# TEST REPORT
# FCC ID: 2AT7Z-GHUB0203

| | | |
|---|---|---|
| Report Number | : | ZKT-231012L7800E-3 |
| Date of Test | | Sep. 13, 2023 to Oct. 13, 2023 |
| Date of issue | : | Oct. 24, 2023 |
| Total number of pages | | 129 |
| Test Result | : | PASS |
| **Testing Laboratory.** | **:** | **Shenzhen ZKT Technology Co., Ltd.** |
| Address | : | 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China |
| **Applicant's name** | **:** | **Asteria Technology Pte. Ltd.** |
| Address | : | 160 ROBINSON ROAD, #19-05 SBF CENTER, SINGAPORE, 068914 |
| **Manufacturer's name** | **:** | **Asteria Technology Pte. Ltd.** |
| Address | : | 160 ROBINSON ROAD, #19-05 SBF CENTER, SINGAPORE, 068914 |
| Test specification: | | |
| Standard | : | FCC CFR Title 47 Part 15 Subpart C Section 15.407<br>ANSI C63.10:2013<br>KDB 789033 D02 v01r02 |
| Test procedure | : | / |
| Non-standard test method | : | N/A |
| **Test Report Form No.** | **:** | TRF-EL-113_V0 |
| **Test Report Form(s) Originator** | **:** | ZKT Testing |
| **Master TRF** | **:** | Dated: 2020-01-06 |

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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| | | |
|---|---|---|
| **Product name** | **:** | **Gravio Hub 2** |
| Trademark | : | Gravio |
| Model/Type reference | : | GHUB002 |
| Ratings | : | Input: DC 12V, 2A |

Testing procedure and testing location:

| | |
|---|---|
| Testing Laboratory ..... : | Shenzhen ZKT Technology Co., Ltd. |
| Address ..... : | 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China |
| Tested by (name + signature) ..... : | Alen He |
| Reviewer (name + signature)..... : | Joe Liu |
| Approved (name + signature) ..... : | Lake Xie |

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## 1. VERSION

| Report No. | Version | Description | Approved |
|---|---|---|---|
| ZKT-231012L7800E-3 | Rev.01 | Initial issue of report | Oct. 24, 2023 |
| | | | |
| | | | |

## 2.SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.407) , Subpart E<br>RSS-247 Issue 2 | | | |
|---|---|---|---|
| Standard Section | Test Item | Judgment | Remark |
| FCC part 15.209(a),<br>FCC part 15.407 (b)(1)<br>FCC part 15.407 (b)(4)<br>FCC part 15.407 (b)(8) | Spurious Radiated Emissions | PASS | |
| FCC part 15.207 | Conducted Emission | PASS | |
| FCC part 15.407 (a)(12)<br>15.1049 | 99% Emission Bandwidth | PASS | |
| FCC part 15.407(e) | 6 dB bandwidth | PASS | |
| FCC part 15.407 (a)(1)<br>FCC part 15.407 (a)(3) | Maximum Conducted Output Power | PASS | |
| 2.1051,<br>FCC part 15.407(b)(1)<br>FCC part 15.407(b)(4) | Band Edge | PASS | |
| FCC part 15.407 (a)(1)<br>FCC part 15.407 (a)(3) | Power Spectral Density | PASS | |
| 2.1051,<br>FCC part 15.407(b) | Spurious Emissions at Antenna Terminals | PASS | |
| FCC part 15.203 | Antenna Requirement | PASS | |

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

## 2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.
Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225
Designation Number: CN1299
IC Registered No.: 27033
Designation Number: CN0110

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %。

| No. | Item | Uncertainty |
|---|---|---|
| 1 | 3m camber Radiated spurious emission(30MHz-1GHz) | U=4.3dB |
| 2 | 3m chamber Radiated spurious emission(1GHz-18GHz) | U=4.5dB |
| 3 | 3m chamber Radiated spurious emission(18GHz-40GHz) | U=3.34dB |
| 4 | Conducted Adjacent channel power | U=1.38dB |
| 5 | Conducted output power uncertainty Above 1G | U=1.576dB |
| 6 | Conducted output power uncertainty below 1G | U=1.28dB |
| 7 | humidity uncertainty | U=5.3% |
| 8 | Temperature uncertainty | U=0.59℃ |
| 9 | Radiated disturbance(30MHz-1000MHz) | U=4.8dB |
| 10 | Radiated disturbance(1GHz-6GHz) | U=4.9dB |
| 11 | Radiated disturbance(1GHz-18GHz) | U=5.0dB |

## 3. GENERAL INFORMATION

### 3.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| Product Name: | Gravio Hub 2 | |
| Model No.: | GHUB002 | |
| Serial No.: | N/A | |
| Model Different.: | N/A | |
| Hardware Version: | V4.4 | |
| Software Version: | V2.0 | |
| Sample ID | ZKT-231012L7800E-3 | |
| Sample(s) Status: | Engineer sample | |
| Product Description | IEEE 802.11 WLAN Mode Supported | ☒802.11a (20MHz channel bandwidth)<br>☒802.11n (20/40MHz channel bandwidth)<br>☒802.11ac (20/40/80MHz channel bandwidth) |
| | Data Rate | 802.11a: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6 Mbps<br>802.11n: up to 150 Mbps<br>802.11ac: up to VHT-MCS9 |
| | Modulation | 256QAM, 64QAM, 16QAM, BPSK, QPSK |
| | Operating Frequency Range | U-NII-1: 5150 MHz to 5250 MHz<br>U-NII-3: 5725 MHz to 5850 MHz |
| Channel List | Please refer to the Note 2. | |
| Antenna Type: | Ceramic Antenna | |
| Antenna gain: | 1.0 dBi | |
| Power supply: | AC 120V, 60Hz/AC 240V, 60Hz | |
| Switching power adapter: | AC 100-240V, 50/60Hz | |

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

| 802.11a/n/ac(20MHz) Frequency Channel | | | |
|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36 | 5180 | 149 | 5745 |
| 44 | 5220 | 157 | 5785 |
| 48 | 5240 | 165 | 5825 |

802.11n(40MHz) Frequency Channel

| 802.11n/ac(40MHz) Frequency Channel | | | |
|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 38 | 5190 | 151 | 5755 |
| 46 | 5230 | 159 | 5795 |

| 802.11ac(80MHz) Frequency Channel | |
|---|---|
| Channel | Frequency (MHz) |
| 42 | 5210 |
| 155 | 5775 |

3.2 DESCRIPTION OF TEST MODES

| Transmitting mode | Keep the EUT in continuously transmitting mode |
|---|---|
| Remark: During the test, the duty cycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. | |

| Pretest Mode | Description |
|---|---|
| Mode 1 | 802.11a / n 20 CH36/ CH44/ CH48/ CH149/ CH157/ CH165 |
| Mode 2 | 802.11n 40 CH38/ CH46/ CH151/ CH159 |
| Mode 3 | 802.11 ac80 CH42/ CH155 |
| Mode 4 | Link Mode |

| Conducted Emission | |
|---|---|
| Final Test Mode | Description |
| Mode 4 | Link Mode |

| For Radiated Emission | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | 802.11a / n 20 CH36/ CH44/ CH48/ CH149/ CH157/ CH165 |
| Mode 2 | 802.11n 40 CH38/ CH46/ CH151/ CH159 |
| Mode 3 | 802.11 ac80 CH42/ CH155 |

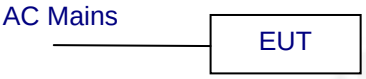
Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

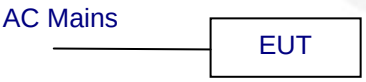
| | |
|---|---|
| Test Software | Realtek Test Tool |
| Power level setup | <8dBm |

## 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission




Radiated Emission




Conducted Spurious


## 3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|---|---|---|---|---|---|
| E-1 | Gravio Hub 2 | Gravio | GHUB002 | N/A | EUT |
| A-1 | Adapter | MI | A232-050200U-CN2 | N/A | N/A |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation emissions& Radio Test equipment

| Item | Equipment | Manufacturer | Type No. | Serial No. | Firmware Version | Last calibration | Calibrated until |
|---|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer (9kHz-26.5GHz) | KEYSIGHT | 9020A | MY55370835 | A.17.05 | Oct. 28, 2022 | Oct. 27, 2023 |
| 2 | Spectrum Analyzer (10kHz-39.9GHz) | R&S | FSV40-N | 100363 | 1.71 SP2 | Oct. 28, 2022 | Oct. 27, 2023 |
| 3 | EMI Test Receiver (9kHz-7GHz) | R&S | ESCI7 | 101169 | 4.32 | Oct. 28, 2022 | Oct. 27, 2023 |
| 4 | Bilog Antenna (30MHz-1500MHz) | Schwarzbeck | VULB9168 | N/A | N/A | Nov. 02, 2022 | Nov. 01, 2023 |
| 5 | Horn Antenna (1GHz-18GHz) | Agilent | AH-118 | 071145 | N/A | Nov. 01, 2022 | Oct. 31, 2023 |
| 6 | Horn Antenna (15GHz-40GHz) | A.H.System | SAS-574 | 588 | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 7 | Loop Antenna | TESEQ | HLA6121 | 58357 | N/A | Nov. 01, 2022 | Oct. 31, 2023 |
| 8 | Amplifier (30-1000MHz) | EM Electronics | EM330 Amplifier | 060747 | N/A | Nov. 15, 2022 | Nov. 14, 2023 |
| 9 | Amplifier (1GHz-26.5GHz) | Agilent | 8449B | 3008A00315 | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 10 | Amplifier (500MHz-40GHz) | QuanJuDa | DLE-161 | 097 | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 11 | Test Cable | N/A | R-01 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 12 | Test Cable | N/A | R-02 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 13 | Test Cable | N/A | R-03 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 14 | Test Cable | N/A | RF-01 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 15 | Test Cable | N/A | RF-02 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 16 | Test Cable | N/A | RF-03 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 17 | ESG Signal Generator | Agilent | E4421B | N/A | B.03.84 | Oct. 21, 2022 | Oct. 20, 2023 |
| 18 | Signal Generator | Agilent | N5182A | N/A | A.01.87 | Oct. 21, 2022 | Oct. 20, 2023 |
| 19 | Magnetic Field Probe Tester | Narda | ELT-400 | 0-0344 | N/A | Nov. 15, 2022 | Nov. 14, 2023 |
| 20 | Wideband Radio Communication Test | R&S | CMW500 | 106504 | V 3.7.22 | Oct. 28, 2022 | Oct. 27, 2023 |
| 21 | MWRF Power Meter Test system | MW | MW100-RFCB | N/A | N/A | Oct. 21, 2022 | Oct. 20, 2023 |
| 22 | D.C. Power Supply | LongWei | TPR-6405D | N/A | N/A | \ | \ |
| 23 | EMC Software | Frad | EZ-EMC | Ver.EMC-CON 3A1.1 | N/A | \ | \ |
| 24 | RF Software | MW | MTS8310 | V2.0.0.0 | N/A | \ | \ |
| 25 | Turntable | MF | MF-7802BS | N/A | N/A | \ | \ |
| 26 | Antenna tower | MF | MF-7802BS | N/A | N/A | \ | \ |

## Conducted emissions Test

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Firmware Version | Last calibration | Calibrated until |
|---|---|---|---|---|---|---|---|
| 1 | LISN | R&S | ENV216 | 101471 | N/A | Oct. 21, 2022 | Oct. 20, 2023 |
| 2 | LISN | CYBERTEK | EM5040A | E1850400149 | N/A | Oct. 21, 2022 | Oct. 20, 2023 |
| 3 | Test Cable | N/A | C-01 | N/A | N/A | Oct. 21, 2022 | Oct. 20, 2023 |
| 4 | Test Cable | N/A | C-02 | N/A | N/A | Oct. 21, 2022 | Oct. 20, 2023 |
| 5 | Test Cable | N/A | C-03 | N/A | N/A | Oct. 21, 2022 | Oct. 20, 2023 |
| 6 | EMI Test Receiver | R&S | ESCI3 | 101393 | 4.42 SP3 | Oct. 28, 2022 | Oct. 27, 2023 |
| 7 | Triple-Loop Antenna | N/A | RF300 | N/A | N/A | Oct. 28, 2022 | Oct. 27, 2023 |
| 8 | Absorbing Clamp | DZ | ZN23201 | 15034 | N/A | Oct. 31, 2022 | Oct. 30, 2023 |
| 9 | EMC Software | Frad | EZ-EMC | Ver.EMC-CON 3A1.1 | N/A | \ | \ |

## 4.EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.207 |
| Test Method: | ANSI C63.10:2013 |
| Test Frequency Range: | 150KHz to 30MHz |
| Receiver setup: | RBW=9KHz, VBW=30KHz, Sweep time=auto |

#### 4.1.1 POWER LINE CONDUCTED EMISSION Limits

| FREQUENCY (MHz) | Limit (dBuV) | | Standard |
|---|---|---|---|
| | Quasi-peak | Average | |
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 56.00 | 46.00 | FCC |
| 5.0 -30.0 | 60.00 | 50.00 | FCC |

Note:

(1) *Decreases with the logarithm of the frequency.

#### 4.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

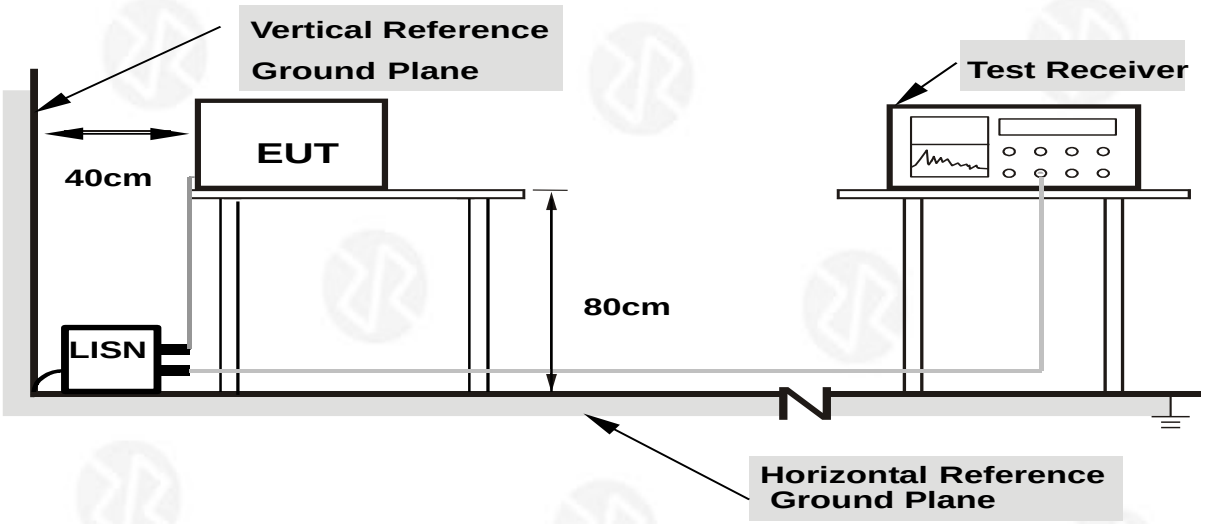
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



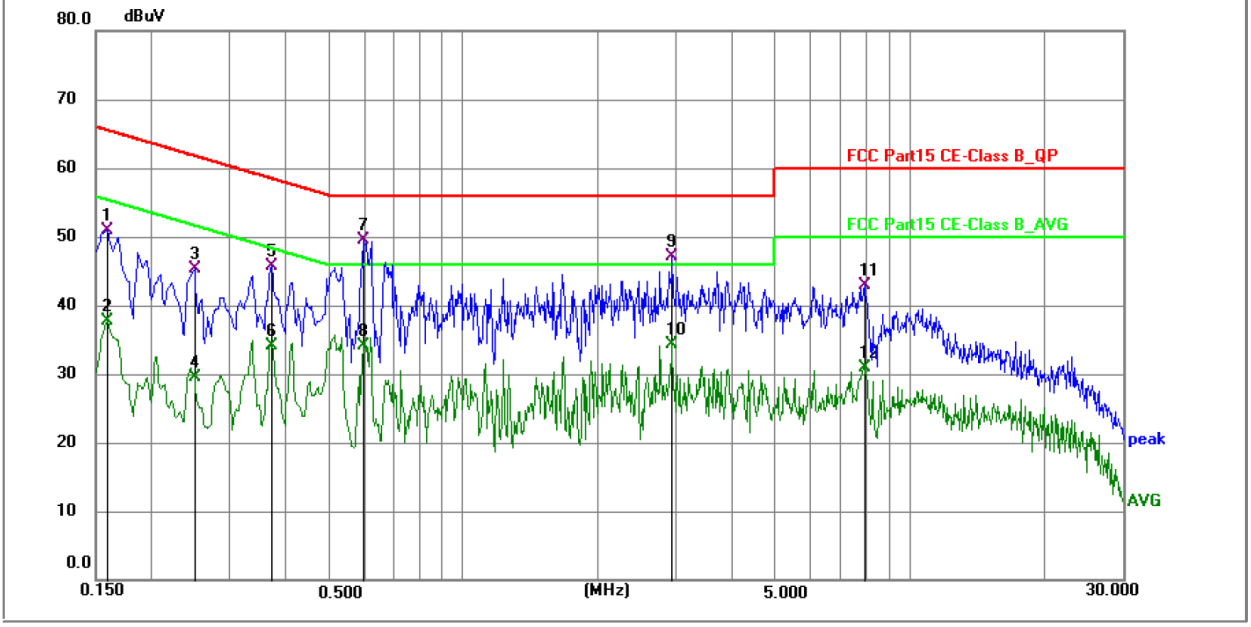

**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.
We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.
During the test, pre-scan all modes, and found the 802.11n(HT40) CH38 which is the worst case, only the worst case is recorded in the report.

4.1.6 Test Result

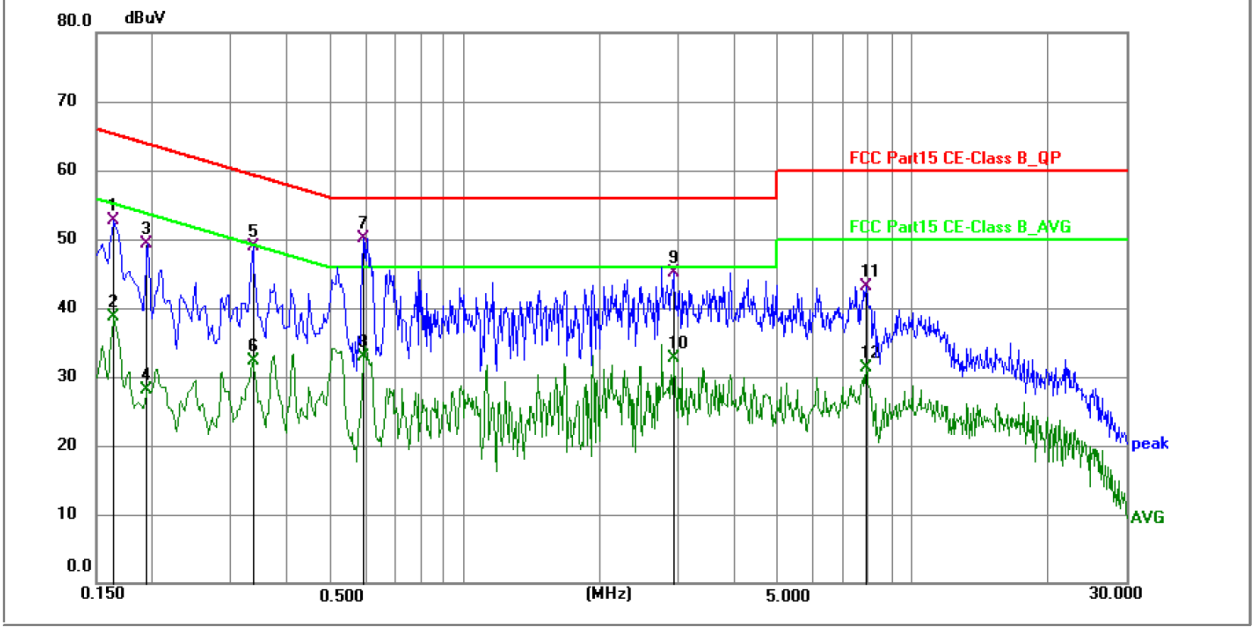
| Temperature: | 26℃ | Relative Humidity: | 54% |
|---|---|---|---|
| Pressure: | 101 kPa | Polarization: | L |
| Test Voltage: | AC 120V/60Hz | | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1590 | 40.99 | 9.91 | 50.90 | 65.52 | -14.62 | QP | P | |
| 2 | 0.1590 | 27.77 | 9.91 | 37.68 | 55.52 | -17.84 | AVG | P | |
| 3 | 0.2490 | 35.44 | 9.92 | 45.36 | 61.79 | -16.43 | QP | P | |
| 4 | 0.2490 | 19.62 | 9.92 | 29.54 | 51.79 | -22.25 | AVG | P | |
| 5 | 0.3704 | 35.84 | 9.95 | 45.79 | 58.49 | -12.70 | QP | P | |
| 6 | 0.3704 | 24.15 | 9.95 | 34.10 | 48.49 | -14.39 | AVG | P | |
| 7 * | 0.5955 | 39.59 | 9.97 | 49.56 | 56.00 | -6.44 | QP | P | |
| 8 | 0.5955 | 24.05 | 9.97 | 34.02 | 46.00 | -11.98 | AVG | P | |
| 9 | 2.9355 | 36.99 | 10.02 | 47.01 | 56.00 | -8.99 | QP | P | |
| 10 | 2.9355 | 24.21 | 10.02 | 34.23 | 46.00 | -11.77 | AVG | P | |
| 11 | 7.9125 | 32.95 | 10.01 | 42.96 | 60.00 | -17.04 | QP | P | |
| 12 | 7.9125 | 20.95 | 10.01 | 30.96 | 50.00 | -19.04 | AVG | P | |

Level = Reading + Factor  Margin = Level - Limit

| | | | |
|---|---|---|---|
| Temperature: | 26℃ | Relative Humidity: | 54% |
| Pressure: | 101 kPa | Polarization: | N |
| Test Voltage: | AC 120V/60Hz | | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1635 | 42.75 | 9.93 | 52.68 | 65.28 | -12.60 | QP | P | |
| 2 | 0.1635 | 28.85 | 9.93 | 38.78 | 55.28 | -16.50 | AVG | P | |
| 3 | 0.1949 | 39.33 | 9.94 | 49.27 | 63.83 | -14.56 | QP | P | |
| 4 | 0.1949 | 18.19 | 9.94 | 28.13 | 53.83 | -25.70 | AVG | P | |
| 5 | 0.3345 | 38.84 | 9.97 | 48.81 | 59.34 | -10.53 | QP | P | |
| 6 | 0.3345 | 22.42 | 9.97 | 32.39 | 49.34 | -16.95 | AVG | P | |
| 7 * | 0.5910 | 40.14 | 10.00 | 50.14 | 56.00 | -5.86 | QP | P | |
| 8 | 0.5910 | 22.85 | 10.00 | 32.85 | 46.00 | -13.15 | AVG | P | |
| 9 | 2.9355 | 35.07 | 10.01 | 45.08 | 56.00 | -10.92 | QP | P | |
| 10 | 2.9355 | 22.74 | 10.01 | 32.75 | 46.00 | -13.25 | AVG | P | |
| 11 | 7.8855 | 33.08 | 10.04 | 43.12 | 60.00 | -16.88 | QP | P | |
| 12 | 7.8855 | 21.25 | 10.04 | 31.29 | 50.00 | -18.71 | AVG | P | |

Level = Reading + Factor  Margin = Level - Limit

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

### 4.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| 10.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (2) |
| 13.36-13.41 | | | |

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---|---|---|---|
| 0.009~0.490 | 2400/F(KHz) | 20 log (uV/m) | 300 |
| 0.490~1.705 | 2400/F(KHz) | 20 log (uV/m) | 30 |
| 1.705~30.0 | 30 | 29.5 | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Limits of Radiated Emission Measurement(Above 1000MHz)

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

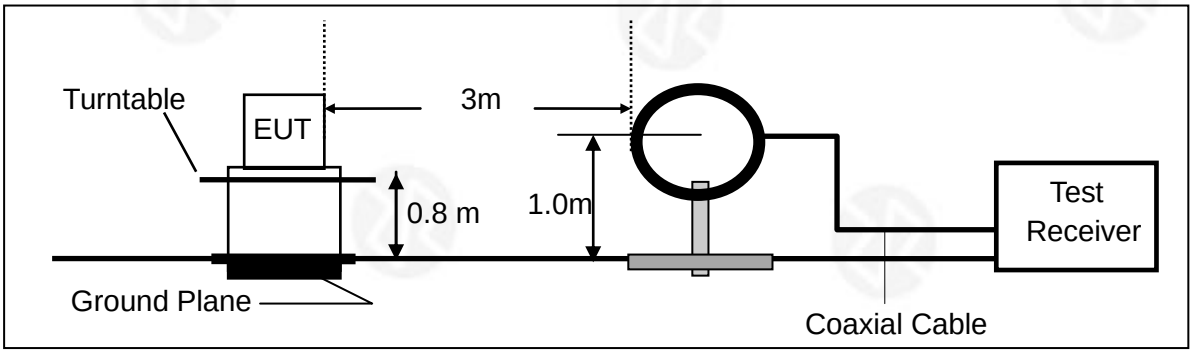
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)( dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

### 4.2.3 MEASURING INSTRUMENTS

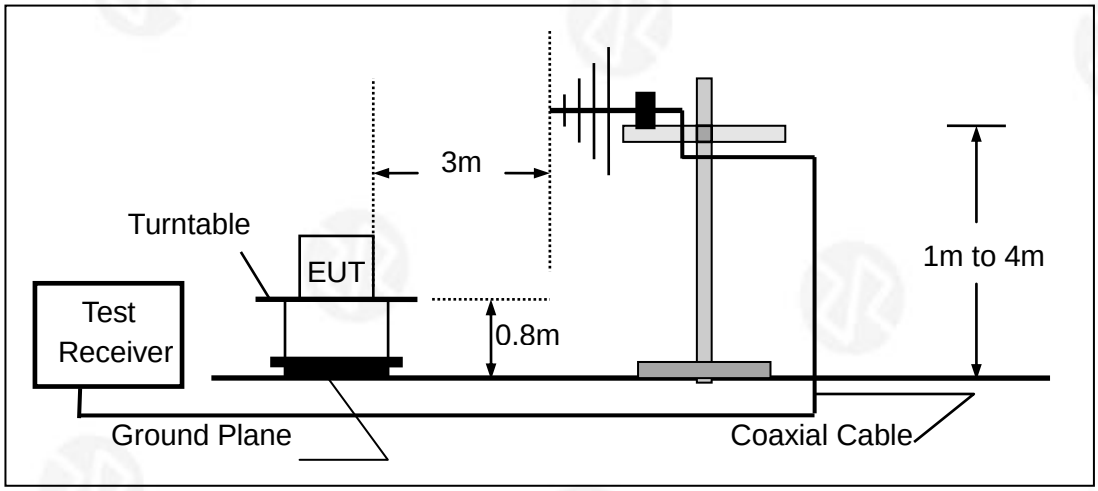
The Measuring equipment is listed in the section 6.3 of this test report.

4.2.4 TEST CONFIGURATION

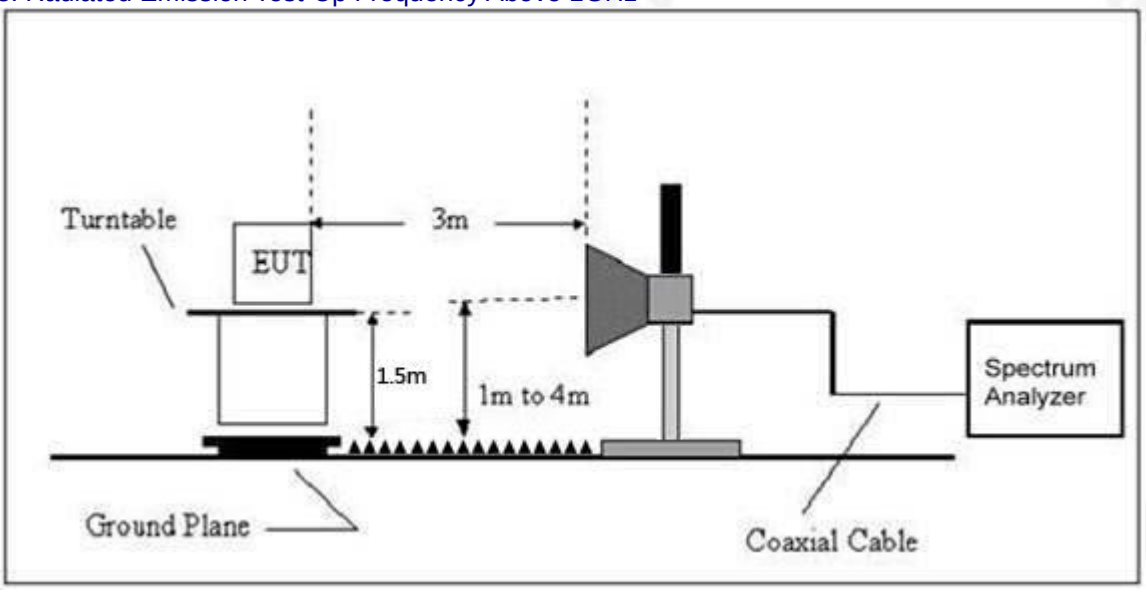
1.For radiated emissions below 30MHz




2.For radiated emissions from 30MHz to 1000MHz




3. Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

| Frequency Band (MHz) | Function | Resolution bandwidth | Video Bandwidth |
|---|---|---|---|
| 30 to 1000 | QP | 120 kHz | 300 kHz |
| Above 1000 | Peak | 1 MHz | 1 MHz |
| | Average | 1 MHz | 10 Hz |

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

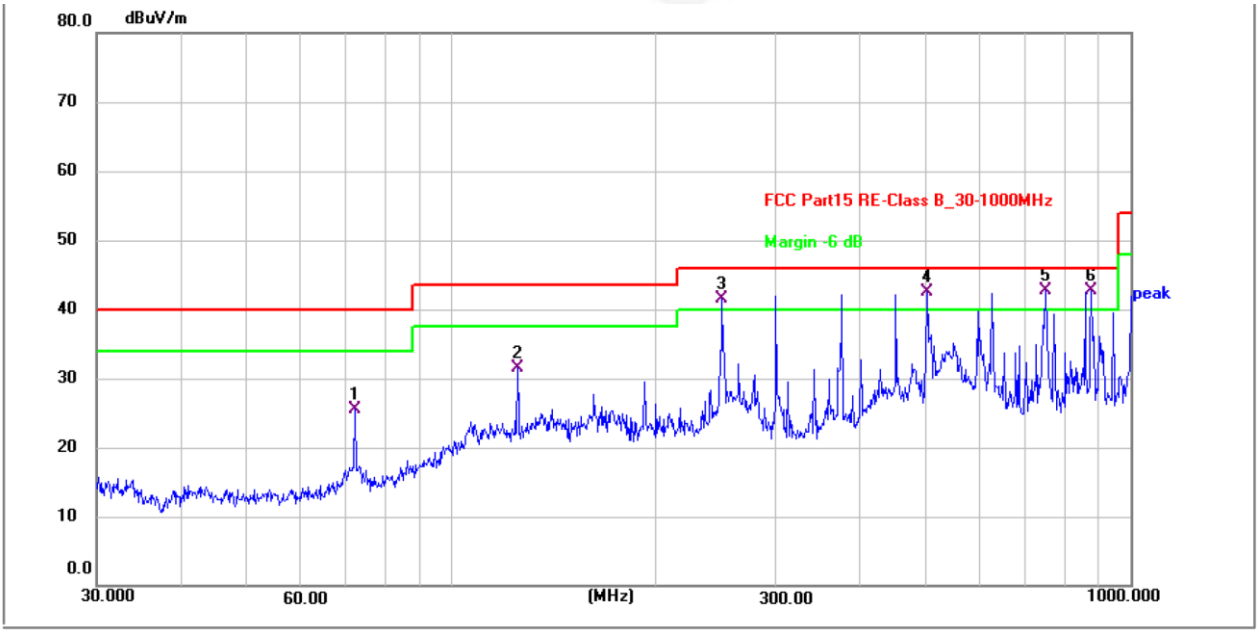
4.2.6 TEST RESULT

Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

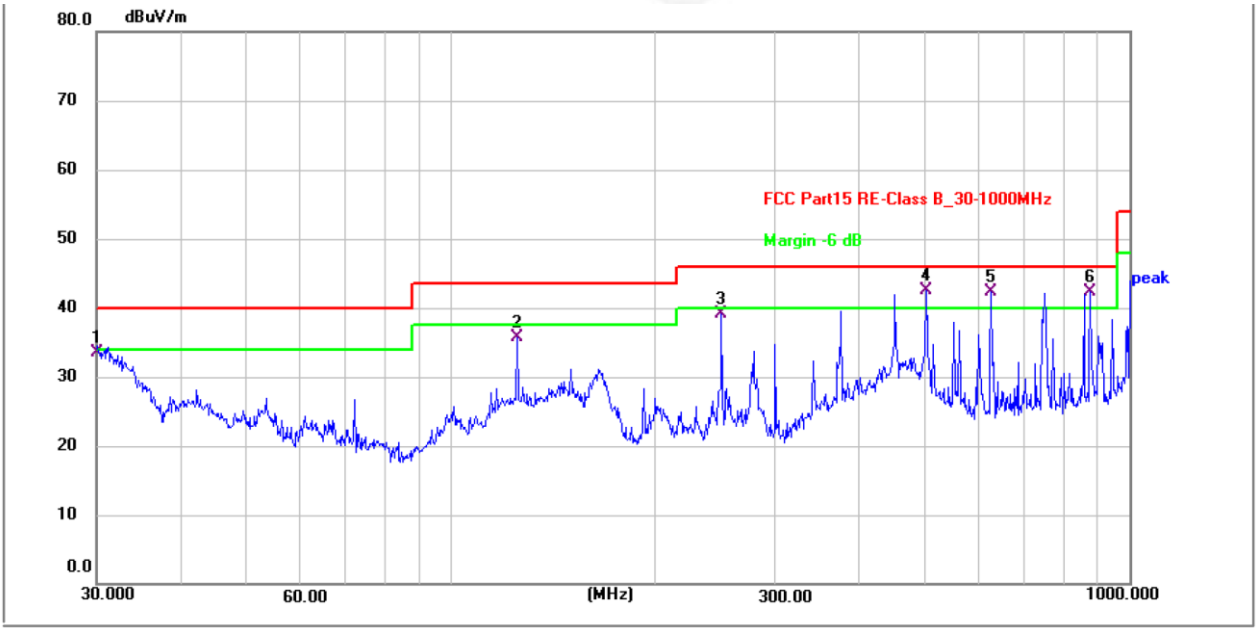
Between 30MHz – 1GHz

| | | | |
|---|---|---|---|
| Temperature: | 26℃ | Relative Humidity: | 54% |
| Pressure: | 101 kPa | Polarization: | Horizontal |
| Test Voltage: | AC 120V, 60Hz | | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F |
|---|---|---|---|---|---|---|---|---|
| 1 | 72.0841 | 43.67 | -18.11 | 25.56 | 40.00 | -14.44 | QP | P |
| 2 | 125.0065 | 48.17 | -16.74 | 31.43 | 43.50 | -12.07 | QP | P |
| 3 ! | 250.3010 | 54.48 | -12.97 | 41.51 | 46.00 | -4.49 | QP | P |
| 4 ! | 501.1790 | 50.85 | -8.33 | 42.52 | 46.00 | -3.48 | QP | P |
| 5 * | 750.1082 | 46.12 | -3.39 | 42.73 | 46.00 | -3.27 | QP | P |
| 6 ! | 875.2470 | 43.68 | -0.97 | 42.71 | 46.00 | -3.29 | QP | P |

| | | | |
|---|---|---|---|
| Temperature: | 26℃ | Relative Humidity: | 54% |
| Pressure: | 101kPa | Polarization: | Vertical |
| Test Voltage: | AC 120V, 60Hz | | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F |
|---|---|---|---|---|---|---|---|---|
| 1 | 30.1051 | 49.92 | -16.49 | 33.43 | 40.00 | -6.57 | QP | P |
| 2 | 125.0065 | 52.38 | -16.74 | 35.64 | 43.50 | -7.86 | QP | P |
| 3 | 250.3010 | 52.27 | -13.15 | 39.12 | 46.00 | -6.88 | QP | P |
| 4 * | 501.1790 | 50.75 | -8.23 | 42.52 | 46.00 | -3.48 | QP | P |
| 5 ! | 625.0780 | 47.65 | -5.37 | 42.28 | 46.00 | -3.72 | QP | P |
| 6 ! | 875.2470 | 43.42 | -1.18 | 42.24 | 46.00 | -3.76 | QP | P |

Remarks:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.The test data shows only the worst case U-NII-1 band 802.11a high channel mode.

Between 1GHz – 40GHz

| | | | |
|---|---|---|---|
| Temperature： | 26℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Test Voltage ： | AC 120V, 60Hz |
| Test Mode ： | U-NII-1: 802.11n(HT40) | | |

| Test mode: | IEEE 802.11n(HT40) | Test channel: | Low CH |
|---|---|---|---|

Peak value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Pol. |
|---|---|---|---|---|---|---|---|---|
| 10380.00 | 41.06 | 31.98 | 17.08 | 33.91 | 56.21 | 68.20 | -11.99 | V |
| 15570.00 | 41.87 | 32.65 | 20.03 | 34.85 | 59.70 | 68.20 | -8.50 | V |
| 10380.00 | 39.80 | 31.98 | 17.08 | 33.91 | 54.95 | 68.20 | -13.25 | H |
| 15570.00 | 41.43 | 32.65 | 20.03 | 34.85 | 59.26 | 68.20 | -8.94 | H |

Average value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Pol. |
|---|---|---|---|---|---|---|---|---|
| 10380.00 | 27.72 | 31.98 | 17.08 | 33.91 | 42.87 | 54.00 | -11.13 | V |
| 15570.00 | 29.05 | 32.65 | 20.03 | 34.85 | 46.88 | 54.00 | -7.12 | V |
| 10380.00 | 29.37 | 31.98 | 17.08 | 33.91 | 44.52 | 54.00 | -9.48 | H |
| 15570.00 | 29.54 | 32.65 | 20.03 | 34.85 | 47.37 | 54.00 | -6.63 | H |

| Test mode: | IEEE 802.11n(HT40) | Test channel: | High CH |
|---|---|---|---|

Peak value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Pol. |
|---|---|---|---|---|---|---|---|---|
| 10460.00 | 39.82 | 32.59 | 18.02 | 33.92 | 56.51 | 68.20 | -11.69 | V |
| 15690.00 | 41.89 | 32.87 | 20.15 | 34.88 | 60.03 | 68.20 | -8.17 | V |
| 10460.00 | 41.81 | 32.59 | 18.02 | 33.92 | 58.50 | 68.20 | -9.70 | H |
| 15690.00 | 39.08 | 32.87 | 20.15 | 34.88 | 57.22 | 68.20 | -10.98 | H |

Average value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Pol. |
|---|---|---|---|---|---|---|---|---|
| 10460.00 | 28.18 | 32.59 | 18.02 | 33.92 | 44.87 | 54.00 | -9.13 | V |
| 15690.00 | 27.24 | 32.87 | 20.15 | 34.88 | 45.38 | 54.00 | -8.62 | V |
| 10460.00 | 27.40 | 32.59 | 18.02 | 33.92 | 44.09 | 54.00 | -9.91 | H |
| 15690.00 | 28.35 | 32.78 | 20.12 | 34.86 | 46.39 | 54.00 | -7.61 | H |

Remark:

1. During the test, pre-scan the 802.11a,n(HT20),ac(HT20),n(HT40),ac(HT40),ac(HT80) mode, and found the U-NII-1 band 802.11n(HT40) mode is worse case , the report only record this mode.
2. Final Level =Receiver Read level + Antenna Factor + Cable Loss–Preamplifier Factor

## 5.POWER SPECTRAL DENSITY TEST

### 5.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(3)

Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

## 5.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

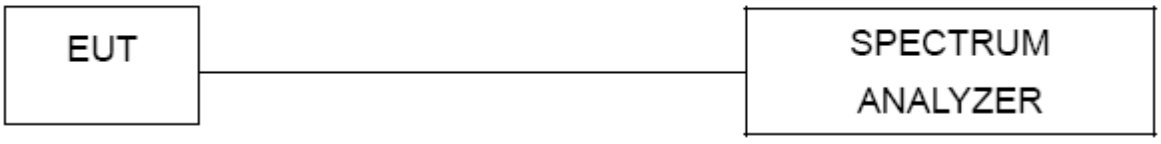
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

## 5.3 DEVIATION FROM STANDARD

No deviation.

## 5.4 TEST SETUP




## 5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

| | | | |
|---|---|---|---|
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1015 hPa | Test Voltage ： | AC 120V, 60Hz |
| Test Mode ： | TX | | |

U-NII-1:

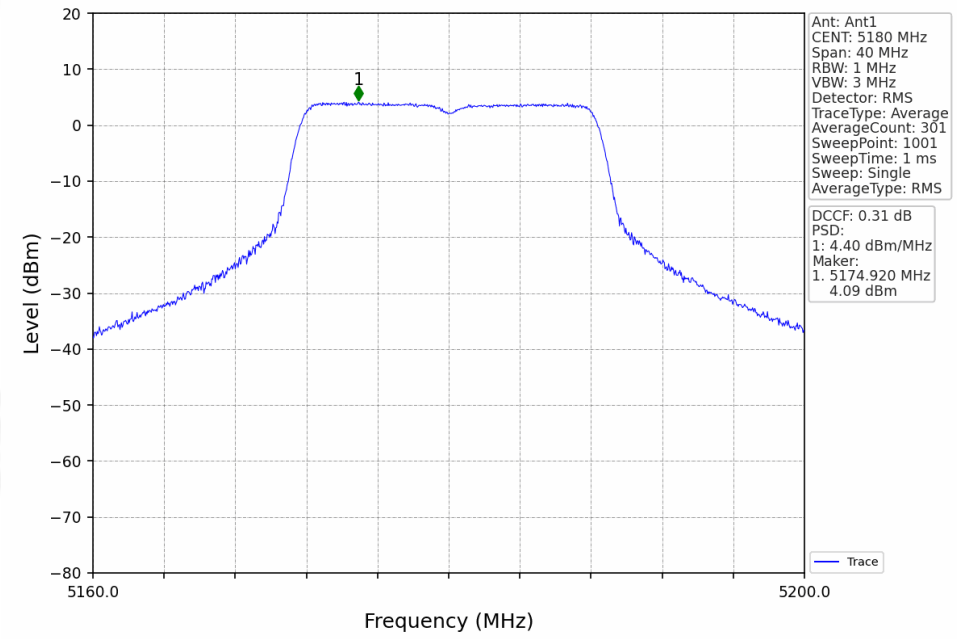
| Mode | TX Type | Frequency (MHz) | Maximum PSD (dBm/MHz) | | Verdict |
|---|---|---|---|---|---|
| | | | ANT1 | Limit | |
| 802.11a | SISO | 5180 | 4.40 | <=11 | Pass |
| | | 5200 | 4.19 | <=11 | Pass |
| | | 5240 | 4.79 | <=11 | Pass |
| 802.11n (HT20) | SISO | 5180 | 3.52 | <=11 | Pass |
| | | 5200 | 3.74 | <=11 | Pass |
| | | 5240 | 4.55 | <=11 | Pass |
| 802.11n (HT40) | SISO | 5190 | 0.61 | <=11 | Pass |
| | | 5230 | 1.47 | <=11 | Pass |
| 802.11ac (VHT20) | SISO | 5180 | 3.93 | <=11 | Pass |
| | | 5200 | 4.11 | <=11 | Pass |
| | | 5240 | 4.86 | <=11 | Pass |
| 802.11ac (VHT40) | SISO | 5190 | 0.70 | <=11 | Pass |
| | | 5230 | 1.53 | <=11 | Pass |
| 802.11ac (VHT80) | SISO | 5210 | -2.60 | <=11 | Pass |
| Note1: Antenna Gain: Ant1: 1.0dBi; | | | | | |

U-NII-3：

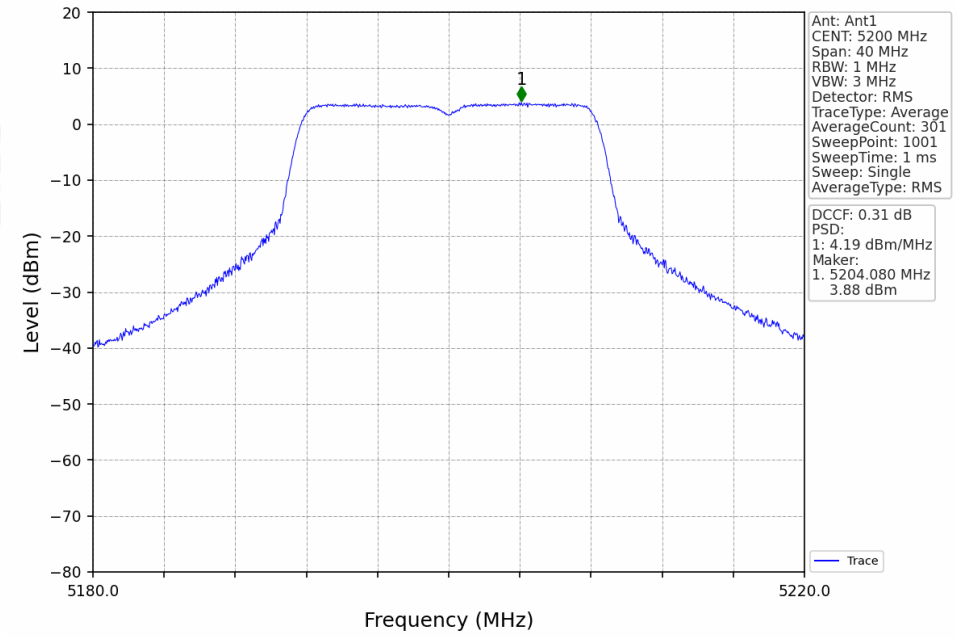
| Mode | TX Type | Frequency (MHz) | Maximum PSD (dBm/500kHz) | | Verdict |
|---|---|---|---|---|---|
| | | | ANT1 | Limit | |
| 802.11a | SISO | 5745 | 1.62 | <=30 | Pass |
| | | 5785 | 1.17 | <=30 | Pass |
| | | 5825 | 1.02 | <=30 | Pass |
| 802.11n (HT20) | SISO | 5745 | 2.27 | <=30 | Pass |
| | | 5785 | 1.46 | <=30 | Pass |
| | | 5825 | 1.28 | <=30 | Pass |
| 802.11n (HT40) | SISO | 5755 | -1.44 | <=30 | Pass |
| | | 5795 | -1.67 | <=30 | Pass |
| 802.11ac (VHT20) | SISO | 5745 | 1.31 | <=30 | Pass |
| | | 5785 | 1.30 | <=30 | Pass |
| | | 5825 | 1.24 | <=30 | Pass |
| 802.11ac (VHT40) | SISO | 5755 | -1.42 | <=30 | Pass |
| | | 5795 | -1.59 | <=30 | Pass |
| 802.11ac (VHT80) | SISO | 5775 | -5.10 | <=30 | Pass |
| Note1: Antenna Gain: Ant1: 1.0dBi; | | | | | |

Test Graph

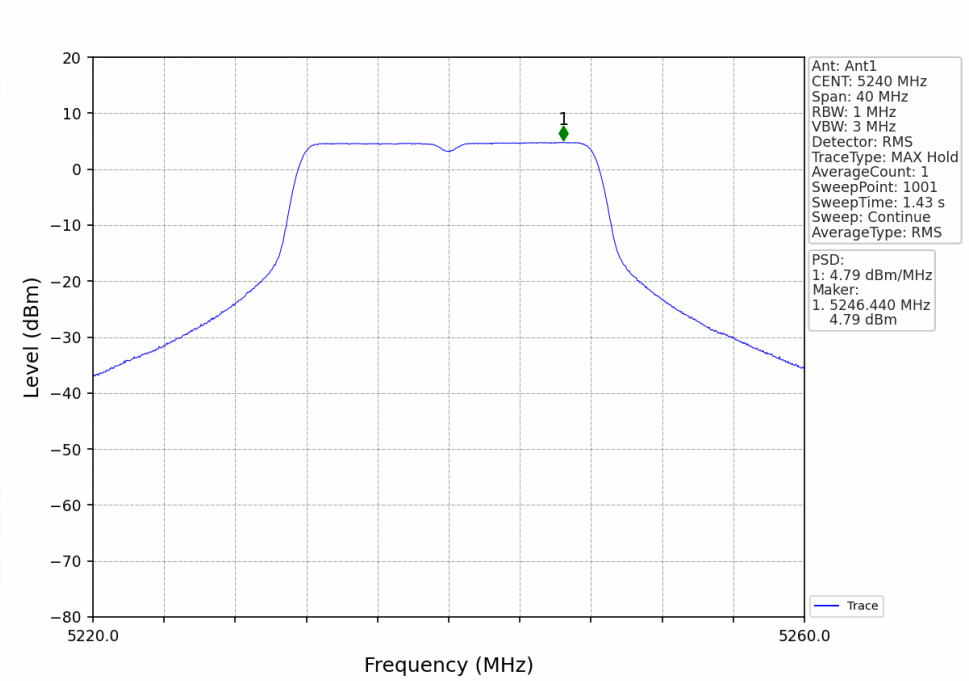
802.11a_LCH_5180MHz_Ant1_NTNV



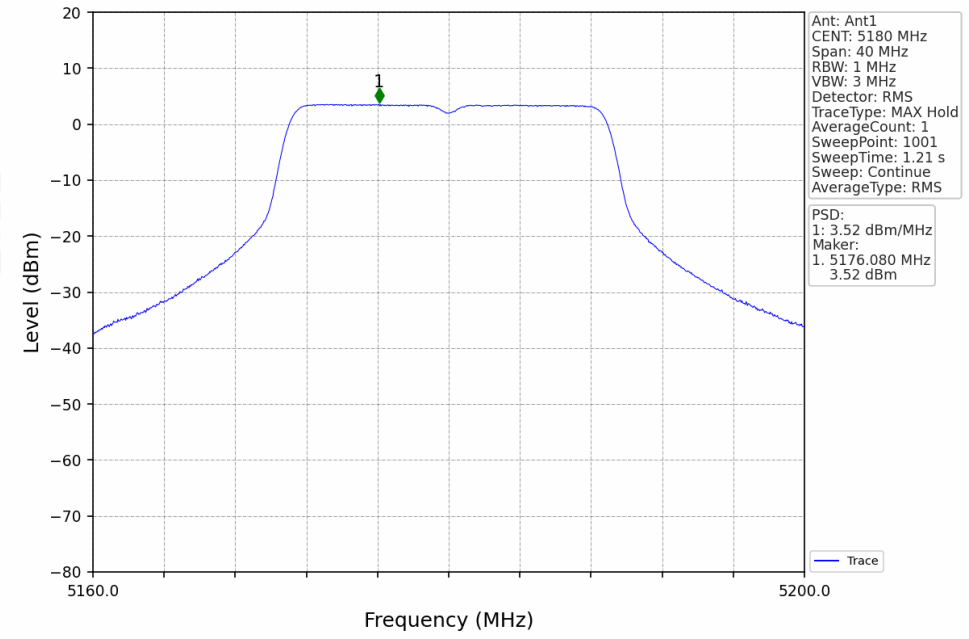

802.11a_MCH_5200MHz_Ant1_NTNV



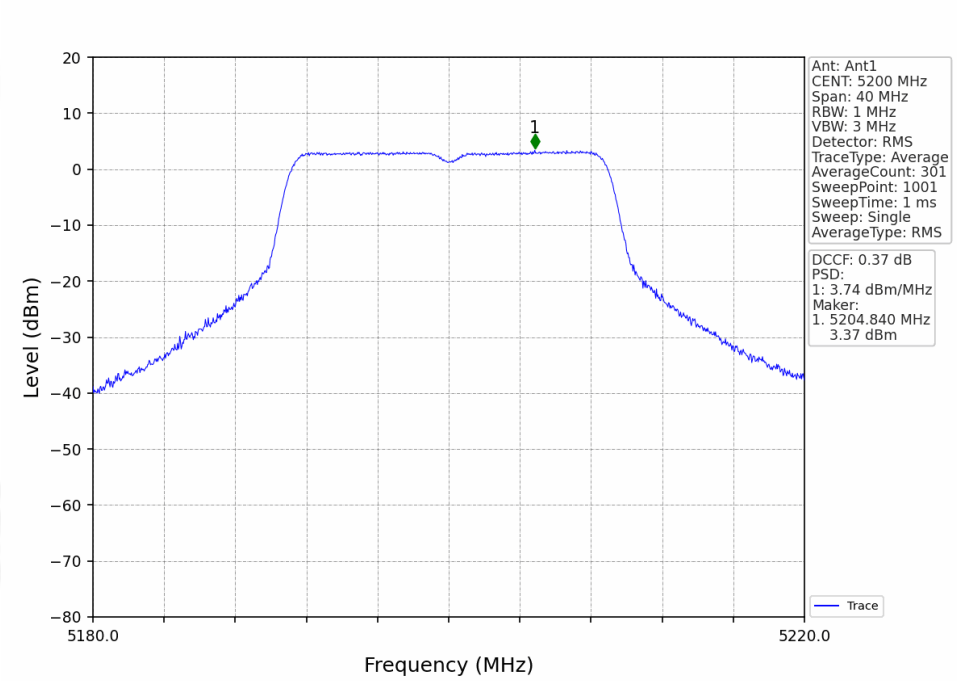
802.11a_HCH_5240MHz_Ant1_NTNV



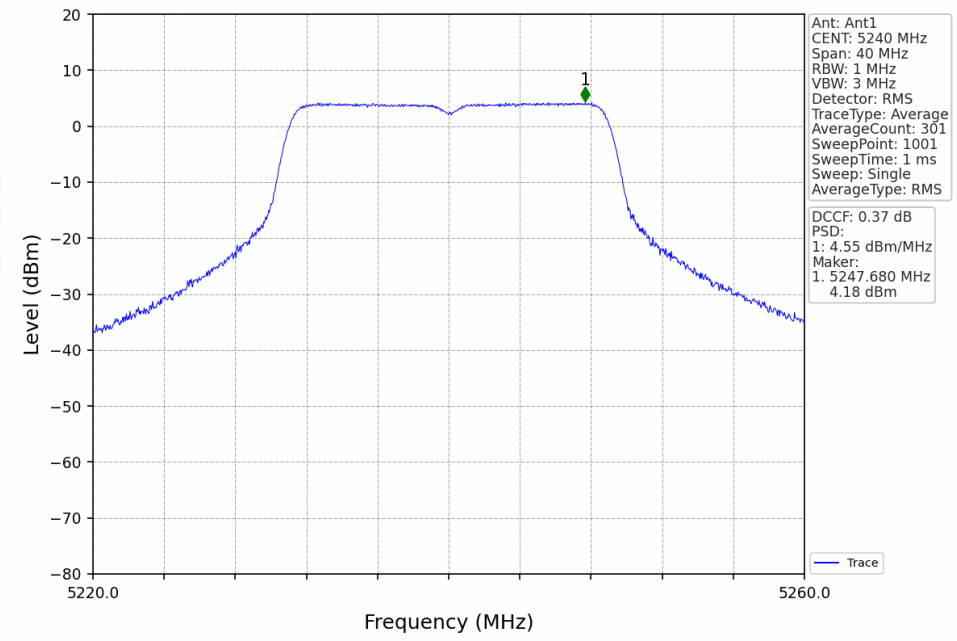

802.11n(HT20)_LCH_5180MHz_Ant1_NTNV



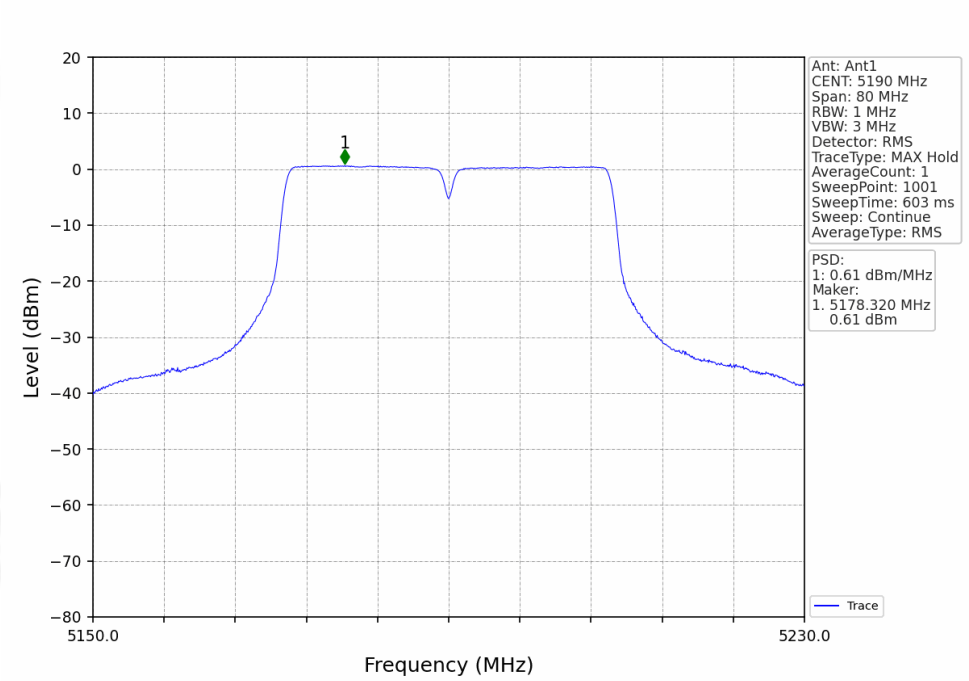
802.11n(HT20)_MCH_5200MHz_Ant1_NTNV



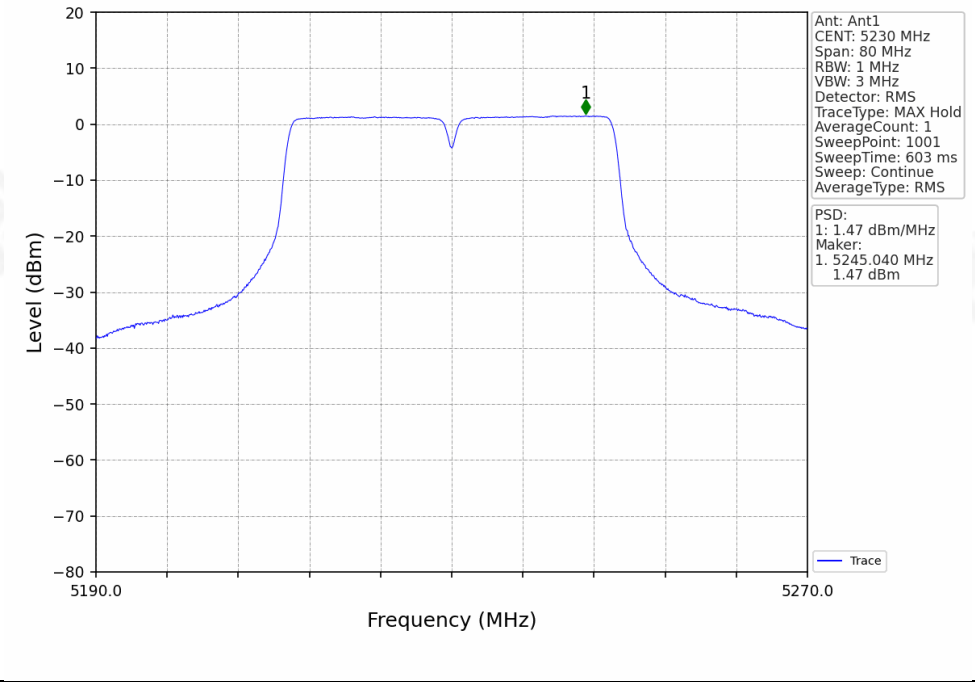

802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



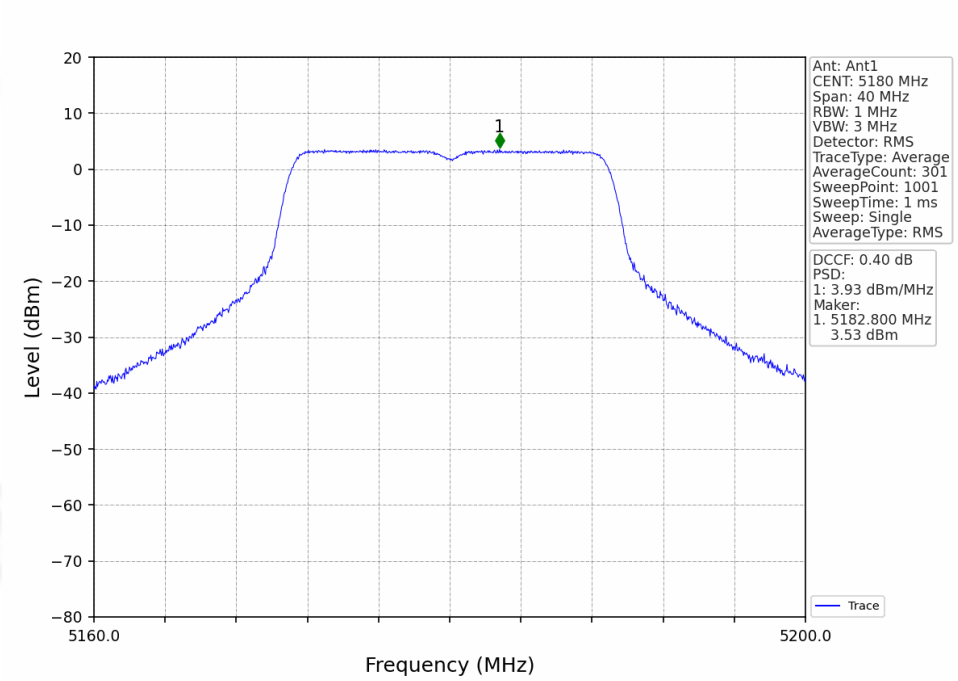
802.11n(HT40)_LCH_5190MHz_Ant1_NTNV



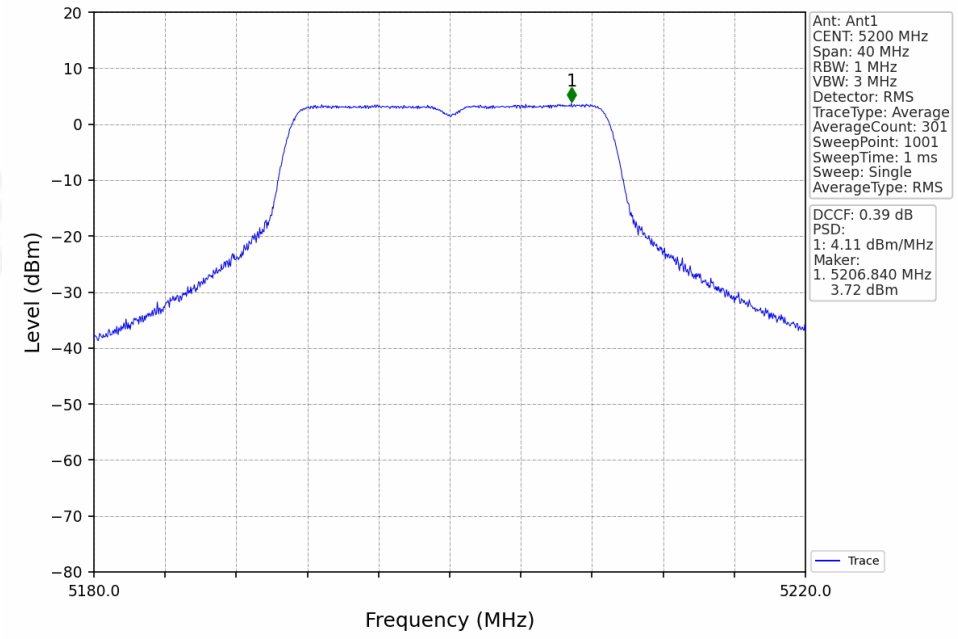

802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



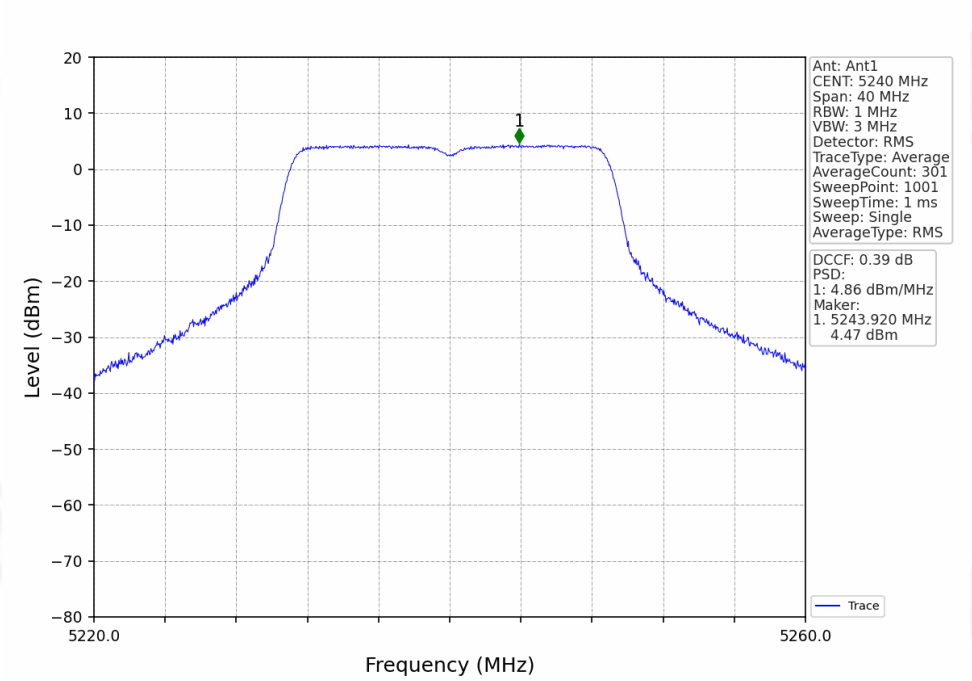
802.11ac(VHT20)_LCH_5180MHz_Ant1_NTNV



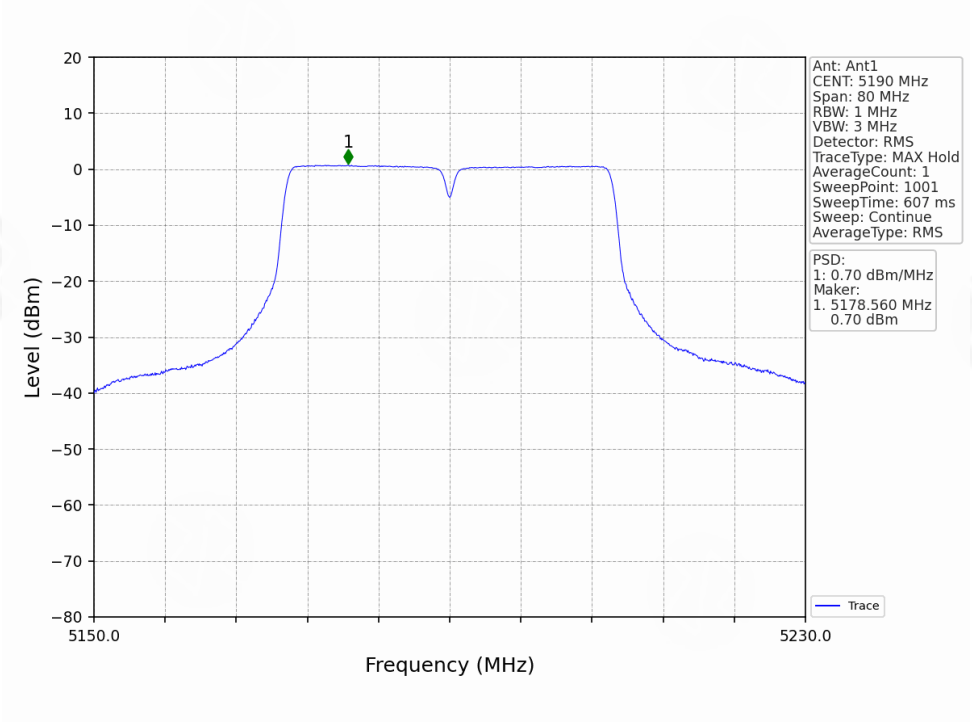

802.11ac(VHT20)_MCH_5200MHz_Ant1_NTNV



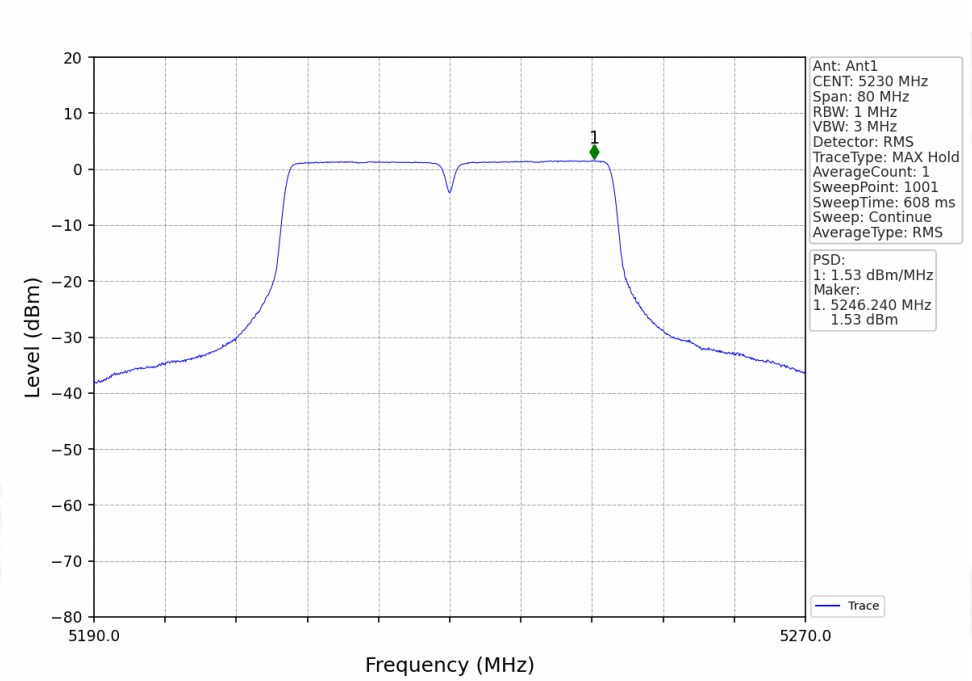
802.11ac(VHT20)_HCH_5240MHz_Ant1_NTNV



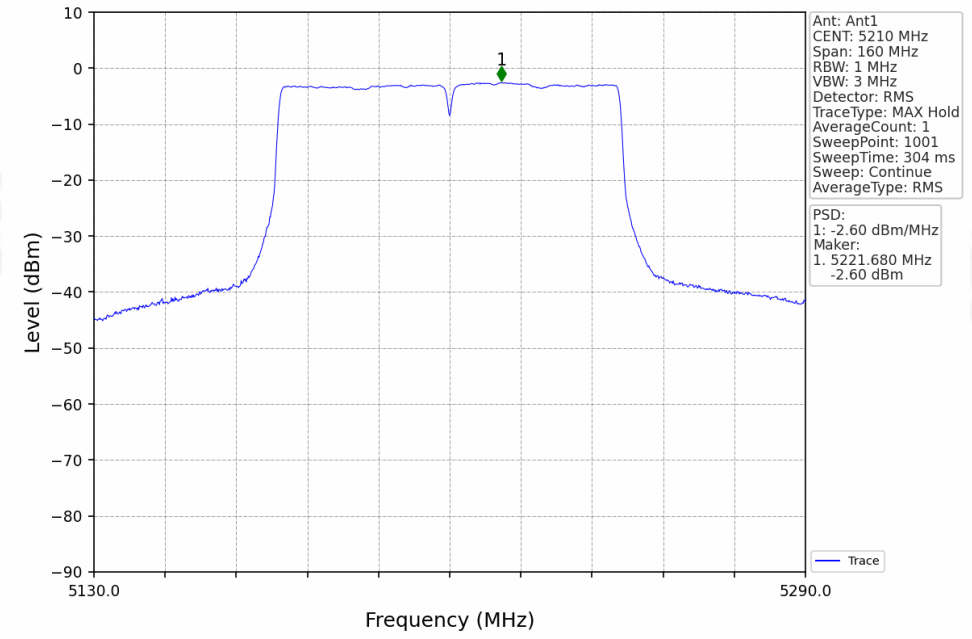

802.11ac(VHT40)_LCH_5190MHz_Ant1_NTNV



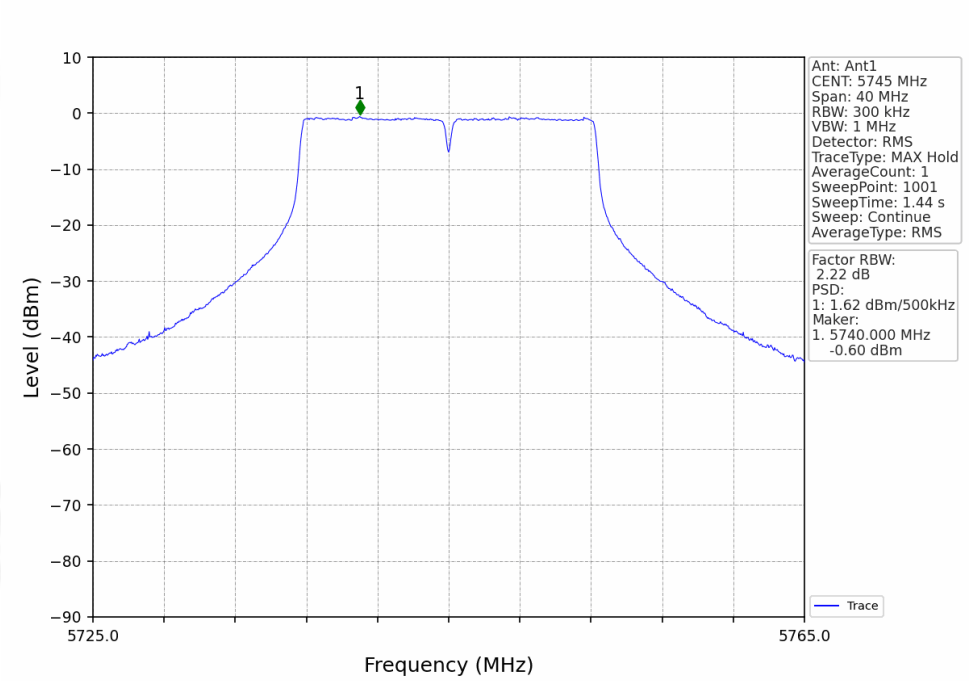
802.11ac(VHT40)_HCH_5230MHz_Ant1_NTNV



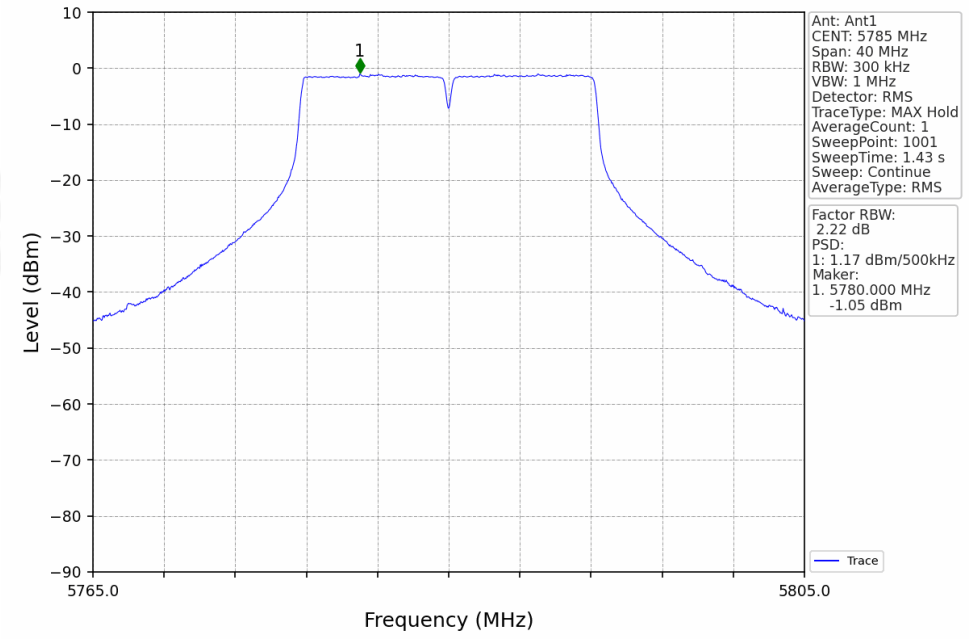

802.11ac(VHT80)_MCH_5210MHz_Ant1_NTNV



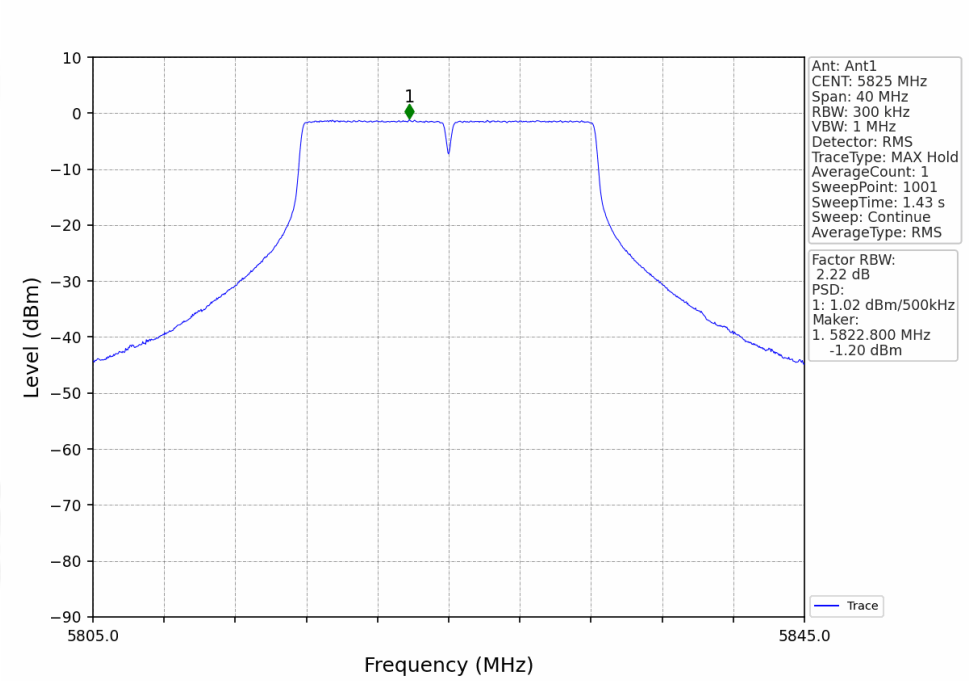
802.11a_LCH_5745MHz_Ant1_NTNV



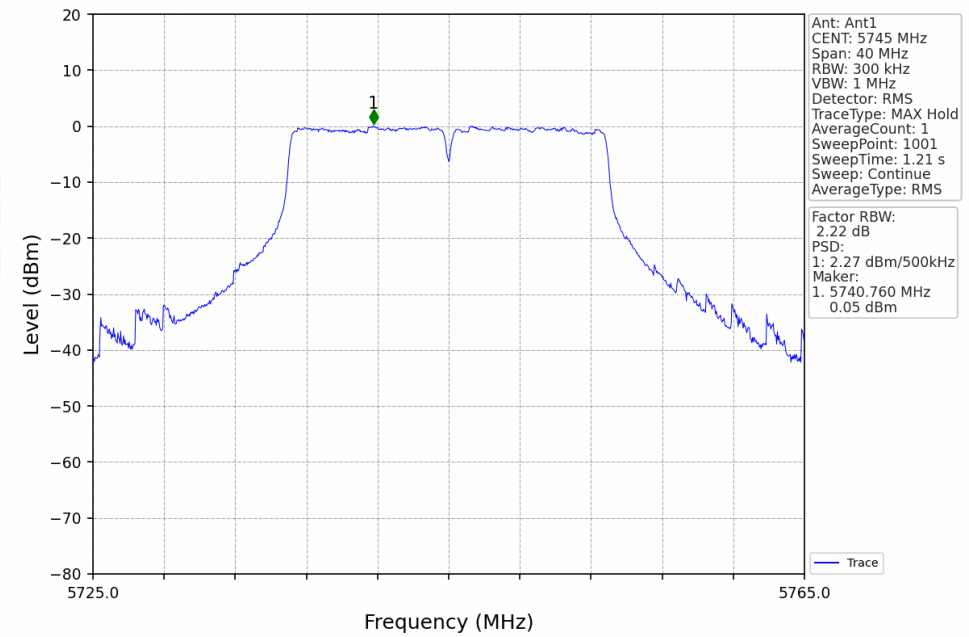

802.11a_MCH_5785MHz_Ant1_NTNV



802.11a_HCH_5825MHz_Ant1_NTNV




802.11n(HT20)_LCH_5745MHz_Ant1_NTNV



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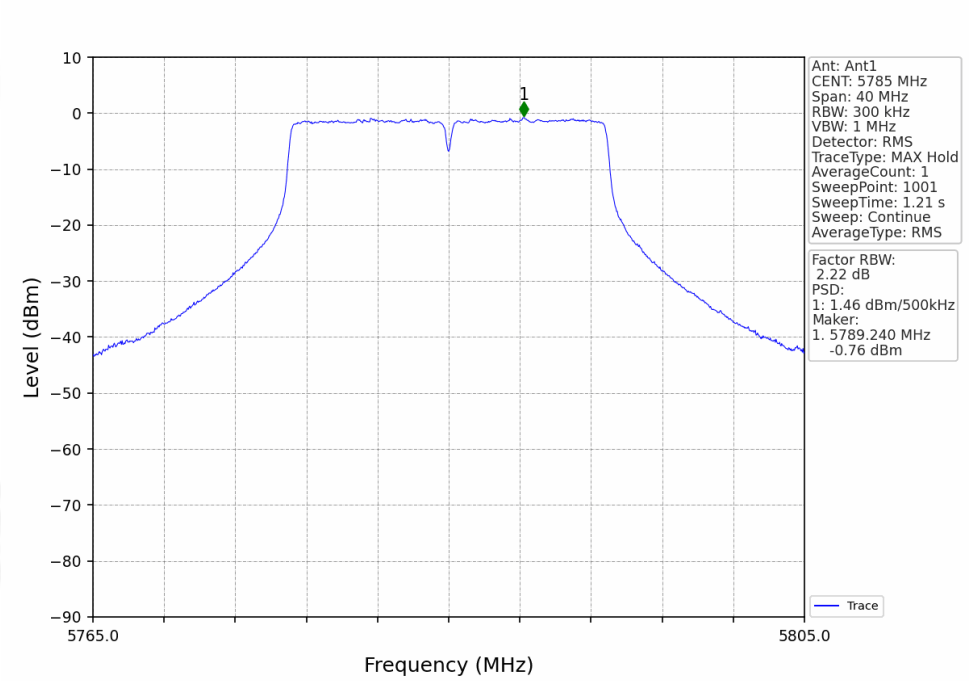


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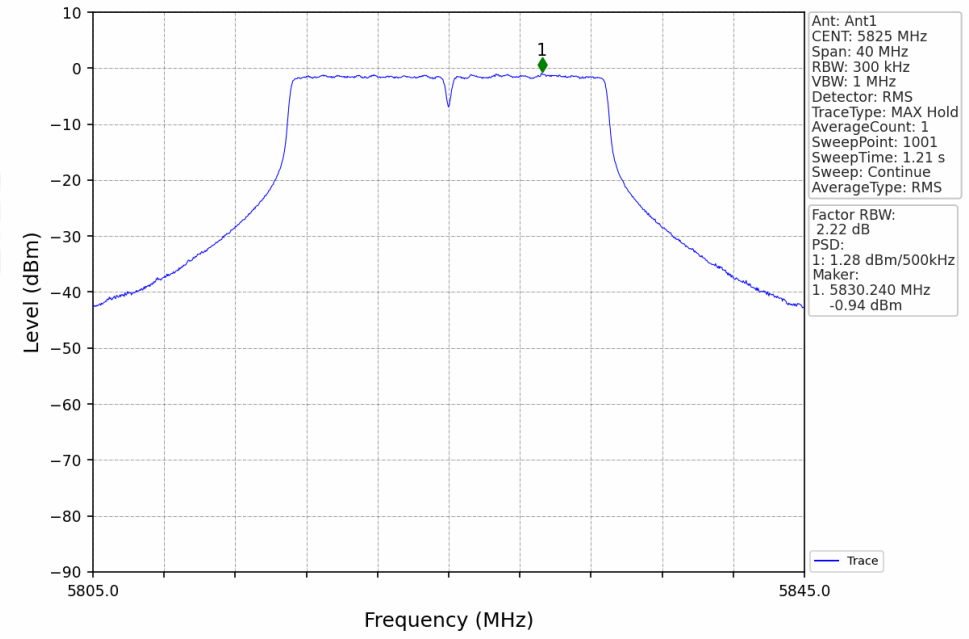
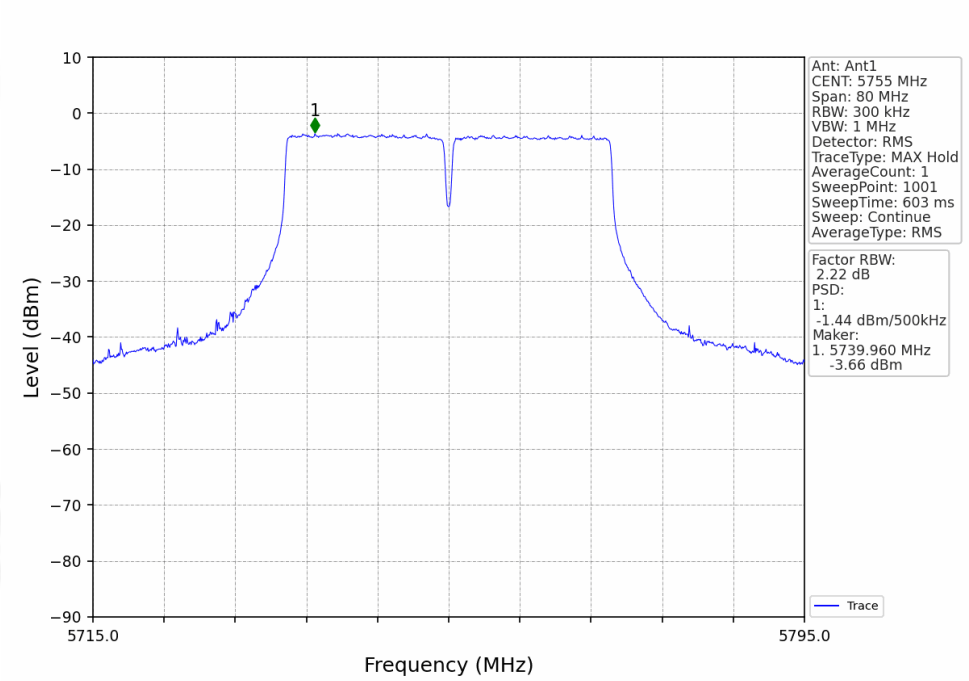
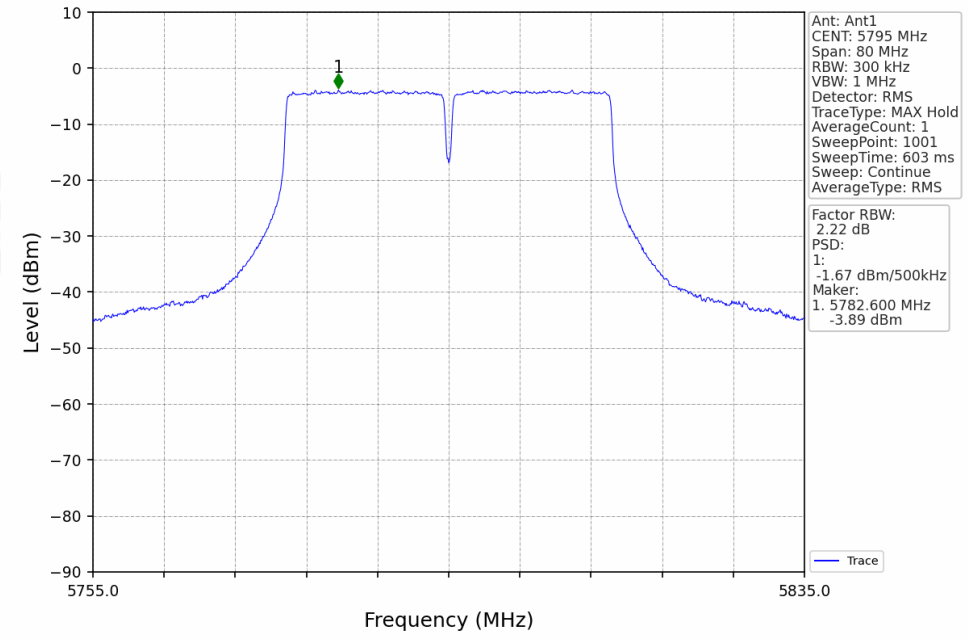


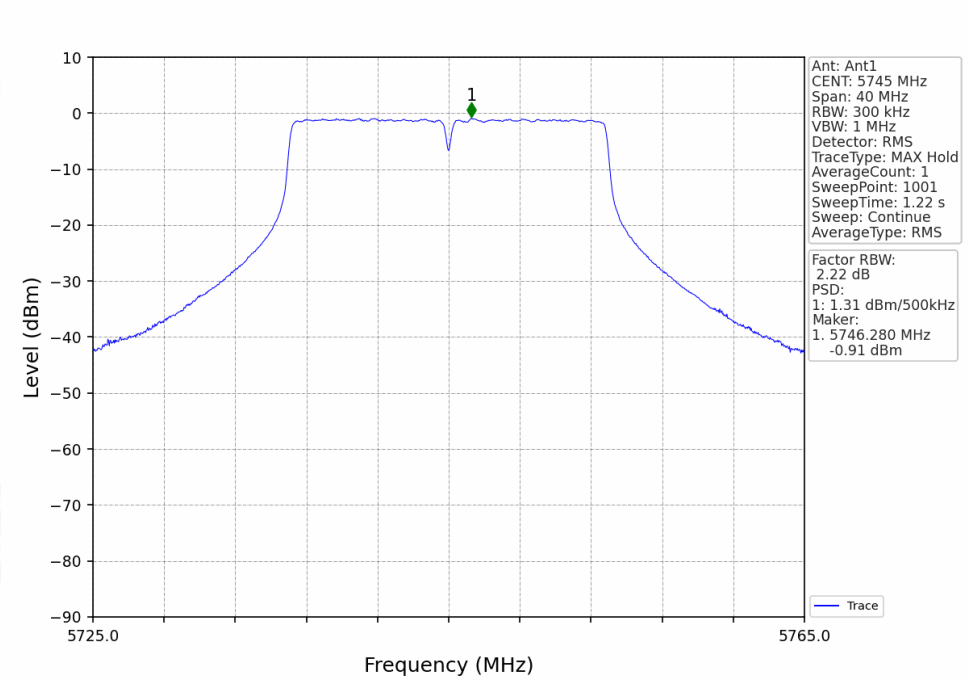
802.11n(HT40)_LCH_5755MHz_Ant1_NTNV



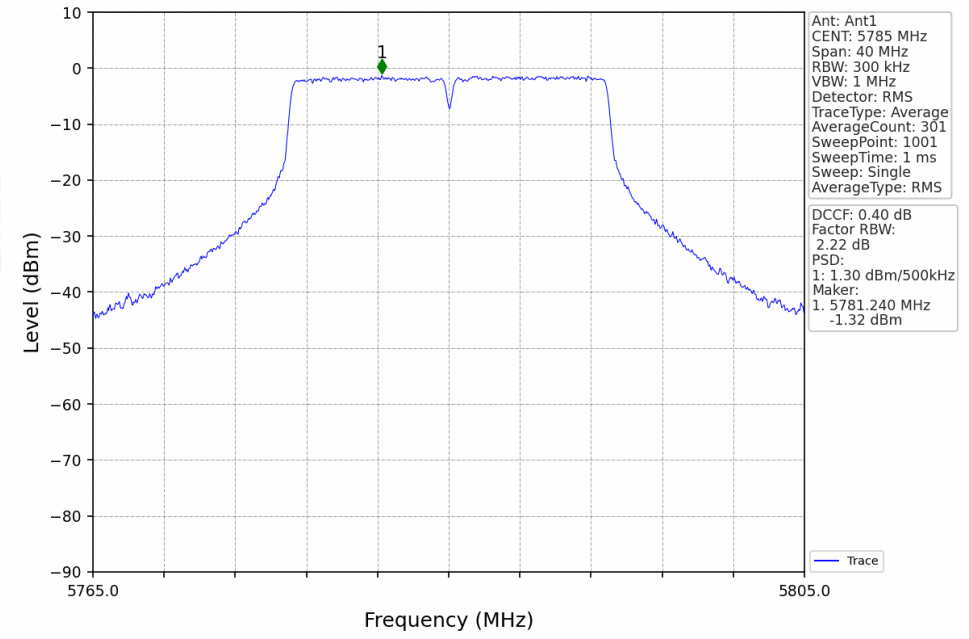

802.11n(HT40)_HCH_5795MHz_Ant1_NTNV



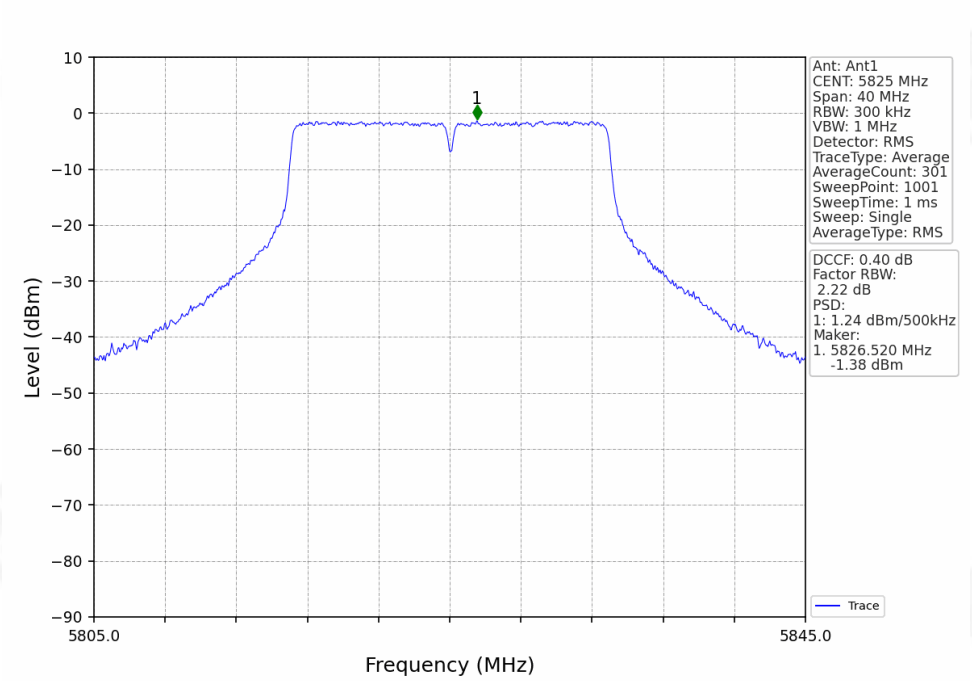
802.11ac(VHT20)_LCH_5745MHz_Ant1_NTNV



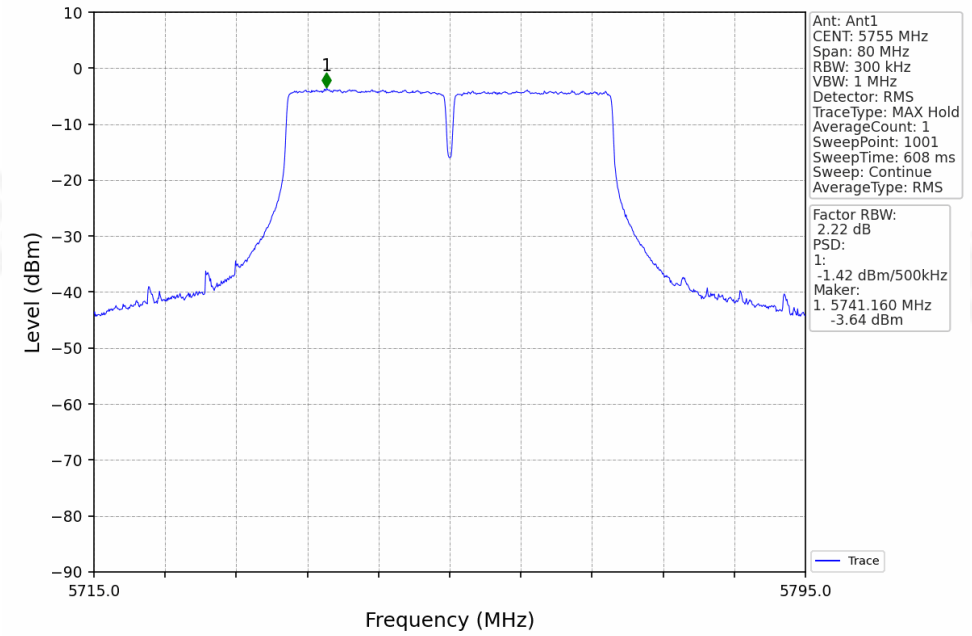

802.11ac(VHT20)_MCH_5785MHz_Ant1_NTNV



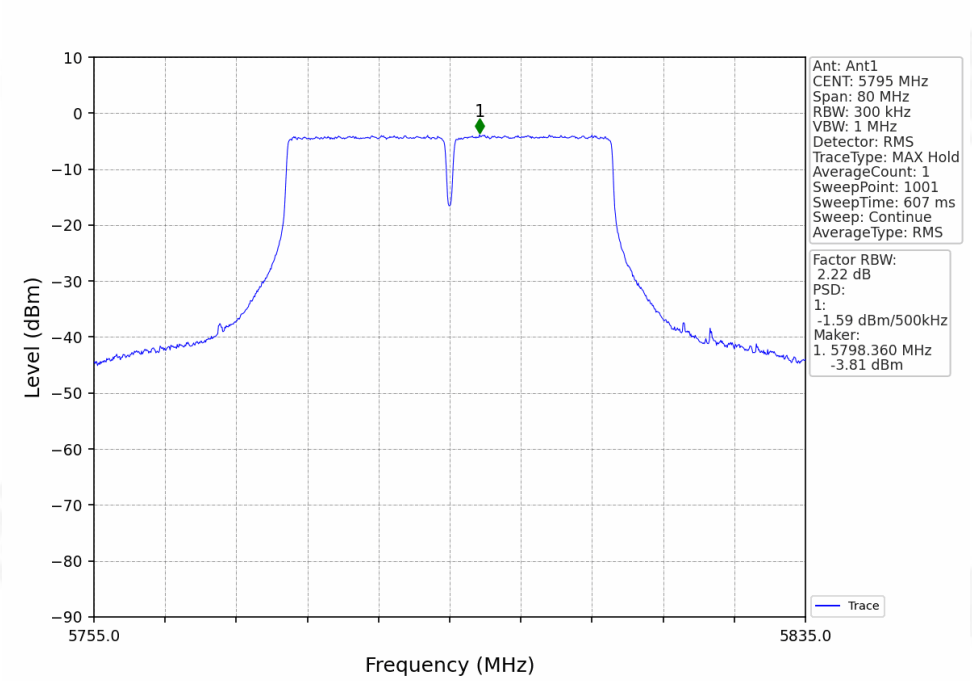
802.11ac(VHT20)_HCH_5825MHz_Ant1_NTNV



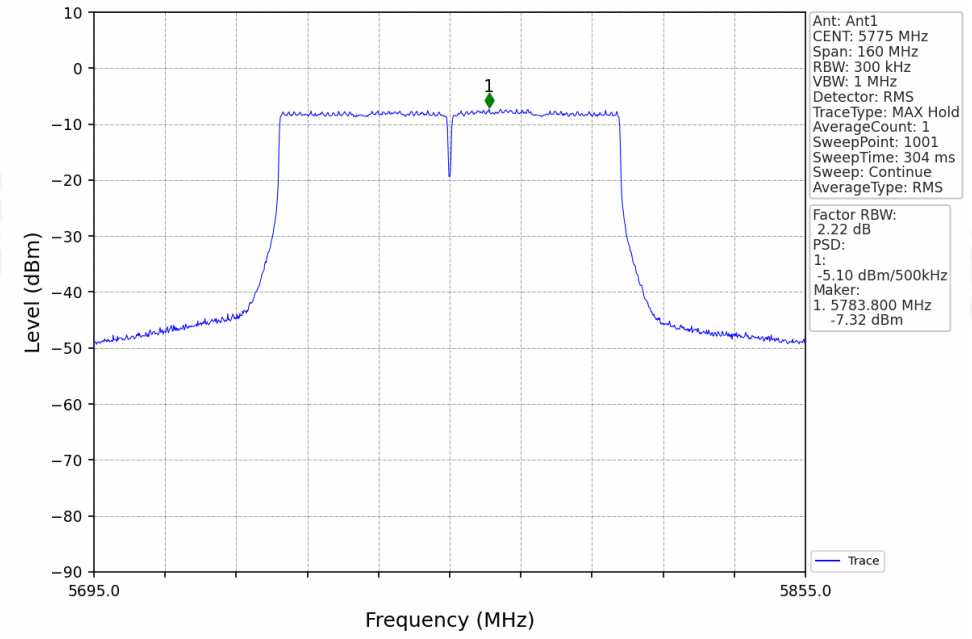

802.11ac(VHT40)_LCH_5755MHz_Ant1_NTNV



802.11ac(VHT40)_HCH_5795MHz_Ant1_NTNV




802.11ac(VHT80)_MCH_5775MHz_Ant1_NTNV



## 6. 26DB & 6DB & 99% EMISSION BANDWIDTH

### 6.1 APPLIED PROCEDURES / LIMIT

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

### 6.2 TEST PROCEDURE

a) Set RBW = 100KHz.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.4 TEST RESULTS

| | | | |
|---|---|---|---|
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 101kPa | Test Voltage ： | AC 120V, 60Hz |
| Test Mode ： | TX | | |

99% Occupy Bandwidth (MHz)

| Mode | TX Type | Frequency (MHz) | ANT | 99% Occupied Bandwidth (MHz) Result | Verdict |
|---|---|---|---|---|---|
| 802.11a | SISO | 5180 | 1 | 18.295 | Pass |
| | | 5200 | 1 | 18.329 | Pass |
| | | 5240 | 1 | 18.323 | Pass |
| | | 5745 | 1 | 18.252 | Pass |
| | | 5785 | 1 | 18.262 | Pass |
| | | 5825 | 1 | 18.198 | Pass |
| 802.11n (HT20) | SISO | 5180 | 1 | 19.326 | Pass |
| | | 5200 | 1 | 19.419 | Pass |
| | | 5240 | 1 | 19.504 | Pass |
| | | 5745 | 1 | 19.384 | Pass |
| | | 5785 | 1 | 19.285 | Pass |
| | | 5825 | 1 | 19.230 | Pass |
| 802.11n (HT40) | SISO | 5190 | 1 | 38.302 | Pass |
| | | 5230 | 1 | 38.125 | Pass |
| | | 5755 | 1 | 38.216 | Pass |
| | | 5795 | 1 | 37.962 | Pass |
| 802.11ac (VHT20) | SISO | 5180 | 1 | 19.235 | Pass |
| | | 5200 | 1 | 19.430 | Pass |
| | | 5240 | 1 | 19.507 | Pass |
| | | 5745 | 1 | 19.292 | Pass |
| | | 5785 | 1 | 19.346 | Pass |
| | | 5825 | 1 | 19.333 | Pass |
| 802.11ac (VHT40) | SISO | 5190 | 1 | 38.349 | Pass |
| | | 5230 | 1 | 38.192 | Pass |
| | | 5755 | 1 | 38.146 | Pass |
| | | 5795 | 1 | 38.050 | Pass |
| 802.11ac (VHT80) | SISO | 5210 | 1 | 77.727 | Pass |
| | | 5775 | 1 | 77.547 | Pass |

6dB Channel Bandwidth (MHz)

| Mode | TX Type | Frequency (MHz) | ANT | 6dB Bandwidth (MHz) | | Verdict |
|---|---|---|---|---|---|---|
| | | | | Result | Limit | |
| 802.11a | SISO | 5745 | 1 | 16.421 | >=0.5 | Pass |
| | | 5785 | 1 | 16.437 | >=0.5 | Pass |
| | | 5825 | 1 | 16.425 | >=0.5 | Pass |
| 802.11n (HT20) | SISO | 5745 | 1 | 17.716 | >=0.5 | Pass |
| | | 5785 | 1 | 17.703 | >=0.5 | Pass |
| | | 5825 | 1 | 17.701 | >=0.5 | Pass |
| 802.11n (HT40) | SISO | 5755 | 1 | 36.522 | >=0.5 | Pass |
| | | 5795 | 1 | 36.514 | >=0.5 | Pass |
| 802.11ac (VHT20) | SISO | 5745 | 1 | 17.699 | >=0.5 | Pass |
| | | 5785 | 1 | 17.676 | >=0.5 | Pass |
| | | 5825 | 1 | 17.690 | >=0.5 | Pass |
| 802.11ac (VHT40) | SISO | 5755 | 1 | 36.529 | >=0.5 | Pass |
| | | 5795 | 1 | 36.516 | >=0.5 | Pass |
| 802.11ac (VHT80) | SISO | 5775 | 1 | 76.510 | >=0.5 | Pass |

-26dB Channel Bandwidth (MHz)

| Mode | TX Type | Frequency (MHz) | ANT | 26dB Bandwidth (MHz) Result | Verdict |
|---|---|---|---|---|---|
| 802.11a | SISO | 5180 | 1 | 24.040 | Pass |
| | | 5200 | 1 | 23.851 | Pass |
| | | 5240 | 1 | 23.787 | Pass |
| 802.11n (HT20) | SISO | 5180 | 1 | 28.300 | Pass |
| | | 5200 | 1 | 30.102 | Pass |
| | | 5240 | 1 | 30.196 | Pass |
| 802.11n (HT40) | SISO | 5190 | 1 | 49.769 | Pass |
| | | 5230 | 1 | 49.162 | Pass |
| 802.11ac (VHT20) | SISO | 5180 | 1 | 30.189 | Pass |
| | | 5200 | 1 | 30.157 | Pass |
| | | 5240 | 1 | 29.866 | Pass |
| 802.11ac (VHT40) | SISO | 5190 | 1 | 45.751 | Pass |
| | | 5230 | 1 | 54.660 | Pass |
| 802.11ac (VHT80) | SISO | 5210 | 1 | 91.066 | Pass |

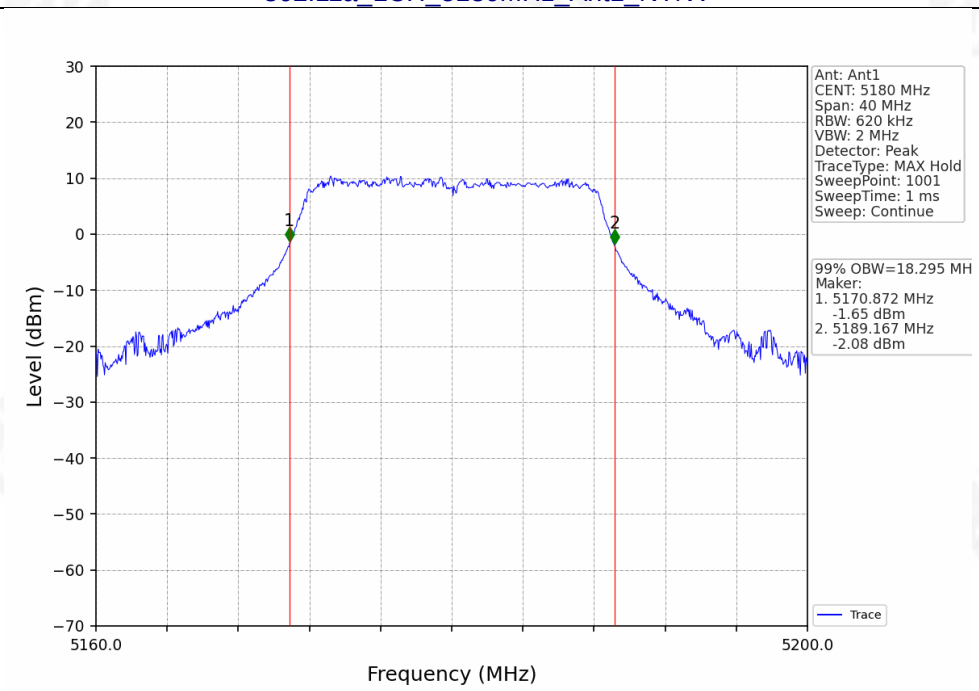
-26dB Channel Bandwidth (MHz)

| Mode | TX Type | Frequency (MHz) | ANT | 26dB Bandwidth (MHz) Result | Verdict |
|---|---|---|---|---|---|
| 802.11a | SISO | 5180 | 1 | 24.040 | Pass |
| | | 5200 | 1 | 23.851 | Pass |
| | | 5240 | 1 | 23.787 | Pass |
| 802.11n (HT20) | SISO | 5180 | 1 | 28.300 | Pass |
| | | 5200 | 1 | 30.102 | Pass |
| | | 5240 | 1 | 30.196 | Pass |
| 802.11n (HT40) | SISO | 5190 | 1 | 49.769 | Pass |
| | | 5230 | 1 | 49.162 | Pass |
| 802.11ac (VHT20) | SISO | 5180 | 1 | 30.189 | Pass |
| | | 5200 | 1 | 30.157 | Pass |
| | | 5240 | 1 | 29.866 | Pass |
| 802.11ac (VHT40) | SISO | 5190 | 1 | 45.751 | Pass |
| | | 5230 | 1 | 54.660 | Pass |
| 802.11ac (VHT80) | SISO | 5210 | 1 | 91.066 | Pass |

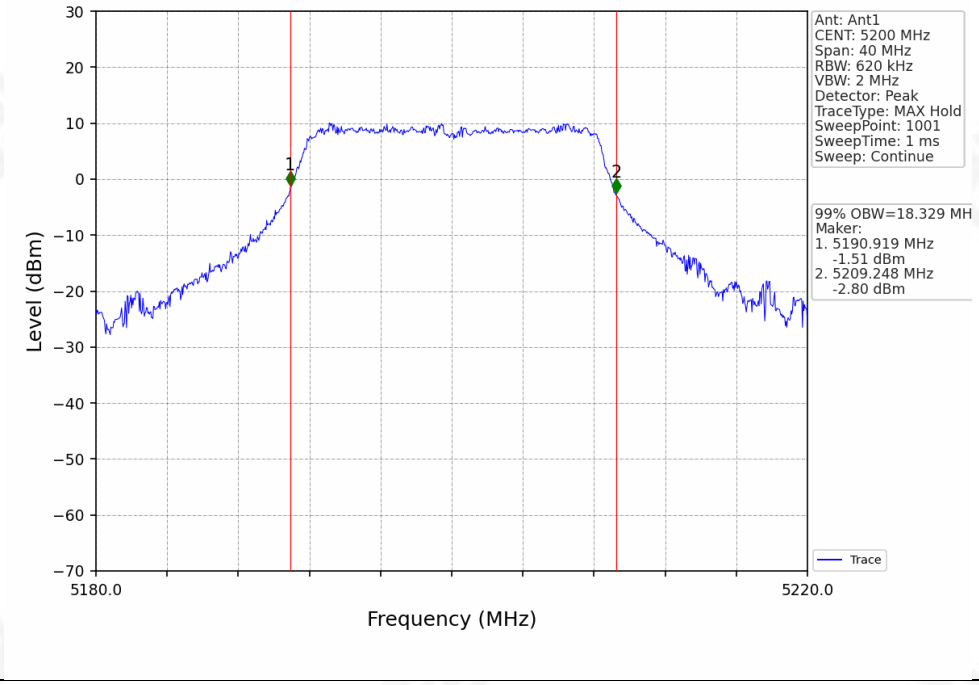
Test Result

99% Occupy Bandwidth (MHz)

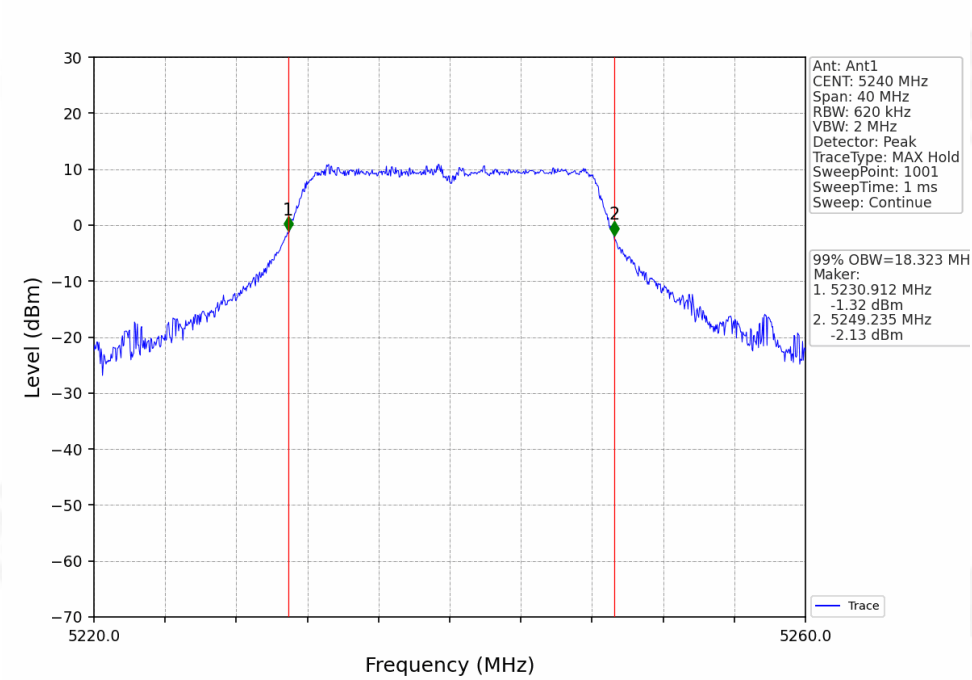
802.11a_LCH_5180MHz_Ant1_NTNV



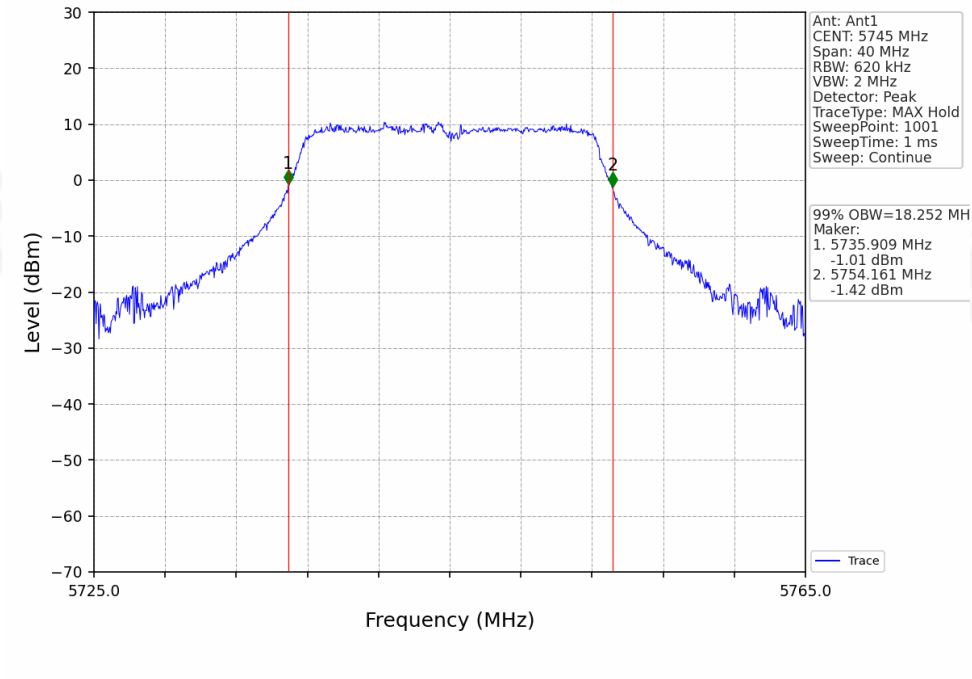

802.11a_MCH_5200MHz_Ant1_NTNV



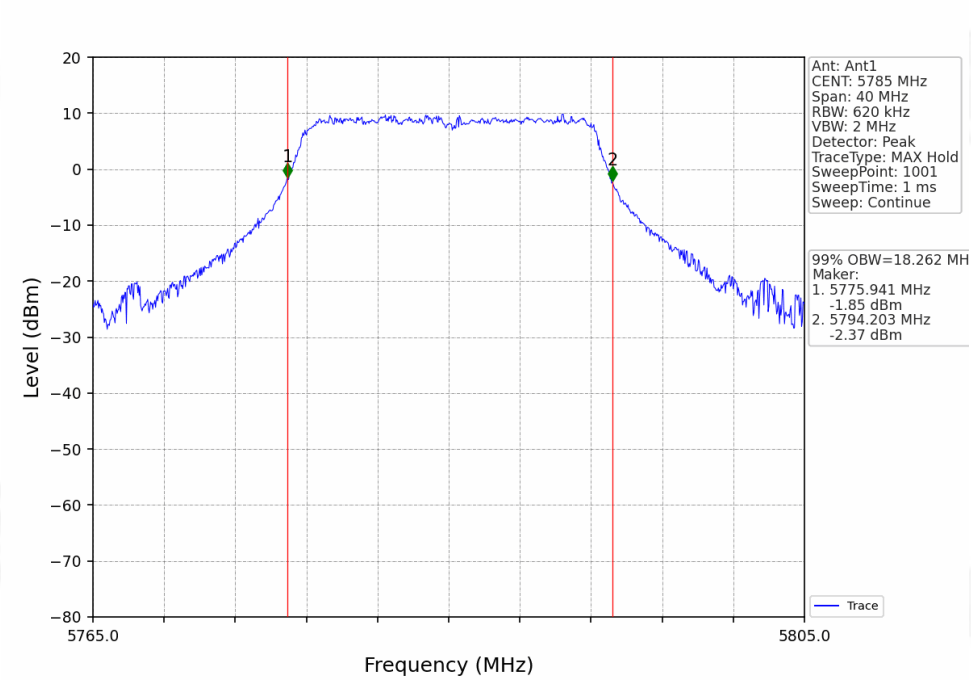
802.11a_HCH_5240MHz_Ant1_NTNV



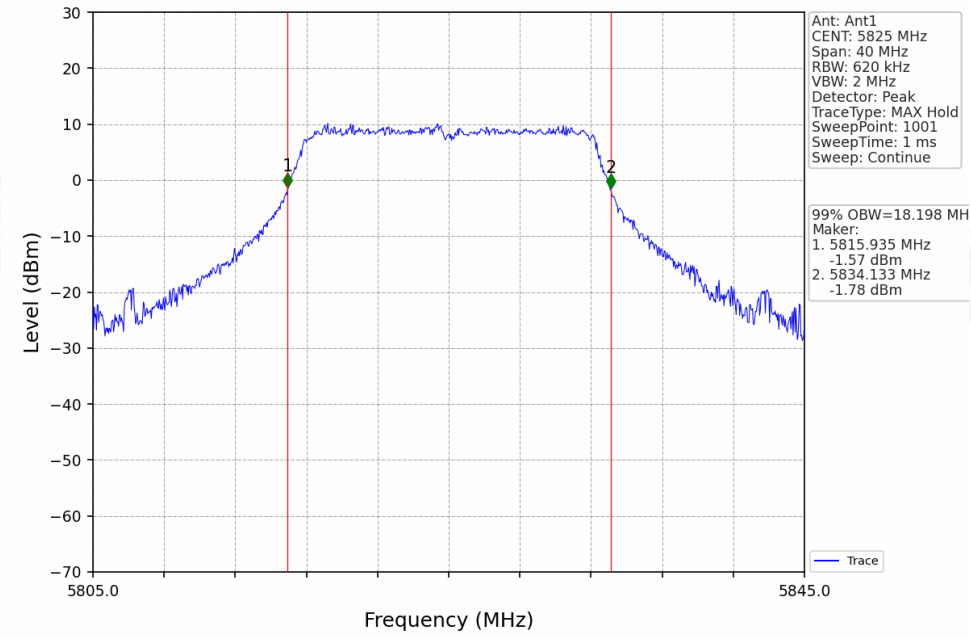

802.11a_LCH_5745MHz_Ant1_NTNV



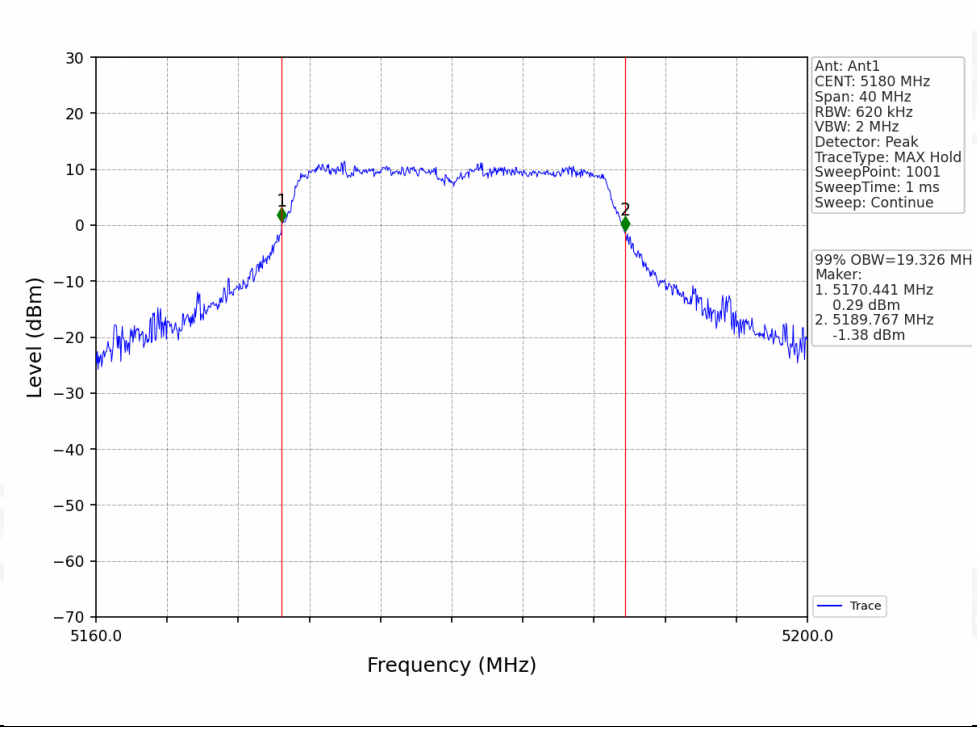
802.11a_MCH_5785MHz_Ant1_NTNV



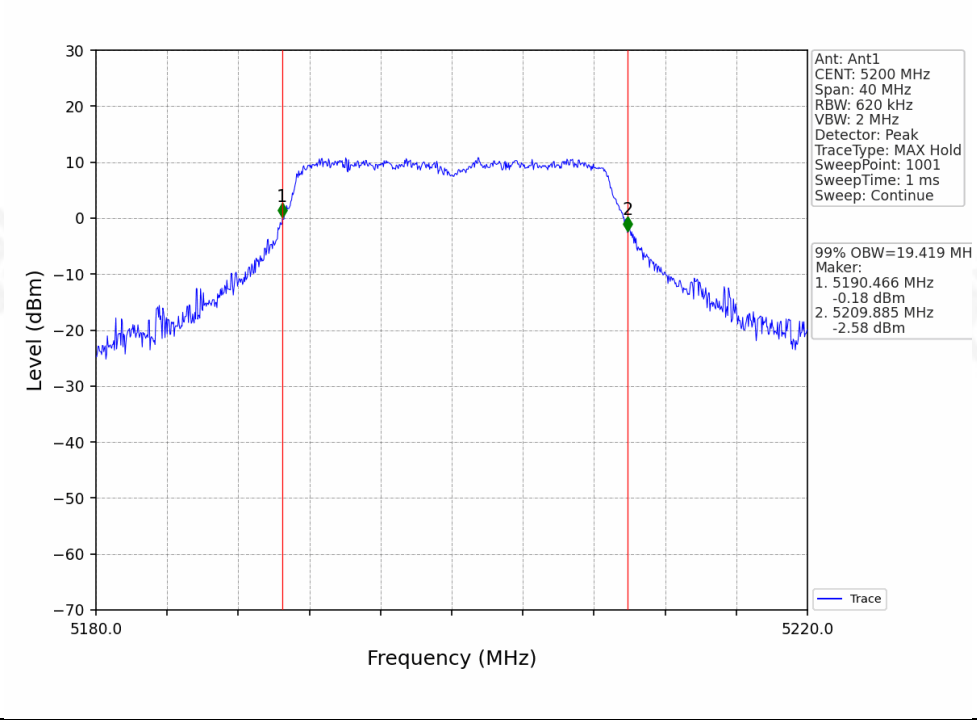

802.11a_HCH_5825MHz_Ant1_NTNV



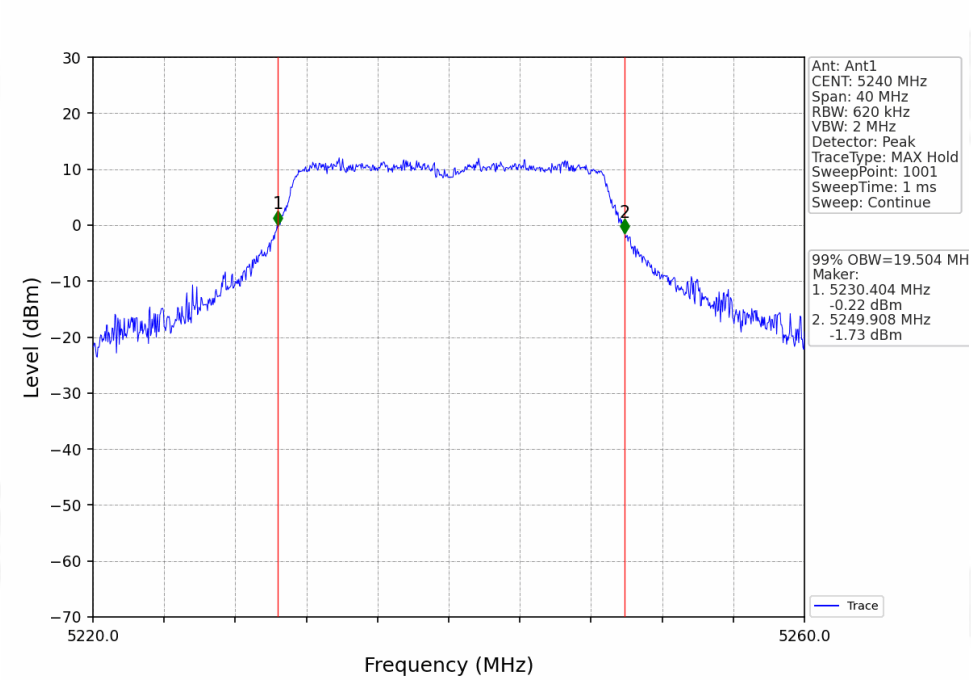
802.11n(HT20)_LCH_5180MHz_Ant1_NTNV



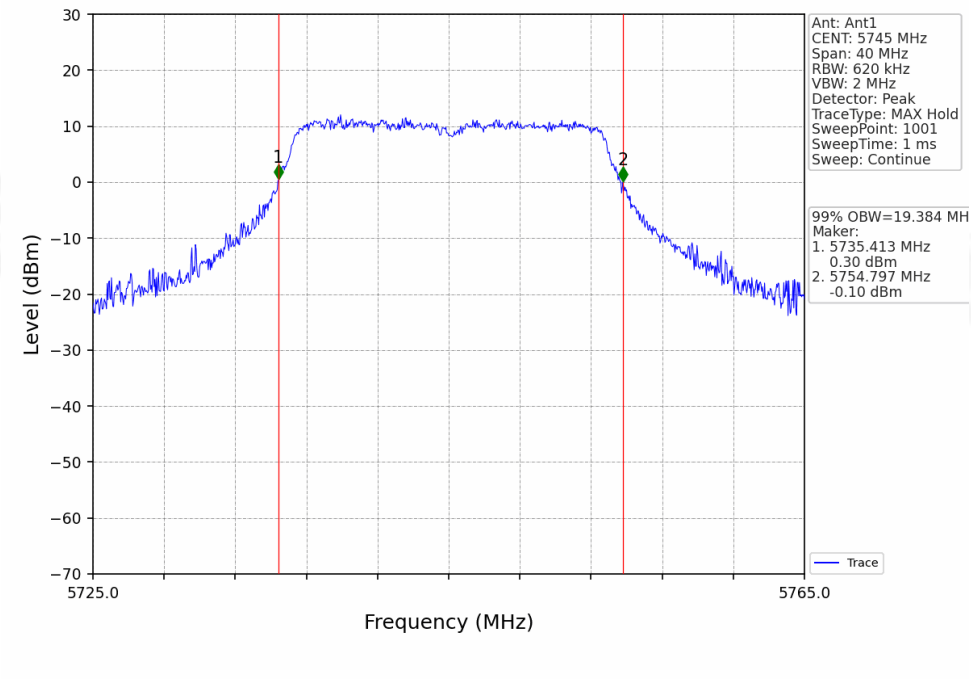

802.11n(HT20)_MCH_5200MHz_Ant1_NTNV



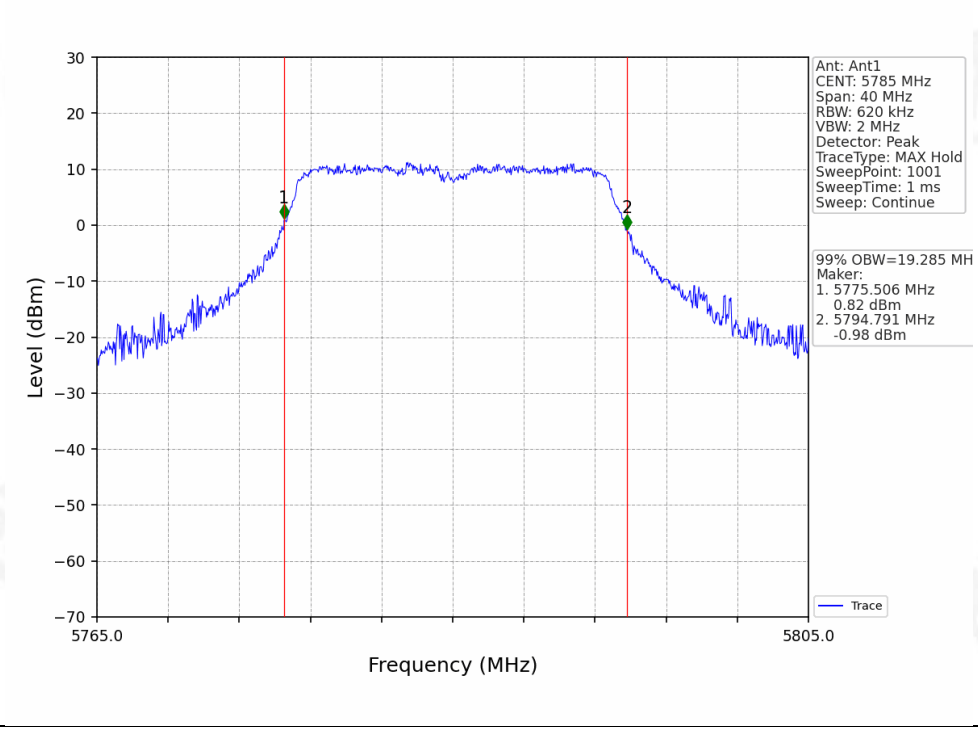
802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



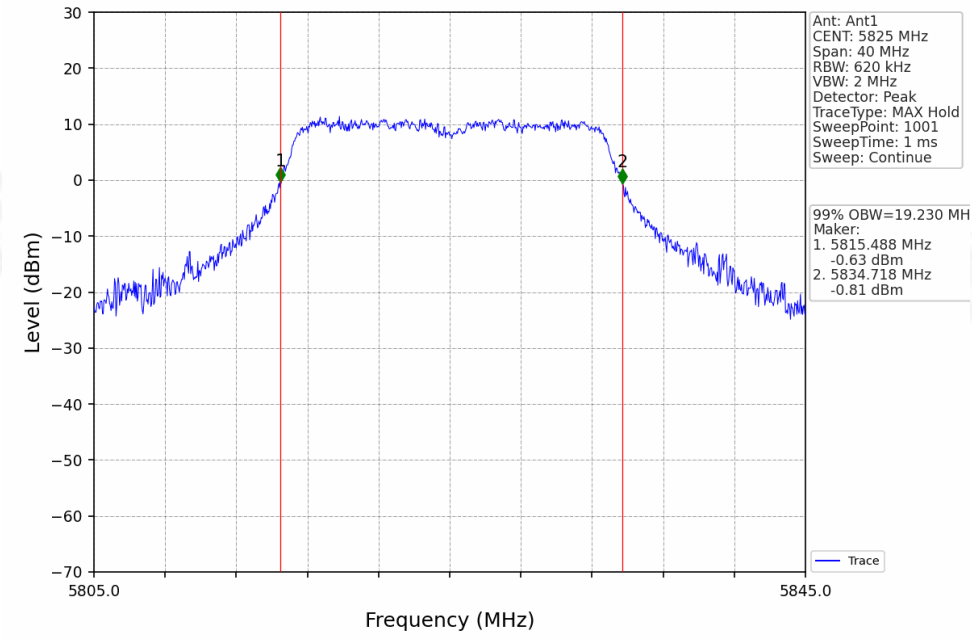

802.11n(HT20)_LCH_5745MHz_Ant1_NTNV



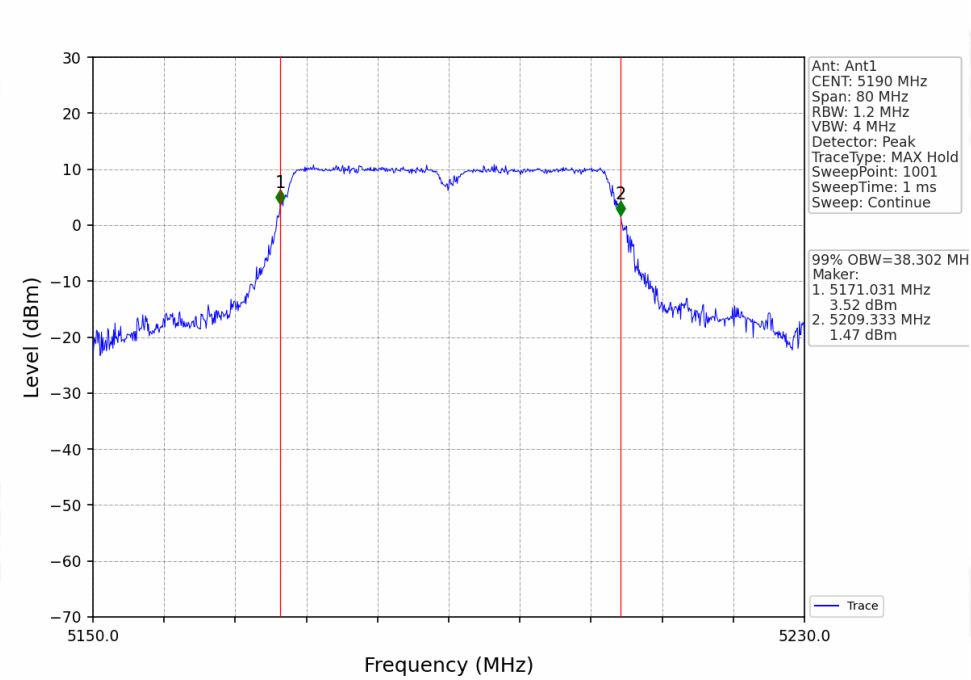
802.11n(HT20)_MCH_5785MHz_Ant1_NTNV



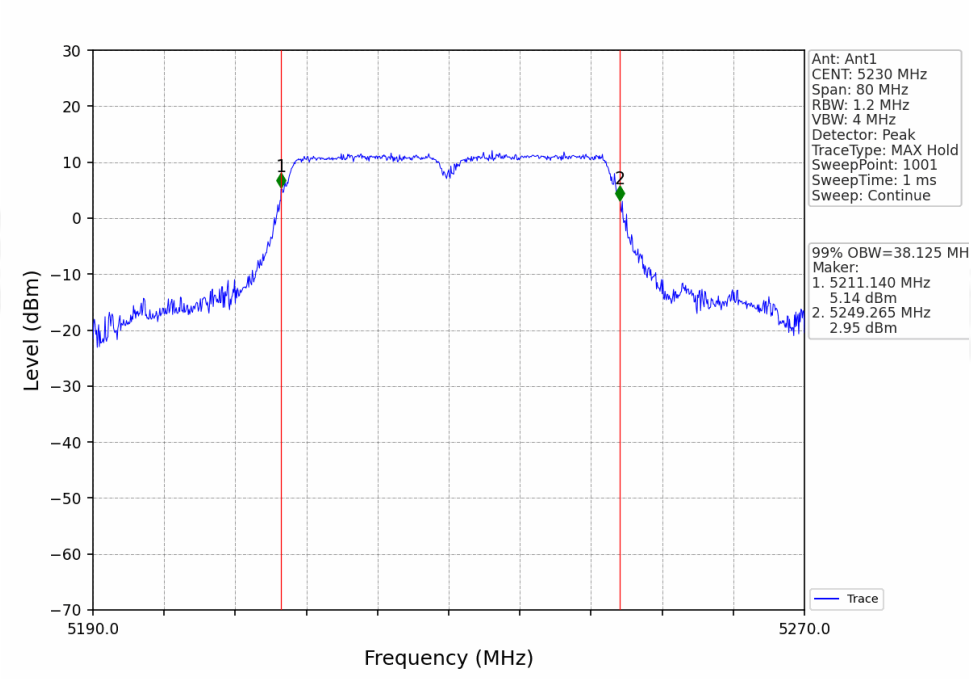

802.11n(HT20)_HCH_5825MHz_Ant1_NTNV



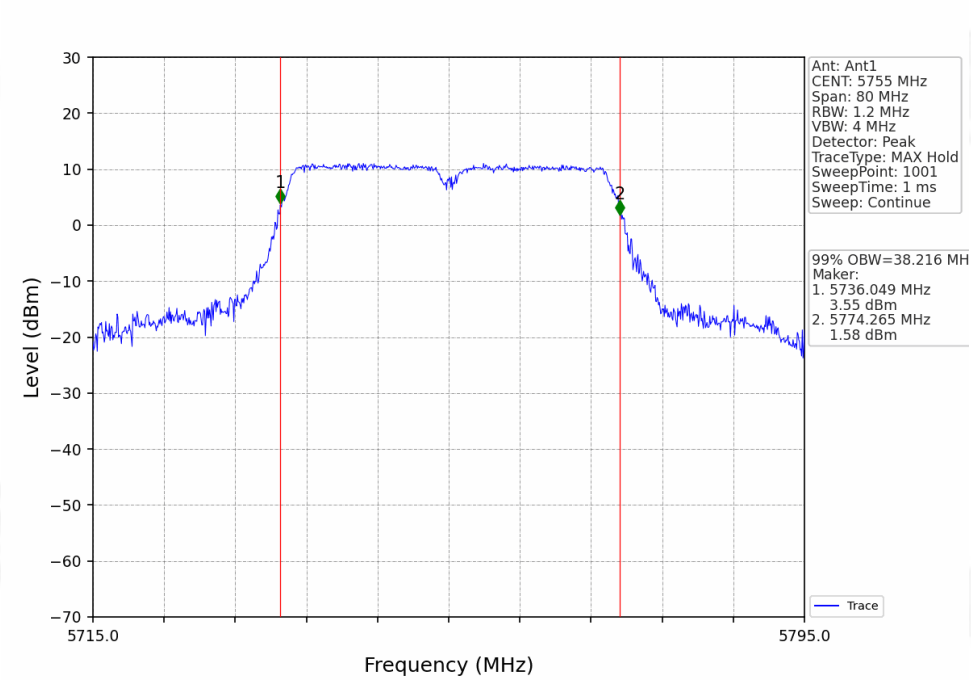
802.11n(HT40)_LCH_5190MHz_Ant1_NTNV



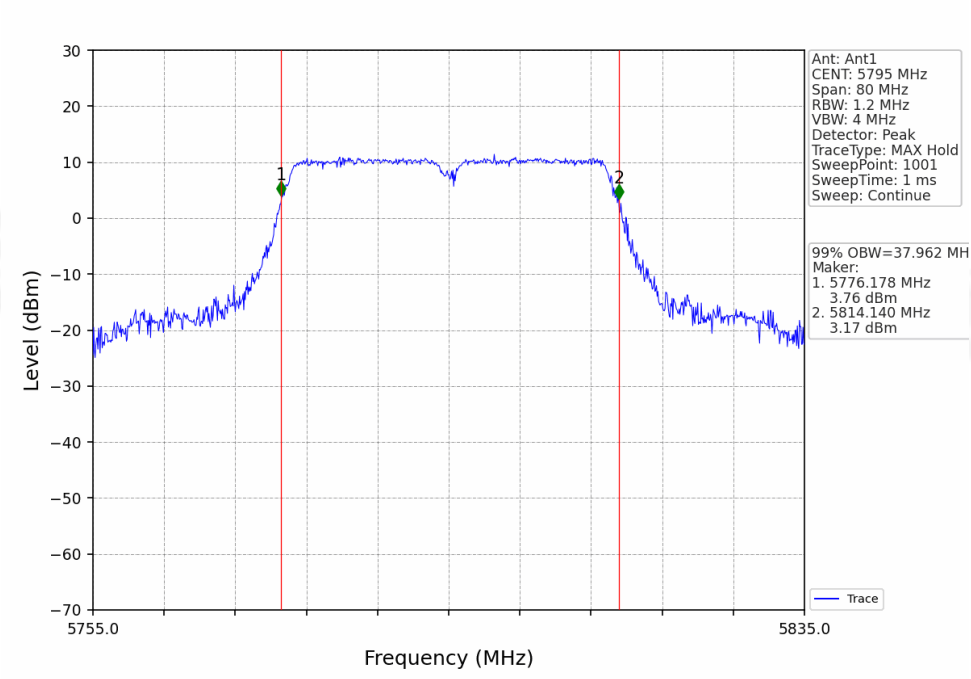

802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



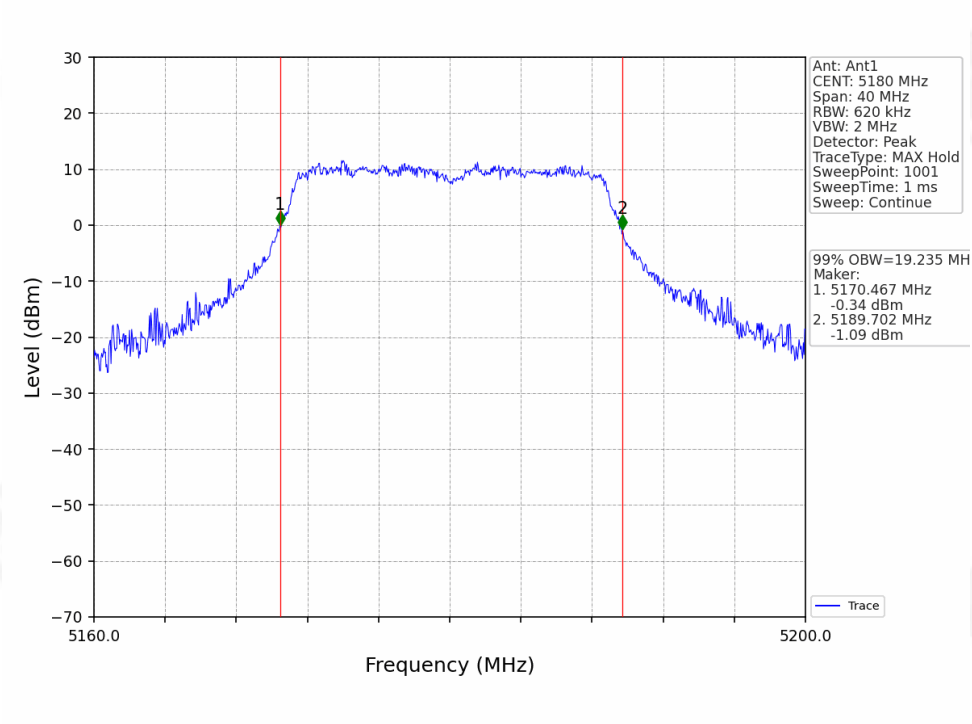
802.11n(HT40)_LCH_5755MHz_Ant1_NTNV



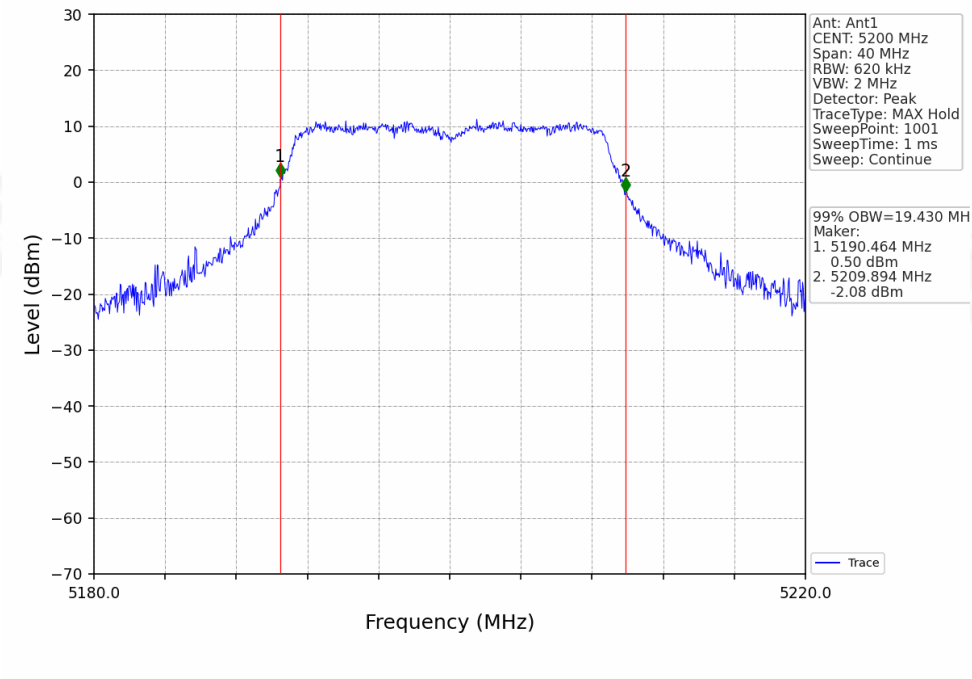

802.11n(HT40)_HCH_5795MHz_Ant1_NTNV



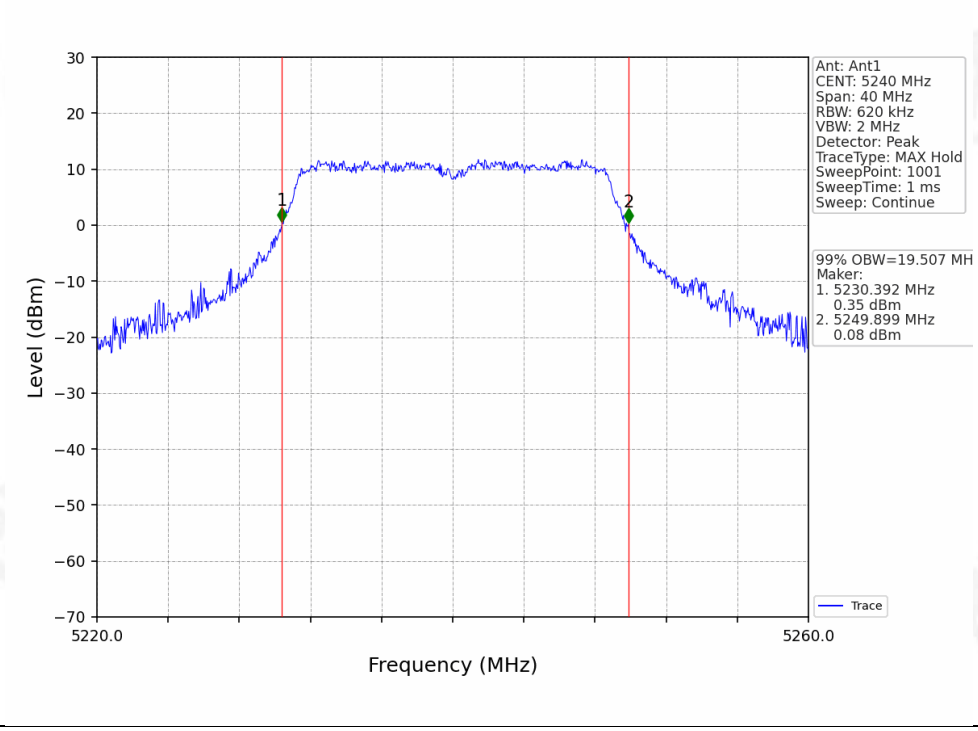
802.11ac(VHT20)_LCH_5180MHz_Ant1_NTNV



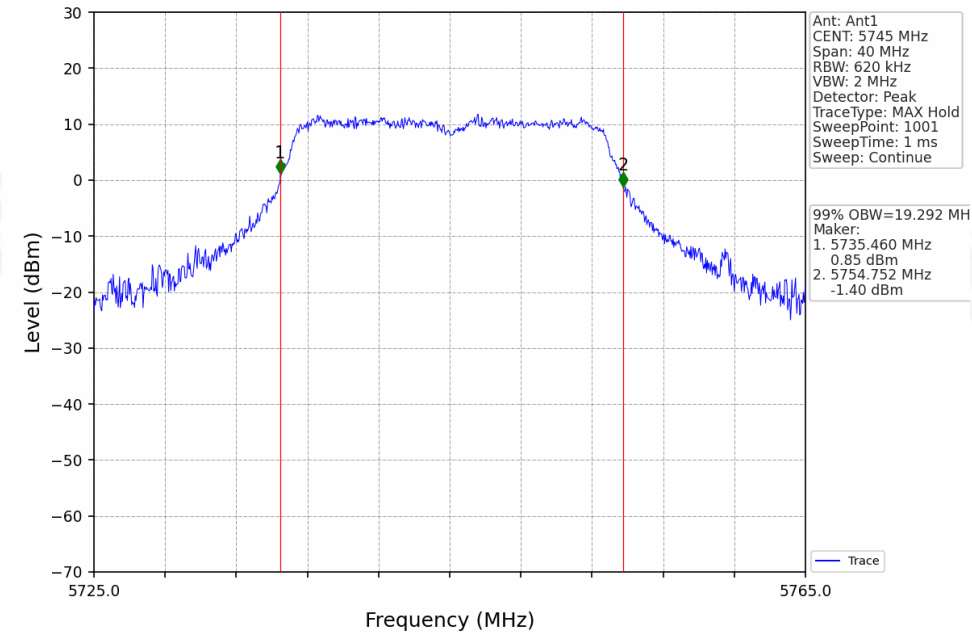

802.11ac(VHT20)_MCH_5200MHz_Ant1_NTNV



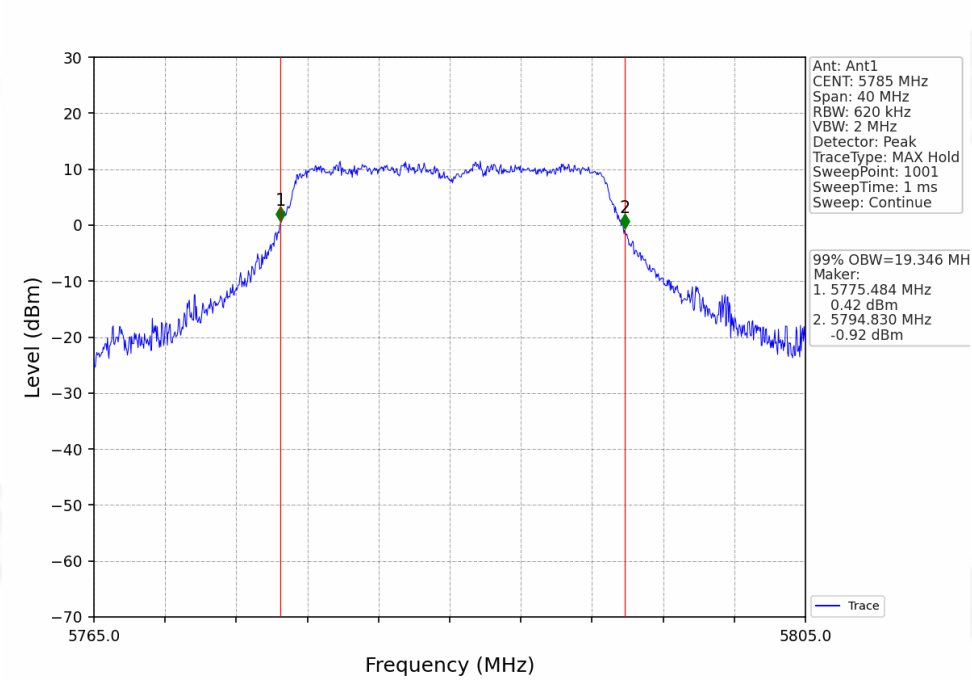
802.11ac(VHT20)_HCH_5240MHz_Ant1_NTNV



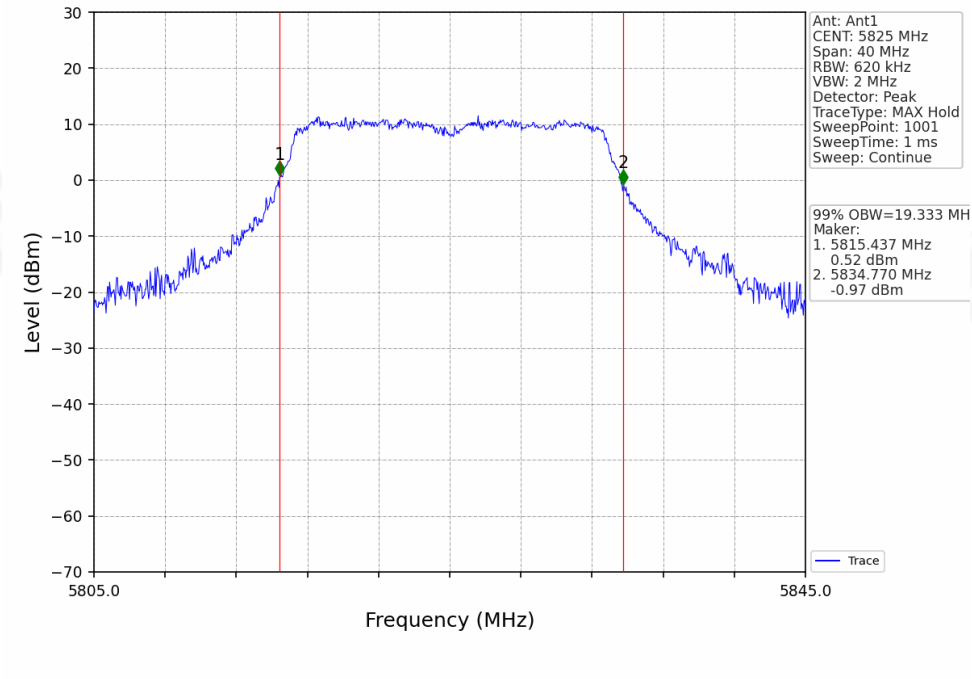

802.11ac(VHT20)_LCH_5745MHz_Ant1_NTNV



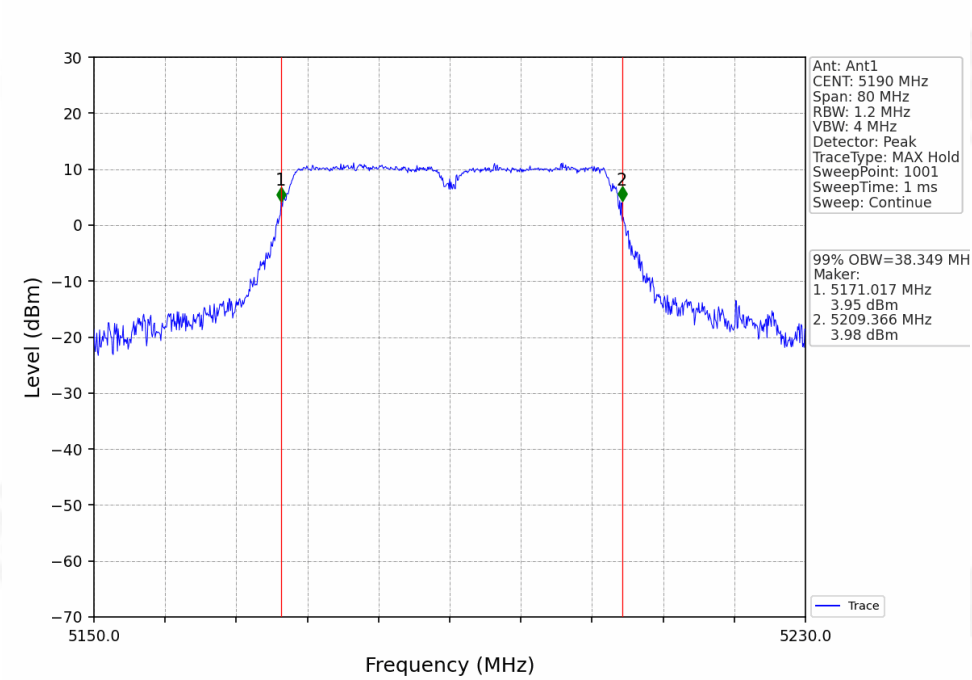
802.11ac(VHT20)_MCH_5785MHz_Ant1_NTNV



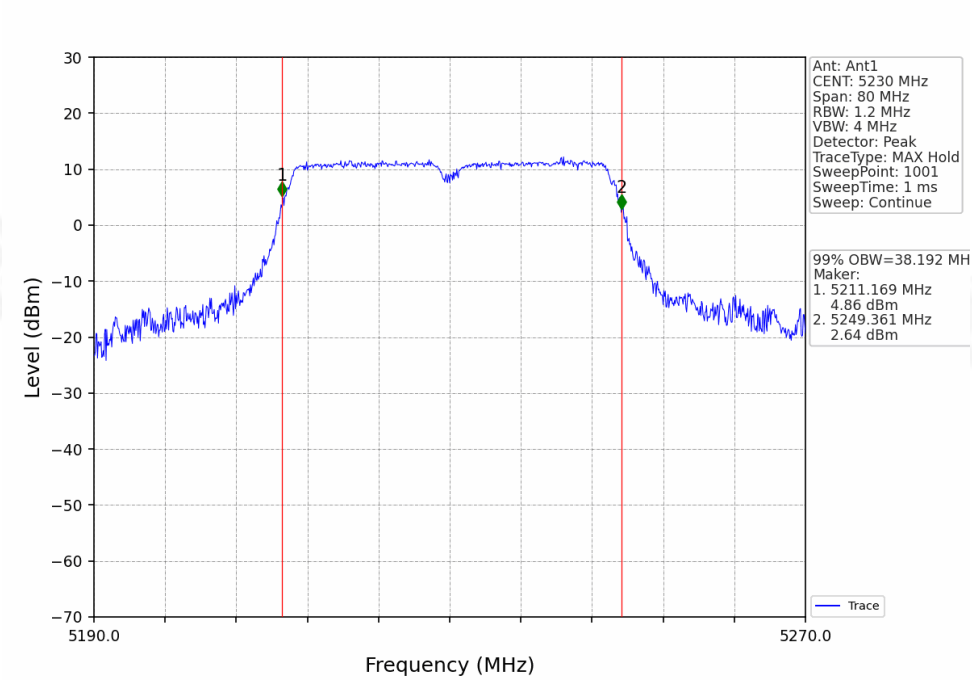

802.11ac(VHT20)_HCH_5825MHz_Ant1_NTNV



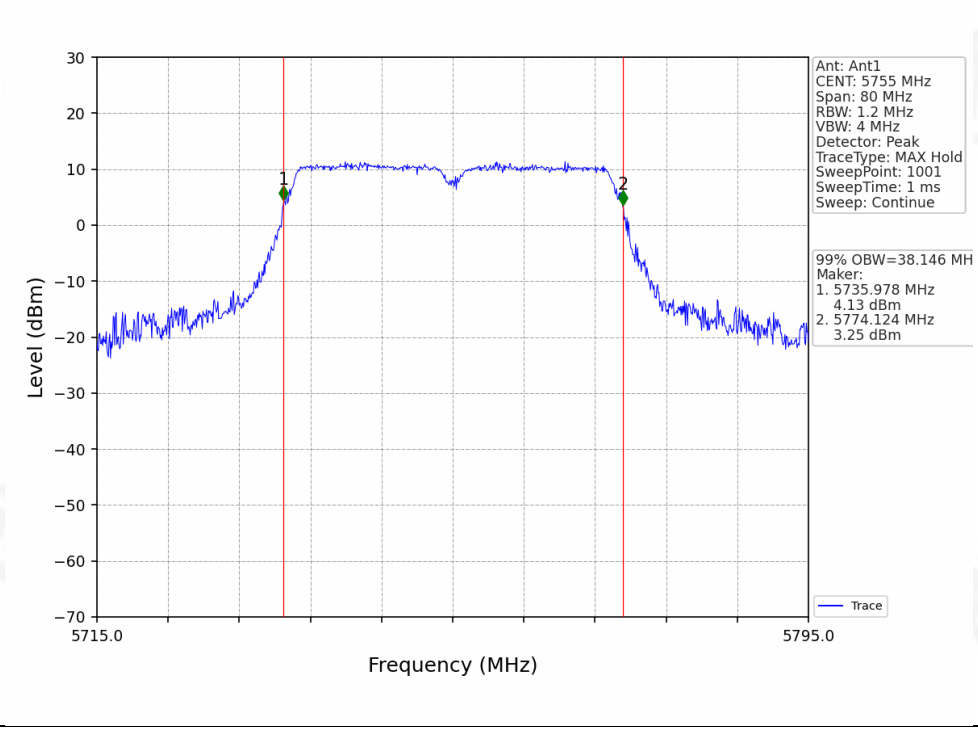
802.11ac(VHT40)_LCH_5190MHz_Ant1_NTNV



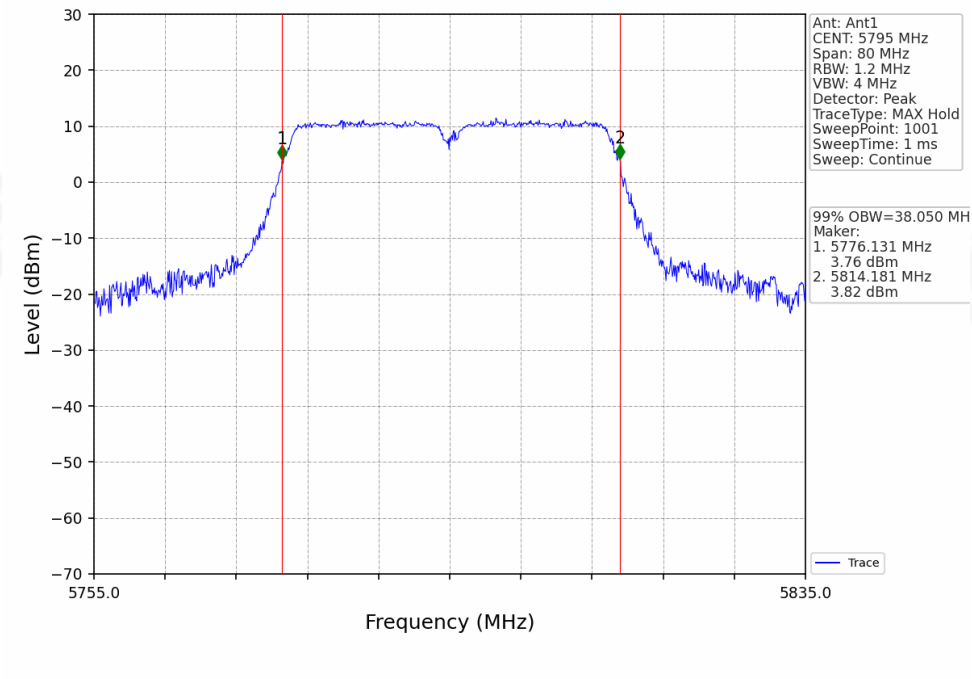

802.11ac(VHT40)_HCH_5230MHz_Ant1_NTNV



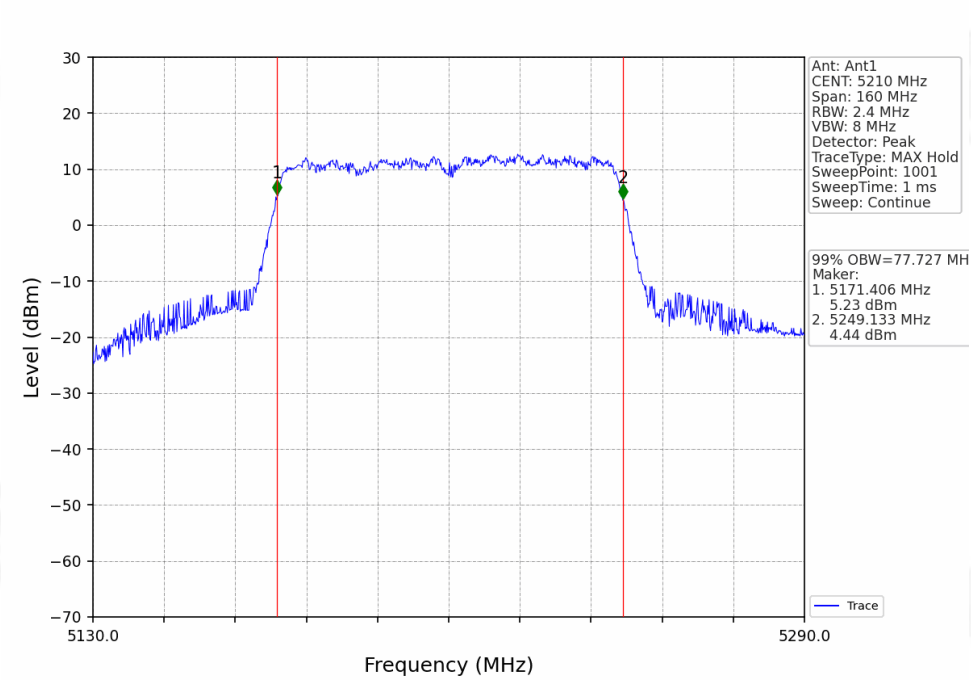
802.11ac(VHT40)_LCH_5755MHz_Ant1_NTNV



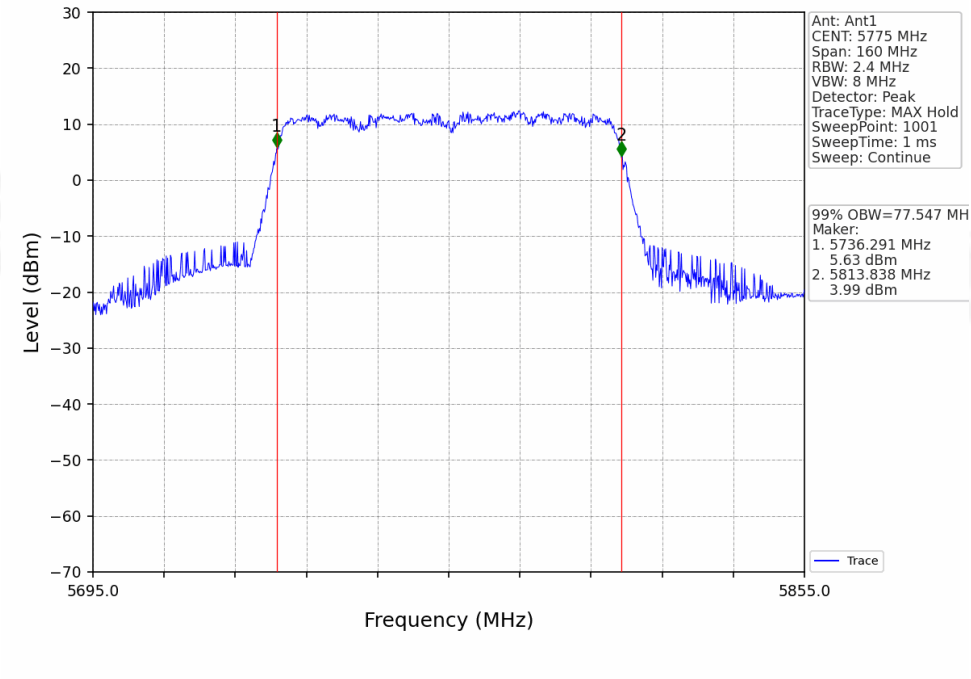

802.11ac(VHT40)_HCH_5795MHz_Ant1_NTNV



802.11ac(VHT80)_MCH_5210MHz_Ant1_NTNV

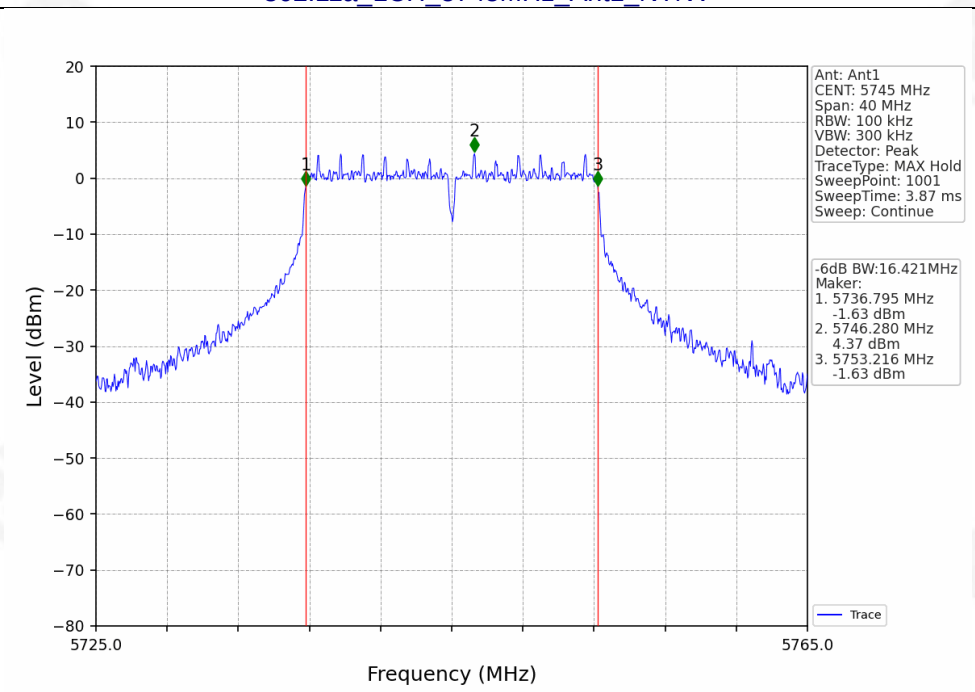



802.11ac(VHT80)_MCH_5775MHz_Ant1_NTNV

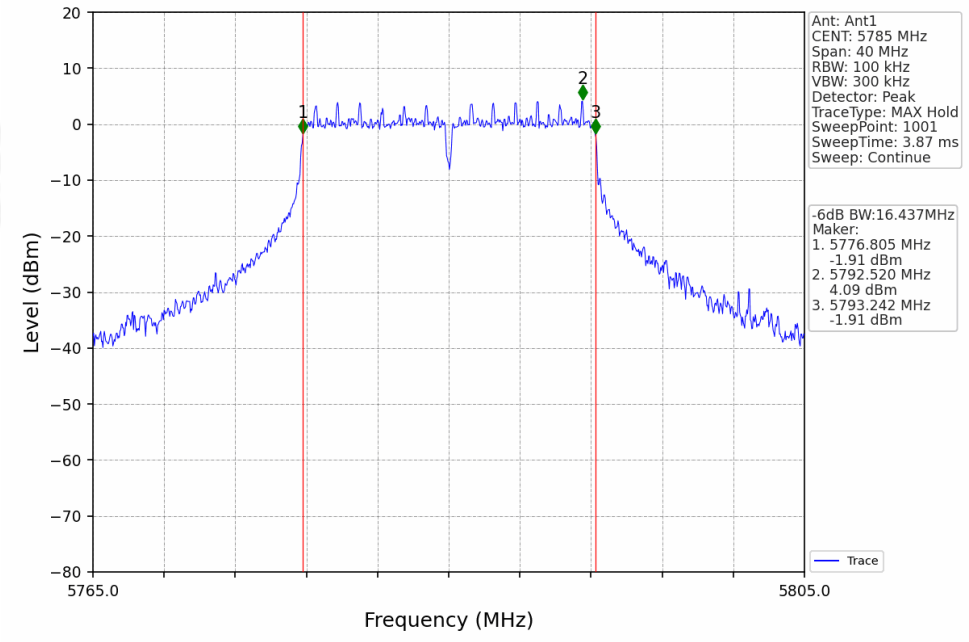


6dB Channel Bandwidth (MHz)

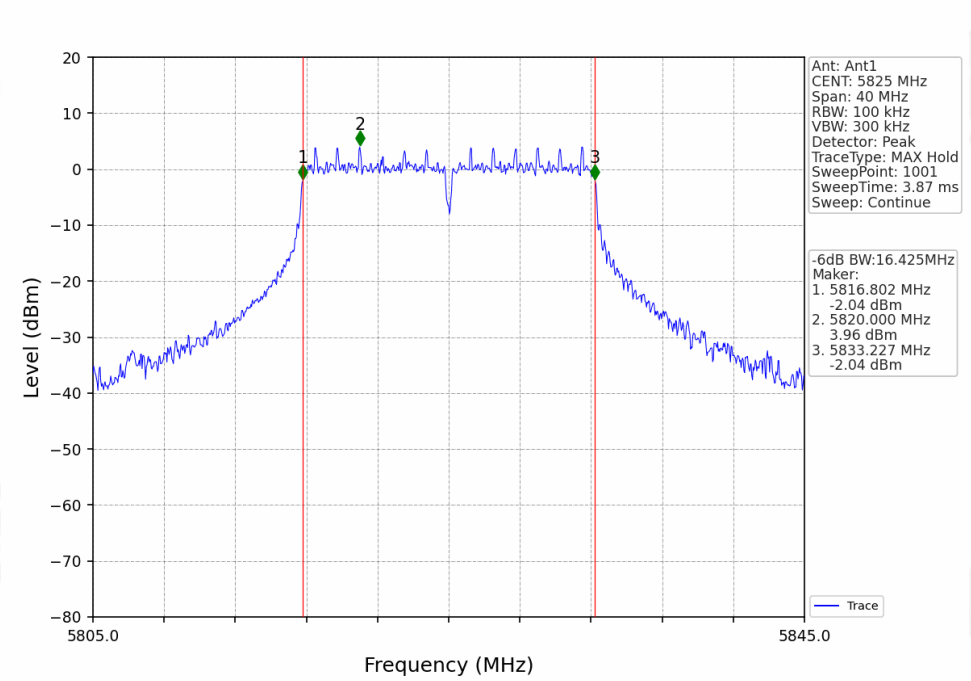
802.11a_LCH_5745MHz_Ant1_NTNV




802.11a_MCH_5785MHz_Ant1_NTNV



802.11a_HCH_5825MHz_Ant1_NTNV




802.11n(HT20)_LCH_5745MHz_Ant1_NTNV