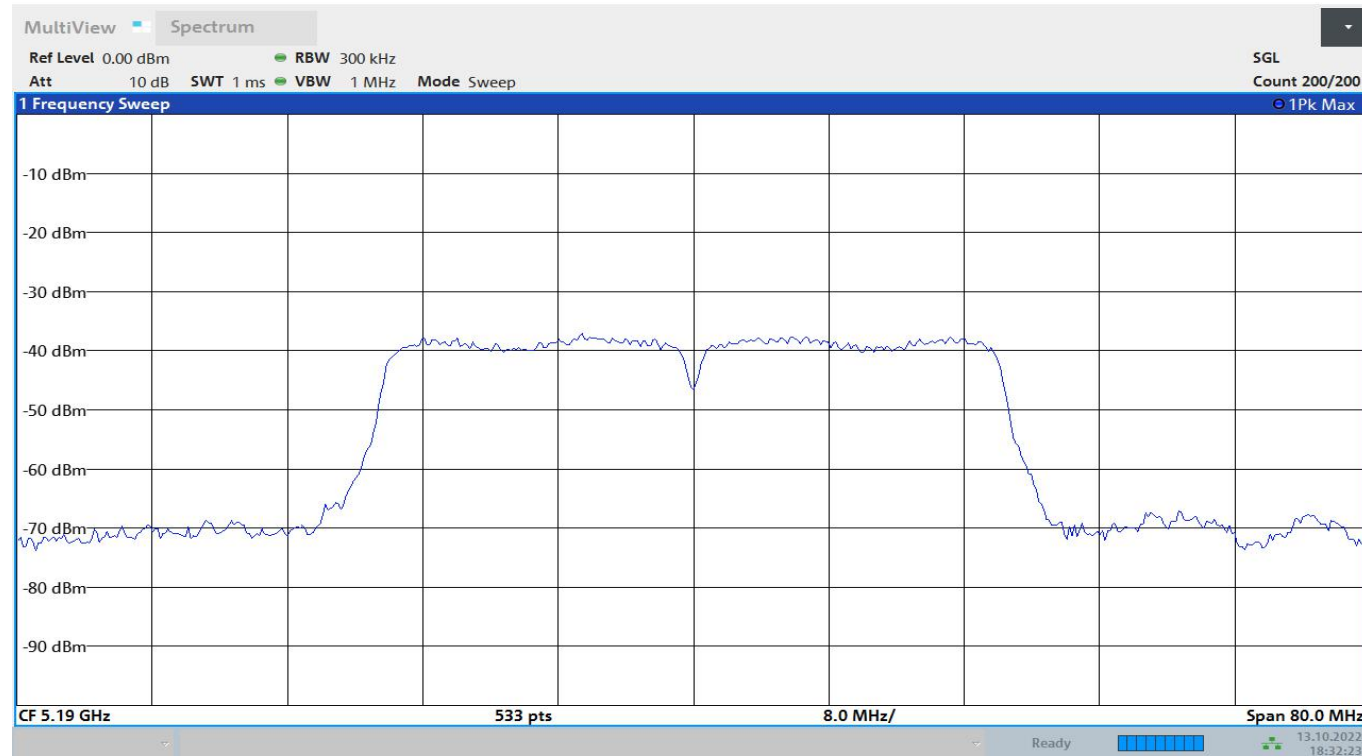


# 802.11n (HT40) 5190MHz MCS0

26 dB Bandwidth

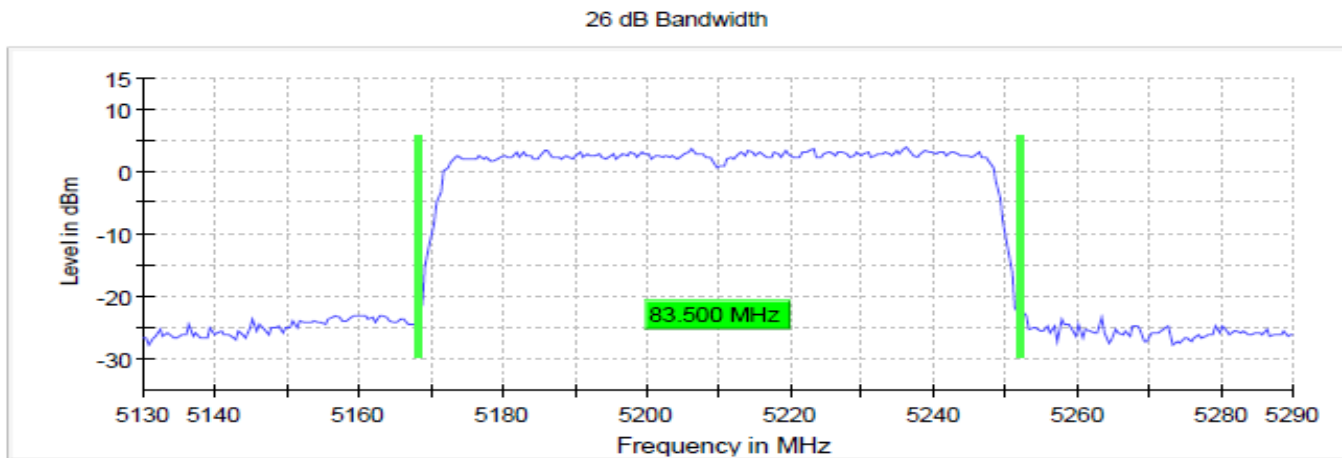


HAR-004 - HCH - DH1 - DFLTpwrSET - PWR

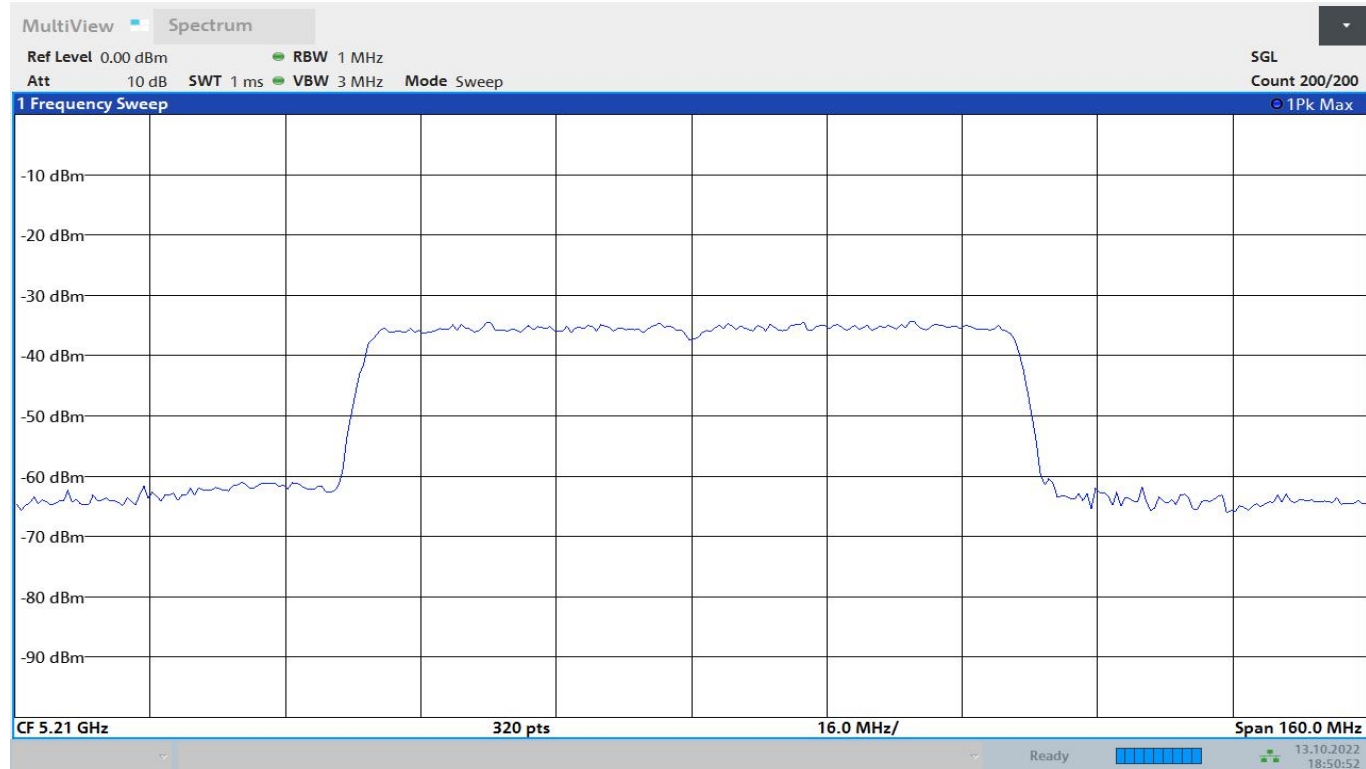


18:32:23 13.10.2022

802.11ac (VHT80) 5210MHz MCS0



HAR-004 - HCH - DH1 - DFLTprxSET - PWR



18:50:52 13.10.2022

## 4.5 UNII-3

| Mode                                        | Channel | Frequency |
|---------------------------------------------|---------|-----------|
| 802.11a<br>802.11n(HT20)<br>802.11ac(VHT20) | 149     | 5745      |
| 802.11n(HT40)<br>802.11ac(VHT40)            | 151     | 5755      |
| 802.11ac(VHT80)                             | 155     | 5775      |
| 802.11a<br>802.11n(HT20)<br>802.11ac(VHT20) | 157     | 5785      |
| 802.11n(HT40)<br>802.11ac(VHT40)            | 159     | 5795      |
| 802.11a<br>802.11n(HT20)<br>802.11ac(VHT20) | 165     | 5825      |

Notes:- Output power measurements performed on all supported worst data rate of each supported 802.11 mode.

## Power Settings

| 802.11a |               | 802.11n (HT20) |               | 802.11ac (VHT20) |               |
|---------|---------------|----------------|---------------|------------------|---------------|
| Channel | Power Setting | Channel        | Power Setting | Channel          | Power Setting |
| 149     | 15            | 149            | 15            | 149              | 15            |
| 157     | 15            | 157            | 15            | 157              | 15            |
| 165     | 15            | 165            | 15            | 165              | 15            |

| 802.11n (HT40) |               | 802.11ac (VHT40) |               |
|----------------|---------------|------------------|---------------|
| Channel        | Power Setting | Channel          | Power Setting |
| 151            | 15            | 151              | 15            |
| 159            | 15            | 159              | 15            |

| 802.11ac (VHT80) |               |
|------------------|---------------|
| Channel          | Power Setting |
| 155              | 15            |

## 4.5.1 RF output power and Duty-Cycle

### FCC and RSS-247

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 II.E and ANSI C63.10-2013 (In Reference to KDB 789033 E.3.B)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Combined Uncertainty of absolute Level Measurement ( $K=2$ ) < 1 dB

#### 802.11a

| Data Rate | Gated RMS (dBm)<br>5745 MHz | Gated RMS (dBm)<br>5785 MHz | Gated RMS (dBm)<br>5825 MHz | Limit<br>(dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| 6 Mbps    | 10.482                      | 10.759                      | 8.828                       | 30.0           | 99.057         |

#### 802.11n (HT20)

| Data Rate | Gated RMS (dBm)<br>5745 MHz | Gated RMS (dBm)<br>5785 MHz | Gated RMS (dBm)<br>5825 MHz | Limit<br>(dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| MCS0      | 10.579                      | 10.692                      | 8.878                       | 30.0           | 98.994         |

#### 802.11ac (VHT20)

| Data Rate | Gated RMS (dBm)<br>5745 MHz | Gated RMS (dBm)<br>5785 MHz | Gated RMS (dBm)<br>5825 MHz | Limit<br>(dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| MCS0      | 10.505                      | 10.768                      | 8.807                       | 30.0           | 99.000         |

#### 802.11n (HT40)

| Data Rate | Gated RMS (dBm)<br>5755 MHz | Gated RMS (dBm)<br>5795 MHz | Limit<br>(dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|----------------|----------------|
| MCS0      | 10.767                      | 10.923                      | 30.0           | 98.022         |

#### 802.11ac (VHT40)

| Data Rate | Gated RMS (dBm)<br>5755 MHz | Gated RMS (dBm)<br>5795 MHz | Limit<br>(dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|----------------|----------------|
| MCS0      | 10.707                      | 10.879                      | 30.0           | 98.040         |

#### 802.11ac (VHT80)

| Data Rate | Gated RMS (dBm)<br>5775 MHz | Limit<br>(dBm) | Duty Cycle (%) |
|-----------|-----------------------------|----------------|----------------|
| MCS0      | 10.910                      | 30.0           | 96.119         |

## 4.5.2 Power Spectral Density

### FCC and RSS-247

Test according to FCC title 47 part 15 §15.407(a), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 II.F with test method SA-1 and ANSI C63.10-2013

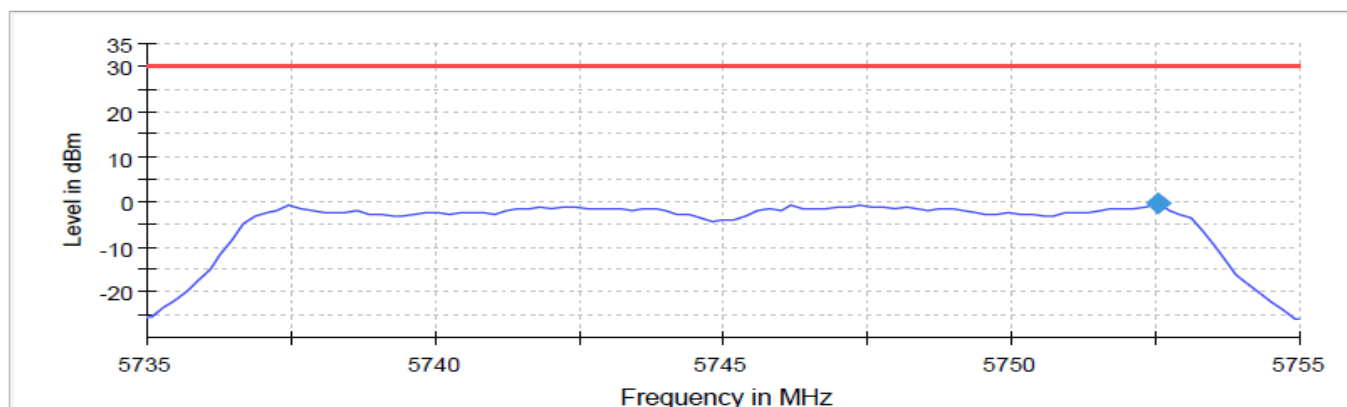
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

### 802.11a 6Mbps

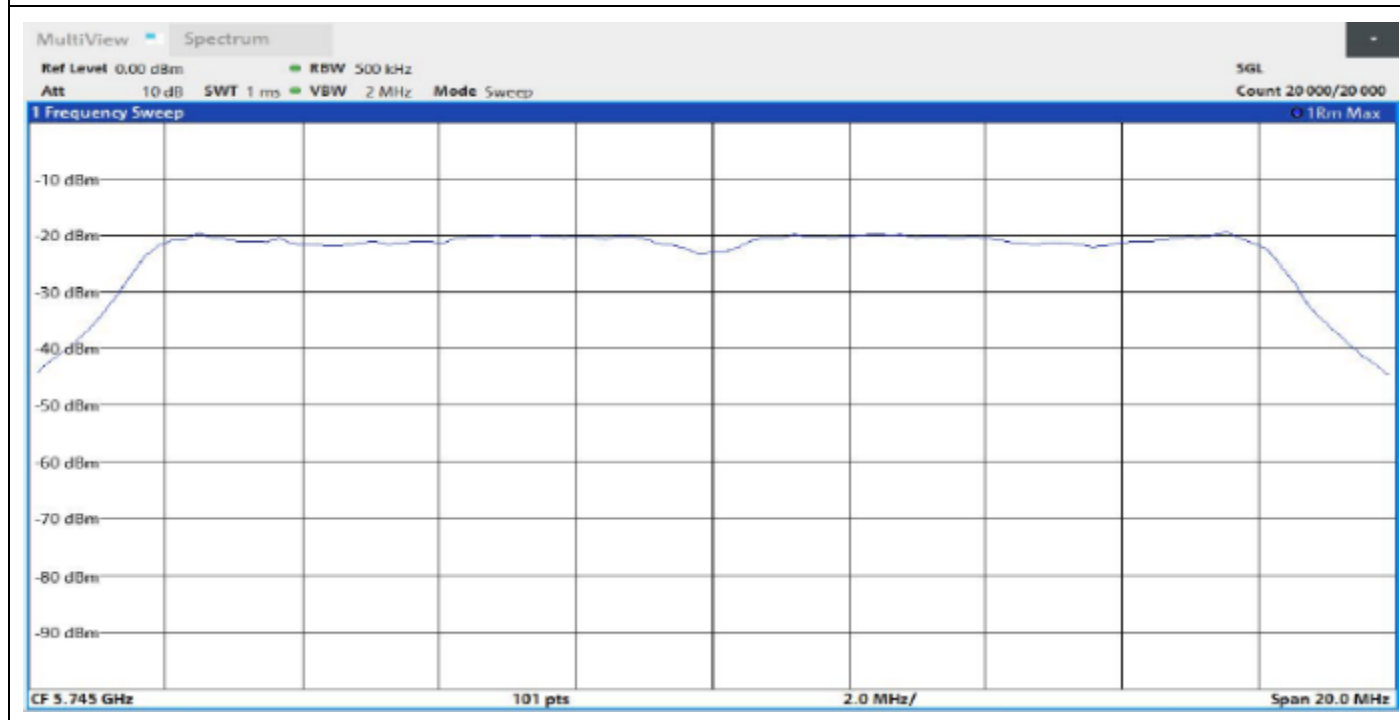
| Data Rate | PSD (dBm)<br>5745 MHz | PSD (dBm)<br>5785 MHz | PSD (dBm)<br>5825 MHz | Limit (dBm) |
|-----------|-----------------------|-----------------------|-----------------------|-------------|
| 6Mbps     | -0.535                | -0.433                | -2.638                | 30.0        |

#### 802.11a 5745 MHz 6Mbps

Power Spectral Density



Connector 1 Sum Level Limit PSD



## 802.11n (HT20)

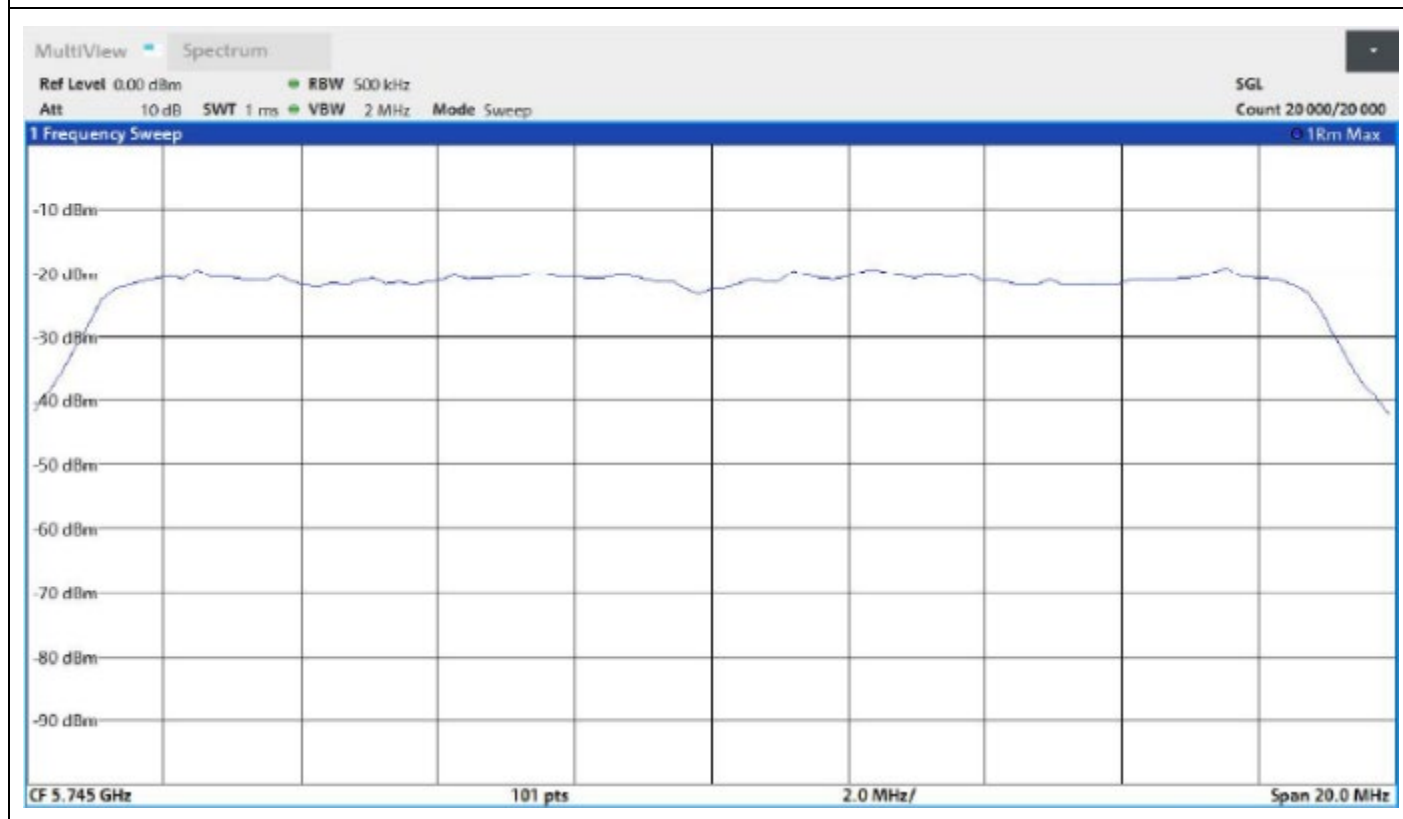
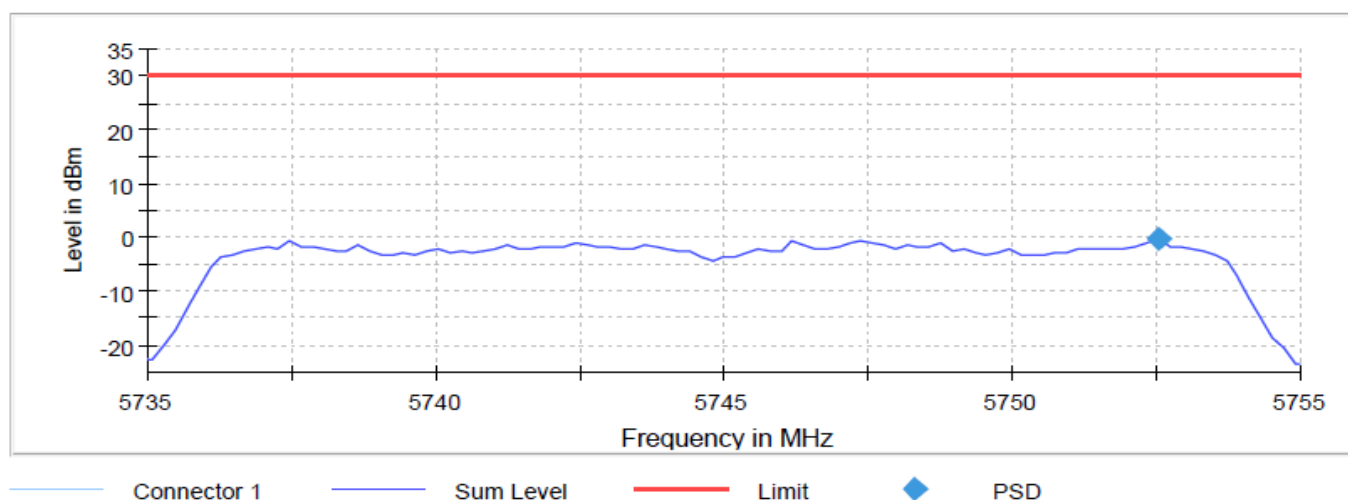
| Data Rate | PSD (dBm)<br>5745 MHz | PSD (dBm)<br>5785 MHz | PSD (dBm)<br>5825 MHz | Limit (dBm) |
|-----------|-----------------------|-----------------------|-----------------------|-------------|
| MCS0      | -0.220                | -0.224                | -2.434                | 30.0        |

## 802.11n (HT40)

| Data Rate | PSD (dBm)<br>5755 MHz | PSD (dBm)<br>5795 MHz | Limit (dBm) |
|-----------|-----------------------|-----------------------|-------------|
| MCS0      | -2.419                | -2.474                | 30.0        |

### 802.11n (HT20) 5745 MHz MCS0

Power Spectral Density



### 802.11ac (VHT20)

| Data Rate | PSD (dBm)<br>5745 MHz | PSD (dBm)<br>5785 MHz | PSD (dBm)<br>5825 MHz | Limit (dBm) |
|-----------|-----------------------|-----------------------|-----------------------|-------------|
| MCS0      | -0.149                | -0.162                | -2.332                | 30.0        |

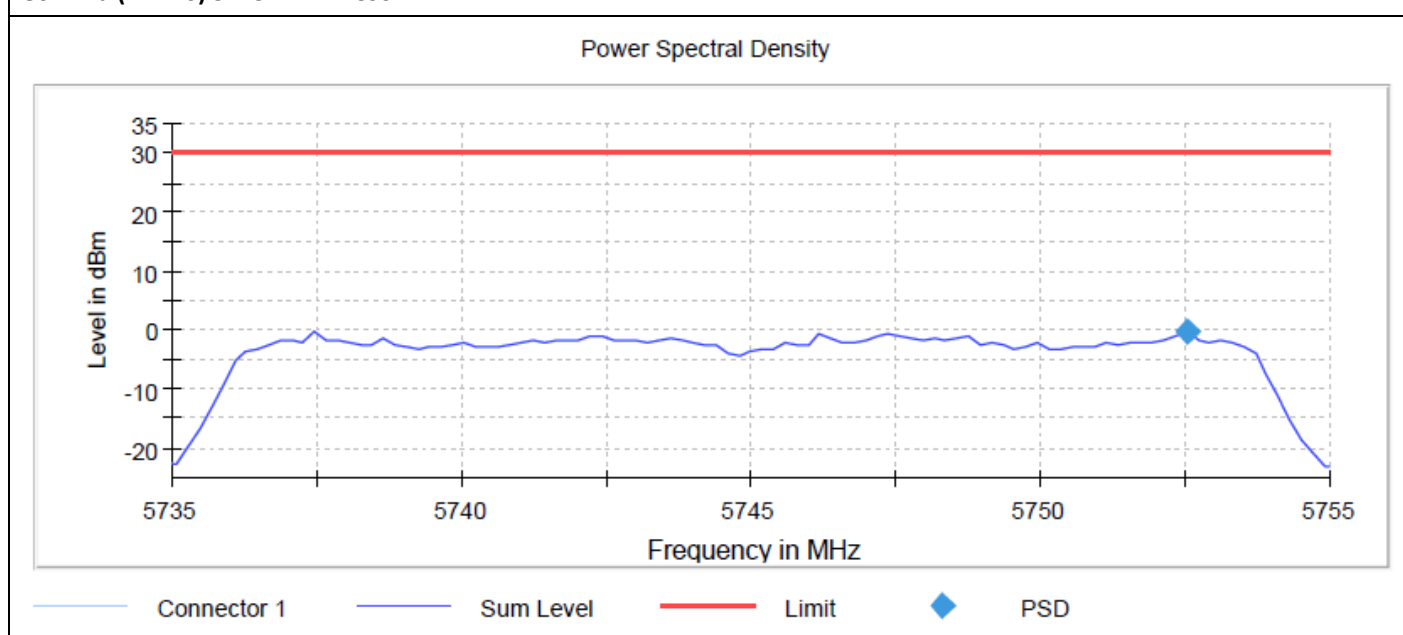
### 802.11ac (VHT40)

| Data Rate | PSD (dBm)<br>5755 MHz | PSD (dBm)<br>5795 MHz | Limit (dBm) |
|-----------|-----------------------|-----------------------|-------------|
| MCS0      | -2.585                | -2.551                | 30.0        |

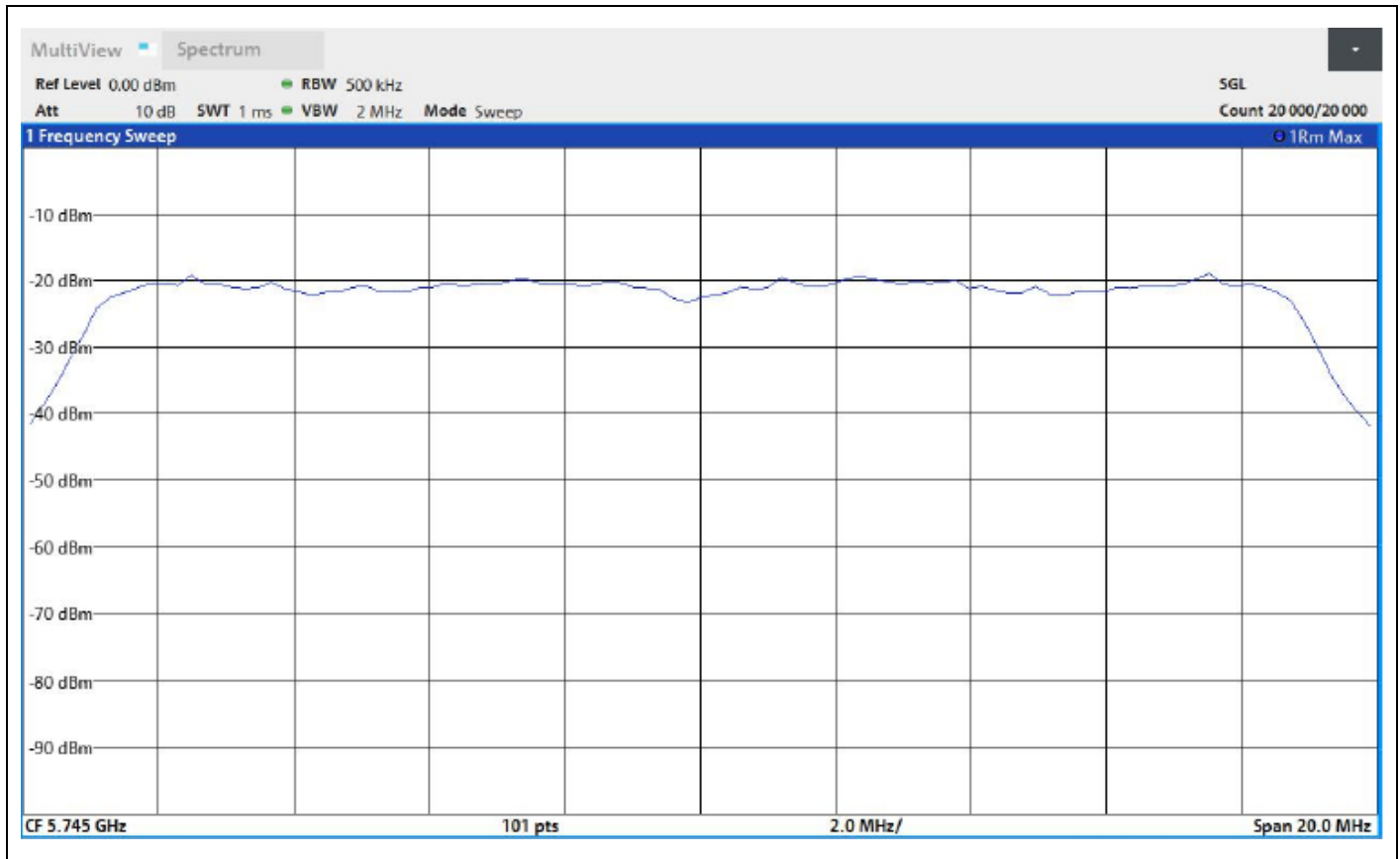
### 802.11ac (VHT80)

| Data Rate | PSD (dBm)<br>5775 MHz | Limit (dBm) |
|-----------|-----------------------|-------------|
| MCS0      | -4.379                | 30.0        |

#### 802.11a (VHT20) 5745 MHz MCS0







### 4.5.3 DTS Bandwidth 6dB

#### FCC and RSS-247

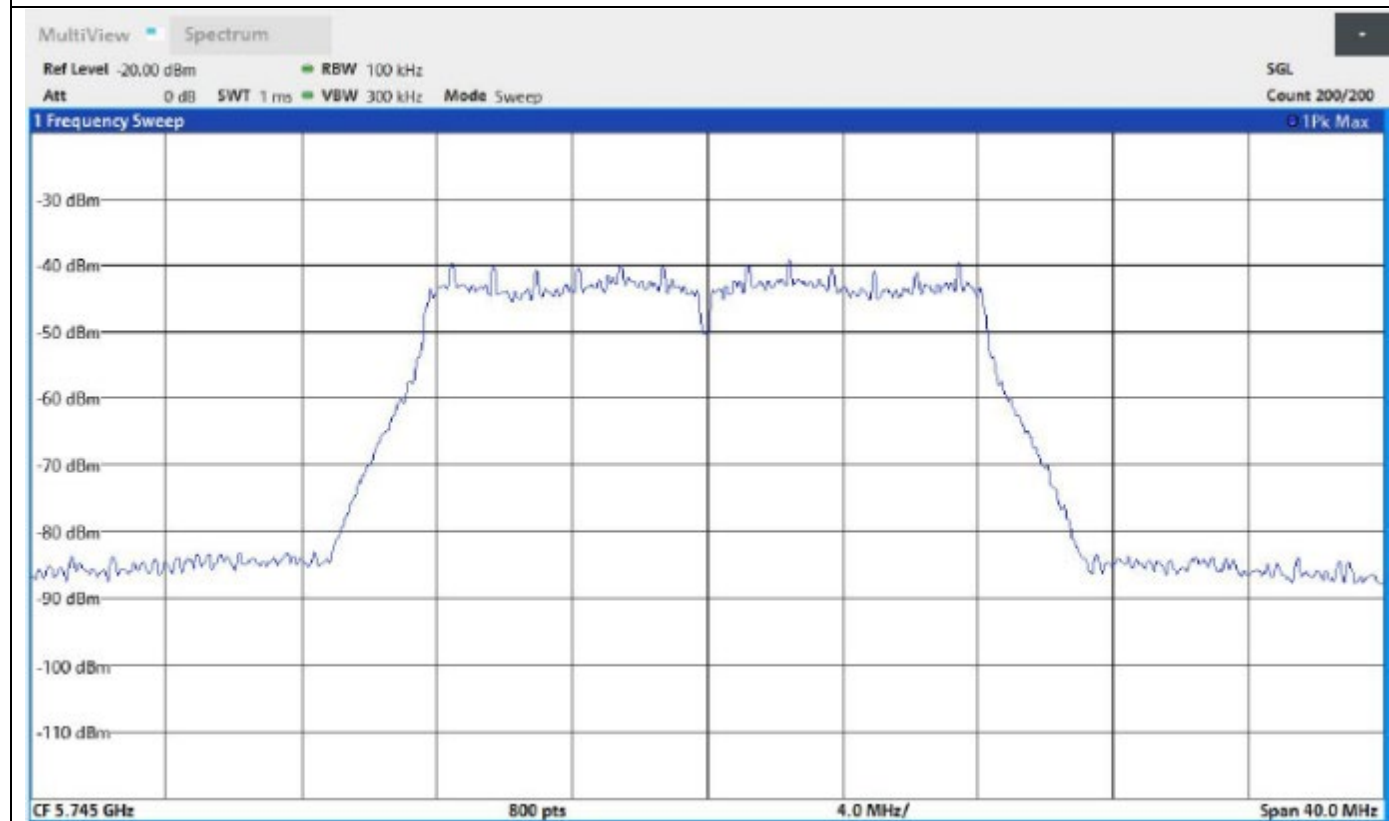
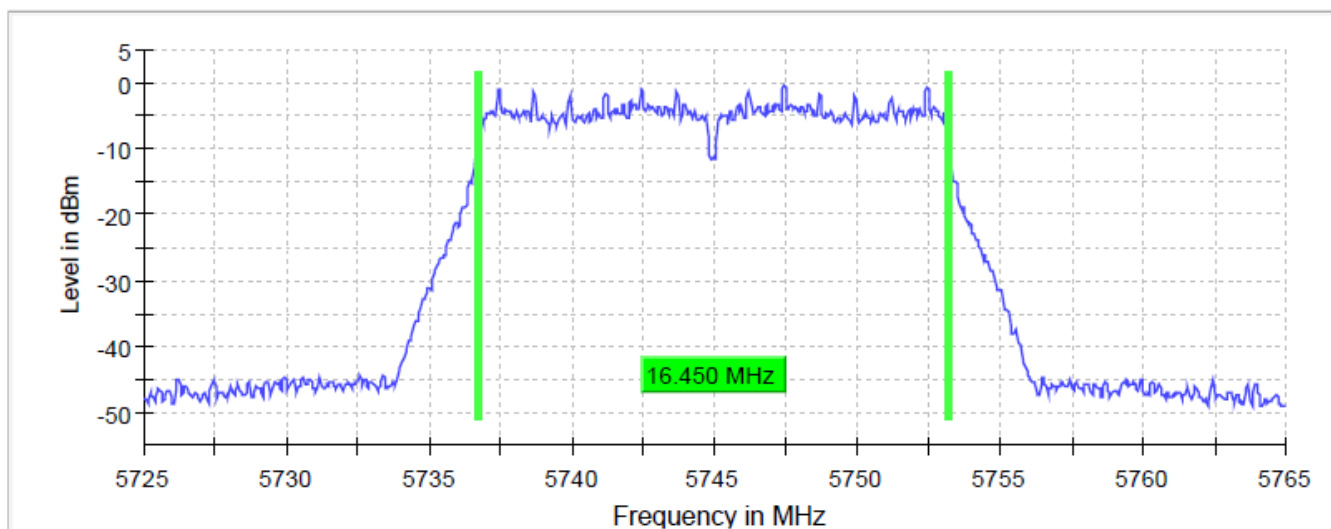
Test according to FCC title 47 part 15 §15.407(a) (e), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 Section C.2 and ANSI C63.10-2013, ISEDC RSS-247 6.2.4(1)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

| Data Rate             | DUT Frequency (MHz) | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Minimum Band Limit (MHz) |
|-----------------------|---------------------|-----------------|----------------------|-----------------------|--------------------------|
| 802.11a 6Mbps         | 5745.000000         | 16.450000       | 5736.725000          | 5753.175000           | 0.500000                 |
| 802.11n (HT20) MCS0   | 5745.000000         | 17.400000       | 5736.125000          | 5753.525000           | 0.500000                 |
| 802.11ac (VHT20) MCS0 | 5745.000000         | 17.600000       | 5736.125000          | 5753.725000           | 0.500000                 |
| 802.11n (HT40) MCS0   | 5755.000000         | 35.900000       | 5737.025000          | 5772.925000           | 0.500000                 |
| 802.11ac (VHT40) MCS0 | 5755.000000         | 35.900000       | 5737.025000          | 5772.925000           | 0.500000                 |
| 802.11ac (VHT80) MCS0 | 5775.000000         | 76.400000       | 5736.775000          | 5813.175000           | 0.500000                 |
| 802.11a 6Mbps         | 5785.000000         | 16.450000       | 5776.725000          | 5793.175000           | 0.500000                 |
| 802.11n (HT20) MCS0   | 5785.000000         | 17.200000       | 5776.325000          | 5793.525000           | 0.500000                 |
| 802.11ac (VHT20) MCS0 | 5785.000000         | 17.400000       | 5776.125000          | 5793.525000           | 0.500000                 |
| 802.11n (HT40) MCS0   | 5795.000000         | 35.750000       | 5777.025000          | 5812.775000           | 0.500000                 |
| 802.11ac (VHT40) MCS0 | 5795.000000         | 35.750000       | 5777.025000          | 5812.775000           | 0.500000                 |
| 802.11a 6Mbps         | 5825.000000         | 16.450000       | 5816.725000          | 5833.175000           | 0.500000                 |
| 802.11n (HT20) MCS0   | 5825.000000         | 17.600000       | 5816.125000          | 5833.725000           | 0.500000                 |
| 802.11ac (VHT20) MCS0 | 5825.000000         | 17.600000       | 5816.125000          | 5833.725000           | 0.500000                 |

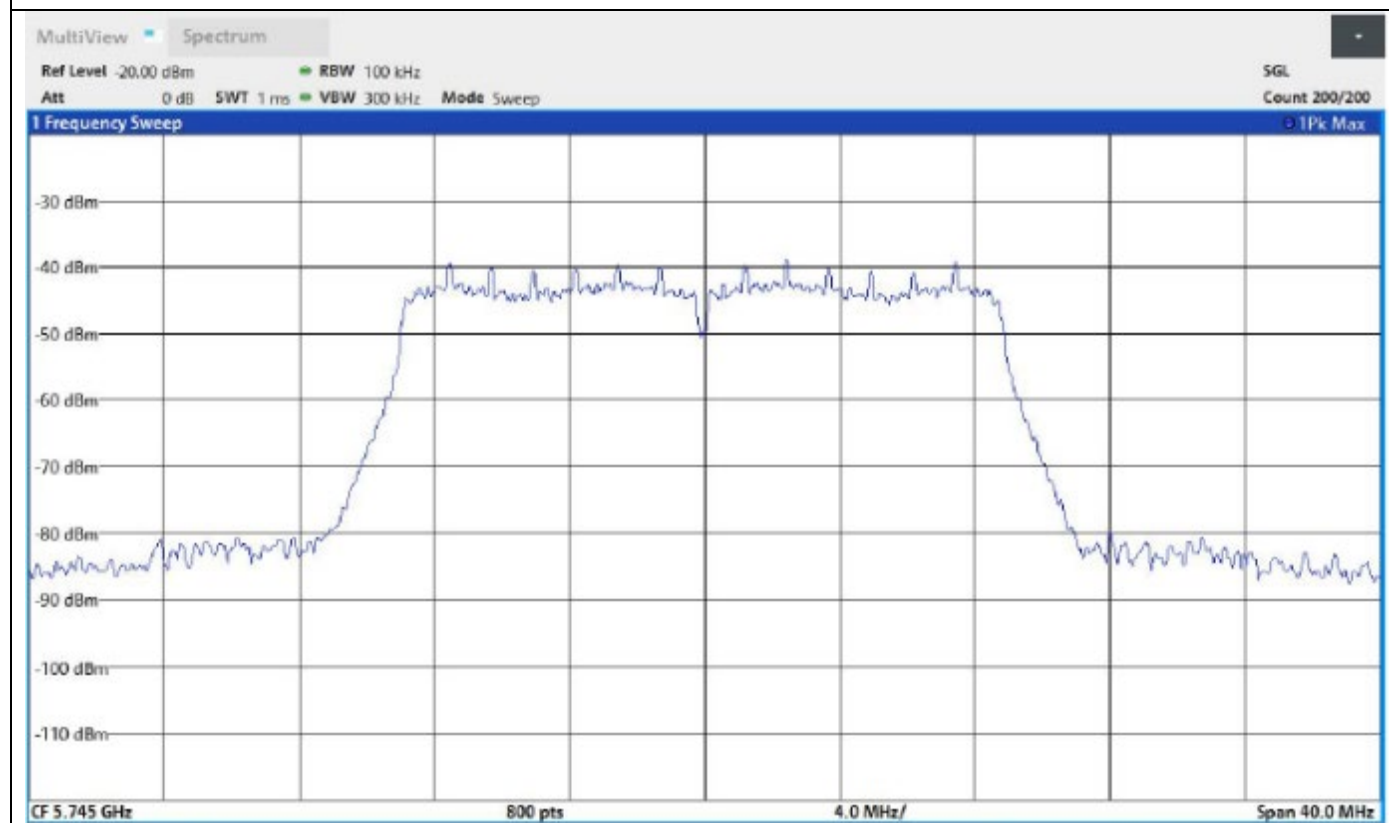
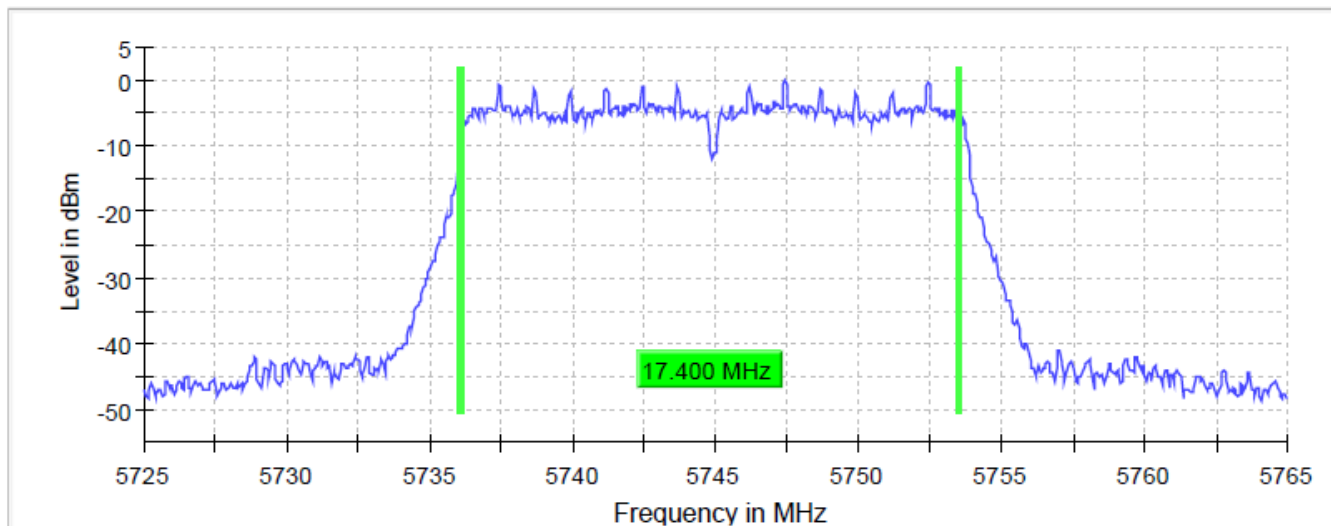
802.11a 5745MHz 6Mbps

6 dB Bandwidth



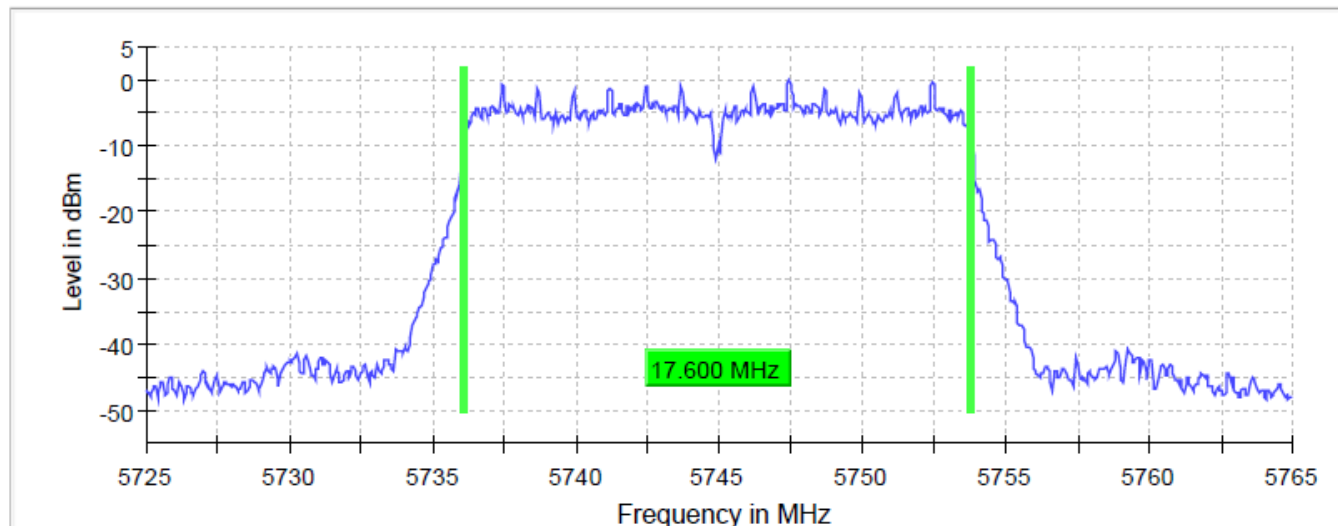
802.11n (HT20) 5745MHz MCS0

6 dB Bandwidth



802.11ac (VHT20) 5745MHz MCS0

6 dB Bandwidth



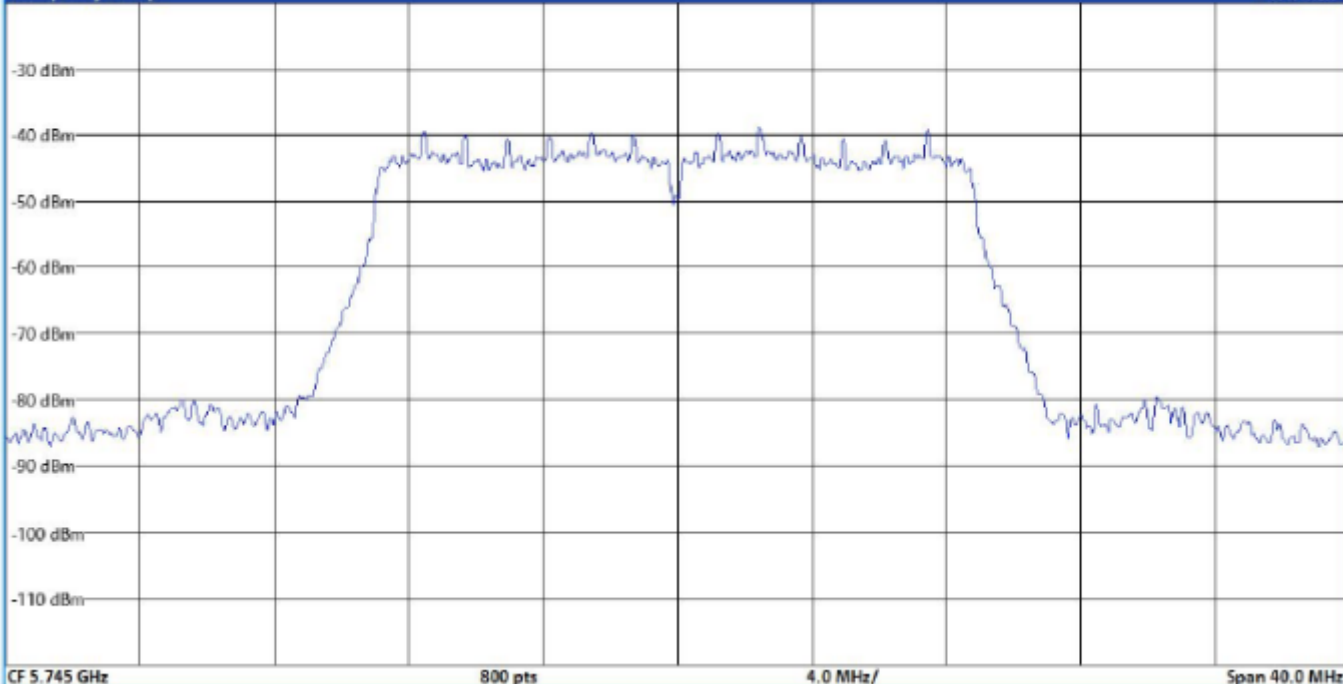
MultiView Spectrum

Ref Level -20.00 dBm  
Att 0 dB  
RBW 100 kHz  
VBW 300 kHz  
Mode Sweep

SGL  
Count 200/200

1 Frequency Sweep

1Pk Max



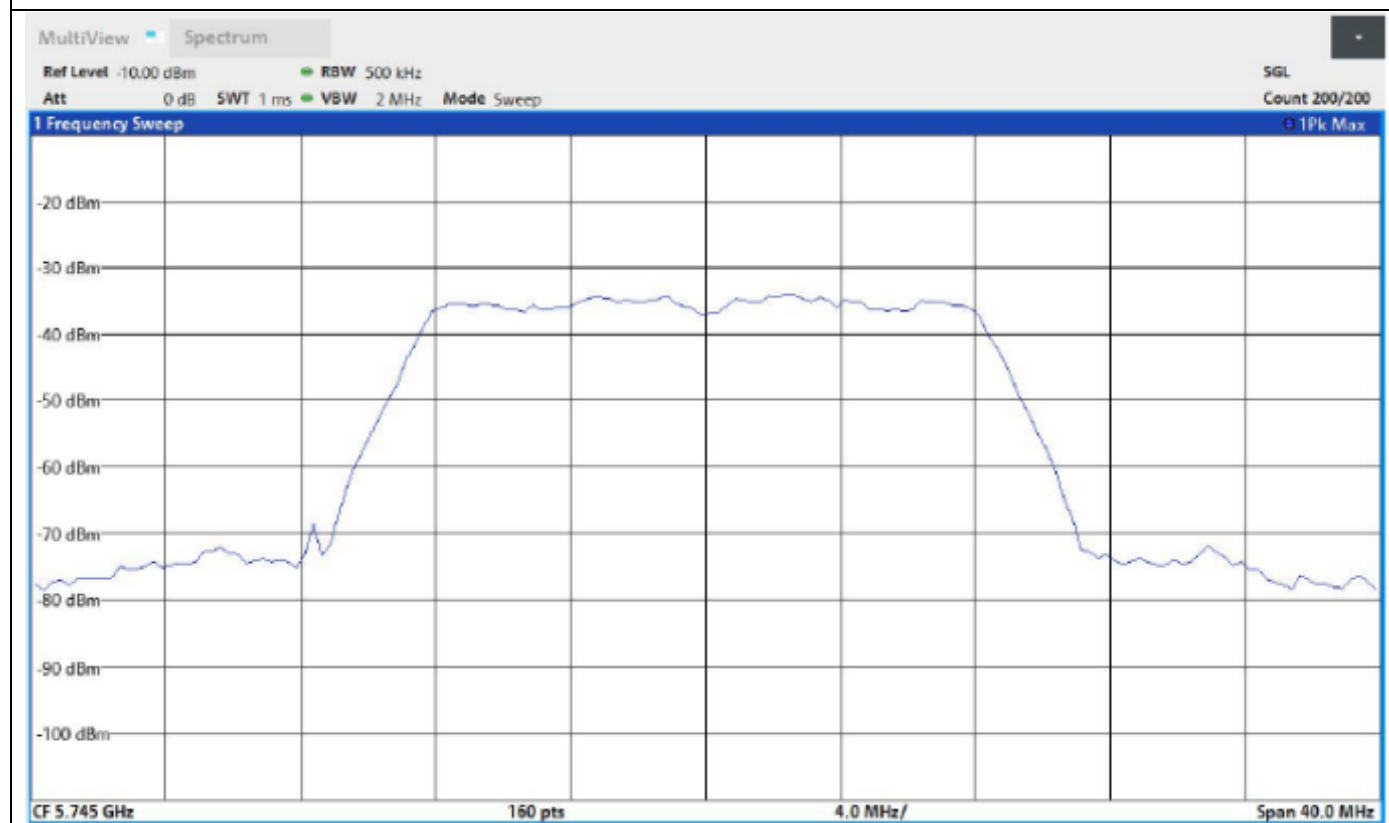
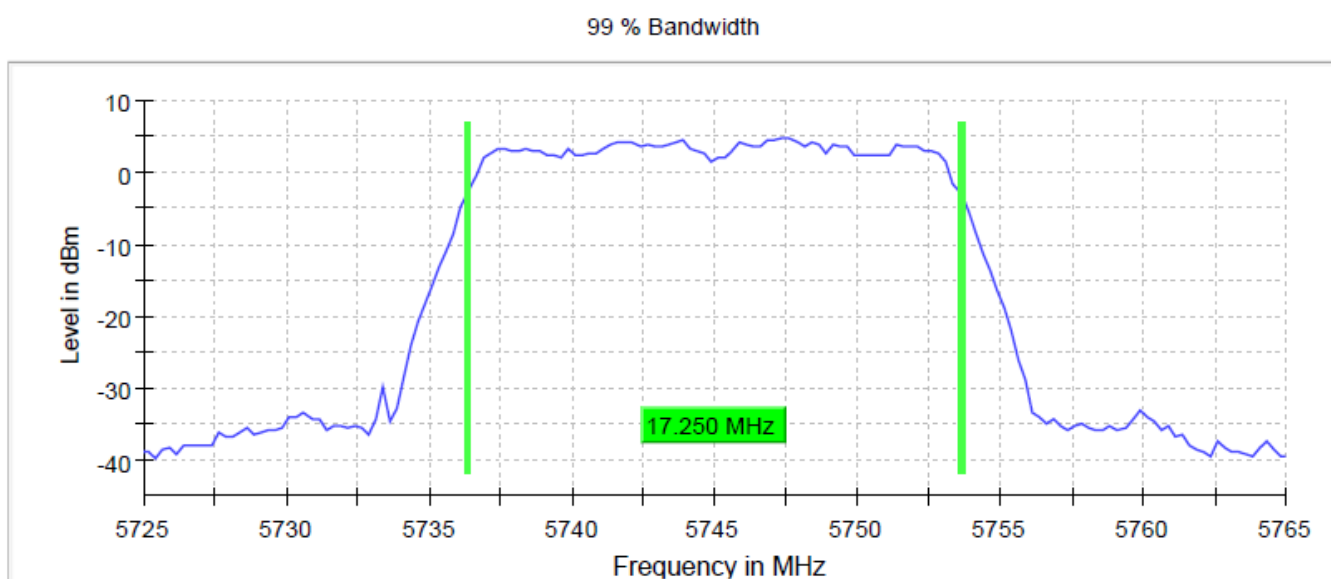
## 4.5.4 Occupied Channel Bandwidth

Test according to RSS-GEN Section 6.7, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 D and ANSI C63.10-2013

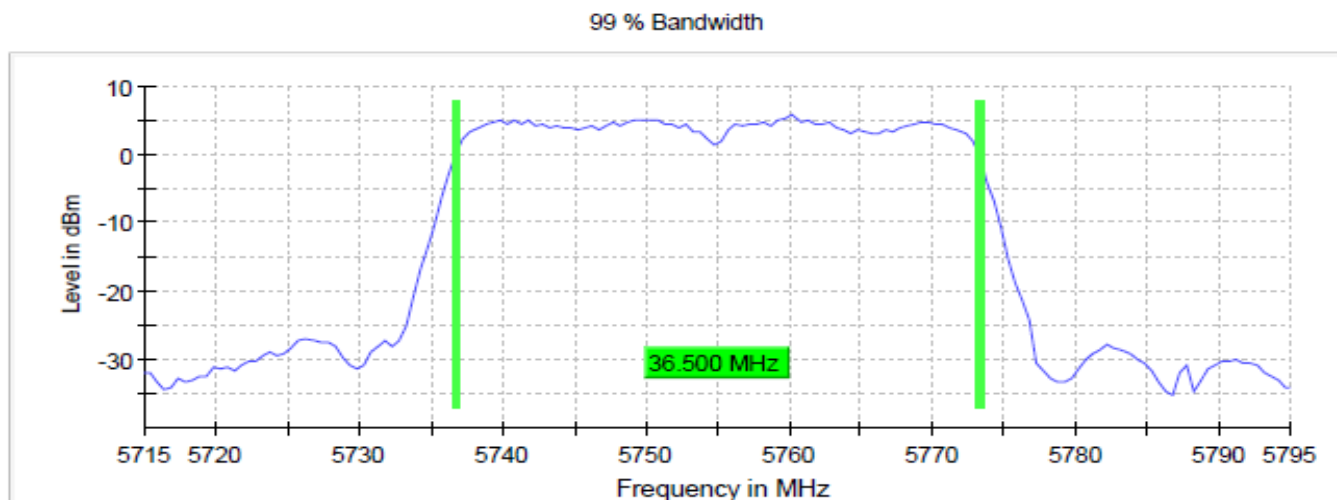
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

| Data Rate             | DUT Frequency (MHz) | Bandwidth (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) | Band Limit (MHz) |
|-----------------------|---------------------|-----------------|----------------------|-----------------------|------------------|
| 802.11a 6Mbps         | 5745.000000         | 17.250000       | 5736.375000          | 5753.625000           | 5725-5850        |
| 802.11n (HT20) MCS0   | 5745.000000         | 18.250000       | 5735.875000          | 5754.125000           | 5725-5850        |
| 802.11ac (VHT20) MCS0 | 5745.000000         | 18.250000       | 5735.875000          | 5754.125000           | 5725-5850        |
| 802.11n (HT40) MCS0   | 5755.000000         | 36.500000       | 5736.750000          | 5773.250000           | 5725-5850        |
| 802.11ac (VHT40) MCS0 | 5755.000000         | 36.500000       | 5736.750000          | 5773.250000           | 5725-5850        |
| 802.11ac (VHT80) MCS0 | 5775.000000         | 77.000000       | 5736.500000          | 5813.500000           | 5725-5850        |
| 802.11a 6Mbps         | 5785.000000         | 17.250000       | 5776.375000          | 5793.625000           | 5725-5850        |
| 802.11n (HT20) MCS0   | 5785.000000         | 18.250000       | 5775.875000          | 5794.125000           | 5725-5850        |
| 802.11ac (VHT20) MCS0 | 5785.000000         | 18.250000       | 5775.875000          | 5794.125000           | 5725-5850        |
| 802.11n (HT40) MCS0   | 5795.000000         | 36.500000       | 5776.750000          | 5813.250000           | 5725-5850        |
| 802.11ac (VHT40) MCS0 | 5795.000000         | 36.500000       | 5776.750000          | 5813.250000           | 5725-5850        |
| 802.11a 6Mbps         | 5825.000000         | 17.250000       | 5816.375000          | 5833.625000           | 5725-5850        |
| 802.11n (HT20) MCS0   | 5825.000000         | 18.250000       | 5815.875000          | 5834.125000           | 5725-5850        |
| 802.11ac (VHT20) MCS0 | 5825.000000         | 18.250000       | 5815.875000          | 5834.125000           | 5725-5850        |

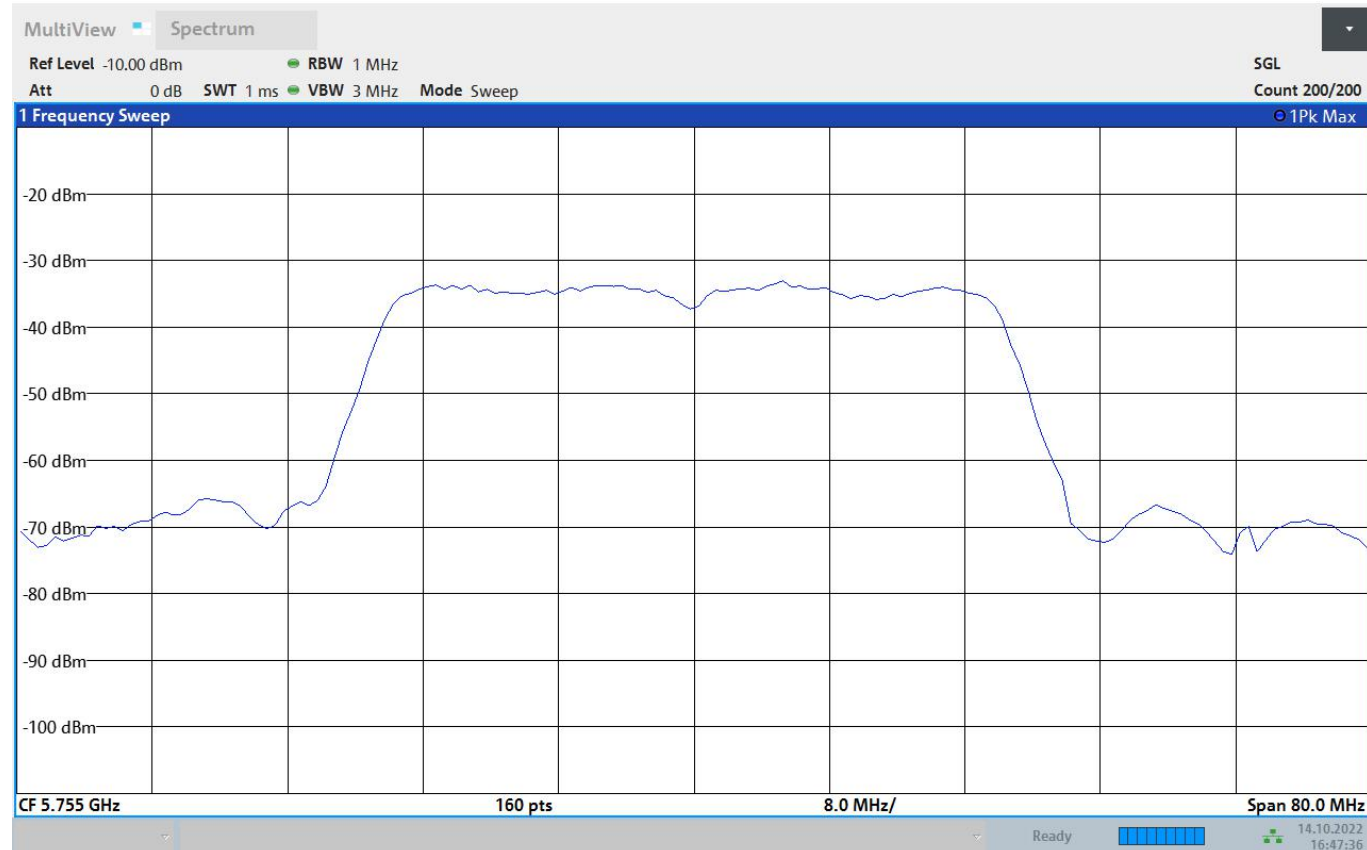
802.11a 5745MHz 6Mbps



802.11n (HT40) 5755MHz MCS0



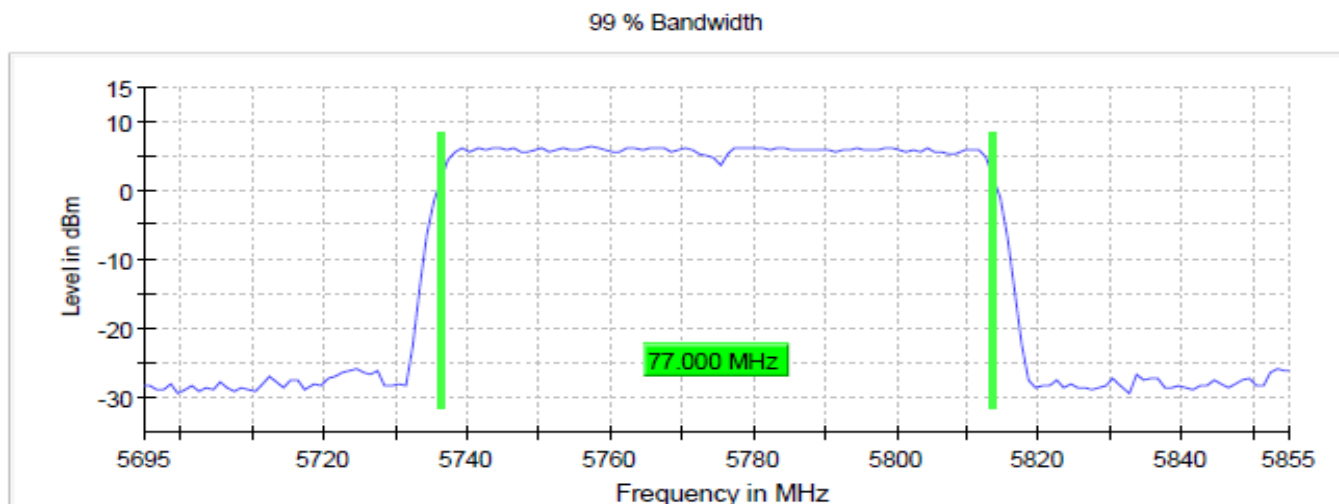
HAR-004 - HCH - DH1 - DFLTPwrSET - PWR



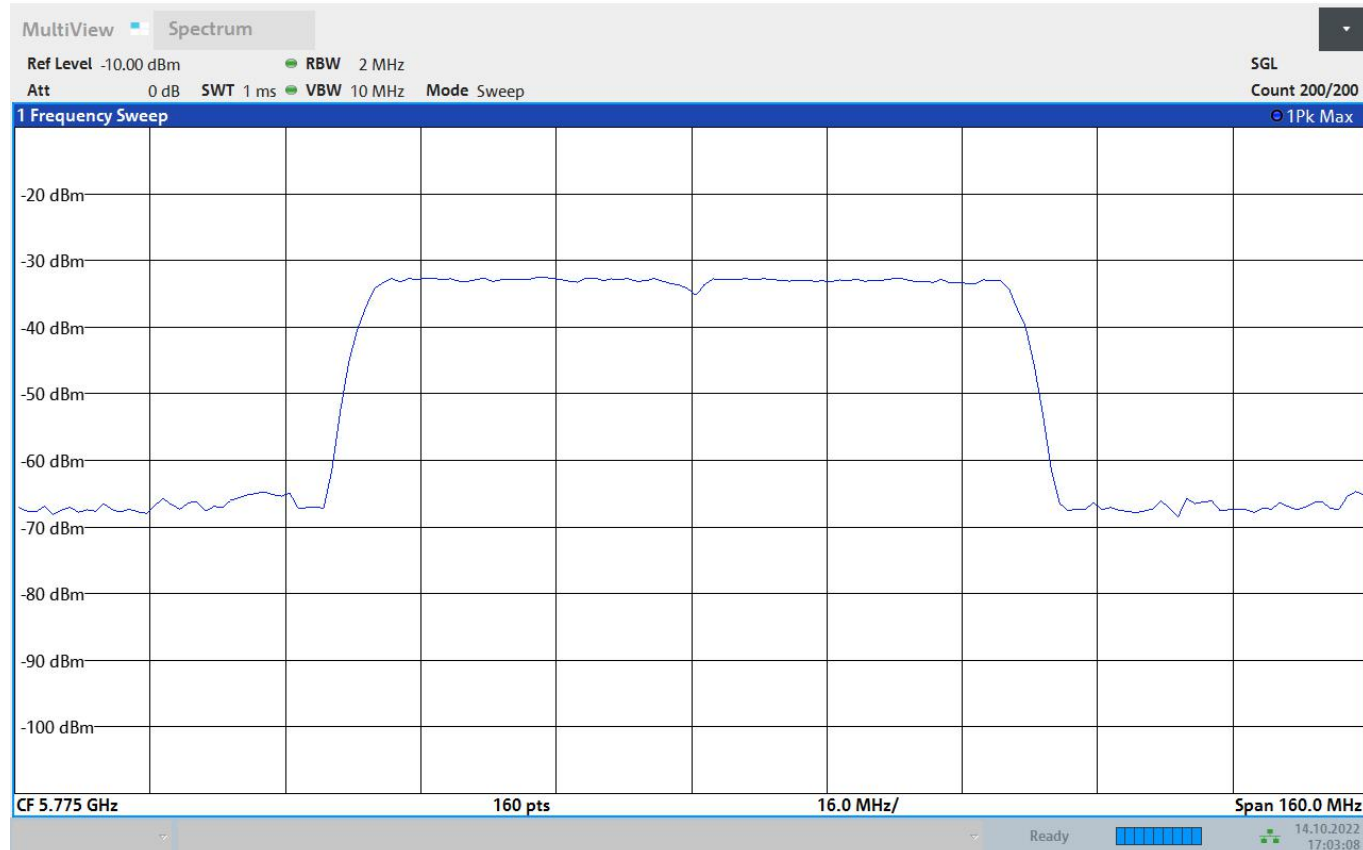
16:47:37 14.10.2022



802.11ac (VHT80) 5775MHz MCS0



HAR-004 - HCH - DH1 - DFLTpwrsET - PWR



17:03:09 14.10.2022

## 5. RADIATED TESTING

### 5.1 Test Summary

|                   |                 |                                            |              |
|-------------------|-----------------|--------------------------------------------|--------------|
| Start: 11/18/2022 | End: 01/13/2023 | Temperature: 23.2°C<br>Humidity: 23.8 %R.H | Initials: AB |
|-------------------|-----------------|--------------------------------------------|--------------|

| DUT S/N      | DUT Operating Mode                                                                                                                                                                                                                                                        |                 | 5GHz WLAN                                                               |       |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------|-------|
|              | AH22100701-HAR-053#4<br>AH22100701-HAR-053#5                                                                                                                                                                                                                              |                 |                                                                         |       |
| Comment      | UNII-1: 802.11a for all 20MHz channels.<br>802.11ac for all 40MHz and 80MHz channels.<br>UNII-3: 802.11a for all 20MHz channels.<br>802.11ac for all 40MHz channels.<br>802.11ac for all 80MHz channels.<br>Worst-case modes tested from 20MHz, 40MHz and 80MHz channels. |                 |                                                                         |       |
| Antenna      | Frequency Range                                                                                                                                                                                                                                                           | Polarization    | Result<br>Over/Under Limit                                              | Notes |
| Loop         | 9kHz-30MHz                                                                                                                                                                                                                                                                | Parallel        | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
|              |                                                                                                                                                                                                                                                                           | Perpendicular   | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
|              |                                                                                                                                                                                                                                                                           | Ground-Parallel | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
| Log Periodic | 30MHz-1GHz                                                                                                                                                                                                                                                                | Horizontal      | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
|              |                                                                                                                                                                                                                                                                           | Vertical        | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
| Horn         | 1GHz-18GHz                                                                                                                                                                                                                                                                | Horizontal      | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
|              |                                                                                                                                                                                                                                                                           | Vertical        | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
| Horn         | 18GHz-27.5GHz                                                                                                                                                                                                                                                             | Horizontal      | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |
|              |                                                                                                                                                                                                                                                                           | Vertical        | <input type="checkbox"/> Over <input checked="" type="checkbox"/> Under | √     |

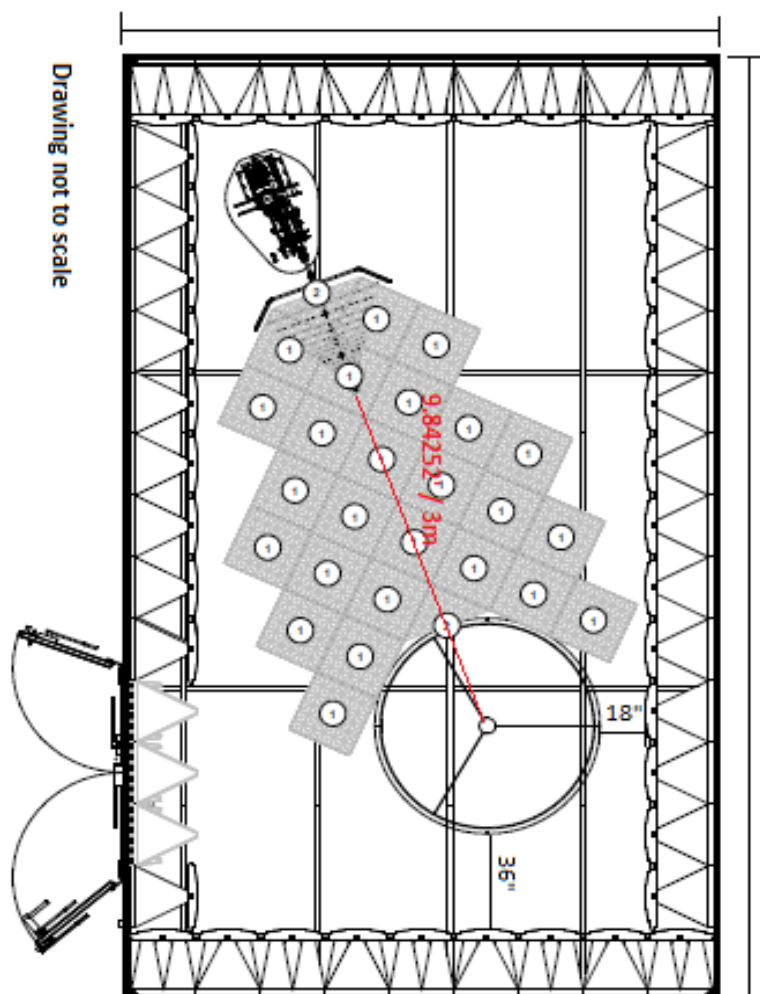
**Notes:** √ meets the requirements of the acceptance criteria.

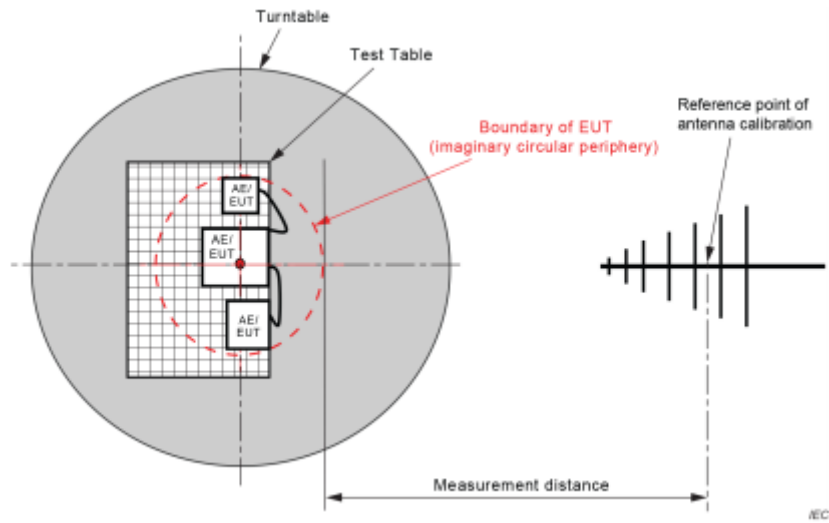
## 5.2 Test Setup

Semi-Anechoic Chamber Test Site-3 meter

|                                |                                                 |
|--------------------------------|-------------------------------------------------|
| Chamber Location               | 815 N Opdyke Rd<br>Auburn Hills, Michigan 48326 |
| Chamber Manufacturer:          | ETS-Lindgren                                    |
| Chamber Type                   | Semi-Anechoic                                   |
| Model                          | FACT™ 3-2.0 Plus                                |
| Chamber Dimensions (L x W x H) | 18'x18'x30'                                     |
| Quiet Zone Diameter            | 2.0 meters                                      |
| Quiet Zone Test Heights        | 1 & 2 meters (front only)                       |
| Test Distance                  | 3.0 meters                                      |
| Test Frequency Range           | 1-40 GHz                                        |
| Measured Performance           | 4.87 dB Site sVSWR                              |

Chamber Dimensions





### 5.3 Test Equipment Used

| ID #    | Equipment                                       | Manufacturer          | Model #        | Serial #              | Cal Due    |
|---------|-------------------------------------------------|-----------------------|----------------|-----------------------|------------|
| BVD0217 | Receiver 2Hz-44GHz                              | Rohde & Schwarz       | ESW44          | 101871                | 4/20/2023  |
| BVD0118 | Antenna Mast Position Controller                | ETS                   | 7006-001       | 00214778/00<br>214648 | N/A        |
| BVD0111 | 3 Meter Anechoic Chamber                        | ETS                   | N/A            | N/A                   | N/A        |
| BVD0247 | Turn Table                                      | ETS                   | 920250         | N/A                   | N/A        |
| BVD0323 | Foam Test Table For 3 Meter Chamber             | ETS-Lindgren          | LDT-1.5        | N/A                   | N/A        |
| BVD0069 | Bore Sight Tower                                | ETS                   | 2171B          | 226732                | N/A        |
| BVD0259 | Optima 12V Blue top Marine battery              | Optima                | D34M           | N/A                   | N/A        |
| BVD0184 | Preamplifier 29dB 1-18GHz                       | Rohde & Schwarz       | TS-PR18        | 101646                | 5/6/2023   |
| BVD0185 | Preamplifier 45dB 18-40GHz                      | Rohde & Schwarz       | TS-PR1840      | 100064                | 4/6/2023   |
| BVD0267 | Double Ridge Waveguide 800MHz-18GHz             | Rohde & Schwarz       | HF907          | 102832                | 5/5/2023   |
| BVD0021 | UltraLog Antenna 30-6000 MHz                    | Rohde & Schwarz       | HL562E         | 101113                | 7/21/2023  |
| BVD0320 | 18-40GHz Horn Antenna                           | L3 Narda ATM          | PNR 180-442-KF | 136164-01             | 4/4/2023   |
| BVD0011 | Loop Antenna 9kHz-30MHz                         | Rohde & Schwarz       | FMZB1519B      | 145                   | 5/4/2023   |
| BVD0045 | Field Probe Mast                                | Rohde & Schwarz       | TS-FPMA        | N/A                   | N/A        |
| BVD0481 | Band Reject Filter 40dB from 5150 to 5880MHz    | Micro-Tronics         | BRM50716       | G336                  | 4/11/2023  |
| BVD0394 | Double Shielded N-Type Cable 6.9 Meter          | Rohde & Schwarz       | N-Type         | N/A                   | 3/11/2023  |
| BVD0398 | Double Shielded N-Type Cable 2 Meter            | Rohde & Schwarz       | N-Type         | N/A                   | 12/29/2024 |
| BVD0486 | Sucoflex K-Type Coaxial Cable 5 Meter           | Huber+Suhner, inc     | K-Type Coaxial | 474343                | 3/7/2023   |
| BVD0407 | Double Shielded N-Type Cable 410mm (For PreAmp) | Rohde & Schwarz       | N-Type         | N/A                   | 8/31/2023  |
| BVD0495 | SMA Shielded Cable approx 100mm (for Pre-Amp)   | Rohde & Schwarz       | SMA-Type       | N/A                   | 4/6/2023   |
| BVD0552 | Double Shielded N-Type Cable 440mm (For PreAmp) | Electronic Assemblies | N-Type         | N/A                   | 5/7/2023   |
| BVD0229 | Temp and Humidity Meter                         | Fluke                 | 971            | 12001009              | 5/1/2023   |

### Equipment List (Software)

| ID # | Equipment         | Manufacturer    | Model | Version No. |     |
|------|-------------------|-----------------|-------|-------------|-----|
| N/A  | EMC Test Software | Rodhe & Schwarz | EMC32 | 11.20.00    | N/A |

## Customer Supplied Equipment

| ID # | Equipment                          | Manufacturer | Model        | Serial # | Version No.     |
|------|------------------------------------|--------------|--------------|----------|-----------------|
| N/A  | Harness                            | Harman       | N/A          | N/A      | N/A             |
| N/A  | Display Unit                       | Innolux Corp | INFOMM-15524 | 0024     | N/A             |
| N/A  | Ethernet Board                     | GM           | N/A          | N/A      | CSMate<br>rev.4 |
| N/A  | GM BT WLAN Test Tool NXP Chips S/W | Harman       | N/A          | N/A      | 2.4             |

## 5.4 Test Limits and Procedure

Radiated emissions that fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a)

| Frequencies (MHz) | Field strength ( $\mu\text{V/m}$ ) | Field strength ( $\text{dB}\mu\text{V/m}$ ) | Measurement distance (meters) |
|-------------------|------------------------------------|---------------------------------------------|-------------------------------|
| 0.009 ~ 0.490     | $2400/F(\text{kHz})$               | 48.5 - 13.8                                 | 300                           |
| 0.490 ~ 1.705     | $24000/F(\text{kHz})$              | 33.8 - 23                                   | 30                            |
| 1.705 ~ 30.0      | 30                                 | 29.54                                       | 30                            |
| 30 ~ 88           | 100                                | 40.0                                        | 3                             |
| 88 ~ 216          | 150                                | 43.5                                        | 3                             |
| 216 ~ 960         | 200                                | 46.0                                        | 3                             |
| Above 960         | 500                                | 54.0                                        | 3                             |

Note:

- The lower limit shall apply at the transition frequencies.
- For performing measurements at a specified distance of 3m, the values are extrapolated using extrapolation factor.  
Frequencies below 30MHz are extrapolated using 40dB/decade.  
Frequencies above 30MHz are extrapolated using 20dB/decade.

| Frequencies (MHz) | Formula for Limits derivation for below 30MHz                  | Limits for frequencies below 30MHz ( $\text{dB}\mu\text{V/m}$ ) |
|-------------------|----------------------------------------------------------------|-----------------------------------------------------------------|
| 0.009 ~ 0.490     | $2400/F(\text{kHz}) + 40 \text{ Log } (300\text{m}/3\text{m})$ | 128.5 ~ 93.8                                                    |
| 0.490 ~ 1.705     | $24000/F(\text{kHz}) + 40 \text{ Log } (30\text{m}/3\text{m})$ | 73.8 ~ 62.96                                                    |
| 1.705 ~ 30.0      | $29.54 + 40 \text{ Log } (30\text{m}/3\text{m})$               | 69.54                                                           |

- For frequencies above 1000MHz, the field strength limits based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 30dB under any condition of modulation.

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of  $377\Omega$ .

For example, the measurement frequency 2190KHz resulted in a level of 28.50  $\text{dB}\mu\text{V/m}$ , which is equivalent to  $28.50 - 51.48 = -22.98 \text{ dB}\mu\text{A/m}$ , which has the same margin, -41.04 dB, to the corresponding RSS-GEN Table 6 limit as it has to the 15.209(a) limit.

The measurement procedures are as per **789033 D02 General UNII Test Procedures New Rules v02r01, ISED RSS-247 6.2**

The Limits for Unwanted emissions out of the Restricted Bands are as follows.

| Procedure                                                       | Limits           |                     |
|-----------------------------------------------------------------|------------------|---------------------|
|                                                                 | Peak<br>(dBμV/m) | Average<br>(dBμV/m) |
| KDB 789033 D02 General UNII Test<br>Procedures New Rules v02r01 | 74               | 54                  |

#### § 15.407

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) 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.
- (2) For transmitters operating in the 5.25–5.35 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.
- (3) For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725–5.85 GHz band:
  - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

| Procedure    | Peak Limit<br>(dBμV/m) |
|--------------|------------------------|
| 15.407(b)(1) | 68.23                  |
| 15.407(b)(2) |                        |
| 15.407(b)(3) |                        |
| 15.407(b)(4) | As stated above        |

1. The table height for emissions measurements
  - i) Below 1 GHz, the table height is 80 cm above the reference ground plane.
  - ii) Above 1 GHz, the table height is 1.5 m
2. Measurements performed with the EUT rotated from 0° to 360°, the antenna height scanned between 1m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.



## 5.5 Test Data

### Uncertainty

Radiated Emissions (30MHz to 40GHz)

#### Test Engineer Initials: AB

The test is to measure the radiated emissions of the EUT. Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

#### 30MHz to 1GHZ

| Source of Uncertainty                                                 | Value (dB) | ProbabilityDistribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|-----------------------------------------------------------------------|------------|-------------------------|----------|-------------------------|----------------------|
| Receiver Reading                                                      | 0.12       | Rectangular             | 1.732    | 1                       | 0.069284             |
| Cable Insertion Loss                                                  | 0.21       | Normal                  | 2        | 1                       | 0.105                |
| Filter Insertion Loss                                                 | 0.25       | Normal                  | 2        | 1                       | 0.125                |
| Antenna Factor                                                        | 0.65       | Normal                  | 2        | 1                       | 0.325                |
| Receiver CW accuracy                                                  | 0.5        | Rectangular             | 1.732    | 1                       | 0.2886836            |
| Pulse Amplitude Response                                              | 1.5        | Rectangular             | 1.732    | 1                       | 0.86605081           |
| PRF Response                                                          | 1.5        | Rectangular             | 1.732    | 1                       | 0.86605081           |
| Mismatch Filter – Receiver                                            | 0.25       | U-Shape                 | 2.449    | 1                       | 0.1768033            |
| NSA Calibration                                                       | 4.0        | Triangular              | 1.414    | 1                       | 1.633332             |
| ETS Foam Table (LDT-1.5)                                              | 1.8        | Rectangular             | 1.732    | 1                       | 1.039261             |
| Combined Standard Uncertainty (square root of the sum of the squares) |            |                         |          |                         | 2.113781             |
| <b>Expanded Uncertainty (K=2)</b>                                     |            |                         |          |                         | <b>4.227562</b>      |

The total derived measurement uncertainty is +/- 4.228 dB

**1GHz to 40GHz**

| Source of Uncertainty                                                 | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|-----------------------------------------------------------------------|------------|--------------------------|----------|-------------------------|----------------------|
| Receiver Reading                                                      | 0.12       | Rectangular              | 1.732    | 1                       | 0.069284             |
| Cable Insertion Loss                                                  | 0.21       | Normal                   | 2        | 1                       | 0.105000             |
| Filter Insertion Loss                                                 | 0.25       | Normal                   | 2        | 1                       | 0.125000             |
| Antenna Factor                                                        | 0.65       | Normal                   | 2        | 1                       | 0.325000             |
| Receiver CW accuracy                                                  | 0.5        | Rectangular              | 1.732    | 1                       | 0.2886836            |
| Pulse Amplitude Response                                              | 1.5        | Rectangular              | 1.732    | 1                       | 0.866051             |
| PRF Response                                                          | 1.5        | Rectangular              | 1.732    | 1                       | 0.866051             |
| Mismatch Filter – Receiver                                            | 0.25       | U-Shape                  | 1.414    | 1                       | 0.176803             |
| VSWR Calibration                                                      | 2.0        | Triangular               | 2.449    | 1                       | 0.816659             |
| ETS Foam Table (LDT-1.5)                                              | 1.8        | Rectangular              | 1.732    | 1                       | 1.039261             |
| Combined Standard Uncertainty (square root of the sum of the squares) |            |                          |          |                         | 1.869213             |
| <b>Expanded Uncertainty (K=2)</b>                                     |            |                          |          |                         | <b>3.738426</b>      |

The total derived measurement uncertainty is +/- 3.738 dB.

Remarks:

1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

Remarks:

1. Level Peak Reading (dBμV/m) = Raw Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Peak Reading – Limit

Remarks:

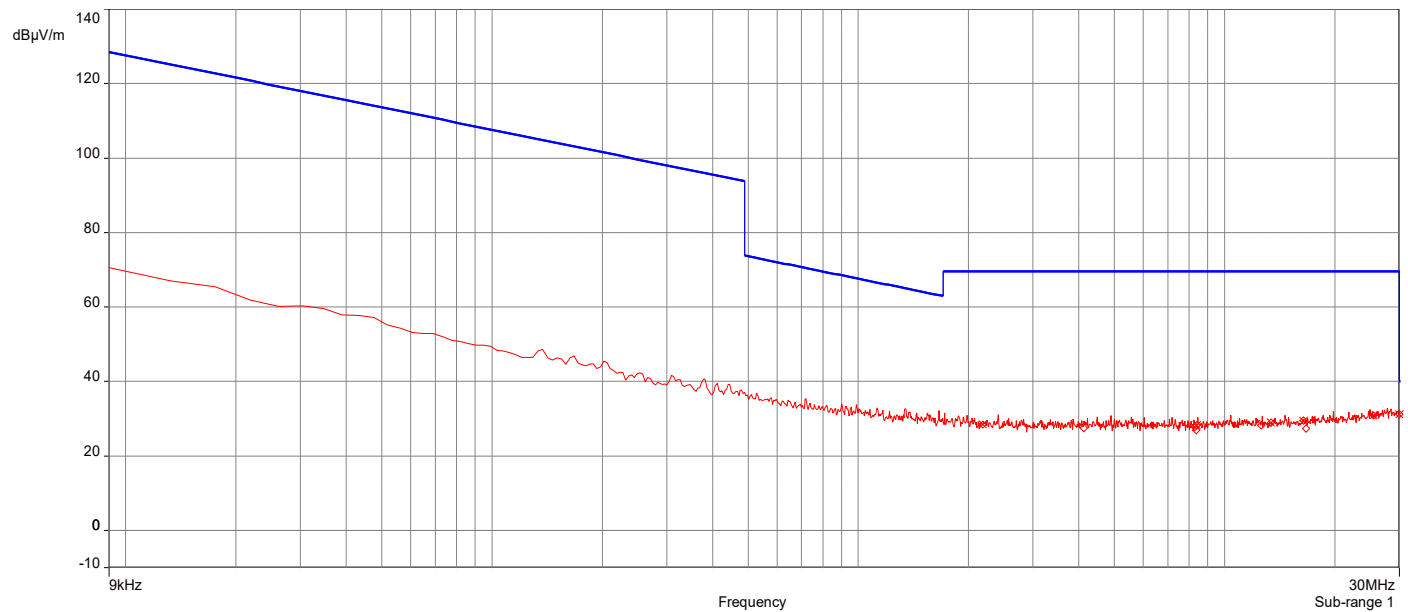
1. Level Average Reading (dBμV/m) = Raw Average Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Average Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-1 802.11a\_Ch 40\_9kHz-30MHz\_Ground-Parallel**

12/1/2022 3:19:06 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1. | 2.190086MHz     | 28.50                         | 19.49                  | 69.54        | -41.04      | 3.05       | 69.40     | H/V          | Passed    |
| 2. | 8.386255MHz     | 28.17                         | 19.45                  | 69.54        | -41.37      | 3.05       | 38.40     | H/V          | Passed    |
| 3. | 13.395467MHz    | 28.93                         | 19.85                  | 69.54        | -40.61      | 3.05       | 129.90    | H/V          | Passed    |
| 4. | 16.420706MHz    | 29.57                         | 19.89                  | 69.54        | -39.97      | 3.05       | 338.00    | H/V          | Passed    |
| 5. | 25.534988MHz    | 30.88                         | 20.98                  | 69.54        | -38.66      | 3.05       | 100.70    | H/V          | Passed    |
| 6. | 30MHz           | 31.29                         | 21.85                  | 40.00        | -8.71       | 3.05       | 283.20    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

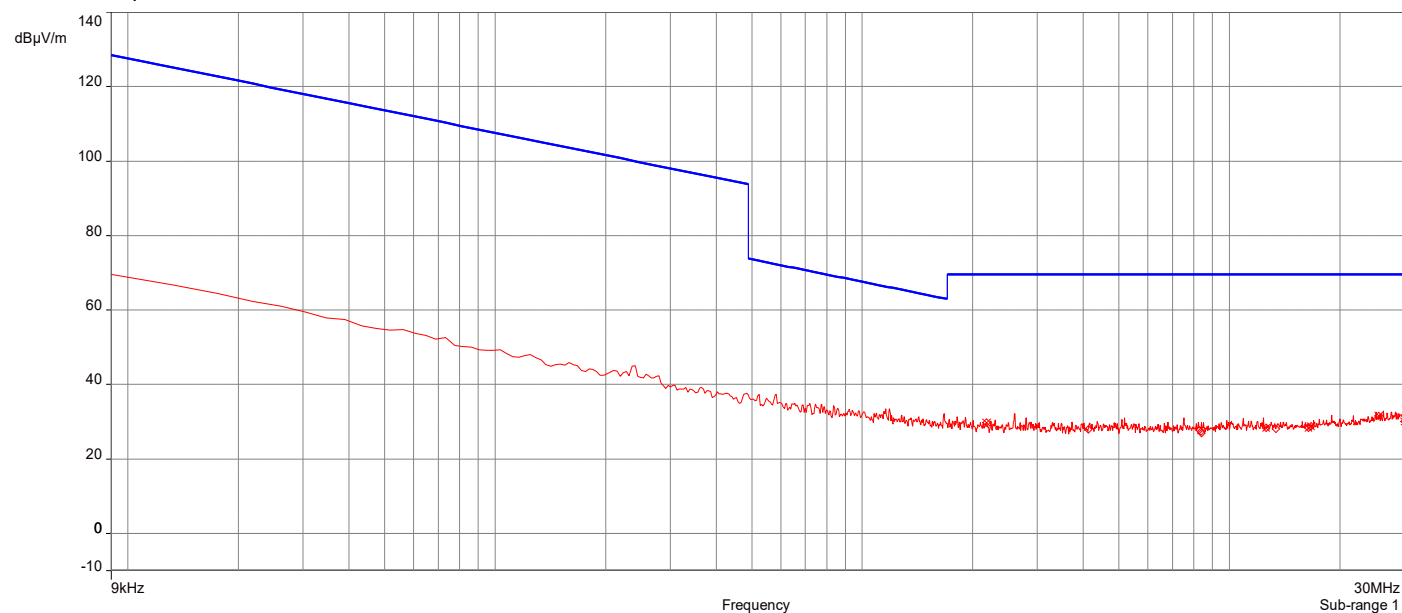
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-1 802.11a\_Ch 40\_9kHz-30MHz\_Parallel**

12/1/2022 3:11:02 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 29.75                         | 19.49                  | 69.54        | -39.79      | 3.05       | 346.10    | H/V          | Passed    |
| 2  | 12.577024MHz    | 28.43                         | 19.83                  | 69.54        | -41.11      | 3.05       | 248.70    | H/V          | Passed    |
| 3  | 16.420706MHz    | 28.37                         | 19.89                  | 69.54        | -41.17      | 3.05       | 58.00     | H/V          | Passed    |
| 4  | 16.694949MHz    | 28.85                         | 19.92                  | 69.54        | -40.69      | 3.05       | 66.30     | H/V          | Passed    |
| 5  | 25.530703MHz    | 31.60                         | 20.98                  | 69.54        | -37.94      | 3.05       | 136.40    | H/V          | Passed    |
| 6  | 30MHz           | 30.05                         | 21.85                  | 40.00        | -9.95       | 3.05       | 268.90    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

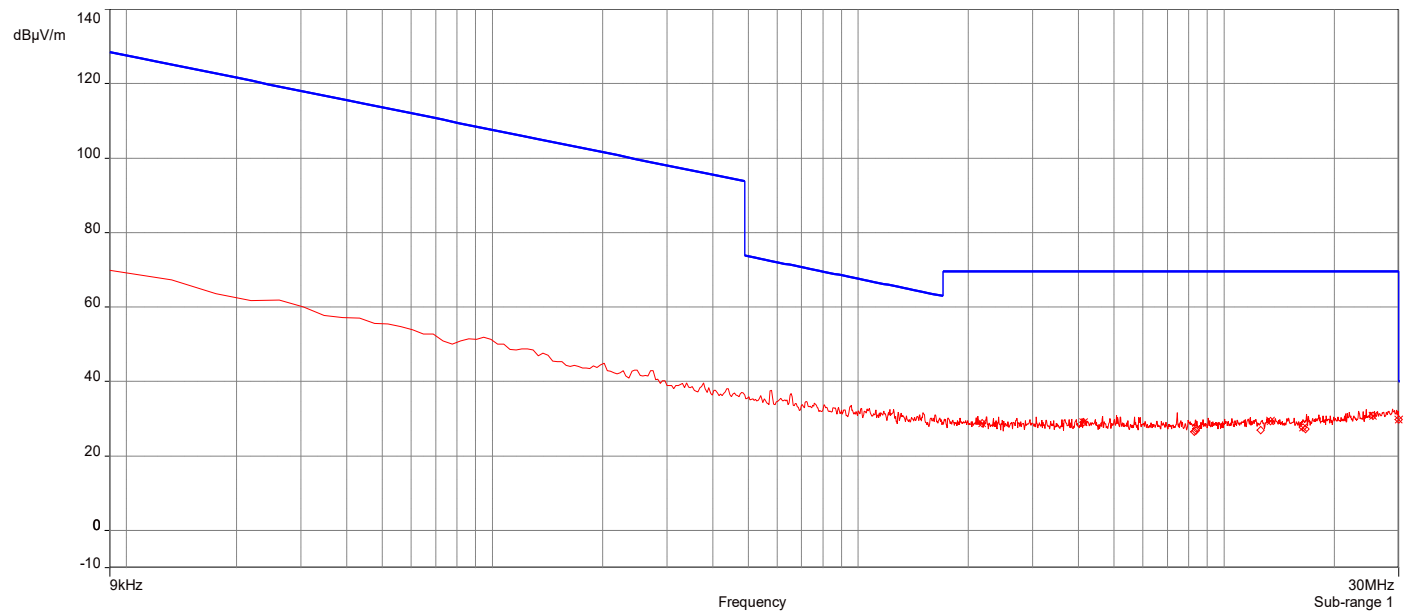
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-1 802.11a\_Ch 40\_9kHz-30MHz\_Perpendicular**

12/1/2022 3:16:24 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 28.74                         | 19.49                  | 69.54        | -40.80      | 3.05       | 1.50      | H/V          | Passed    |
| 2  | 4.126924MHz     | 29.04                         | 19.69                  | 69.54        | -40.50      | 3.05       | 190.30    | H/V          | Passed    |
| 3  | 13.382612MHz    | 29.32                         | 19.85                  | 69.54        | -40.22      | 3.05       | 137.60    | H/V          | Passed    |
| 4  | 16.420706MHz    | 27.69                         | 19.89                  | 69.54        | -41.85      | 3.05       | 310.80    | H/V          | Passed    |
| 5  | 25.526417MHz    | 30.76                         | 20.98                  | 69.54        | -38.78      | 3.05       | 55.10     | H/V          | Passed    |
| 6  | 30MHz           | 29.76                         | 21.85                  | 40.00        | -10.24      | 3.05       | 60.00     | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

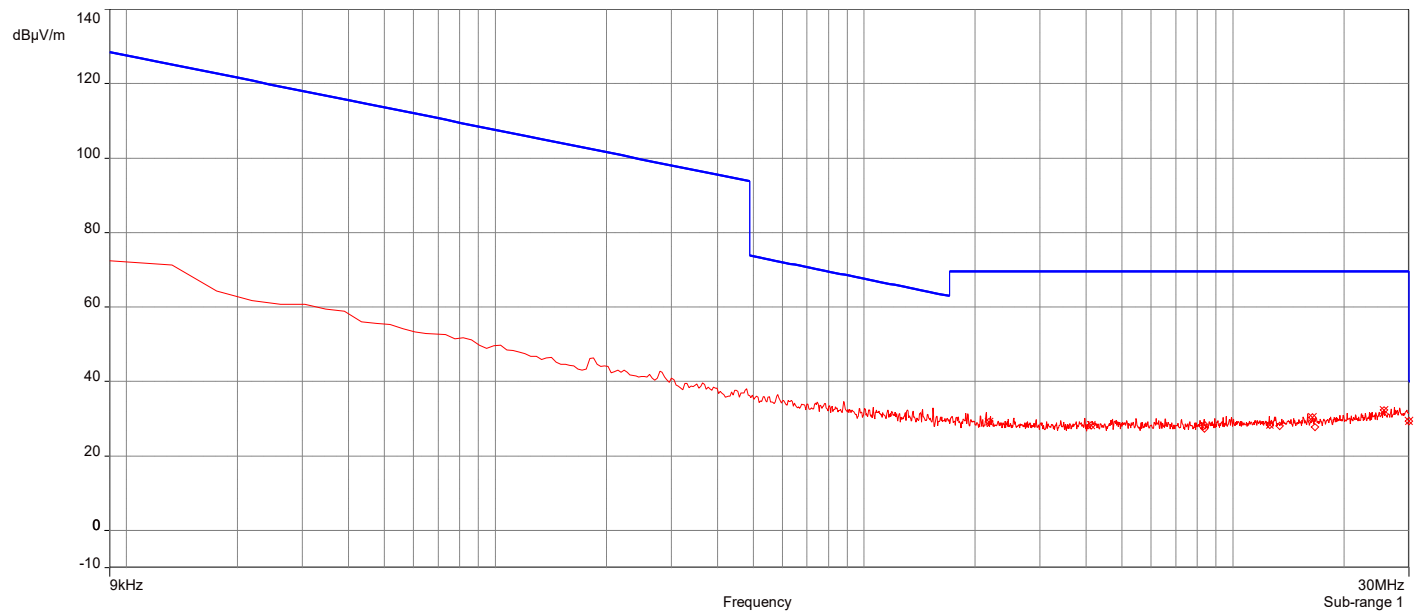
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-1 802.11ac\_Ch 40\_9kHz-30MHz\_Ground-Parallel**

12/28/2022 6:19:47 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 29.21                         | 19.49                  | 69.54        | -40.33      | 1.00       | 357.60    | H/V          | Passed    |
| 2  | 4.126924MHz     | 28.23                         | 19.69                  | 69.54        | -41.31      | 1.00       | 3.10      | H/V          | Passed    |
| 3  | 12.577024MHz    | 28.35                         | 19.83                  | 69.54        | -41.19      | 1.00       | 0.10      | H/V          | Passed    |
| 4  | 16.420706MHz    | 30.40                         | 19.89                  | 69.54        | -39.14      | 1.00       | 49.20     | H/V          | Passed    |
| 5  | 25.659254MHz    | 32.42                         | 20.99                  | 69.54        | -37.12      | 1.00       | 80.90     | H/V          | Passed    |
| 6  | 30MHz           | 29.36                         | 21.85                  | 40.00        | -10.64      | 1.00       | 337.60    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

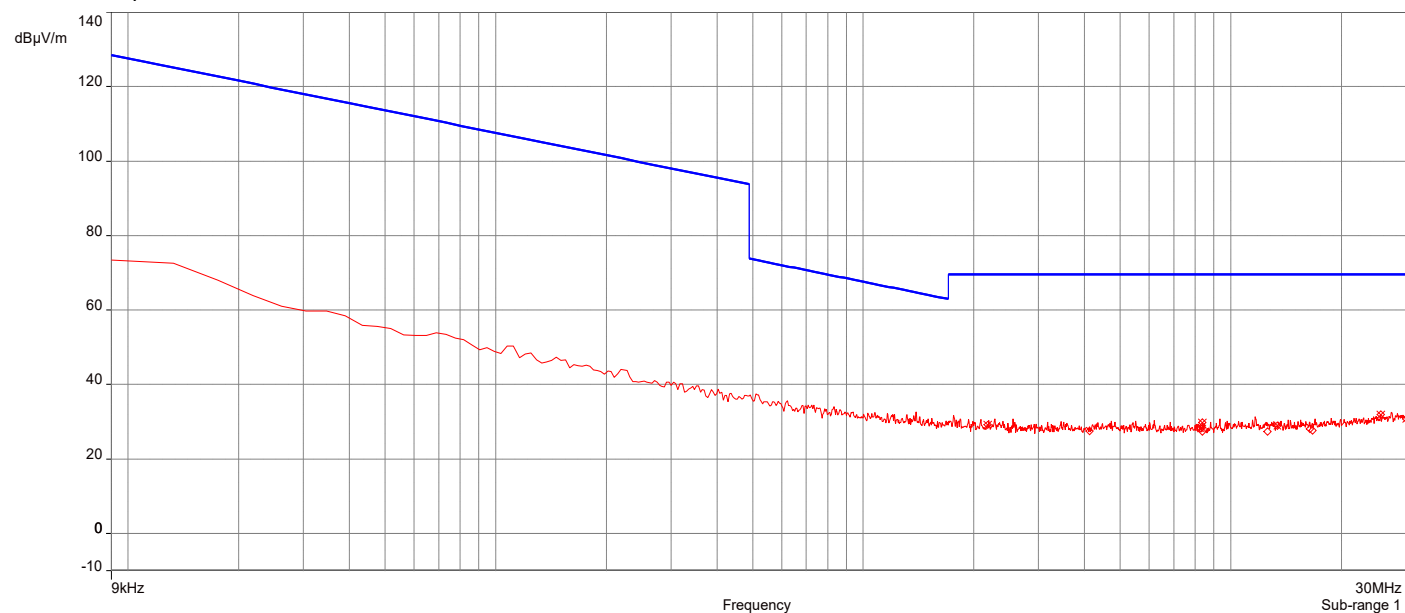
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-1 802.11ac\_Ch 40\_9kHz-30MHz\_Parallel**

12/28/2022 6:22:21 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 29.17                         | 19.49                  | 69.54        | -40.37      | 1.00       | 351.80    | H/V          | Passed    |
| 2  | 8.291984MHz     | 28.29                         | 19.45                  | 69.54        | -41.25      | 1.00       | 195.30    | H/V          | Passed    |
| 3  | 8.38197MHz      | 29.80                         | 19.45                  | 69.54        | -39.74      | 1.00       | 106.60    | H/V          | Passed    |
| 4  | 13.391182MHz    | 28.91                         | 19.85                  | 69.54        | -40.63      | 1.00       | 358.90    | H/V          | Passed    |
| 5  | 25.616403MHz    | 31.96                         | 20.99                  | 69.54        | -37.58      | 1.00       | 108.30    | H/V          | Passed    |
| 6  | 30MHz           | 30.73                         | 21.85                  | 40.00        | -9.27       | 1.00       | 216.00    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

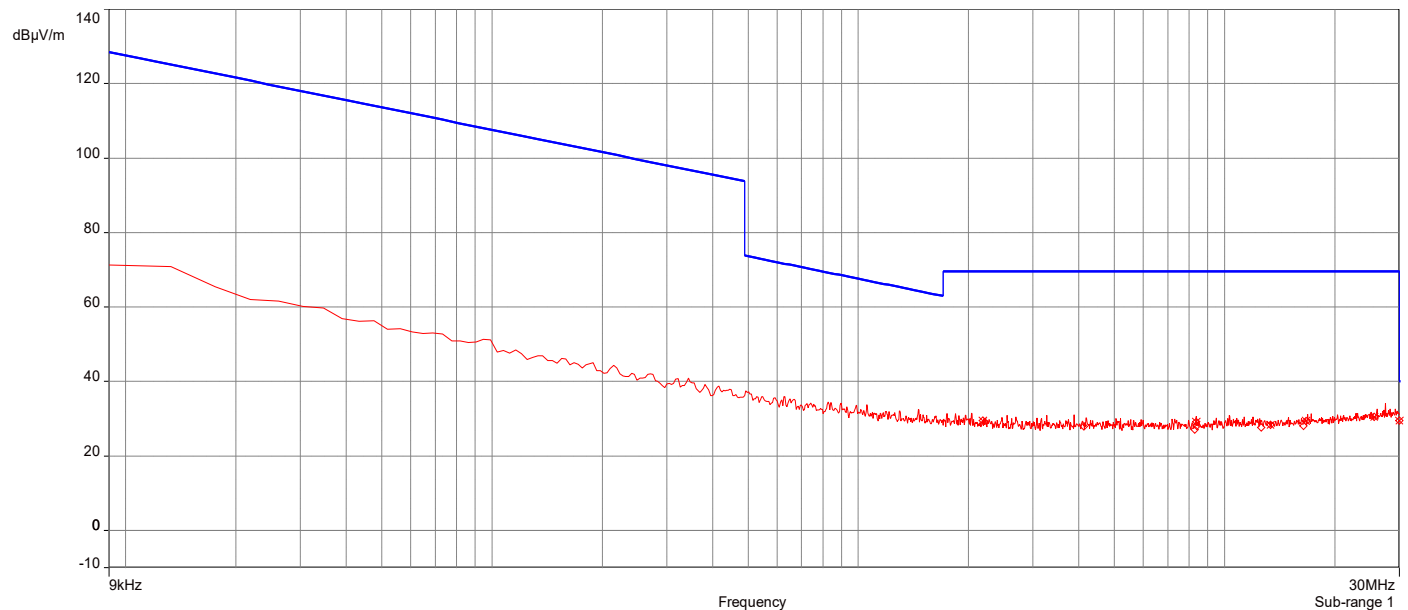
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-1 802.11ac\_Ch 40\_9kHz-30MHz\_Perpendicular**

12/28/2022 6:17:26 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.185801MHz     | 29.48                         | 19.49                  | 69.54        | -40.06      | 1.00       | 345.50    | H/V          | Passed    |
| 2  | 8.364829MHz     | 29.26                         | 19.45                  | 69.54        | -40.28      | 1.00       | 52.90     | H/V          | Passed    |
| 3  | 13.361187MHz    | 28.43                         | 19.85                  | 69.54        | -41.11      | 1.00       | 339.50    | H/V          | Passed    |
| 4  | 16.694949MHz    | 29.38                         | 19.92                  | 69.54        | -40.16      | 1.00       | 113.40    | H/V          | Passed    |
| 5  | 25.599263MHz    | 30.56                         | 20.99                  | 69.54        | -38.98      | 1.00       | 259.10    | H/V          | Passed    |
| 6  | 30MHz           | 29.46                         | 21.85                  | 40.00        | -10.54      | 1.00       | 344.20    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

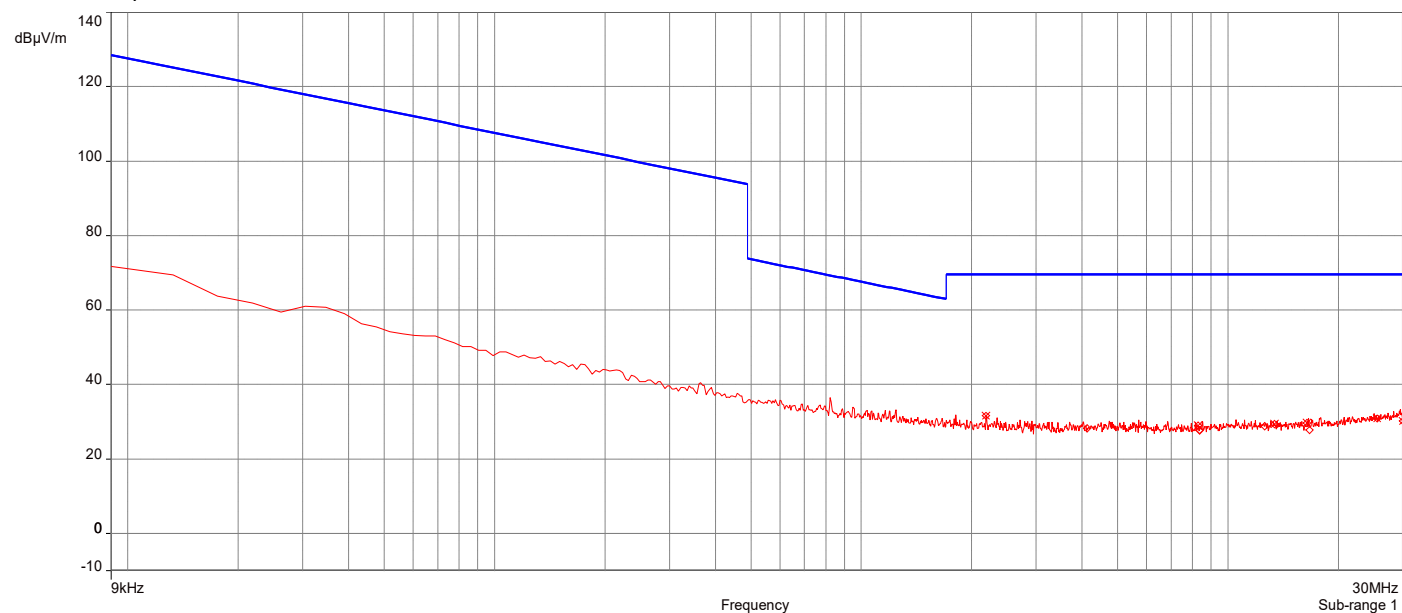


**AH22100701-HAR-053#5\_5G UNII-3 802.11n\_Ch 157\_9kHz-30MHz\_Ground-Parallel**

12/1/2022 3:26:56 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.190086MHz     | 31.65                         | 19.49                  | 69.54        | -37.89      | 3.05       | 50.70     | H/V          | Passed    |
| 2  | 8.291984MHz     | 28.90                         | 19.45                  | 69.54        | -40.64      | 3.05       | 222.30    | H/V          | Passed    |
| 3  | 13.391182MHz    | 29.37                         | 19.85                  | 69.54        | -40.17      | 3.05       | 110.90    | H/V          | Passed    |
| 4  | 16.420706MHz    | 29.63                         | 19.89                  | 69.54        | -39.91      | 3.05       | 151.10    | H/V          | Passed    |
| 5  | 25.500707MHz    | 30.94                         | 20.98                  | 69.54        | -38.60      | 3.05       | 207.00    | H/V          | Passed    |
| 6  | 30MHz           | 30.25                         | 21.85                  | 40.00        | -9.75       | 3.05       | 182.10    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

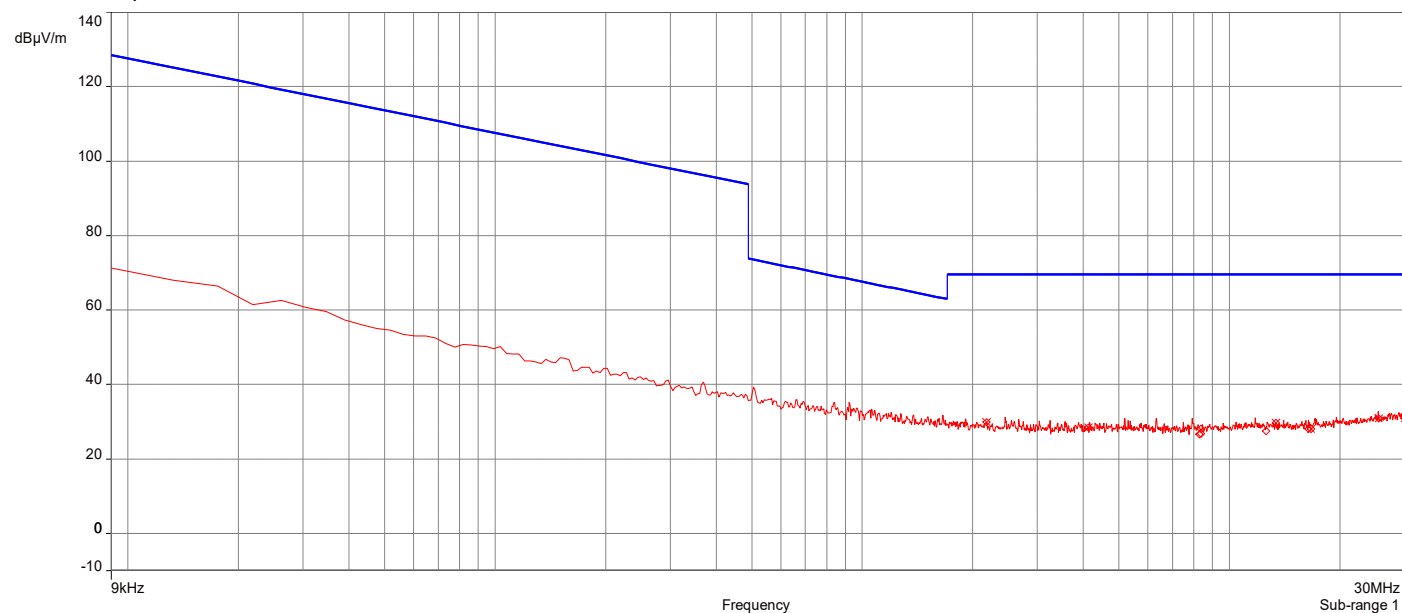
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-3 802.11n\_Ch 157\_9kHz-30MHz\_Parallel**

12/1/2022 3:38:08 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 29.88                         | 19.49                  | 69.54        | -39.66      | 1.00       | 166.20    | H/V          | Passed    |
| 2  | 4.126924MHz     | 28.48                         | 19.69                  | 69.54        | -41.06      | 1.00       | 248.10    | H/V          | Passed    |
| 3  | 13.391182MHz    | 29.61                         | 19.85                  | 69.54        | -39.93      | 1.00       | 38.20     | H/V          | Passed    |
| 4  | 16.694949MHz    | 28.12                         | 19.92                  | 69.54        | -41.42      | 1.00       | 127.80    | H/V          | Passed    |
| 5  | 25.556413MHz    | 30.92                         | 20.98                  | 69.54        | -38.62      | 1.00       | 16.50     | H/V          | Passed    |
| 6  | 30MHz           | 30.95                         | 21.85                  | 40.00        | -9.05       | 1.00       | 1.10      | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

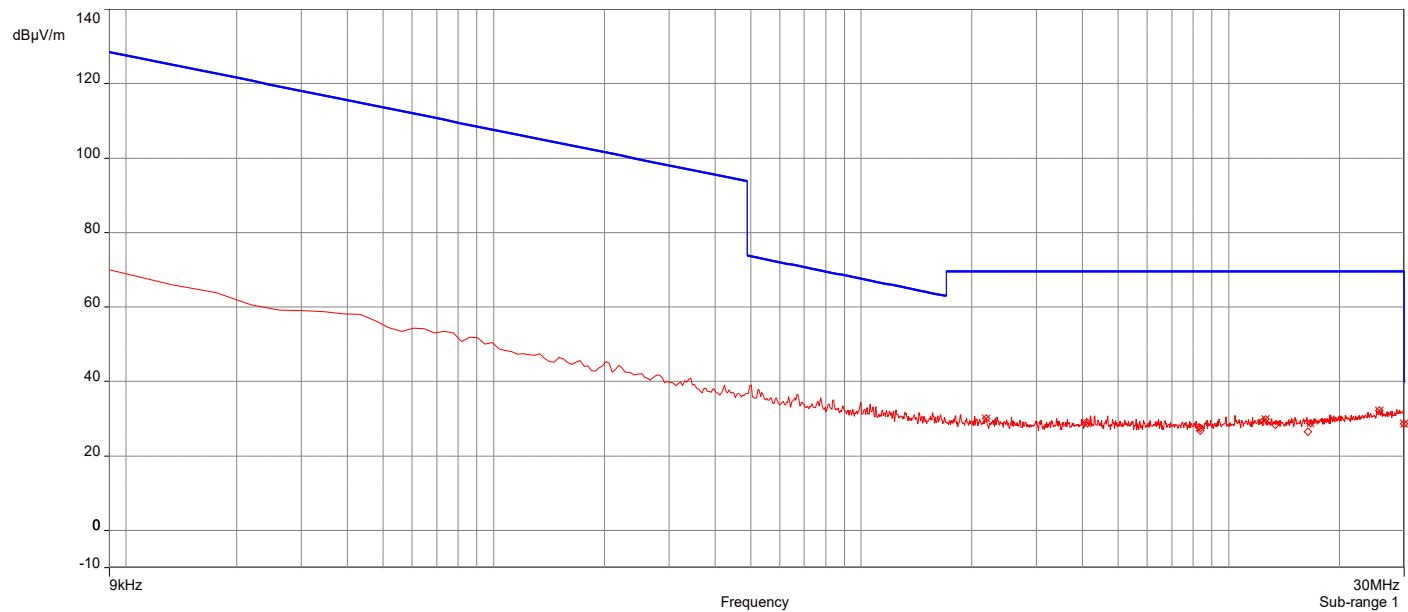
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-3 802.11n\_Ch 157\_9kHz-30MHz\_Perpendicular**

12/1/2022 3:31:05 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.185801MHz     | 30.03                         | 19.49                  | 69.54        | -39.51      | 3.05       | 354.20    | H/V          | Passed    |
| 2  | 4.126924MHz     | 28.73                         | 19.69                  | 69.54        | -40.81      | 3.05       | 30.20     | H/V          | Passed    |
| 3  | 12.577024MHz    | 30.00                         | 19.83                  | 69.54        | -39.54      | 3.05       | 0.50      | H/V          | Passed    |
| 4  | 16.694949MHz    | 28.75                         | 19.92                  | 69.54        | -40.79      | 3.05       | 22.40     | H/V          | Passed    |
| 5  | 25.663539MHz    | 32.24                         | 20.99                  | 69.54        | -37.30      | 3.05       | 246.60    | H/V          | Passed    |
| 6  | 30MHz           | 28.71                         | 21.85                  | 40.00        | -11.29      | 3.05       | 196.30    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

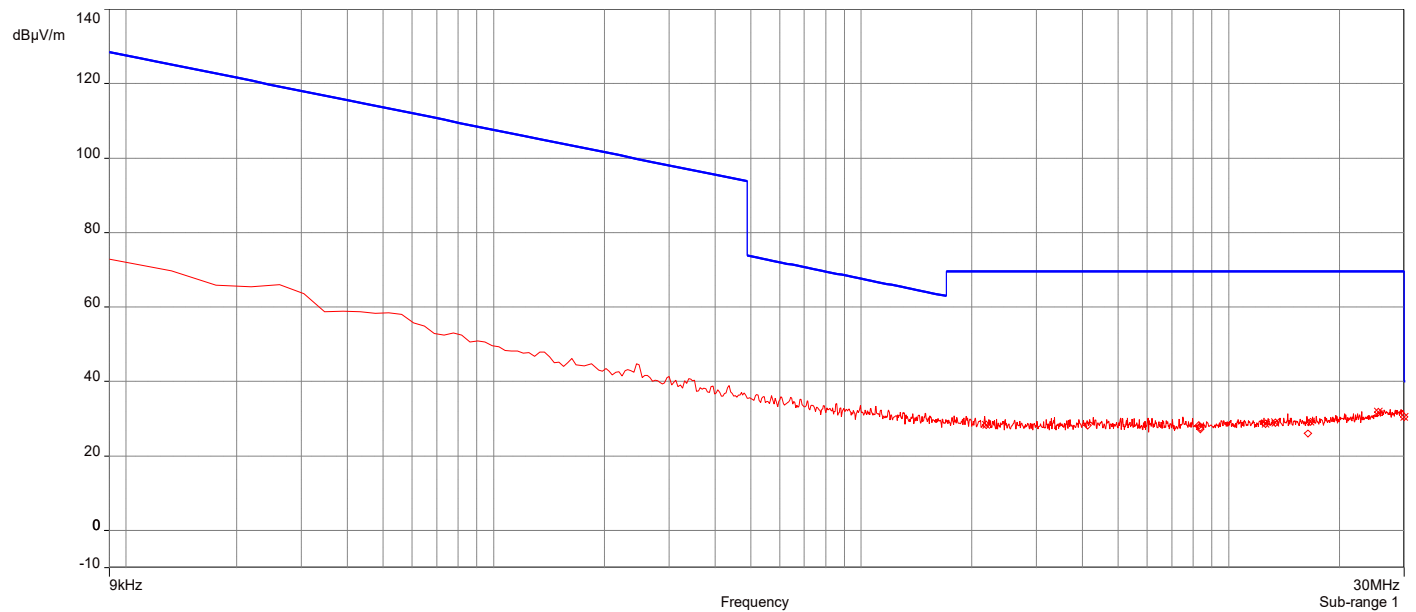
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-3 802.11a\_Ch 157\_9kHz-30MHz\_Ground-Parallel**

12/28/2022 6:30:12 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.185801MHz     | 28.39                         | 19.49                  | 69.54        | -41.15      | 1.00       | 357.80    | H/V          | Passed    |
| 2  | 12.577024MHz    | 28.61                         | 19.83                  | 69.54        | -40.93      | 1.00       | 48.50     | H/V          | Passed    |
| 3  | 13.374042MHz    | 29.00                         | 19.85                  | 69.54        | -40.54      | 1.00       | 8.20      | H/V          | Passed    |
| 4  | 16.694949MHz    | 29.17                         | 19.92                  | 69.54        | -40.37      | 1.00       | 103.90    | H/V          | Passed    |
| 5  | 25.500707MHz    | 31.82                         | 20.98                  | 69.54        | -37.72      | 1.00       | 53.30     | H/V          | Passed    |
| 6  | 30MHz           | 30.44                         | 21.85                  | 40.00        | -9.56       | 1.00       | 53.30     | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

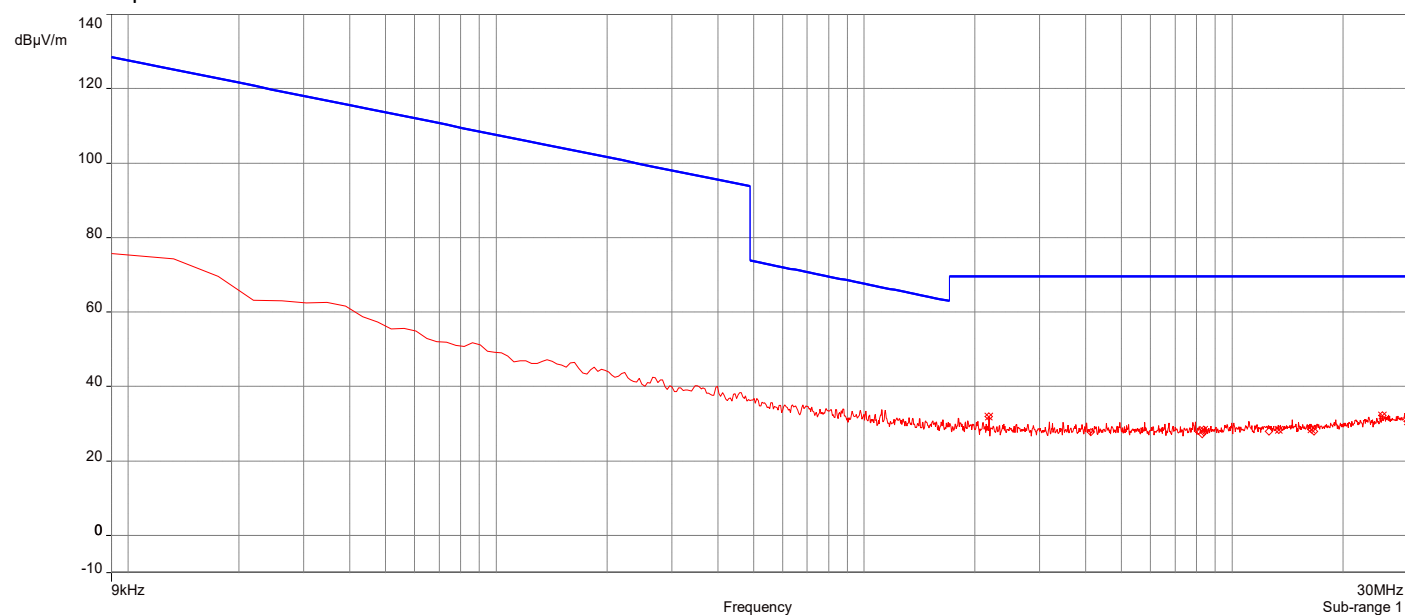
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-3 802.11a\_Ch 157\_9kHz-30MHz\_Parallel**

12/28/2022 6:27:58 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 31.99                         | 19.49                  | 69.54        | -37.55      | 1.00       | 0.10      | H/V          | Passed    |
| 2  | 8.364829MHz     | 28.39                         | 19.45                  | 69.54        | -41.15      | 1.00       | 355.90    | H/V          | Passed    |
| 3  | 13.399752MHz    | 28.37                         | 19.85                  | 69.54        | -41.17      | 1.00       | 172.30    | H/V          | Passed    |
| 4  | 16.420706MHz    | 28.58                         | 19.89                  | 69.54        | -40.96      | 1.00       | 327.50    | H/V          | Passed    |
| 5  | 25.607833MHz    | 32.19                         | 20.99                  | 69.54        | -37.35      | 1.00       | 90.10     | H/V          | Passed    |
| 6  | 30MHz           | 30.67                         | 21.85                  | 40.00        | -9.33       | 1.00       | 252.60    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

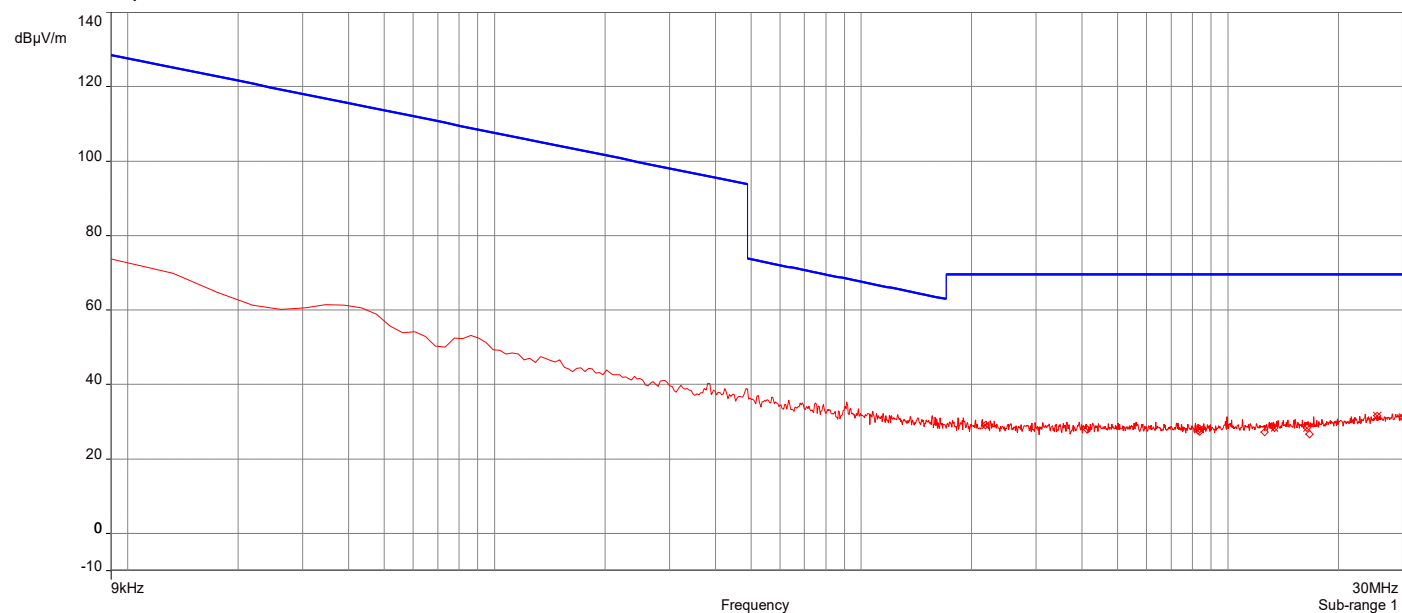
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-3 802.11a\_Ch 157\_9kHz-30MHz\_Perpendicular**

12/28/2022 6:33:03 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.177231MHz     | 29.06                         | 19.49                  | 69.54        | -40.48      | 1.00       | 0.10      | H/V          | Passed    |
| 2  | 8.377685MHz     | 28.10                         | 19.45                  | 69.54        | -41.44      | 1.00       | 110.10    | H/V          | Passed    |
| 3  | 13.369757MHz    | 28.43                         | 19.85                  | 69.54        | -41.11      | 1.00       | 353.90    | H/V          | Passed    |
| 4  | 16.420706MHz    | 28.39                         | 19.89                  | 69.54        | -41.15      | 1.00       | 160.10    | H/V          | Passed    |
| 5  | 25.534988MHz    | 31.58                         | 20.98                  | 69.54        | -37.96      | 1.00       | 323.10    | H/V          | Passed    |
| 6  | 30MHz           | 31.22                         | 21.85                  | 40.00        | -8.78       | 1.00       | 0.10      | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

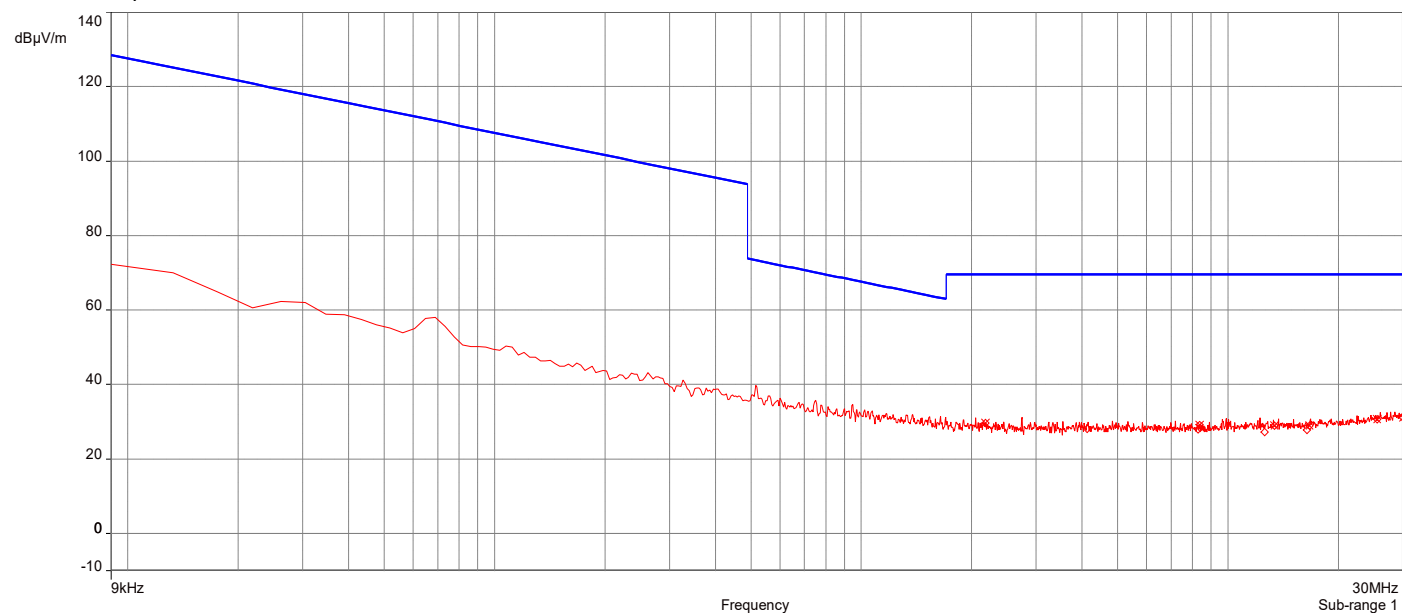
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-3 802.11ac\_Ch 157\_9kHz-30MHz\_Ground-Parallel**

12/28/2022 6:40:00 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 29.60                         | 19.49                  | 69.54        | -39.94      | 1.00       | 0.10      | H/V          | Passed    |
| 2  | 8.364829MHz     | 29.21                         | 19.45                  | 69.54        | -40.33      | 1.00       | 116.20    | H/V          | Passed    |
| 3  | 13.395467MHz    | 28.98                         | 19.85                  | 69.54        | -40.56      | 1.00       | 32.70     | H/V          | Passed    |
| 4  | 16.694949MHz    | 28.92                         | 19.92                  | 69.54        | -40.62      | 1.00       | 6.50      | H/V          | Passed    |
| 5  | 25.543558MHz    | 30.69                         | 20.98                  | 69.54        | -38.85      | 1.00       | 323.50    | H/V          | Passed    |
| 6  | 30MHz           | 31.05                         | 21.85                  | 40.00        | -8.95       | 1.00       | 46.30     | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

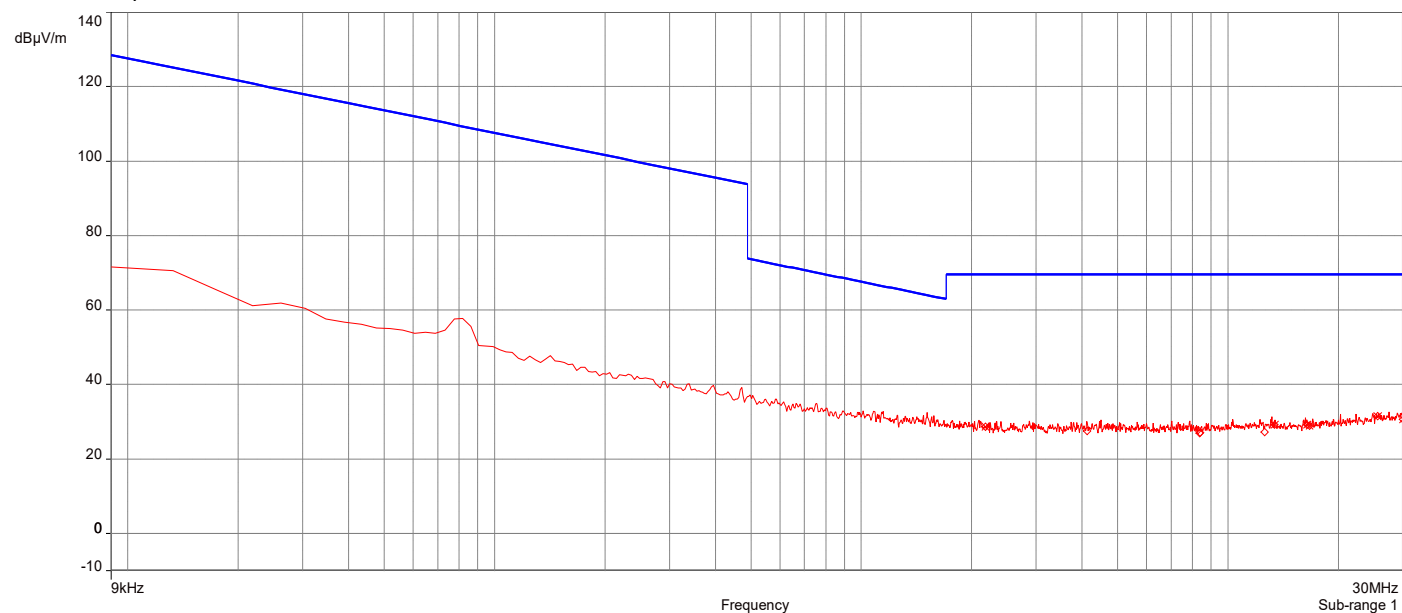
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#4\_5G UNII-3 802.11ac\_Ch 157\_9kHz-30MHz\_Parallel**

12/28/2022 6:43:27 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.181516MHz     | 28.64                         | 19.49                  | 69.54        | -40.90      | 1.00       | 57.60     | H/V          | Passed    |
| 2  | 13.369757MHz    | 29.21                         | 19.85                  | 69.54        | -40.33      | 1.00       | 111.90    | H/V          | Passed    |
| 3  | 16.420706MHz    | 29.23                         | 19.89                  | 69.54        | -40.31      | 1.00       | 124.50    | H/V          | Passed    |
| 4  | 16.694949MHz    | 28.97                         | 19.92                  | 69.54        | -40.57      | 1.00       | 126.20    | H/V          | Passed    |
| 5  | 25.633544MHz    | 31.48                         | 20.99                  | 69.54        | -38.06      | 1.00       | 191.90    | H/V          | Passed    |
| 6  | 30MHz           | 30.59                         | 21.85                  | 40.00        | -9.41       | 1.00       | 286.80    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

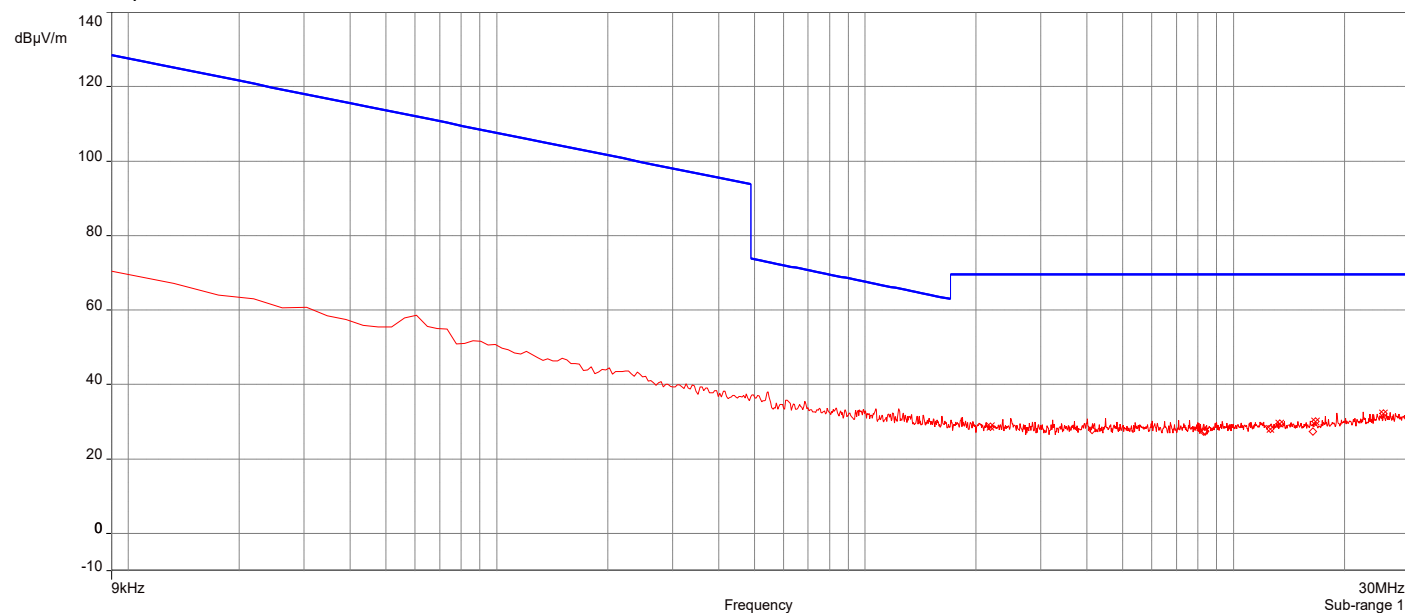


**AH22100701-HAR-053#4\_5G UNII-3 802.11ac\_Ch 157\_9kHz-30MHz\_Perpendicular**

12/28/2022 6:37:42 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 2.190086MHz     | 28.68                         | 19.49                  | 69.54        | -40.86      | 1.00       | 0.10      | H/V          | Passed    |
| 2  | 12.577024MHz    | 28.04                         | 19.83                  | 69.54        | -41.50      | 1.00       | 112.00    | H/V          | Passed    |
| 3  | 13.361187MHz    | 29.48                         | 19.85                  | 69.54        | -40.06      | 1.00       | 276.10    | H/V          | Passed    |
| 4  | 16.694949MHz    | 30.14                         | 19.92                  | 69.54        | -39.40      | 1.00       | 358.90    | H/V          | Passed    |
| 5  | 25.552128MHz    | 32.27                         | 20.98                  | 69.54        | -37.27      | 1.00       | 337.40    | H/V          | Passed    |
| 6  | 30MHz           | 29.60                         | 21.85                  | 40.00        | -10.40      | 1.00       | 169.60    | H/V          | Passed    |

**Overall Graphs:**



**Remarks:**

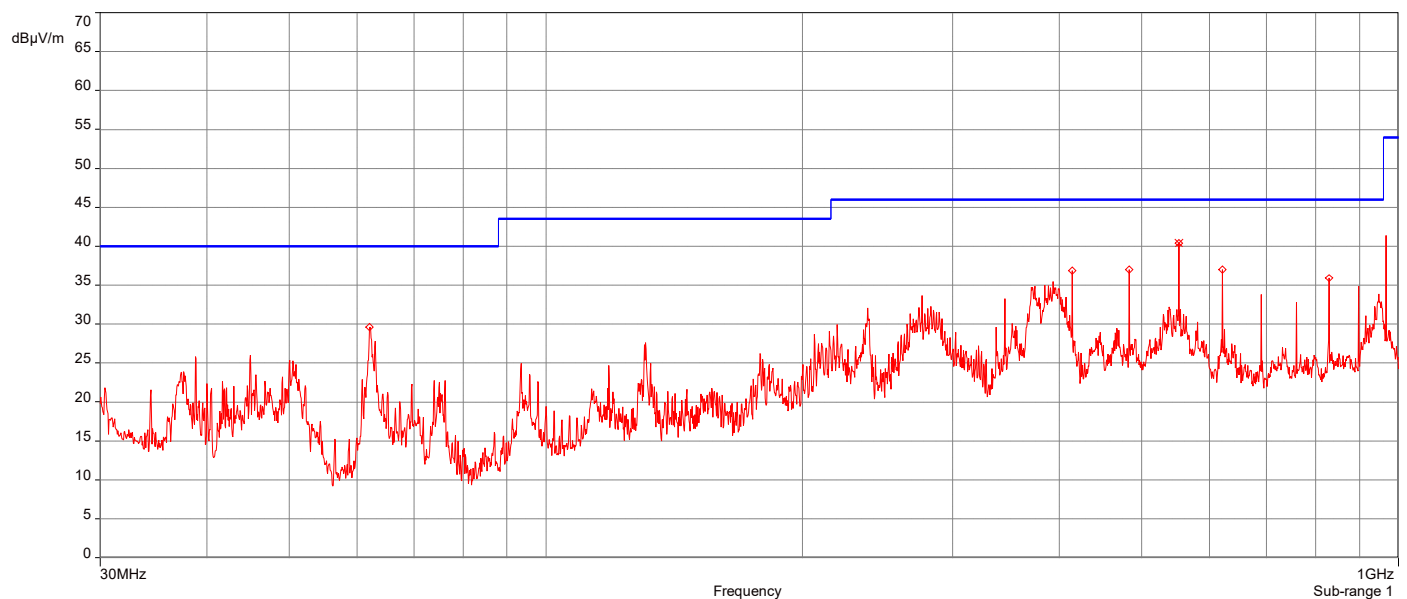
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

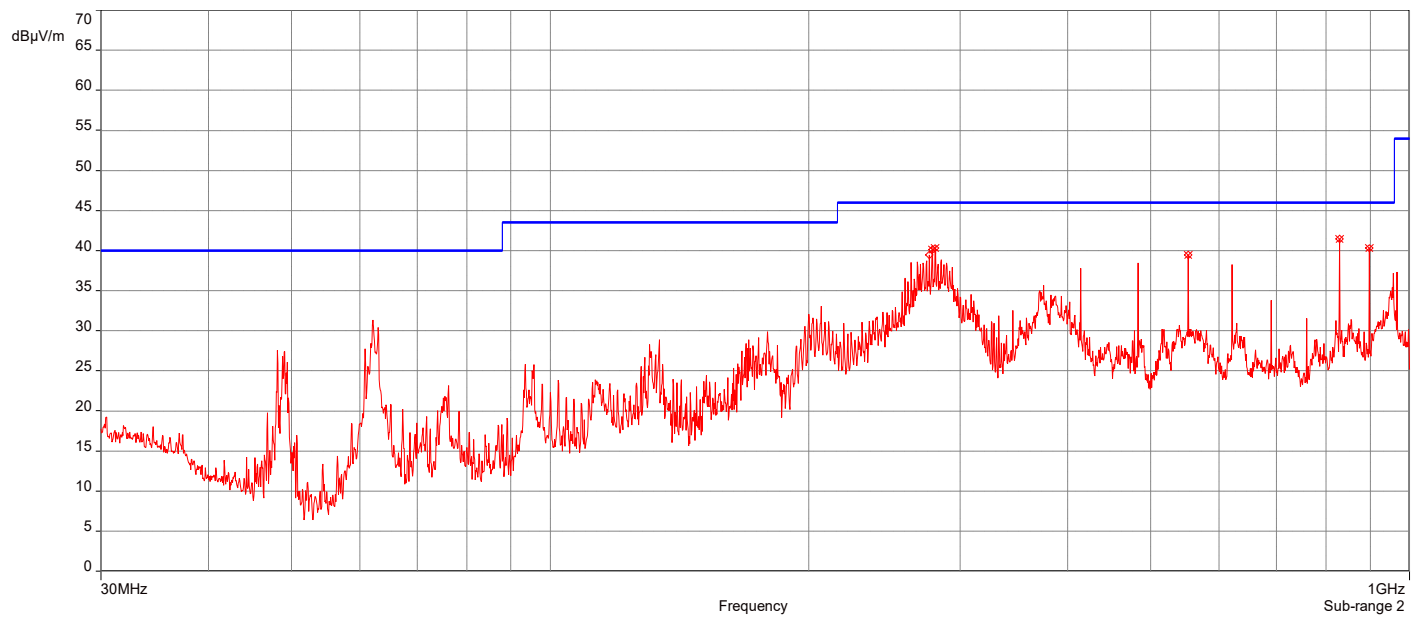
**AH22100701-HAR-053#5\_5G UNII-1 802.11a\_Ch 40\_30MHz-1GHz**

11/29/2022 10:30:10 AM

| No | Frequency (MHz) | Level Q-<br>Peak<br>Reading<br>(dBμV/m) | Correction<br>Factor (dB) | Limit<br>dBμV/m | Margin<br>(dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-----------------------------------------|---------------------------|-----------------|----------------|------------|-----------|--------------|-----------|
| 1. | 552.40426MHz    | 40.42                                   | -6.60                     | 46.00           | -5.58          | 1.25       | 222.40    | Vertical     | Passed    |
| 2. | 278.33461MHz    | 40.10                                   | -11.92                    | 46.00           | -5.90          | 1.50       | 165.00    | Horizontal   | Passed    |
| 3. | 280.56003MHz    | 40.33                                   | -11.96                    | 46.00           | -5.67          | 1.00       | 307.70    | Horizontal   | Passed    |
| 4. | 552.40426MHz    | 39.45                                   | -5.66                     | 46.00           | -6.55          | 1.00       | 297.00    | Horizontal   | Passed    |
| 5. | 828.64227MHz    | 41.43                                   | -0.85                     | 46.00           | -4.57          | 1.00       | 135.50    | Horizontal   | Passed    |
| 6. | 897.68751MHz    | 40.36                                   | -0.39                     | 46.00           | -5.64          | 1.50       | 138.00    | Horizontal   | Passed    |

**Overall Graphs:**





Remarks:

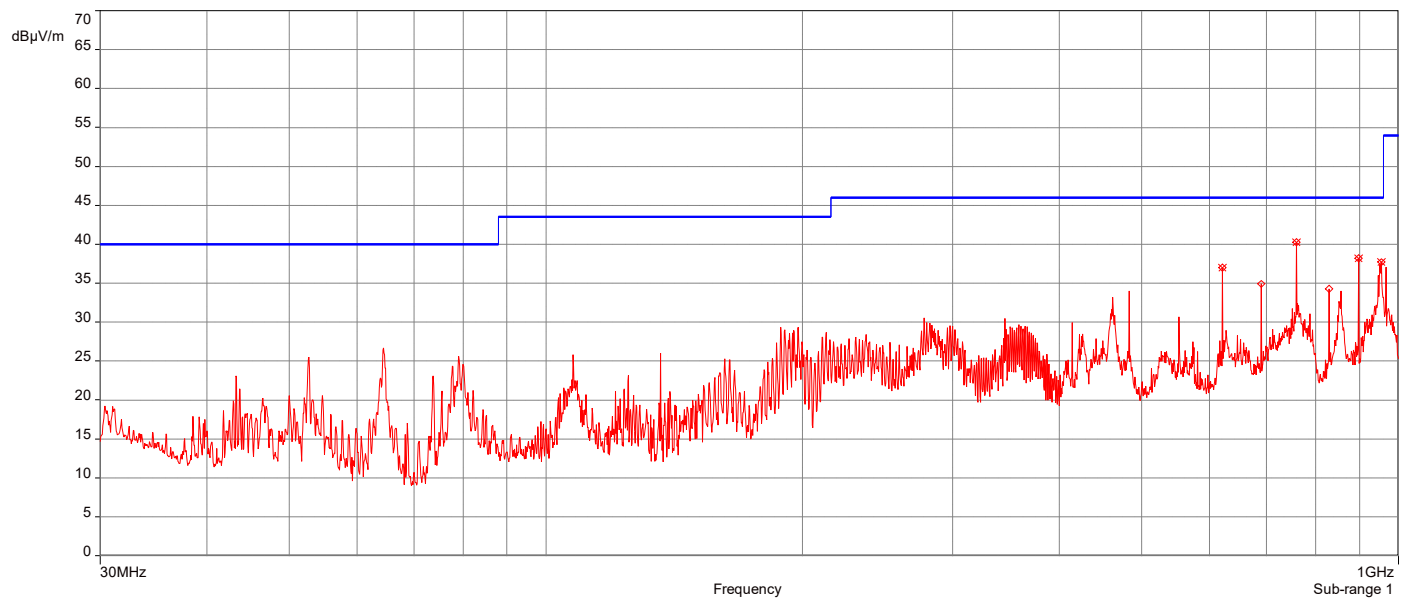
1. Level Q-Peak Reading (dBµV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

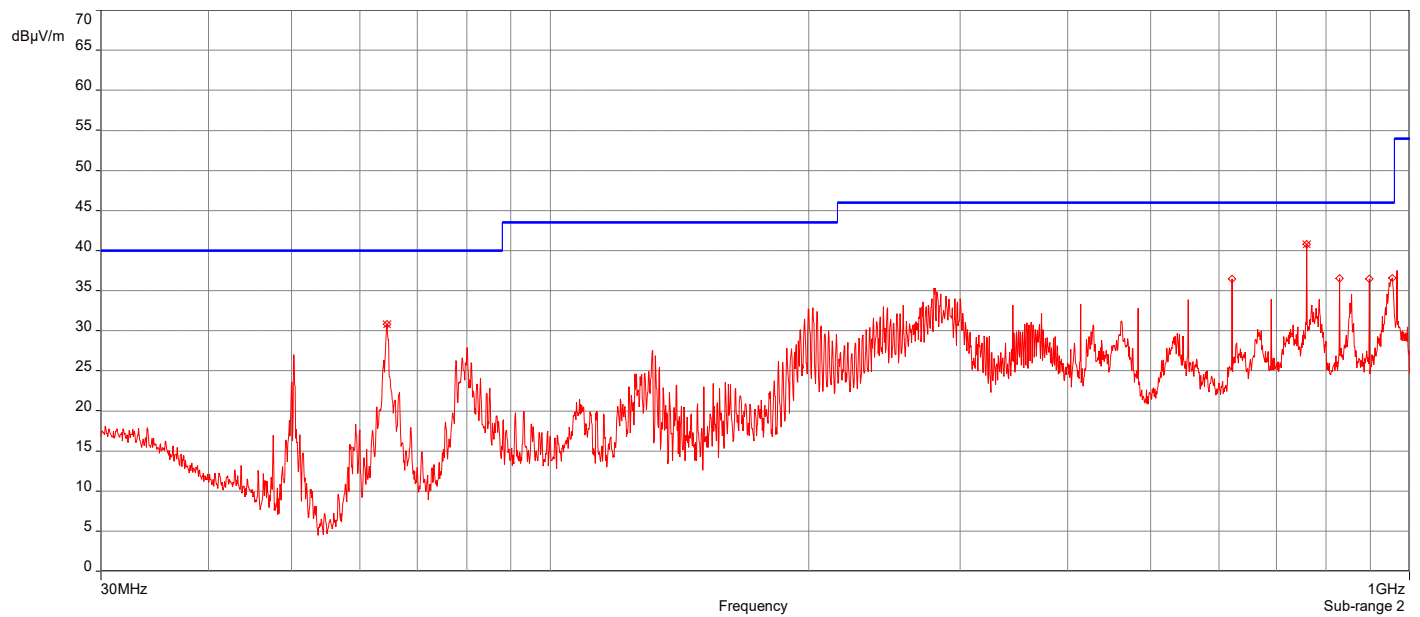
**AH22100701-HAR-053#5\_5G UNII-1 802.11ac\_Ch 40\_30MHz-1GHz**

12/29/2022 5:20:14 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 621.4495MHz     | 36.98                         | -5.19                  | 46.00        | -9.02       | 1.00       | 107.60    | Vertical     | Passed    |
| 2  | 759.59704MHz    | 40.24                         | -3.29                  | 46.00        | -5.76       | 1.25       | 155.40    | Vertical     | Passed    |
| 3  | 897.68751MHz    | 38.21                         | -1.69                  | 46.00        | -7.79       | 1.25       | 181.80    | Vertical     | Passed    |
| 4  | 955.32031MHz    | 37.73                         | -1.04                  | 46.00        | -8.27       | 1.25       | 340.30    | Vertical     | Passed    |
| 5  | 64.579681MHz    | 30.80                         | -17.94                 | 40.00        | -9.20       | 4.00       | 8.00      | Horizontal   | Passed    |
| 6  | 759.59704MHz    | 40.80                         | -2.19                  | 46.00        | -5.20       | 1.00       | 69.00     | Horizontal   | Passed    |

Overall Graphs:





Remarks:

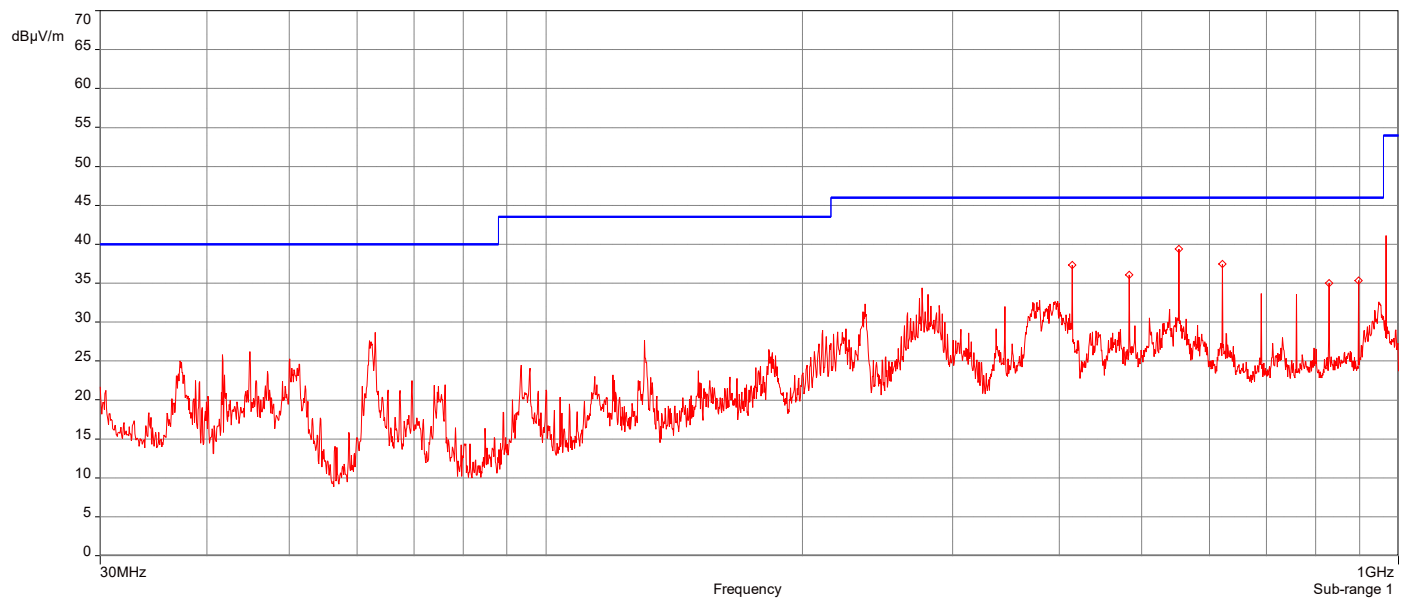
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

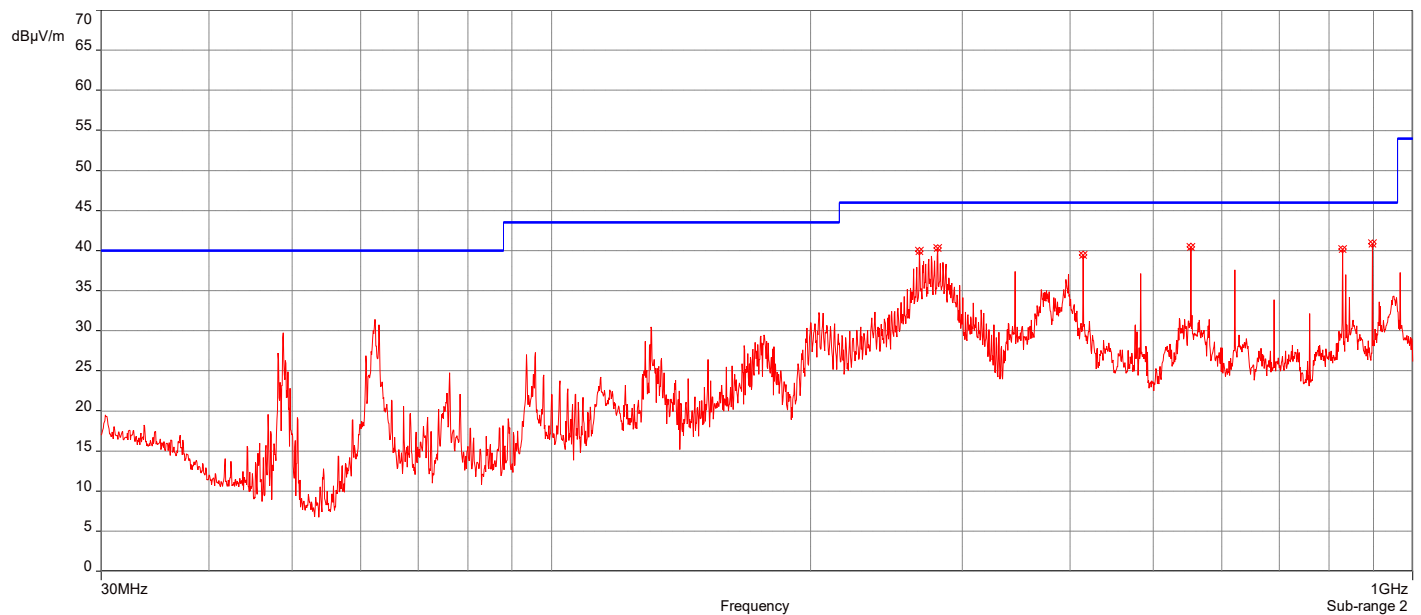
**AH22100701-HAR-053#5\_5G UNII-1 802.11ac\_Ch 38\_30MHz-1GHz**

11/29/2022 11:35:27 AM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 267.54986MHz    | 39.92                         | -11.99                 | 46.00        | -6.08       | 1.50       | 307.60    | Horizontal   | Passed    |
| 2  | 280.67416MHz    | 40.33                         | -11.95                 | 46.00        | -5.67       | 1.25       | 189.90    | Horizontal   | Passed    |
| 3  | 414.31378MHz    | 39.45                         | -8.30                  | 46.00        | -6.55       | 1.25       | 200.40    | Horizontal   | Passed    |
| 4  | 552.40426MHz    | 40.43                         | -5.66                  | 46.00        | -5.57       | 1.00       | 291.10    | Horizontal   | Passed    |
| 5  | 828.64227MHz    | 40.22                         | -0.85                  | 46.00        | -5.78       | 1.00       | 142.60    | Horizontal   | Passed    |
| 6  | 897.68751MHz    | 40.86                         | -0.39                  | 46.00        | -5.14       | 1.50       | 140.40    | Horizontal   | Passed    |

Overall Graphs:





Remarks:

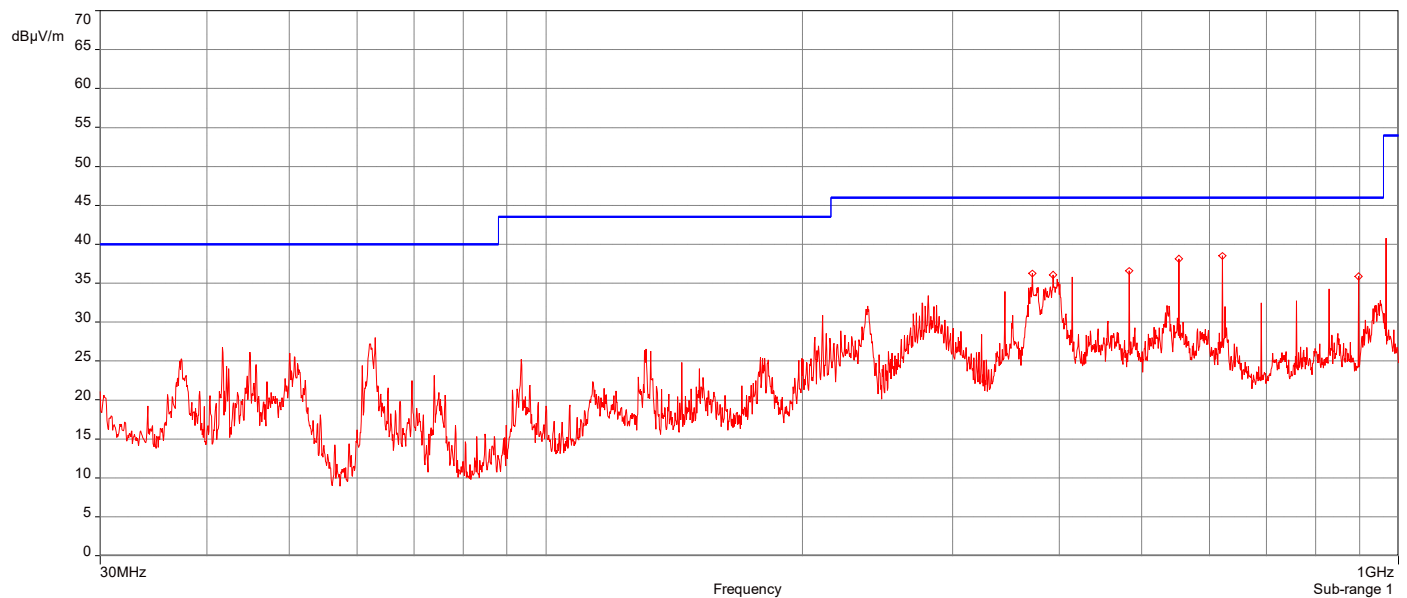
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-1 802.11ac\_Ch 46\_30MHz-1GHz**

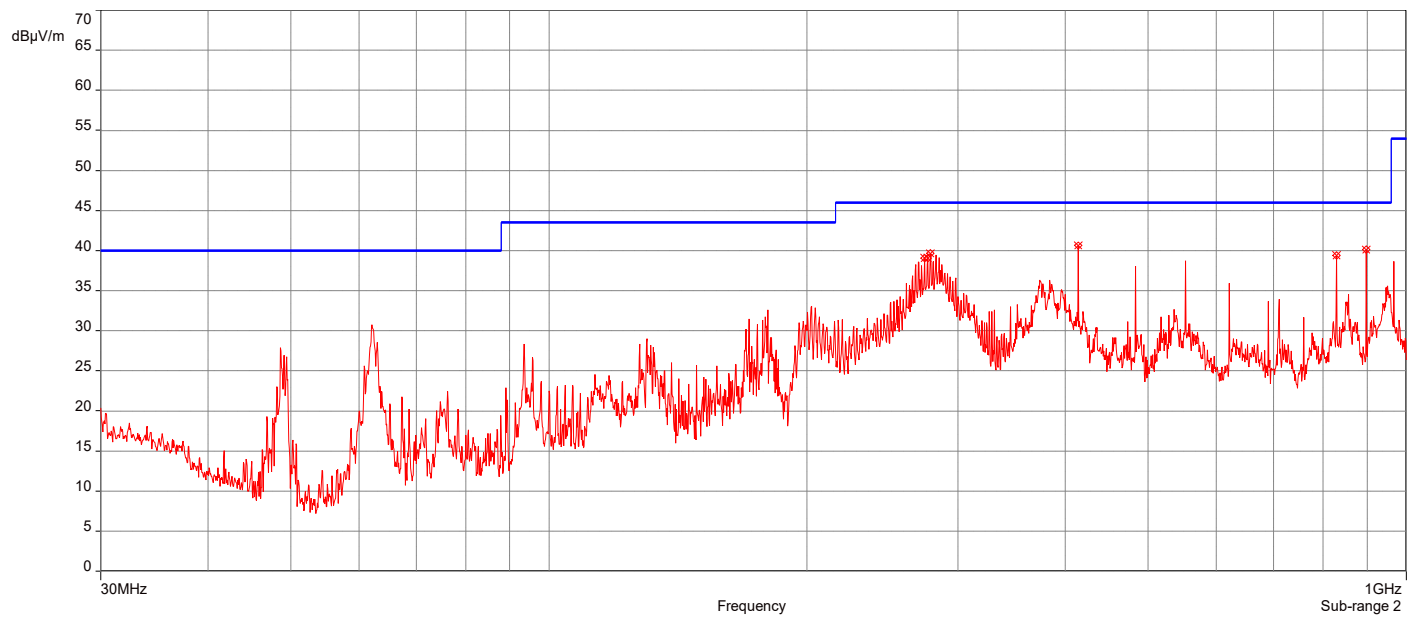
11/29/2022 12:03:15 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 274.16907MHz    | 39.07                         | -11.91                 | 46.00        | -6.93       | 1.00       | 161.00    | Horizontal   | Passed    |
| 2  | 276.45156MHz    | 39.07                         | -11.97                 | 46.00        | -6.93       | 1.50       | 304.50    | Horizontal   | Passed    |
| 3  | 278.56286MHz    | 39.69                         | -11.93                 | 46.00        | -6.31       | 1.50       | 182.40    | Horizontal   | Passed    |
| 4  | 414.31378MHz    | 40.69                         | -8.30                  | 46.00        | -5.31       | 1.00       | 210.10    | Horizontal   | Passed    |
| 5  | 828.64227MHz    | 39.42                         | -0.85                  | 46.00        | -6.58       | 1.00       | 139.10    | Horizontal   | Passed    |
| 6  | 897.68751MHz    | 40.11                         | -0.39                  | 46.00        | -5.89       | 1.50       | 125.50    | Horizontal   | Passed    |

Overall Graphs:







Remarks:

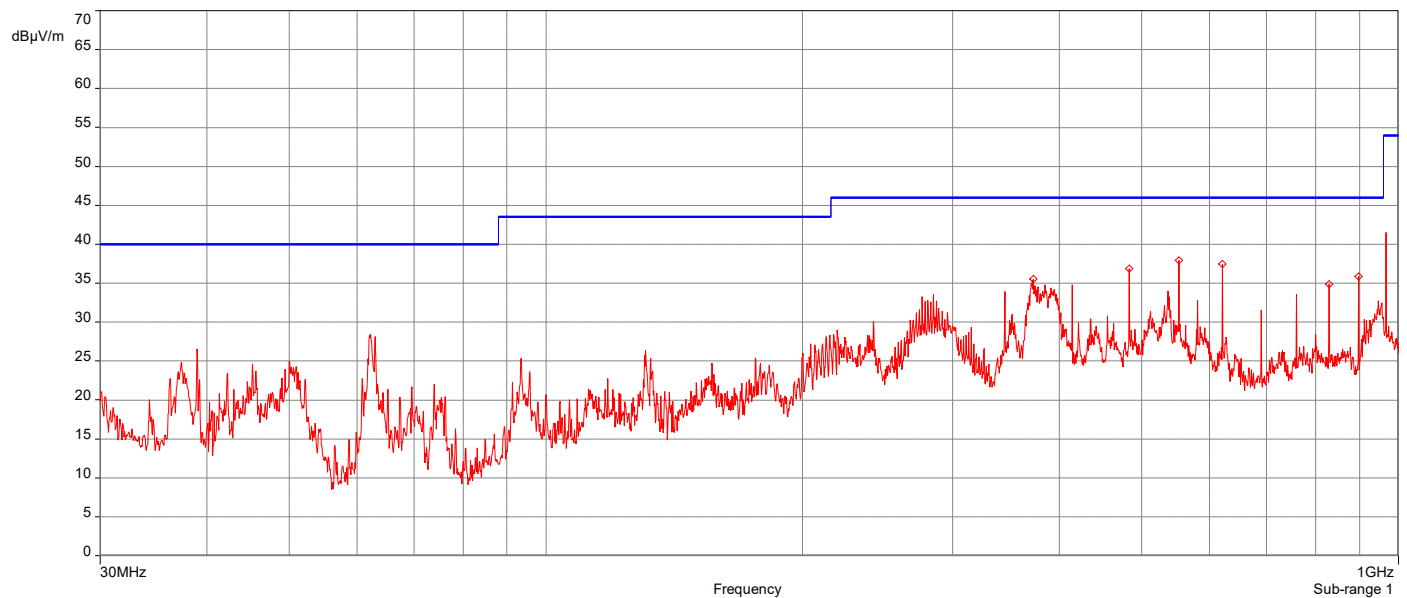
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

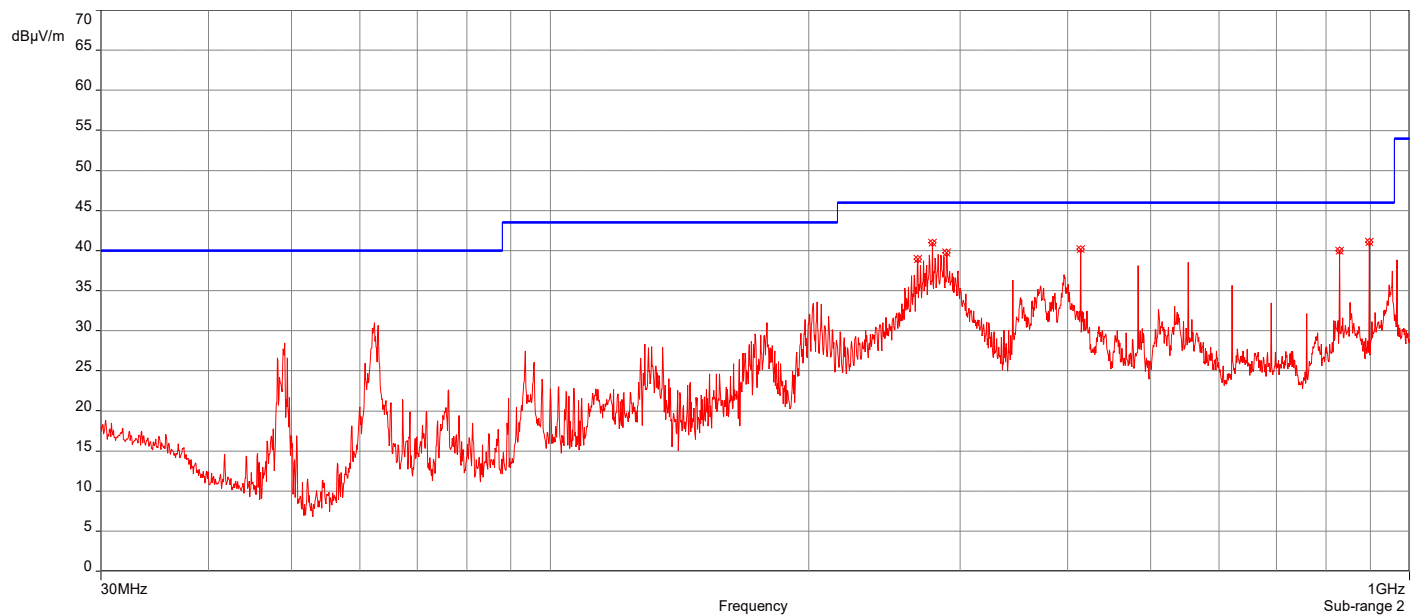
**AH22100701-HAR-053#5\_5G UNII-1 802.11ac\_Ch 42\_30MHz-1GHz**

11/30/2022 11:26:47 AM

| No | Frequency (MHz) | Level Q-<br>Peak<br>Reading<br>(dBμV/m) | Correction<br>Factor (dB) | Limit<br>dBμV/m | Margin<br>(dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-----------------------------------------|---------------------------|-----------------|----------------|------------|-----------|--------------|-----------|
| 1  | 267.60692MHz    | 38.94                                   | -11.99                    | 46.00           | -7.06          | 1.50       | 308.60    | Horizontal   | Passed    |
| 2  | 278.44873MHz    | 40.99                                   | -11.93                    | 46.00           | -5.01          | 1.00       | 170.60    | Horizontal   | Passed    |
| 3  | 289.40467MHz    | 39.75                                   | -11.66                    | 46.00           | -6.25          | 1.25       | 311.70    | Horizontal   | Passed    |
| 4  | 414.31378MHz    | 40.21                                   | -8.30                     | 46.00           | -5.79          | 1.25       | 209.10    | Horizontal   | Passed    |
| 5  | 828.64227MHz    | 40.02                                   | -0.85                     | 46.00           | -5.98          | 1.00       | 134.20    | Horizontal   | Passed    |
| 6  | 897.68751MHz    | 41.05                                   | -0.39                     | 46.00           | -4.95          | 1.50       | 132.40    | Horizontal   | Passed    |

Overall Graphs:





Remarks:

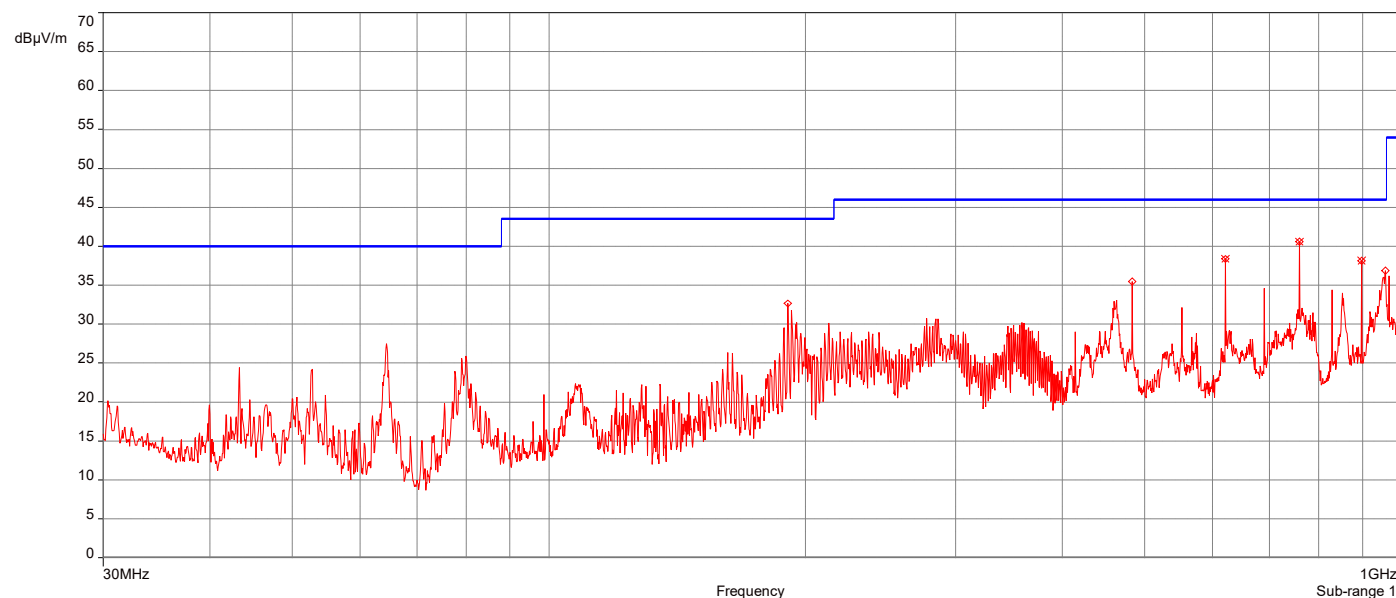
1. Level Q-Peak Reading (dBµV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

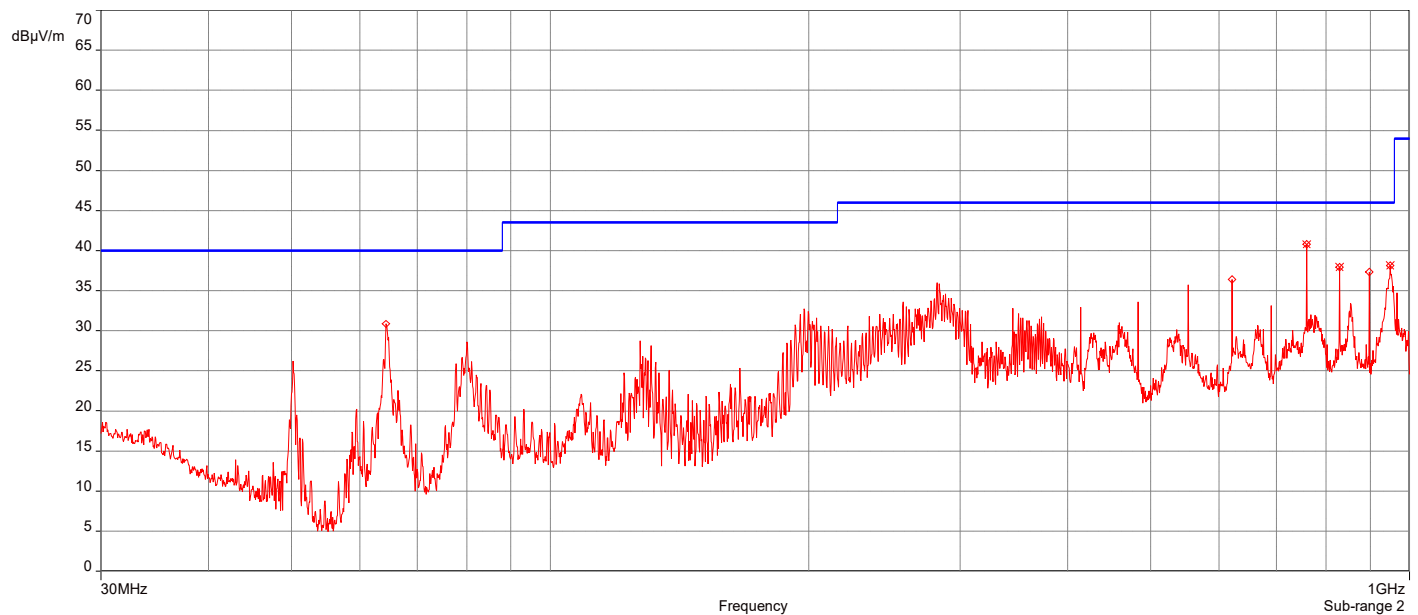
**AH22100701-HAR-053#5\_5G UNII-3 802.11a\_Ch 157\_30MHz-1GHz**

1/3/2023 11:35:03 AM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 621.4495MHz     | 38.40                         | -5.19                  | 46.00        | -7.60       | 1.00       | 107.40    | Vertical     | Passed    |
| 2  | 759.59704MHz    | 40.58                         | -3.29                  | 46.00        | -5.42       | 1.25       | 146.90    | Vertical     | Passed    |
| 3  | 897.68751MHz    | 38.11                         | -1.69                  | 46.00        | -7.89       | 1.25       | 175.50    | Vertical     | Passed    |
| 4  | 759.59704MHz    | 40.80                         | -2.19                  | 46.00        | -5.20       | 1.00       | 67.50     | Horizontal   | Passed    |
| 5  | 828.64227MHz    | 37.92                         | -0.86                  | 46.00        | -8.08       | 1.00       | 38.20     | Horizontal   | Passed    |
| 6  | 949.49997MHz    | 38.15                         | 0.00                   | 46.00        | -7.85       | 1.00       | 342.40    | Horizontal   | Passed    |

Overall Graphs:





Remarks:

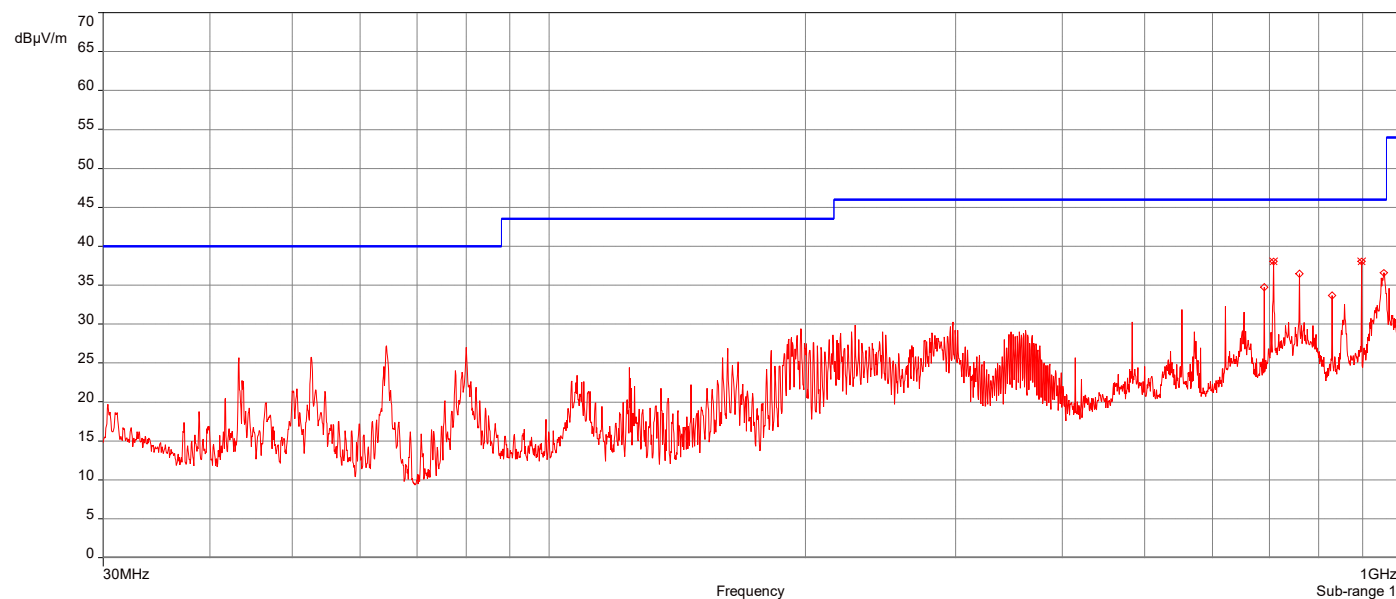
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

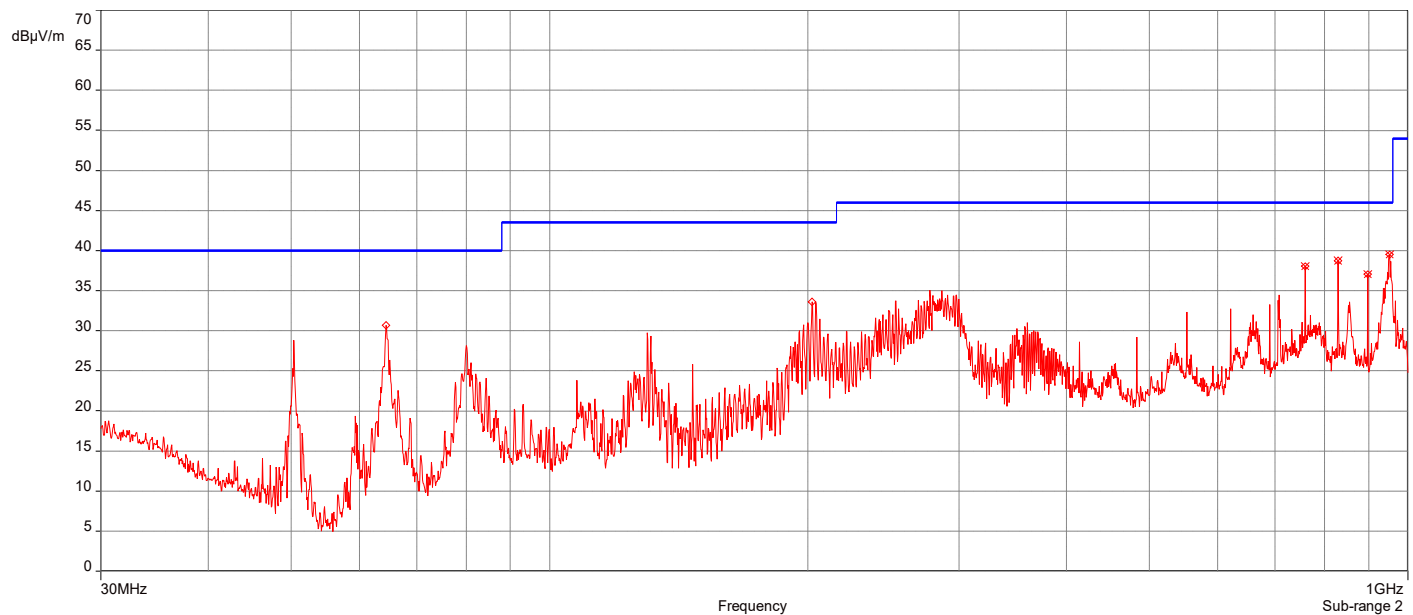
**AH22100701-HAR-053#5\_5G UNII-3 802.11ac\_Ch 157\_30MHz-1GHz**

1/3/2023 12:00:19 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 707.55633MHz    | 38.07                         | -3.87                  | 46.00        | -7.93       | 1.25       | 82.90     | Vertical     | Passed    |
| 2  | 897.68751MHz    | 38.09                         | -1.69                  | 46.00        | -7.91       | 1.25       | 169.70    | Vertical     | Passed    |
| 3  | 759.59704MHz    | 38.09                         | -2.19                  | 46.00        | -7.91       | 1.25       | 70.30     | Horizontal   | Passed    |
| 4  | 828.64227MHz    | 38.70                         | -0.86                  | 46.00        | -7.30       | 1.00       | 40.90     | Horizontal   | Passed    |
| 5  | 897.68751MHz    | 37.08                         | -0.39                  | 46.00        | -8.92       | 1.00       | 69.40     | Horizontal   | Passed    |
| 6  | 951.7254MHz     | 39.51                         | 0.02                   | 46.00        | -6.49       | 1.00       | 340.00    | Horizontal   | Passed    |

**Overall Graphs:**





Remarks:

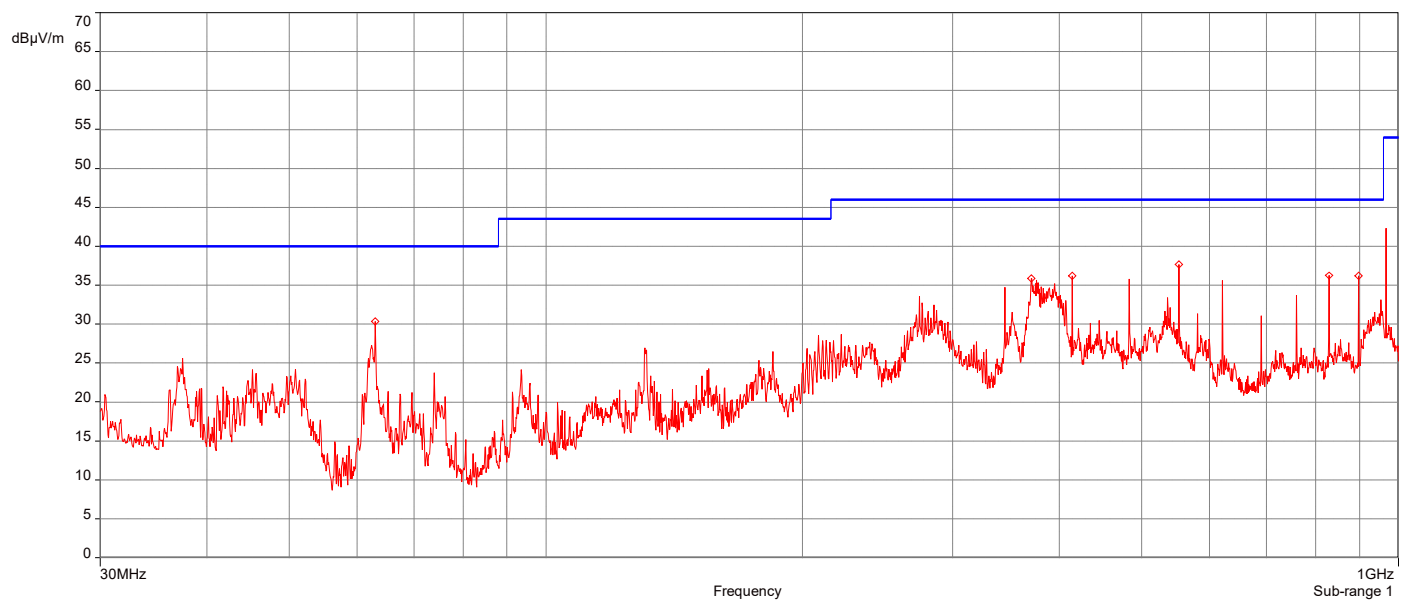
1. Level Q-Peak Reading (dBµV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-3 802.11n\_Ch 151\_30MHz-1GHz**

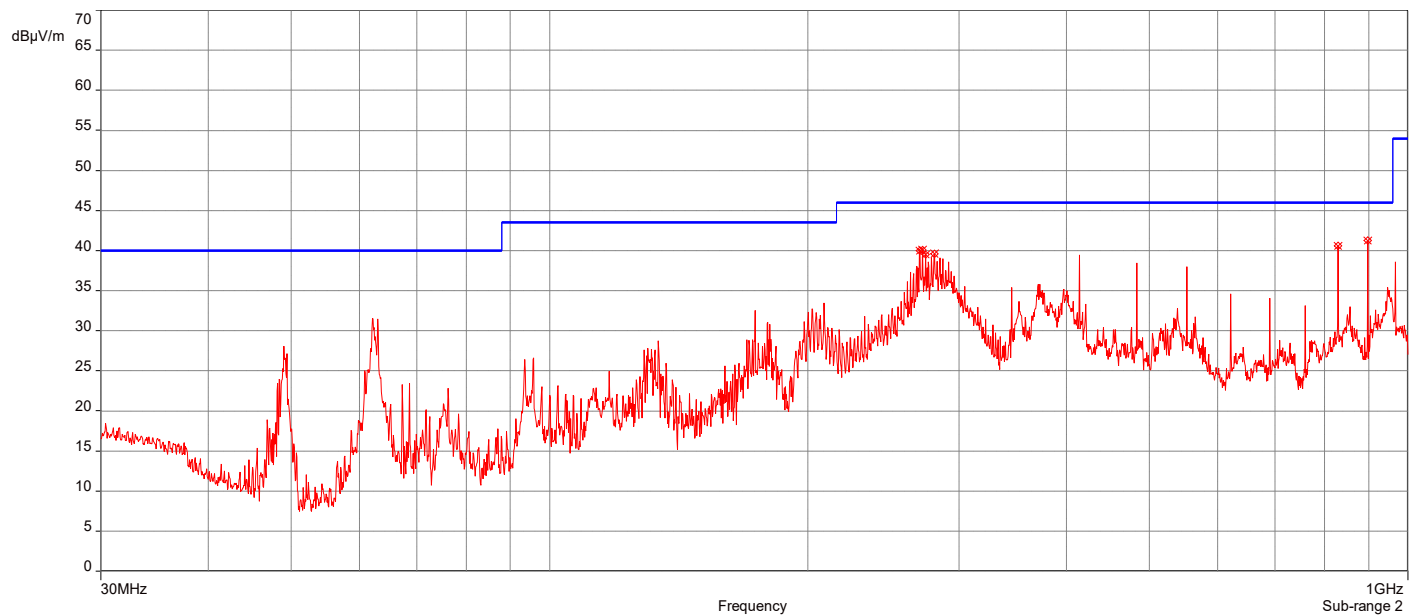
11/30/2022 5:23:50 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 269.88941MHz    | 40.01                         | -12.04                 | 46.00        | -5.99       | 1.25       | 307.50    | Horizontal   | Passed    |
| 2  | 271.94364MHz    | 40.04                         | -12.02                 | 46.00        | -5.96       | 1.25       | 162.50    | Horizontal   | Passed    |
| 3  | 274.11201MHz    | 39.56                         | -11.91                 | 46.00        | -6.44       | 1.00       | 173.00    | Horizontal   | Passed    |
| 4  | 280.78828MHz    | 39.56                         | -11.95                 | 46.00        | -6.44       | 1.00       | 305.60    | Horizontal   | Passed    |
| 5  | 828.64227MHz    | 40.60                         | -0.85                  | 46.00        | -5.40       | 1.00       | 145.20    | Horizontal   | Passed    |
| 6  | 897.68751MHz    | 41.29                         | -0.39                  | 46.00        | -4.71       | 1.50       | 132.60    | Horizontal   | Passed    |

Overall Graphs:







Remarks:

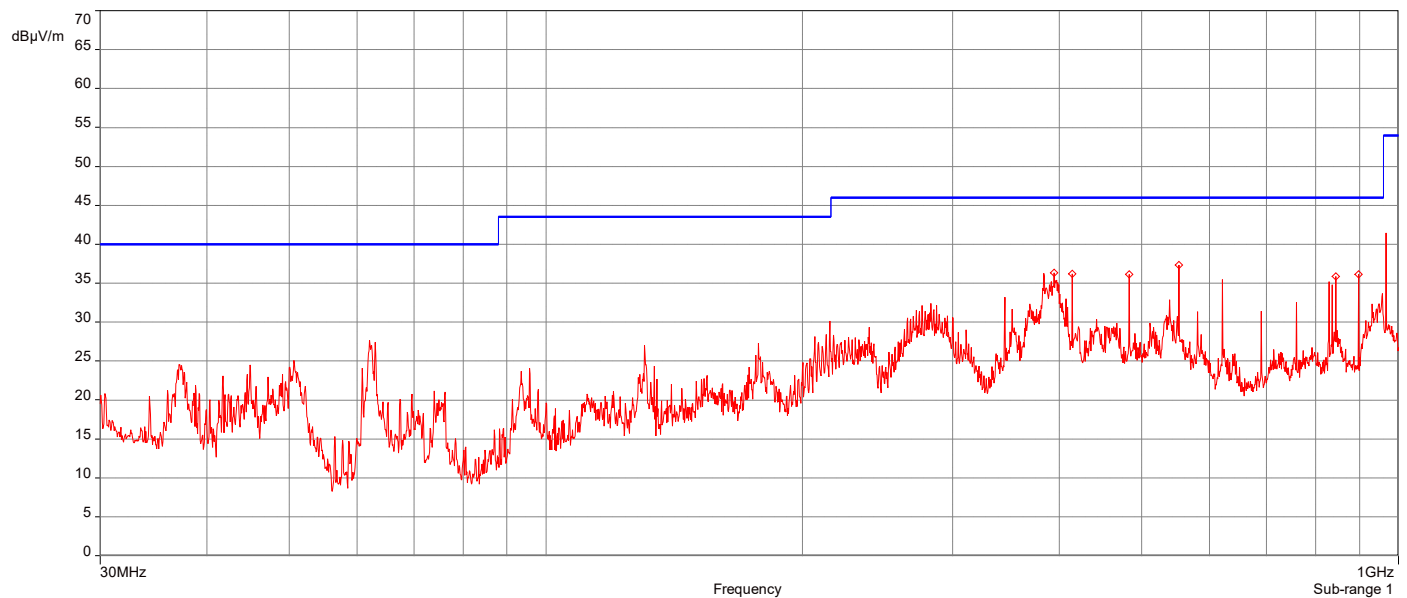
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

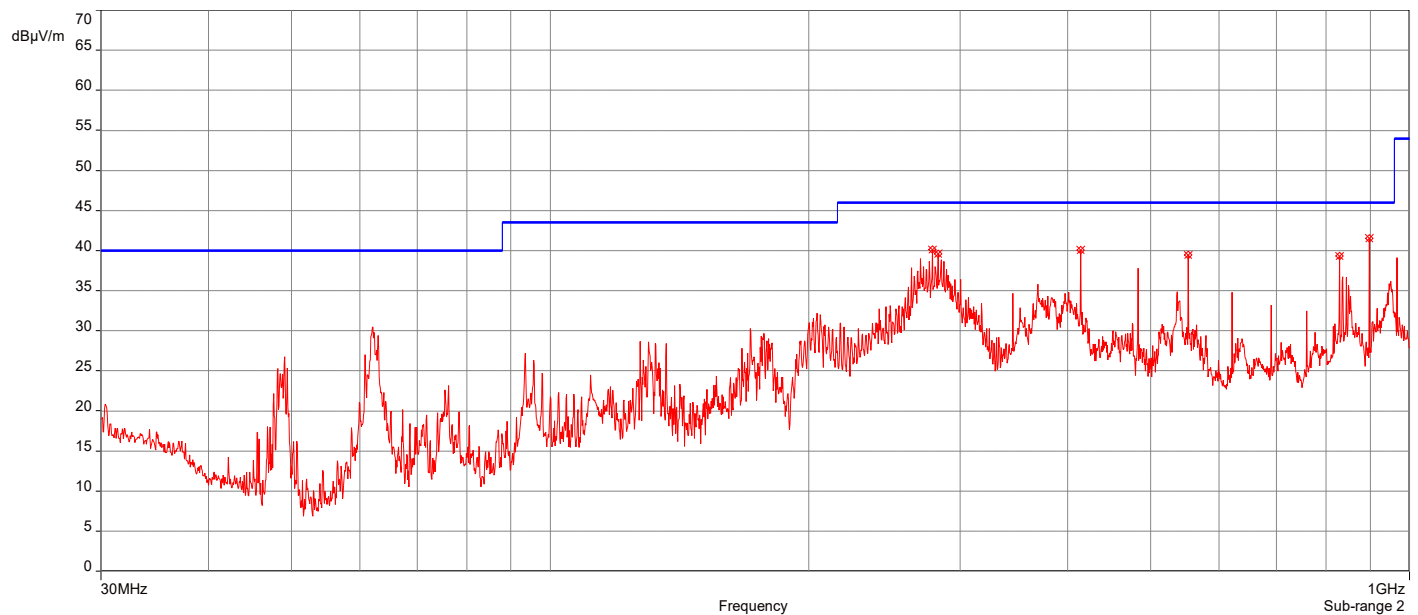
**AH22100701-HAR-053#5\_5G UNII-3 802.11n\_Ch 159\_30MHz-1GHz**

11/30/2022 5:46:23 PM

| No | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1  | 278.44873MHz    | 40.12                         | -11.93                 | 46.00        | -5.88       | 1.25       | 329.10    | Horizontal   | Passed    |
| 2  | 282.78546MHz    | 39.57                         | -11.81                 | 46.00        | -6.43       | 1.50       | 303.10    | Horizontal   | Passed    |
| 3  | 414.31378MHz    | 40.09                         | -8.30                  | 46.00        | -5.91       | 1.25       | 213.50    | Horizontal   | Passed    |
| 4  | 552.40426MHz    | 39.44                         | -5.66                  | 46.00        | -6.56       | 1.00       | 301.20    | Horizontal   | Passed    |
| 5  | 828.64227MHz    | 39.33                         | -0.85                  | 46.00        | -6.67       | 1.00       | 144.30    | Horizontal   | Passed    |
| 6  | 897.68751MHz    | 41.56                         | -0.39                  | 46.00        | -4.44       | 1.50       | 133.80    | Horizontal   | Passed    |

Overall Graphs:





Remarks:

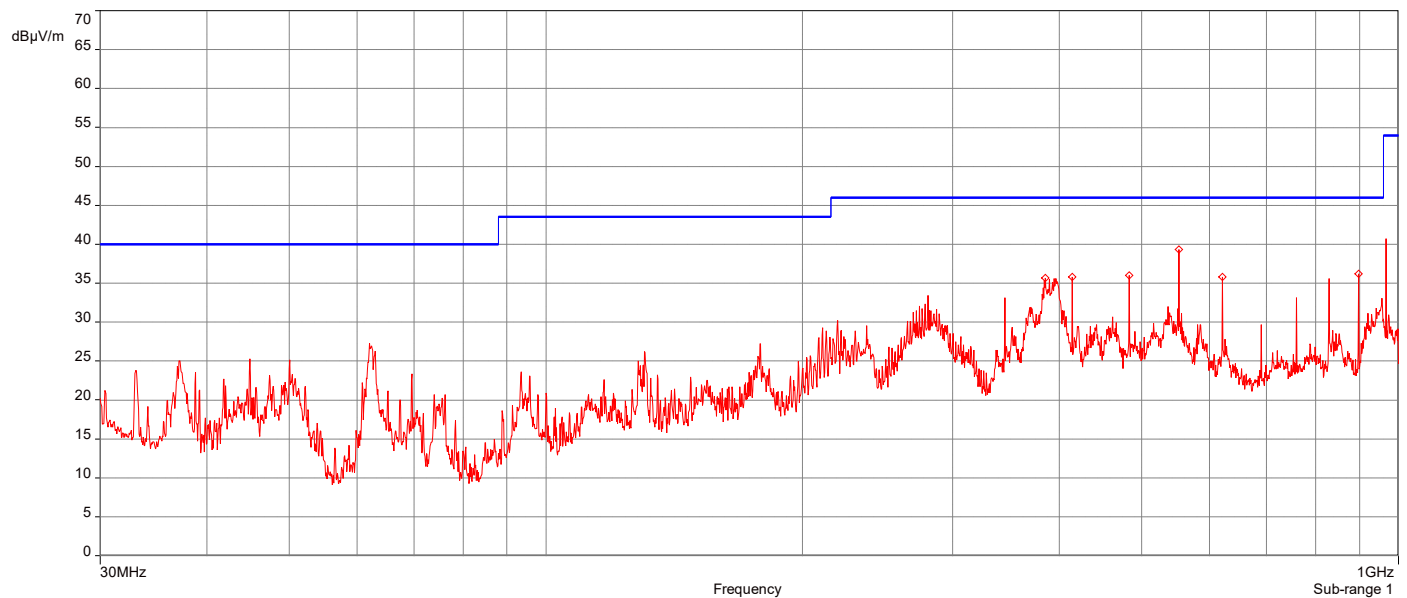
1. Level Q-Peak Reading (dBµV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

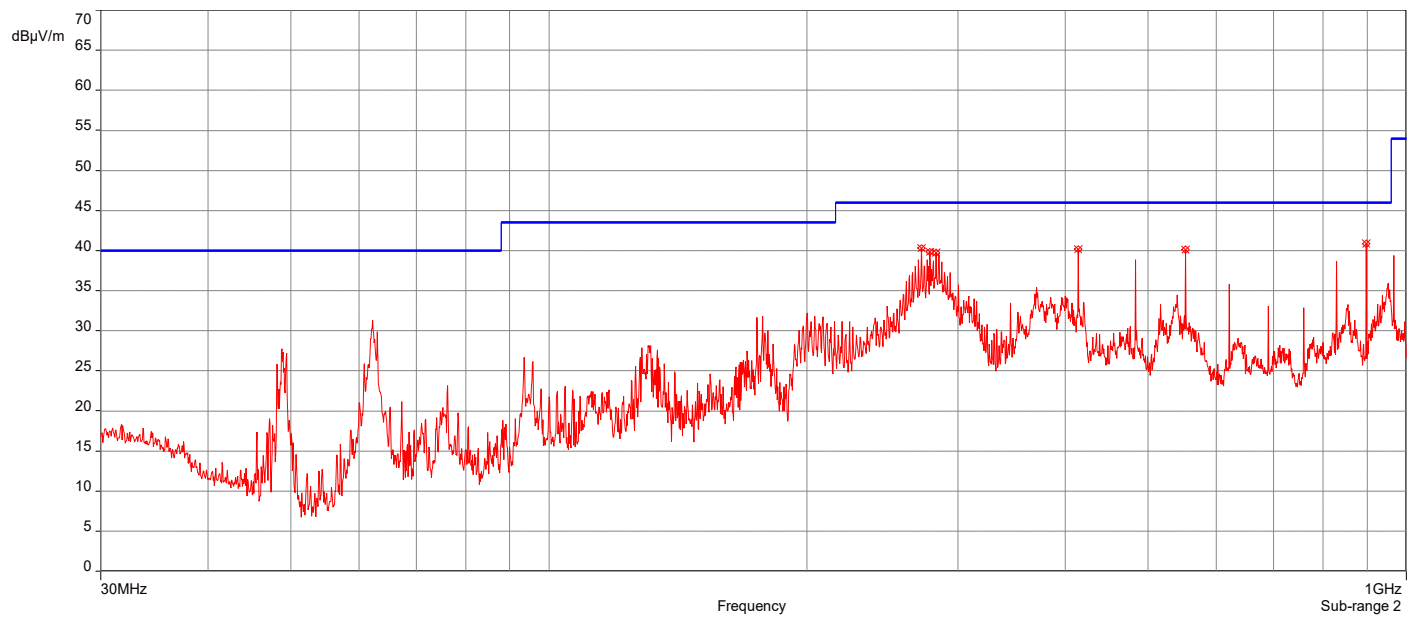
**AH22100701-HAR-053#5\_5G UNII-3 802.11ac\_Ch 155\_30MHz-1GHz**

11/30/2022 6:10:01 PM

| No | Frequency (MHz) | Level Q-<br>Peak<br>Reading<br>(dBμV/m) | Correction<br>Factor (dB) | Limit<br>dBμV/m | Margin<br>(dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-----------------------------------------|---------------------------|-----------------|----------------|------------|-----------|--------------|-----------|
| 1  | 271.94364MHz    | 40.32                                   | -12.02                    | 46.00           | -5.68          | 1.00       | 314.10    | Horizontal   | Passed    |
| 2  | 278.22048MHz    | 39.88                                   | -11.92                    | 46.00           | -6.12          | 1.25       | 310.70    | Horizontal   | Passed    |
| 3  | 282.89958MHz    | 39.71                                   | -11.81                    | 46.00           | -6.29          | 1.00       | 296.30    | Horizontal   | Passed    |
| 4  | 414.31378MHz    | 40.17                                   | -8.30                     | 46.00           | -5.83          | 1.00       | 206.40    | Horizontal   | Passed    |
| 5  | 552.40426MHz    | 40.16                                   | -5.66                     | 46.00           | -5.84          | 1.00       | 303.40    | Horizontal   | Passed    |
| 6  | 897.68751MHz    | 40.83                                   | -0.39                     | 46.00           | -5.17          | 1.50       | 132.30    | Horizontal   | Passed    |

Overall Graphs:





Remarks:

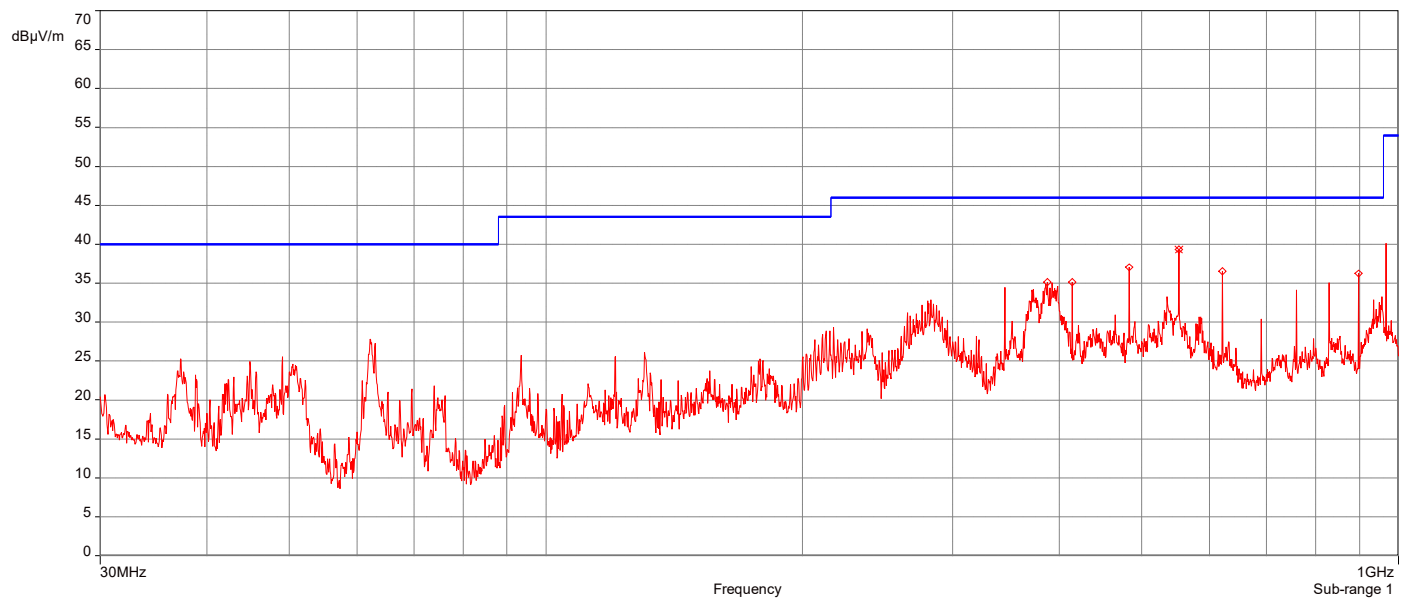
1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

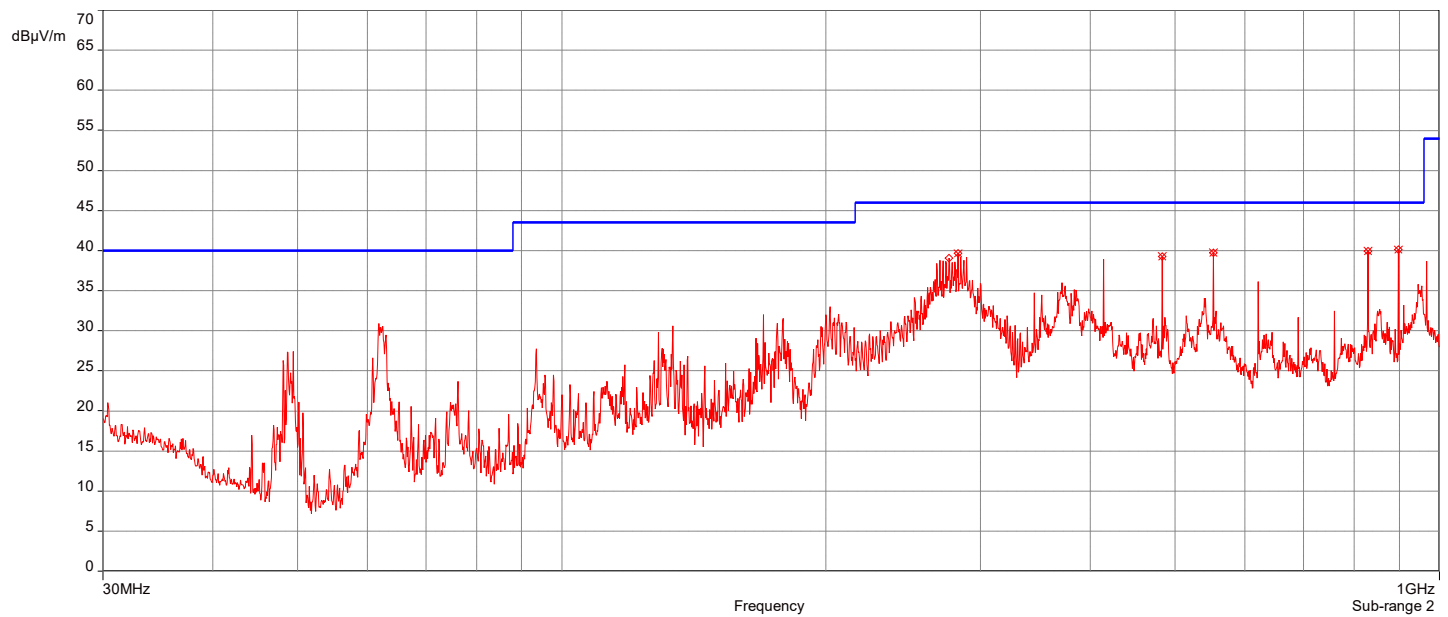
**AH22100701-HAR-053#5\_5G UNII-3 802.11n\_Ch 157\_30MHz-1GHz**

11/30/2022 11:58:19 AM

| No  | Frequency (MHz) | Level Q-Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|-----|-----------------|-------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 7.  | 552.40426MHz    | 39.30                         | -6.60                  | 46.00        | -6.70       | 1.00       | 222.10    | Vertical     | Passed    |
| 8.  | 282.7284MHz     | 39.67                         | -11.81                 | 46.00        | -6.33       | 1.00       | 308.00    | Horizontal   | Passed    |
| 9.  | 483.35902MHz    | 39.27                         | -6.80                  | 46.00        | -6.73       | 1.00       | 206.90    | Horizontal   | Passed    |
| 10. | 552.40426MHz    | 39.73                         | -5.66                  | 46.00        | -6.27       | 1.00       | 295.50    | Horizontal   | Passed    |
| 11. | 828.64227MHz    | 39.90                         | -0.85                  | 46.00        | -6.10       | 1.00       | 136.20    | Horizontal   | Passed    |
| 12. | 897.68751MHz    | 40.15                         | -0.39                  | 46.00        | -5.85       | 1.50       | 131.60    | Horizontal   | Passed    |

Overall Graphs:





Remarks:

1. Level Q-Peak Reading (dBμV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

**AH22100701-HAR-053#5\_5G UNII-1 802.11a Ch 36\_1-18GHz**

11/18/2022 10:34:39 AM

| No | Frequency (MHz) | Level Peak Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgement |
|----|-----------------|-----------------------------|------------------------|--------------|-------------|------------|-----------|--------------|-----------|
| 1. | 10.359775GHz    | 55.32                       | 9.35                   | 68.23        | -12.91      | 3.50       | 86.40     | Vertical     | Passed    |
| 2. | 17.9915GHz      | 55.54                       | 21.28                  | 74.00        | -18.46      | 2.00       | 0.10      | Vertical     | Passed    |
| 3. | 2.2285361GHz    | 46.05                       | -2.80                  | 74.00        | - 27.95     | 3.00       | 359.90    | Horizontal   | Passed    |
| 4. | 7.1281802GHz    | 45.23                       | 7.53                   | 68.23        | -23         | 1.50       | 101.70    | Horizontal   | Passed    |
| 5. | 14.835907GHz    | 50.70                       | 15.68                  | 68.23        | -17.53      | 3.50       | 171.70    | Horizontal   | Passed    |
| 6. | 17.9955GHz      | 55.96                       | 21.34                  | 74.00        | -18.04      | 4.00       | 3.40      | Horizontal   | Passed    |

| No | Frequency (MHz) | Level Average Reading (dBμV/m) | Correction Factor (dB) | Limit dBμV/m | Margin (dB) | Height (m) | Angle (°) | Polarization | Judgment |
|----|-----------------|--------------------------------|------------------------|--------------|-------------|------------|-----------|--------------|----------|
| 1. | 12.326833GHz    | 34.01                          | 11.98                  | 54.00        | -19.99      | 1.50       | 57.10     | Vertical     | Passed   |
| 2. | 17.745993GHz    | 41.22                          | 19.62                  | 54.00        | -12.78      | 2.00       | 318.10    | Vertical     | Passed   |
| 3. | 17.967999GHz    | 42.73                          | 20.89                  | 54.00        | -11.27      | 1.00       | 353.90    | Horizontal   | Passed   |

Overall Graphs:

