# MEASUREMENT REPORT

## FCC PART 15 Subpart E & IC RSS-247 WLAN 802.11a/n/ac

| | |
|---|---|
| **FCC ID:** | 2AWJG-OTPR |
| **IC:** | 26228-OTPR |
| **APPLICANT:** | OhmniLabs, Inc. |
| **Application Type:** | Certification |
| **Product:** | OHMNI TELEPRESENCE ROBOTS |
| **Model No.:** | OHMNI ROBOT |
| **FCC Classification:** | Unlicensed National Information Infrastructure (UNII) |
| **FCC Rule Part(s):** | Part 15 Subpart E (Section 15.407) |
| **IC Standard:** | RSS-247 Issue 2 |
| **Test Procedure(s):** | ANSI C63.10-2013, KDB 789033 D02v02r01, KDB 662911 D01v02r01 |
| **Received Date:** | March 25,2020 |
| **Test Date:** | April 23~June 10,2020 |

**Tested By** : Peter Syu

( Peter Syu )

**Reviewed By** : Paddy Chen

( Paddy Chen )

**Approved By** : Chenz Ker

( Chenz Ker)

Testing Laboratory
3261

The test results only relate to the tested samples.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

# Revision History

| Report No. | Version | Description | Issue Date | Note |
|---|---|---|---|---|
| 2003TW3801-U3 | 1.0 | Original Report | 2020-07-22 | |

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## §2.1033 General Information

| | |
|---|---|
| **Applicant** | OhmniLabs, Inc. |
| **Applicant Address** | 2367 Bering Dr, San Jose, CA 95131, United States |
| **Manufacturer** | AAEON Technology, Inc. |
| **Manufacturer Address** | 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist., New Taipei City, 231 Taiwan, R.O.C. |
| **Test Site** | MRT Technology (Taiwan) Co., Ltd |
| **Test Site Address** | No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C) |
| **MRT FCC Registration No.** | 291082 |
| **FCC Rule Part(s)** | Part 15 Subpart E (Section 15.407) |
| **IC Standard:** | RSS-247 Issue 2 |
| **Model No.** | OHMNI ROBOT |
| **Test Device Serial No.** | #1 ☐ Production ☒ Pre-Production ☐ Engineering |

**Test Facility / Accreditations**

**Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan ( R.O.C )**

- **MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.**
- **MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.**
- **MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.**

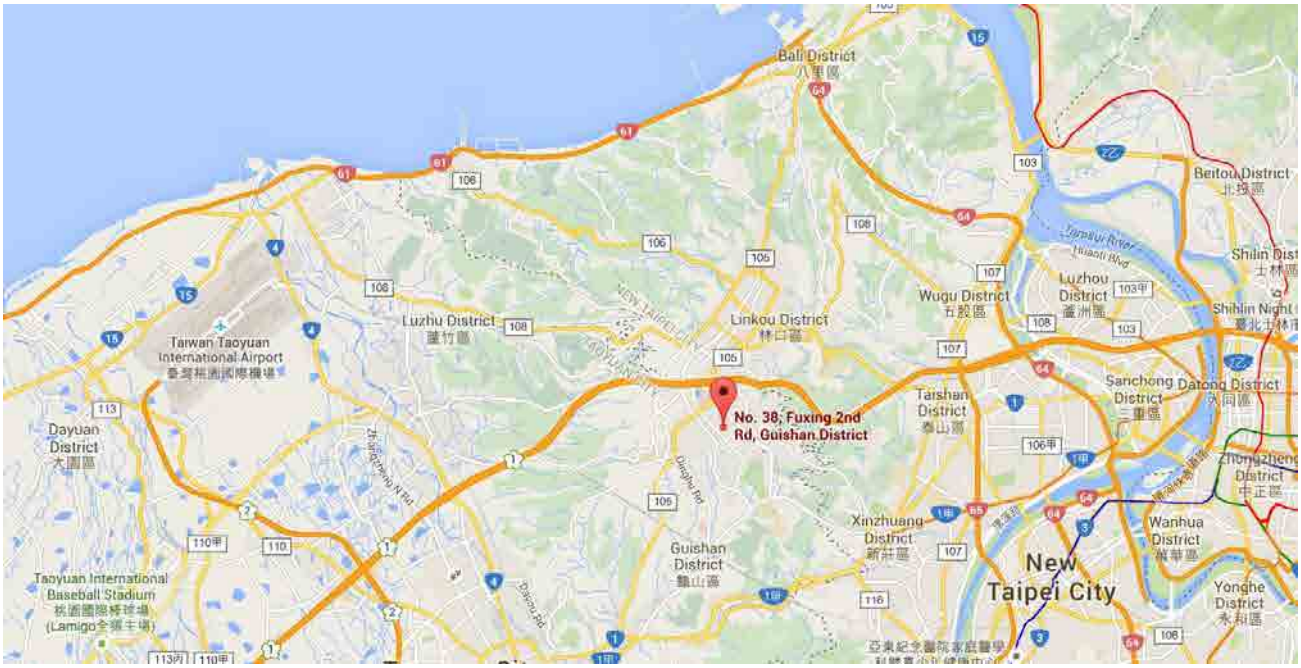
# 1. INTRODUCTION

## 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

## 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



# 2. PRODUCT INFORMATION

## 2.1. Equipment Description

| | |
|---|---|
| Product Name | OHMNI TELEPRESENCE ROBOTS |
| Model No. | OHMNI ROBOT |
| Supports Radios Spec. | WLAN:<br>2.4G: 802.11b/g/n-20/n-40 (2TX/2RX)<br>5G: 802.11a/n-20/ac-20/n-40/ac-40/ac-80, Band 1,2,3,4 (2TX/2RX) |
| Wi-Fi Specification | 802.11a/n/ac |
| Frequency Range | **5GHz:**<br>For 802.11a/n-HT20/ac-VHT-20:<br>5180~5320MHz, 5500~5700MHz, 5745~5825MHz<br>For 802.11n-HT40/ ac-VHT40:<br>5190~5310MHz, 5510~5670MHz, 5755~5795MHz<br>For 802.11ac-VHT80:<br>5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz |
| Maximum Output Power | 802.11a: 16.45dBm<br>802.11n-HT20: 15.46dBm,<br>802.11ac- VHT20: 15.49dBm<br>802.11n-HT40: 15.31dBm,<br>802.11ac- VHT40: 15.36dBm<br>802.11ac-VHT80: 14.29dBm |
| Modulation Type | 802.11a/n-20/ac-20/n-40/ac-40/ac-80: OFDM (BPSK, QPSK, 16QAM, 64QAM,256QAM) |
| Adapter | Brand Name: Atech OEM<br>Model No: ADS065T-W 240200<br>Input: AC 100-240V~ 50-60Hz 2.0A<br>Output: DC 24V, 2.0A |

## 2.2. Operation Frequencies and Channel List

802.11 a/n-HT20/ ac-VHT20

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 36 | 5180 MHz | 40 | 5200 MHz | 44 | 5220 MHz |
| 48 | 5240 MHz | 52 | 5260 MHz | 56 | 5280 MHz |
| 60 | 5300 MHz | 64 | 5320 MHz | 100 | 5500 MHz |
| 104 | 5520 MHz | 108 | 5540 MHz | 112 | 5560 MHz |
| 120 | 5600 MHz | 124 | 5620 MHz | 128 | 5640 MHz |
| 132 | 5660 MHz | 136 | 5680 MHz | 140 | 5700 MHz |
| 144 | 5720 MHz | 149 | 5745 MHz | 153 | 5765 MHz |
| 157 | 5785 MHz | 161 | 5805 MHz | 165 | 5825 MHz |

802.11 n-HT40/ ac-VHT40

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 38 | 5190 MHz | 46 | 5230 MHz | 54 | 5270 MHz |
| 62 | 5310 MHz | 102 | 5510 MHz | 110 | 5550 MHz |
| 126 | 5630 MHz | 134 | 5670 MHz | 151 | 5755 MHz |
| 159 | 5795 MHz | -- | -- | -- | -- |

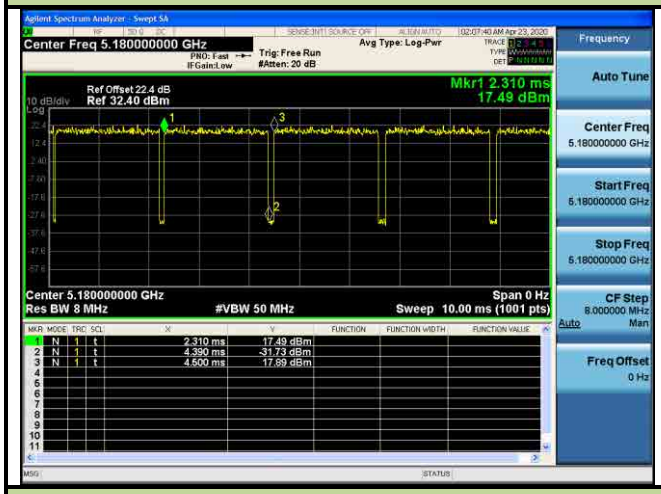
802.11ac-VHT80

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 42 | 5210 MHz | 58 | 5290 MHz | 106 | 5530 MHz |
| 122 | 5610 MHz | 138 | 5690 MHz | 155 | 5775 MHz |

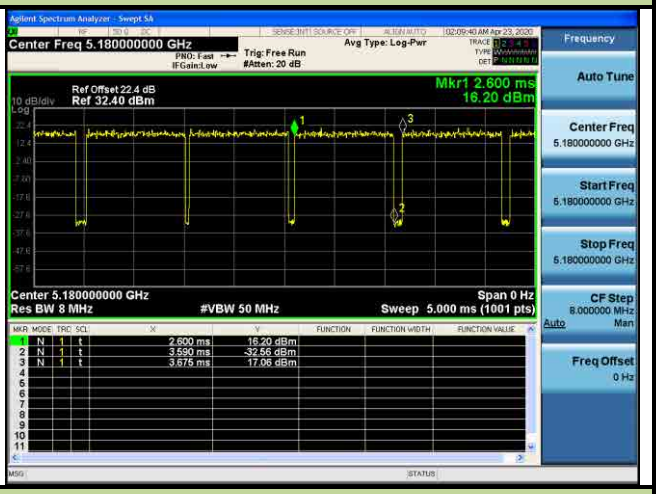
Duty Cycle

| Test Mode | Duty Cycle |
|---|---|
| 802.11a | 95% |
| 802.11n-HT20 | 92% |
| 802.11ac-VHT20 | 91% |
| 802.11n-HT40 | 79% |
| 802.11ac-VHT40 | 79% |
| 802.11ac-VHT80 | 68% |

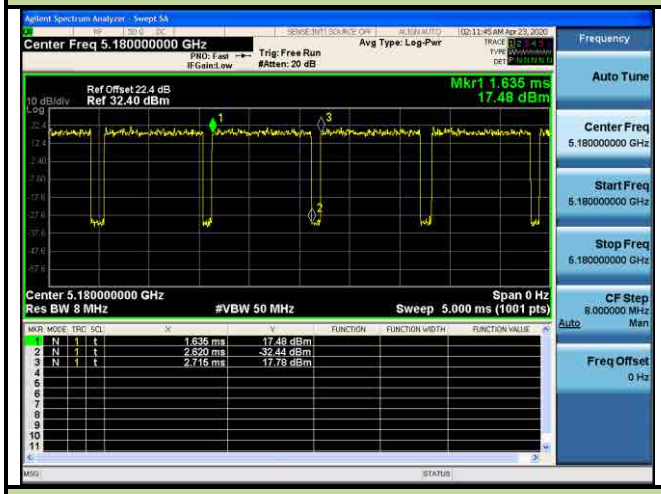
**802.11 a**



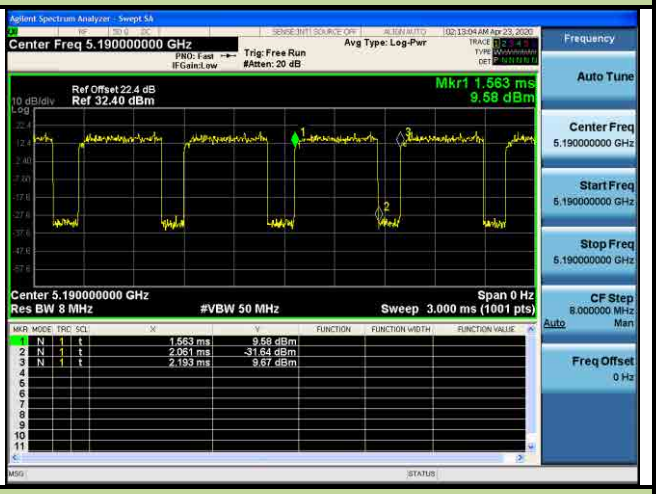

**802.11 n20**



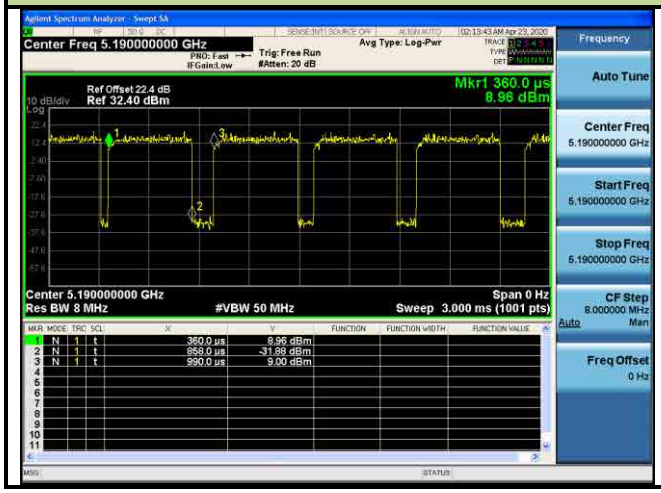

**802.11ac-20**



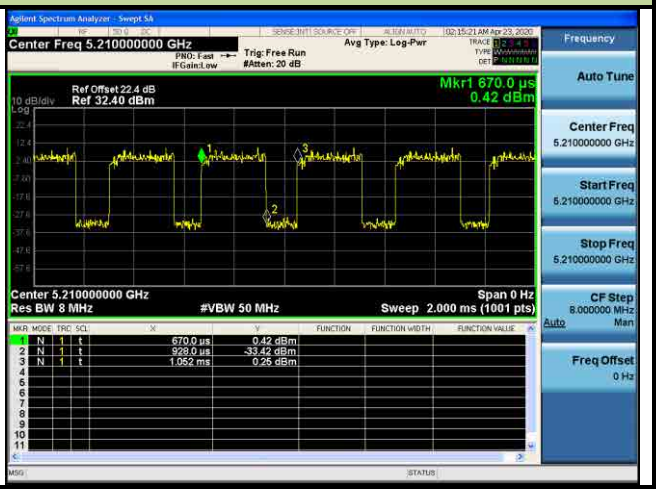

**802.11 n40**




**802.11 ac40**




**802.11 ac80**



## 2.3. Test Mode

| | |
|---|---|
| Test Mode | Mode 1: Transmit by 802.11a |
| | Mode 2: Transmit by 802.11n-HT20 |
| | Mode 3: Transmit by 802.11ac- VHT 20 |
| | Mode 4: Transmit by 802.11n-HT40 |
| | Mode 5: Transmit by 802.11ac- VHT 40 |
| | Mode 6: Transmit by 802.11ac-VHT80 |
| | Mode 7: Receive by 802.11n-20 |

## 2.4. Test Software

The test utility software used during testing was “WLAN Test”.

## 2.5. Device Capabilities

This device contains the following capabilities:
2.4GHz WLAN (DTS) and 5GHz WLAN (NII).
**Note:** 5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = average per the guidance of Section B)2)b) of KDB 789033 D02v02r01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100.

## 2.6. Test Configuration

This device was tested per the guidance of KDB 789033 D02v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

## 2.7. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

## 2.8. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19
The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

# 3. DESCRIPTION OF TEST

## 3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 789033 were used in the measurement of the device.

**Deviation from measurement procedure…….....None**

## 3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 9'x4'x3' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

Line conducted emissions test results are shown in Section 7.10.

### 3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

# 4. ANTENNA REQUIREMENTS

**Excerpt from §15.203 of the FCC Rules/Regulations:**

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna of the **OHMNI TELEPRESENCE ROBOTS,** is permanently attached.
- There are no provisions for connection to an external antenna.

**Conclusion:**

The EUT unit complies with the requirement of §15.203.

**Antenna List**

| No. | Manufacturer | Part No. | Antenna Type | Peak Gain |
|---|---|---|---|---|
| 1 | N/A | UD812A08_1v0 | PCB | 6dBi*2 |

Note :

1. Directional gain = $G_{ANT}$ + Array Gain, where Array Gain is as follows.
   - For power spectral density (PSD) measurements on all devices,

   Array Gain = 10 log ($N_{ANT}$/ $N_{SS}$) dB = 3.01;
   - For power measurements on IEEE 802.11 devices,

   Array Gain = 0 dB for $N_{ANT} \leq 4$;
2. For PSD , Directional gain = 6+3.01= 9.01

# 5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions – SR2

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| Two-Line V-Network | R&S | ENV216 | MRTTWA00019 | 1 year | 2021/3/26 |
| Cable | Rosnol | N1C50-RG400-B 1C50-500CM | MRTTWE00013 | 1 year | 2021/6/21 |
| EMI Test Receiver | R&S | ESR3 | MRTTWA00009 | 1 year | 2021/3/25 |

Radiated Emissions – AC1

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| Broadband TRILOG Antenna | SCHWARZBECK | VULB 9162 | MRTTWA00001 | 1 year | 2020/9/4 |
| EMI Test Receiver | R&S | ESR3 | MRTTWA00009 | 1 year | 2021/3/26 |
| Acitve Loop Antenna | Schwarzbeck | FMZB 1519B | MRTTWA00002 | 1 year | 2021/4/27 |
| Broadband Horn antenna | SCHWARZBECK | BBHA 9120D | MRTTWA00003 | 1 year | 2021/4/24 |
| Breitband Hornantenna | Schwarzbeck | BBHA 9170 | MRTTWA00004 | 1 year | 2021/4/24 |
| Broadband Amplifier | Schwarzbeck | BBV 9721 | MRTTWA00006 | 1 year | 2021/4/24 |
| Broadband Preamplifier | SCHWARZBECK | BBV 9718 | MRTTWA00005 | 1 year | 2021/4/24 |
| Antenna Cable | HUBERSUHNER | SF106 | MRTTWE00010 | 1 year | 2021/6/16 |
| Cable | Rosnol | K1K50-UP0264-K1K50-4M | MRTTWE00012 | 1 year | 2020/6/21 |

Conducted Test Equipment – SR2

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| EXA Signal Analyzer | KEYSIGHT | N9010A | MRTTWA00012 | 1 year | 2020/10/2 |
| EXA Signal Analyzer | KEYSIGHT | N9010B | MRTTWA00074 | 1 year | 2020/7/11 |
| USB Wideband Power Sensor | KEYSIGHT | U2021XA | MRTTWA00015 | 1 year | 2021/3/26 |

Test Software

| Software | Version | Function |
|---|---|---|
| e3 | 9.160520a | EMI Test Software |
| EMI | V3 | EMI Test Software |

# 6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

| |
|---|
| Conducted Emission- Power Line |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>0.15MHz~30MHz: ± 2.53dB |
| Radiated Spurious Emission |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>9kHz~30MHz: ± 3.92dB<br>30MHz~1GHz: ± 4.25dB<br>1GHz~18GHz: ± 4.40dB<br>18GHz~40GHz: ± 4.45dB |
| Frequency Error |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ±78.4Hz |
| Conducted Power |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ± 0.84dB |
| Conducted Spurious Emission |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):± 2.65 dB |
| Occupied Bandwidth |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 3.3% |
| Temp. / Humidity |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ±0.82°C/ ±3% |
| DC Voltage |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ±0.3% |

# 7. TEST RESULT

## 7.1. Summary

**Company Name:** **OHMNI TELEPRESENCE ROBOTS**

**FCC Classification:** **Unlicensed National Information Infrastructure (UNII)**

**Data Rate(s) Tested:** **6Mbps ~ 54Mbps (a);**
**6.5/7.2Mbps ~ 130/144.4Mbps (n-HT20);**
**13.5/15.0Mbps ~ 270/300Mbps (n-HT40);**
**6.5/7.2Mbps ~ 156/173.4Mbps (ac-VHT20MHz);**
**13.5/15.0Mbps ~ 360/400Mbps (ac-VHT40MHz);**
**29.3/32.5Mbps ~ 780/866.7Mbps (ac-VHT80MHz)**

| FCC Section(s) | IC Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|---|---|---|---|---|---|---|
| 15.407(a) | RSS-247 §6.2.1 | 26dB Bandwidth | N/A | Conducted | Pass | Section 7.2 |
| 15.407(e) | RSS-247 §6.2.4 | 6dB Bandwidth | ≥ 500kHz | | Pass | Section 7.3 |
| 15.407(a)(1)(i), (2), (3) | RSS-247 §6.2.1, §6.2.2, §6.2.3, §6.2.4 | Maximum Conducted Output Power | Refer to Section 7.5 | | Pass | Section 7.5 |
| 15.407(h)(1) | RSS-247 §6.2.2, §6.2.3 | Transmit Power Control | ≤ 24 dBm | | N/A | Section 7.6 |
| 15.407(a)(1)(i), (2), (3), (5) | RSS-247 §6.2.1, §6.2.2, §6.2.3, §6.2.4 | Power Spectral Density | Refer to Section 7.7 | | Pass | Section 7.7 |
| 15.407(b)(1), (4) | RSS-247 §6.2.1, §6.2.2, §6.2.3, §6.2.4 | Undesirable Emissions | ≤ -27dBm/MHz EIRP<br>≤ -17dBm/MHz EIRP | Radiated | Pass | Section 7.8 & 7.9 |
| 15.205, 15.209 15.407(b)(5), (6), (7) | RSS-247 §6.2.1, §6.2.2, §6.2.3, §6.2.4 | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | | Pass | |
| 15.207 | RSS-Gen 8.8 | AC Conducted Emissions 150kHz - 30MHz | < FCC 15.207 limits | Line Conducted | Pass | Section 7.10 |

Notes:

1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

## 7.2. 26dB Bandwidth Measurement

### 7.2.1. Test Limit

N/A

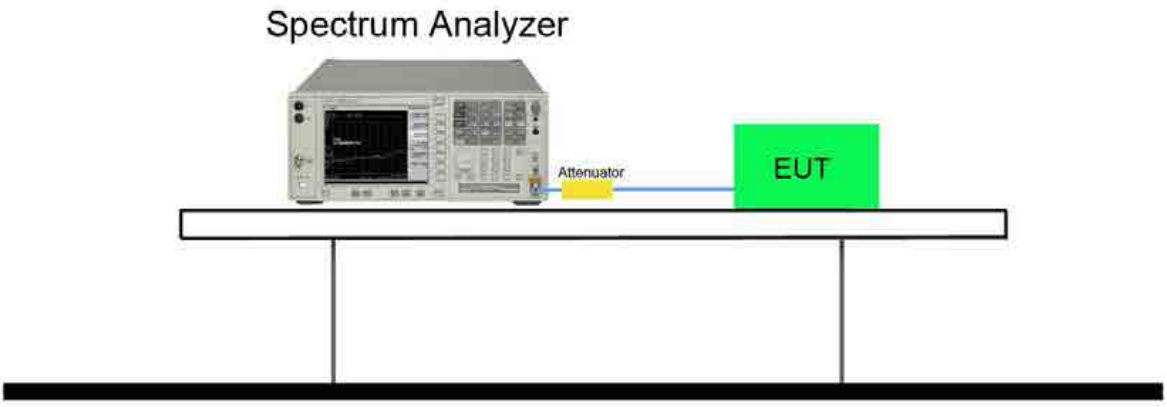
### 7.2.2. Test Procedure used

KDB 789033 D02v02r01 - Section C.1 / ANSI C63.10 6.9.3 / RSS-Gen 6.7

### 7.2.3. Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.

### 7.2.4. Test Setup



### 7.2.5. Test Result

| Product | OHMNI TELEPRESENCE ROBOTS | Test Engineer | Peter |
|---|---|---|---|
| Test Site | SR2 | Test Date | 2020/05/26 |
| Test Item | 26dB Bandwidth & 99% Bandwidth | | |

| Test Mode | Channel No. | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|---|
| Antenna 0 | | | | |
| 802.11a | 36 | 5180 | 20.990 | 16.636 |
| 802.11a | 44 | 5220 | 20.360 | 16.567 |
| 802.11a | 48 | 5240 | 20.980 | 16.617 |
| 802.11a | 52 | 5260 | 20.200 | 16.623 |
| 802.11a | 60 | 5300 | 20.290 | 16.558 |
| 802.11a | 64 | 5320 | 20.990 | 16.618 |
| 802.11a | 100 | 5500 | 19.570 | 16.568 |
| 802.11a | 120 | 5600 | 20.870 | 16.635 |
| 802.11a | 140 | 5700 | 20.620 | 16.607 |
| 802.11a | 144 | 5720 | 20.610 | 16.609 |
| 802.11a | 149 | 5745 | 20.100 | 16.597 |
| 802.11a | 157 | 5785 | 20.390 | 16.615 |
| 802.11a | 165 | 5825 | 20.490 | 16.549 |
| 802.11n-HT20 | 36 | 5180 | 20.860 | 17.717 |
| 802.11n-HT20 | 44 | 5220 | 20.940 | 17.767 |
| 802.11n-HT20 | 48 | 5240 | 20.340 | 17.661 |
| 802.11n-HT20 | 52 | 5260 | 20.660 | 17.684 |
| 802.11n-HT20 | 60 | 5300 | 21.200 | 17.672 |
| 802.11n-HT20 | 64 | 5320 | 20.980 | 17.652 |
| 802.11n-HT20 | 100 | 5500 | 21.130 | 17.729 |
| 802.11n-HT20 | 120 | 5600 | 21.110 | 17.698 |
| 802.11n-HT20 | 140 | 5700 | 21.100 | 17.604 |
| 802.11n-HT20 | 144 | 5720 | 21.030 | 17.699 |
| 802.11n-HT20 | 149 | 5745 | 20.680 | 17.677 |
| 802.11n-HT20 | 157 | 5785 | 20.580 | 17.690 |
| 802.11n-HT20 | 165 | 5825 | 20.470 | 17.717 |

| Test Mode | Channel No. | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|---|
| 802.11n-HT40 | 38 | 5190 | 42.690 | 36.275 |
| 802.11n-HT40 | 46 | 5230 | 41.030 | 36.326 |
| 802.11n-HT40 | 54 | 5270 | 42.900 | 36.262 |
| 802.11n-HT40 | 62 | 5310 | 41.830 | 36.207 |
| 802.11n-HT40 | 102 | 5510 | 41.560 | 36.207 |
| 802.11n-HT40 | 110 | 5550 | 41.940 | 36.276 |
| 802.11n-HT40 | 134 | 5670 | 41.530 | 36.312 |
| 802.11n-HT40 | 142 | 5710 | 42.380 | 36.252 |
| 802.11n-HT40 | 151 | 5755 | 41.890 | 36.203 |
| 802.11n-HT40 | 159 | 5795 | 41.230 | 36.231 |
| 802.11ac-VHT80 | 42 | 5210 | 80.650 | 75.044 |
| 802.11ac-VHT80 | 58 | 5290 | 80.520 | 75.129 |
| 802.11ac-VHT80 | 106 | 5530 | 79.900 | 75.235 |
| 802.11ac-VHT80 | 122 | 5610 | 80.280 | 75.300 |
| 802.11ac-VHT80 | 138 | 5690 | 80.910 | 75.076 |
| 802.11ac-VHT80 | 155 | 5775 | 81.480 | 75.175 |

| Test Mode | Channel No. | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|---|
| Antenna 1 | | | | |
| 802.11a | 36 | 5180 | 20.030 | 16.641 |
| 802.11a | 44 | 5220 | 20.130 | 16.508 |
| 802.11a | 48 | 5240 | 20.500 | 16.580 |
| 802.11a | 52 | 5260 | 20.020 | 16.538 |
| 802.11a | 60 | 5300 | 20.350 | 16.592 |
| 802.11a | 64 | 5320 | 20.060 | 16.594 |
| 802.11a | 100 | 5500 | 20.140 | 16.556 |
| 802.11a | 120 | 5600 | 19.910 | 16.505 |
| 802.11a | 140 | 5700 | 20.390 | 16.552 |
| 802.11a | 144 | 5720 | 20.450 | 16.486 |
| 802.11a | 149 | 5745 | 20.740 | 16.542 |
| 802.11a | 157 | 5785 | 20.490 | 16.587 |
| 802.11a | 165 | 5825 | 20.470 | 16.527 |
| 802.11n-HT20 | 36 | 5180 | 20.800 | 17.690 |
| 802.11n-HT20 | 44 | 5220 | 20.430 | 17.663 |
| 802.11n-HT20 | 48 | 5240 | 20.640 | 17.707 |
| 802.11n-HT20 | 52 | 5260 | 21.830 | 17.700 |
| 802.11n-HT20 | 60 | 5300 | 20.670 | 17.695 |
| 802.11n-HT20 | 64 | 5320 | 20.900 | 17.656 |
| 802.11n-HT20 | 100 | 5500 | 20.520 | 17.657 |
| 802.11n-HT20 | 120 | 5600 | 20.960 | 17.685 |
| 802.11n-HT20 | 140 | 5700 | 21.310 | 17.689 |
| 802.11n-HT20 | 144 | 5720 | 20.420 | 17.665 |
| 802.11n-HT20 | 149 | 5745 | 20.820 | 17.694 |
| 802.11n-HT20 | 157 | 5785 | 19.910 | 17.654 |
| 802.11n-HT20 | 165 | 5825 | 20.080 | 17.704 |

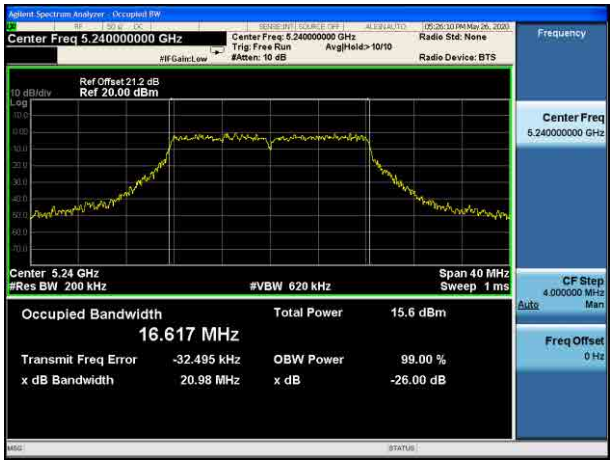
| Test Mode | Channel No. | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|---|
| 802.11n-HT40 | 38 | 5190 | 42.080 | 36.382 |
| 802.11n-HT40 | 46 | 5230 | 39.890 | 36.188 |
| 802.11n-HT40 | 54 | 5270 | 40.300 | 36.238 |
| 802.11n-HT40 | 62 | 5310 | 41.240 | 36.188 |
| 802.11n-HT40 | 102 | 5510 | 42.060 | 36.178 |
| 802.11n-HT40 | 110 | 5550 | 40.930 | 36.357 |
| 802.11n-HT40 | 134 | 5670 | 41.460 | 36.314 |
| 802.11n-HT40 | 142 | 5710 | 41.360 | 36.218 |
| 802.11n-HT40 | 151 | 5755 | 40.810 | 36.236 |
| 802.11n-HT40 | 159 | 5795 | 41.660 | 36.244 |
| 802.11ac-VHT80 | 42 | 5210 | 81.470 | 75.056 |
| 802.11ac-VHT80 | 58 | 5290 | 79.600 | 74.860 |
| 802.11ac-VHT80 | 106 | 5530 | 79.120 | 75.073 |
| 802.11ac-VHT80 | 122 | 5610 | 79.650 | 75.148 |
| 802.11ac-VHT80 | 138 | 5690 | 79.890 | 75.171 |
| 802.11ac-VHT80 | 155 | 5775 | 79.040 | 75.027 |

## 802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0

### Channel 36 (5180MHz)

### Channel 44 (5220MHz)

### Channel 48 (5240MHz)




### Channel 52 (5260MHz)

### Channel 60 (5300MHz)

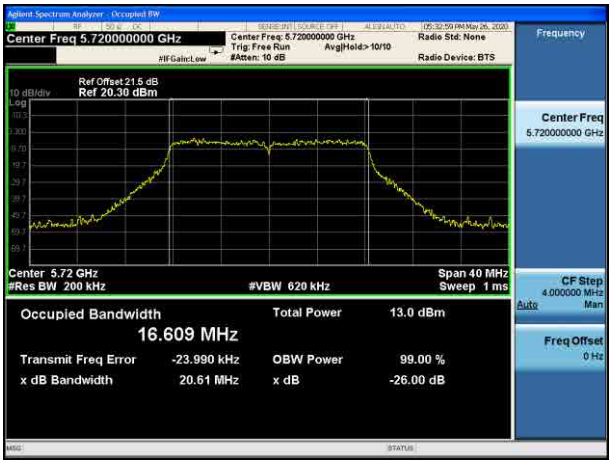
### Channel 64 (5320MHz)

## Channel 100 (5500MHz)

## Channel 120 (5600MHz)

## Channel 140 (5700MHz)

## Channel 144 (5720MHz)




## Channel 149 (5745MHz)

## Channel 157 (5785MHz)

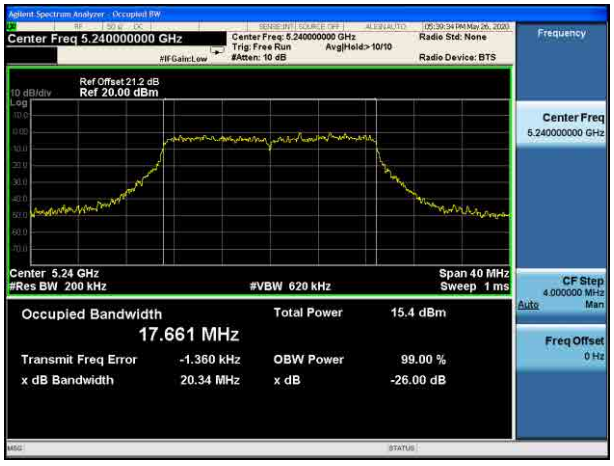
| Channel 165 (5825MHz) | |
|---|---|
| | |

## 802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 0

### Channel 36 (5180MHz)

### Channel 44 (5220MHz)

### Channel 48 (5240MHz)

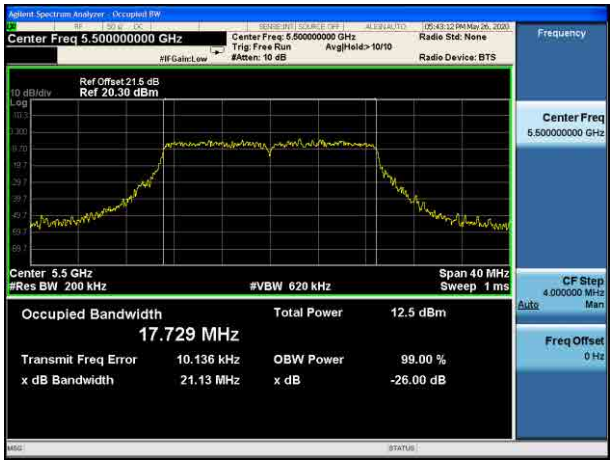



### Channel 52 (5260MHz)

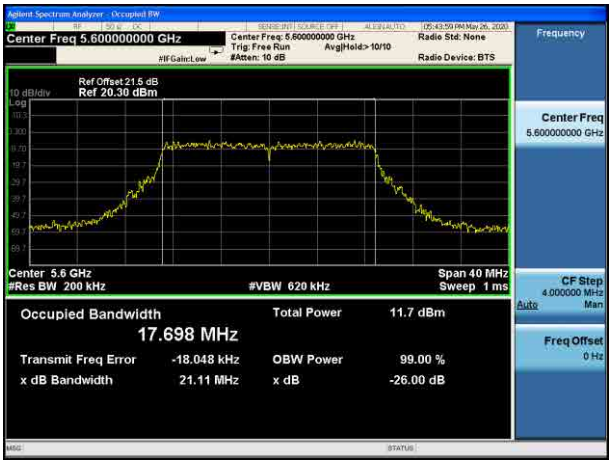
### Channel 60 (5300MHz)

### Channel 64 (5320MHz)

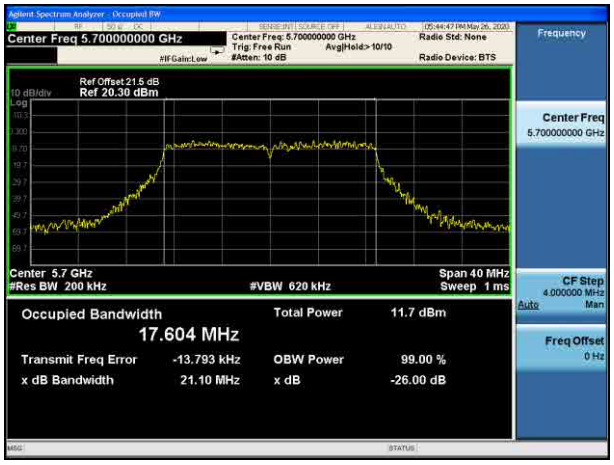
## Channel 100 (5500MHz)




## Channel 120 (5600MHz)




## Channel 140 (5700MHz)




## Channel 144 (5720MHz)

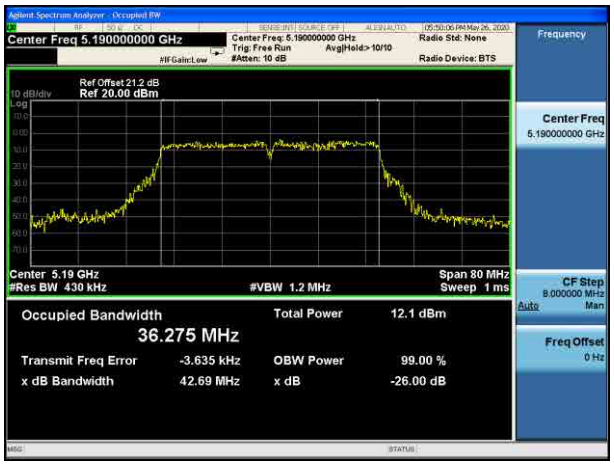
## Channel 149 (5745MHz)

## Channel 157 (5785MHz)

| Channel 165 (5825MHz) | |
|---|---|
| | |

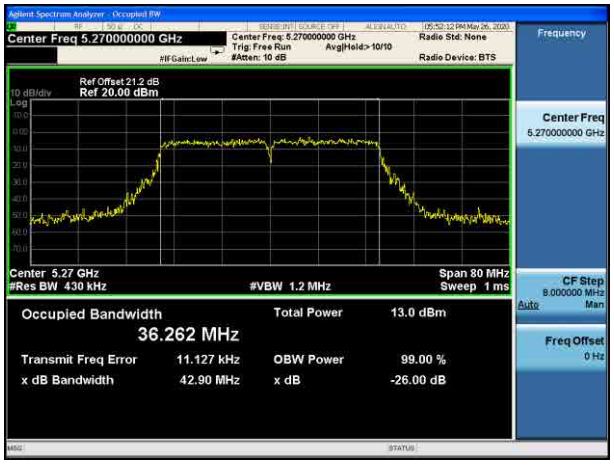
## 802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 0

### Channel 38 (5190MHz)

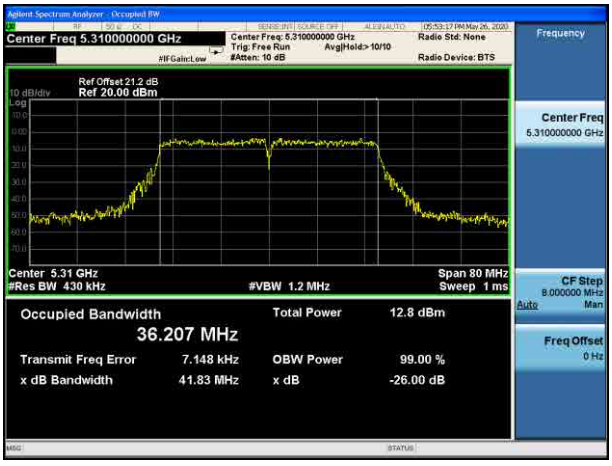



### Channel 46 (5230MHz)

### Channel 54 (5270MHz)

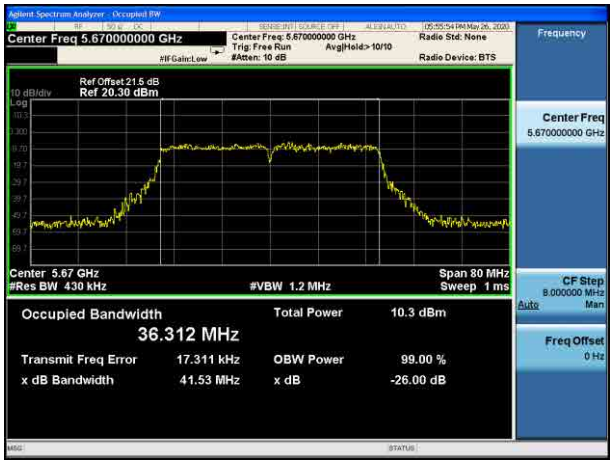
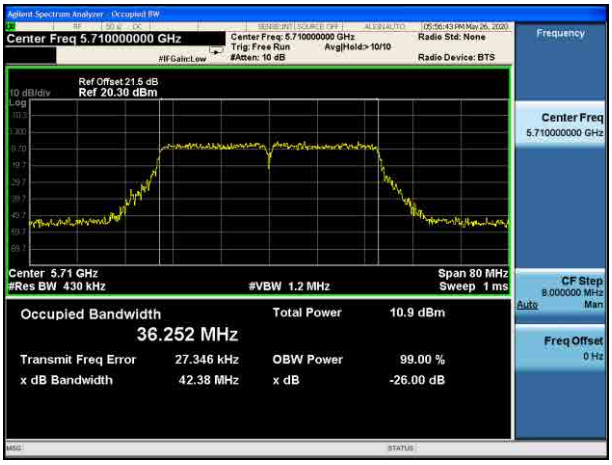
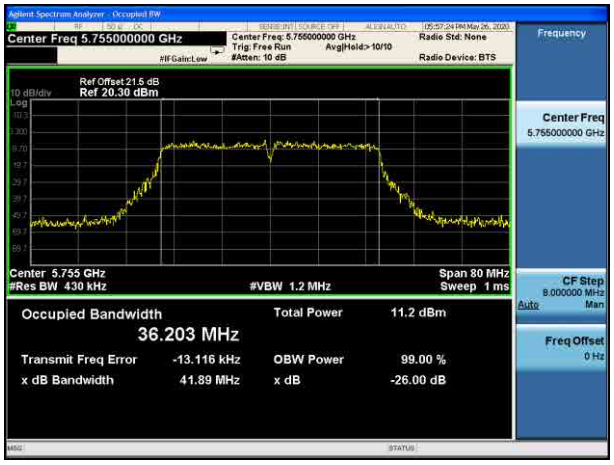
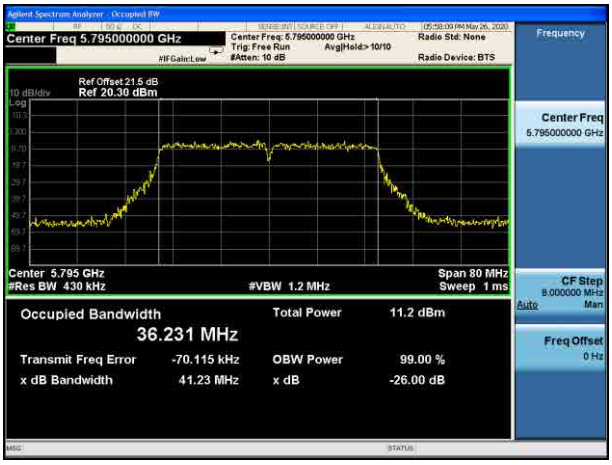



### Channel 62 (5310MHz)



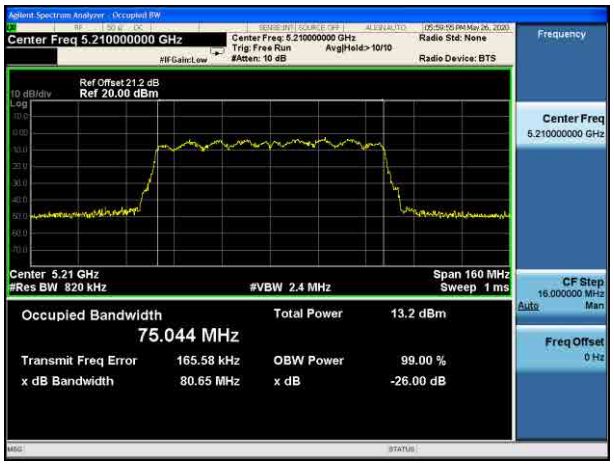

### Channel 102 (5510MHz)

### Channel 110 (5550MHz)

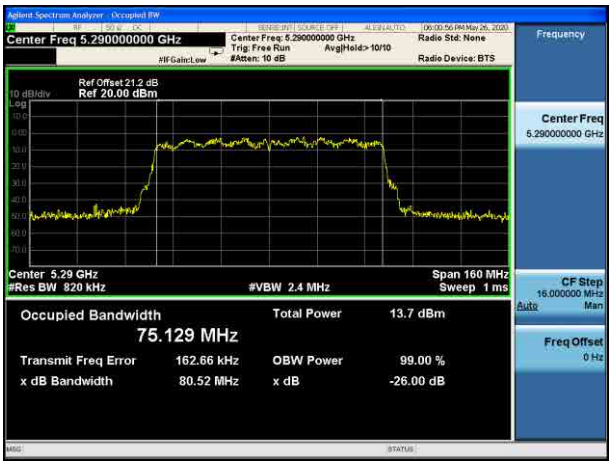
| Channel 134 (5670MHz) | Channel 142 (5710MHz) |
|---|---|
|  |  |
| **Channel 151 (5755MHz)** | **Channel 159 (5795MHz)** |
|  |  |

## 802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 0

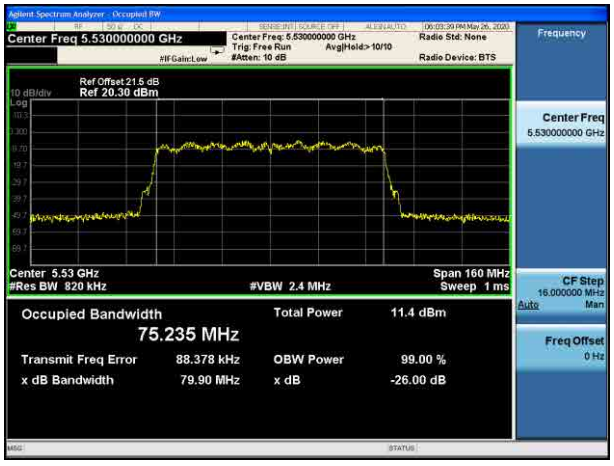
### Channel 42 (5210MHz)



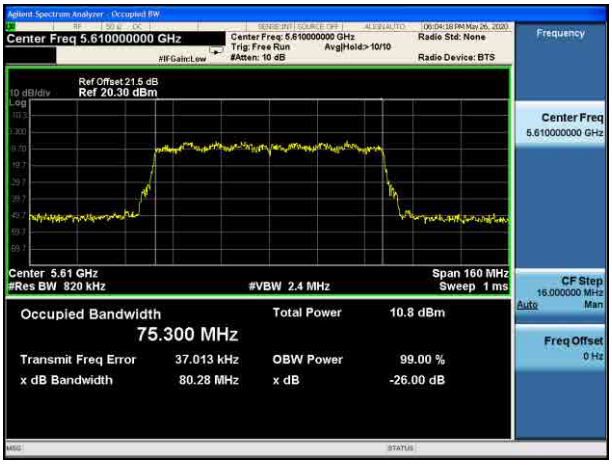

### Channel 58 (5290MHz)



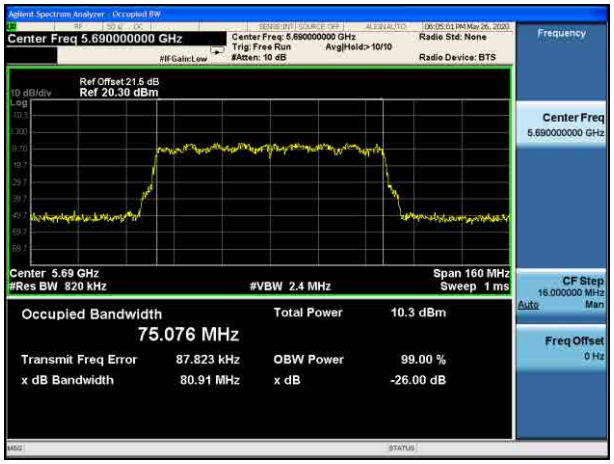

### Channel 106 (5530MHz)



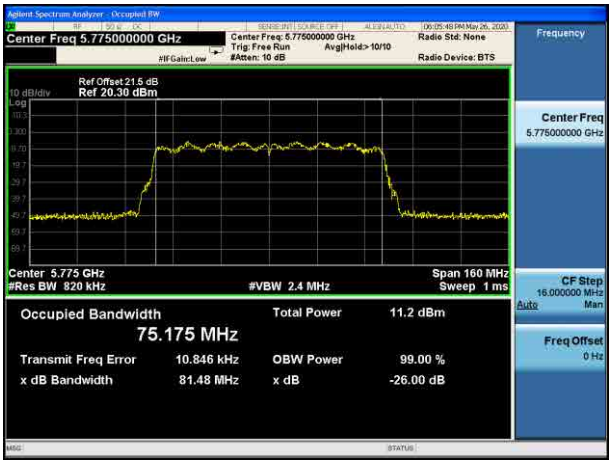

### Channel 122 (5610MHz)




### Channel 138 (5690MHz)




### Channel 155 (5775MHz)

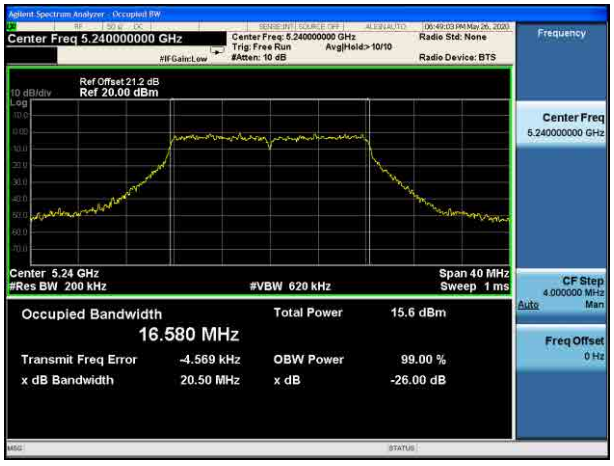


## 802.11a 26dB Bandwidth & 99% Bandwidth - Ant 1

### Channel 36 (5180MHz)

### Channel 44 (5220MHz)

### Channel 48 (5240MHz)




### Channel 52 (5260MHz)

### Channel 60 (5300MHz)

### Channel 64 (5320MHz)

## Channel 100 (5500MHz)

## Channel 120 (5600MHz)

## Channel 140 (5700MHz)

## Channel 144 (5720MHz)

## Channel 149 (5745MHz)

## Channel 157 (5785MHz)

| Channel 165 (5825MHz) | |
|---|---|
| | |

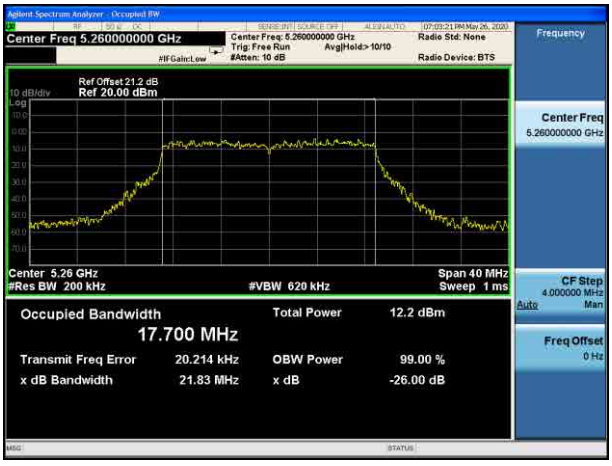
## 802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 1

### Channel 36 (5180MHz)

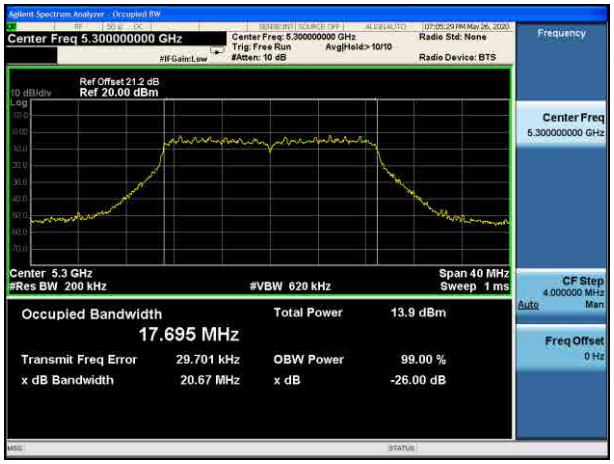
### Channel 44 (5220MHz)

### Channel 48 (5240MHz)

### Channel 52 (5260MHz)

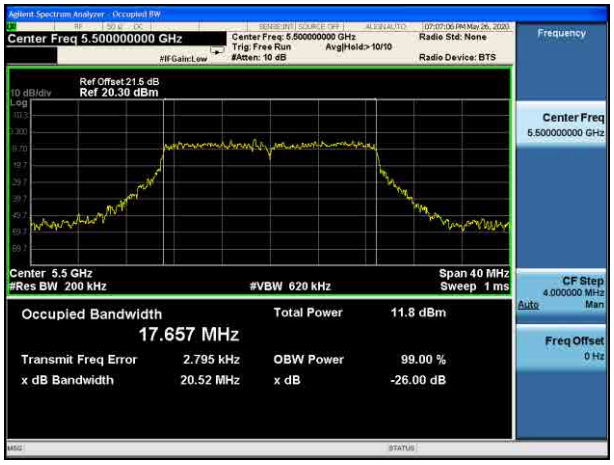



### Channel 60 (5300MHz)



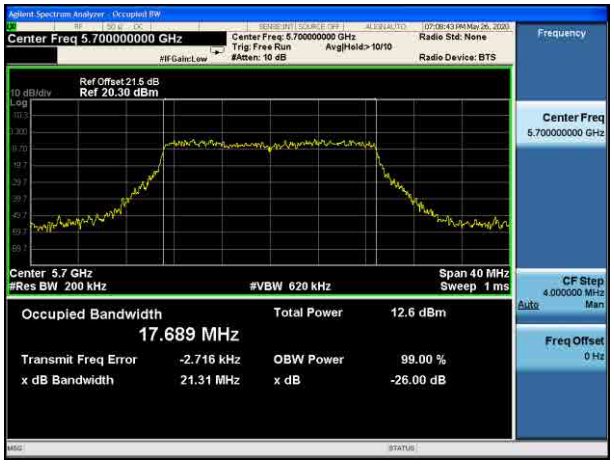

### Channel 64 (5320MHz)

## Channel 100 (5500MHz)

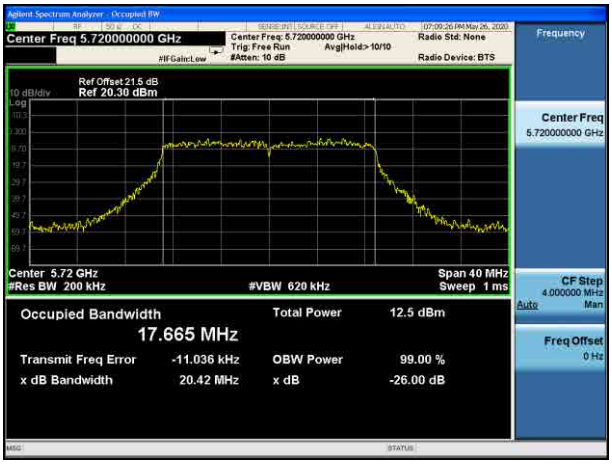



## Channel 120 (5600MHz)

## Channel 140 (5700MHz)




## Channel 144 (5720MHz)




## Channel 149 (5745MHz)

## Channel 157 (5785MHz)

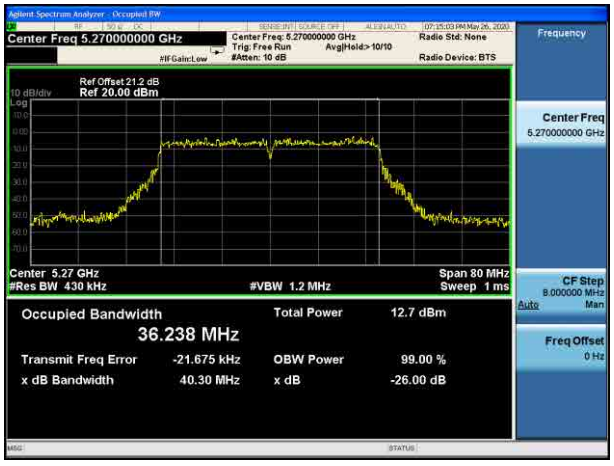
| Channel 165 (5825MHz) | |
|---|---|
| | |

## 802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 1

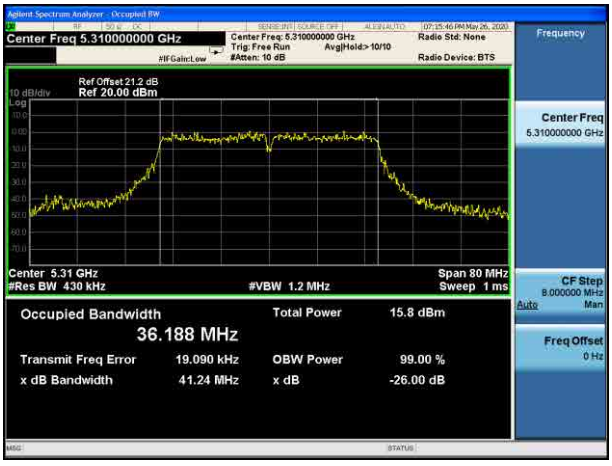
### Channel 38 (5190MHz)

### Channel 46 (5230MHz)

### Channel 54 (5270MHz)

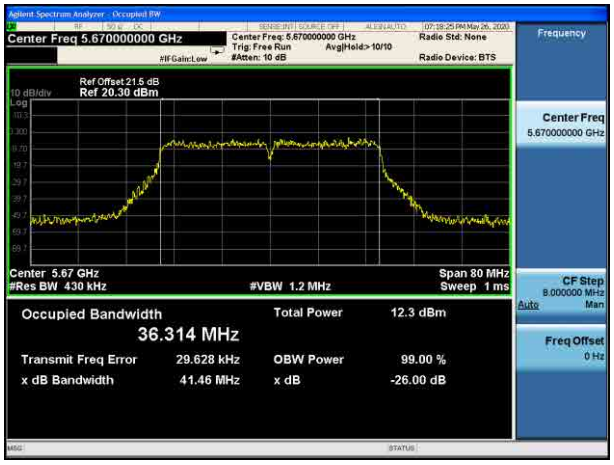
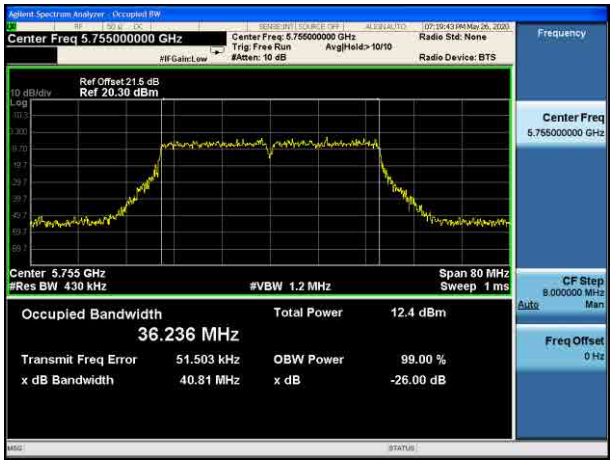
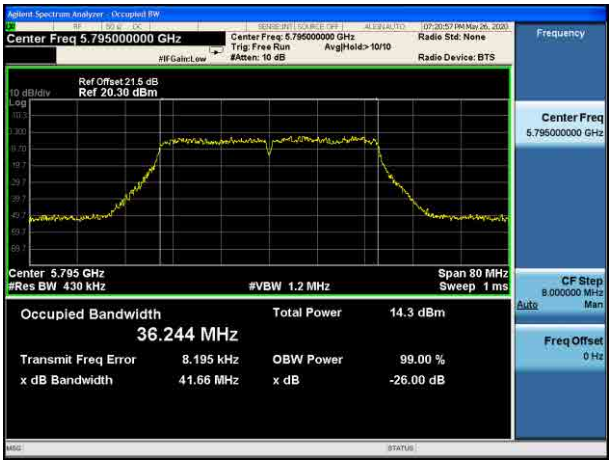



### Channel 62 (5310MHz)



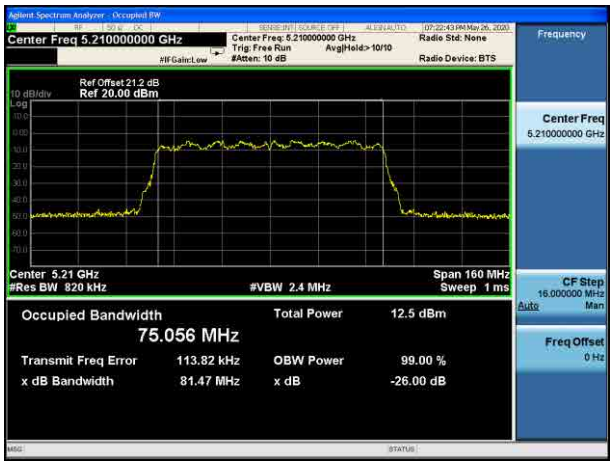

### Channel 102 (5510MHz)

### Channel 110 (5550MHz)

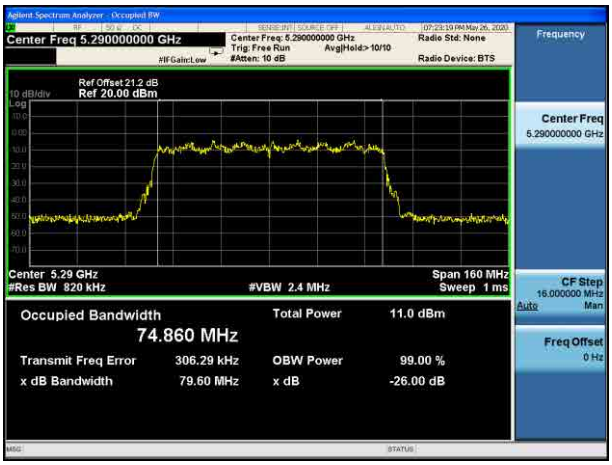
| Channel 134 (5670MHz) | Channel 142 (5710MHz) |
|---|---|
|  | |
| **Channel 151 (5755MHz)** | **Channel 159 (5795MHz)** |
|  |  |

## 802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 1

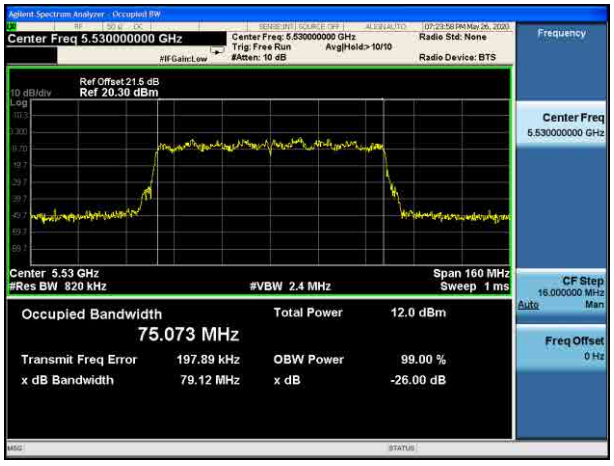
### Channel 42 (5210MHz)



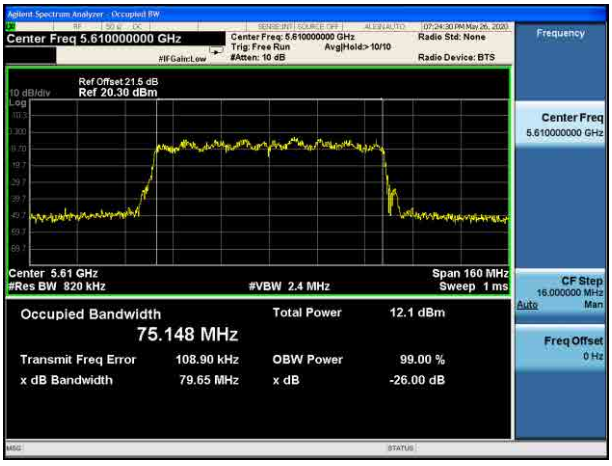

### Channel 58 (5290MHz)



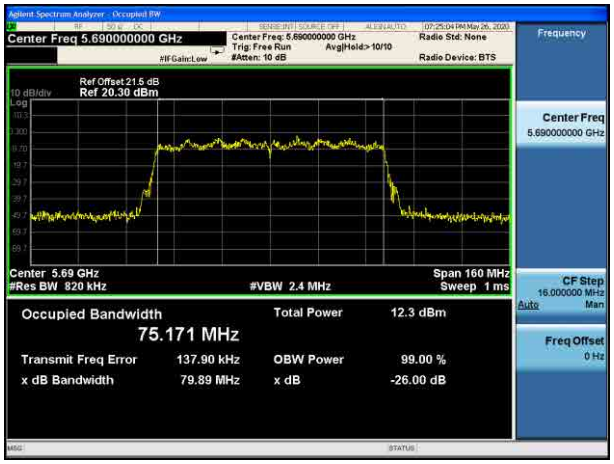

### Channel 106 (5530MHz)



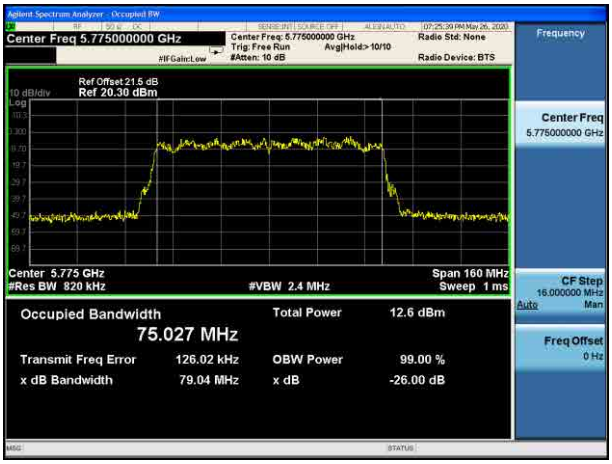

### Channel 122 (5610MHz)




### Channel 138 (5690MHz)




### Channel 155 (5775MHz)



## 7.3. 6dB Bandwidth Measurement

### 7.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

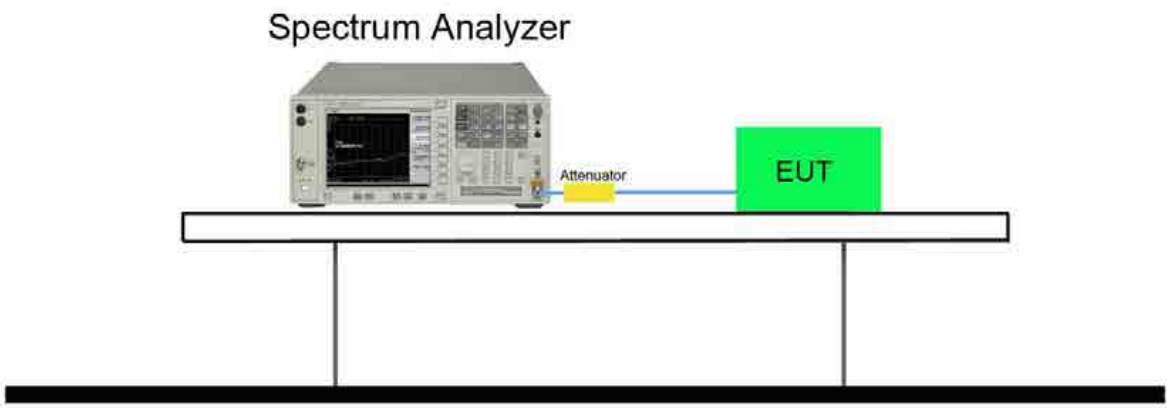
### 7.3.2. Test Procedure used

KDB 789033 D02v02r01 - Section C.2

### 7.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW ≧ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 7.3.4. Test Setup



### 7.3.5. Test Result

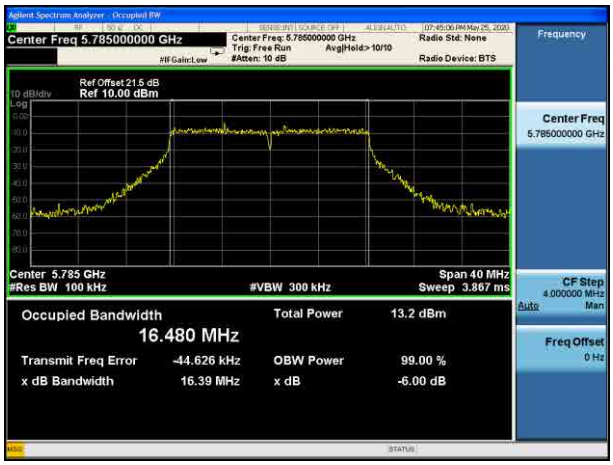
| Product | OHMNI TELEPRESENCE ROBOTS | Test Engineer | Peter |
|---|---|---|---|
| Test Site | SR2 | Test Date | 2020/05/25 |
| Test Item | 6dB Bandwidth | | |

| Test Mode | Channel No. | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|---|
| Antenna 0 | | | | | |
| 802.11a | 149 | 5745 | 16.550 | ≥ 0.5 | Pass |
| 802.11a | 157 | 5785 | 16.390 | ≥ 0.5 | Pass |
| 802.11a | 165 | 5825 | 16.380 | ≥ 0.5 | Pass |
| 802.11n-HT20 | 149 | 5745 | 17.020 | ≥ 0.5 | Pass |
| 802.11n-HT20 | 157 | 5785 | 17.320 | ≥ 0.5 | Pass |
| 802.11n-HT20 | 165 | 5825 | 17.580 | ≥ 0.5 | Pass |
| 802.11n-HT40 | 151 | 5755 | 35.610 | ≥ 0.5 | Pass |
| 802.11n-HT40 | 159 | 5795 | 35.750 | ≥ 0.5 | Pass |
| 802.11ac-VHT80 | 155 | 5775 | 75.080 | ≥ 0.5 | Pass |
| Antenna 1 | | | | | |
| 802.11a | 149 | 5745 | 15.940 | ≥ 0.5 | Pass |
| 802.11a | 157 | 5785 | 16.530 | ≥ 0.5 | Pass |
| 802.11a | 165 | 5825 | 16.390 | ≥ 0.5 | Pass |
| 802.11n-HT20 | 149 | 5745 | 16.970 | ≥ 0.5 | Pass |
| 802.11n-HT20 | 157 | 5785 | 17.590 | ≥ 0.5 | Pass |
| 802.11n-HT20 | 165 | 5825 | 17.030 | ≥ 0.5 | Pass |
| 802.11n-HT40 | 151 | 5755 | 35.820 | ≥ 0.5 | Pass |
| 802.11n-HT40 | 159 | 5795 | 35.850 | ≥ 0.5 | Pass |
| 802.11ac-VHT80 | 155 | 5775 | 74.970 | ≥ 0.5 | Pass |

## 802.11a 6dB Bandwidth - Ant 0

### Channel 149 (5745MHz)

### Channel 157 (5785MHz)

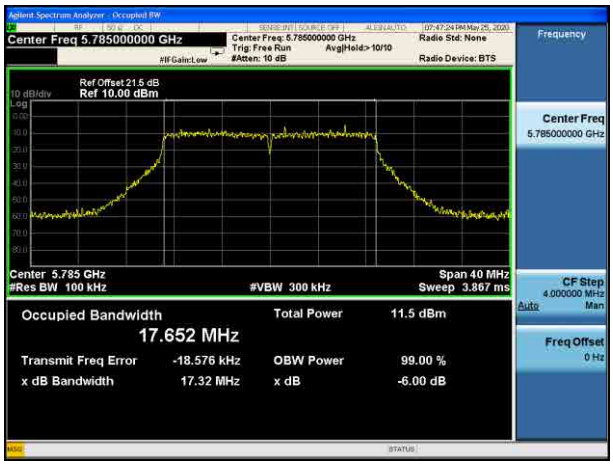



### Channel 165 (5825MHz)

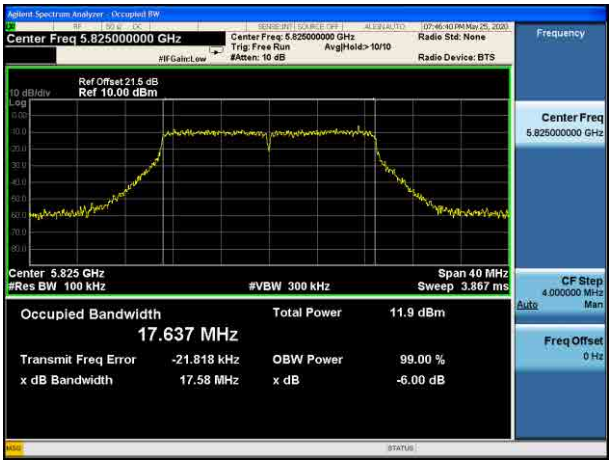
## 802.11n-HT20 6dB Bandwidth - Ant 0

### Channel 149 (5745MHz)

### Channel 157 (5785MHz)



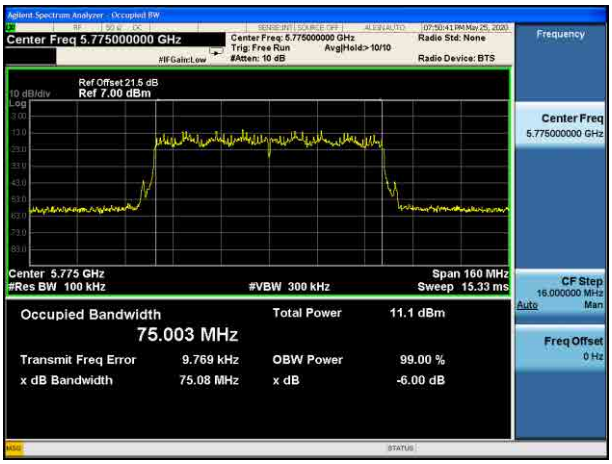

### Channel 165 (5825MHz)




## 802.11n-HT40 6dB Bandwidth - Ant 0

### Channel 151 (5755MHz)

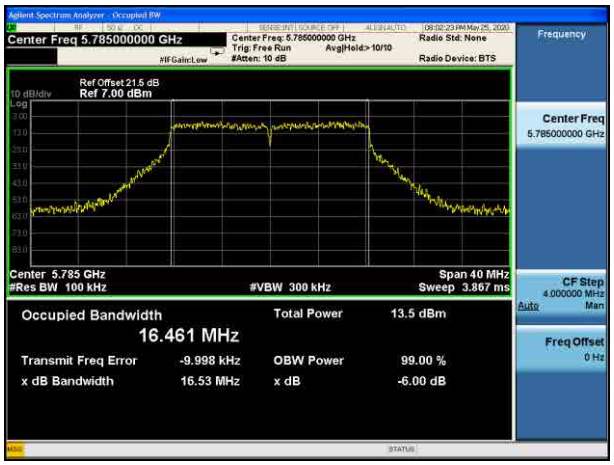
### Channel 159 (5795MHz)

| 802.11ac-VHT80 6dB Bandwidth - Ant 0 | |
|---|---|
| **Channel 155 (5775MHz)** | |
|  | |

## 802.11a 6dB Bandwidth - Ant 1

### Channel 149 (5745MHz)

### Channel 157 (5785MHz)

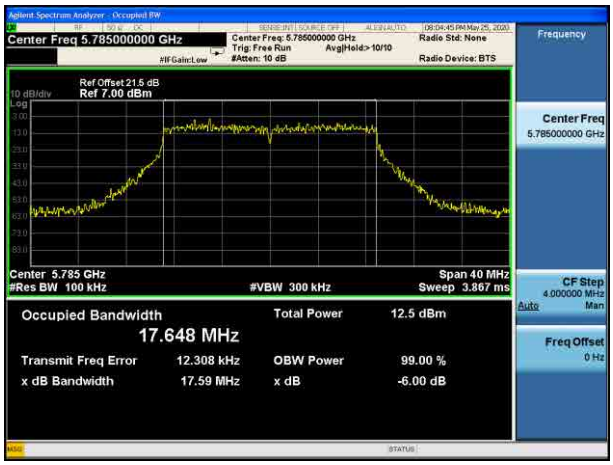



### Channel 165 (5825MHz)

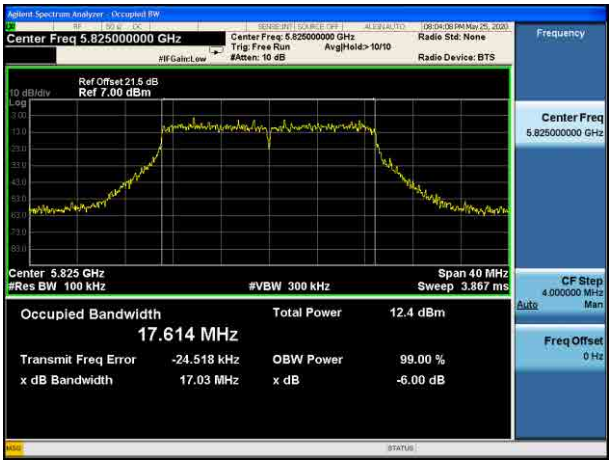
## 802.11n-HT20 6dB Bandwidth - Ant 1

### Channel 149 (5745MHz)

### Channel 157 (5785MHz)



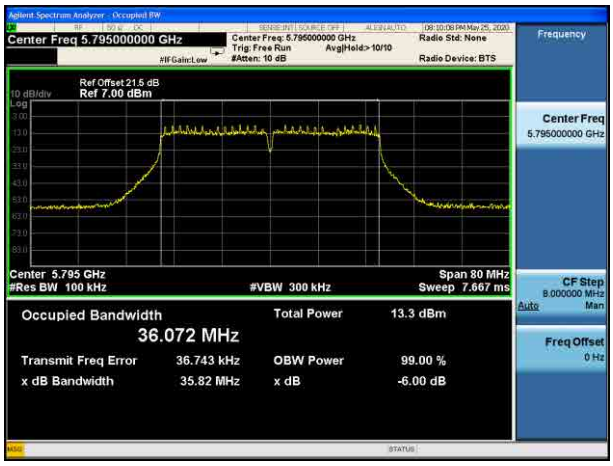

### Channel 165 (5825MHz)

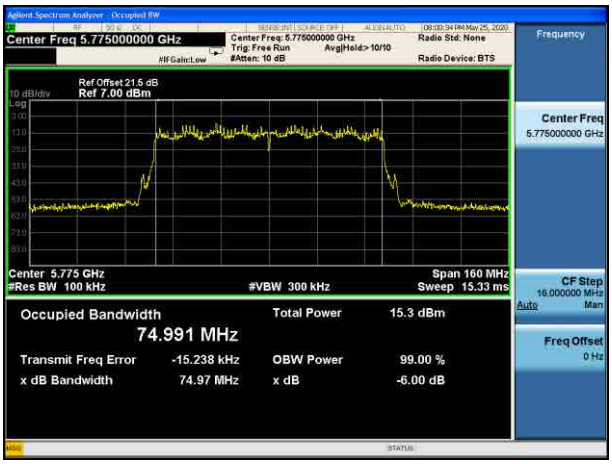



## 802.11n-HT40 6dB Bandwidth - Ant 1

### Channel 151 (5755MHz)

### Channel 159 (5795MHz)



| 802.11ac-VHT80 6dB Bandwidth - Ant 1 | |
|---|---|
| **Channel 155 (5775MHz)** | |
|  | |

## 7.4. Output Power Measurement

### 7.4.1. Test Limit

**For FCC Power Measurement Limit**

For client operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 250mW(23.98dBm).
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 (23.98dBm) or 11dBm +10 log (26dB BW).
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

**For IC Power Measurement Limit**

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23.01dBm) or 10 + 10*log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (23.98dBm) or 11 + 10 log10 B, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W (30dBm) or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
For the 5.725-5.85 GHz band, the maximum conducted output power shall not exceed 1 W.
If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

**EIRP Limit Calculation as below:**

For 5150-5250MHz

802.11a: 10 + 10 $\log_{10}$ (16.64MHz) = 22.21dBm < 23.01dBm;

802.11n-HT20: 10 + 10 $\log_{10}$ (17.77MHz) = 22.55dBm < 23.01dBm;

802.11n-HT40/ ac-VHT80: 10 + 10 $\log_{10}$ B > 23.01dBm;

For 5250-5350MHz, 5470-5725MHz

802.11a: 17 + 10 $\log_{10}$ (16.64MHz) = 29.21dBm < 30dBm;

802.11n-HT20: 17 + 10 $\log_{10}$ (17.73MHz) = 29.49dBm < 30dBm;

802.11n-HT40/ac-VHT80: 10 + 10 $\log_{10}$ B > 30dBm;

**Max Conducted Output Power Limit Calculation as below:**

For 5250-5350MHz, 5470-5725MHz

802.11a: 11 + 10 log10 (16.64MHz) = 23.21dBm < 23.98dBm;

802.11n-HT20: 11 + 10 log10 (17.73MHz) = 23.49dBm < 23.98dBm;

802.11n-HT40/ac-VHT80: 11 + 10 log10 B > 23.98dBm;

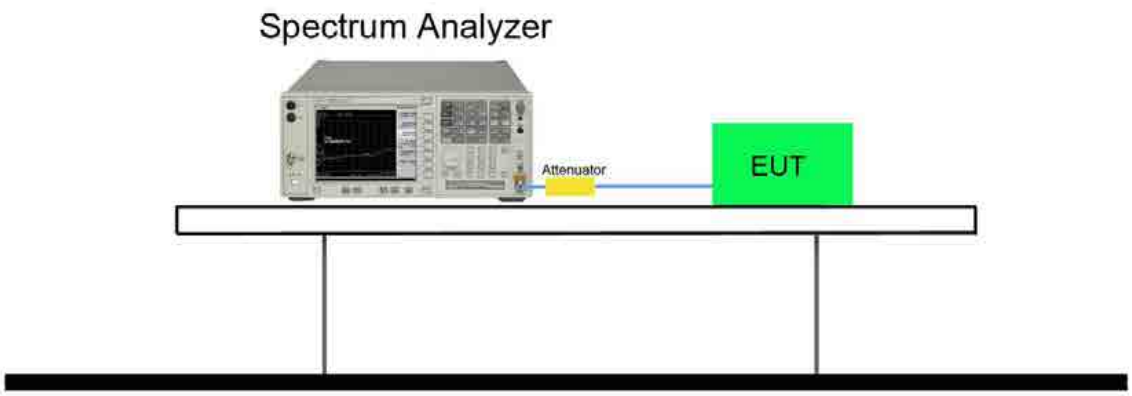
### 7.4.2. Test Procedure Used

KDB 789033 D02v02r01 - Section E) 3) b) Method PM-G

### 7.4.3. Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

### 7.4.4. Test Setup



### 7.4.5. Test Result

| Product | OHMNI TELEPRESENCE ROBOTS | Test Engineer | Peter |
|---|---|---|---|
| Test Site | SR2 | Test Date | 2020/04/23 |
| Test Item | Output Power | | |

**802.11a – Antenna 0**

| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **6** | 9 | 12 | 18 | 24 | 36 | 48 | 54 | |
| 36 | 5180 | 12.85 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.21 for IC |
| 44 | 5220 | 13.44 | 13.40 | 13.38 | 13.27 | 13.21 | 13.18 | 13.15 | 13.13 | ≤ 23.98 / ≤ 22.21 for IC |
| 48 | 5240 | 13.28 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.21 for IC |
| 52 | 5260 | 13.11 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 60 | 5300 | 13.42 | 13.38 | 13.33 | 13.28 | 13.24 | 13.20 | 13.16 | 13.12 | ≤ 23.98 / ≤ 23.21 for IC |
| 64 | 5320 | 13.26 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 100 | 5500 | 13.18 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 120 | 5600 | 13.29 | 13.26 | 13.23 | 13.21 | 13.19 | 13.16 | 13.12 | 13.10 | ≤ 23.98 / ≤ 23.21 for IC |
| 140 | 5700 | 13.13 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 144 | 5720 | 12.98 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 149 | 5745 | 13.10 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 13.39 | 13.37 | 13.34 | 13.32 | 13.30 | 13.28 | 13.21 | 13.19 | ≤ 30 |
| 165 | 5825 | 13.41 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power =Reading value on power meter + duty cycle factor + cable loss.

| 802.11a – Antenna 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | **6** | 9 | 12 | 18 | 24 | 36 | 48 | 54 | |
| 36 | 5180 | 13.33 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.21 for IC |
| 44 | 5220 | 13.33 | 13.30 | 13.28 | 13.20 | 13.19 | 13.18 | 13.13 | 13.10 | ≤ 23.98 / ≤ 22.21 for IC |
| 48 | 5240 | 13.49 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.21 for IC |
| 52 | 5260 | 13.49 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 60 | 5300 | 13.46 | 13.44 | 13.38 | 13.33 | 13.32 | 13.30 | 13.28 | 13.25 | ≤ 23.98 / ≤ 23.21 for IC |
| 64 | 5320 | 13.38 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 100 | 5500 | 13.17 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 120 | 5600 | 13.50 | 13.48 | 13.43 | 13.30 | 13.27 | 13.24 | 13.12 | 13.06 | ≤ 23.98 / ≤ 23.21 for IC |
| 140 | 5700 | 13.37 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 144 | 5720 | 13.21 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 149 | 5745 | 13.12 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 13.21 | 13.20 | 13.19 | 13.18 | 13.17 | 13.16 | 13.14 | 13.13 | ≤ 30 |
| 165 | 5825 | 12.94 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power =Reading value on power meter + duty cycle factor + cable loss.

| 802.11a – Antenna 0+1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | **MCS8** | MCS9 | MCS10 | MCS11 | MCS12 | MCS13 | MCS14 | MCS15 | |
| 36 | 5180 | 16.11 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.21 for IC |
| 44 | 5220 | 16.40 | 16.36 | 16.34 | 16.25 | 16.21 | 16.19 | 16.15 | 16.13 | ≤ 23.98 / ≤ 22.21 for IC |
| 48 | 5240 | 16.40 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.21 for IC |
| 52 | 5260 | 16.32 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 60 | 5300 | 16.45 | 16.42 | 16.37 | 16.32 | 16.29 | 16.26 | 16.23 | 16.20 | ≤ 23.98 / ≤ 23.21 for IC |
| 64 | 5320 | 16.33 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 100 | 5500 | 16.19 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 120 | 5600 | 16.41 | 16.39 | 16.35 | 16.27 | 16.24 | 16.21 | 16.13 | 16.09 | ≤ 23.98 / ≤ 23.21 for IC |
| 140 | 5700 | 16.27 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 144 | 5720 | 16.11 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.21 for IC |
| 149 | 5745 | 16.12 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 16.31 | 16.30 | 16.28 | 16.26 | 16.25 | 16.23 | 16.19 | 16.17 | ≤ 30 |
| 165 | 5825 | 16.20 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power $=10*\log\{10^{\text{Ant 0 RF Output Power /10}}+10^{\text{Ant 1 RF Output Power /10}}\}$ (dBm).

| 802.11n-20M – Antenna 0 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | **MCS8** | MCS9 | MCS10 | MCS11 | MCS12 | MCS13 | MCS14 | MCS15 | |
| 36 | 5180 | 12.02 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 44 | 5220 | 12.47 | 12.44 | 12.38 | 12.35 | 12.32 | 12.27 | 12.24 | 12.23 | ≤ 23.98 / ≤ 22.55 for IC |
| 48 | 5240 | 12.59 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 52 | 5260 | 12.29 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 60 | 5300 | 12.09 | 12.07 | 12.06 | 12.05 | 12.04 | 12.03 | 12.01 | 11.99 | ≤ 23.98 / ≤ 23.49 for IC |
| 64 | 5320 | 12.31 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 100 | 5500 | 12.29 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 120 | 5600 | 12.32 | 12.30 | 12.29 | 12.28 | 12.27 | 12.24 | 12.22 | 12.19 | ≤ 23.98 / ≤ 23.49 for IC |
| 140 | 5700 | 12.36 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 144 | 5720 | 11.95 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 149 | 5745 | 12.09 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 12.49 | 12.47 | 12.46 | 12.44 | 12.43 | 12.41 | 12.40 | 12.38 | ≤ 30 |
| 165 | 5825 | 12.22 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power =Reading value on power meter + duty cycle factor + cable loss.

| 802.11n-20M – Antenna 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | MCS8 | MCS9 | MCS10 | MCS11 | MCS12 | MCS13 | MCS14 | MCS15 | |
| 36 | 5180 | 12.38 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 44 | 5220 | 12.43 | 12.39 | 12.36 | 12.20 | 12.15 | 12.10 | 12.07 | 12.05 | ≤ 23.98 / ≤ 22.55 for IC |
| 48 | 5240 | 12.23 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 52 | 5260 | 12.22 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 60 | 5300 | 12.55 | 12.54 | 12.52 | 12.51 | 12.50 | 12.46 | 12.42 | 12.38 | ≤ 23.98 / ≤ 23.49 for IC |
| 64 | 5320 | 12.37 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 100 | 5500 | 12.43 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 120 | 5600 | 11.90 | 11.88 | 11.86 | 11.85 | 11.84 | 11.82 | 11.75 | 11.74 | ≤ 23.98 / ≤ 23.49 for IC |
| 140 | 5700 | 12.50 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 144 | 5720 | 11.99 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 149 | 5745 | 12.07 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 12.41 | 12.40 | 12.39 | 12.37 | 12.36 | 12.31 | 12.24 | 12.22 | ≤ 30 |
| 165 | 5825 | 12.10 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power =Reading value on power meter + duty cycle factor + cable loss.

| 802.11n-20M – Antenna 0+1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | **MCS8** | MCS9 | MCS10 | MCS11 | MCS12 | MCS13 | MCS14 | MCS15 | |
| 36 | 5180 | 15.21 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 44 | 5220 | 15.46 | 15.42 | 15.38 | 15.28 | 15.24 | 15.19 | 15.16 | 15.15 | ≤ 23.98 / ≤ 22.55 for IC |
| 48 | 5240 | 15.42 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 52 | 5260 | 15.26 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 60 | 5300 | 15.33 | 15.32 | 15.30 | 15.29 | 15.28 | 15.26 | 15.23 | 15.20 | ≤ 23.98 / ≤ 23.49 for IC |
| 64 | 5320 | 15.35 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 100 | 5500 | 15.37 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 120 | 5600 | 15.12 | 15.10 | 15.09 | 15.08 | 15.07 | 15.04 | 15.00 | 14.98 | ≤ 23.98 / ≤ 23.49 for IC |
| 140 | 5700 | 15.44 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 144 | 5720 | 14.98 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 149 | 5745 | 15.09 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 15.46 | 15.44 | 15.43 | 15.41 | 15.40 | 15.37 | 15.33 | 15.31 | ≤ 30 |
| 165 | 5825 | 15.17 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power $=10*\log\{10^{\text{Ant 0 RF Output Power /10}}+10^{\text{Ant 1 RF Output Power /10}}\}$ (dBm).

| 802.11ac-20M – Antenna 0 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | **MCS8** | MCS9 | MCS10 | MCS11 | MCS12 | MCS13 | MCS14 | MCS15 | |
| 36 | 5180 | 12.03 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 44 | 5220 | 12.65 | 12.61 | 12.58 | 12.50 | 12.44 | 12.43 | 12.40 | 12.39 | ≤ 23.98 / ≤ 22.55 for IC |
| 48 | 5240 | 12.63 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 52 | 5260 | 12.28 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 60 | 5300 | 12.22 | 12.21 | 12.20 | 12.18 | 12.17 | 12.16 | 12.14 | 12.12 | ≤ 23.98 / ≤ 23.49 for IC |
| 64 | 5320 | 12.23 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 100 | 5500 | 11.92 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 120 | 5600 | 12.18 | 12.11 | 12.05 | 11.90 | 11.80 | 11.76 | 11.66 | 11.63 | ≤ 23.98 / ≤ 23.49 for IC |
| 140 | 5700 | 11.90 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 144 | 5720 | 11.88 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 149 | 5745 | 12.11 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 12.60 | 12.52 | 12.42 | 12.36 | 12.33 | 12.31 | 12.28 | 12.27 | ≤ 30 |
| 165 | 5825 | 12.23 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power =Reading value on power meter + duty cycle factor + cable loss.

| 802.11ac-20M – Antenna 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Average Power For different Data Rate (Mbps) | | | | | | | | Required Limit (dBm) |
| | | MCS8 | MCS9 | MCS10 | MCS11 | MCS12 | MCS13 | MCS14 | MCS15 | |
| 36 | 5180 | 12.32 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 44 | 5220 | 12.26 | 12.20 | 12.15 | 12.09 | 12.07 | 12.06 | 12.02 | 12.00 | ≤ 23.98 / ≤ 22.55 for IC |
| 48 | 5240 | 12.22 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 22.55 for IC |
| 52 | 5260 | 12.12 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 60 | 5300 | 12.73 | 12.71 | 12.68 | 12.66 | 12.63 | 12.61 | 12.60 | 12.57 | ≤ 23.98 / ≤ 23.49 for IC |
| 64 | 5320 | 12.34 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 100 | 5500 | 12.04 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 120 | 5600 | 11.84 | 11.80 | 11.76 | 11.72 | 11.71 | 11.68 | 11.66 | 11.65 | ≤ 23.98 / ≤ 23.49 for IC |
| 140 | 5700 | 11.87 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 144 | 5720 | 11.91 | -- | -- | -- | -- | -- | -- | -- | ≤ 23.98 / ≤ 23.49 for IC |
| 149 | 5745 | 11.94 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |
| 157 | 5785 | 12.16 | 12.11 | 12.08 | 12.02 | 11.99 | 11.96 | 11.94 | 11.92 | ≤ 30 |
| 165 | 5825 | 12.09 | -- | -- | -- | -- | -- | -- | -- | ≤ 30 |

Note: Output power =Reading value on power meter + duty cycle factor + cable loss.