

FCC PART 15.407  
RSS-GEN, ISSUE 5, APRIL 2018  
RSS-247, ISSUE 2, FEBRUARY 2017  
TEST REPORT

For

**Shenzhen Jingwah Information Technology Co., Ltd.**

4F, Bldg 4, Jinghua Square, No.1 Huafa North Road, Futian District, Shenzhen, China

**FCC ID: RBD-S5003L**  
**IC: 20054-S5003L**

|                                         |                                                                                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Type:</b><br>Original Report  | <b>Product Name:</b><br>Smart Phone                                                                                                                                                                                                                   |
| <b>Report Number:</b> RGMA181226002-00E |                                                                                                                                                                                                                                                       |
| <b>Report Date:</b> 2019-03-22          |                                                                                                                                                                                                                                                       |
| <b>Reviewed By:</b>                     | Jerry Zhang<br>EMC Manager                                                                                                                                                                                                                            |
| <b>Test Laboratory:</b>                 | Bay Area Compliance Laboratories Corp. (Dongguan)<br>No.69 Pulongcun, Puxinhu Industry Area,<br>Tangxia, Dongguan, Guangdong, China<br>Tel: +86-769-86858888<br>Fax: +86-769-86858891<br><a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a> |

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA\* or any agency of the Federal Government. \* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “\*”.

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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|                             |                |                                          |
|-----------------------------|----------------|------------------------------------------|
| <b>EUT Name:</b>            |                | Smart Phone                              |
| <b>EUT Model:</b>           |                | S5003L                                   |
| <b>Multiple Model:</b>      |                | A5000-PB                                 |
| <b>Rated Input Voltage:</b> |                | DC3.7V from Battery or DC5V from adapter |
| <b>Adapter Information</b>  | <b>Model:</b>  | TPA-95A050100UU                          |
|                             | <b>Input:</b>  | AC 100-240V, 50/60Hz, 0.15A              |
|                             | <b>Output:</b> | DC5V, 1000mA                             |
| <b>External Dimension:</b>  |                | 146mm(L)* 73mm(W)*11mm(H)                |
| <b>Serial Number:</b>       |                | 181226002                                |
| <b>EUT Received Date:</b>   |                | 2019.01.03                               |

*Note: The series product model A5000-PB is electrically identical with model S5003L, we selected S5003L for fully testing, the differences details was explained in the declaration letter.*

### Objective

This type approval report is prepared on behalf of **Shenzhen Jingwah Information Technology Co., Ltd.** in accordance with Part 2-Subpart J, Part 15-Subparts A, and E of the Federal Communications Commission's rules and RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules and RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada.

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

FCC Part 22H, 24E, 27 PCE submissions with FCC ID: RBD-S5003L.  
FCC Part 15C DSS submissions with FCC ID: RBD-S5003L.  
FCC Part 15C DTS submissions with FCC ID: RBD-S5003L.  
FCC Part 15B JBP submissions with FCC ID: RBD-S5003L.  
RSS-247 DSSs, RSS-247 DTSSs, RSS-130, RSS-132, RSS-133, RSS-139 submissions with IC: 20054- S5003L

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB 789033 D02 General U-NII Test Procedures New Rules v02r01, and RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

**Measurement Uncertainty**

| Parameter                         | Measurement Uncertainty                                                                                           |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Occupied Channel Bandwidth        | ±5 %                                                                                                              |
| RF output power, conducted        | ±0.61dB                                                                                                           |
| Power Spectral Density, conducted | ±0.61 dB                                                                                                          |
| Unwanted Emissions, radiated      | 30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB,<br>6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB |
| Unwanted Emissions,conducted      | ±1.5 dB                                                                                                           |
| Temperature                       | ±1 °C                                                                                                             |
| Humidity                          | ±5%                                                                                                               |
| DC and low frequency voltages     | ±0.4%                                                                                                             |
| Duty Cycle                        | 1%                                                                                                                |
| AC Power Lines Conducted Emission | 3.12 dB (150 kHz to 30 MHz)                                                                                       |

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

The system support 802.11a/n ht20/ n ht40 in 5GHz band.

For 5150~5250 MHz band, 6 channels are provided:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 36      | 5180            | 44      | 5220            |
| 38      | 5190            | 46      | 5230            |
| 40      | 5200            | 48      | 5240            |

For 802.11a, 802.11n ht20 Channel 36, 40 and 48 was tested, for 802.11n ht40 Channel 38, 46 were tested.

For 5250~5350 MHz band, 6 channels are provided:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 52      | 5260            | 60      | 5300            |
| 54      | 5270            | 62      | 5310            |
| 56      | 5280            | 64      | 5320            |

For 802.11a, 802.11n ht20, Channel 52, 56 and 64 were tested, for 802.11n ht40 Channel 54, 62 were tested.

For 5470~5725 MHz band, 18 channels are provided:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 100     | 5500            | 116     | 5580            | 132     | 5660            |
| 102     | 5510            | 118     | 5590            | 134     | 5670            |
| 104     | 5520            | 120     | 5600            | 136     | 5680            |
| 108     | 5540            | 124     | 5620            | 140     | 5700            |
| 110     | 5550            | 126     | 5630            | 142     | 5710            |
| 112     | 5560            | 128     | 5640            | 144     | 5720            |

For 802.11a, 802.11n ht20 Channel 100, 116 and 140 were tested, for 802.11n ht40 Channel 102, 110 and 134 were tested.

Channel 144 for 802.11a, n ht20, 142 for 802.11n ht40, crossed the band U-NII 2C to U-NII 3, were choosed to test for compliance requirement.

For Canada RSS-247, channels 118 to 128 were disabled by software since the frequency occupied the frequency band 5600-5650MHz.

For 5725~5850MHz band, 7 channels are provided to testing:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 149     | 5745            | 159     | 5795            |
| 151     | 5755            | 161     | 5805            |
| 153     | 5765            | 165     | 5825            |
| 157     | 5785            | /       | /               |

For 802.11a, 802.11n ht20 Channel 149, 157 and 165 was tested, for 802.11n ht40 Channel 151, 159 was tested.

### EUT Exercise Software

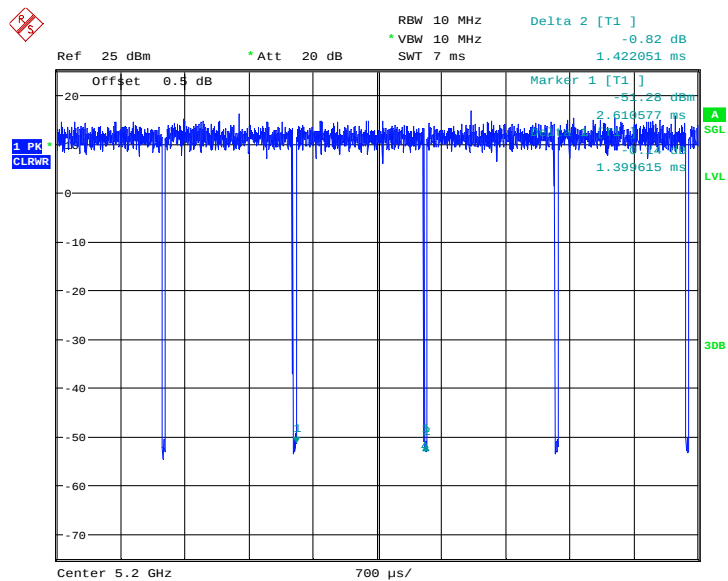
The software “Engineering Mode” was used for testing, which was provided by manufacturer. The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations. The maximum power was configured as below table, that provided by the manufacturer:

| Band                     | Mode            | Channel | Frequency (MHz) | Data rate | Power level |
|--------------------------|-----------------|---------|-----------------|-----------|-------------|
| 5150<br>-<br>5250<br>MHz | 802.11a         | Low     | 5180            | 6 Mbps    | 12          |
|                          |                 | Middle  | 5200            | 6 Mbps    | 12          |
|                          |                 | High    | 5240            | 6 Mbps    | 12          |
|                          | 802.11n<br>ht20 | Low     | 5180            | MCS0      | 12          |
|                          |                 | Middle  | 5200            | MCS0      | 12          |
|                          |                 | High    | 5240            | MCS0      | 12          |
|                          | 802.11n<br>ht40 | Low     | 5190            | MCS0      | 11          |
|                          |                 | High    | 5230            | MCS0      | 11          |
| 5250<br>-<br>5350<br>MHz | 802.11 a        | Low     | 5260            | 6 Mbps    | 15.0        |
|                          |                 | Middle  | 5280            | 6 Mbps    | 15.0        |
|                          |                 | High    | 5320            | 6 Mbps    | 15.0        |
|                          | 802.11 n20      | Low     | 5260            | MCS0      | 15.0        |
|                          |                 | Middle  | 5280            | MCS0      | 15.0        |
|                          |                 | High    | 5320            | MCS0      | 15.0        |
|                          | 802.11 n40      | Low     | 5270            | MCS0      | 14.5        |
|                          |                 | High    | 5310            | MCS0      | 14.5        |
| 5470<br>-<br>5725<br>MHz | 802.11 a        | Low     | 5500            | 6 Mbps    | 14.5        |
|                          |                 | Middle  | 5580            | 6 Mbps    | 15.0        |
|                          |                 | High    | 5700            | 6 Mbps    | 18.5        |
|                          |                 | Crossed | 5720            | 6 Mbps    | 18.5        |
|                          | 802.11 n20      | Low     | 5500            | MCS0      | 14.5        |
|                          |                 | Middle  | 5580            | MCS0      | 15.0        |
|                          |                 | High    | 5700            | MCS0      | 19.0        |
|                          |                 | Crossed | 5720            | MCS0      | 19.0        |
|                          | 802.11 n40      | Low     | 5510            | MCS0      | 13.5        |
|                          |                 | Middle  | 5550            | MCS0      | 13.5        |
|                          |                 | High    | 5670            | MCS0      | 16.5        |
|                          |                 | Crossed | 5710            | MCS0      | 17.0        |
| 5725<br>-<br>5850<br>MHz | 802.11a         | Low     | 5745            | 6 Mbps    | 14          |
|                          |                 | Middle  | 5785            | 6 Mbps    | 14          |
|                          |                 | High    | 5825            | 6 Mbps    | 15          |
|                          | 802.11n<br>ht20 | Low     | 5745            | MCS0      | 14          |
|                          |                 | Middle  | 5785            | MCS0      | 14          |
|                          |                 | High    | 5825            | MCS0      | 15          |
|                          | 802.11n<br>ht40 | Low     | 5755            | MCS0      | 13          |
|                          |                 | High    | 5795            | MCS0      | 13          |

The duty cycle as below:

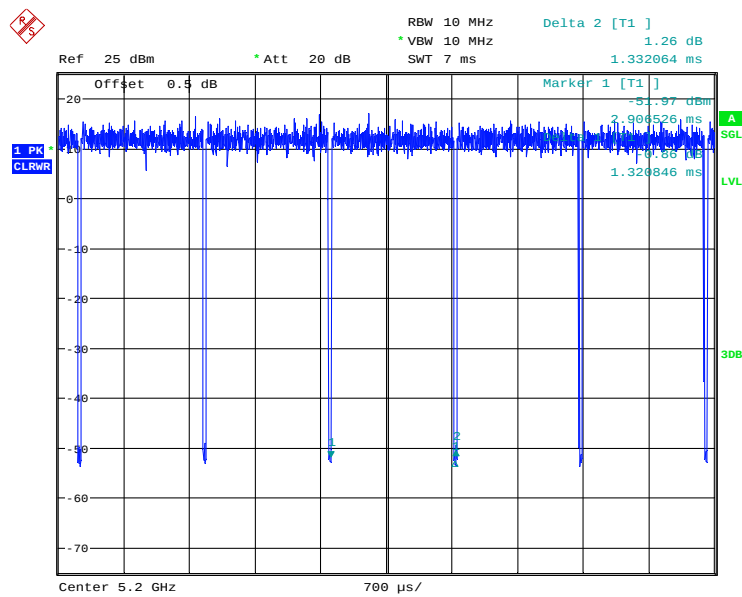
| Mode         | T <sub>on</sub><br>(ms) | T <sub>on+off</sub><br>(ms) | Duty Cycle(x)<br>(%) | Duty Cycle Factor<br>(10*log(1/x))<br>(dB) |
|--------------|-------------------------|-----------------------------|----------------------|--------------------------------------------|
| 802.11 a     | 1.400                   | 1.422                       | 98.45                | /                                          |
| 802.11n ht20 | 1.321                   | 1.332                       | 99.17                | /                                          |
| 802.11n ht40 | 0.656                   | 0.685                       | 95.77                | 0.19                                       |

**802.11a**

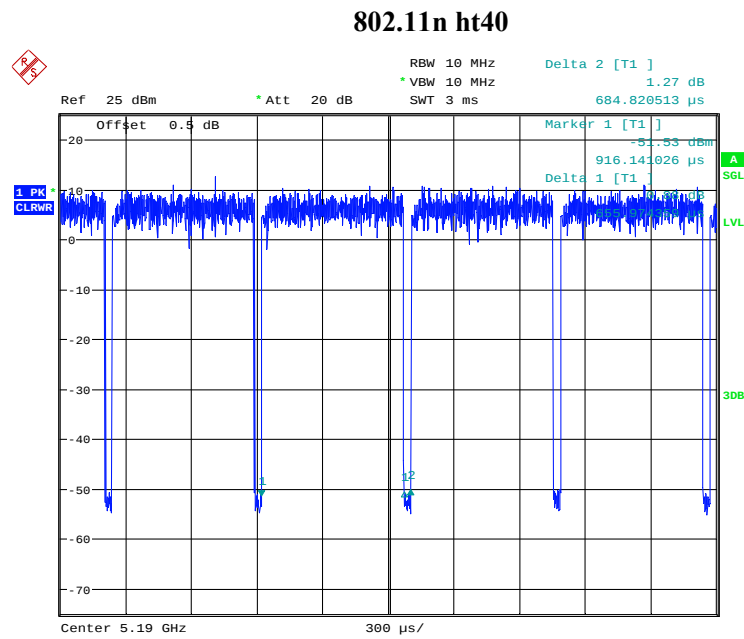


Date: 8.JAN.2019 20:32:19

## 802.11n ht20



Date: 8.JAN.2019 20:33:42



Date: 8.JAN.2019 20:36:19

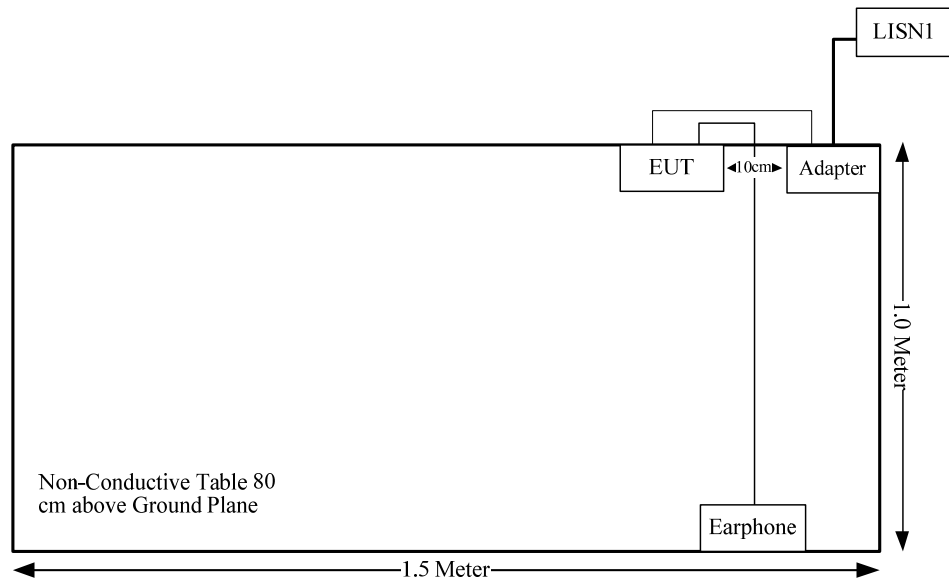
## Equipment Modifications

No modification was made to the EUT.

## Support Cable List and Details

| Cable Description | Shielding Type | Ferrite Core | Length (m) | From | To       |
|-------------------|----------------|--------------|------------|------|----------|
| USB Cable         | yes            | no           | 1          | EUT  | Adapter  |
| EarphoneCable     | yes            | no           | 1          | EUT  | Earphone |

## Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

| Rules                                                          | Description of Test                    | Result      |
|----------------------------------------------------------------|----------------------------------------|-------------|
| FCC §15.407 (f) & §1.1310 &<br>§2.1093<br>RSS-102 Clause 4     | RF Exposure                            | Compliance  |
| FCC§15.203,<br>RSS-Gen Clause 6.8                              | Antenna Requirement                    | Compliance  |
| FCC§15.407(b)(6)&<br>§15.207(a),<br>RSS-Gen Clause 8.8         | Conducted Emissions                    | Compliance  |
| FCC§15.205& §15.209<br>&§15.407(b),<br>RSS-247 Clause 6.2      | Undesirable Emission& Restricted Bands | Compliance  |
| FCC§15.407(a) (e),<br>RSS-247 Clause 6.2<br>RSS-Gen Clause 6.7 | Emission Bandwidth                     | Compliance  |
| FCC§15.407(a)<br>RSS-247 Clause 6.2                            | Conducted Transmitter Output Power     | Compliance  |
| FCC§15.407 (a),<br>RSS-247 Clause 6.2                          | Power Spectral Density                 | Compliance  |
| FCC§15.407 (h),<br>RSS-247 Clause 6.3                          | Dynamic Frequency Selection(DFS)       | Compliance* |

Compliance\*: Please refer to the DFS report: RGMA190305001-00E.

**FCC §15.407 (f) & §1.1310 & §2.1093, RSS-102 CLAUSE 4- RF EXPOSURE****Applicable Standard**

According to §15.407(f), §1.1310 and §2.1093.

According to RSS-102 Clause 4 Table 3, SAR limits for device used by the general public

| Body Region                    | Average SAR<br>(W/Kg) | Averaging Time<br>(minutes) | Mass Average<br>(g) |
|--------------------------------|-----------------------|-----------------------------|---------------------|
| Whole Body                     | 0.08                  | 6                           | Whole Body          |
| Localized Head, Neck and Trunk | 1.6                   | 6                           | 1                   |
| Localized Limbs                | 4                     | 6                           | 10                  |

**Test Result**

Compliant, please refer to the SAR report: RGMA181226002-20.

**FCC §15.203& RSS-GEN CLAUSE 6.8 - ANTENNA REQUIREMENT****Applicable Standard**

According to FCC§ 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

According to RSS-Gen Clause 6.8, The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

**Antenna Connector Construction**

The EUT has one internal FPC antenna arrangement for BT/WLAN, fulfill the requirement of this section. Please refer to the EUT photos.

| Antenna Type | input impedance<br>(Ohm) | Antenna Gain<br>/Frequency Range            |
|--------------|--------------------------|---------------------------------------------|
| FPC          | 50                       | 2.7 dBi/2.4~2.5GHz<br>2.27 dBi/5.15~5.85GHz |

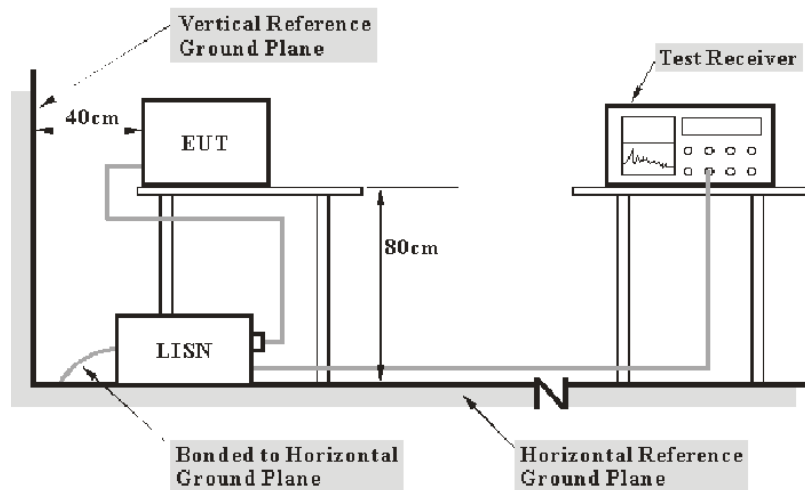
**Result:** Compliance.

## FCC §15.207(a) RSS-GEN CLAUSE 8.8– CONDUCTED EMISSIONS

### Applicable Standard

FCC §15.207(a), §15.407(b) (6), RSS-GEN CLAUSE 8.8.

### EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits and RSS-Gen clause 8.8 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisn with a 120 V/60 Hz AC power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

$V_C$  (cord. Reading): corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN

$C_f$ : Correction Factor

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Equipment List and Details

| Manufacturer | Description        | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------------|-----------|---------------|------------------|----------------------|
| R&S          | EMI Test Receiver  | ESCS 30   | 830245/006    | 2018-12-10       | 2019-12-10           |
| Unknown      | Coaxial Cable      | C-NJNJ-50 | C-0200-01     | 2018-09-05       | 2019-09-05           |
| R&S          | Test Software      | EMC32     | Version8.53.0 | N/A              | N/A                  |
| R&S          | Two-line V-network | ENV 216   | 101614        | 2018-12-10       | 2019-12-10           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Procedure

During the conducted emission test, the EUT was connected to the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

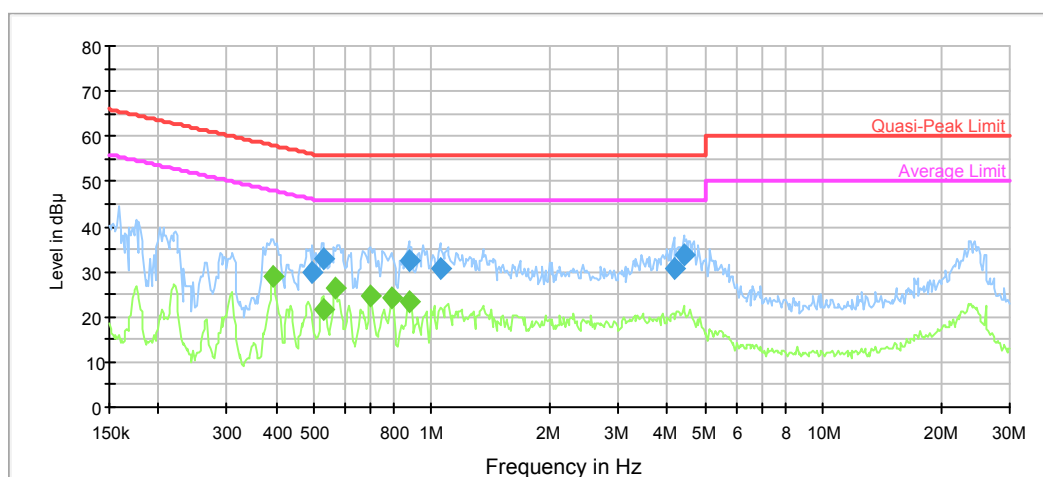
**Test Data****Environmental Conditions**

|                           |                 |
|---------------------------|-----------------|
| <b>Temperature:</b>       | 27.9 °C         |
| <b>Relative Humidity:</b> | 60 %            |
| <b>ATM Pressure:</b>      | 100.1~102.1 kPa |

The testing was performed by Lily Xie on 2019-01-08.

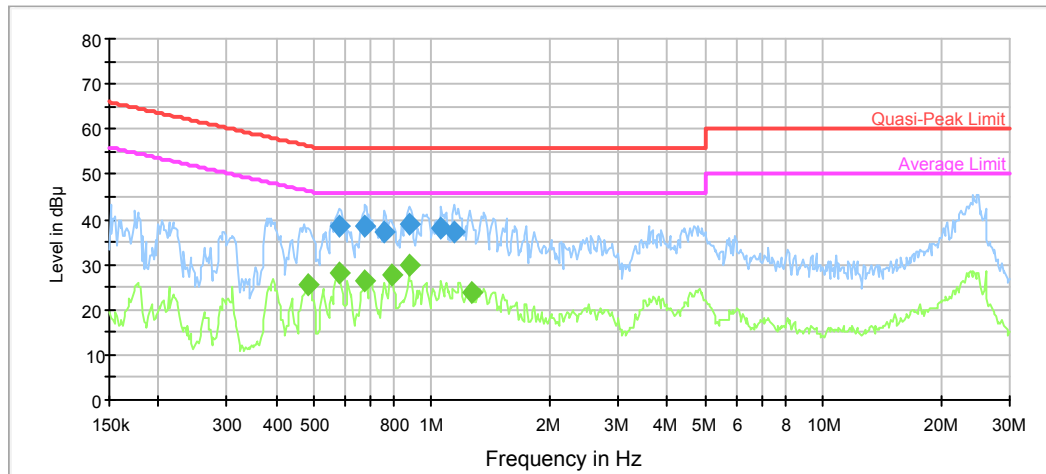
Test Mode: Transmitting

AC120 V, 60 Hz, Line:



| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.495646        | 29.7             | 9.000           | L1   | 9.9        | 26.4        | 56.1         | Compliance |
| 0.528270        | 33.0             | 9.000           | L1   | 9.9        | 23.0        | 56.0         | Compliance |
| 0.872708        | 32.3             | 9.000           | L1   | 9.8        | 23.7        | 56.0         | Compliance |
| 1.048242        | 30.7             | 9.000           | L1   | 9.8        | 25.3        | 56.0         | Compliance |
| 4.160384        | 30.9             | 9.000           | L1   | 9.8        | 25.1        | 56.0         | Compliance |
| 4.399032        | 33.6             | 9.000           | L1   | 9.8        | 22.4        | 56.0         | Compliance |

| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|------------|
| 0.393383        | 28.8           | 9.000           | L1   | 10.0       | 19.2        | 48.0         | Compliance |
| 0.528270        | 21.8           | 9.000           | L1   | 9.9        | 24.2        | 46.0         | Compliance |
| 0.567545        | 26.4           | 9.000           | L1   | 9.8        | 19.6        | 46.0         | Compliance |
| 0.698191        | 24.7           | 9.000           | L1   | 9.8        | 21.3        | 46.0         | Compliance |
| 0.786832        | 24.0           | 9.000           | L1   | 9.8        | 22.0        | 46.0         | Compliance |
| 0.872708        | 23.5           | 9.000           | L1   | 9.8        | 22.5        | 46.0         | Compliance |

**AC120 V, 60 Hz, Neutral:**

| frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.581275        | 38.5             | 9.000           | N    | 9.8        | 17.5        | 56.0         | Compliance |
| 0.676289        | 38.6             | 9.000           | N    | 9.8        | 17.4        | 56.0         | Compliance |
| 0.756101        | 37.1             | 9.000           | N    | 9.8        | 18.9        | 56.0         | Compliance |
| 0.872708        | 39.0             | 9.000           | N    | 9.8        | 17.0        | 56.0         | Compliance |
| 1.056628        | 38.2             | 9.000           | N    | 9.8        | 17.8        | 56.0         | Compliance |
| 1.144267        | 37.2             | 9.000           | N    | 9.8        | 18.8        | 56.0         | Compliance |

| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|------------|
| 0.483938        | 25.6           | 9.000           | N    | 9.9        | 20.7        | 46.3         | Compliance |
| 0.581275        | 28.1           | 9.000           | N    | 9.8        | 17.9        | 46.0         | Compliance |
| 0.676289        | 26.2           | 9.000           | N    | 9.8        | 19.8        | 46.0         | Compliance |
| 0.793127        | 27.5           | 9.000           | N    | 9.8        | 18.5        | 46.0         | Compliance |
| 0.872708        | 29.8           | 9.000           | N    | 9.8        | 16.2        | 46.0         | Compliance |
| 1.259081        | 23.7           | 9.000           | N    | 9.8        | 22.3        | 46.0         | Compliance |

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**FCC §15.209, §15.205 , §15.407(b) &RSS-247 CLAUSE 6.2, RSS-GEN  
CLAUSE 8.10 –UNWANTED EMISSION**

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**Applicable Standard**

FCC §15.407; §15.209; §15.205;

(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.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

According to RSS-247 Clause 6.2

### **Frequency band 5150-5250 MHz**

#### **6.2.1.2 Unwanted emission limits**

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

### **Frequency band 5250-5350 MHz**

#### **6.2.2.2 Unwanted emission limits**

Devices shall comply with the following:

- a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
- b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

### **Frequency bands 5470-5600 MHz and 5650-5725 MHz:**

#### **6.2.3.2 Unwanted emission limits**

Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

## Frequency band 5725-5850 MHz

### 6.2.4.2 Unwanted emission limits

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.

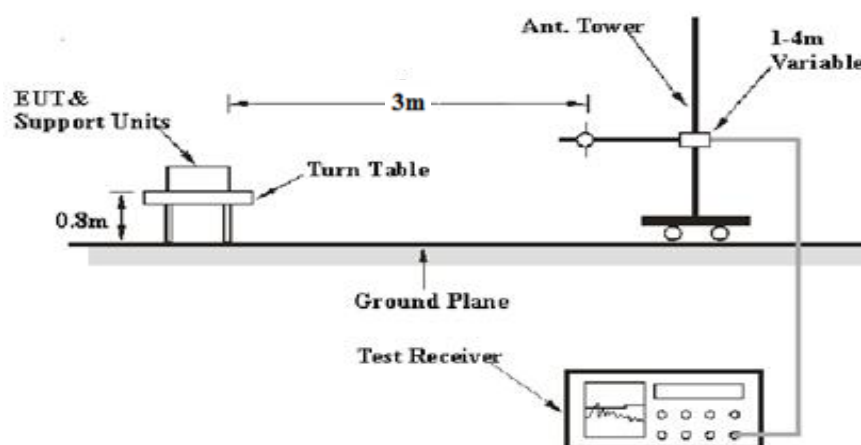
Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.

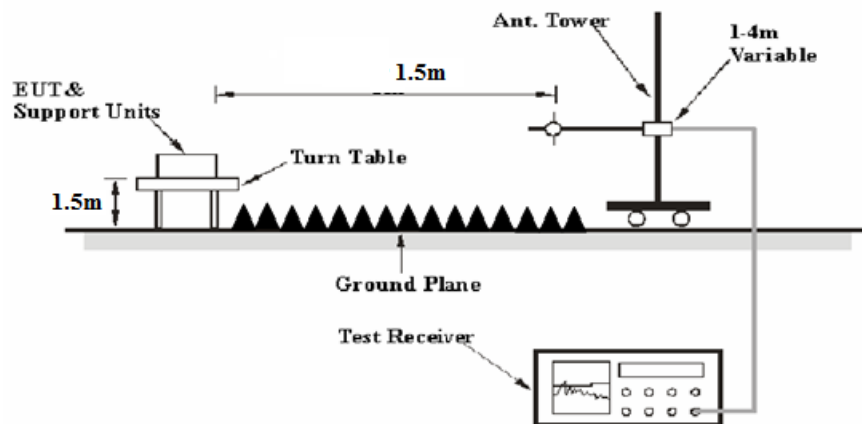
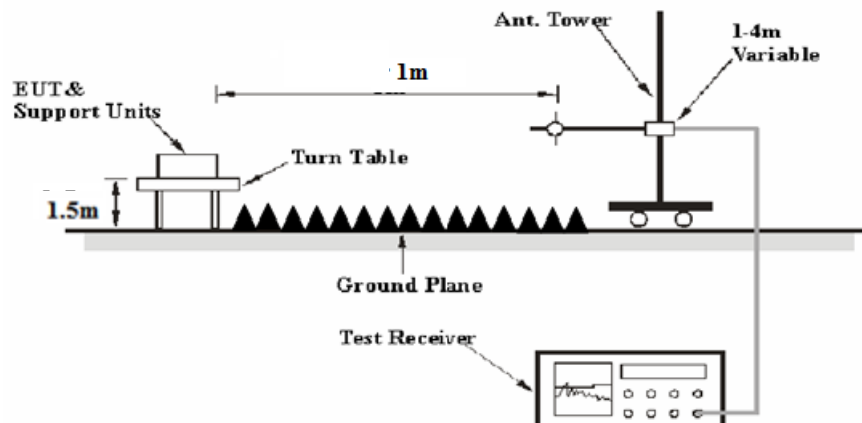
Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- 27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

## EUT Setup

### Below 1 GHz:



**1-26.5 GHz:****26.5-40 GHz:**

The radiated emission Below 1GHz tests were performed in the 3 meters chamber test site A , above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.407 limits and RSS-247, RSS-Gen limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

## EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

30-1000MHz:

| Measurement | RBW     | Video B/W | IF B/W |
|-------------|---------|-----------|--------|
| QP          | 120 kHz | 300 kHz   | 120kHz |

1GHz- 40GHz:

| Measurement | Duty cycle | RBW  | Video B/W |
|-------------|------------|------|-----------|
| PK          | Any        | 1MHz | 3 MHz     |
| Ave.        | >98%       | 1MHz | 10 Hz     |
|             | <98%       | 1MHz | 1/T       |

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

## Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as:  $E [dB\mu V/m] = EIRP[dBm] + 95.2$ , for  $d = 3$  meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m or 1m

Distance extrapolation factor =  $20 \log (\text{specific distance } [3m]/\text{test distance } [1.5m])$  dB= 6.02 dB

or

Distance extrapolation factor =  $20 \log (\text{specific distance } [3m]/\text{test distance } [1m])$  dB= 9.54 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

### Corrected Amplitude & Margin Calculation

For the range 30MHz-1GHz, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

For the range 1GHz-40GHz, Test performed at 1.5m or 1m, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading and the Distance extrapolation factor. The basic equation is as follows:

$$\begin{aligned} &\text{Corrected Amplitude} \\ &= \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} - \text{Distance extrapolation factor} \end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

**Test Equipment List and Details**

| Manufacturer          | Description       | Model                       | Serial Number      | Calibration Date | Calibration Due Date |
|-----------------------|-------------------|-----------------------------|--------------------|------------------|----------------------|
| Farad                 | Test Software     | EZ-EMC                      | V1.1.4.2           | N/A              | N/A                  |
| R&S                   | EMI Test Receiver | ESCI                        | 100224             | 2018-12-10       | 2019-12-10           |
| Sunol Sciences        | Antenna           | JB3                         | A060611-1          | 2017-11-10       | 2020-11-10           |
| Unknown               | Coaxial Cable     | C-NJNJ-50                   | C-0400-01          | 2018-09-05       | 2019-09-05           |
| Unknown               | Coaxial Cable     | C-NJNJ-50                   | C-0075-01          | 2018-09-05       | 2019-09-05           |
| Unknown               | Coaxial Cable     | C-NJNJ-50                   | C-1400-01          | 2018-05-06       | 2019-05-06           |
| HP                    | Amplifier         | 8447D                       | 2727A05902         | 2018-09-05       | 2019-09-05           |
| Agilent               | Spectrum Analyzer | E4440A                      | SG43360054         | 2019-01-04       | 2020-01-04           |
| R&S                   | Spectrum Analyzer | FSP 38                      | 100478             | 2018-12-10       | 2019-12-10           |
| ETS-Lindgren          | Horn Antenna      | 3115                        | 000 527 35         | 2018-10-12       | 2021-10-12           |
| Ducommun Technologies | Horn Antenna      | ARH-4223-02                 | 1007726-01<br>1304 | 2016-11-18       | 2019-11-18           |
| Ducommun Technologies | Horn Antenna      | ARH-2823-02                 | 1007726-01<br>1302 | 2016-11-18       | 2019-11-18           |
| Unknown               | Coaxial Cable     | C-SJSJ-50                   | C-0800-01          | 2018-09-05       | 2019-09-05           |
| Unknown               | Coaxial Cable     | C-2.4J2.4J-50               | C-0700-02          | 2018-06-27       | 2019-06-27           |
| MITEQ                 | Amplifier         | AFS42-00101800-<br>25-S-42  | 2001271            | 2018-09-05       | 2019-09-05           |
| Quinstar              | Amplifier         | QLW-18405536-JO             | 15964001001        | 2018-06-27       | 2019-06-27           |
| Sinoscite             | Bandstop Filters  | BSF5150-5850MN-<br>0899-003 | 0899003            | 2018-05-06       | 2019-05-06           |
| Mini Circuits         | High Pass Filter  | VHF-6010+                   | 31118              | 2018-06-16       | 2019-06-16           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

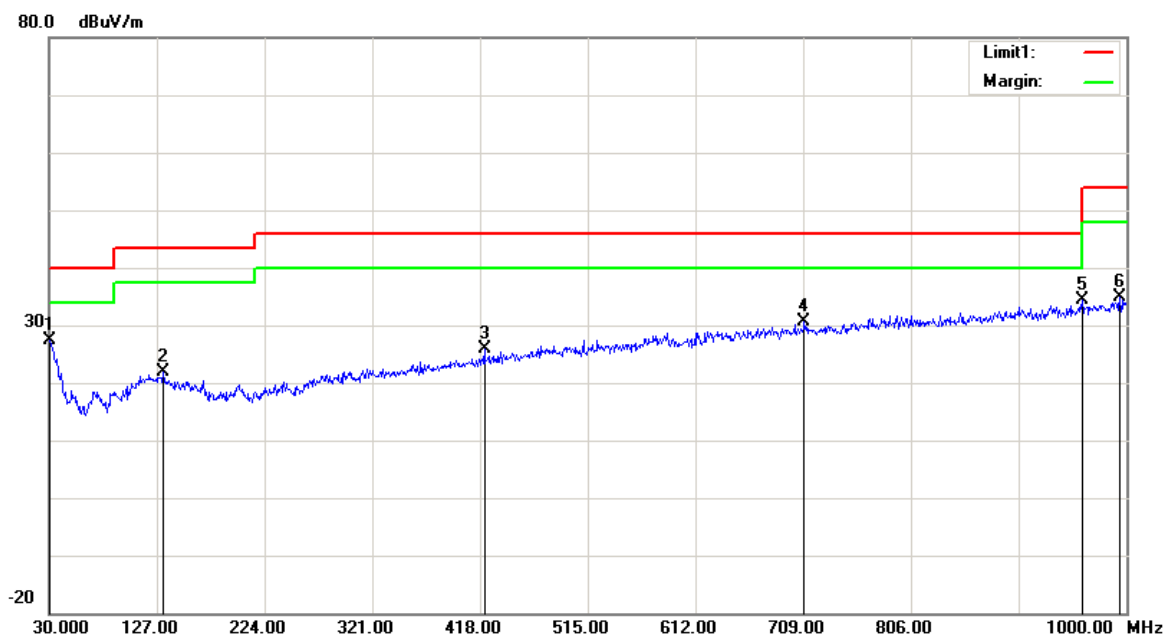
|                           |                |
|---------------------------|----------------|
| <b>Temperature:</b>       | 21.2~24.6 °C   |
| <b>Relative Humidity:</b> | 28~53 %        |
| <b>ATM Pressure:</b>      | 100.1~102.1kPa |

\* The testing was performed by Tyler Pan, Kami Zhou Vern Shen from 2019-01-12 to 2019-03-18.

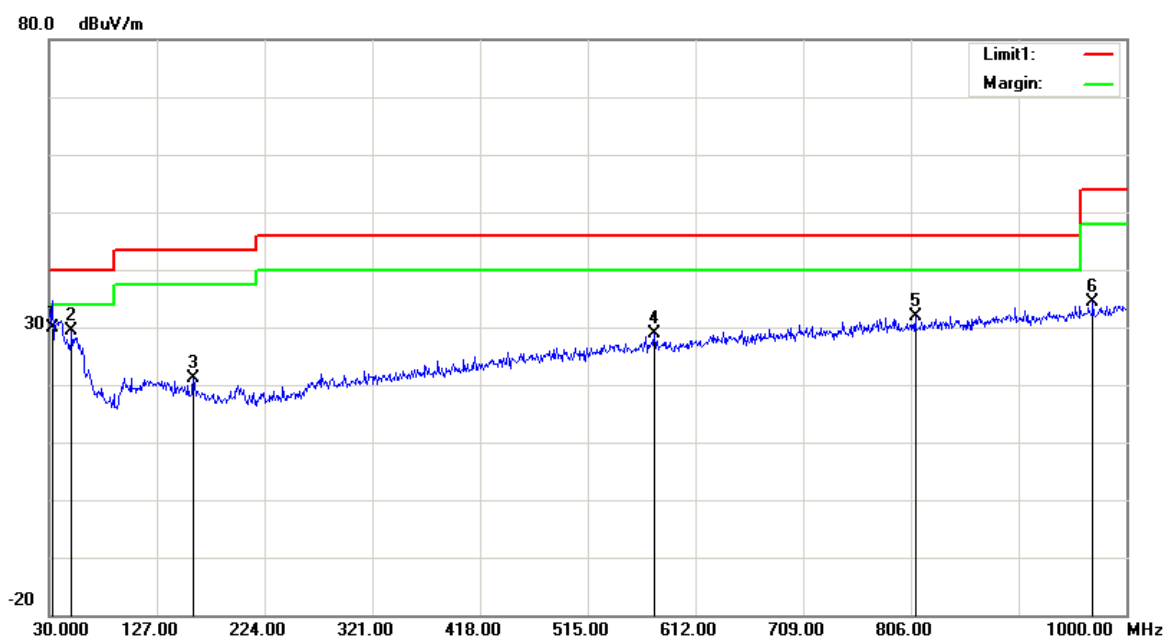
Test Mode: Transmitting

1) Below 1GHz(802.11a 5825 MHz was the worst):

### Horizontal



| Frequency (MHz) | Receiver Reading (dBμV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|-------------------------|----------|--------------------------|---------------------|----------------|-------------|
| 30.9700         | 26.52                   | peak     | 0.95                     | 27.47               | 40.00          | 12.53       |
| 132.8200        | 26.79                   | peak     | -4.95                    | 21.84               | 43.50          | 21.66       |
| 421.8800        | 27.39                   | peak     | -1.51                    | 25.88               | 46.00          | 20.12       |
| 709.9700        | 27.45                   | peak     | 3.12                     | 30.57               | 46.00          | 15.43       |
| 960.2300        | 11.46                   | peak     | 22.90                    | 34.36               | 54.00          | 19.64       |
| 994.1800        | 11.72                   | peak     | 23.20                    | 34.92               | 54.00          | 19.08       |

**Vertical**

| Frequency (MHz) | Receiver Reading (dBμV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|-------------------------|----------|--------------------------|---------------------|----------------|-------------|
| 32.9100         | 30.44                   | QP       | -0.50                    | 29.94               | 40.00          | 10.06       |
| 50.3700         | 40.62                   | peak     | -11.25                   | 29.37               | 40.00          | 10.63       |
| 159.9800        | 27.06                   | peak     | -5.85                    | 21.21               | 43.50          | 22.29       |
| 575.1400        | 27.76                   | peak     | 1.11                     | 28.87               | 46.00          | 17.13       |
| 809.8800        | 27.05                   | peak     | 4.83                     | 31.88               | 46.00          | 14.12       |
| 969.9300        | 11.29                   | peak     | 23.00                    | 34.29               | 54.00          | 19.71       |

**2) 1GHz-40GHz:  
5150-5250MHz  
802.11a**

| Frequency<br>(MHz)       | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|--------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                          | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5180 MHz    |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5180.00                  | 65.25             | PK       | H              | 33.59            | 3.58                  | 0.00                      | 102.42                             | 96.4                                | N/A               | N/A            |
| 5180.00                  | 55.68             | AV       | H              | 33.59            | 3.58                  | 0.00                      | 92.85                              | 86.83                               | N/A               | N/A            |
| 5180.00                  | 59.38             | PK       | V              | 33.59            | 3.58                  | 0.00                      | 96.55                              | 90.53                               | N/A               | N/A            |
| 5180.00                  | 49.25             | AV       | V              | 33.59            | 3.58                  | 0.00                      | 86.42                              | 80.4                                | N/A               | N/A            |
| 5150.00                  | 27.87             | PK       | H              | 33.54            | 3.56                  | 0.00                      | 64.97                              | 58.95                               | 74.00             | 15.05          |
| 5150.00                  | 14.54             | AV       | H              | 33.54            | 3.56                  | 0.00                      | 51.64                              | 45.62                               | 54.00             | 8.38           |
| 10360.00                 | 47.69             | PK       | H              | 38.17            | 6.29                  | 36.85                     | 55.30                              | 49.28                               | 68.20             | 18.92          |
| 15540.00                 | 54.57             | PK       | H              | 38.06            | 8.85                  | 39.04                     | 62.44                              | 56.42                               | 74.00             | 17.58          |
| 15540.00                 | 40.78             | AV       | H              | 38.06            | 8.85                  | 39.04                     | 48.65                              | 42.63                               | 54.00             | 11.37          |
| Middle Channel: 5200 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5200.00                  | 66.86             | PK       | H              | 33.62            | 3.60                  | 0.00                      | 104.08                             | 98.06                               | N/A               | N/A            |
| 5200.00                  | 56.74             | AV       | H              | 33.62            | 3.60                  | 0.00                      | 93.96                              | 87.94                               | N/A               | N/A            |
| 5200.00                  | 60.25             | PK       | V              | 33.62            | 3.60                  | 0.00                      | 97.47                              | 91.45                               | N/A               | N/A            |
| 5200.00                  | 50.64             | AV       | V              | 33.62            | 3.60                  | 0.00                      | 87.86                              | 81.84                               | N/A               | N/A            |
| 10400.00                 | 48.93             | PK       | H              | 38.18            | 6.32                  | 36.86                     | 56.57                              | 50.55                               | 68.20             | 17.65          |
| 15600.00                 | 53.44             | PK       | H              | 38.00            | 8.83                  | 39.09                     | 61.18                              | 55.16                               | 74.00             | 18.84          |
| 15600.00                 | 40.12             | AV       | H              | 38.00            | 8.83                  | 39.09                     | 47.86                              | 41.84                               | 54.00             | 12.16          |
| High Channel: 5240 MHz   |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5240.00                  | 65.92             | PK       | H              | 33.68            | 3.52                  | 0.00                      | 103.12                             | 97.1                                | N/A               | N/A            |
| 5240.00                  | 55.26             | AV       | H              | 33.68            | 3.52                  | 0.00                      | 92.46                              | 86.44                               | N/A               | N/A            |
| 5240.00                  | 59.74             | PK       | V              | 33.68            | 3.52                  | 0.00                      | 96.94                              | 90.92                               | N/A               | N/A            |
| 5240.00                  | 49.65             | AV       | V              | 33.68            | 3.52                  | 0.00                      | 86.85                              | 80.83                               | N/A               | N/A            |
| 5350.00                  | 24.60             | PK       | H              | 33.86            | 3.52                  | 0.00                      | 61.98                              | 55.96                               | 74.00             | 18.04          |
| 5350.00                  | 14.27             | AV       | H              | 33.86            | 3.52                  | 0.00                      | 51.65                              | 45.63                               | 54.00             | 8.37           |
| 10480.00                 | 49.55             | PK       | H              | 38.20            | 6.37                  | 36.88                     | 57.24                              | 51.22                               | 68.20             | 16.98          |
| 15720.00                 | 53.05             | PK       | H              | 37.88            | 8.79                  | 39.18                     | 60.54                              | 54.52                               | 74.00             | 19.48          |
| 15720.00                 | 39.74             | AV       | H              | 37.88            | 8.79                  | 39.18                     | 47.23                              | 41.21                               | 54.00             | 12.79          |

## 802.11n ht20

| Frequency<br>(MHz)       | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|--------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                          | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5180 MHz    |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5180.00                  | 65.79             | PK       | H              | 33.59            | 3.58                  | 0.00                      | 102.96                             | 96.94                               | N/A               | N/A            |
| 5180.00                  | 56.30             | AV       | H              | 33.59            | 3.58                  | 0.00                      | 93.47                              | 87.45                               | N/A               | N/A            |
| 5180.00                  | 57.69             | PK       | V              | 33.59            | 3.58                  | 0.00                      | 94.86                              | 88.84                               | N/A               | N/A            |
| 5180.00                  | 48.57             | AV       | V              | 33.59            | 3.58                  | 0.00                      | 85.74                              | 79.72                               | N/A               | N/A            |
| 5150.00                  | 24.66             | PK       | H              | 33.54            | 3.56                  | 0.00                      | 61.76                              | 55.74                               | 74.00             | 18.26          |
| 5150.00                  | 15.18             | AV       | H              | 33.54            | 3.56                  | 0.00                      | 52.28                              | 46.26                               | 54.00             | 7.74           |
| 10360.00                 | 48.37             | PK       | H              | 38.17            | 6.29                  | 36.85                     | 55.98                              | 49.96                               | 68.20             | 18.24          |
| 15540.00                 | 52.84             | PK       | H              | 38.06            | 8.85                  | 39.04                     | 60.71                              | 54.69                               | 74.00             | 19.31          |
| 15540.00                 | 39.46             | AV       | H              | 38.06            | 8.85                  | 39.04                     | 47.33                              | 41.31                               | 54.00             | 12.69          |
| Middle Channel: 5200 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5200.00                  | 66.17             | PK       | H              | 33.62            | 3.60                  | 0.00                      | 103.39                             | 97.37                               | N/A               | N/A            |
| 5200.00                  | 57.35             | AV       | H              | 33.62            | 3.60                  | 0.00                      | 94.57                              | 88.55                               | N/A               | N/A            |
| 5200.00                  | 59.31             | PK       | V              | 33.62            | 3.60                  | 0.00                      | 96.53                              | 90.51                               | N/A               | N/A            |
| 5200.00                  | 50.42             | AV       | V              | 33.62            | 3.60                  | 0.00                      | 87.64                              | 81.62                               | N/A               | N/A            |
| 10400.00                 | 48.24             | PK       | H              | 38.18            | 6.32                  | 36.86                     | 55.88                              | 49.86                               | 68.20             | 18.34          |
| 15600.00                 | 53.21             | PK       | H              | 38.00            | 8.83                  | 39.09                     | 60.95                              | 54.93                               | 74.00             | 19.07          |
| 15600.00                 | 40.08             | AV       | H              | 38.00            | 8.83                  | 39.09                     | 47.82                              | 41.8                                | 54.00             | 12.20          |
| High Channel: 5240 MHz   |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5240.00                  | 65.21             | PK       | H              | 33.68            | 3.52                  | 0.00                      | 102.41                             | 96.39                               | N/A               | N/A            |
| 5240.00                  | 56.34             | AV       | H              | 33.68            | 3.52                  | 0.00                      | 93.54                              | 87.52                               | N/A               | N/A            |
| 5240.00                  | 58.37             | PK       | V              | 33.68            | 3.52                  | 0.00                      | 95.57                              | 89.55                               | N/A               | N/A            |
| 5240.00                  | 49.57             | AV       | V              | 33.68            | 3.52                  | 0.00                      | 86.77                              | 80.75                               | N/A               | N/A            |
| 5350.00                  | 24.76             | PK       | H              | 33.86            | 3.52                  | 0.00                      | 62.14                              | 56.12                               | 74.00             | 17.88          |
| 5350.00                  | 15.40             | AV       | H              | 33.86            | 3.52                  | 0.00                      | 52.78                              | 46.76                               | 54.00             | 7.24           |
| 10480.00                 | 48.88             | PK       | H              | 38.20            | 6.37                  | 36.88                     | 56.57                              | 50.55                               | 68.20             | 17.65          |
| 15720.00                 | 53.61             | PK       | H              | 37.88            | 8.79                  | 39.18                     | 61.10                              | 55.08                               | 74.00             | 18.92          |
| 15720.00                 | 40.12             | AV       | H              | 37.88            | 8.79                  | 39.18                     | 47.61                              | 41.59                               | 54.00             | 12.41          |

**802.11n ht40**

| Frequency<br>(MHz)     | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                        | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5190 MHz  |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5190.00                | 62.66             | PK       | H              | 33.60            | 3.59                  | 0.00                      | 99.85                              | 93.83                               | N/A               | N/A            |
| 5190.00                | 53.84             | AV       | H              | 33.60            | 3.59                  | 0.00                      | 91.03                              | 85.01                               | N/A               | N/A            |
| 5190.00                | 57.00             | PK       | V              | 33.60            | 3.59                  | 0.00                      | 94.19                              | 88.17                               | N/A               | N/A            |
| 5190.00                | 48.61             | AV       | V              | 33.60            | 3.59                  | 0.00                      | 85.80                              | 79.78                               | N/A               | N/A            |
| 5150.00                | 32.28             | PK       | H              | 33.54            | 3.56                  | 0.00                      | 69.38                              | 63.36                               | 74.00             | 10.64          |
| 5150.00                | 17.53             | AV       | H              | 33.54            | 3.56                  | 0.00                      | 54.63                              | 48.61                               | 54.00             | 5.39           |
| 10380.00               | 46.77             | PK       | H              | 38.18            | 6.31                  | 36.85                     | 54.41                              | 48.39                               | 68.20             | 19.81          |
| 15570.00               | 51.22             | PK       | H              | 38.03            | 8.84                  | 39.06                     | 59.03                              | 53.01                               | 74.00             | 20.99          |
| 15570.00               | 39.39             | AV       | H              | 38.03            | 8.84                  | 39.06                     | 47.20                              | 41.18                               | 54.00             | 12.82          |
| High Channel: 5230 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5230.00                | 63.29             | PK       | H              | 33.67            | 3.54                  | 0.00                      | 100.50                             | 94.48                               | N/A               | N/A            |
| 5230.00                | 53.61             | AV       | H              | 33.67            | 3.54                  | 0.00                      | 90.82                              | 84.8                                | N/A               | N/A            |
| 5230.00                | 58.35             | PK       | V              | 33.67            | 3.54                  | 0.00                      | 95.56                              | 89.54                               | N/A               | N/A            |
| 5230.00                | 48.57             | AV       | V              | 33.67            | 3.54                  | 0.00                      | 85.78                              | 79.76                               | N/A               | N/A            |
| 5350.00                | 25.27             | PK       | H              | 33.86            | 3.52                  | 0.00                      | 62.65                              | 56.63                               | 74.00             | 17.37          |
| 5350.00                | 15.97             | AV       | H              | 33.86            | 3.52                  | 0.00                      | 53.35                              | 47.33                               | 54.00             | 6.67           |
| 10460.00               | 49.24             | PK       | H              | 38.19            | 6.36                  | 36.87                     | 56.92                              | 50.9                                | 68.20             | 17.3           |
| 15690.00               | 50.07             | PK       | H              | 37.91            | 8.80                  | 39.15                     | 57.63                              | 51.61                               | 74.00             | 22.39          |
| 15690.00               | 38.87             | AV       | H              | 37.91            | 8.80                  | 39.15                     | 46.43                              | 40.41                               | 54.00             | 13.59          |

**5250-5350MHz**  
**802.11a**

| Frequency                | Receiver |          | Rx Antenna |        | Cable loss | Amplifier Gain | Corrected Amplitude | Extrapolation result | Limit  | Margin |
|--------------------------|----------|----------|------------|--------|------------|----------------|---------------------|----------------------|--------|--------|
|                          | Reading  | Detector | Polar      | Factor |            |                |                     |                      |        |        |
| MHz                      | dBμV     | PK/QP/AV | H/V        | dB/m   | dB         | dB             | dBμV/m              | dBμV/m               | dBμV/m | dB     |
| Low Channel: 5260 MHz    |          |          |            |        |            |                |                     |                      |        |        |
| 5260.00                  | 70.85    | PK       | H          | 33.72  | 3.49       | 0.00           | 108.06              | 102.04               | N/A    | N/A    |
| 5260.00                  | 60.87    | AV       | H          | 33.72  | 3.49       | 0.00           | 98.08               | 92.06                | N/A    | N/A    |
| 5260.00                  | 66.26    | PK       | V          | 33.72  | 3.49       | 0.00           | 103.47              | 97.45                | N/A    | N/A    |
| 5260.00                  | 56.28    | AV       | V          | 33.72  | 3.49       | 0.00           | 93.49               | 87.47                | N/A    | N/A    |
| 5150.00                  | 26.14    | PK       | H          | 33.54  | 3.56       | 0.00           | 63.24               | 57.22                | 74.00  | 16.78  |
| 5150.00                  | 16.33    | AV       | H          | 33.54  | 3.56       | 0.00           | 53.43               | 47.41                | 54.00  | 6.59   |
| 10520.00                 | 52.34    | PK       | H          | 38.21  | 6.39       | 36.89          | 60.05               | 54.03                | 68.20  | 14.17  |
| 15780.00                 | 58.41    | PK       | H          | 37.82  | 8.76       | 39.22          | 65.77               | 59.75                | 74.00  | 14.25  |
| 15780.00                 | 44.12    | AV       | H          | 37.82  | 8.76       | 39.22          | 51.48               | 45.46                | 54.00  | 8.54   |
| Middle Channel: 5280 MHz |          |          |            |        |            |                |                     |                      |        |        |
| 5280.00                  | 70.52    | PK       | H          | 33.75  | 3.45       | 0.00           | 107.72              | 101.7                | N/A    | N/A    |
| 5280.00                  | 60.47    | AV       | H          | 33.75  | 3.45       | 0.00           | 97.67               | 91.65                | N/A    | N/A    |
| 5280.00                  | 65.91    | PK       | V          | 33.75  | 3.45       | 0.00           | 103.11              | 97.09                | N/A    | N/A    |
| 5280.00                  | 56.03    | AV       | V          | 33.75  | 3.45       | 0.00           | 93.23               | 87.21                | N/A    | N/A    |
| 10560.00                 | 52.41    | PK       | H          | 38.24  | 6.40       | 36.90          | 60.15               | 54.13                | 68.20  | 14.07  |
| 15840.00                 | 58.17    | PK       | H          | 37.76  | 8.74       | 39.27          | 65.40               | 59.38                | 74.00  | 14.62  |
| 15840.00                 | 44.06    | AV       | H          | 37.76  | 8.74       | 39.27          | 51.29               | 45.27                | 54.00  | 8.73   |
| High Channel: 5320 MHz   |          |          |            |        |            |                |                     |                      |        |        |
| 5320.00                  | 70.47    | PK       | H          | 33.81  | 3.45       | 0.00           | 107.73              | 101.71               | N/A    | N/A    |
| 5320.00                  | 60.49    | AV       | H          | 33.81  | 3.45       | 0.00           | 97.75               | 91.73                | N/A    | N/A    |
| 5320.00                  | 65.96    | PK       | V          | 33.81  | 3.45       | 0.00           | 103.22              | 97.2                 | N/A    | N/A    |
| 5320.00                  | 56.07    | AV       | V          | 33.81  | 3.45       | 0.00           | 93.33               | 87.31                | N/A    | N/A    |
| 5350.00                  | 28.64    | PK       | H          | 33.86  | 3.52       | 0.00           | 66.02               | 60                   | 74.00  | 14.00  |
| 5350.00                  | 16.66    | AV       | H          | 33.86  | 3.52       | 0.00           | 54.04               | 48.02                | 54.00  | 5.98   |
| 10640.00                 | 52.16    | PK       | H          | 38.28  | 6.43       | 36.93          | 59.94               | 53.92                | 74.00  | 20.08  |
| 10640.00                 | 39.10    | AV       | H          | 38.28  | 6.43       | 36.93          | 46.88               | 40.86                | 54.00  | 13.14  |
| 15960.00                 | 58.33    | PK       | H          | 37.64  | 8.70       | 39.36          | 65.31               | 59.29                | 74.00  | 14.71  |
| 15960.00                 | 44.28    | AV       | H          | 37.64  | 8.70       | 39.36          | 51.26               | 45.24                | 54.00  | 8.76   |

**802.11n ht20**

| Frequency                | Receiver |          | Rx Antenna |        | Cable loss | Amplifier Gain | Corrected Amplitude | Extrapolation result | Limit  | Margin |
|--------------------------|----------|----------|------------|--------|------------|----------------|---------------------|----------------------|--------|--------|
|                          | Reading  | Detector | Polar      | Factor |            |                |                     |                      |        |        |
| MHz                      | dBμV     | PK/QP/AV | H/V        | dB/m   | dB         | dB             | dBμV/m              | dBμV/m               | dBμV/m | dB     |
| Low Channel: 5260 MHz    |          |          |            |        |            |                |                     |                      |        |        |
| 5260.00                  | 70.70    | PK       | H          | 33.72  | 3.49       | 0.00           | 107.91              | 101.89               | N/A    | N/A    |
| 5260.00                  | 60.77    | AV       | H          | 33.72  | 3.49       | 0.00           | 97.98               | 91.96                | N/A    | N/A    |
| 5260.00                  | 66.23    | PK       | V          | 33.72  | 3.49       | 0.00           | 103.44              | 97.42                | N/A    | N/A    |
| 5260.00                  | 56.17    | AV       | V          | 33.72  | 3.49       | 0.00           | 93.38               | 87.36                | N/A    | N/A    |
| 5150.00                  | 26.54    | PK       | H          | 33.54  | 3.56       | 0.00           | 63.64               | 57.62                | 74.00  | 16.38  |
| 5150.00                  | 16.31    | AV       | H          | 33.54  | 3.56       | 0.00           | 53.41               | 47.39                | 54.00  | 6.61   |
| 10520.00                 | 53.03    | PK       | H          | 38.21  | 6.39       | 36.89          | 60.74               | 54.72                | 68.20  | 13.48  |
| 15780.00                 | 58.02    | PK       | H          | 37.82  | 8.76       | 39.22          | 65.38               | 59.36                | 74.00  | 14.64  |
| 15780.00                 | 43.92    | AV       | H          | 37.82  | 8.76       | 39.22          | 51.28               | 45.26                | 54.00  | 8.74   |
| Middle Channel: 5280 MHz |          |          |            |        |            |                |                     |                      |        |        |
| 5280.00                  | 70.87    | PK       | H          | 33.75  | 3.45       | 0.00           | 108.07              | 102.05               | N/A    | N/A    |
| 5280.00                  | 60.90    | AV       | H          | 33.75  | 3.45       | 0.00           | 98.10               | 92.08                | N/A    | N/A    |
| 5280.00                  | 66.14    | PK       | V          | 33.75  | 3.45       | 0.00           | 103.34              | 97.32                | N/A    | N/A    |
| 5280.00                  | 56.20    | AV       | V          | 33.75  | 3.45       | 0.00           | 93.40               | 87.38                | N/A    | N/A    |
| 10560.00                 | 53.21    | PK       | H          | 38.24  | 6.40       | 36.90          | 60.95               | 54.93                | 68.20  | 13.27  |
| 15840.00                 | 58.44    | PK       | H          | 37.76  | 8.74       | 39.27          | 65.67               | 59.65                | 74.00  | 14.35  |
| 15840.00                 | 45.10    | AV       | H          | 37.76  | 8.74       | 39.27          | 52.33               | 46.31                | 54.00  | 7.69   |
| High Channel: 5320 MHz   |          |          |            |        |            |                |                     |                      |        |        |
| 5320.00                  | 70.92    | PK       | H          | 33.81  | 3.45       | 0.00           | 108.18              | 102.16               | N/A    | N/A    |
| 5320.00                  | 61.02    | AV       | H          | 33.81  | 3.45       | 0.00           | 98.28               | 92.26                | N/A    | N/A    |
| 5320.00                  | 66.30    | PK       | V          | 33.81  | 3.45       | 0.00           | 103.56              | 97.54                | N/A    | N/A    |
| 5320.00                  | 56.22    | AV       | V          | 33.81  | 3.45       | 0.00           | 93.48               | 87.46                | N/A    | N/A    |
| 5350.00                  | 27.75    | PK       | H          | 33.86  | 3.52       | 0.00           | 65.13               | 59.11                | 74.00  | 14.89  |
| 5350.00                  | 16.03    | AV       | H          | 33.86  | 3.52       | 0.00           | 53.41               | 47.39                | 54.00  | 6.61   |
| 10640.00                 | 54.01    | PK       | H          | 38.28  | 6.43       | 36.93          | 61.79               | 55.77                | 74.00  | 18.23  |
| 10640.00                 | 41.11    | AV       | H          | 38.28  | 6.43       | 36.93          | 48.89               | 42.87                | 54.00  | 11.13  |
| 15960.00                 | 58.30    | PK       | H          | 37.64  | 8.70       | 39.36          | 65.28               | 59.26                | 74.00  | 14.74  |
| 15960.00                 | 45.07    | AV       | H          | 37.64  | 8.70       | 39.36          | 52.05               | 46.03                | 54.00  | 7.97   |

**802.11n ht40**

| Frequency              | Receiver |          | Rx Antenna |         | Cable loss | Amplifier Gain | Corrected Amplitude | Extrapolation result | Limit  | Margin |
|------------------------|----------|----------|------------|---------|------------|----------------|---------------------|----------------------|--------|--------|
|                        | Reading  | Detector | Polar      | Factor  |            |                |                     |                      |        |        |
| MHz                    | dBμV     | PK/QP/AV | H/V        | dB(1/m) | dB         | dB             | dBμV/m              | dBμV/m               | dBμV/m | dB     |
| Low Channel: 5270 MHz  |          |          |            |         |            |                |                     |                      |        |        |
| 5270.00                | 67.58    | PK       | H          | 33.73   | 3.47       | 0.00           | 104.78              | 98.76                | N/A    | N/A    |
| 5270.00                | 58.02    | AV       | H          | 33.73   | 3.47       | 0.00           | 95.22               | 89.2                 | N/A    | N/A    |
| 5270.00                | 63.44    | PK       | V          | 33.73   | 3.47       | 0.00           | 100.64              | 94.62                | N/A    | N/A    |
| 5270.00                | 53.89    | AV       | V          | 33.73   | 3.47       | 0.00           | 91.09               | 85.07                | N/A    | N/A    |
| 5150.00                | 26.70    | PK       | H          | 33.54   | 3.56       | 0.00           | 63.80               | 57.78                | 74.00  | 16.22  |
| 5150.00                | 16.41    | AV       | H          | 33.54   | 3.56       | 0.00           | 53.51               | 47.49                | 54.00  | 6.51   |
| 10540.00               | 50.36    | PK       | H          | 38.22   | 6.40       | 36.89          | 58.09               | 52.07                | 68.20  | 16.13  |
| 15810.00               | 55.43    | PK       | H          | 37.79   | 8.75       | 39.25          | 62.72               | 56.7                 | 74.00  | 17.30  |
| 15810.00               | 41.64    | AV       | H          | 37.79   | 8.75       | 39.25          | 48.93               | 42.91                | 54.00  | 11.09  |
| High Channel: 5310 MHz |          |          |            |         |            |                |                     |                      |        |        |
| 5310.00                | 67.69    | PK       | H          | 33.80   | 3.43       | 0.00           | 104.92              | 98.9                 | N/A    | N/A    |
| 5310.00                | 58.21    | AV       | H          | 33.80   | 3.43       | 0.00           | 95.44               | 89.42                | N/A    | N/A    |
| 5310.00                | 63.85    | PK       | V          | 33.80   | 3.43       | 0.00           | 101.08              | 95.06                | N/A    | N/A    |
| 5310.00                | 54.24    | AV       | V          | 33.80   | 3.43       | 0.00           | 91.47               | 85.45                | N/A    | N/A    |
| 5350.00                | 35.44    | PK       | H          | 33.86   | 3.52       | 0.00           | 72.82               | 66.8                 | 74.00  | 7.20   |
| 5350.00                | 20.63    | AV       | H          | 33.86   | 3.52       | 0.00           | 58.01               | 51.99                | 54.00  | 2.01   |
| 10620.00               | 50.71    | PK       | H          | 38.27   | 6.43       | 36.92          | 58.49               | 52.47                | 74.00  | 21.53  |
| 10620.00               | 37.54    | AV       | H          | 38.27   | 6.43       | 36.92          | 45.32               | 39.3                 | 54.00  | 14.70  |
| 15930.00               | 55.69    | PK       | H          | 37.67   | 8.71       | 39.34          | 62.73               | 56.71                | 74.00  | 17.29  |
| 15930.00               | 41.49    | AV       | H          | 37.67   | 8.71       | 39.34          | 48.53               | 42.51                | 54.00  | 11.49  |

**5470-5725MHz:  
802.11a**

| Frequency                 | Receiver |          | Rx Antenna |        | Cable loss | Amplifier Gain | Corrected Amplitude | Extrapolation result | Limit  | Margin |
|---------------------------|----------|----------|------------|--------|------------|----------------|---------------------|----------------------|--------|--------|
|                           | Reading  | Detector | Polar      | Factor |            |                |                     |                      |        |        |
| MHz                       | dBμV     | PK/QP/AV | H/V        | dB/m   | dB         | dB             | dBμV/m              | dBμV/m               | dBμV/m | dB     |
| Low Channel: 5500 MHz     |          |          |            |        |            |                |                     |                      |        |        |
| 5500.00                   | 71.34    | PK       | H          | 34.10  | 3.54       | 0.00           | 108.98              | 102.96               | N/A    | N/A    |
| 5500.00                   | 61.40    | AV       | H          | 34.10  | 3.54       | 0.00           | 99.04               | 93.02                | N/A    | N/A    |
| 5500.00                   | 67.59    | PK       | V          | 34.10  | 3.54       | 0.00           | 105.23              | 99.21                | N/A    | N/A    |
| 5500.00                   | 57.63    | AV       | V          | 34.10  | 3.54       | 0.00           | 95.27               | 89.25                | N/A    | N/A    |
| 5460.00                   | 28.06    | PK       | H          | 34.04  | 3.57       | 0.00           | 65.67               | 59.65                | 74.00  | 14.35  |
| 5460.00                   | 16.64    | AV       | H          | 34.04  | 3.57       | 0.00           | 54.25               | 48.23                | 54.00  | 5.77   |
| 11000.00                  | 55.79    | PK       | H          | 38.50  | 6.57       | 37.06          | 63.80               | 57.78                | 74.00  | 16.22  |
| 11000.00                  | 42.45    | AV       | H          | 38.50  | 6.57       | 37.06          | 50.46               | 44.44                | 54.00  | 9.56   |
| 16500.00                  | 56.24    | PK       | H          | 38.20  | 8.63       | 39.30          | 63.77               | 57.75                | 68.20  | 10.45  |
| Middle Channel: 5580 MHz  |          |          |            |        |            |                |                     |                      |        |        |
| 5580.00                   | 72.81    | PK       | H          | 34.13  | 3.56       | 0.00           | 110.50              | 104.48               | N/A    | N/A    |
| 5580.00                   | 62.83    | AV       | H          | 34.13  | 3.56       | 0.00           | 100.52              | 94.5                 | N/A    | N/A    |
| 5580.00                   | 67.98    | PK       | V          | 34.13  | 3.56       | 0.00           | 105.67              | 99.65                | N/A    | N/A    |
| 5580.00                   | 58.04    | AV       | V          | 34.13  | 3.56       | 0.00           | 95.73               | 89.71                | N/A    | N/A    |
| 11160.00                  | 57.02    | PK       | H          | 38.66  | 6.58       | 37.16          | 65.10               | 59.08                | 74.00  | 14.92  |
| 11160.00                  | 43.87    | AV       | H          | 38.66  | 6.58       | 37.16          | 51.95               | 45.93                | 54.00  | 8.07   |
| 16740.00                  | 57.86    | PK       | H          | 39.16  | 8.67       | 39.05          | 66.64               | 60.62                | 68.20  | 7.58   |
| High Channel: 5700 MHz    |          |          |            |        |            |                |                     |                      |        |        |
| 5700.00                   | 75.60    | PK       | H          | 34.18  | 3.68       | 0.00           | 113.46              | 107.44               | N/A    | N/A    |
| 5700.00                   | 65.97    | AV       | H          | 34.18  | 3.68       | 0.00           | 103.83              | 97.81                | N/A    | N/A    |
| 5700.00                   | 71.65    | PK       | V          | 34.18  | 3.68       | 0.00           | 109.51              | 103.49               | N/A    | N/A    |
| 5700.00                   | 62.10    | AV       | V          | 34.18  | 3.68       | 0.00           | 99.96               | 93.94                | N/A    | N/A    |
| 5725.00                   | 33.02    | PK       | H          | 34.19  | 3.69       | 0.00           | 70.90               | 64.88                | 68.20  | 3.32   |
| 11400.00                  | 60.50    | PK       | H          | 38.90  | 6.59       | 37.30          | 68.69               | 62.67                | 74.00  | 11.33  |
| 11400.00                  | 47.03    | AV       | H          | 38.90  | 6.59       | 37.30          | 55.22               | 49.2                 | 54.00  | 4.80   |
| 17100.00                  | 61.41    | PK       | H          | 40.78  | 8.75       | 38.70          | 72.24               | 66.22                | 68.20  | 1.98   |
| Crossed Channel: 5720 MHz |          |          |            |        |            |                |                     |                      |        |        |
| 5720.00                   | 75.17    | PK       | H          | 34.19  | 3.69       | 0.00           | 113.05              | 107.03               | N/A    | N/A    |
| 5720.00                   | 65.20    | AV       | H          | 34.19  | 3.69       | 0.00           | 103.08              | 97.06                | N/A    | N/A    |
| 5720.00                   | 71.21    | PK       | V          | 34.19  | 3.69       | 0.00           | 109.09              | 103.07               | N/A    | N/A    |
| 5720.00                   | 61.30    | AV       | V          | 34.19  | 3.69       | 0.00           | 99.18               | 93.16                | N/A    | N/A    |
| 11440.00                  | 59.87    | PK       | H          | 38.94  | 6.59       | 37.32          | 68.08               | 62.06                | 74.00  | 11.94  |
| 11440.00                  | 46.69    | AV       | H          | 38.94  | 6.59       | 37.32          | 54.90               | 48.88                | 54.00  | 5.12   |
| 17160.00                  | 60.73    | PK       | H          | 41.13  | 8.76       | 38.66          | 71.96               | 65.94                | 68.20  | 2.26   |

**802.11n ht20**

| Frequency                 | Receiver |          | Rx Antenna |        | Cable loss | Amplifier Gain | Corrected Amplitude | Extrapolation result | Limit  | Margin |
|---------------------------|----------|----------|------------|--------|------------|----------------|---------------------|----------------------|--------|--------|
|                           | Reading  | Detector | Polar      | Factor |            |                |                     |                      |        |        |
| MHz                       | dBμV     | PK/QP/AV | H/V        | dB/m   | dB         | dB             | dBμV/m              | dBμV/m               | dBμV/m | dB     |
| Low Channel: 5500 MHz     |          |          |            |        |            |                |                     |                      |        |        |
| 5500.00                   | 71.98    | PK       | H          | 34.10  | 3.54       | 0.00           | 109.62              | 103.6                | N/A    | N/A    |
| 5500.00                   | 62.17    | AV       | H          | 34.10  | 3.54       | 0.00           | 99.81               | 93.79                | N/A    | N/A    |
| 5500.00                   | 67.44    | PK       | V          | 34.10  | 3.54       | 0.00           | 105.08              | 99.06                | N/A    | N/A    |
| 5500.00                   | 57.60    | AV       | V          | 34.10  | 3.54       | 0.00           | 95.24               | 89.22                | N/A    | N/A    |
| 5460.00                   | 28.76    | PK       | H          | 34.04  | 3.57       | 0.00           | 66.37               | 60.35                | 74.00  | 13.65  |
| 5460.00                   | 17.09    | AV       | H          | 34.04  | 3.57       | 0.00           | 54.70               | 48.68                | 54.00  | 5.32   |
| 11000.00                  | 55.61    | PK       | V          | 38.50  | 6.57       | 37.06          | 63.62               | 57.6                 | 74.00  | 16.40  |
| 11000.00                  | 42.36    | AV       | V          | 38.50  | 6.57       | 37.06          | 50.37               | 44.35                | 54.00  | 9.65   |
| 16500.00                  | 55.81    | PK       | V          | 38.20  | 8.63       | 39.30          | 63.34               | 57.32                | 68.20  | 10.88  |
| Middle Channel: 5580 MHz  |          |          |            |        |            |                |                     |                      |        |        |
| 5580.00                   | 72.49    | PK       | H          | 34.13  | 3.56       | 0.00           | 110.18              | 104.16               | N/A    | N/A    |
| 5580.00                   | 62.56    | AV       | H          | 34.13  | 3.56       | 0.00           | 100.25              | 94.23                | N/A    | N/A    |
| 5580.00                   | 68.04    | PK       | V          | 34.13  | 3.56       | 0.00           | 105.73              | 99.71                | N/A    | N/A    |
| 5580.00                   | 58.10    | AV       | V          | 34.13  | 3.56       | 0.00           | 95.79               | 89.77                | N/A    | N/A    |
| 11160.00                  | 57.67    | PK       | H          | 38.66  | 6.58       | 37.16          | 65.75               | 59.73                | 74.00  | 14.27  |
| 11160.00                  | 43.80    | AV       | H          | 38.66  | 6.58       | 37.16          | 51.88               | 45.86                | 54.00  | 8.14   |
| 16740.00                  | 57.65    | PK       | H          | 39.16  | 8.67       | 39.05          | 66.43               | 60.41                | 68.20  | 7.79   |
| High Channel: 5700 MHz    |          |          |            |        |            |                |                     |                      |        |        |
| 5700.00                   | 75.69    | PK       | H          | 34.18  | 3.68       | 0.00           | 113.55              | 107.53               | N/A    | N/A    |
| 5700.00                   | 65.87    | AV       | H          | 34.18  | 3.68       | 0.00           | 103.73              | 97.71                | N/A    | N/A    |
| 5700.00                   | 71.53    | PK       | V          | 34.18  | 3.68       | 0.00           | 109.39              | 103.37               | N/A    | N/A    |
| 5700.00                   | 61.64    | AV       | V          | 34.18  | 3.68       | 0.00           | 99.50               | 93.48                | N/A    | N/A    |
| 5725.00                   | 34.02    | PK       | H          | 34.19  | 3.69       | 0.00           | 71.90               | 65.88                | 68.20  | 2.32   |
| 11400.00                  | 59.87    | PK       | H          | 38.90  | 6.59       | 37.30          | 68.06               | 62.04                | 74.00  | 11.96  |
| 11400.00                  | 46.56    | AV       | H          | 38.90  | 6.59       | 37.30          | 54.75               | 48.73                | 54.00  | 5.27   |
| 17100.00                  | 60.38    | PK       | H          | 40.78  | 8.75       | 38.70          | 71.21               | 65.19                | 68.20  | 3.01   |
| Crossed Channel: 5720 MHz |          |          |            |        |            |                |                     |                      |        |        |
| 5720.00                   | 74.57    | PK       | H          | 34.19  | 3.69       | 0.00           | 112.45              | 106.43               | N/A    | N/A    |
| 5720.00                   | 64.53    | AV       | H          | 34.19  | 3.69       | 0.00           | 102.41              | 96.39                | N/A    | N/A    |
| 5720.00                   | 71.00    | PK       | V          | 34.19  | 3.69       | 0.00           | 108.88              | 102.86               | N/A    | N/A    |
| 5720.00                   | 61.14    | AV       | V          | 34.19  | 3.69       | 0.00           | 99.02               | 93                   | N/A    | N/A    |
| 11440.00                  | 59.60    | PK       | H          | 38.94  | 6.59       | 37.32          | 67.81               | 61.79                | 74.00  | 12.21  |
| 11440.00                  | 46.28    | AV       | H          | 38.94  | 6.59       | 37.32          | 54.49               | 48.47                | 54.00  | 5.53   |
| 17160.00                  | 60.32    | PK       | H          | 41.13  | 8.76       | 38.66          | 71.55               | 65.53                | 68.20  | 2.67   |

**802.11n ht40**

| Frequency                 | Receiver |          | Rx Antenna |        | Cable loss | Amplifier Gain | Corrected Amplitude | Extrapolation result | Limit  | Margin |
|---------------------------|----------|----------|------------|--------|------------|----------------|---------------------|----------------------|--------|--------|
|                           | Reading  | Detector | Polar      | Factor |            |                |                     |                      |        |        |
| MHz                       | dBμV     | PK/QP/AV | H/V        | dB/m   | dB         | dB             | dBμV/m              | dBμV/m               | dBμV/m | dB     |
| Low Channel: 5510 MHz     |          |          |            |        |            |                |                     |                      |        |        |
| 5510.00                   | 66.50    | PK       | H          | 34.10  | 3.54       | 0.00           | 104.14              | 98.12                | N/A    | N/A    |
| 5510.00                   | 56.17    | AV       | H          | 34.10  | 3.54       | 0.00           | 93.81               | 87.79                | N/A    | N/A    |
| 5510.00                   | 61.77    | PK       | V          | 34.10  | 3.54       | 0.00           | 99.41               | 93.39                | N/A    | N/A    |
| 5510.00                   | 51.80    | AV       | V          | 34.10  | 3.54       | 0.00           | 89.44               | 83.42                | N/A    | N/A    |
| 5460.00                   | 35.62    | PK       | H          | 34.04  | 3.57       | 0.00           | 73.23               | 67.21                | 74.00  | 6.79   |
| 5460.00                   | 20.72    | AV       | H          | 34.04  | 3.57       | 0.00           | 58.33               | 52.31                | 54.00  | 1.69   |
| 11020.00                  | 50.85    | PK       | H          | 38.52  | 6.57       | 37.07          | 58.87               | 52.85                | 74.00  | 21.15  |
| 11020.00                  | 37.66    | AV       | H          | 38.52  | 6.57       | 37.07          | 45.68               | 39.66                | 54.00  | 14.34  |
| 16530.00                  | 51.36    | PK       | H          | 38.32  | 8.64       | 39.27          | 59.05               | 53.03                | 68.20  | 15.17  |
| Middle Channel: 5550 MHz  |          |          |            |        |            |                |                     |                      |        |        |
| 5550.00                   | 66.85    | PK       | H          | 34.12  | 3.56       | 0.00           | 104.53              | 98.51                | N/A    | N/A    |
| 5550.00                   | 56.90    | AV       | H          | 34.12  | 3.56       | 0.00           | 94.58               | 88.56                | N/A    | N/A    |
| 5550.00                   | 61.81    | PK       | V          | 34.12  | 3.56       | 0.00           | 99.49               | 93.47                | N/A    | N/A    |
| 5550.00                   | 51.74    | AV       | V          | 34.12  | 3.56       | 0.00           | 89.42               | 83.4                 | N/A    | N/A    |
| 11100.00                  | 51.13    | PK       | H          | 38.60  | 6.57       | 37.12          | 59.18               | 53.16                | 74.00  | 20.84  |
| 11100.00                  | 38.20    | AV       | H          | 38.60  | 6.57       | 37.12          | 46.25               | 40.23                | 54.00  | 13.77  |
| 16650.00                  | 51.40    | PK       | H          | 38.80  | 8.66       | 39.14          | 59.72               | 53.7                 | 68.20  | 14.50  |
| High Channel: 5670 MHz    |          |          |            |        |            |                |                     |                      |        |        |
| 5670.00                   | 70.84    | PK       | H          | 34.17  | 3.65       | 0.00           | 108.66              | 102.64               | N/A    | N/A    |
| 5670.00                   | 61.30    | AV       | H          | 34.17  | 3.65       | 0.00           | 99.12               | 93.1                 | N/A    | N/A    |
| 5670.00                   | 66.10    | PK       | V          | 34.17  | 3.65       | 0.00           | 103.92              | 97.9                 | N/A    | N/A    |
| 5670.00                   | 57.06    | AV       | V          | 34.17  | 3.65       | 0.00           | 94.88               | 88.86                | N/A    | N/A    |
| 5725.00                   | 33.98    | PK       | H          | 34.19  | 3.69       | 0.00           | 71.86               | 65.84                | 68.20  | 2.36   |
| 11340.00                  | 54.66    | PK       | H          | 38.84  | 6.58       | 37.26          | 62.82               | 56.8                 | 74.00  | 17.20  |
| 11340.00                  | 41.32    | AV       | H          | 38.84  | 6.58       | 37.26          | 49.48               | 43.46                | 54.00  | 10.54  |
| 17010.00                  | 54.98    | PK       | H          | 40.26  | 8.72       | 38.76          | 65.20               | 59.18                | 68.20  | 9.02   |
| Crossed Channel: 5710 MHz |          |          |            |        |            |                |                     |                      |        |        |
| 5710.00                   | 70.56    | PK       | H          | 34.18  | 3.68       | 0.00           | 108.42              | 102.4                | N/A    | N/A    |
| 5710.00                   | 61.30    | AV       | H          | 34.18  | 3.68       | 0.00           | 99.16               | 93.14                | N/A    | N/A    |
| 5710.00                   | 66.54    | PK       | V          | 34.18  | 3.68       | 0.00           | 104.40              | 98.38                | N/A    | N/A    |
| 5710.00                   | 57.33    | AV       | V          | 34.18  | 3.68       | 0.00           | 95.19               | 89.17                | N/A    | N/A    |
| 11420.00                  | 54.32    | PK       | H          | 38.92  | 6.59       | 37.31          | 62.52               | 56.5                 | 74.00  | 17.50  |
| 11420.00                  | 41.06    | AV       | H          | 38.92  | 6.59       | 37.31          | 49.26               | 43.24                | 54.00  | 10.76  |
| 17130.00                  | 55.21    | PK       | H          | 40.95  | 8.75       | 38.68          | 66.23               | 60.21                | 68.20  | 7.99   |

**5725-5850MHz**  
**802.11a**

| Frequency<br>(MHz)       | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|--------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                          | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5745 MHz    |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5745.00                  | 66.43             | PK       | H              | 34.20            | 3.69                  | 0.00                      | 104.32                             | 98.3                                | N/A               | N/A            |
| 5745.00                  | 56.31             | AV       | H              | 34.20            | 3.69                  | 0.00                      | 94.20                              | 88.18                               | N/A               | N/A            |
| 5745.00                  | 65.25             | PK       | V              | 34.20            | 3.69                  | 0.00                      | 103.14                             | 97.12                               | N/A               | N/A            |
| 5745.00                  | 55.38             | AV       | V              | 34.20            | 3.69                  | 0.00                      | 93.27                              | 87.25                               | N/A               | N/A            |
| 5725.00                  | 33.07             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 70.95                              | 64.93                               | 122.20            | 57.27          |
| 5720.00                  | 27.58             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 65.46                              | 59.44                               | 110.80            | 51.36          |
| 5700.00                  | 26.30             | PK       | H              | 34.18            | 3.68                  | 0.00                      | 64.16                              | 58.14                               | 105.20            | 47.06          |
| 5650.00                  | 25.99             | PK       | H              | 34.16            | 3.63                  | 0.00                      | 63.78                              | 57.76                               | 68.20             | 10.44          |
| 11490.00                 | 62.31             | PK       | H              | 38.99            | 6.59                  | 37.35                     | 70.54                              | 64.52                               | 74.00             | 9.48           |
| 11490.00                 | 47.67             | AV       | H              | 38.99            | 6.59                  | 37.35                     | 55.90                              | 49.88                               | 54.00             | 4.12           |
| 17235.00                 | 57.14             | PK       | H              | 41.56            | 8.78                  | 38.61                     | 68.87                              | 62.85                               | 68.20             | 5.35           |
| Middle Channel: 5785 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5785.00                  | 66.26             | PK       | H              | 34.21            | 3.71                  | 0.00                      | 104.18                             | 98.16                               | N/A               | N/A            |
| 5785.00                  | 56.37             | AV       | H              | 34.21            | 3.71                  | 0.00                      | 94.29                              | 88.27                               | N/A               | N/A            |
| 5785.00                  | 65.17             | PK       | V              | 34.21            | 3.71                  | 0.00                      | 103.09                             | 97.07                               | N/A               | N/A            |
| 5785.00                  | 55.42             | AV       | V              | 34.21            | 3.71                  | 0.00                      | 93.34                              | 87.32                               | N/A               | N/A            |
| 11570.00                 | 66.58             | PK       | H              | 39.00            | 6.61                  | 37.44                     | 74.75                              | 68.73                               | 74.00             | 5.27           |
| 11570.00                 | 50.03             | AV       | H              | 39.00            | 6.61                  | 37.44                     | 58.20                              | 52.18                               | 54.00             | 1.82           |
| 17355.00                 | 52.46             | PK       | H              | 42.26            | 8.81                  | 38.52                     | 65.01                              | 58.99                               | 68.20             | 9.21           |
| High Channel: 5825 MHz   |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5825.00                  | 65.61             | PK       | H              | 34.23            | 3.73                  | 0.00                      | 103.57                             | 97.55                               | N/A               | N/A            |
| 5825.00                  | 55.96             | AV       | H              | 34.23            | 3.73                  | 0.00                      | 93.92                              | 87.9                                | N/A               | N/A            |
| 5825.00                  | 64.53             | PK       | V              | 34.23            | 3.73                  | 0.00                      | 102.49                             | 96.47                               | N/A               | N/A            |
| 5825.00                  | 54.34             | AV       | V              | 34.23            | 3.73                  | 0.00                      | 92.30                              | 86.28                               | N/A               | N/A            |
| 5850.00                  | 25.15             | PK       | H              | 34.24            | 3.75                  | 0.00                      | 63.14                              | 57.12                               | 122.20            | 65.08          |
| 5855.00                  | 26.04             | PK       | H              | 34.24            | 3.75                  | 0.00                      | 64.03                              | 58.01                               | 110.80            | 52.79          |
| 5875.00                  | 26.75             | PK       | H              | 34.25            | 3.77                  | 0.00                      | 64.77                              | 58.75                               | 105.20            | 46.45          |
| 5925.00                  | 26.26             | PK       | H              | 34.27            | 3.80                  | 0.00                      | 64.33                              | 58.31                               | 68.20             | 9.89           |
| 11650.00                 | 66.43             | PK       | H              | 39.00            | 6.64                  | 37.53                     | 74.54                              | 68.52                               | 74.00             | 5.48           |
| 11650.00                 | 50.87             | AV       | H              | 39.00            | 6.64                  | 37.53                     | 58.98                              | 52.96                               | 54.00             | 1.04           |
| 17475.00                 | 52.63             | PK       | H              | 42.96            | 8.84                  | 38.44                     | 65.99                              | 59.97                               | 68.20             | 8.23           |

## 802.11n ht20

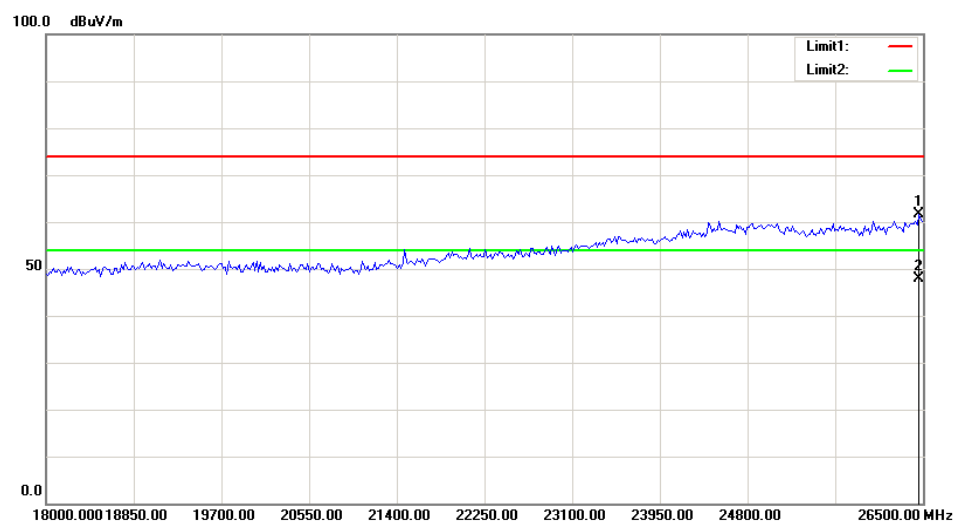
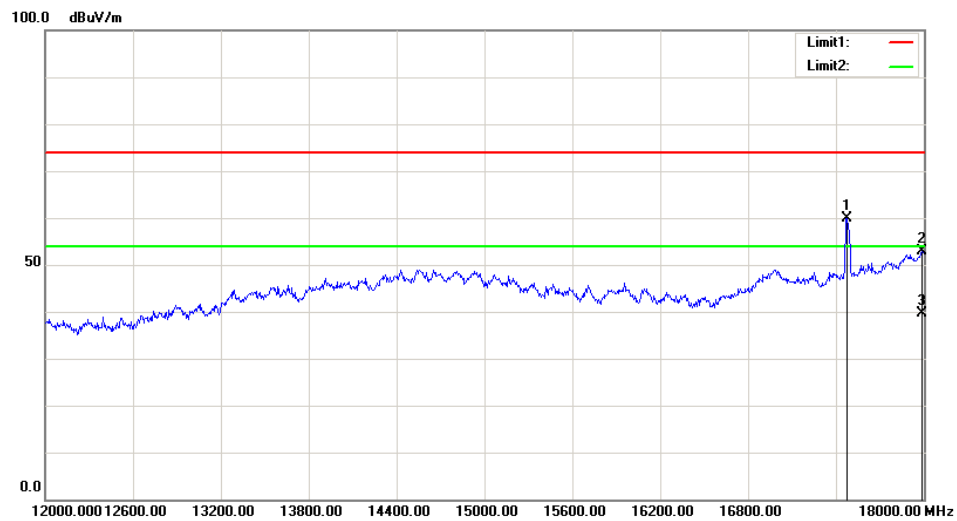
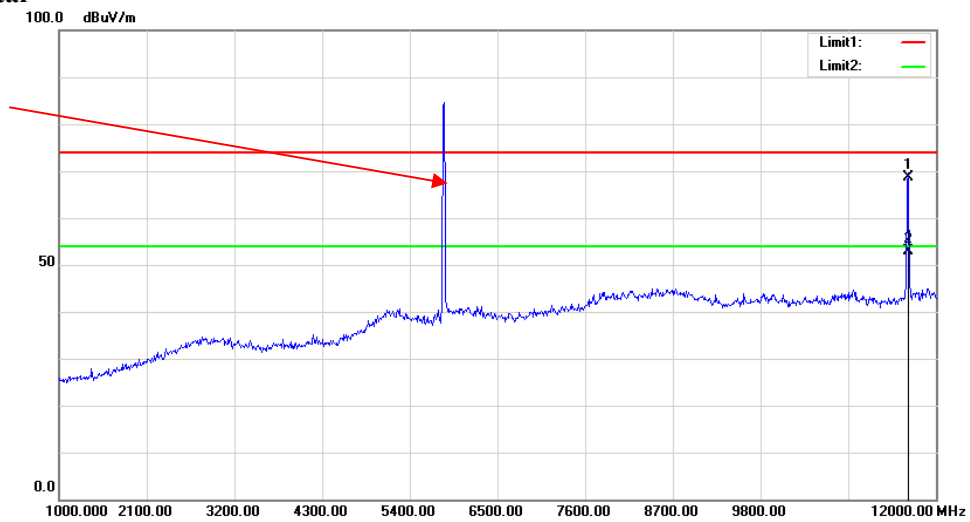
| Frequency<br>(MHz)       | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|--------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                          | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5745 MHz    |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5745.00                  | 68.73             | PK       | H              | 34.20            | 3.69                  | 0.00                      | 106.62                             | 100.6                               | N/A               | N/A            |
| 5745.00                  | 57.51             | AV       | H              | 34.20            | 3.69                  | 0.00                      | 95.40                              | 89.38                               | N/A               | N/A            |
| 5745.00                  | 67.80             | PK       | V              | 34.20            | 3.69                  | 0.00                      | 105.69                             | 99.67                               | N/A               | N/A            |
| 5745.00                  | 56.48             | AV       | V              | 34.20            | 3.69                  | 0.00                      | 94.37                              | 88.35                               | N/A               | N/A            |
| 5725.00                  | 35.28             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 73.16                              | 67.14                               | 122.20            | 55.06          |
| 5720.00                  | 28.86             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 66.74                              | 60.72                               | 110.80            | 50.08          |
| 5700.00                  | 27.06             | PK       | H              | 34.18            | 3.68                  | 0.00                      | 64.92                              | 58.9                                | 105.20            | 46.30          |
| 5650.00                  | 26.56             | PK       | H              | 34.16            | 3.63                  | 0.00                      | 64.35                              | 58.33                               | 68.20             | 9.87           |
| 11490.00                 | 67.60             | PK       | H              | 38.99            | 6.59                  | 37.35                     | 75.83                              | 69.81                               | 74.00             | 4.19           |
| 11490.00                 | 50.35             | AV       | H              | 38.99            | 6.59                  | 37.35                     | 58.58                              | 52.56                               | 54.00             | 1.44           |
| 17235.00                 | 52.36             | PK       | H              | 41.56            | 8.78                  | 38.61                     | 64.09                              | 58.07                               | 68.20             | 10.13          |
| Middle Channel: 5785 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5785.00                  | 68.49             | PK       | H              | 34.21            | 3.71                  | 0.00                      | 106.41                             | 100.39                              | N/A               | N/A            |
| 5785.00                  | 57.02             | AV       | H              | 34.21            | 3.71                  | 0.00                      | 94.94                              | 88.92                               | N/A               | N/A            |
| 5785.00                  | 67.45             | PK       | V              | 34.21            | 3.71                  | 0.00                      | 105.37                             | 99.35                               | N/A               | N/A            |
| 5785.00                  | 56.38             | AV       | V              | 34.21            | 3.71                  | 0.00                      | 94.30                              | 88.28                               | N/A               | N/A            |
| 11570.00                 | 64.05             | PK       | H              | 39.00            | 6.61                  | 37.44                     | 72.22                              | 66.2                                | 74.00             | 7.80           |
| 11570.00                 | 46.84             | AV       | H              | 39.00            | 6.61                  | 37.44                     | 55.01                              | 48.99                               | 54.00             | 5.01           |
| 17355.00                 | 53.74             | PK       | H              | 42.26            | 8.81                  | 38.52                     | 66.29                              | 60.27                               | 68.20             | 7.93           |
| High Channel: 5825 MHz   |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5825.00                  | 66.25             | PK       | H              | 34.23            | 3.73                  | 0.00                      | 104.21                             | 98.19                               | N/A               | N/A            |
| 5825.00                  | 55.37             | AV       | H              | 34.23            | 3.73                  | 0.00                      | 93.33                              | 87.31                               | N/A               | N/A            |
| 5825.00                  | 65.27             | PK       | V              | 34.23            | 3.73                  | 0.00                      | 103.23                             | 97.21                               | N/A               | N/A            |
| 5825.00                  | 54.74             | AV       | V              | 34.23            | 3.73                  | 0.00                      | 92.70                              | 86.68                               | N/A               | N/A            |
| 5850.00                  | 28.45             | PK       | H              | 34.24            | 3.75                  | 0.00                      | 66.44                              | 60.42                               | 122.20            | 61.78          |
| 5855.00                  | 27.18             | PK       | H              | 34.24            | 3.75                  | 0.00                      | 65.17                              | 59.15                               | 110.80            | 51.65          |
| 5875.00                  | 27.51             | PK       | H              | 34.25            | 3.77                  | 0.00                      | 65.53                              | 59.51                               | 105.20            | 45.69          |
| 5925.00                  | 26.89             | PK       | H              | 34.27            | 3.80                  | 0.00                      | 64.96                              | 58.94                               | 68.20             | 9.26           |
| 11650.00                 | 66.98             | PK       | H              | 39.00            | 6.64                  | 37.53                     | 75.09                              | 69.07                               | 74.00             | 4.93           |
| 11650.00                 | 49.82             | AV       | H              | 39.00            | 6.64                  | 37.53                     | 57.93                              | 51.91                               | 54.00             | 2.09           |
| 17475.00                 | 54.64             | PK       | H              | 42.96            | 8.84                  | 38.44                     | 68.00                              | 61.98                               | 68.20             | 6.22           |

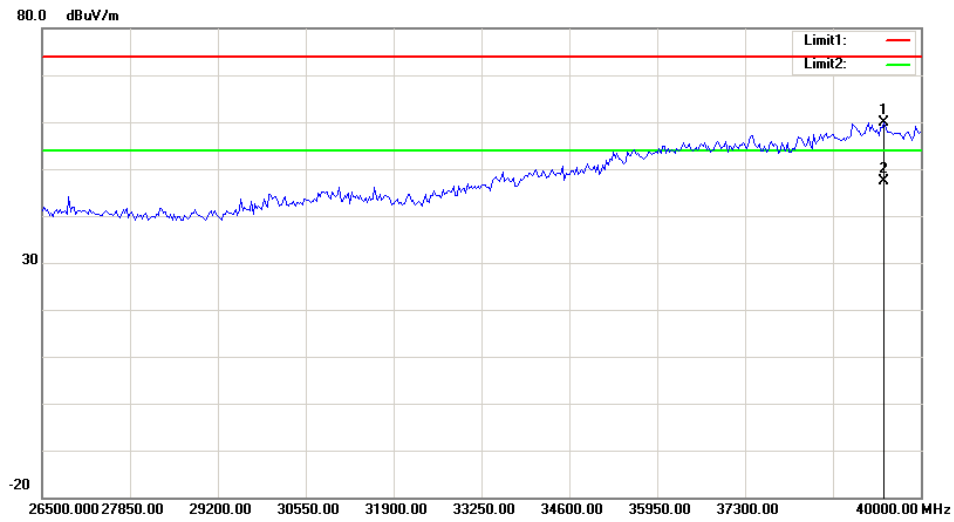
**802.11n ht40**

| Frequency<br>(MHz)     | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                        | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5755 MHz  |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5755.00                | 65.61             | PK       | H              | 34.20            | 3.70                  | 0.00                      | 103.51                             | 97.49                               | N/A               | N/A            |
| 5755.00                | 54.65             | AV       | H              | 34.20            | 3.70                  | 0.00                      | 92.55                              | 86.53                               | N/A               | N/A            |
| 5755.00                | 59.88             | PK       | V              | 34.20            | 3.70                  | 0.00                      | 97.78                              | 91.76                               | N/A               | N/A            |
| 5755.00                | 48.59             | AV       | V              | 34.20            | 3.70                  | 0.00                      | 86.49                              | 80.47                               | N/A               | N/A            |
| 5725.00                | 36.10             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 73.98                              | 67.96                               | 122.20            | 54.24          |
| 5720.00                | 35.23             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 73.11                              | 67.09                               | 110.80            | 43.71          |
| 5700.00                | 26.57             | PK       | H              | 34.18            | 3.68                  | 0.00                      | 64.43                              | 58.41                               | 105.20            | 46.79          |
| 5650.00                | 26.00             | PK       | H              | 34.16            | 3.63                  | 0.00                      | 63.79                              | 57.77                               | 68.20             | 10.43          |
| 11510.00               | 52.83             | PK       | H              | 39.00            | 6.59                  | 37.37                     | 61.05                              | 55.03                               | 74.00             | 18.97          |
| 11510.00               | 37.87             | AV       | H              | 39.00            | 6.59                  | 37.37                     | 46.09                              | 40.07                               | 54.00             | 13.93          |
| 17265.00               | 49.01             | PK       | H              | 41.74            | 8.79                  | 38.58                     | 60.96                              | 54.94                               | 68.20             | 13.26          |
| High Channel: 5795 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5795.00                | 64.72             | PK       | H              | 34.22            | 3.71                  | 0.00                      | 102.65                             | 96.63                               | N/A               | N/A            |
| 5795.00                | 53.48             | AV       | H              | 34.22            | 3.71                  | 0.00                      | 91.41                              | 85.39                               | N/A               | N/A            |
| 5795.00                | 58.55             | PK       | V              | 34.22            | 3.71                  | 0.00                      | 96.48                              | 90.46                               | N/A               | N/A            |
| 5795.00                | 47.69             | AV       | V              | 34.22            | 3.71                  | 0.00                      | 85.62                              | 79.6                                | N/A               | N/A            |
| 5850.00                | 27.12             | PK       | H              | 34.24            | 3.75                  | 0.00                      | 65.11                              | 59.09                               | 122.20            | 63.11          |
| 5855.00                | 26.68             | PK       | H              | 34.24            | 3.75                  | 0.00                      | 64.67                              | 58.65                               | 110.80            | 52.15          |
| 5875.00                | 26.66             | PK       | H              | 34.25            | 3.77                  | 0.00                      | 64.68                              | 58.66                               | 105.20            | 46.54          |
| 5925.00                | 25.09             | PK       | H              | 34.27            | 3.80                  | 0.00                      | 63.16                              | 57.14                               | 68.20             | 11.06          |
| 11590.00               | 51.97             | PK       | H              | 39.00            | 6.62                  | 37.46                     | 60.13                              | 54.11                               | 74.00             | 19.89          |
| 11590.00               | 38.41             | AV       | H              | 39.00            | 6.62                  | 37.46                     | 46.57                              | 40.55                               | 54.00             | 13.45          |
| 17385.00               | 47.26             | PK       | H              | 42.43            | 8.82                  | 38.50                     | 60.01                              | 53.99                               | 68.20             | 14.21          |

**Test Plots(For worst mode 802.11a 5825MHz)**  
**Horizontal**

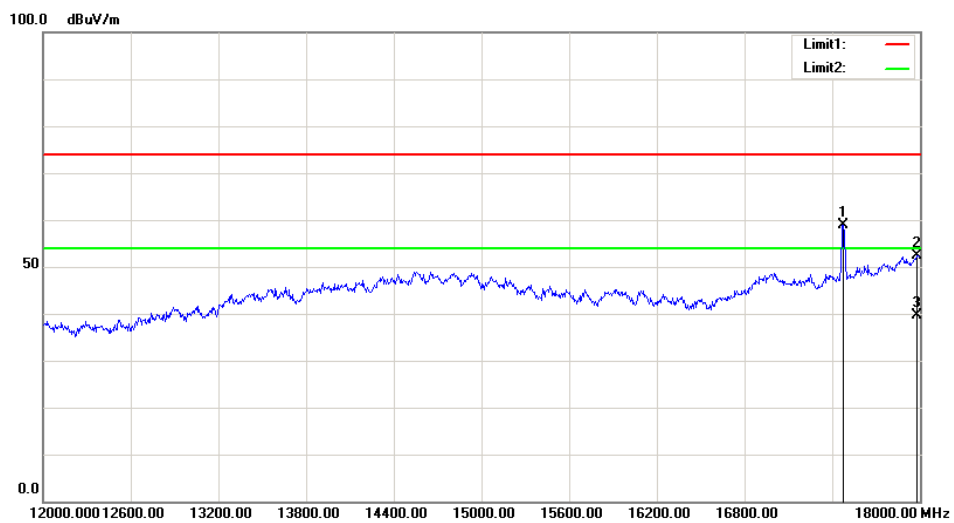
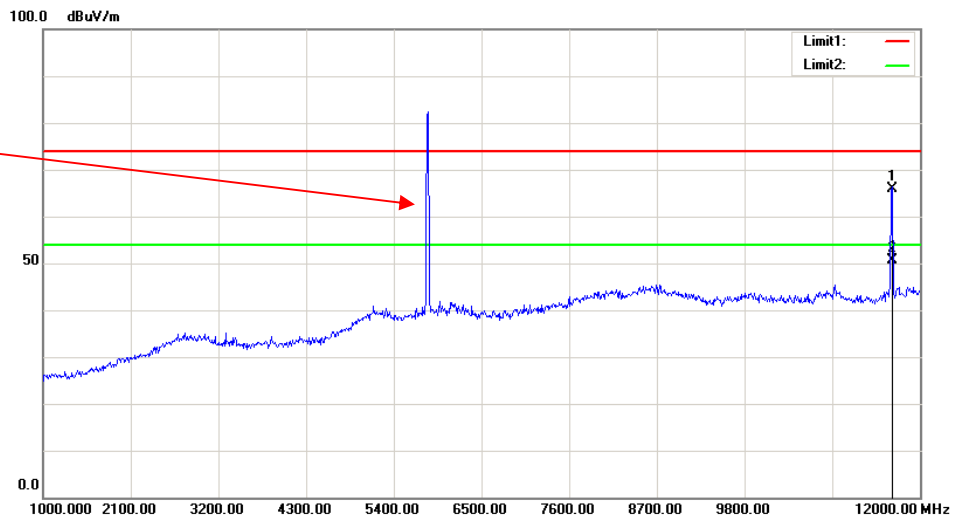
Fundamental  
Test with Band  
Rejection Filter

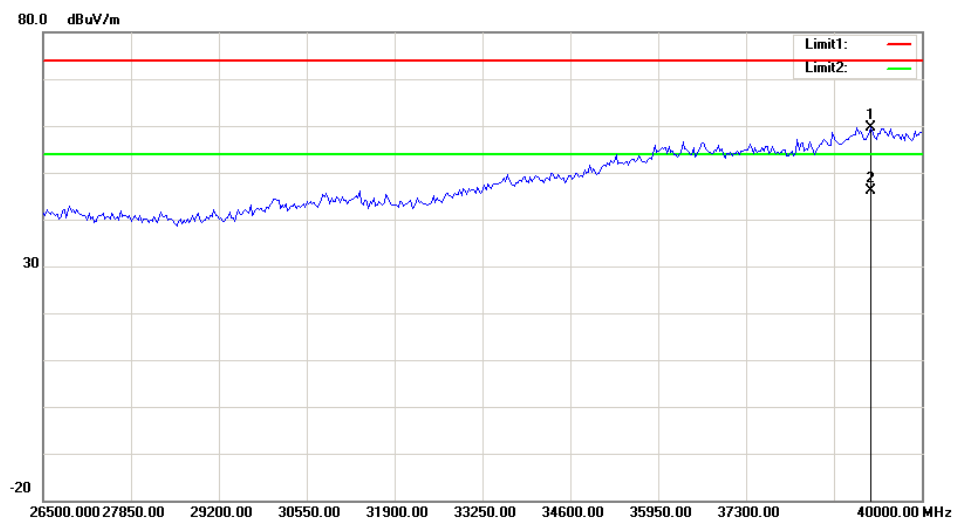
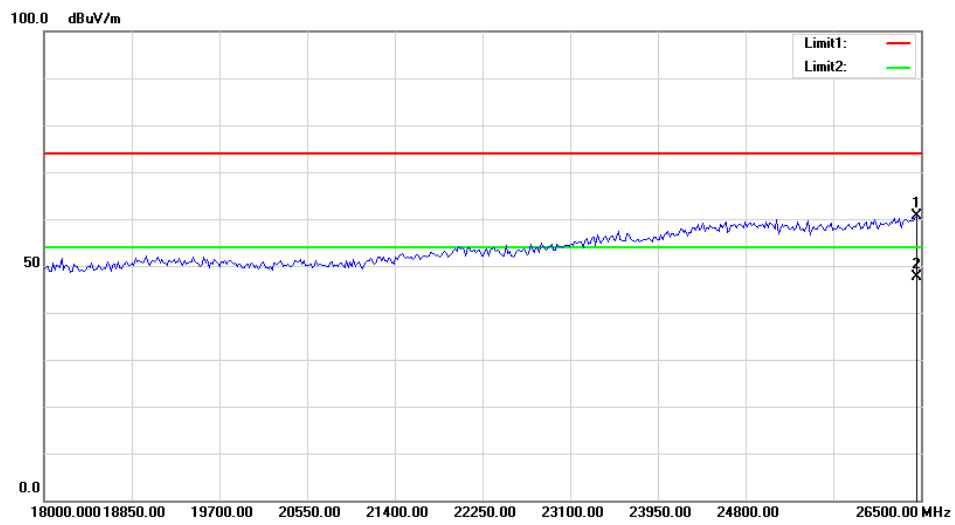




## Vertical

Fundamental  
Test with Band  
Rejection Filter





## FCC §15.407(a)(e) & RSS-247 CLAUSE 6.2, RSS-Gen CLAUSE 6.7– EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

### Applicable Standard

15.407(a) (e), RSS-247 Clause 6.2 and RSS-Gen Clause 6.7

### Test Equipment List and Details

| Manufacturer | Description       | Model       | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------|-------------|---------------|------------------|----------------------|
| R&S          | Spectrum Analyzer | FSU 26      | 200256        | 2019-01-04       | 2020-01-04           |
| Unknown      | Coaxial Cable     | C-SJ00-0010 | C0010/01      | Each time        | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

### Test Data

#### Environmental Conditions

|                           |                |
|---------------------------|----------------|
| <b>Temperature:</b>       | 21.4~25.6°C    |
| <b>Relative Humidity:</b> | 38~73 %        |
| <b>ATM Pressure:</b>      | 100.1~102.1kPa |

The testing was performed by Blake Yang, Elema Lei on 2019-01-08&2019-03-14.

**Test Result:** Pass.

Please refer to the following tables and plots.

Test mode: Transmitting

5150-5250MHz:

| Mode         | Frequency (MHz) | 26 dB Emission Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|--------------|-----------------|--------------------------------|------------------------------|
| 802.11 a     | 5180            | 20.120                         | 17.200                       |
|              | 5200            | 20.120                         | 17.200                       |
|              | 5240            | 20.040                         | 17.200                       |
| 802.11n ht20 | 5180            | 20.281                         | 18.000                       |
|              | 5200            | 20.281                         | 18.080                       |
|              | 5240            | 20.281                         | 18.080                       |
| 802.11n ht40 | 5190            | 39.760                         | 36.480                       |
|              | 5230            | 39.760                         | 36.480                       |

**5250-5350MHz:**

| Mode         | Frequency (MHz) | 26 dB Emission Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|--------------|-----------------|--------------------------------|------------------------------|
| 802.11 a     | 5260            | 25.090                         | 17.200                       |
|              | 5280            | 24.369                         | 17.120                       |
|              | 5320            | 23.246                         | 17.120                       |
| 802.11n ht20 | 5260            | 25.010                         | 17.920                       |
|              | 5280            | 25.010                         | 18.000                       |
|              | 5320            | 27.735                         | 18.080                       |
| 802.11n ht40 | 5270            | 46.653                         | 36.480                       |
|              | 5310            | 41.363                         | 36.640                       |

**5470-5725MHz:**

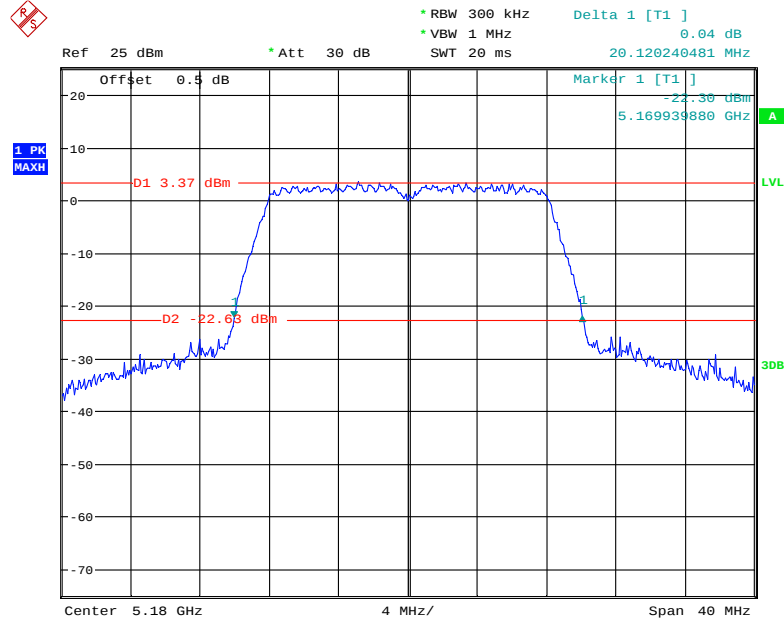
| Mode         | Frequency (MHz) | 26 dB Emission Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|--------------|-----------------|--------------------------------|------------------------------|
| 802.11 a     | 5500            | 20.762                         | 17.040                       |
|              | 5580            | 25.731                         | 17.200                       |
|              | 5700            | 30.862                         | 17.760                       |
|              | 5720            | 30.533                         | 17.600                       |
| 802.11n ht20 | 5500            | 20.120                         | 17.920                       |
|              | 5580            | 24.289                         | 18.000                       |
|              | 5700            | 31.743                         | 18.960                       |
|              | 5720            | 32.867                         | 18.600                       |
| 802.11n ht40 | 5510            | 40.401                         | 36.480                       |
|              | 5550            | 40.240                         | 36.480                       |
|              | 5670            | 57.395                         | 36.640                       |
|              | 5710            | 61.067                         | 36.667                       |

**5725-5850MHz:**

| Mode         | Frequency (MHz) | 6 dB Emission Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|--------------|-----------------|-------------------------------|------------------------------|
| 802.11 a     | 5745            | 15.311                        | 17.040                       |
|              | 5785            | 15.150                        | 16.880                       |
|              | 5825            | 15.551                        | 16.960                       |
| 802.11n ht20 | 5745            | 15.471                        | 17.840                       |
|              | 5785            | 15.230                        | 17.840                       |
|              | 5825            | 15.872                        | 17.840                       |
| 802.11n ht40 | 5755            | 36.072                        | 36.640                       |
|              | 5795            | 35.912                        | 36.640                       |

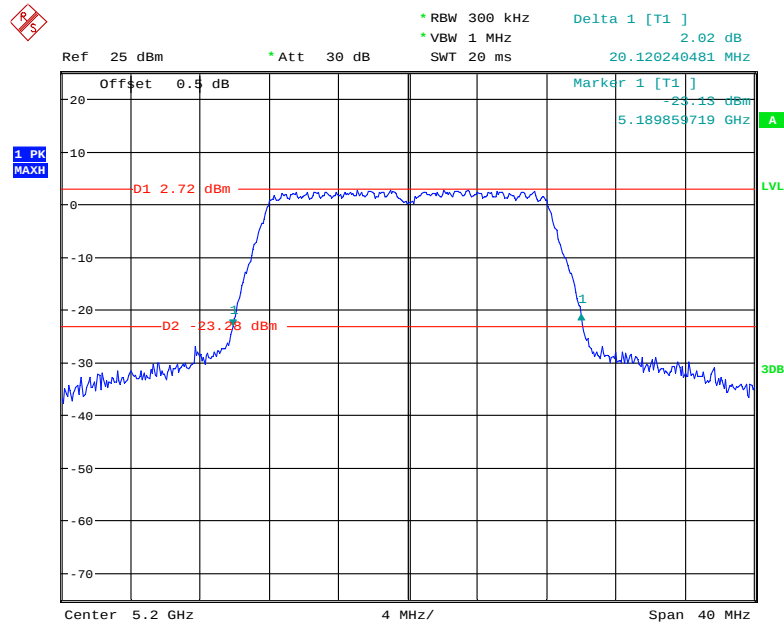
**5150-5250MHz:  
26dB Emission Bandwidth:**

### 802.11a Low Channel



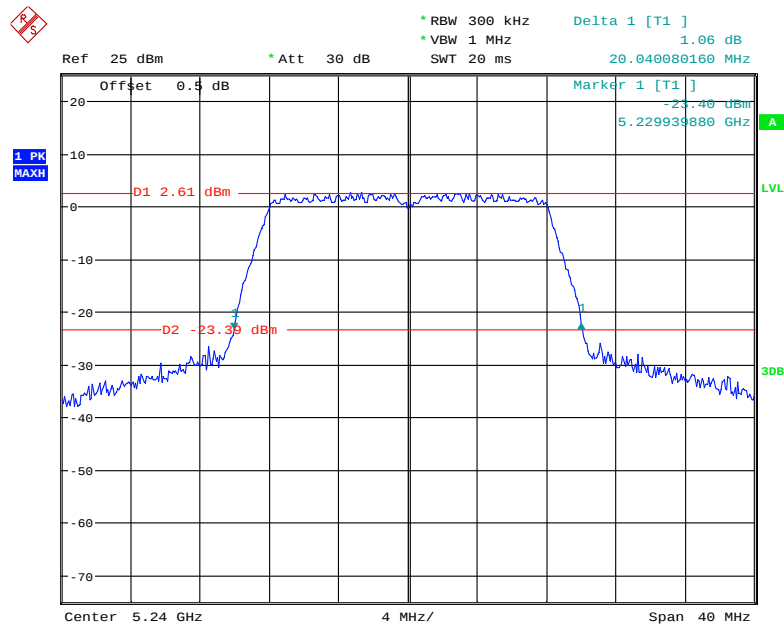
Date: 8.JAN.2019 18:12:44

### 802.11a Middle Channel



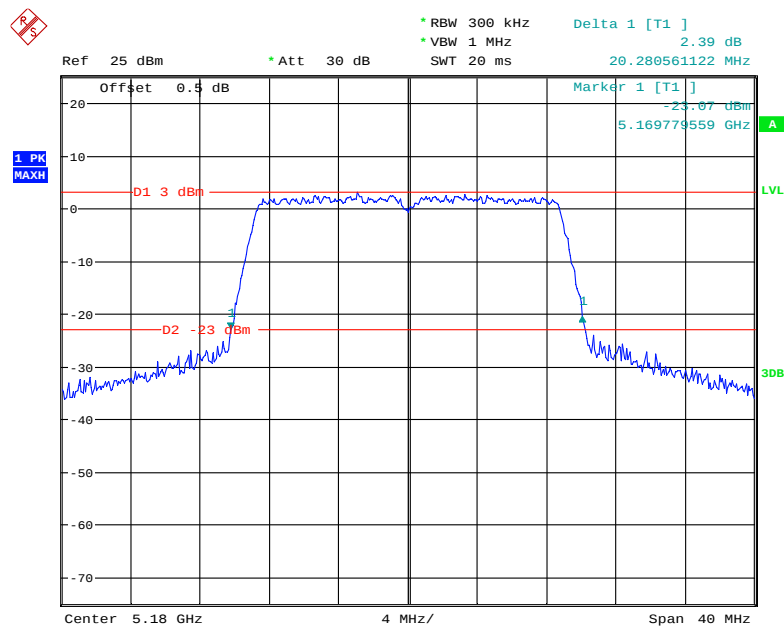
Date: 8.JAN.2019 18:17:55

## 802.11a High Channel



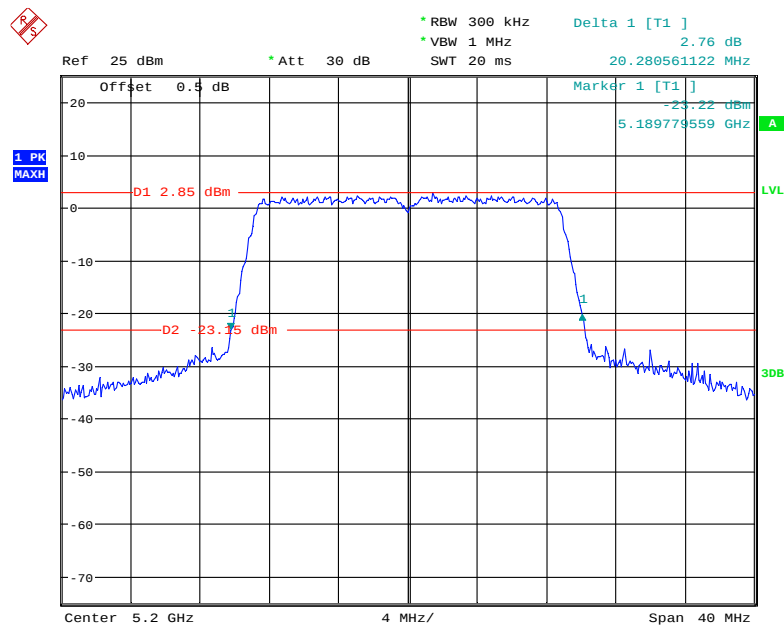
Date: 8.JAN.2019 18:15:19

## 802.11n ht20 Low Channel



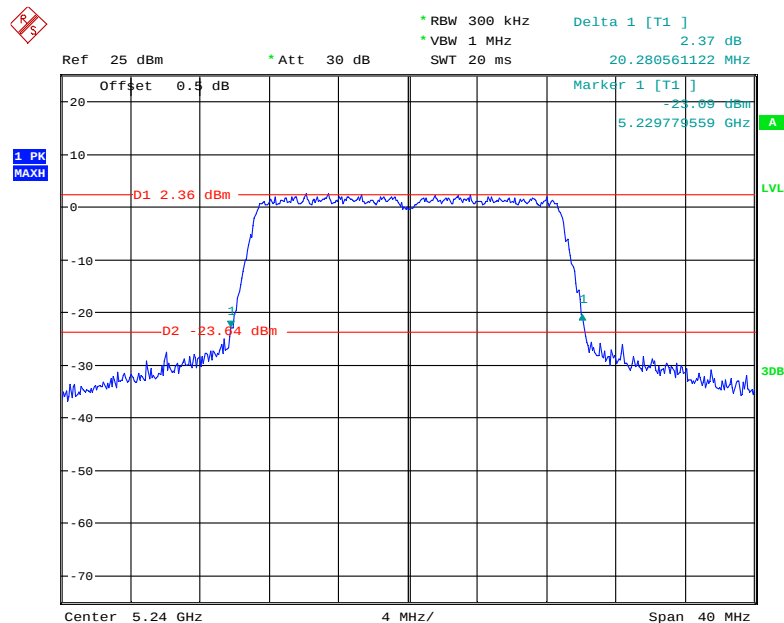
Date: 8.JAN.2019 18:26:09

## 802.11n ht20 Middle Channel



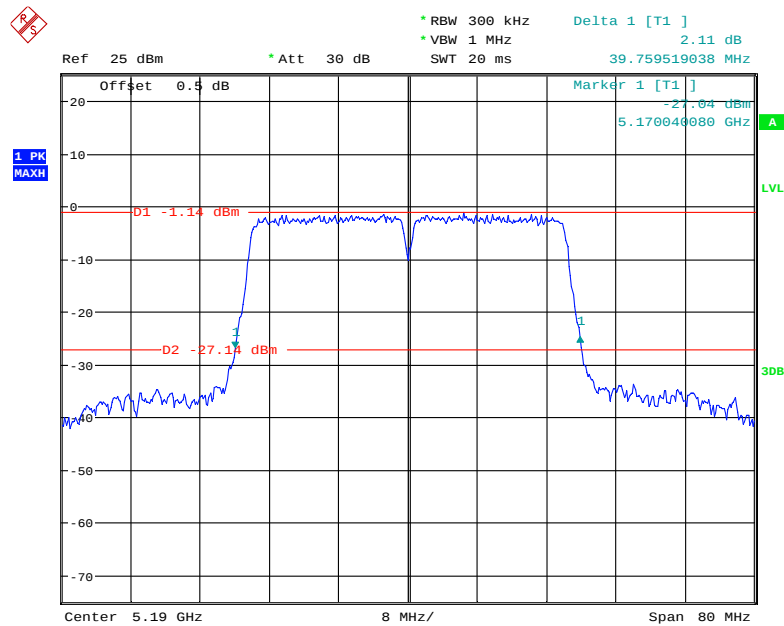
Date: 8.JAN.2019 18:23:46

## 802.11n ht20 High Channel



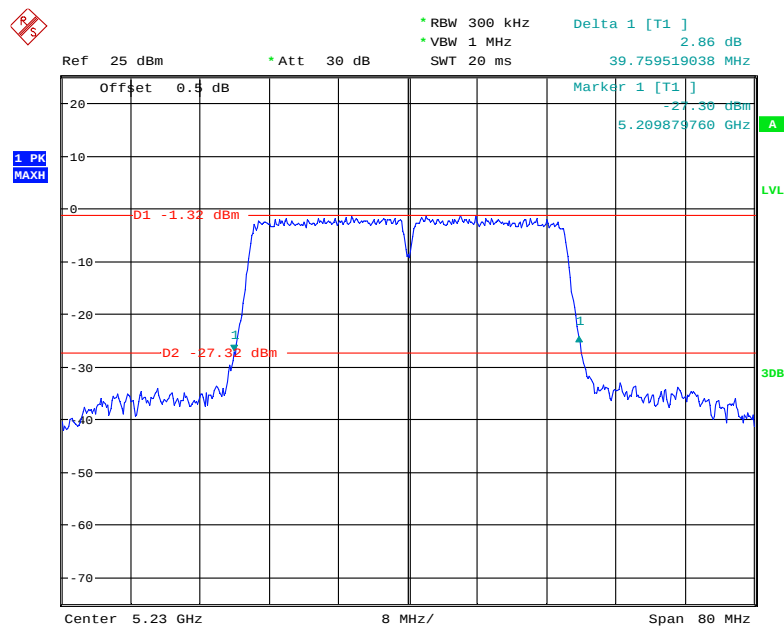
Date: 8.JAN.2019 18:28:55

## 802.11n ht40 Low Channel



Date: 8.JAN.2019 18:36:09

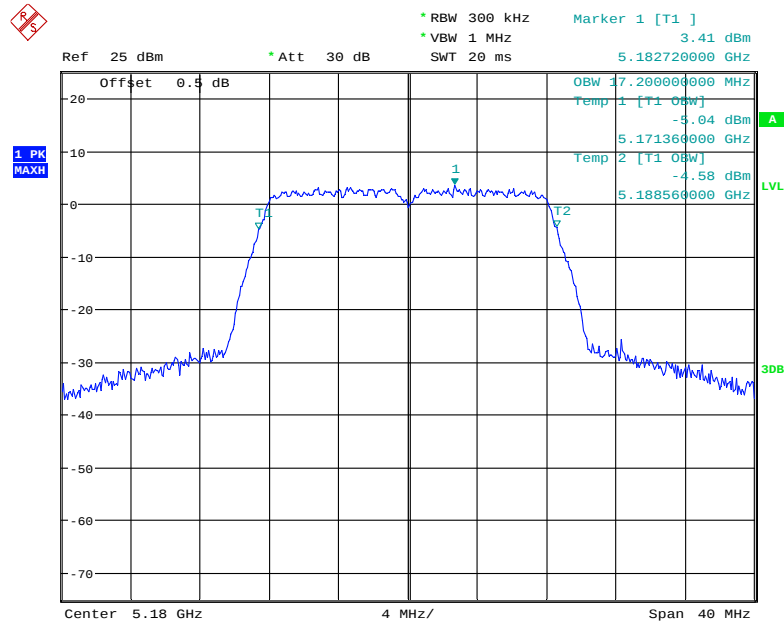
## 802.11n ht40 High Channel



Date: 8.JAN.2019 18:32:01

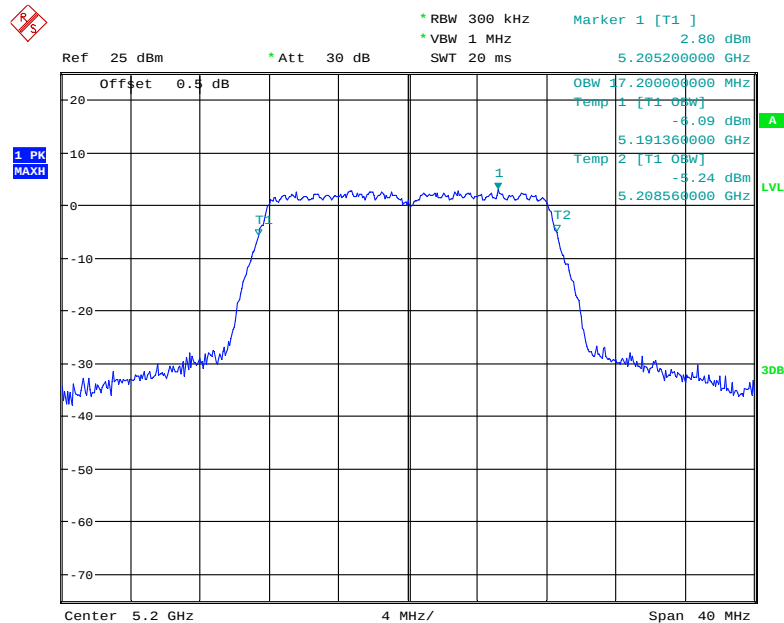
**99% Occupied Bandwidth:  
5150-5250MHz:**

### 802.11a Low Channel



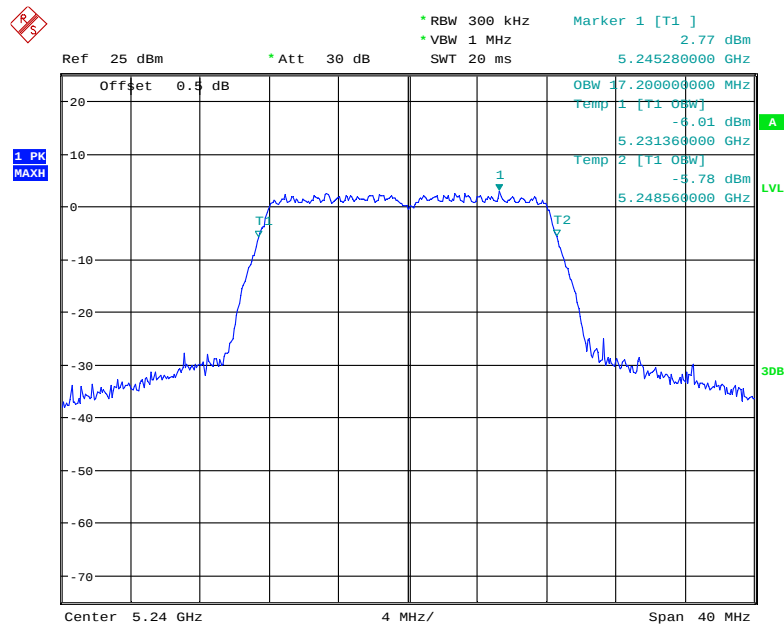
Date: 8.JAN.2019 18:13:14

### 802.11a Middle Channel



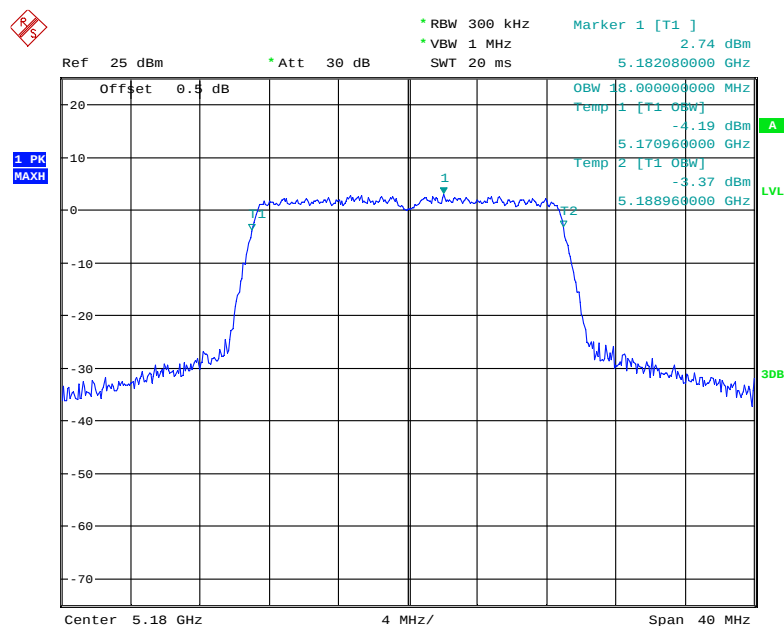
Date: 8.JAN.2019 18:18:24

## 802.11a High Channel



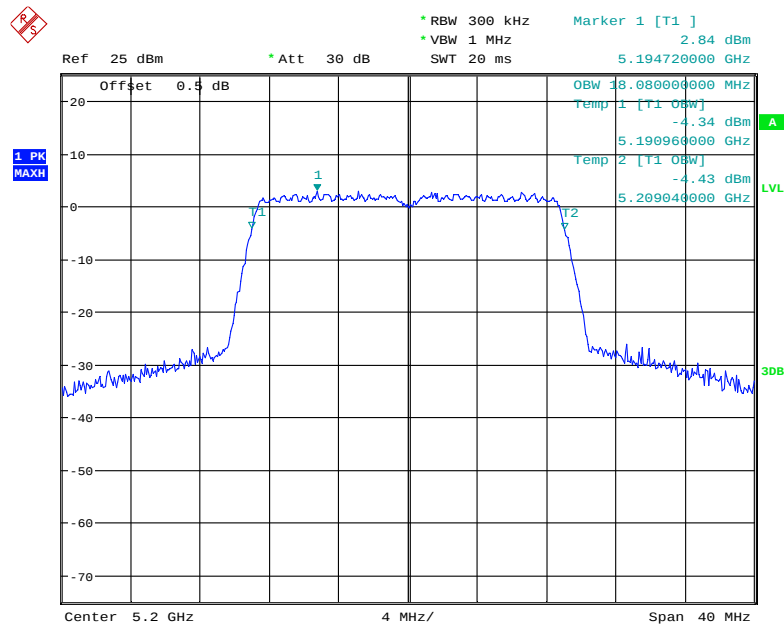
Date: 8.JAN.2019 18:15:52

## 802.11n ht20 Low Channel



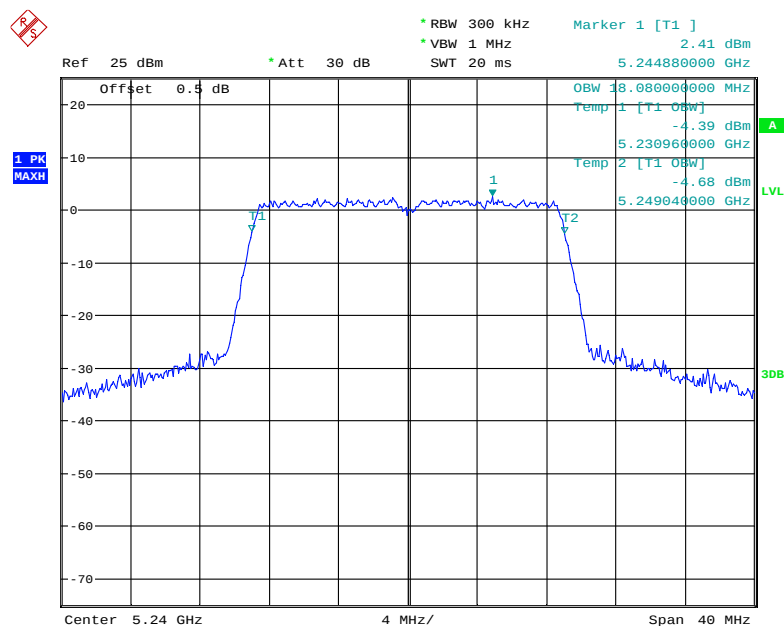
Date: 8.JAN.2019 18:26:39

## 802.11n ht20 Middle Channel



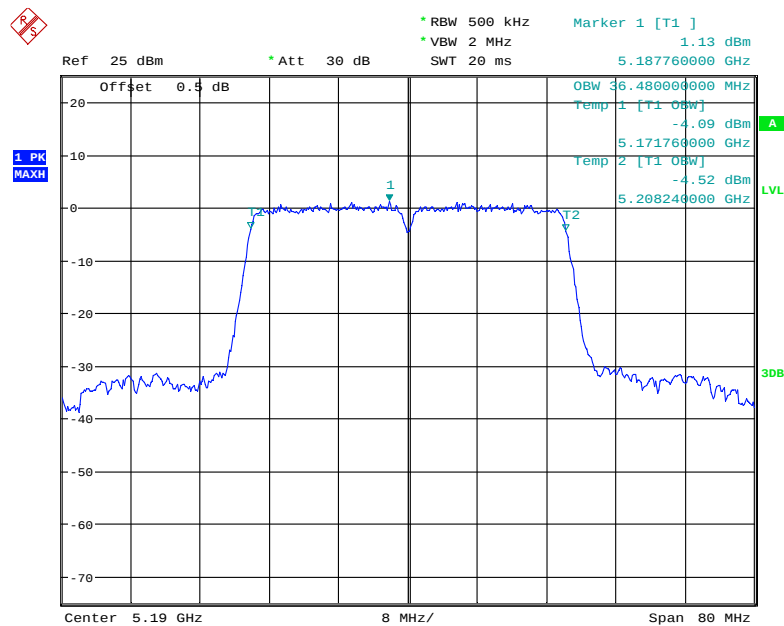
Date: 8.JAN.2019 18:24:26

## 802.11n ht20 High Channel



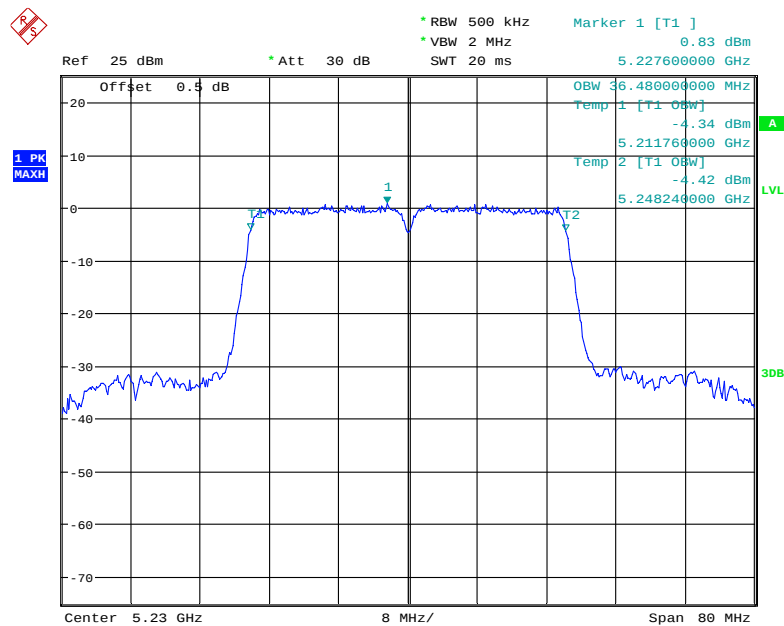
Date: 8.JAN.2019 18:29:28

## 802.11n ht40 Low Channel



Date: 8.JAN.2019 18:36:32

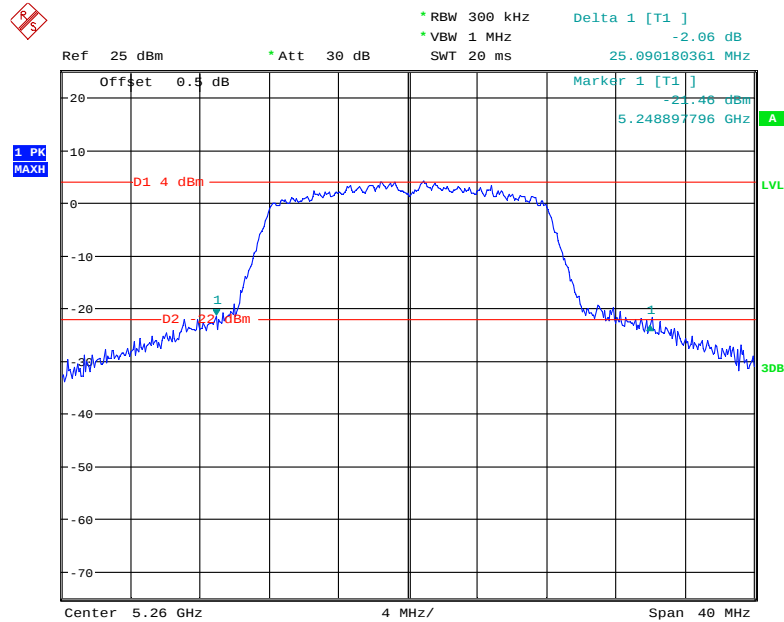
## 802.11n ht40 High Channel



Date: 8.JAN.2019 18:32:23

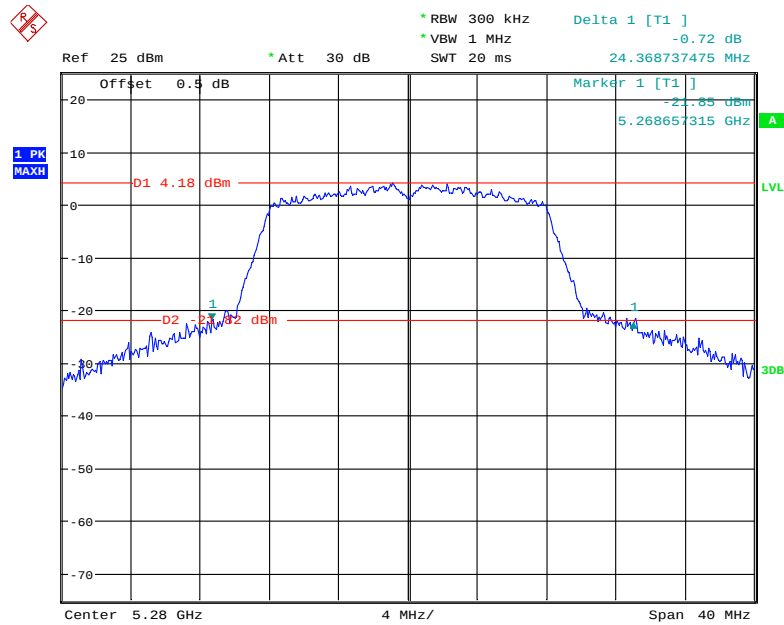
5250-5350MHz:  
26dB Emission Bandwidth:

### 802.11a Low Channel



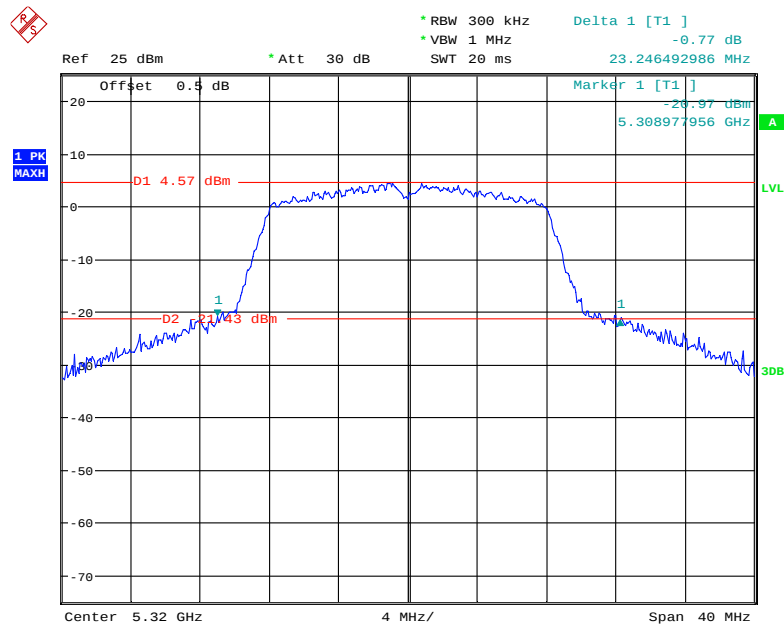
Date: 16.MAR.2019 09:34:45

### 802.11a Middle Channel



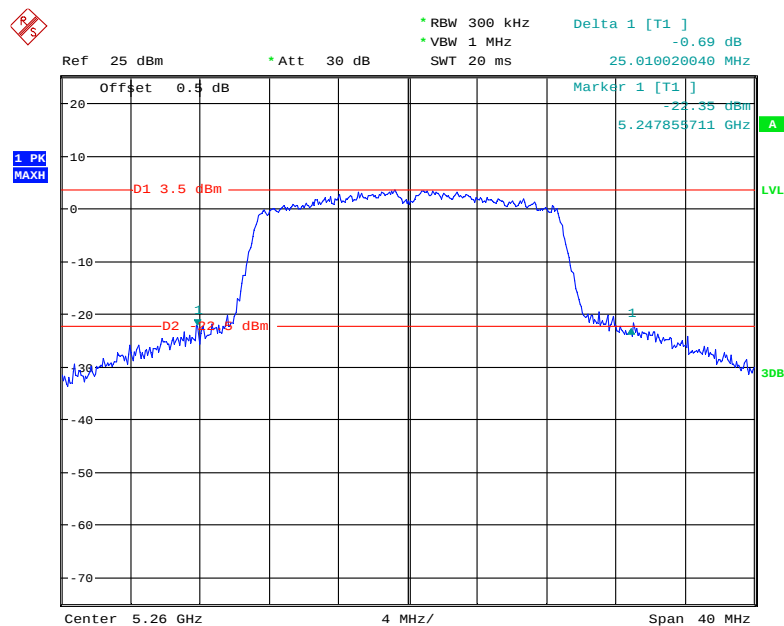
Date: 14.MAR.2019 11:23:02

## 802.11a High Channel



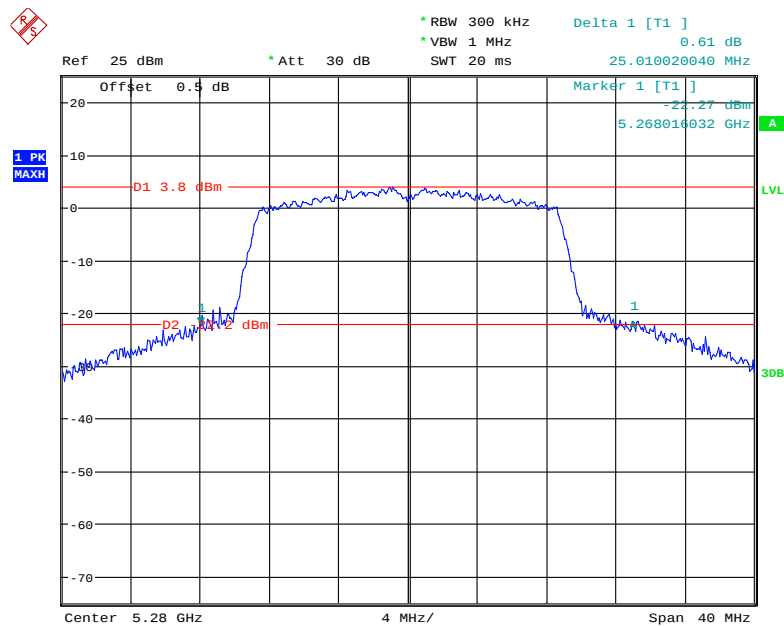
Date: 14.MAR.2019 11:32:08

## 802.11n ht20 Low Channel



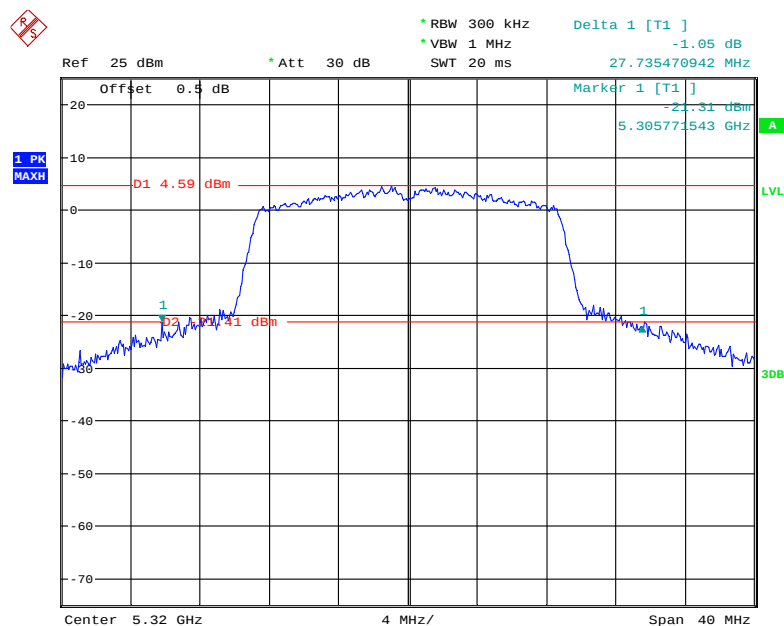
Date: 14.MAR.2019 11:37:43

## 802.11n ht20 Middle Channel



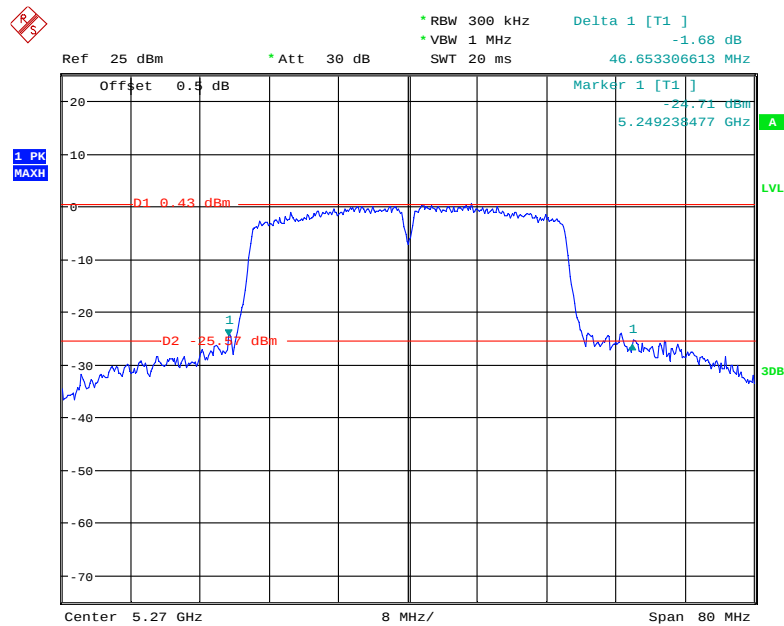
Date: 14.MAR.2019 11:40:12

## 802.11n ht20 High Channel



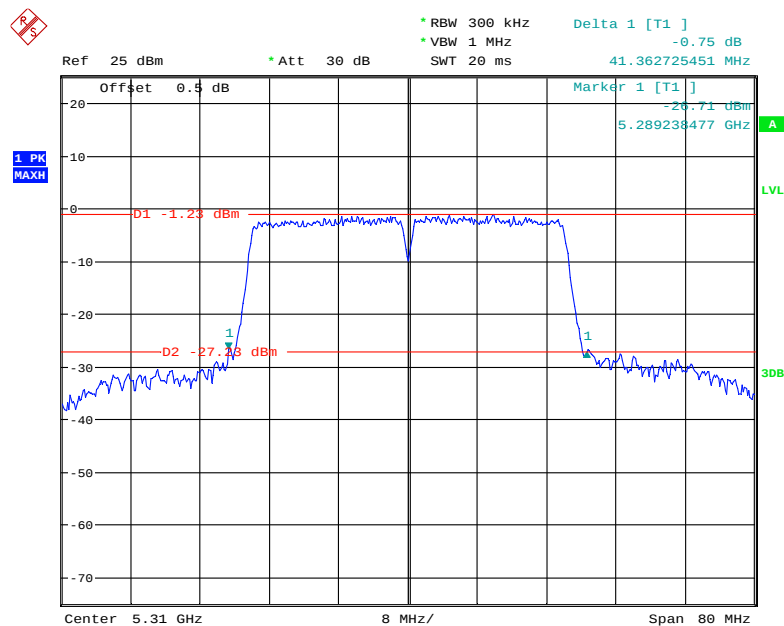
Date: 14.MAR.2019 11:43:10

## 802.11n ht40 Low Channel



Date: 14.MAR.2019 11:47:30

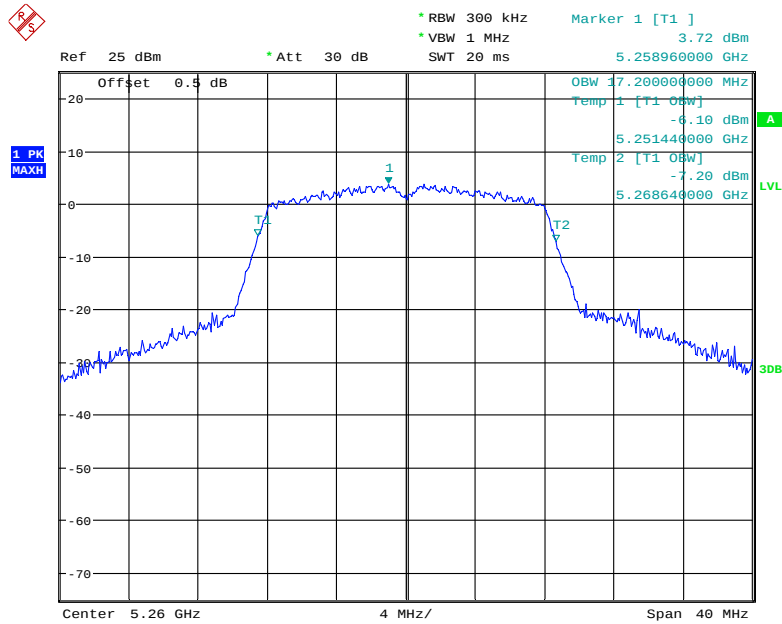
## 802.11n ht40 High Channel



Date: 14.MAR.2019 11:49:30

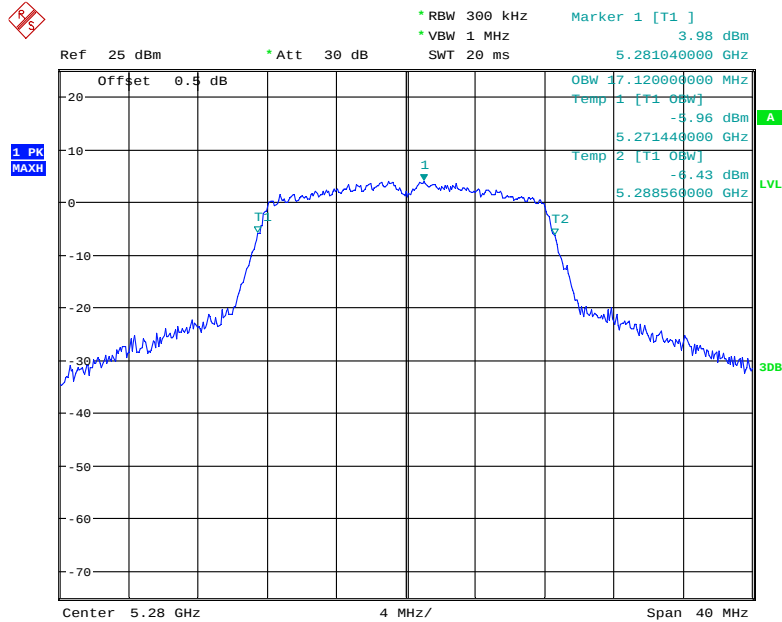
99% Occupied Bandwidth:

802.11a Low Channel



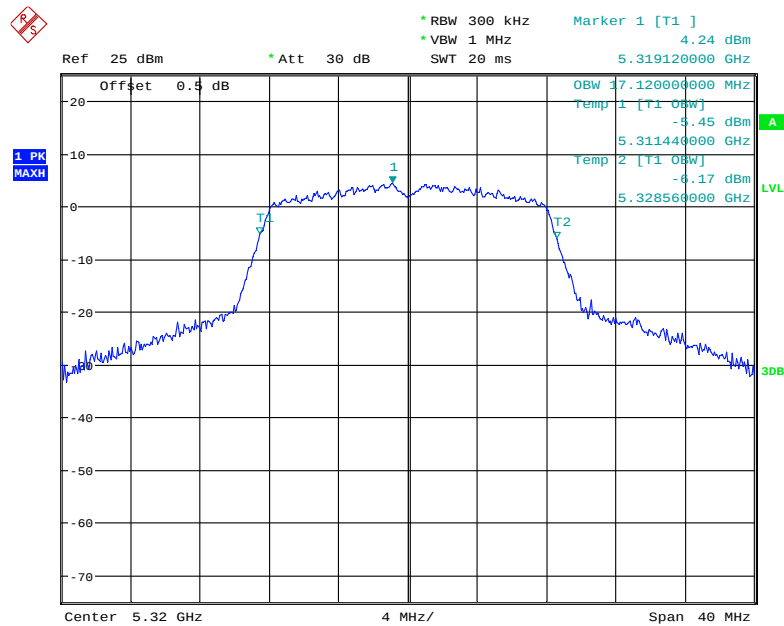
Date: 16.MAR.2019 09:35:43

802.11a Middle Channel



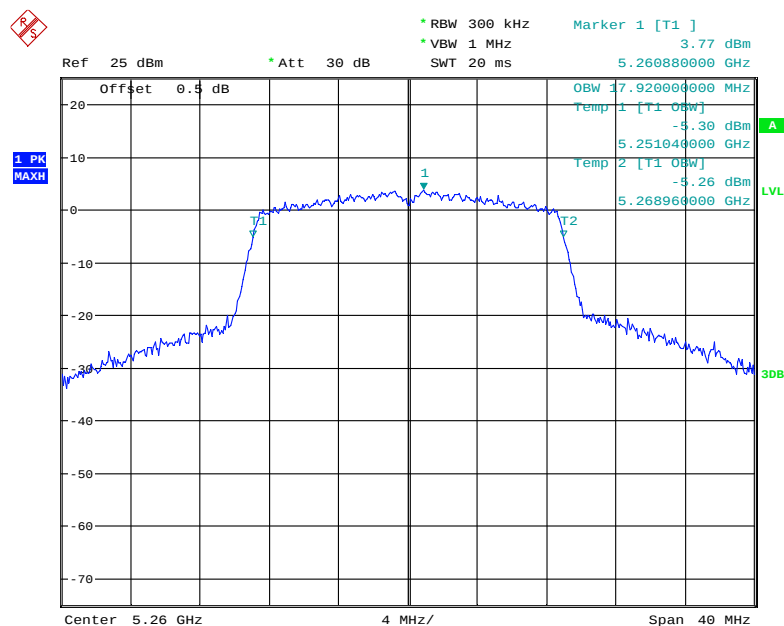
Date: 14.MAR.2019 11:24:13

## 802.11a High Channel



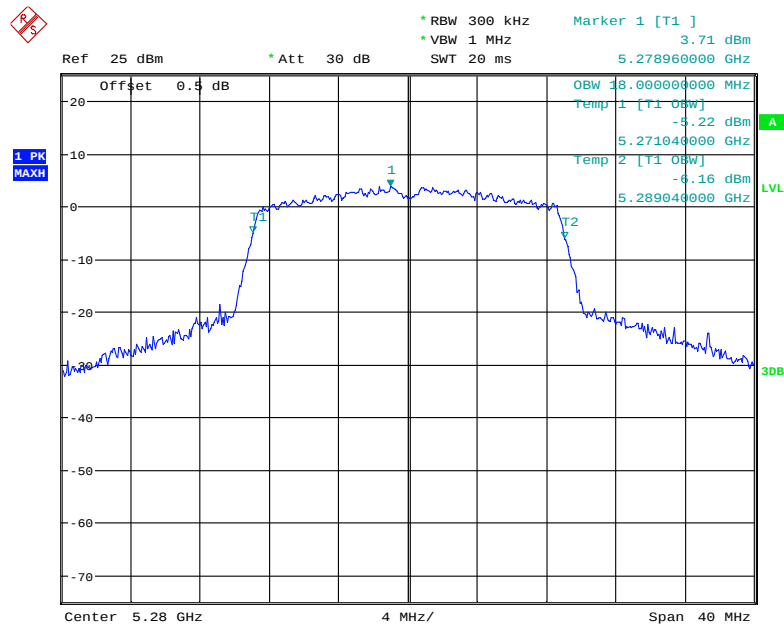
Date: 14.MAR.2019 11:33:20

## 802.11n ht20 Low Channel



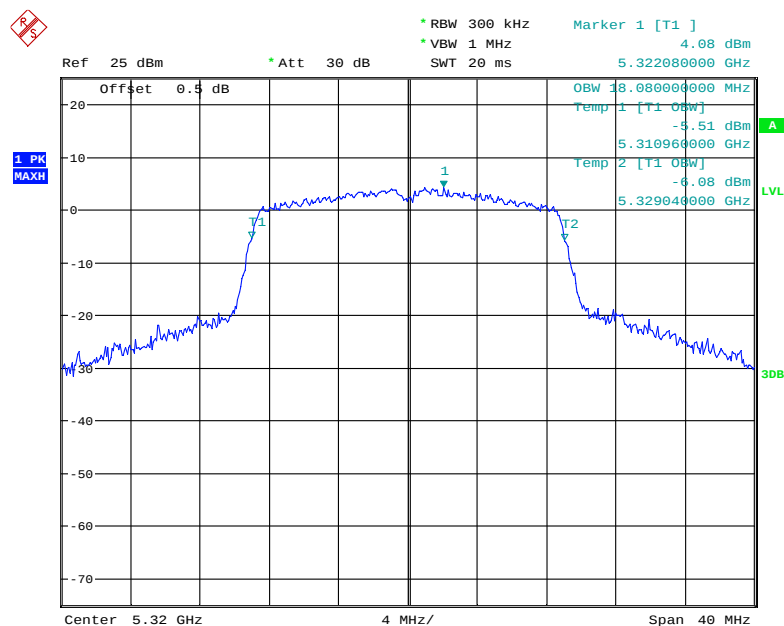
Date: 14.MAR.2019 11:38:42

## 802.11n ht20 Middle Channel



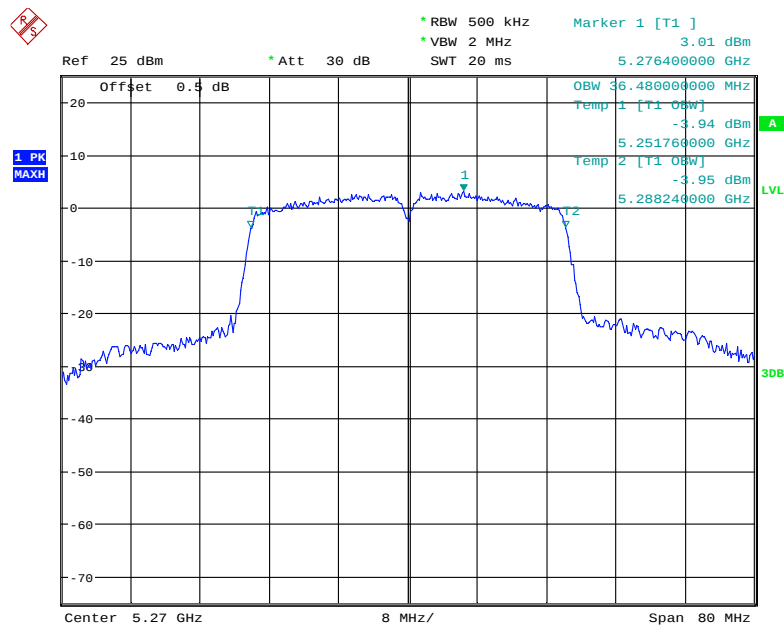
Date: 14.MAR.2019 11:41:14

## 802.11n ht20 High Channel



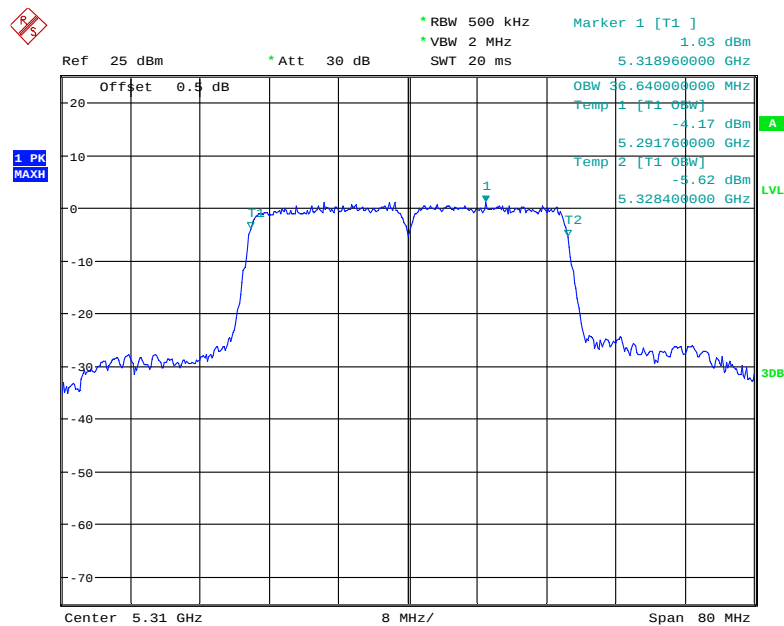
Date: 14.MAR.2019 11:44:08

## 802.11n ht40 Low Channel



Date: 14.MAR.2019 11:48:22

## 802.11n ht40 High Channel

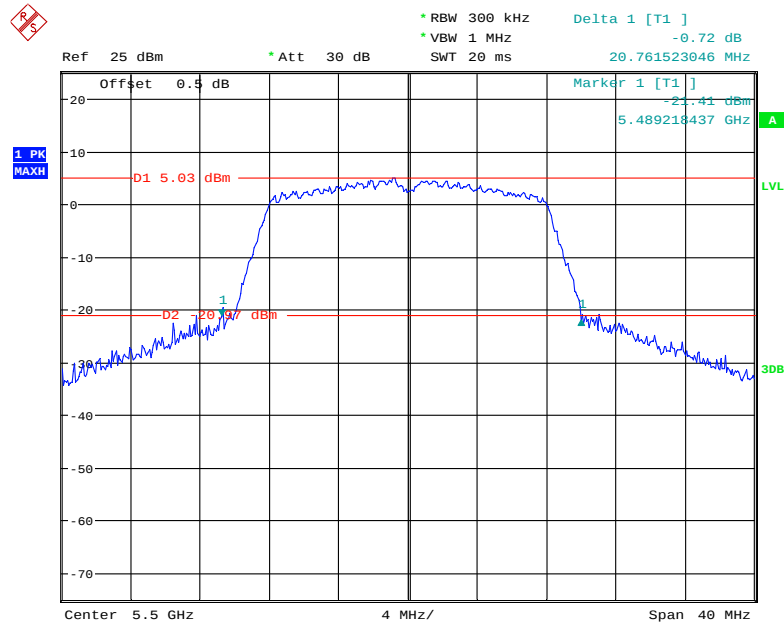


Date: 14.MAR.2019 11:50:14

5470-5725MHz:

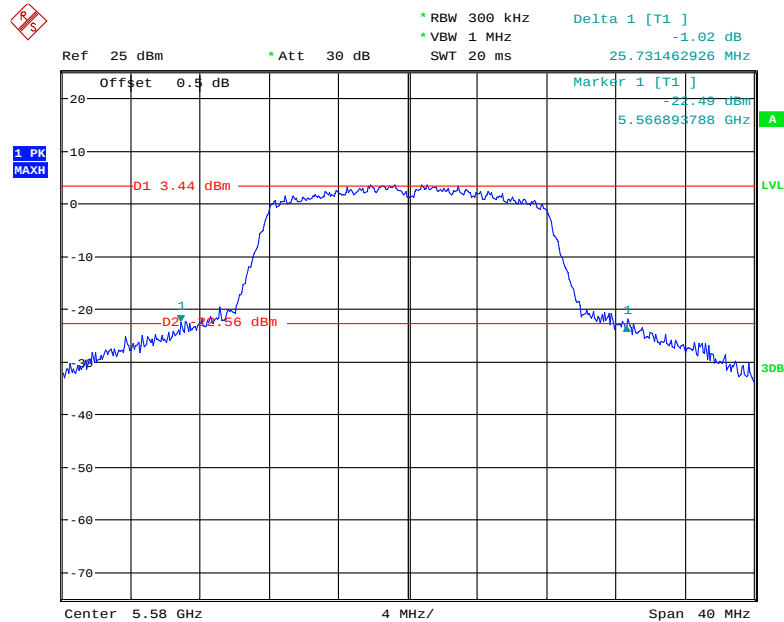
26dB Emission Bandwidth:

### 802.11a Low Channel



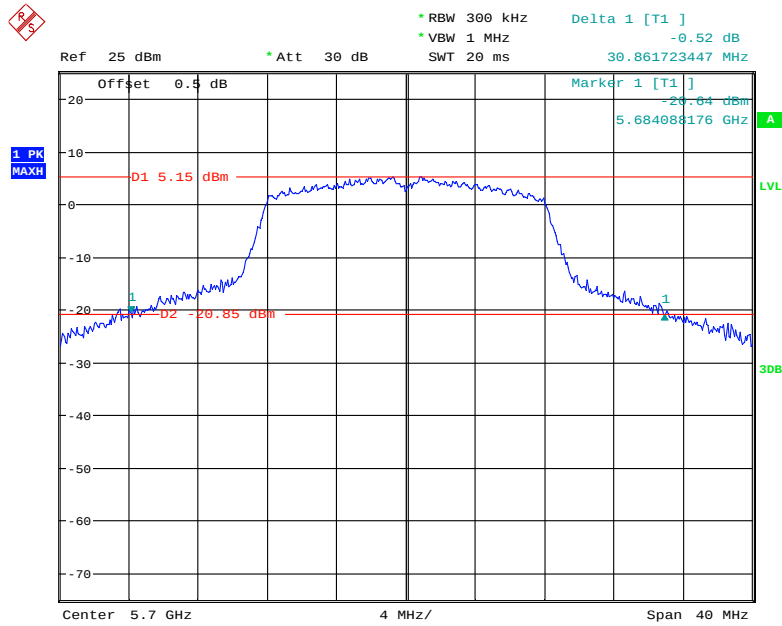
Date: 14.MAR.2019 11:56:59

### 802.11a Middle Channel



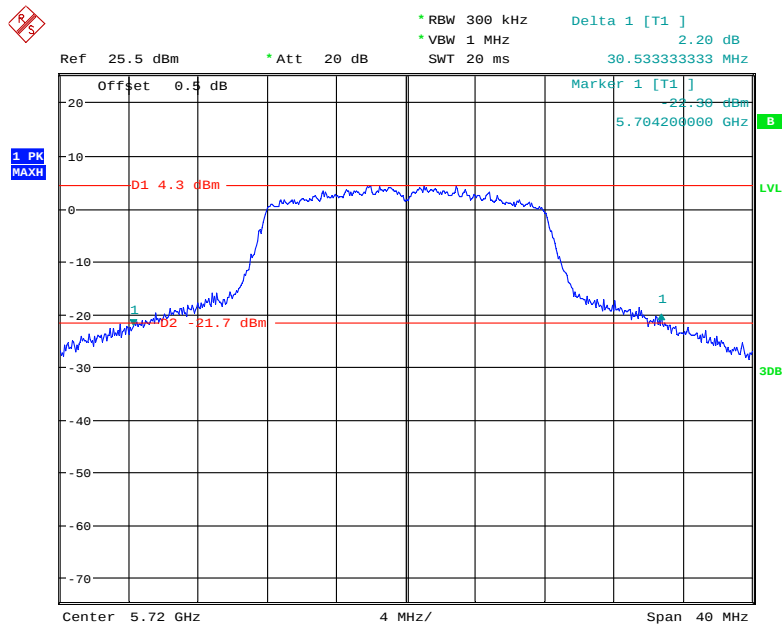
Date: 14.MAR.2019 16:25:53

### 802.11a High Channel



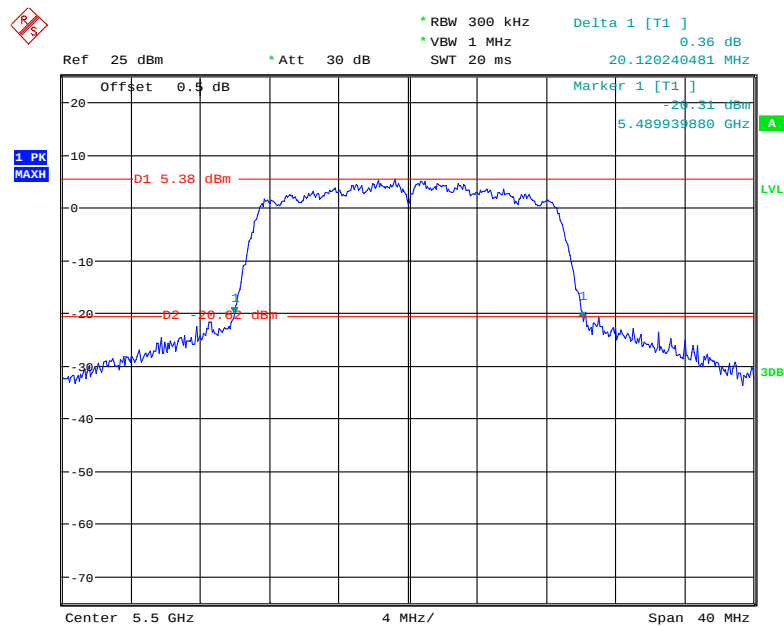
Date: 16.MAR.2019 09:38:14

### 802.11a 5720 Channel



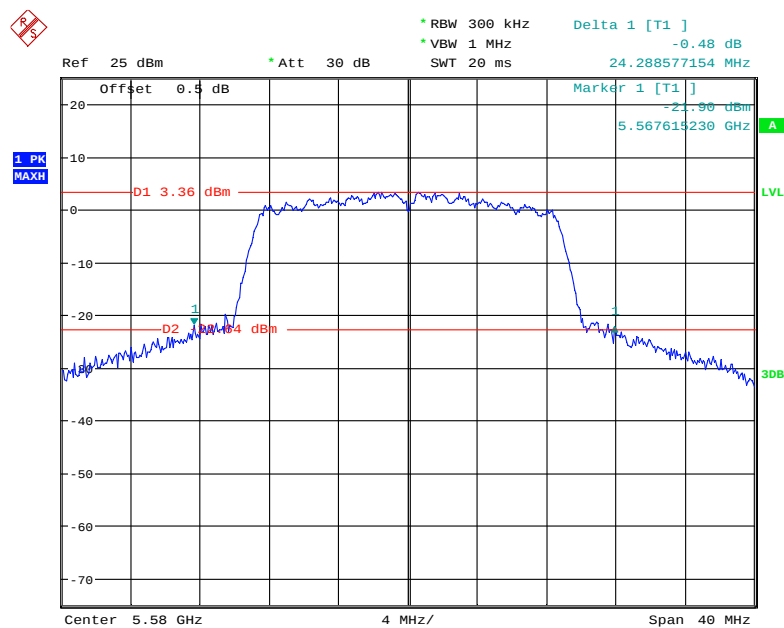
Date: 16.MAR.2019 09:54:12

## 802.11n ht20 Low Channel



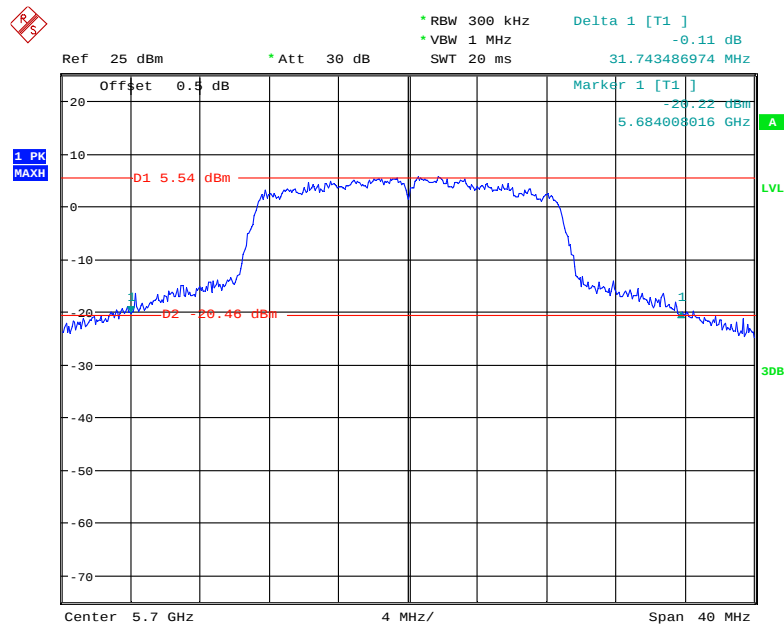
Date: 14.MAR.2019 16:33:21

## 802.11n ht20 Middle Channel



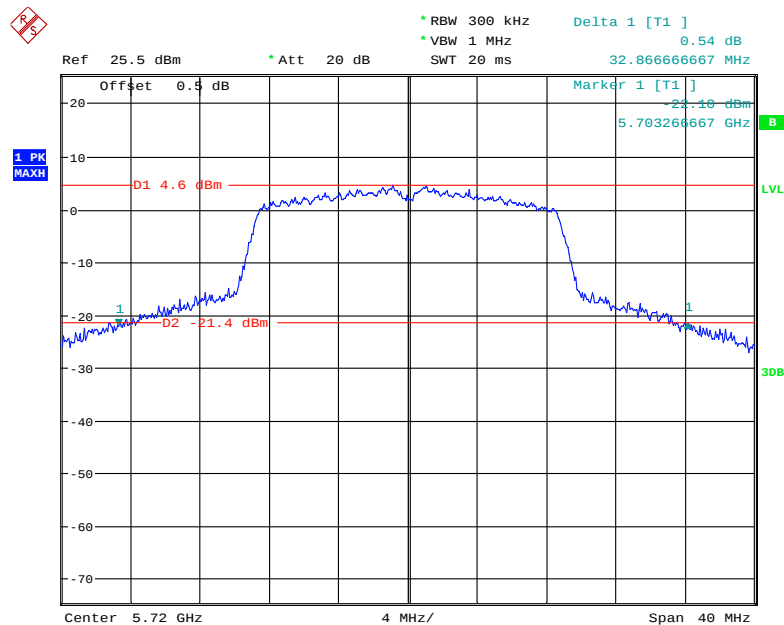
Date: 14.MAR.2019 16:35:56

## 802.11n ht20 High Channel



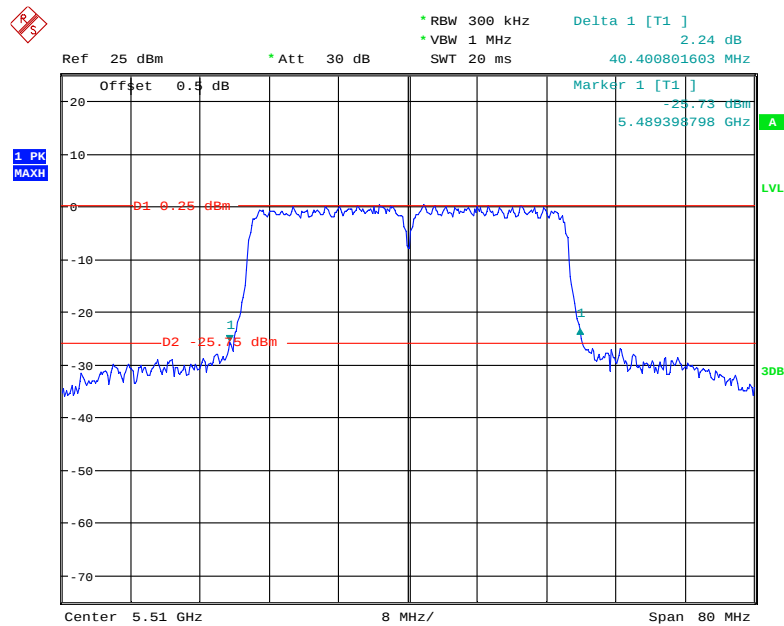
Date: 14.MAR.2019 16:38:41

## 802.11n ht20 5720 Channel



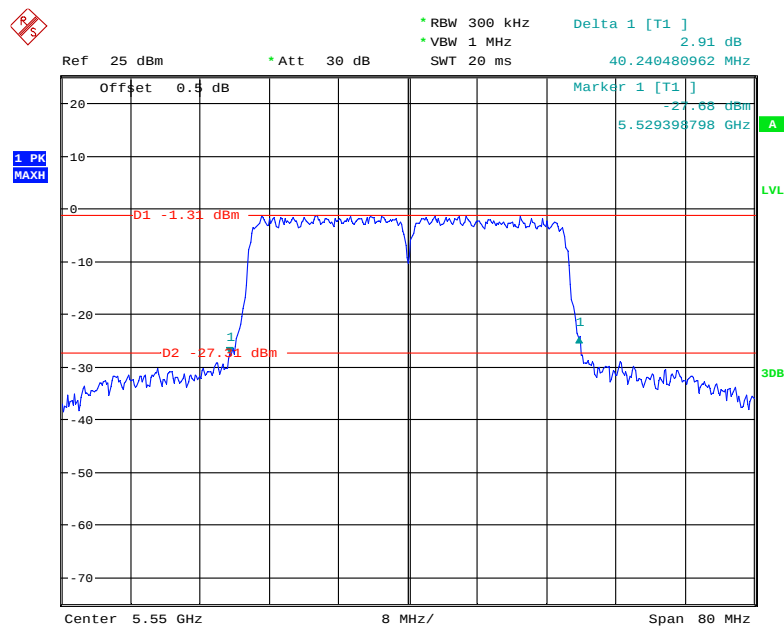
Date: 16.MAR.2019 09:53:10

## 802.11n ht40 Low Channel



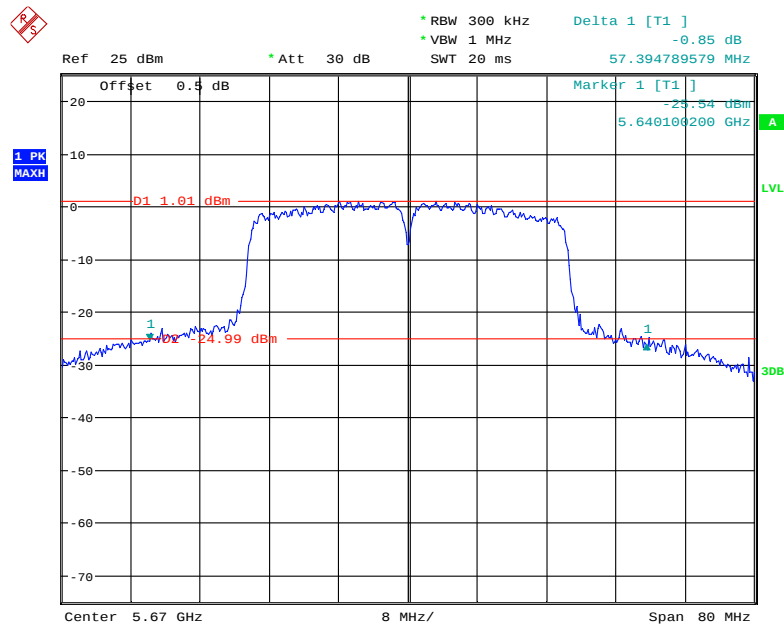
Date: 14.MAR.2019 16:41:33

## 802.11n ht40 Middle Channel



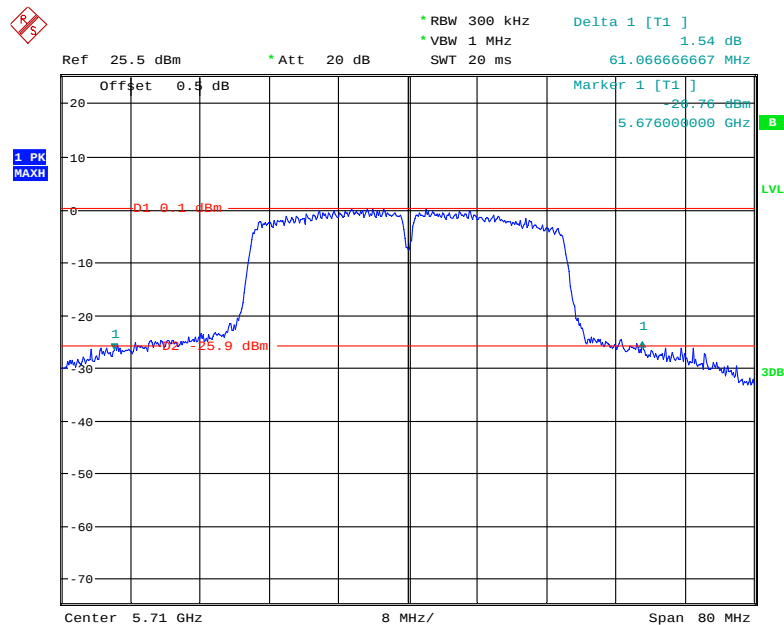
Date: 14.MAR.2019 16:43:32

## 802.11n ht40 High Channel



Date: 14.MAR.2019 16:45:43

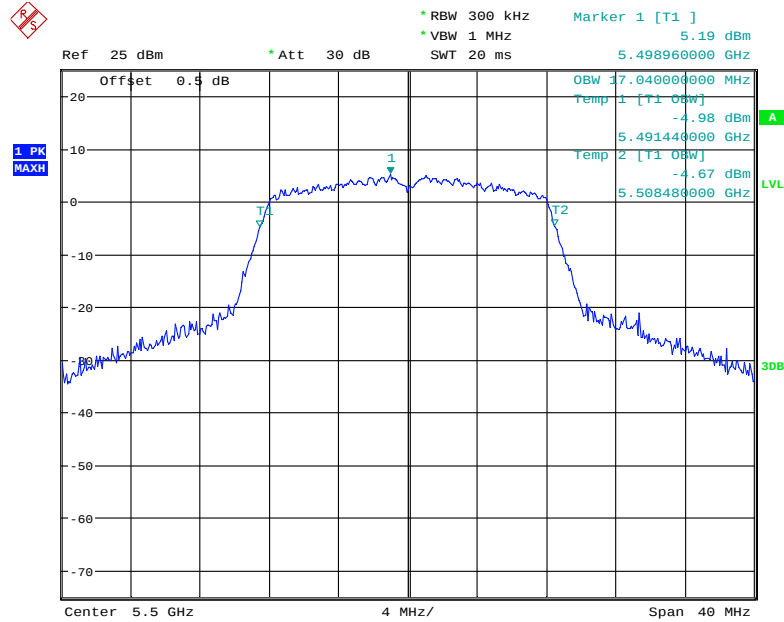
## 802.11n ht40 5710 Channel



Date: 16.MAR.2019 09:48:19

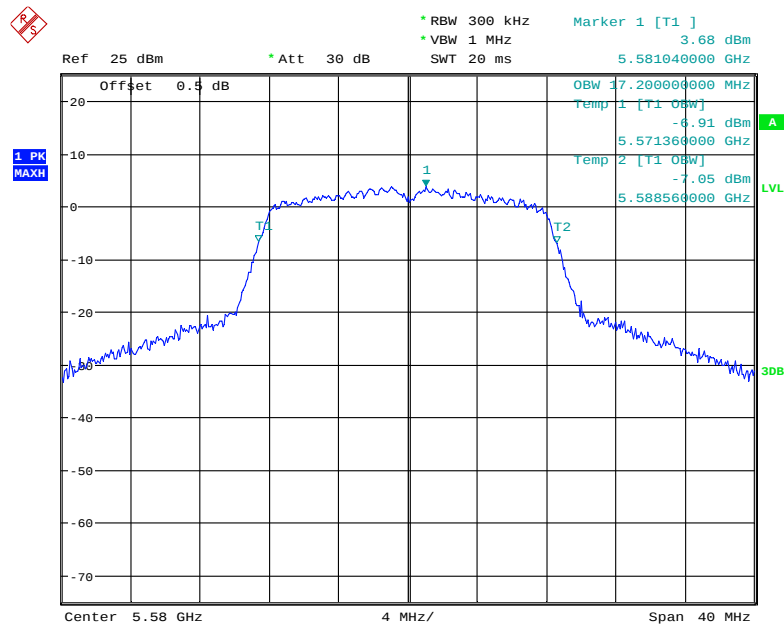
**99% Occupied Bandwidth:  
5470-5725MHz:**

### 802.11a Low Channel



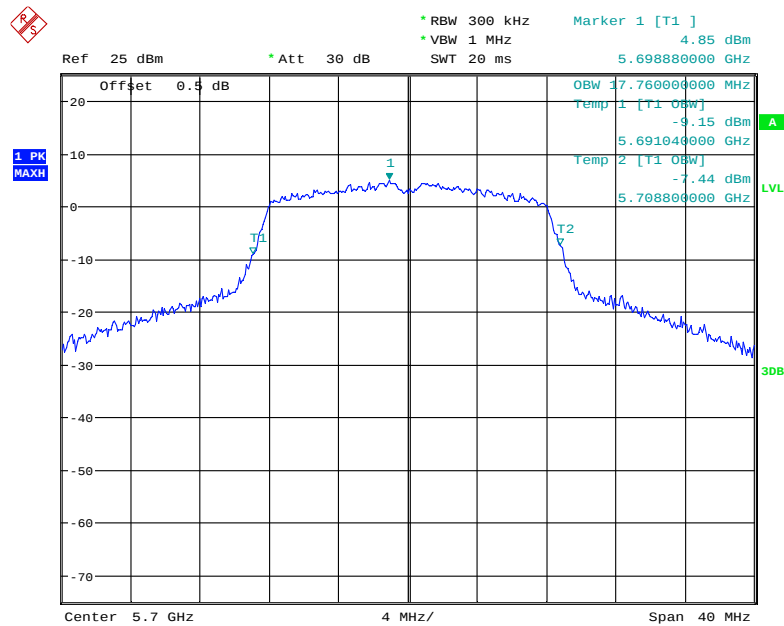
Date: 14.MAR.2019 11:58:05

### 802.11a Middle Channel



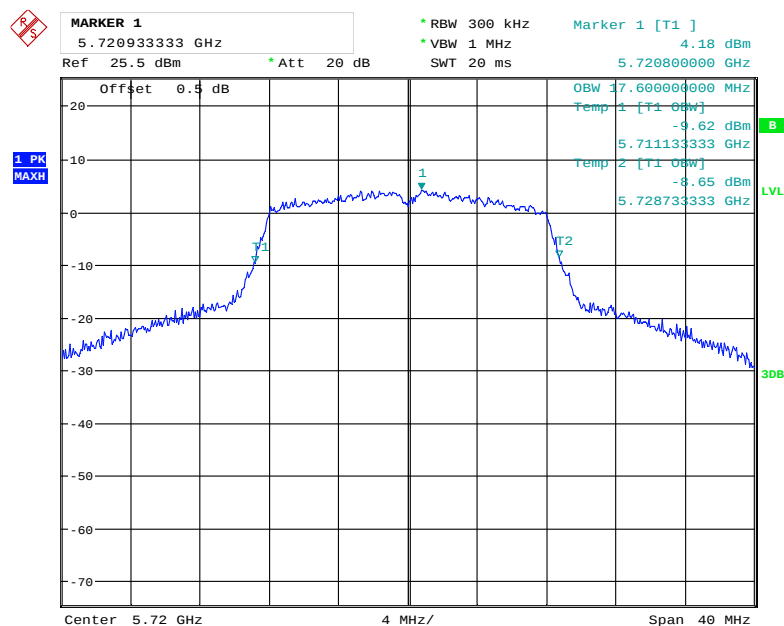
Date: 14.MAR.2019 16:27:03

### 802.11a High Channel



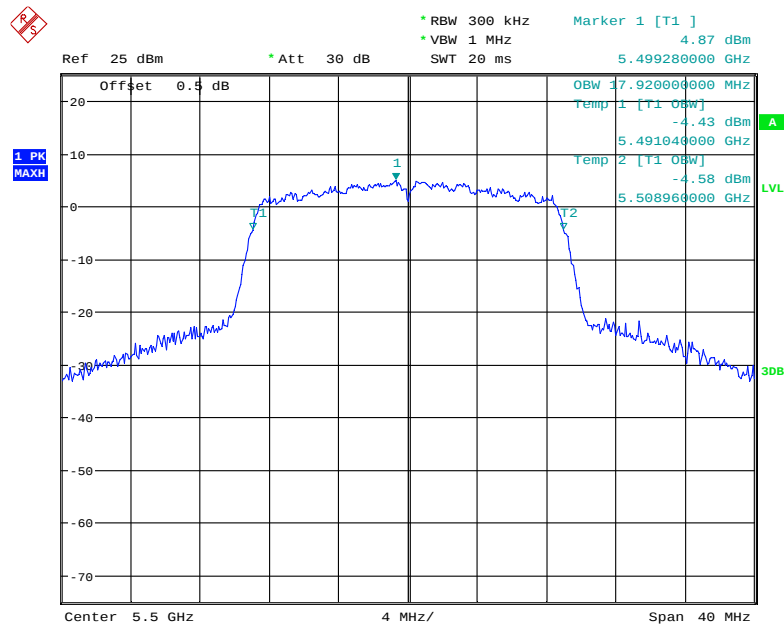
Date: 16.MAR.2019 09:39:09

### 802.11a 5720MHz



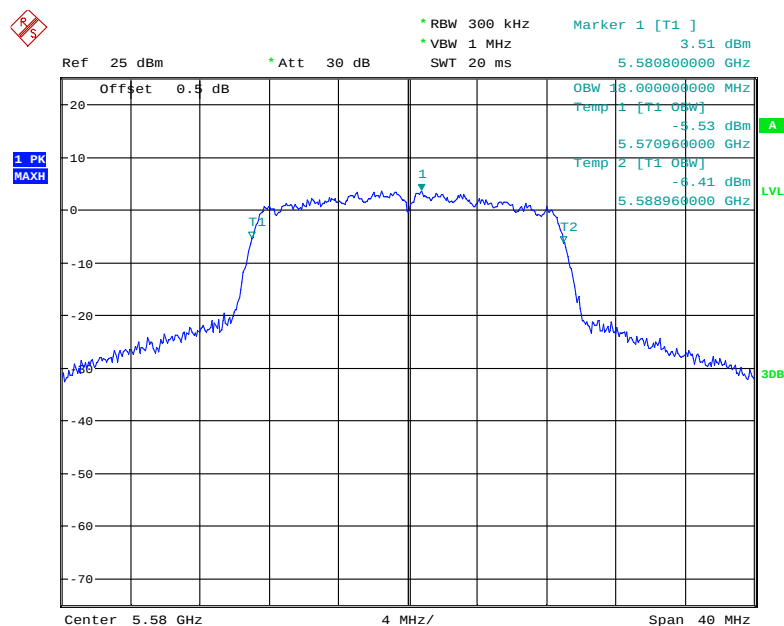
Date: 16.MAR.2019 09:43:51

## 802.11n ht20 Low Channel



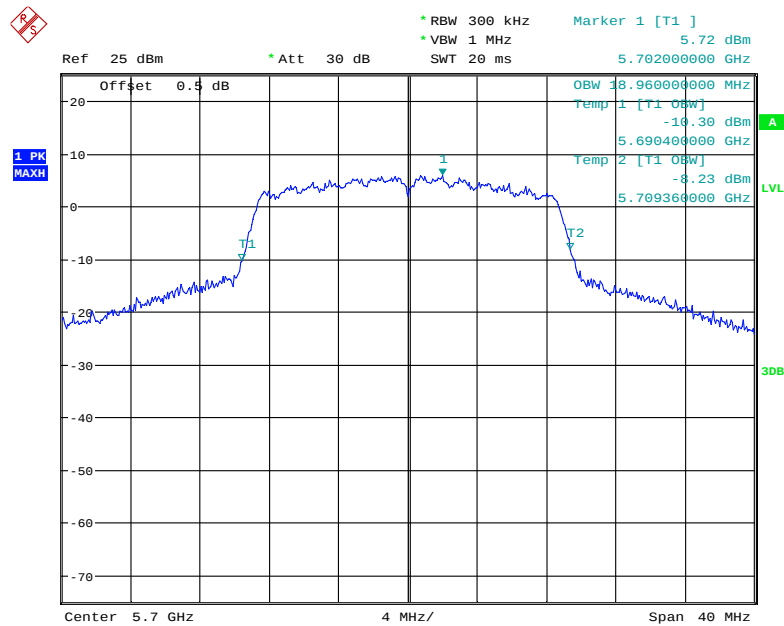
Date: 14.MAR.2019 16:34:26

## 802.11n ht20 Middle Channel



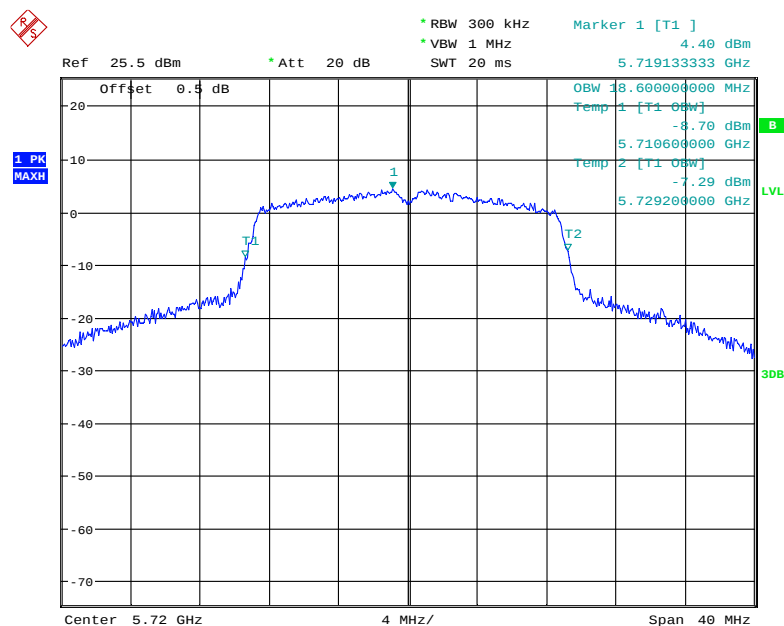
Date: 14.MAR.2019 16:37:12

## 802.11n ht20 High Channel



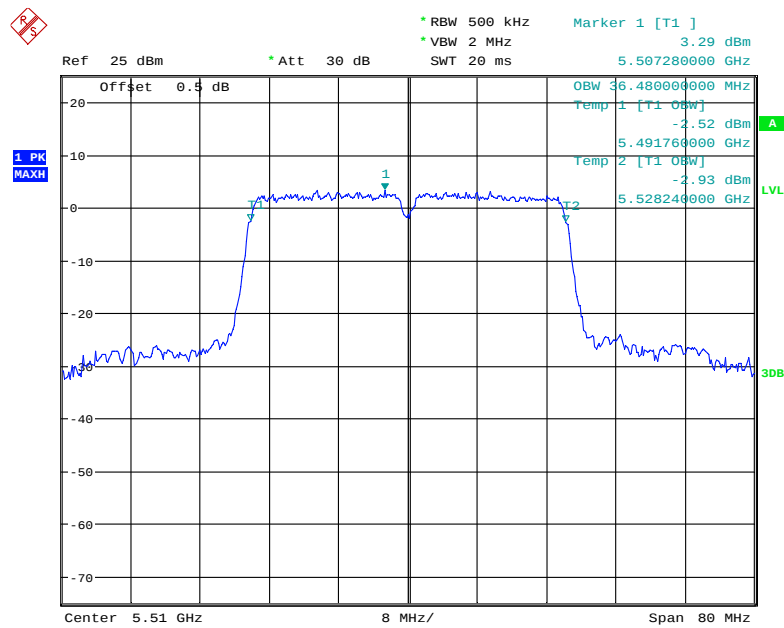
Date: 14.MAR.2019 16:39:52

## 802.11n ht20 5720 MHz



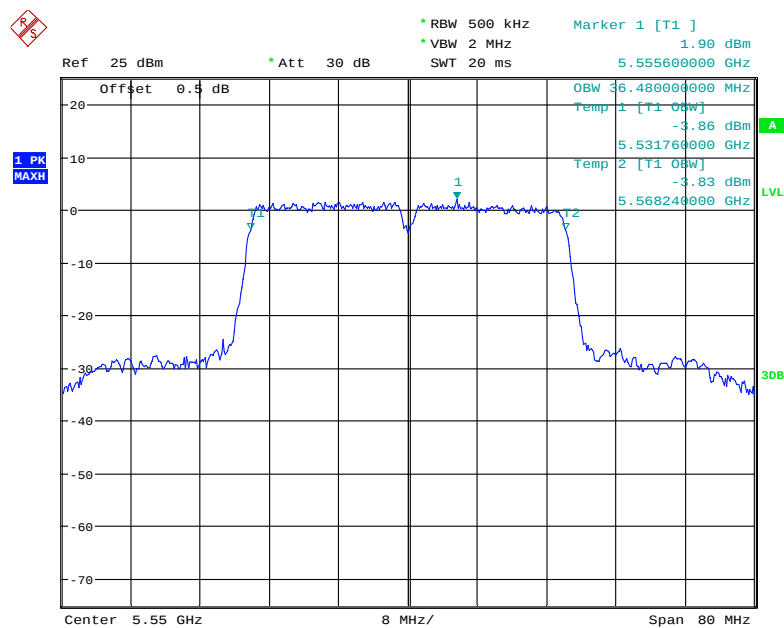
Date: 16.MAR.2019 09:44:36

## 802.11n ht40 Low Channel



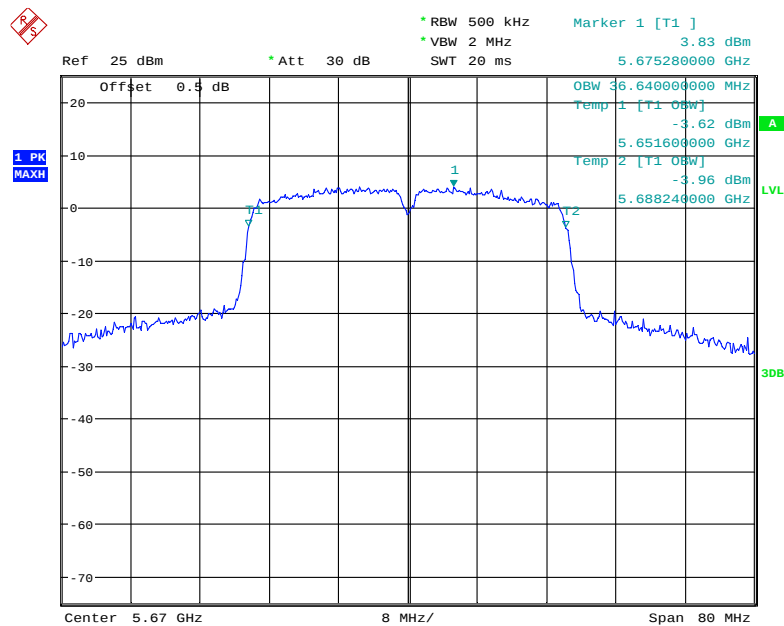
Date: 14.MAR.2019 16:42:14

## 802.11n ht40 Middle Channel



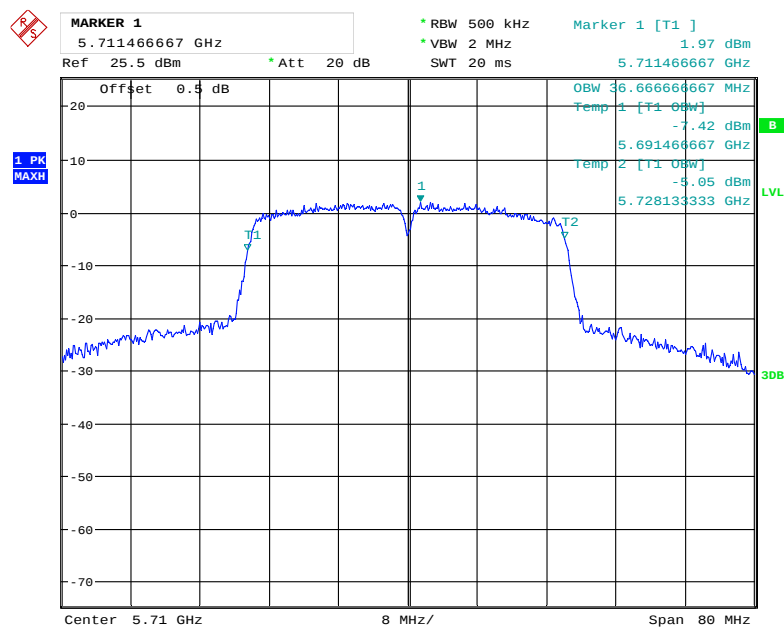
Date: 14.MAR.2019 16:44:20

## 802.11n ht40 High Channel



Date: 14.MAR.2019 16:46:46

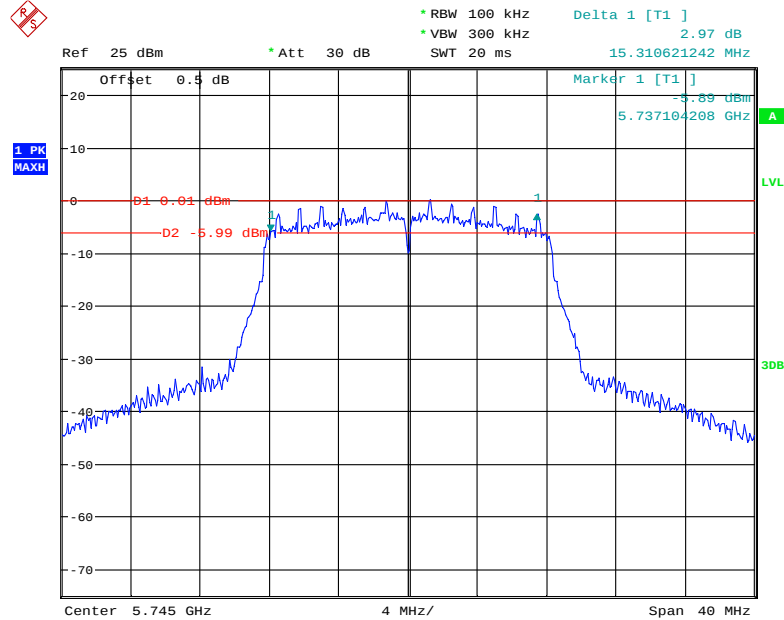
## 802.11n ht40 5710MHz



Date: 16.MAR.2019 09:46:05

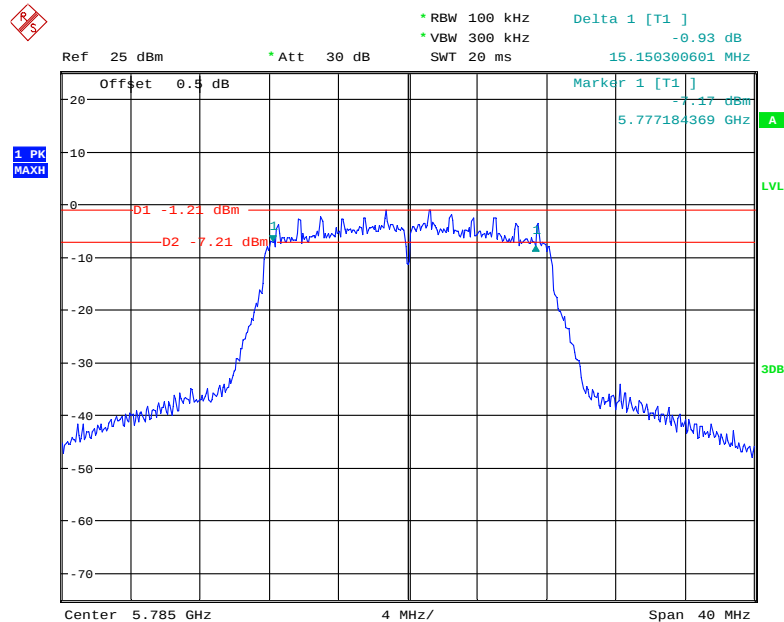
**5725-5850MHz:  
6dB Emission Bandwidth:**

**802.11a Low Channel**



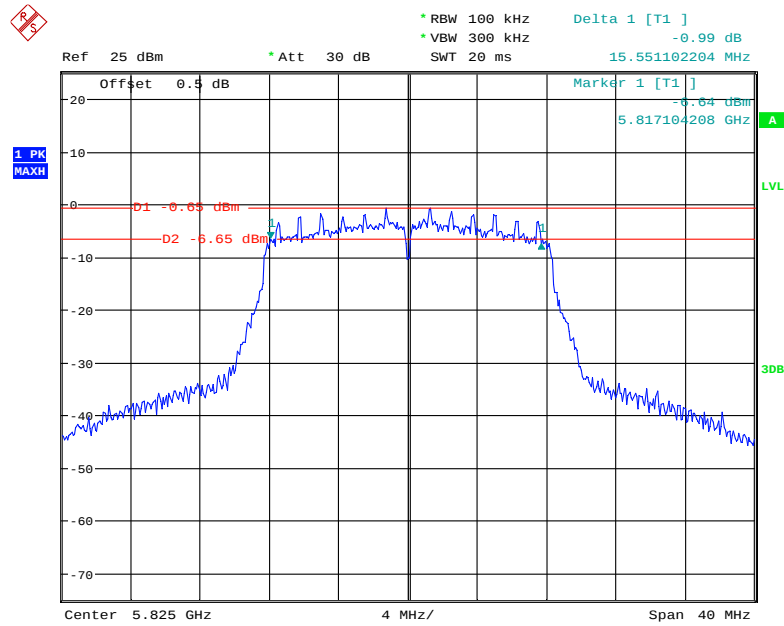
Date: 8.JAN.2019 19:19:28

**802.11a Middle Channel**



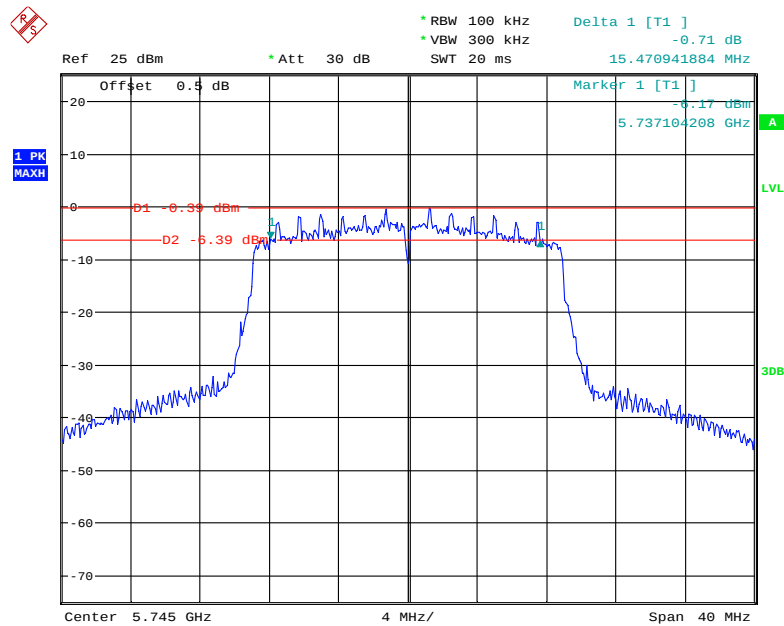
Date: 8.JAN.2019 19:27:22

### 802.11a High Channel



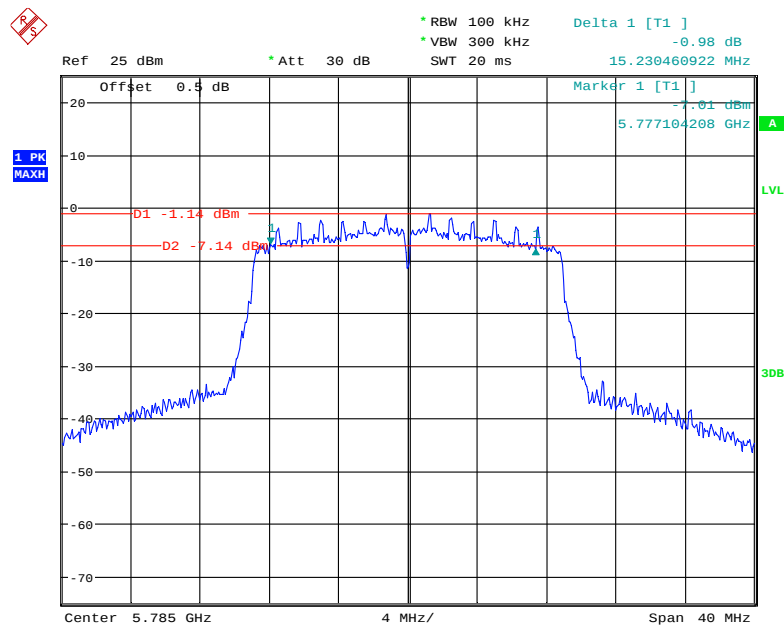
Date: 8.JAN.2019 19:20:44

### 802.11n ht20 Low Channel



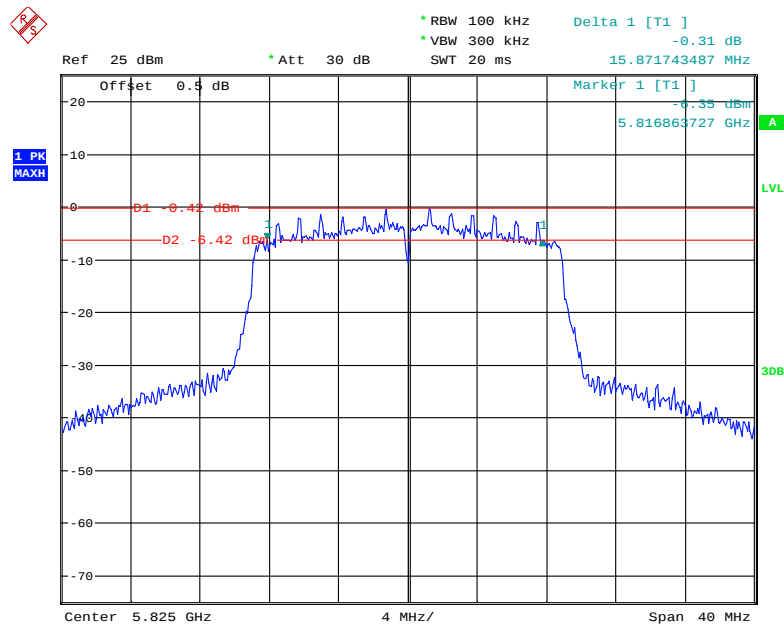
Date: 8.JAN.2019 19:33:14

## 802.11n ht20 Middle Channel



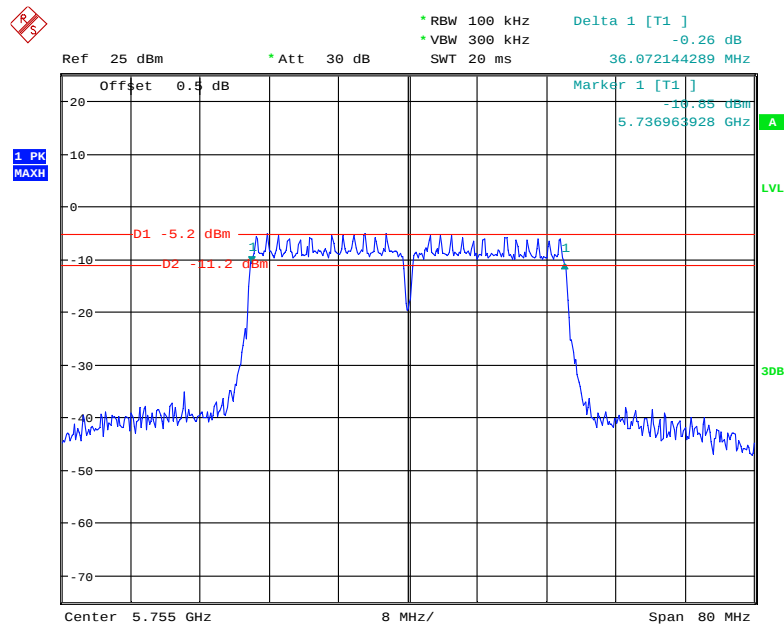
Date: 8.JAN.2019 19:30:56

## 802.11n ht20 High Channel



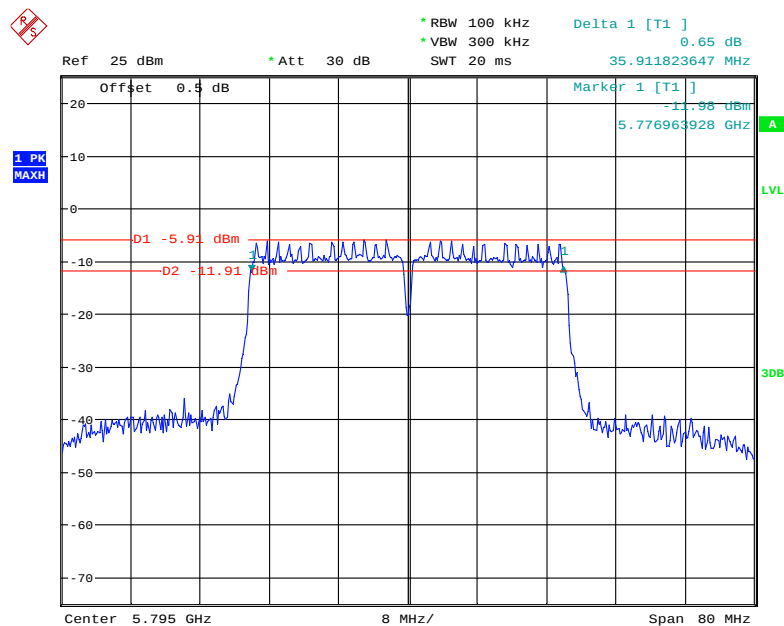
Date: 8.JAN.2019 19:35:47

## 802.11n ht40 Low Channel

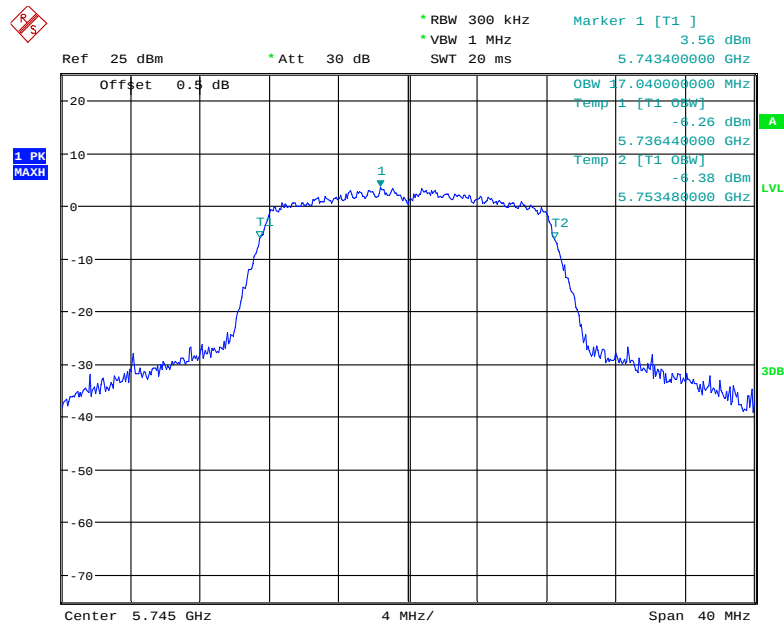


Date: 8.JAN.2019 19:41:59

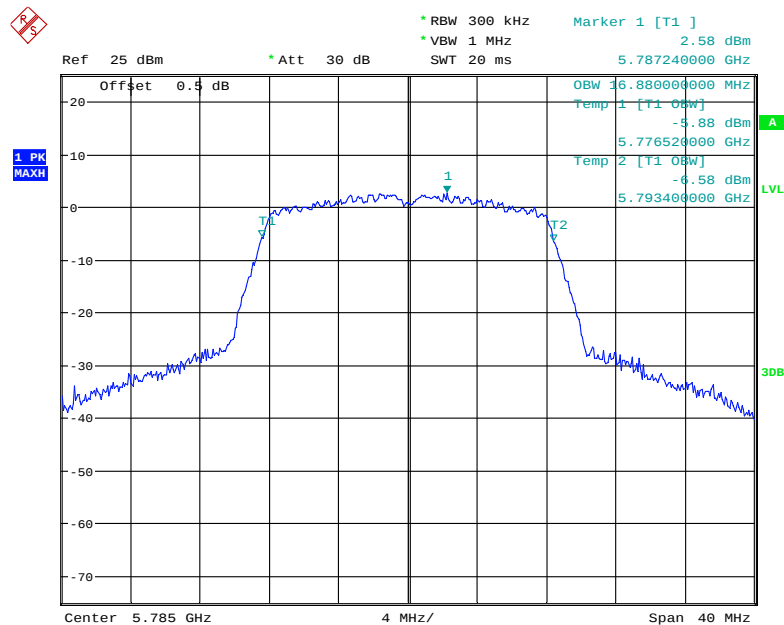
## 802.11n ht40 High Channel



Date: 8.JAN.2019 19:39:29

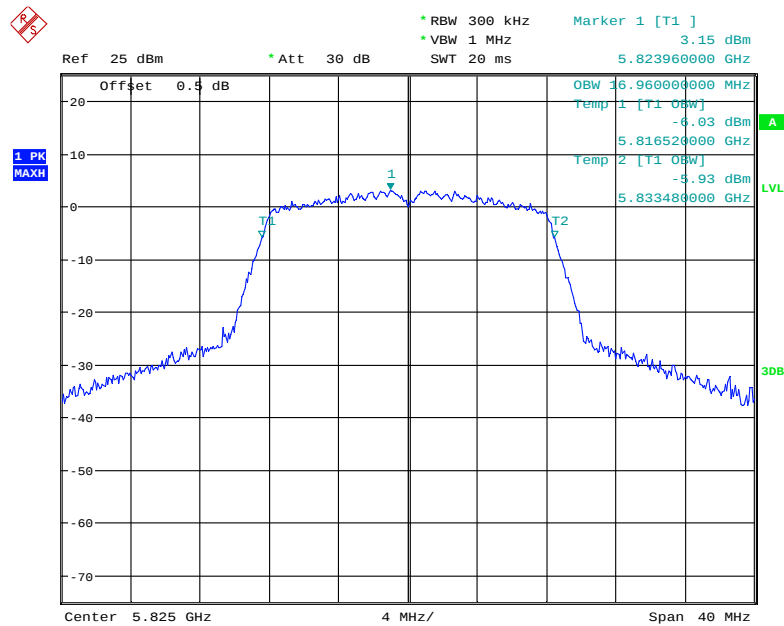
**99% Occupied Bandwidth:****802.11a Low Channel**

Date: 8.JAN.2019 18:40:56

**802.11a Middle Channel**

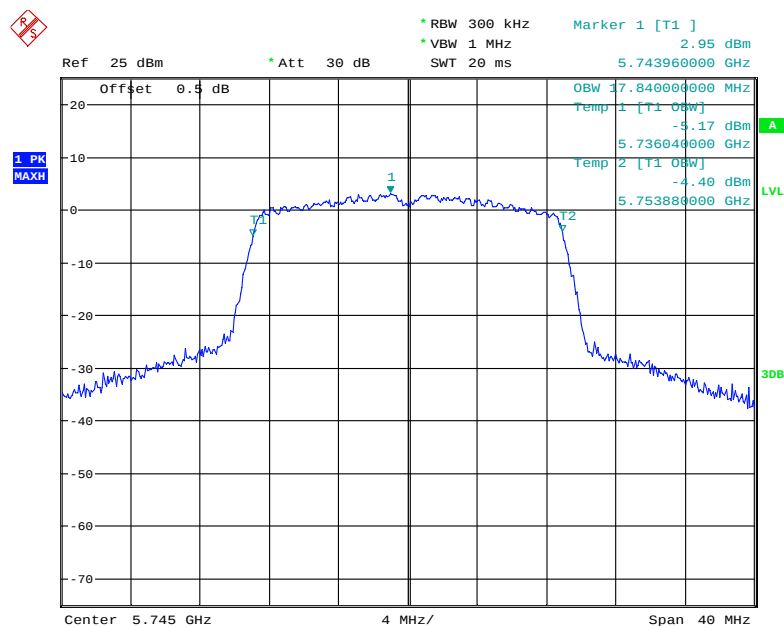
Date: 8.JAN.2019 19:27:59

## 802.11a High Channel



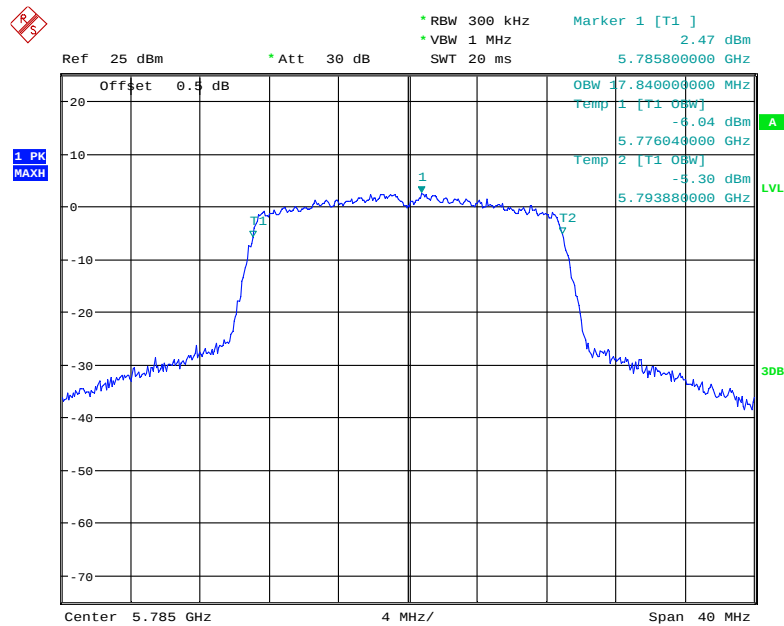
Date: 8.JAN.2019 19:21:17

## 802.11n ht20 Low Channel



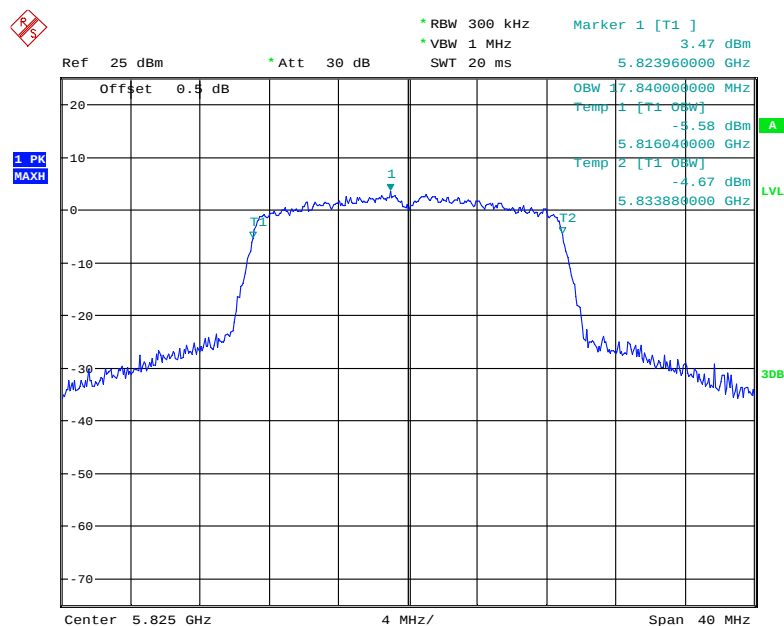
Date: 8.JAN.2019 19:33:50

## 802.11n ht20 Middle Channel



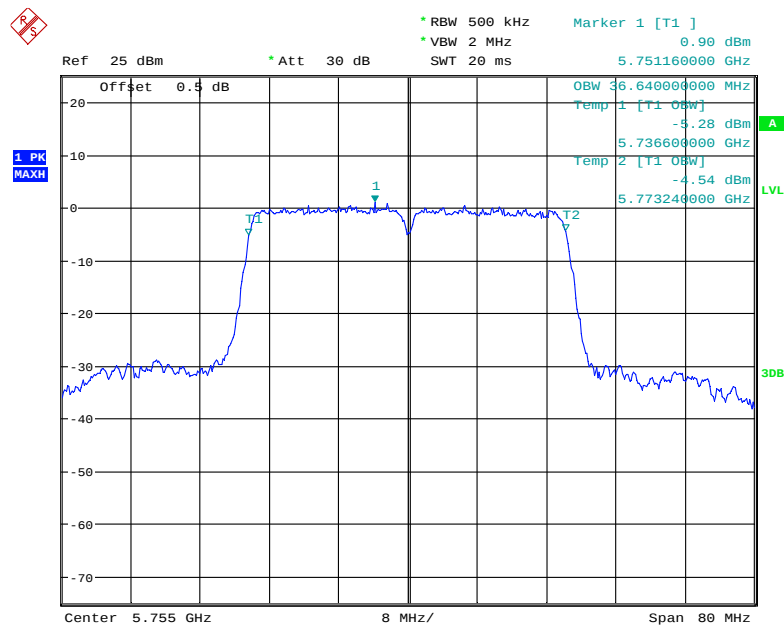
Date: 8.JAN.2019 19:31:29

## 802.11n ht20 High Channel



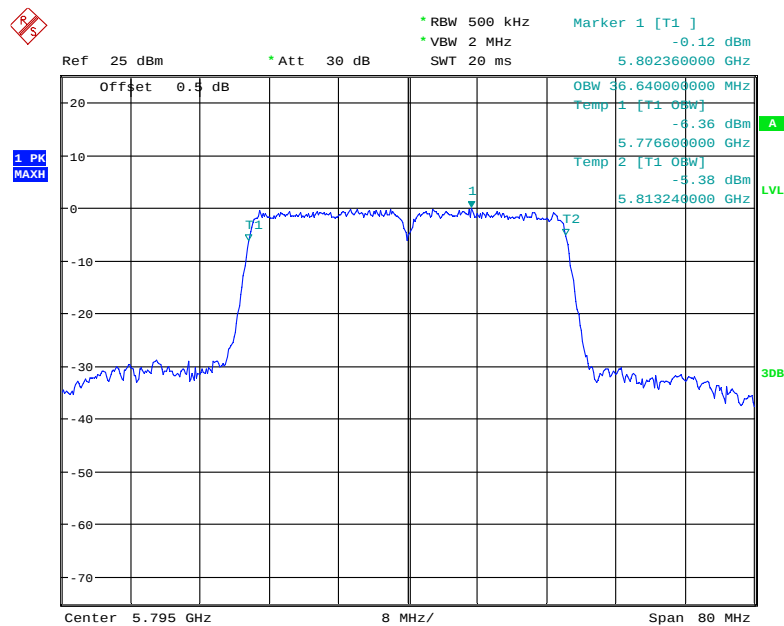
Date: 8.JAN.2019 19:36:16

## 802.11n ht40 Low Channel



Date: 8.JAN.2019 19:42:25

## 802.11n ht40 High Channel



Date: 8.JAN.2019 19:39:51

## **FCC §15.407(a) & RSS-247 CLAUSE 6.2 –MAXIMUM CONDUCTED OUTPUT POWER**

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### **Applicable Standard**

According to FCC §15.407(a)

(a) 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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 conducted output power over the frequency band of operation shall not exceed 1 W. 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 mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

(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  $11 \text{ dBm} + 10 \log B$ , 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.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

According to RSS-247 Clause 6.2:

### **Frequency band 5150-5250 MHz**

#### **6.2.1.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10} B$ , dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

### **Frequency band 5250-5350 MHz**

#### **6.2.2.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10} B$ , dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## Frequency bands 5470-5600 MHz and 5650-5725 MHz

### 6.2.3.1 Power limits

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## Frequency band 5725-5850 MHz

### 6.2.4.1 Power limits

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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<sup>3</sup> systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

## Test Equipment List and Details

| Manufacturer | Description               | Model       | Serial Number | Calibration Date | Calibration Due Date |
|--------------|---------------------------|-------------|---------------|------------------|----------------------|
| Agilent      | USB Wideband Power Sensor | U2022XA     | MY5417006     | 2018-12-10       | 2019-12-10           |
| Unknown      | Coaxial Cable             | C-SJ00-0010 | C0010/01      | Each time        | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

**Test Data****Environmental Conditions**

|                           |                |
|---------------------------|----------------|
| <b>Temperature:</b>       | 21.4~25.6°C    |
| <b>Relative Humidity:</b> | 38~73 %        |
| <b>ATM Pressure:</b>      | 100.1~102.1kPa |

The testing was performed by Blake Yang, Elema Lei on 2019-01-08&2019-03-14.

Test Mode: Transmitting

5150-5250 MHz:

| Mode         | Frequency (MHz) | Conducted Average Output Power (dBm) |               | E.I.R.P. (dBm) |                 | Result |
|--------------|-----------------|--------------------------------------|---------------|----------------|-----------------|--------|
|              |                 | Result                               | Limit for FCC | Result         | Limit for ISSED |        |
| 802.11a      | 5180            | 10.02                                | 24.00         | 12.29          | 22.36           | PASS   |
|              | 5200            | 9.96                                 | 24.00         | 12.23          | 22.36           | PASS   |
|              | 5240            | 9.92                                 | 24.00         | 12.19          | 22.36           | PASS   |
| 802.11n ht20 | 5180            | 9.94                                 | 24.00         | 12.21          | 22.55           | PASS   |
|              | 5200            | 9.92                                 | 24.00         | 12.19          | 22.57           | PASS   |
|              | 5240            | 9.89                                 | 24.00         | 12.16          | 22.57           | PASS   |
| 802.11n ht40 | 5190            | 8.97                                 | 24.00         | 11.24          | 23.00           | PASS   |
|              | 5230            | 8.94                                 | 24.00         | 11.21          | 23.00           | PASS   |

5250-5350MHz

| Mode         | Frequency (MHz) | Conducted Average Output Power (dBm) |           |               | EIRP (dBm) |               | Result |
|--------------|-----------------|--------------------------------------|-----------|---------------|------------|---------------|--------|
|              |                 | Results                              | FCC Limit | RSS-247 Limit | Results    | RSS-247 Limit |        |
| 802.11 a     | 5260            | 9.87                                 | 24.00     | 23.36         | 12.14      | 29.36         | PASS   |
|              | 5280            | 9.80                                 | 24.00     | 23.34         | 12.07      | 29.34         | PASS   |
|              | 5320            | 10.16                                | 24.00     | 23.34         | 12.43      | 29.34         | PASS   |
| 802.11n ht20 | 5260            | 9.74                                 | 24.00     | 23.53         | 12.01      | 29.53         | PASS   |
|              | 5280            | 9.87                                 | 24.00     | 23.55         | 12.14      | 29.55         | PASS   |
|              | 5320            | 9.99                                 | 24.00     | 23.57         | 12.26      | 29.57         | PASS   |
| 802.11n ht40 | 5270            | 8.96                                 | 24.00     | 24.00         | 11.23      | 30.00         | PASS   |
|              | 5310            | 9.07                                 | 24.00     | 24.00         | 11.34      | 30.00         | PASS   |

## 5470-5725MHz

| Mode         | Frequency (MHz) | Conducted Average Output Power (dBm) |           |               | EIRP (dBm) |               | Result |
|--------------|-----------------|--------------------------------------|-----------|---------------|------------|---------------|--------|
|              |                 | Results                              | FCC Limit | RSS-247 Limit | Results    | RSS-247 Limit |        |
| 802.11 a     | 5500            | 10.11                                | 24.00     | 23.31         | 12.38      | 29.31         | PASS   |
|              | 5580            | 9.92                                 | 24.00     | 23.36         | 12.19      | 29.36         | PASS   |
|              | 5700            | 9.95                                 | 24.00     | 23.49         | 12.22      | 29.49         | PASS   |
|              | 5720            | 9.90                                 | 24.00     | 23.46         | 12.17      | 29.46         | PASS   |
| 802.11n ht20 | 5500            | 10.02                                | 24.00     | 23.53         | 12.29      | 29.53         | PASS   |
|              | 5580            | 9.73                                 | 24.00     | 23.55         | 12.00      | 29.55         | PASS   |
|              | 5700            | 9.98                                 | 24.00     | 23.78         | 12.25      | 29.78         | PASS   |
|              | 5720            | 9.99                                 | 24.00     | 23.70         | 12.26      | 29.70         | PASS   |
| 802.11n ht40 | 5510            | 9.08                                 | 24.00     | 24.00         | 11.35      | 30.00         | PASS   |
|              | 5550            | 8.75                                 | 24.00     | 24.00         | 11.02      | 30.00         | PASS   |
|              | 5670            | 9.15                                 | 24.00     | 24.00         | 11.42      | 30.00         | PASS   |
|              | 5710            | 8.70                                 | 24.00     | 24.00         | 10.97      | 30.00         | PASS   |

## 5725-5850MHz:

| Mode         | Frequency (MHz) | Conducted Average Output Power (dBm) | Limit (dBm) | Result |
|--------------|-----------------|--------------------------------------|-------------|--------|
| 802.11 a     | 5745            | 9.74                                 | 30          | PASS   |
|              | 5785            | 9.48                                 | 30          | PASS   |
|              | 5825            | 9.67                                 | 30          | PASS   |
| 802.11n ht20 | 5745            | 9.62                                 | 30          | PASS   |
|              | 5785            | 9.36                                 | 30          | PASS   |
|              | 5825            | 9.95                                 | 30          | PASS   |
| 802.11n Ht40 | 5755            | 8.79                                 | 30          | PASS   |
|              | 5795            | 8.52                                 | 30          | PASS   |

Note: the duty cycle factor have been calculated into the Conducted power result. Antenna gain is 2.27dBi @ 5150-5850MHz.

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**FCC §15.407(a)& RSS-247 CLAUSE 6.2- POWER SPECTRAL DENSITY**

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**Applicable Standard**

According to FCC §15.407(a)

(a) 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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 conducted output power over the frequency band of operation shall not exceed 1 W. 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 mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

(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  $11 + 10 \log B$  dBm, 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.

According to RSS-247 Clause 6.2:

### **Frequency band 5150-5250 MHz**

#### **6.2.1.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10}B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

### **Frequency band 5250-5350 MHz**

#### **6.2.2.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## Frequency bands 5470-5600 MHz and 5650-5725 MHz

### 6.2.3.1 Power limits

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## Frequency band 5725-5850 MHz

### 6.2.4.1 Power limits

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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<sup>3</sup> systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

## Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

## Test Equipment List and Details

| Manufacturer | Description       | Model       | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------|-------------|---------------|------------------|----------------------|
| R&S          | Spectrum Analyzer | FSU 26      | 200256        | 2019-01-04       | 2020-01-04           |
| Unknown      | Coaxial Cable     | C-SJ00-0010 | C0010/01      | Each time        | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

|                           |                |
|---------------------------|----------------|
| <b>Temperature:</b>       | 21.4~25.6°C    |
| <b>Relative Humidity:</b> | 38~73 %        |
| <b>ATM Pressure:</b>      | 100.1~102.1kPa |

The testing was performed by Blake Yang, Elema Lei on 2019-01-08&2019-03-14.

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table and plot.

5150-5250MHz:

| Mode         | Frequency (MHz) | Reading (dBm/MHz) | Duty cycle Factor (dB) | Conducted Power Spectral Density (dBm/MHz) | Conducted Power Spectral Density Limit For FCC (dBm/MHz) | E.I.R.P. Power Spectral Density (dBm/MHz) | E.I.R.P. Power Spectral Density Limit for ISSED (dBm/MHz) |
|--------------|-----------------|-------------------|------------------------|--------------------------------------------|----------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|
| 802.11a      | 5180            | 0.06              | 0.00                   | 0.06                                       | 11                                                       | 2.33                                      | 10                                                        |
|              | 5200            | -0.26             | 0.00                   | -0.26                                      | 11                                                       | 2.01                                      | 10                                                        |
|              | 5240            | -0.53             | 0.00                   | -0.53                                      | 11                                                       | 1.74                                      | 10                                                        |
| 802.11n ht20 | 5180            | -0.04             | 0.00                   | -0.04                                      | 11                                                       | 2.23                                      | 10                                                        |
|              | 5200            | -0.05             | 0.00                   | -0.05                                      | 11                                                       | 2.22                                      | 10                                                        |
|              | 5240            | -0.42             | 0.00                   | -0.42                                      | 11                                                       | 1.85                                      | 10                                                        |
| 802.11n ht40 | 5190            | -4.06             | 0.19                   | -3.87                                      | 11                                                       | -1.6                                      | 10                                                        |
|              | 5230            | -4.30             | 0.19                   | -4.11                                      | 11                                                       | -1.84                                     | 10                                                        |

5250-5350MHz:

| Mode         | Frequency (MHz) | Reading (dBm/MHz) | Duty cycle Factor (dB) | Conducted Power Spectral Density (dBm/MHz) |                    |
|--------------|-----------------|-------------------|------------------------|--------------------------------------------|--------------------|
|              |                 |                   |                        | Results                                    | Limit for FCC/ISED |
| 802.11a      | 5260            | 1.02              | 0.00                   | 1.02                                       | 11                 |
|              | 5280            | 2.31              | 0.00                   | 2.31                                       | 11                 |
|              | 5320            | 1.72              | 0.00                   | 1.72                                       | 11                 |
| 802.11n ht20 | 5260            | 0.95              | 0.00                   | 0.95                                       | 11                 |
|              | 5280            | 1.21              | 0.00                   | 1.21                                       | 11                 |
|              | 5320            | 1.62              | 0.00                   | 1.62                                       | 11                 |
| 802.11n ht40 | 5270            | -2.27             | 0.19                   | -2.08                                      | 11                 |
|              | 5310            | -4.13             | 0.19                   | -3.94                                      | 11                 |

5470-5725 MHz:

| Mode         | Frequency (MHz) | Reading (dBm/MHz) | Duty cycle Factor (dB) | Conducted Power Spectral Density (dBm/MHz) |                    |
|--------------|-----------------|-------------------|------------------------|--------------------------------------------|--------------------|
|              |                 |                   |                        | Results                                    | Limit for FCC/ISED |
| 802.11a      | 5500            | 2.24              | 0.00                   | 2.24                                       | 11                 |
|              | 5580            | 0.82              | 0.00                   | 0.82                                       | 11                 |
|              | 5700            | 2.11              | 0.00                   | 2.11                                       | 11                 |
|              | 5720            | 1.69              | 0.00                   | 1.69                                       | 11                 |
| 802.11n ht20 | 5500            | 1.79              | 0.00                   | 1.79                                       | 11                 |
|              | 5580            | 0.49              | 0.00                   | 0.49                                       | 11                 |
|              | 5700            | 2.78              | 0.00                   | 2.78                                       | 11                 |
|              | 5720            | 2.26              | 0.00                   | 2.26                                       | 11                 |
| 802.11n ht40 | 5510            | -3.07             | 0.19                   | -2.88                                      | 11                 |
|              | 5550            | -4.62             | 0.19                   | -4.43                                      | 11                 |
|              | 5670            | -2.28             | 0.19                   | -2.09                                      | 11                 |
|              | 5710            | -2.91             | 0.19                   | -2.72                                      | 11                 |

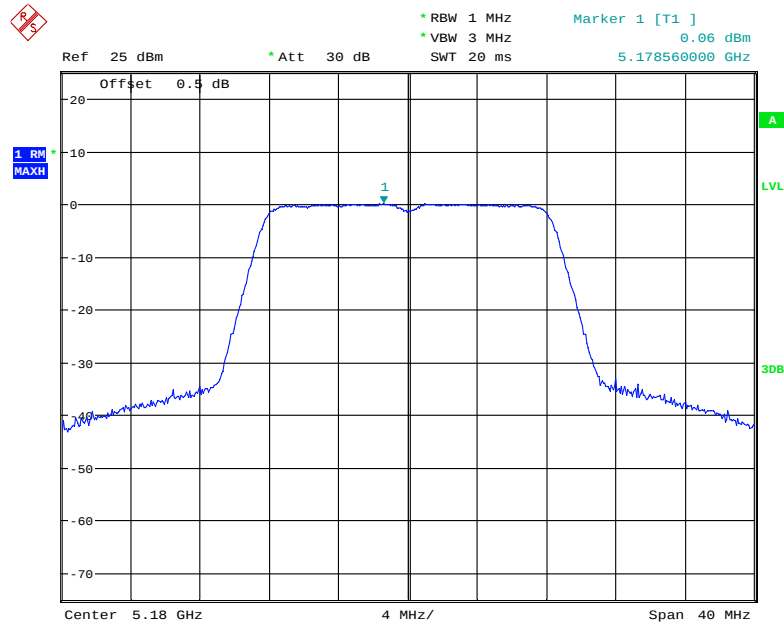
5725-5850 MHz:

| Mode         | Frequency (MHz) | Reading (dBm/300kHz) | Duty cycle Factor (dB) | Conducted Power Spectral Density (dBm/500kHz) | Conducted Power Spectral Density Limit For FCC/ISED (dBm/500kHz) |
|--------------|-----------------|----------------------|------------------------|-----------------------------------------------|------------------------------------------------------------------|
| 802.11a      | 5745            | -2.62                | 0.00                   | -0.4                                          | 30                                                               |
|              | 5785            | -3.79                | 0.00                   | -1.57                                         | 30                                                               |
|              | 5825            | -3.15                | 0.00                   | -0.93                                         | 30                                                               |
| 802.11n ht20 | 5745            | -2.19                | 0.00                   | 0.03                                          | 30                                                               |
|              | 5785            | -3.06                | 0.00                   | -0.84                                         | 30                                                               |
|              | 5825            | -1.92                | 0.00                   | 0.3                                           | 30                                                               |
| 802.11n ht40 | 5755            | -7.63                | 0.19                   | -5.22                                         | 30                                                               |
|              | 5795            | -8.43                | 0.19                   | -6.02                                         | 30                                                               |

Note: For 5.8GHz band, If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10\log(500\text{kHz}/\text{RBW})$  to the measured result, whereas  $\text{RBW} (< 500 \text{ kHz})$  is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

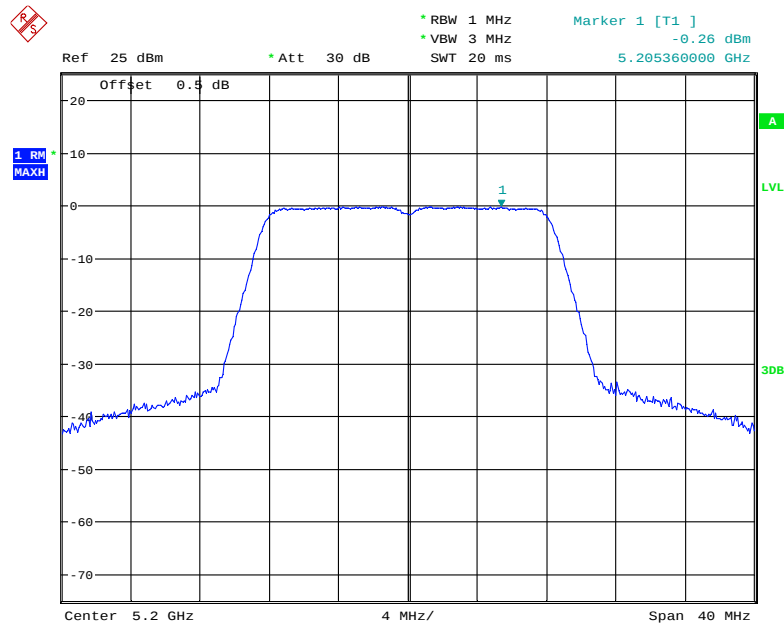
5150-5250MHz

### 802.11a Low Channel



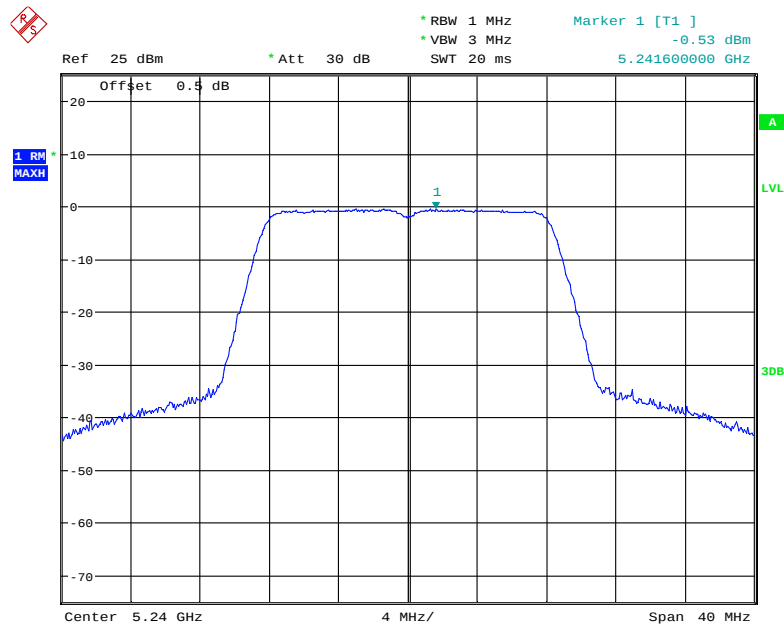
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### 802.11a Middle Channel



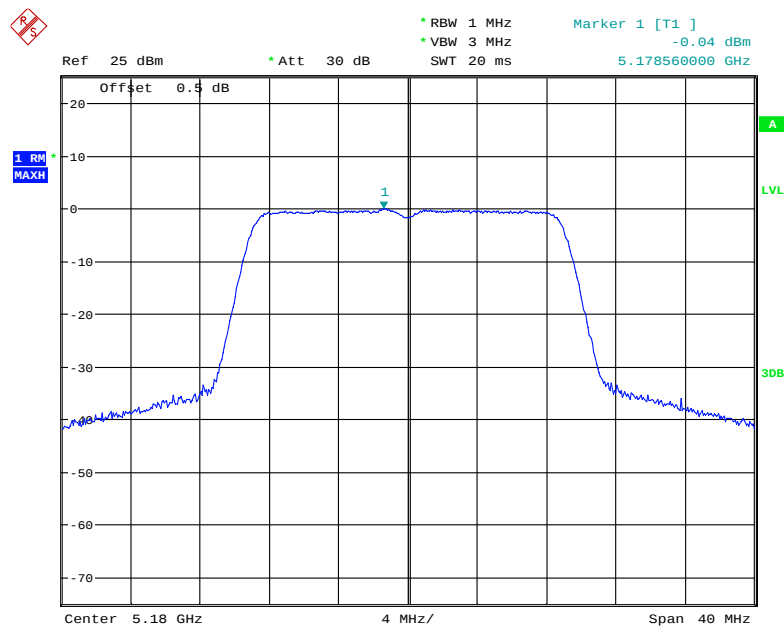
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### 802.11a High Channel



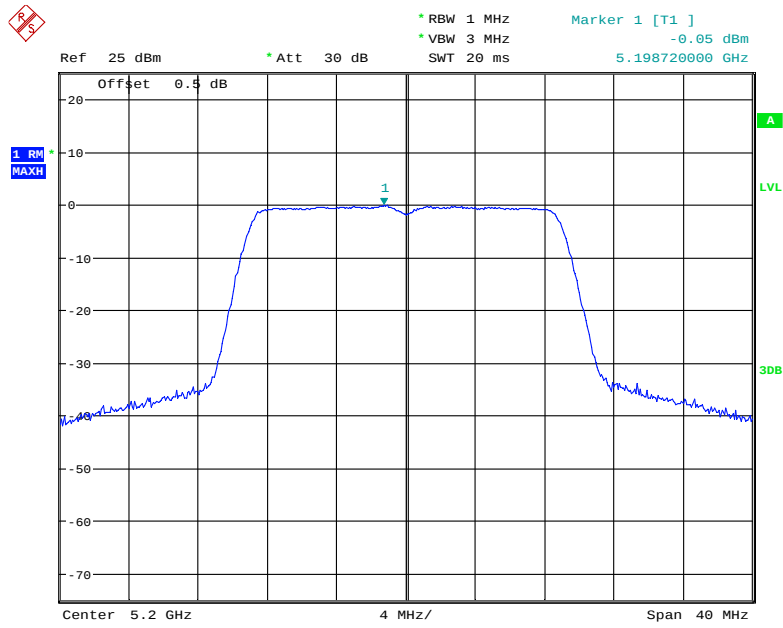
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### 802.11n ht20 Low Channel



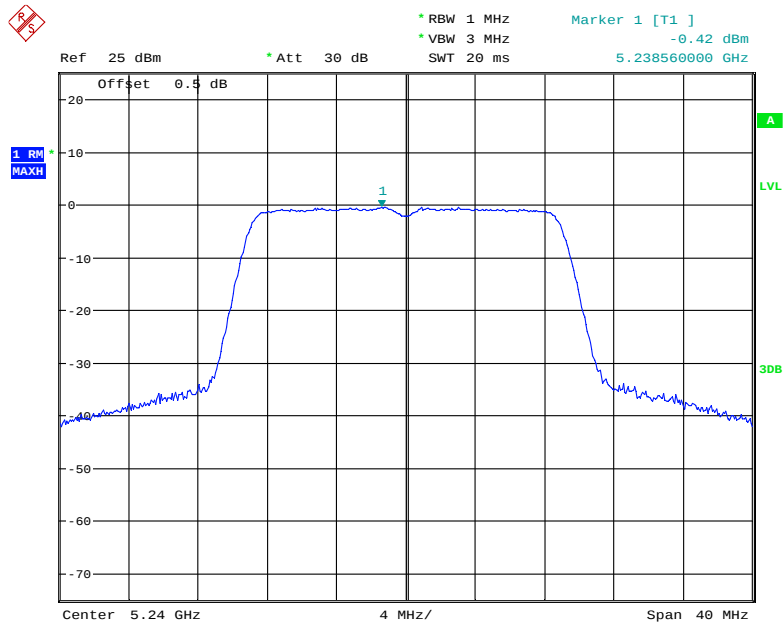
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### 802.11n ht20 Middle Channel



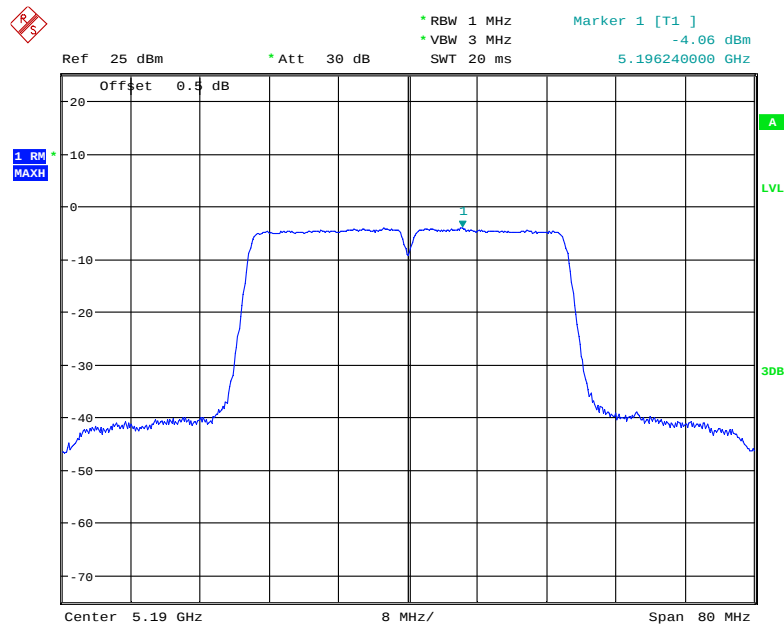
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### 802.11n ht20 High Channel



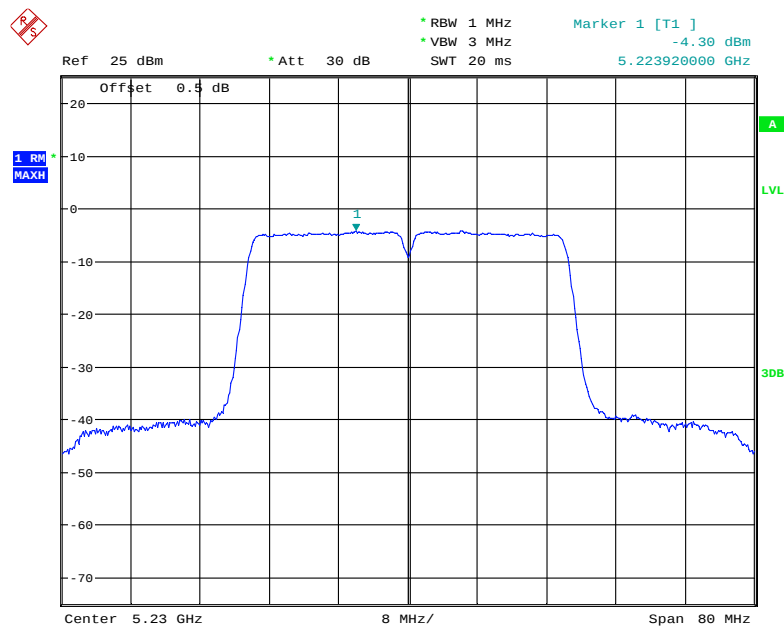
Date: 8.JAN.2019 18:29:46

### 802.11n ht40 Low Channel



Date: 8.JAN.2019 18:36:45

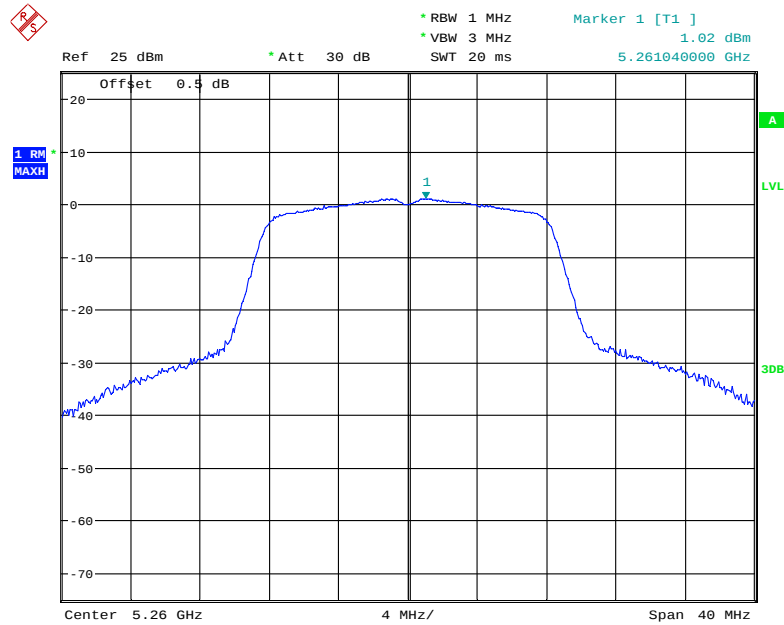
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Date: 8.JAN.2019 18:32:37

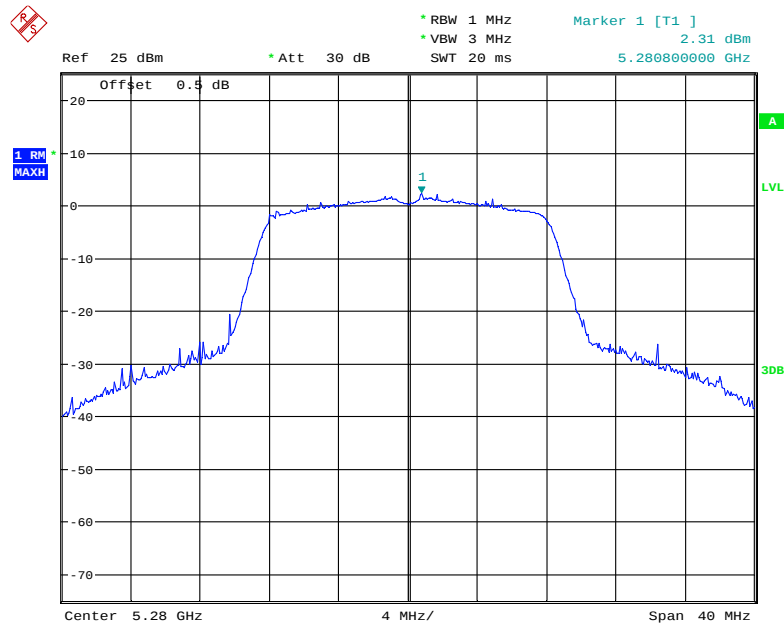
5250-5350MHz

### 802.11a Low Channel



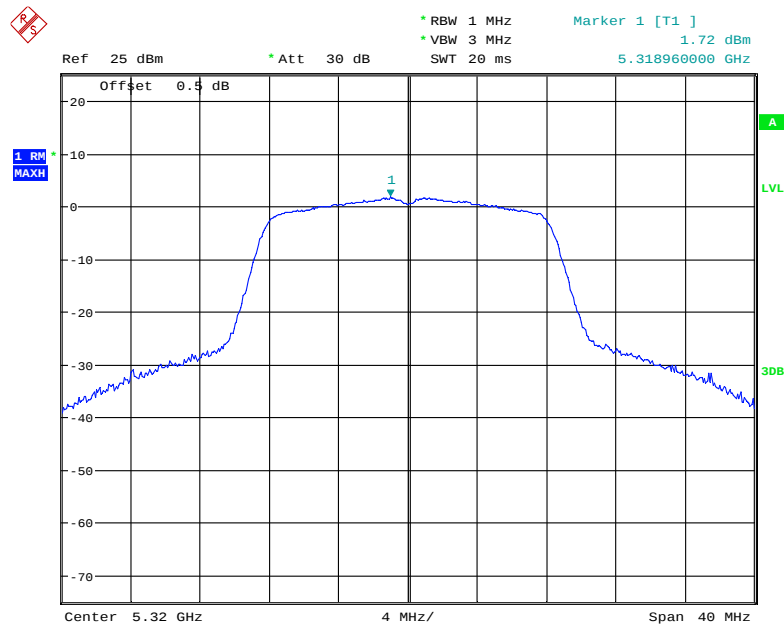
Date: 16.MAR.2019 09:36:04

### 802.11a Middle Channel



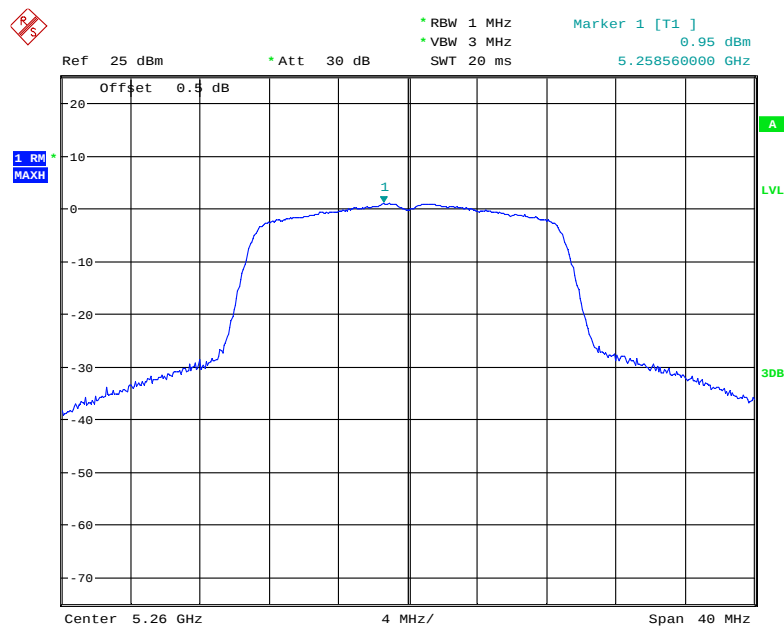
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### 802.11a High Channel



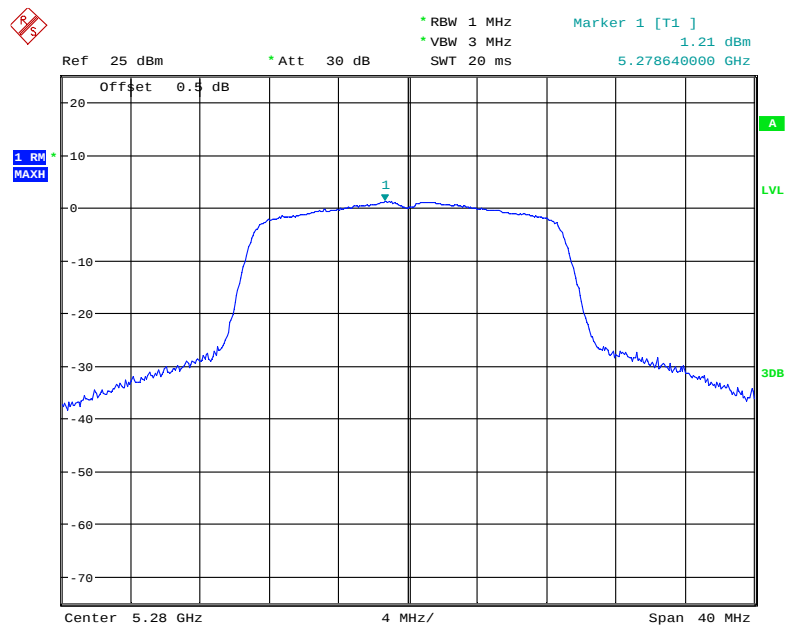
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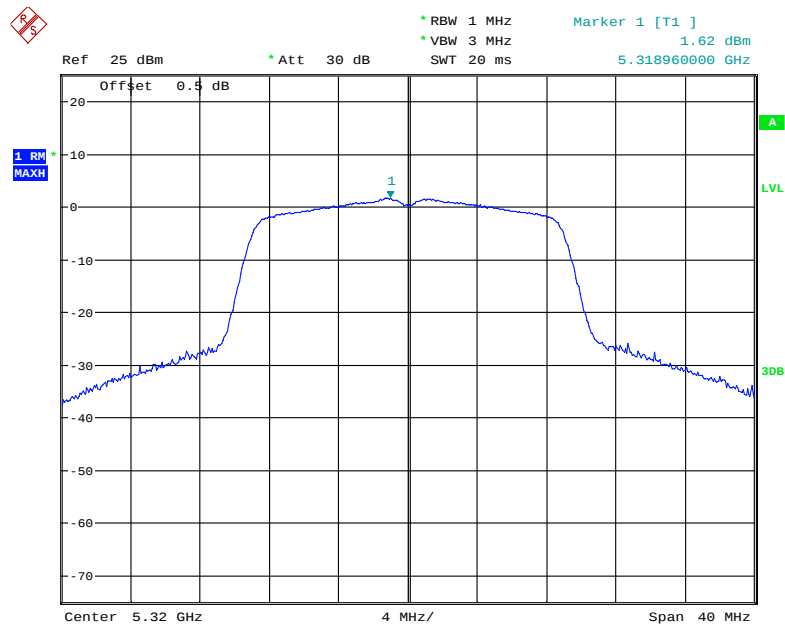
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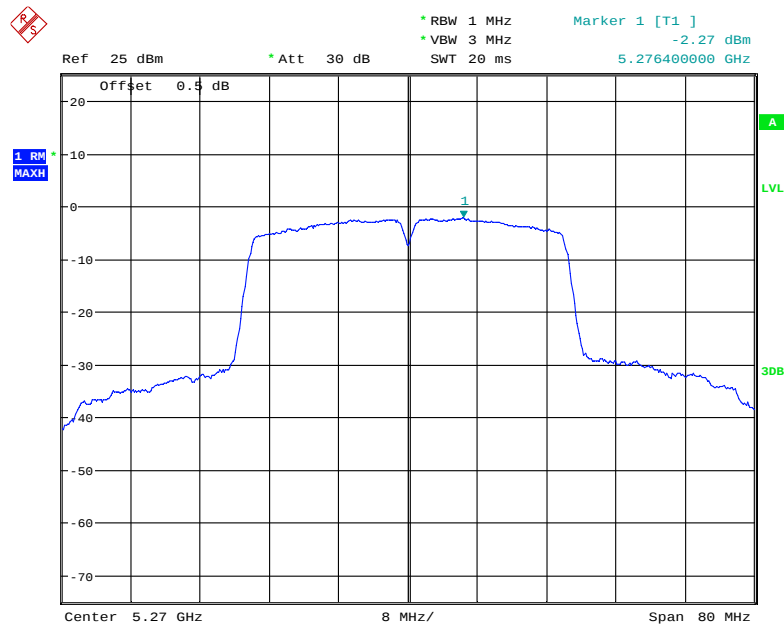
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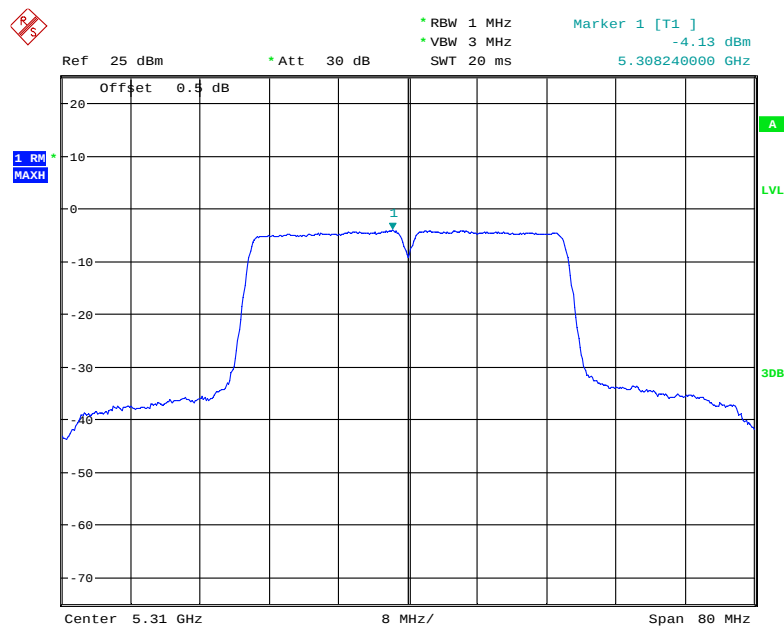
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### 802.11n ht40 Low Channel



Date: 14.MAR.2019 11:48:35

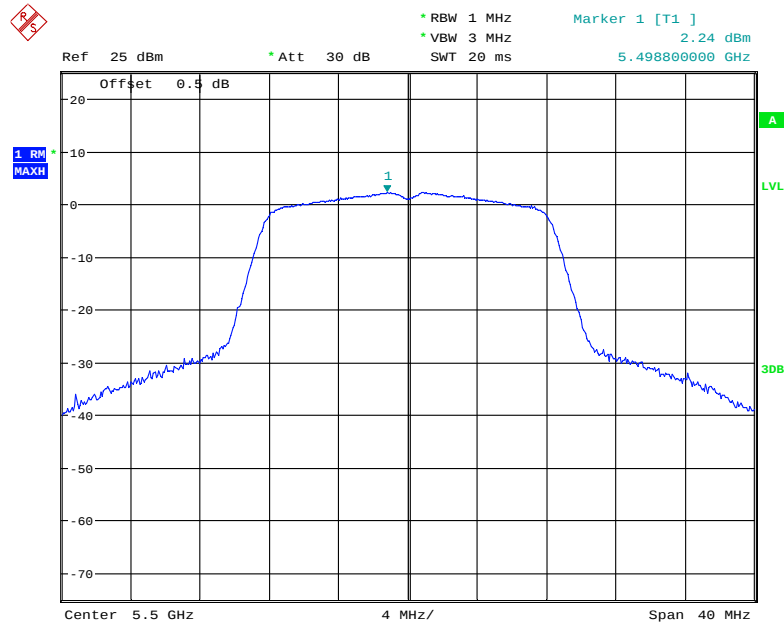
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Date: 14.MAR.2019 11:50:28

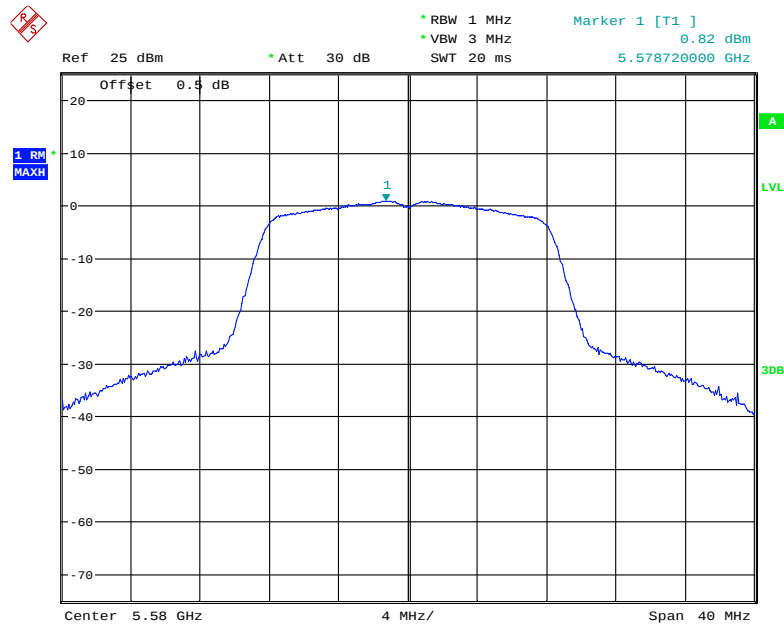
5470-5725MHz

### 802.11a Low Channel



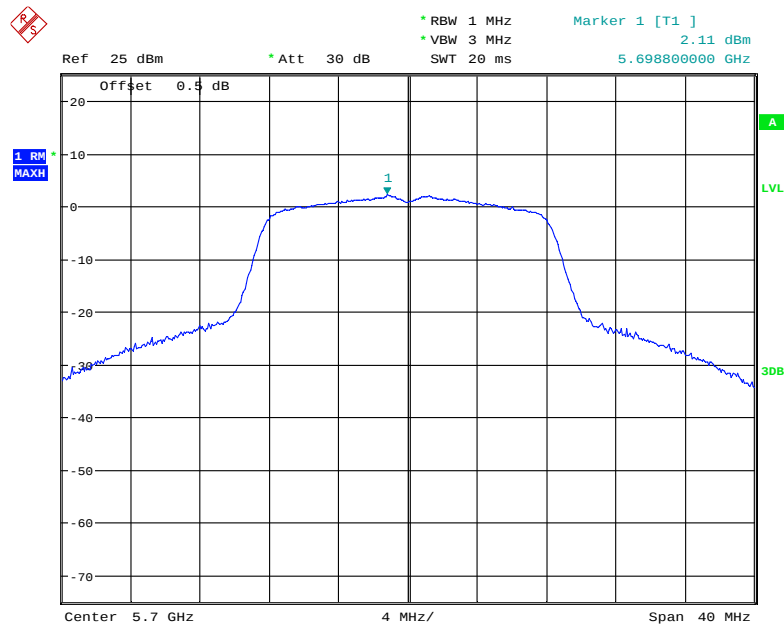
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### 802.11a Middle Channel



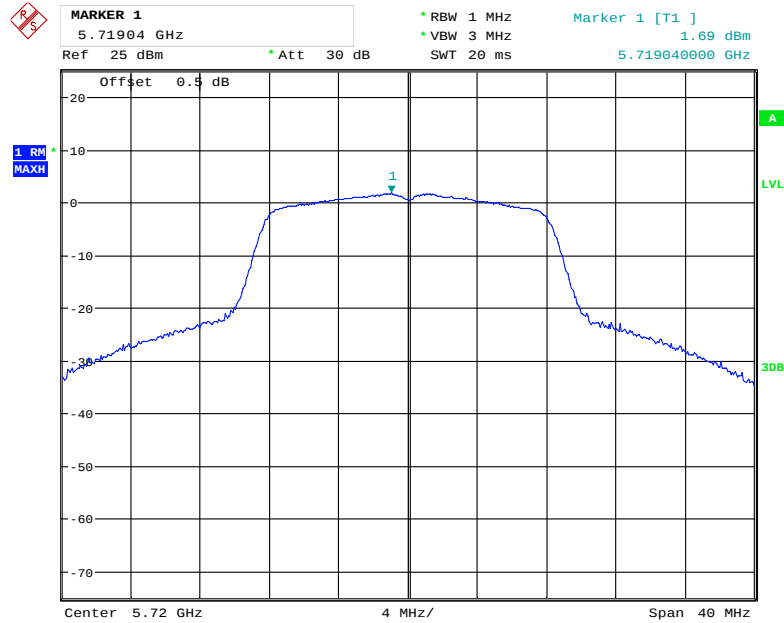
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### 802.11a High Channel



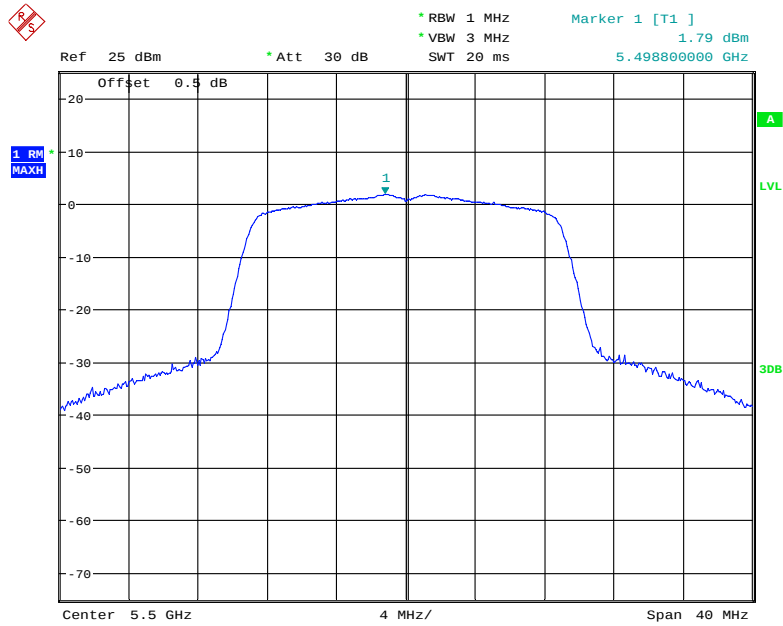
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### 802.11a 5720 Channel



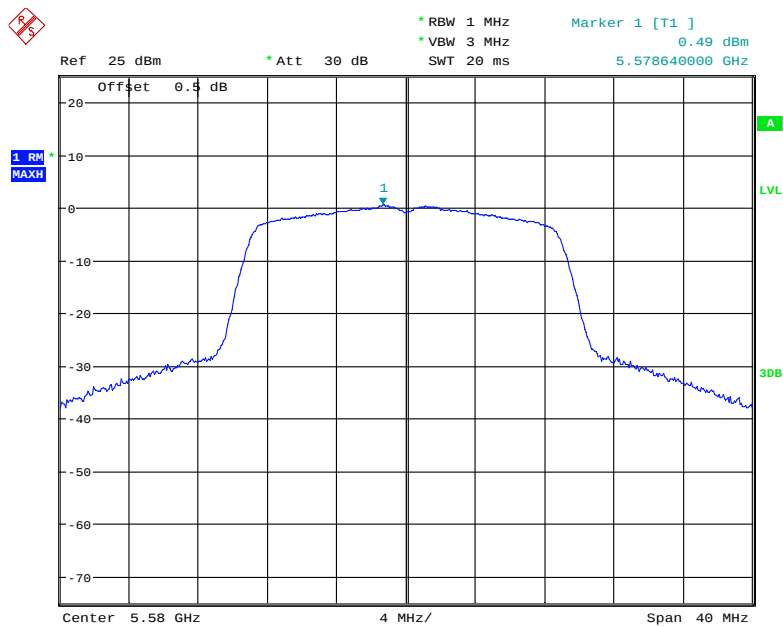
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### 802.11n ht20 Low Channel



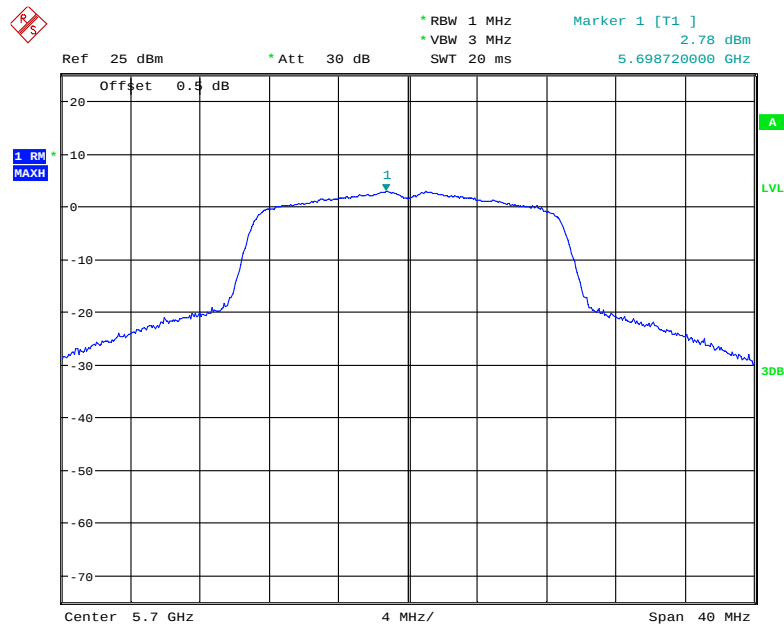
Date: 14.MAR.2019 16:34:44

### 802.11n ht20 Middle Channel



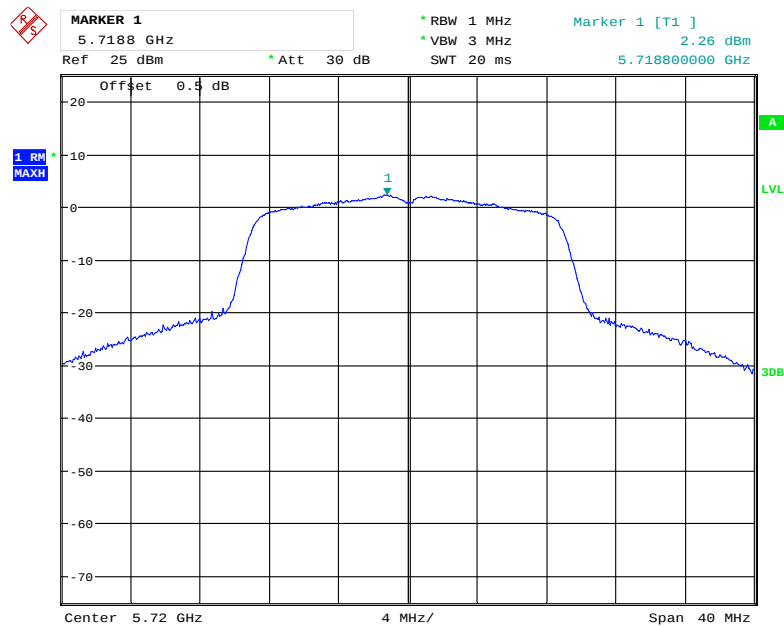
Date: 14.MAR.2019 16:37:33

### 802.11n ht20 High Channel



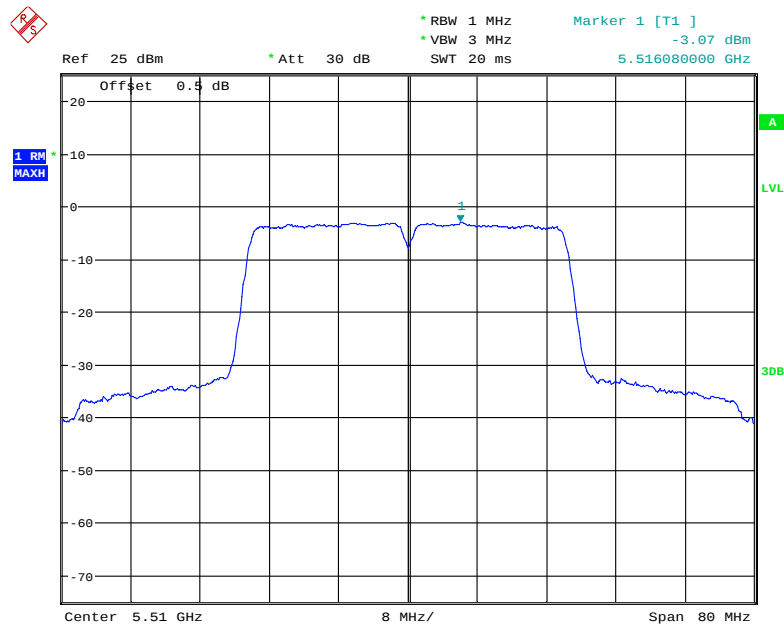
Date: 14.MAR.2019 16:40:10

### 802.11n ht20 5720 Channel



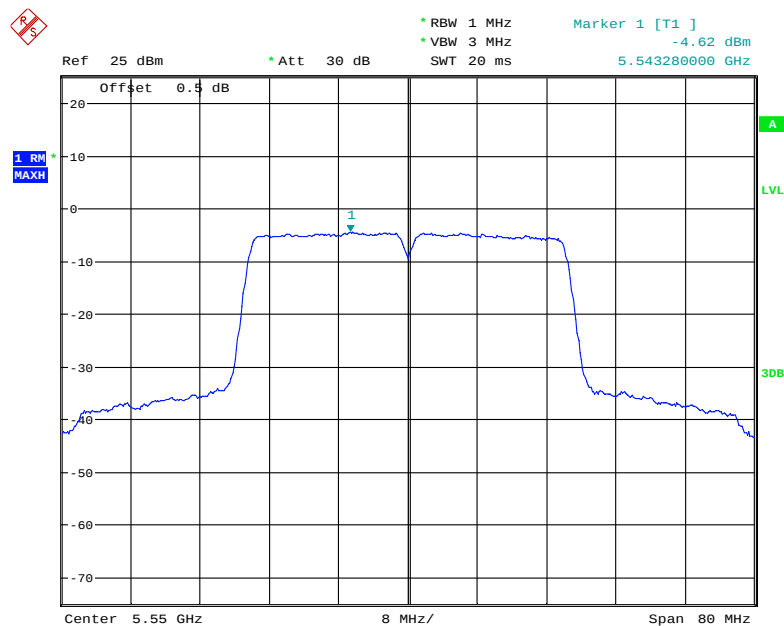
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## 802.11n ht40 Low Channel



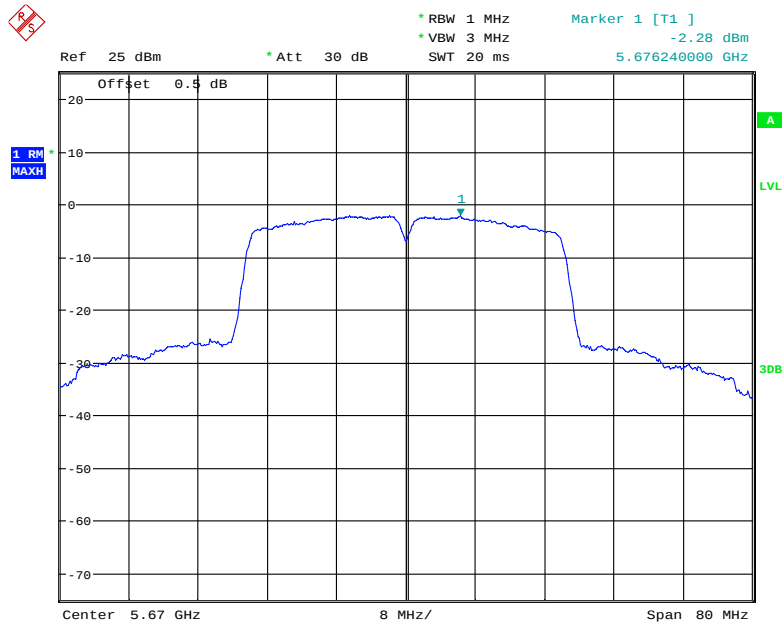
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## 802.11n ht40 Middle Channel



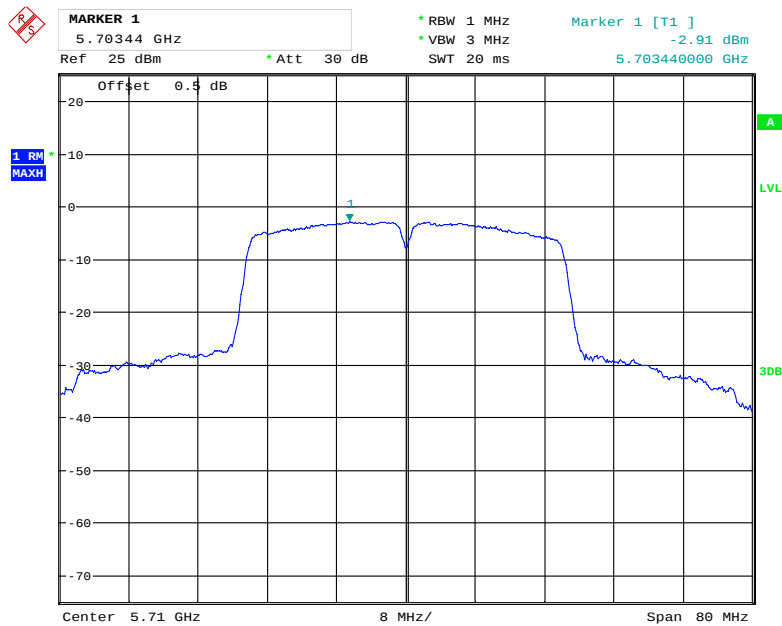
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### 802.11n ht40 High Channel



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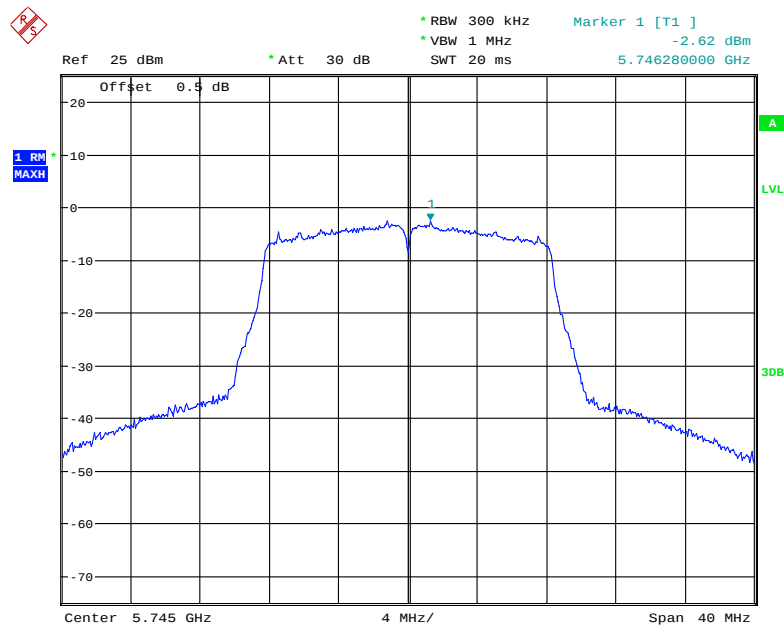
### 802.11n ht40 5710 Channel



Date: 16.MAR.2019 09:45:26

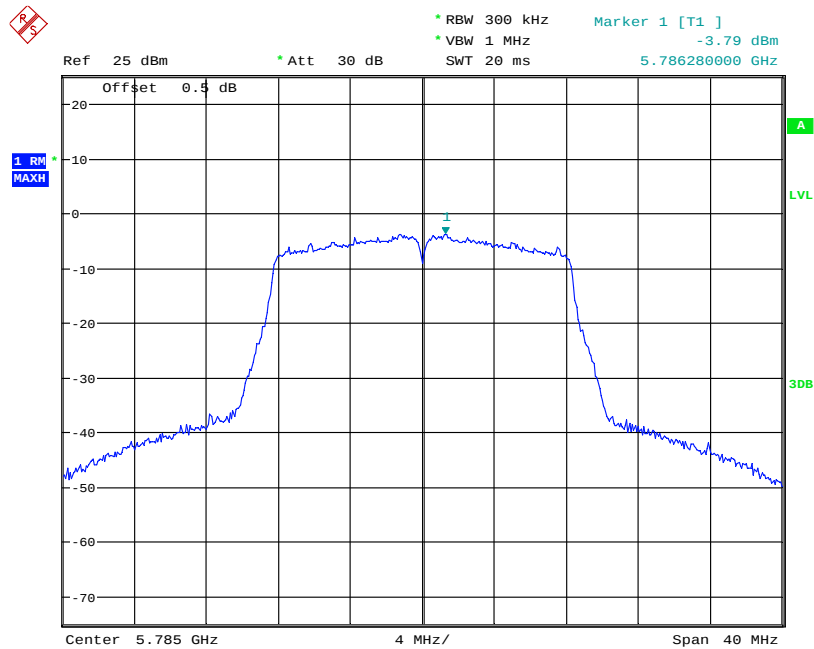
5725-5850MHz

## 802.11a Low Channel



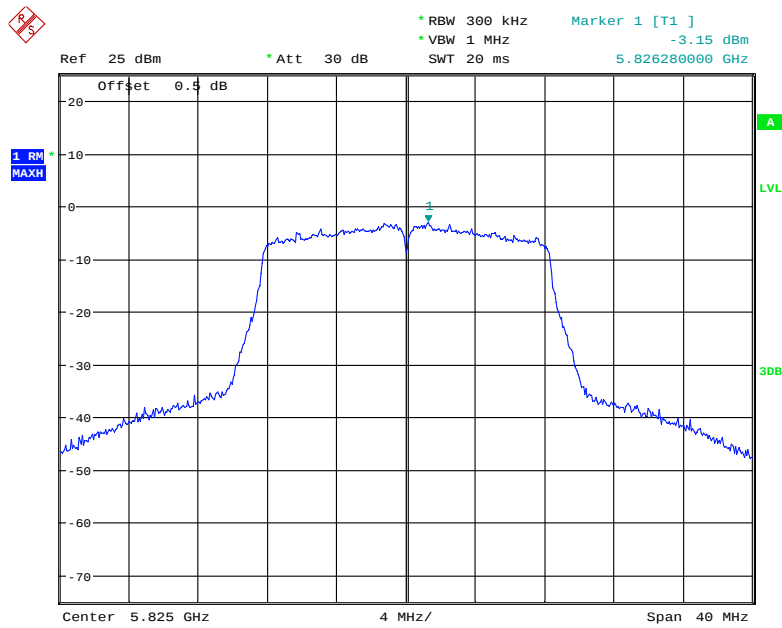
Date: 8.JAN.2019 18:41:24

## 802.11a Middle Channel



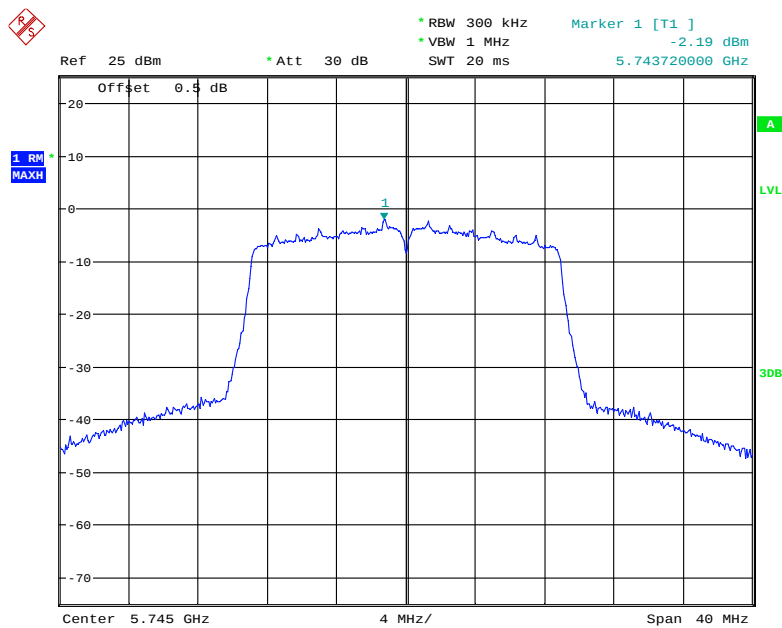
Date: 8.JAN.2019 19:28:24

### 802.11a High Channel



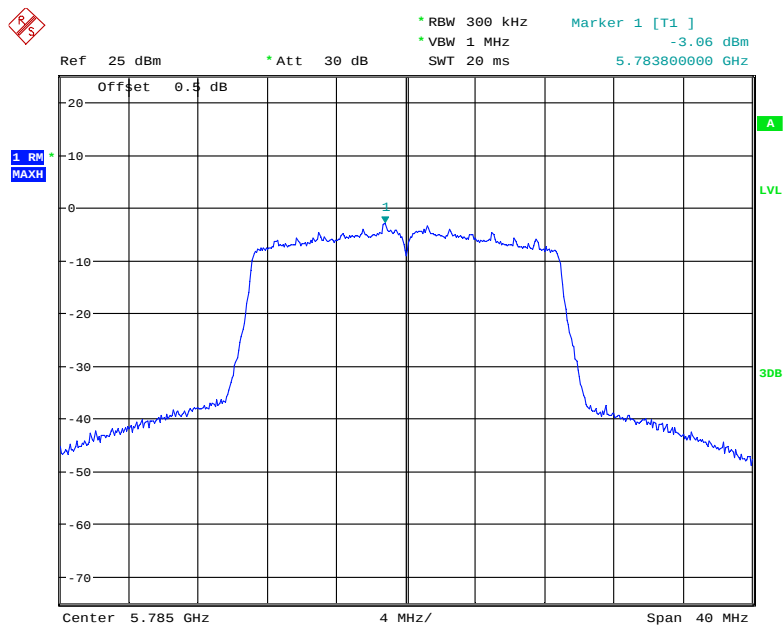
Date: 8.JAN.2019 19:21:49

### 802.11n ht20 Low Channel



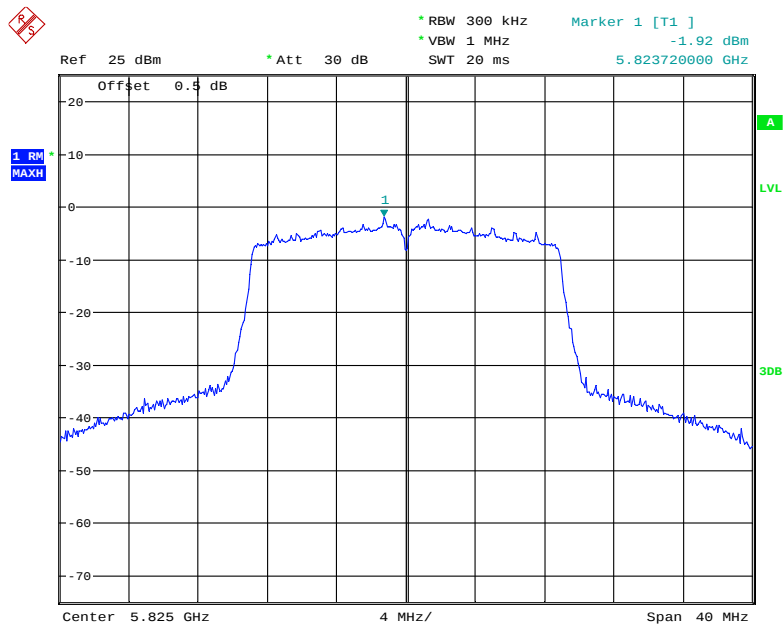
Date: 8.JAN.2019 19:34:11

### 802.11n ht20 Middle Channel



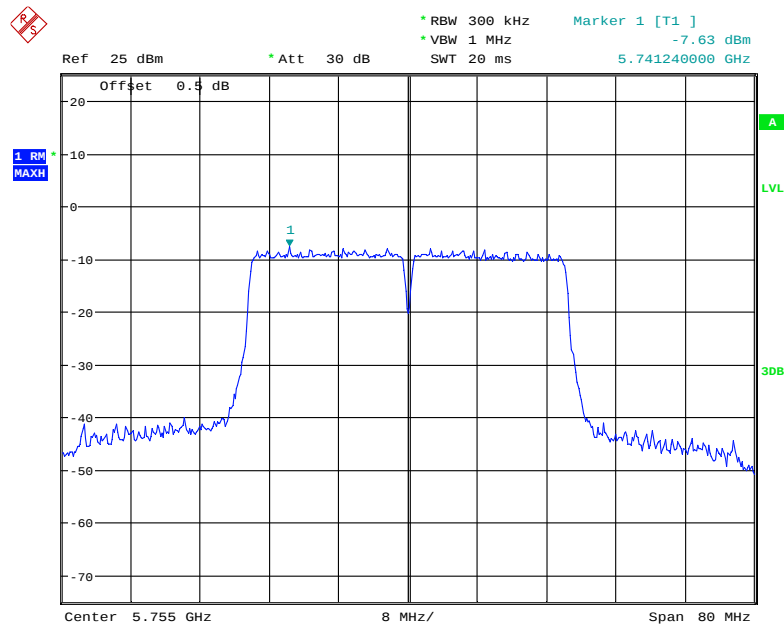
Date: 8.JAN.2019 19:31:54

### 802.11n ht20 High Channel



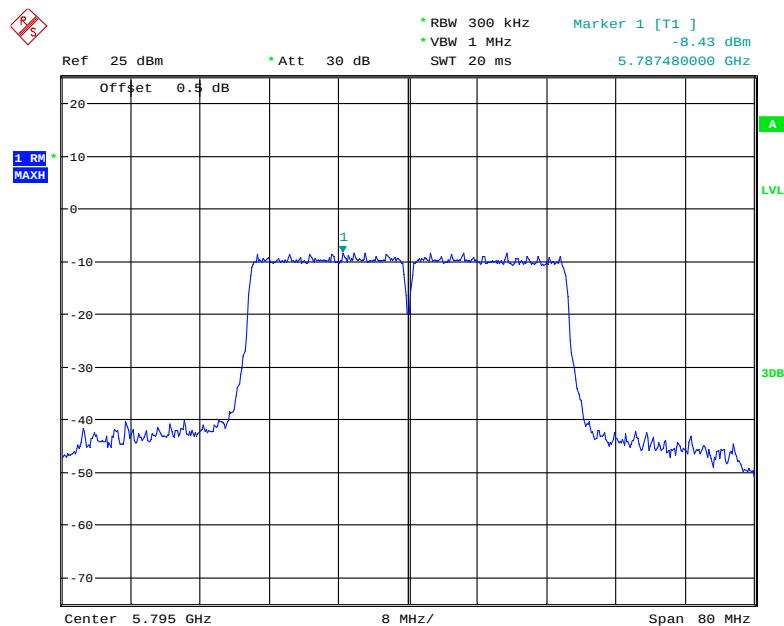
Date: 8.JAN.2019 19:36:44

### 802.11n ht40 Low Channel



Date: 8.JAN.2019 19:42:42

### 802.11n ht40 High Channel



Date: 8.JAN.2019 19:40:09

\*\*\*\*\* END OF REPORT \*\*\*\*\*