

# RADIO TEST REPORT

(for 5 GHz WLAN)

Project No. : JB-Z0566-B  
Client : Sony Corporation  
Client's Address : 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan  
Product Name : Digital Media Player  
Model No. : NW-ZX507  
FCC ID : AK8NWZX500  
Test Standard : 47 CFR Part 15 Subpart E  
Sample Receipt Date : May 24, 2019  
Test Date : June 10, 2019 to July 4, 2019  
Original Report Date : July 5, 2019  
Amend Report Date : July 31, 2019  
Test Result : Complied

Notice:

- \* These test results relate only to the items (combination equipment, test configuration, operation condition etc.) tested.
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- \* All test results are traceable to the national and/or international standards.
- \* The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in Sony Global Manufacturing & Operations Corporation EMC/RF Test Laboratory.
- \* This report replaces and supersedes all previous versions. Refer to Revision History on the following page.

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TESTING CERT #3203.01

Format No.: NV1-1-01 Version 5.0

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Note

- ☒-indicates that the listed condition, standard or equipment is applicable for this report.  
☐-indicates that the listed condition, standard or equipment is not applicable for this report.

### Revision History

| Revision           | Date          | Overview                                                        | Page      |
|--------------------|---------------|-----------------------------------------------------------------|-----------|
| JB-Z0566(Original) | July 5, 2019  | -                                                               | -         |
| JB-Z0572-A         | July 26, 2019 | Correction of Maximum Power Spectral Density result and limit.  | P41 to 53 |
|                    |               | Add procedures and measurement facility drawings for spurious.  | P6,12     |
| JB-Z0572-B         | July 31, 2019 | Correction of Maximum Conducted Output Power result and Margin. | P38       |
|                    |               | Add description to procedures for spurious emission.            | P6        |

# 1. General Information

## 1.1. Description of Equipment Under Test (EUT)

### General Specification

Test Sample Condition : ☐ Prototype ☒ Pre-production ☐ Mass-production  
 Product Name : Digital Media Player  
 Trade Name : SONY  
 Model No. : NW-ZX507  
 Serial No. : 2, 3, 5, 16  
 Power Rating of the EUT : DC 3.7 V (Internal Battery) or DC 5 V (USB)

Similar model(s) to be covered by this report

Model No. : None

### Radio Specification

Function of the Equipment : Transceiver

Operating Frequency :

| IEEE Standard                    | Operating Frequency                          | Channel Spacing | Channel Bandwidth | Number of Channel |
|----------------------------------|----------------------------------------------|-----------------|-------------------|-------------------|
| 802.11a/n HT20<br>802.11ac VHT20 | 5180 - 5320 MHz,                             | 20 MHz          | 20 MHz            | 8                 |
|                                  | 5500 - 5720 MHz<br>(except 5600 - 5640 MHz), |                 |                   | 9                 |
|                                  | 5745 - 5825 MHz                              |                 |                   | 5                 |
| 802.11n HT40<br>802.11ac VHT40   | 5190 - 5310 MHz,                             | 40 MHz          | 40 MHz            | 4                 |
|                                  | 5510 - 5710 MHz<br>(except 5590 - 5630 MHz), |                 |                   | 4                 |
|                                  | 5755 - 5795 MHz                              |                 |                   | 2                 |
| 802.11ac VHT80                   | 5210 - 5290 MHz,                             | 80 MHz          | 80 MHz            | 2                 |
|                                  | 5530 - 5690 MHz<br>(except 5610 MHz),        |                 |                   | 2                 |
|                                  | 5775 MHz                                     |                 |                   | 1                 |

Modulation Type : OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

Antenna Type : Inverted-F antenna

Antenna Connector Type : None

Antenna Gain : + 3.0 dBi

Operating Temperature : +5 to +35 deg.C

## 1.2. Summary of Test Result

| Test Item                         | Test Method | Worst Margin                             | Results  | Note |
|-----------------------------------|-------------|------------------------------------------|----------|------|
| AC Power-line Conducted Emissions | Conducted   | 18.7 dB (QP)<br>0.153 MHz<br>N           | Complied | -    |
| 26dB Emission Bandwidth           | Conducted   | Refer to the test data                   | N/A      | -    |
| 6dB Emission Bandwidth            | Conducted   | Refer to the test data                   | Complied | -    |
| Maximum Conducted Output Power    | Conducted   | 12.75 dB                                 | Complied | -    |
| Maximum Power Spectral Density    | Conducted   | 7.50 dB                                  | Complied | -    |
| Unwanted Emissions                | Radiated    | 1.0 dB (PK)<br>5470.00 MHz<br>Horizontal | Complied | -    |
| Dynamic Frequency Selection       | -           | -                                        | -        | *1   |

Note

\*1: For DFS test results, referred to JB-Z0567 issued by Sony Global Manufacturing & Operations Corporation.

### Other requirements

Part 15.31(e) Supply voltage requirement

: Complied (The voltage supplied from USB or battery are converted to regulated DC voltage by the built-in power circuit of the EUT.)

Part 15.203 / 212 Antenna requirement

: Complied (The EUT has an internal antenna which cannot be replaced by users.)

## 1.3. Tested Methodology

Test Standard : 47 CFR Part15 Subpart E

Test Method : ANSI C63.10 - 2013  
KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Test Condition

### AC Power-line Conducted Emissions

Dimensions of the EUT table : 0.8 m height, 1.5 m width and 1 m depth.

### Radiated Spurious Emissions

Test Distance : ☒ 3 m ☐ 10m (9 kHz to 30 MHz)  
☒ 3 m ☐ 10m (30 MHz to 1000 MHz)  
☒ 3 m (1 GHz to 26.5 GHz)

Dimensions of the EUT table : 0.8 m (below 1 GHz) or 1.5 m (above 1 GHz) height, 2 m width and 1 m depth.

Dimensions of validated test volume : 2.5 m diameter, 3 m top height, 0.5 m bottom height.

## 1.4. Measurement Procedures

We performed the measurements in accordance with NV3-10, available upon the request.

- ☒ No deviation  
☐ Deviation from the above procedure

The summary of the above procedure is mentioned below

### AC Power-line Conducted Emissions

- The non-conductive table (EUT table) made of (☒ FRP, ☐ wood, ☐ other non-conductive material) was placed 0.4 m from its rear to the vertical reference ground plane.
- The EUT was placed on the center of tabletop and its rear was flush with the rear of the table, connected through a LISN to the input power mains.
- The LISN was placed in 80 cm from the nearest part of the EUT chassis.
- The excess length of the AC cable between the EUT and the LISN receptacle, or an adaptor or extension cable connected to and measured with LISN, was folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- The connection of the all other equipment to the second LISN was performed. The second LISN was terminated with a 50-ohm terminator.
- Interconnecting cables that hang closer than 40 cm to the horizontal reference ground plane was folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between the horizontal reference ground plane and the tabletop.
- Find the worst mode and arrangement of the EUT according to the follows:
  - Connecting all peripherals and change the position of peripherals and cables.
  - Changing the all test operation modes of the EUT.
  - On every condition, exploring the highest emissions with the spectrum analyzer.  
(150 kHz to 30 MHz, peak detector, RBW: 10 kHz)
- On the worst condition of the EUT found in above, choose the six highest emissions on the spectrum data.  
The final measurements carried out on these emissions with EMI test receiver.  
(quasi-peak and average detector, RBW: 9 kHz)

### Antenna-port Conducted Measurements

- Antenna-port of the EUT was connected to the power sensor (Maximum Conducted Output Power) or the spectrum analyzer. (other test items).
- For each EUT operation mode, the Antenna-port Conducted Measurements were measured with the power sensor or the spectrum analyzer.

| Test Item<br>Antenna-port Conducted Measurements | Detector | RBW                                                                                                                         |
|--------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------|
| 26dB Emission Bandwidth                          | Peak     | 100 kHz : IEEE 802.11a, 11n(HT20), 11ac(VHT20)<br>300 kHz : IEEE 802.11n(HT40), 11ac(VHT40)<br>1 MHz : IEEE 802.11ac(VHT80) |
| 6dB Emission Bandwidth                           | Peak     | 100 kHz                                                                                                                     |
| 99% Occupied Bandwidth                           | Peak     | 300 kHz : IEEE 802.11a, 11n(HT20), 11ac(VHT20)<br>1 MHz : IEEE 802.11n(HT40), 11ac(VHT40), 11ac(VHT80)                      |
| Maximum Conducted Output Power                   | Average  | -                                                                                                                           |
| Maximum Power Spectral Density                   | RMS      | 100 kHz : U-NII-3<br>1 MHz : U-NII-1/ -2A/ -2C                                                                              |

**Unwanted Emissions**

- The non-conductive table (EUT table) made of (☐ FRP, ☒ Styrene Foam, ☐ other non-conductive material) was placed in the center of the turntable.
- The EUT was placed on the center of the tabletop.
- The test antenna was placed away from the EUT at test distance.
- The limits were compensated the distance factor with follows:  
 $9\text{ kHz to }490\text{ kHz [Limit at 3 m]} = [\text{Limit at 300 m}] + 40\log(300[\text{m}] / 3[\text{m}])$   
 $490\text{ kHz to }30\text{ MHz [Limit at 3 m]} = [\text{Limit at 30 m}] + 40\log(30[\text{m}] / 3[\text{m}])$
- Find the worst arrangement of the EUT according to follows:
  - Rotating the turntable and/or scanning the antenna.
  - On every condition, exploring the highest emissions with the spectrum analyzer.  
(9 kHz to 40 GHz, peak detector)
- On the worst arrangement of the EUT found in above, choose the six highest harmonics or spurious emissions on the spectrum data.(\*excluding carrier band edges)  
 The final measurements of all test operating modes carried out on these emissions as follows:

The test antenna and the turntable were performed with follows:

|                          | 9 kHz to 30 MHz               | 30 MHz to 1000 MHz                          | 1 GHz to 40 GHz                          |
|--------------------------|-------------------------------|---------------------------------------------|------------------------------------------|
| Antenna                  | Loop Antenna                  | Bi-conical Antenna,<br>Log-periodic Antenna | Horn Antenna                             |
| Antenna scanning range   | 1 m,<br>Vertical, 360 degrees | 1 m to 4 m,<br>Horizontal and Vertical      | 1 m to 4 m *,<br>Horizontal and Vertical |
| Turntable rotating range | 360 degrees                   | 360 degrees                                 | 360 degrees                              |

\*: When the measurement frequencies above 1 GHz, final measurements are performed keeping the antenna in the "cone of radiation" from EUT area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.

Instruments settings were carried out with follows:

|            | 9 kHz to 90 kHz<br>110 kHz to 490 kHz | 90 kHz to 110 kHz<br>490 kHz to 30 MHz | 30 MHz to 1000 MHz | 1 GHz to 40 GHz                             |
|------------|---------------------------------------|----------------------------------------|--------------------|---------------------------------------------|
| Detector   | Peak / Average                        | Quasi-peak                             | Quasi-peak         | Peak / Average                              |
| RBW        | 200 Hz (6 dB) or<br>9 kHz (6 dB) *1   | 200 Hz (6 dB) or<br>9 kHz (6 dB) *1    | 120 kHz (6 dB)     | 1 MHz (6 dB)                                |
| VBW        | N/A                                   | N/A                                    | N/A                | 3 MHz (for peak)<br>10 kHz (for average) *2 |
| Instrument | EMI test receiver                     | EMI test receiver                      | EMI test receiver  | Spectrum analyzer                           |

\*1: When the measurement frequencies below 150 kHz, RBW: 200 Hz was used.

\*2: VBW setting (for average) was higher than 1/T. (T is the minimum transmission duration)

- If the final average measurement result exceeded the limit in the authorized band edge, the integration method is carried out with follows;

|            | Unwanted emissions within 2 MHz of the band edge |
|------------|--------------------------------------------------|
| Detector   | Peak                                             |
| RBW        | 100 kHz (6 dB)                                   |
| Instrument | Spectrum analyzer                                |
| Function   | Channel Power (integration BW : 1 MHz)           |

- Although these tests for below 30MHz were performed other than open field area test site, adequate comparison measurements were confirmed against 30 m open field area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788 D01.  
 Further these test for above 1GHz were performed test site complied with CISPR 16-1-4.  
 In the case of EUT size smaller than the validated test volume, the antenna position is adjusted such that the distance between the EUT and the antenna reference point is identical to the 3m used for the S-VSWR validation measurements. These method based on clause 7.3.1 of CISPR16-1-4 Edition 4, therefore correcting distance factor is not applied.

## 1.5. Test Location

Test Facility Name : Sony Global Manufacturing & Operations Corporation  
EMC/RF Test Laboratory, Main Lab.  
Address : 8-4 Shiomi Kisarazu-shi Chiba-ken, 292-0834, Japan  
Phone : +81 438 37 2750

A2LA Certificate No. : 3203.01  
Cert. Validated Date : Oct. 31, 2019

AC Power-line Conducted Emissions

Shielded Room

☐ 4th Site    ☒ EMC Site
Antenna-port Conducted Measurements

Shielded Room

☒ 4th Site SR1
Unwanted Emissions

Semi-Anechoic chamber

☒ 4th Site    ☐ EMC Site

## 1.6. Uncertainty

| Test Item                      | Frequency      | 4th Site SR1 |
|--------------------------------|----------------|--------------|
| Maximum Conducted Output Power | 1 GHz to 6 GHz | ± 0.84 dB    |
| Maximum Power Spectral Density | below 6 GHz    | ± 1.25 dB    |

| Test Item                         | Frequency          | Distance | 4th Site  | EMC Site  |
|-----------------------------------|--------------------|----------|-----------|-----------|
| AC Power-line Conducted Emissions | 150 kHz to 30 MHz  | -        | ± 3.34 dB | ± 3.35 dB |
| Radiated Emissions                | 9 kHz to 30 MHz    | 3m       | ± 2.60 dB | ± 3.13 dB |
|                                   | 30 MHz to 1000 MHz | 3m       | ± 4.96 dB | ± 5.26 dB |
|                                   | 1 GHz to 18 GHz    | 3m       | ± 5.22 dB | ± 5.50 dB |
|                                   | 18 GHz to 26.5 GHz | 3m       | ± 5.36 dB | ± 5.63 dB |
|                                   | 26.5 GHz to 40 GHz | 3m       | ± 6.07 dB | ± 6.31 dB |

## 2. Test Specification

### 2.1. Validation

The system was configured for testing in a typical (as a customer would normally use it).  
The tests were conducted with the worst-case modes as follows.

### 2.2. Operating Condition

The tests have been carried out the following conditions.

[ Transmitting mode ]

| Test Items                                                | Test Channels [MHz]          |                              |                              |                      | Worst Data Rate *1                                                  |
|-----------------------------------------------------------|------------------------------|------------------------------|------------------------------|----------------------|---------------------------------------------------------------------|
|                                                           | U-NII-1                      | U-NII-2A                     | U-NII-2C                     | U-NII-3              |                                                                     |
| AC Power-line Conducted Emissions *2                      | 5180                         | -                            | -                            | -                    | 802.11a : 18 Mbps                                                   |
| 26dB Emission Bandwidth                                   | -                            | 5260<br>5300<br>5320         | 5500<br>5580<br>5700<br>5720 | -                    | 802.11a : 18 Mbps<br>802.11n(HT20) : MCS4<br>802.11ac(VHT20) : MCS4 |
|                                                           | -                            | 5270<br>5310                 | 5510<br>5550<br>5670<br>5710 | -                    | 802.11n(HT40) : MCS4<br>802.11ac(VHT40) : MCS4                      |
|                                                           | -                            | 5290                         | 5530<br>5690                 | -                    | 802.11ac(VHT80) : MCS4                                              |
| 6dB Emission Bandwidth                                    | -                            | -                            | -                            | 5745<br>5785<br>5825 | 802.11a : 18 Mbps<br>802.11n(HT20) : MCS4<br>802.11ac(VHT20) : MCS4 |
|                                                           | -                            | -                            | -                            | 5755<br>5795         | 802.11n(HT40) : MCS4<br>802.11ac(VHT40) : MCS4                      |
|                                                           | -                            | -                            | -                            | 5775                 | 802.11ac(VHT80) : MCS4                                              |
| Maximum Conducted Output Power                            | 5180<br>5200<br>5220<br>5240 | 5260<br>5280<br>5300<br>5320 | 5500<br>5580<br>5700<br>5720 | 5745<br>5785<br>5825 | 802.11a : 18 Mbps<br>802.11n(HT20) : MCS4<br>802.11ac(VHT20) : MCS4 |
|                                                           | 5190<br>5230                 | 5270<br>5310                 | 5510<br>5550<br>5670<br>5710 | 5755<br>5795         | 802.11n(HT40) : MCS4<br>802.11ac(VHT40) : MCS4                      |
|                                                           | 5210                         | 5290                         | 5530<br>5690                 | 5775                 | 802.11ac(VHT80) : MCS4                                              |
| 99% Occupied Bandwidth,<br>Maximum Power Spectral Density | 5180<br>5220<br>5240         | 5260<br>5300<br>5320         | 5500<br>5580<br>5700<br>5720 | 5745<br>5785<br>5825 | 802.11a : 18 Mbps<br>802.11n(HT20) : MCS4<br>802.11ac(VHT20) : MCS4 |
|                                                           | 5190<br>5230                 | 5270<br>5310                 | 5510<br>5550<br>5670<br>5710 | 5755<br>5795         | 802.11n(HT40) : MCS4<br>802.11ac(VHT40) : MCS4                      |
|                                                           | 5210                         | 5290                         | 5530<br>5690                 | 5775                 | 802.11ac(VHT80) : MCS4                                              |

| Test Items                             | Test Channels [MHz] |              |                         |                         | Worst Data Rate *1                            |
|----------------------------------------|---------------------|--------------|-------------------------|-------------------------|-----------------------------------------------|
|                                        | U-NII-1             | U-NII-2A     | U-NII-2C                | U-NII-3                 |                                               |
| Unwanted Emissions *2<br>(Below 1 GHz) | 5180                | -            | -                       | -                       | 802.11a : 18 Mbps                             |
| Unwanted Emissions<br>(Above 1 GHz)    | 5180                | 5260<br>5320 | 5500<br>5580 *3<br>5700 | 5745<br>5785 *3<br>5825 | 802.11a : 18 Mbps<br>802.11ac(VHT20): MCS4    |
|                                        | 5190                | 5270<br>5310 | 5510<br>5550 *4<br>5670 | 5755<br>5795            | 802.11n(HT40) : MCS4<br>802.11ac(VHT40): MCS4 |
|                                        | 5210                | 5290         | 5530                    | 5775                    | 802.11ac(VHT80): MCS4                         |

## Note

\*1: The worst data rate has been decided based on the result of Maximum Conducted Output Power.

\*2: The test was performed with the representative mode that had been found as the worst emissions while exploratory testing.

\*3: It applies only to IEEE802.11a.

\*4: It applies only to IEEE802.11n.

**The Software for Operating Mode**

Software Name : LBEE5ZZ1PJ-331 RF Test  
Software Version : 0.6

**2.3. Special Accessories**

Special accessories needed for connecting the EUT to achieve compliance:

| Item | Manufacturer | Model No. | Serial No. | Remark |
|------|--------------|-----------|------------|--------|
| -    | -            | -         | -          | -      |

**2.4. EUT Modifications**

- ☒ No equipment modification to achieve compliance to the standard levels was done during the tests.  
☐ Equipment was modified to achieve compliance to the standard level as below.

Responsible Party Signature

\_\_\_\_\_  
 Typed/ Print Name :  
 Responsible Party :  
 Position :  
 Date :

## 2.5. Configuration of EUT System

### AC Power-line Conducted Emissions

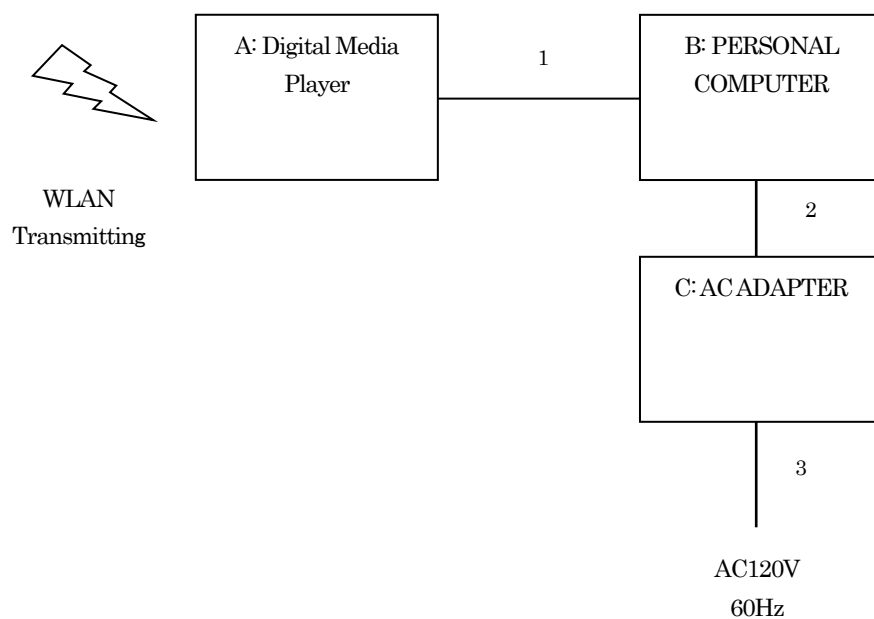
[ EUT and Associated Equipment (AE) ]

| Symbol | EUT/<br>AE | Item                 | Manufacturer | Model No.  | Serial No. |
|--------|------------|----------------------|--------------|------------|------------|
| A      | EUT        | Digital Media Player | SONY         | NW-ZX507   | 3          |
| B      | AE         | PERSONAL COMPUTER    | SONY         | VJS131C11N | 4120398    |
| C      | AE         | AC ADAPTER           | SONY         | VJ8AC10V9  | 274969     |

[ Type of Cable ]

| Symbol | Description | Identification<br>(Manufacturer etc.) | Shielded<br>Yes / No | Ferrite<br>Core | Length<br>(m) | Bundled |
|--------|-------------|---------------------------------------|----------------------|-----------------|---------------|---------|
| 1      | USB Cable   | Kailai                                | Yes                  | No              | 0.5           | No      |
| 2      | DC Cable    | -                                     | No                   | No              | 1.8           | Yes     |
| 3      | AC Cable    | -                                     | No                   | No              | 1.5           | Yes     |

[ Connecting Diagram ]



**Antenna-port Conducted Measurements**

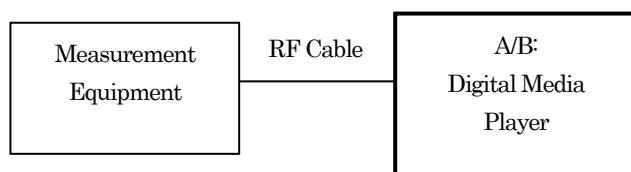
[ EUT and Associated Equipment (AE) ]

| Symbol | EUT/<br>AE | Item                 | Manufacturer | Model No. | Serial No.                             |
|--------|------------|----------------------|--------------|-----------|----------------------------------------|
| A      | EUT        | Digital Media Player | SONY         | NW-ZX507  | 5 (for Maximum Conducted Output Power) |
| B      | EUT        | Digital Media Player | SONY         | NW-ZX507  | 16 (for others)                        |

[ Type of Cable ]

| Symbol | Description | Identification<br>(Manufacturer etc.) | Shielded<br>Yes / No | Ferrite<br>Core | Length<br>(m) | Bundled |
|--------|-------------|---------------------------------------|----------------------|-----------------|---------------|---------|
| -      | -           | -                                     | -                    | -               | -             | -       |

[ Connecting Diagram ]

**Unwanted Emissions**

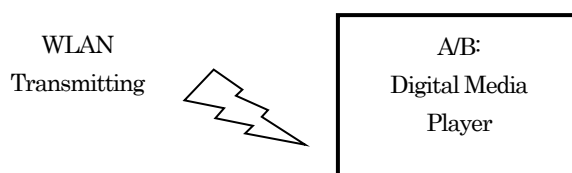
[ EUT and Associated Equipment (AE) ]

| Symbol | EUT/<br>AE | Item                 | Manufacturer | Model No. | Serial No. |
|--------|------------|----------------------|--------------|-----------|------------|
| A      | EUT        | Digital Media Player | SONY         | NW-ZX507  | 2          |
| B      | EUT        | Digital Media Player | SONY         | NW-ZX507  | 3          |

[ Type of Cable ]

| Symbol | Description | Identification<br>(Manufacturer etc.) | Shielded<br>Yes / No | Ferrite<br>Core | Length<br>(m) | Bundled |
|--------|-------------|---------------------------------------|----------------------|-----------------|---------------|---------|
| -      | -           | -                                     | -                    | -               | -             | -       |

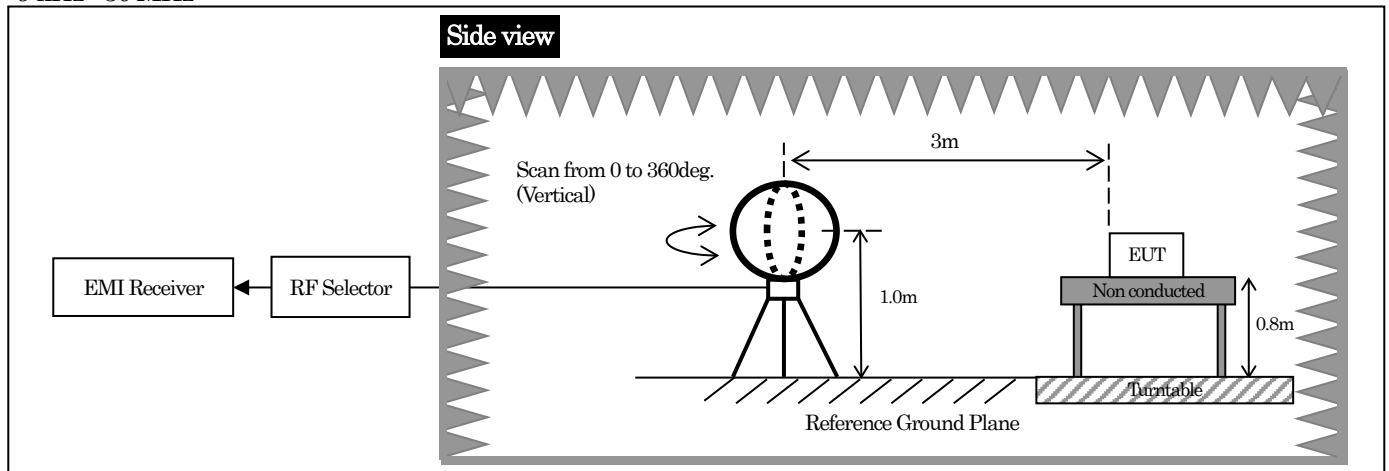
[ Connecting Diagram ]



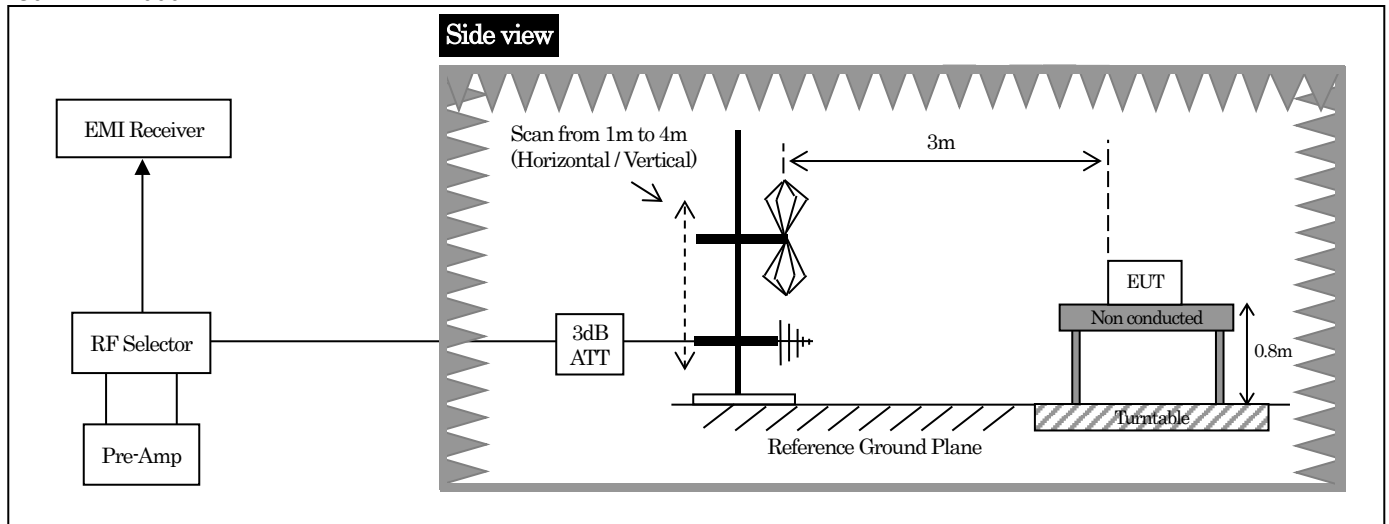
## 2.6. View of Measurement Facility

### Radiated spurious emissions

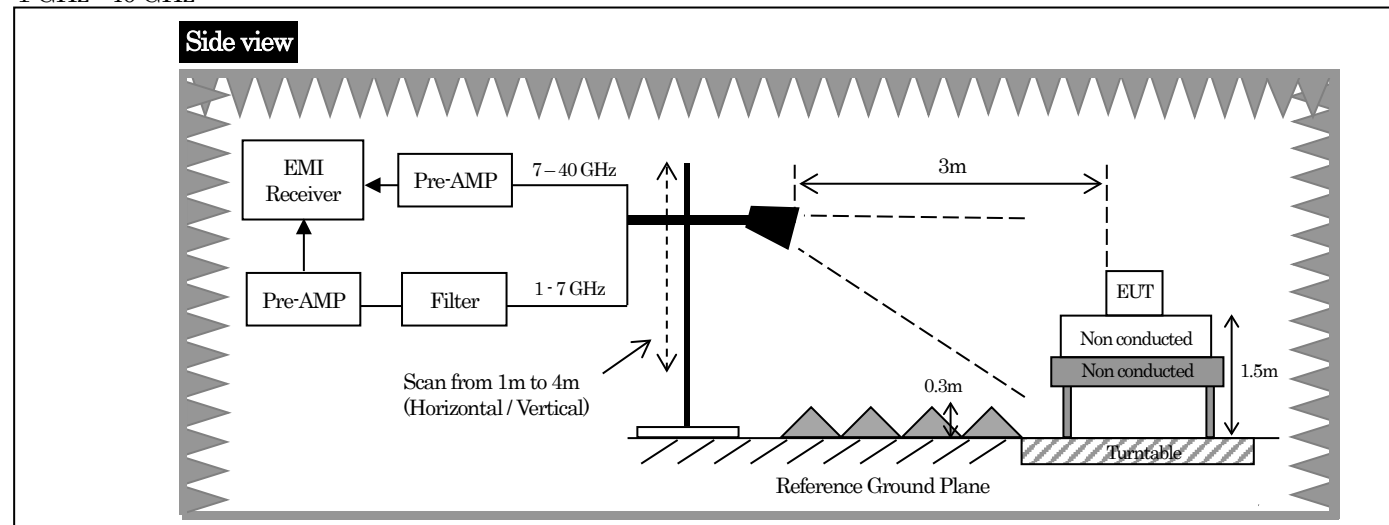
< 9 kHz - 30 MHz >



< 30 MHz - 1000 MHz >



< 1 GHz - 40 GHz >



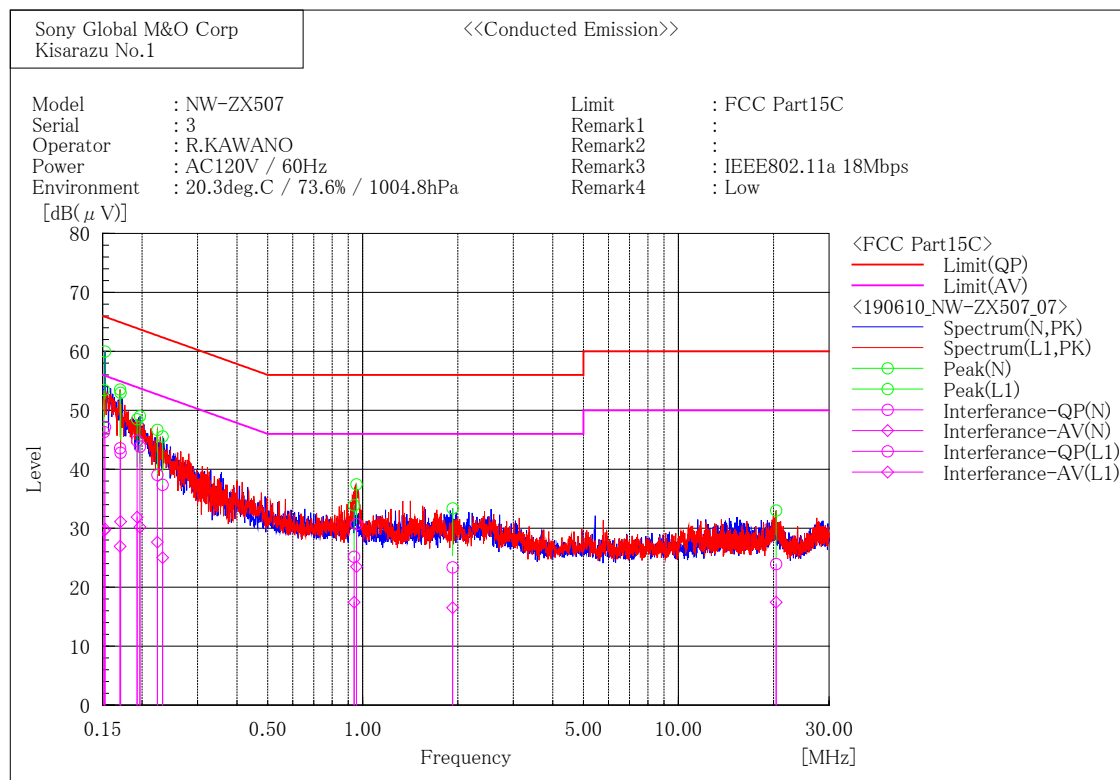
### 3. Test Data

#### 3.1. AC Power-line Conducted Emissions

1) Date of measurement : June 10, 2019

The test data is mentioned as follows.

[ 802.11a/ 5180 MHz ]



## Final Result

--- N Phase ---

| No. | Frequency [MHz] | Reading QP [dB(μV)] | Reading AV [dB(μV)] | c. f [dB] | Result QP [dB(μV)] | Result AV [dB(μV)] | Limit QP [dB(μV)] | Limit AV [dB(μV)] | Margin QP [dB] | Margin AV [dB] |
|-----|-----------------|---------------------|---------------------|-----------|--------------------|--------------------|-------------------|-------------------|----------------|----------------|
| 1   | 0.153           | 31.2                | 13.8                | 16.0      | 47.2               | 29.8               | 65.9              | 55.9              | 18.7           | 26.1           |
| 2   | 0.171           | 26.5                | 14.8                | 16.3      | 42.8               | 31.1               | 64.9              | 54.9              | 22.1           | 23.8           |
| 3   | 0.197           | 27.8                | 14.2                | 16.0      | 43.8               | 30.2               | 63.7              | 53.7              | 19.9           | 23.5           |
| 4   | 0.233           | 21.7                | 9.3                 | 15.7      | 37.4               | 25.0               | 62.4              | 52.4              | 25.0           | 27.4           |
| 5   | 0.940           | 9.2                 | 1.6                 | 15.9      | 25.1               | 17.5               | 56.0              | 46.0              | 30.9           | 28.5           |
| 6   | 1.925           | 7.5                 | 0.6                 | 15.9      | 23.4               | 16.5               | 56.0              | 46.0              | 32.6           | 29.5           |

--- L1 Phase ---

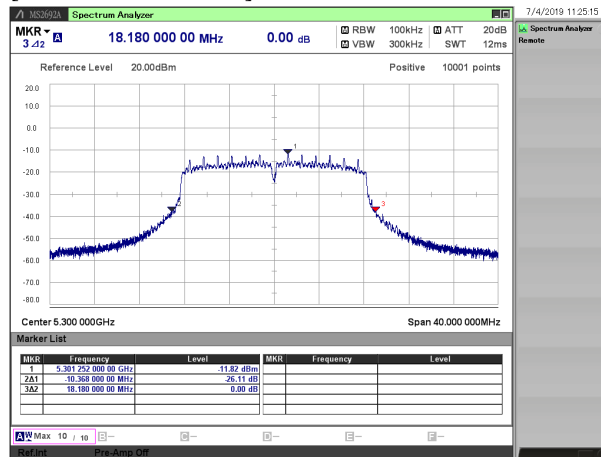
| No. | Frequency [MHz] | Reading QP [dB(μV)] | Reading AV [dB(μV)] | c. f [dB] | Result QP [dB(μV)] | Result AV [dB(μV)] | Limit QP [dB(μV)] | Limit AV [dB(μV)] | Margin QP [dB] | Margin AV [dB] |
|-----|-----------------|---------------------|---------------------|-----------|--------------------|--------------------|-------------------|-------------------|----------------|----------------|
| 1   | 0.152           | 30.3                | 13.6                | 16.0      | 46.3               | 29.6               | 65.9              | 55.9              | 19.6           | 26.3           |
| 2   | 0.171           | 27.2                | 10.6                | 16.3      | 43.5               | 26.9               | 64.9              | 54.9              | 21.4           | 28.0           |
| 3   | 0.193           | 28.7                | 15.8                | 16.1      | 44.8               | 31.9               | 63.9              | 53.9              | 19.1           | 22.0           |
| 4   | 0.224           | 23.3                | 11.9                | 15.8      | 39.1               | 27.7               | 62.7              | 52.7              | 23.6           | 25.0           |
| 5   | 0.955           | 14.7                | 7.5                 | 16.0      | 30.7               | 23.5               | 56.0              | 46.0              | 25.3           | 22.5           |
| 6   | 20.408          | 7.5                 | 1.0                 | 16.4      | 23.9               | 17.4               | 60.0              | 50.0              | 36.1           | 32.6           |

### 3.2. 26dB Emission Bandwidth

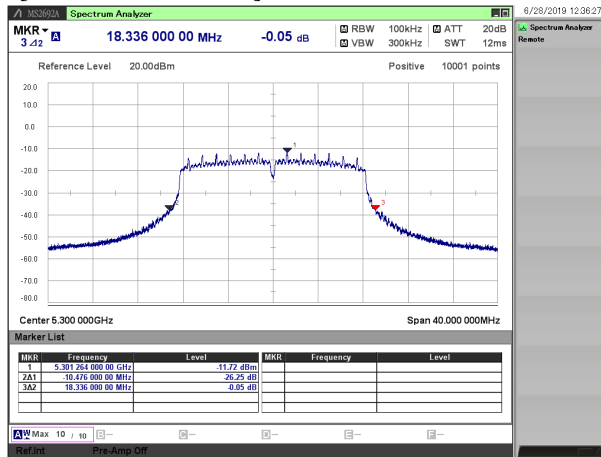
|                        |                     |               |              |              |
|------------------------|---------------------|---------------|--------------|--------------|
| 1) Ambient temperature | : 21.1 deg.C        | 20.0 deg.C    | 20.2 deg.C   | 21.1 deg.C   |
| 2) Relative humidity   | : 62.0 %            | 59.5 %        | 63.0 %       | 68.0 %       |
| 3) Date of measurement | : June 26, 2019     | June 28, 2019 | July 1, 2019 | July 4, 2019 |
| 4) Measured by         | : M.KOUGA           | M.KOUGA       | M.KOUGA      | M.KOUGA      |
| 5) Operating mode      | : Transmitting mode |               |              |              |

| Mode         | Rate [Mbps] | Channel [MHz] | Result [MHz] | Limit [MHz] |
|--------------|-------------|---------------|--------------|-------------|
| 11a          | 18          | 5260          | 18.180       | -           |
|              |             | 5300          | 18.336       | -           |
|              |             | 5320          | 18.188       | -           |
|              |             | 5500          | 18.184       | -           |
|              |             | 5580          | 18.168       | -           |
|              |             | 5700          | 18.192       |             |
|              |             | 5720          | 18.200       | -           |
| 11n (HT20)   | MCS4        | 5260          | 20.340       | -           |
|              |             | 5300          | 20.364       | -           |
|              |             | 5320          | 20.496       | -           |
|              |             | 5500          | 20.368       | -           |
|              |             | 5580          | 20.296       | -           |
|              |             | 5700          | 20.360       |             |
|              |             | 5720          | 20.508       | -           |
| 11n (HT40)   | MCS4        | 5270          | 42.536       | -           |
|              |             | 5310          | 42.432       | -           |
|              |             | 5510          | 42.504       | -           |
|              |             | 5550          | 42.504       | -           |
|              |             | 5670          | 42.488       |             |
|              |             | 5710          | 42.560       | -           |
| 11ac (VHT20) | MCS4        | 5260          | 20.352       | -           |
|              |             | 5300          | 20.356       | -           |
|              |             | 5320          | 20.436       | -           |
|              |             | 5500          | 20.396       | -           |
|              |             | 5580          | 20.372       | -           |
|              |             | 5700          | 20.652       | -           |
|              |             | 5720          | 20.372       | -           |
| 11ac (VHT40) | MCS4        | 5270          | 42.952       | -           |
|              |             | 5310          | 42.624       | -           |
|              |             | 5510          | 43.000       | -           |
|              |             | 5550          | 43.000       | -           |
|              |             | 5670          | 42.408       | -           |
|              |             | 5710          | 42.936       | -           |
| 11ac (VHT80) | MCS4        | 5290          | 89.248       | -           |
|              |             | 5530          | 89.312       | -           |
|              |             | 5690          | 84.400       | -           |

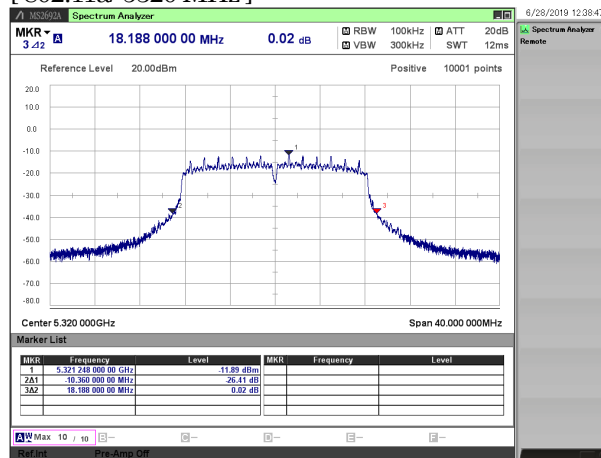
## [ 802.11a/ 5260 MHz ]



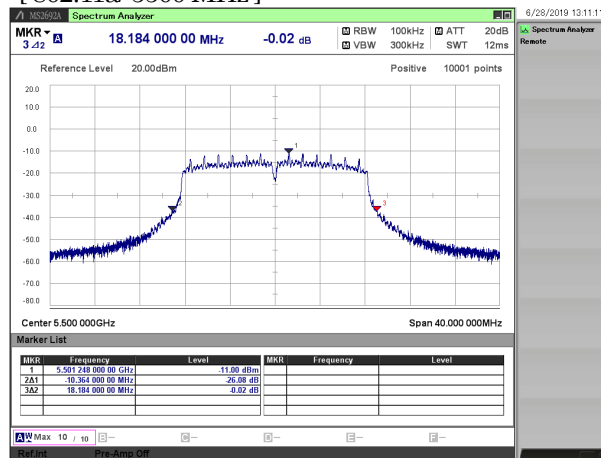
## [ 802.11a/ 5300 MHz ]



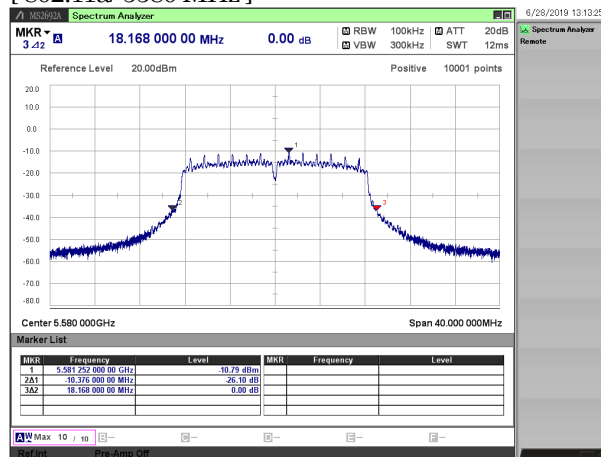
## [ 802.11a/ 5320 MHz ]



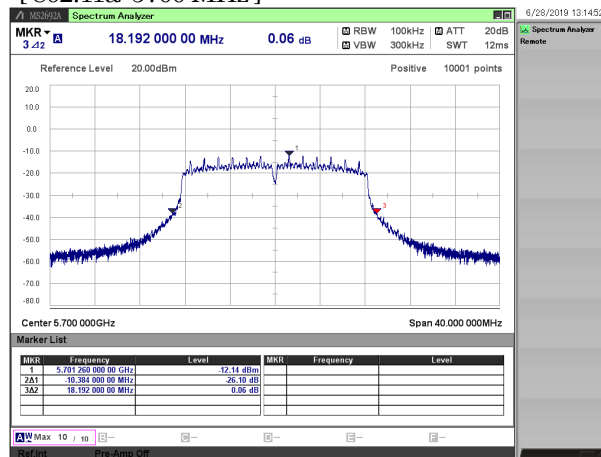
## [ 802.11a/ 5500 MHz ]



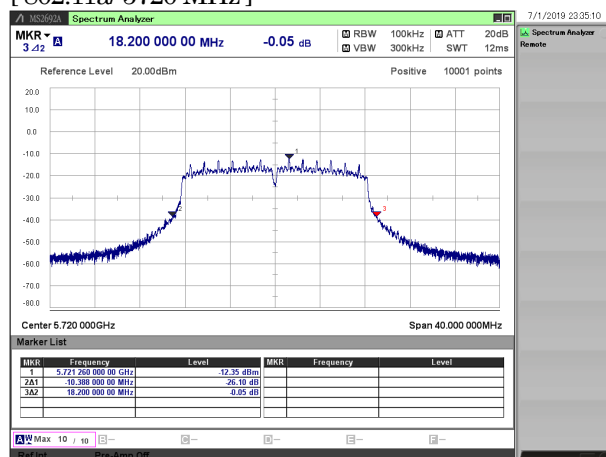
## [ 802.11a/ 5580 MHz ]



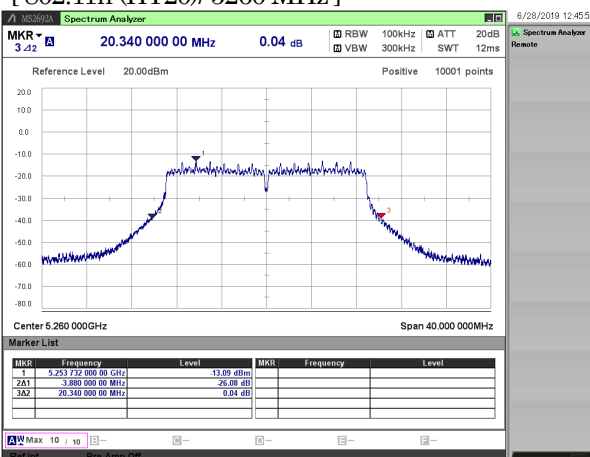
## [ 802.11a/ 5700 MHz ]



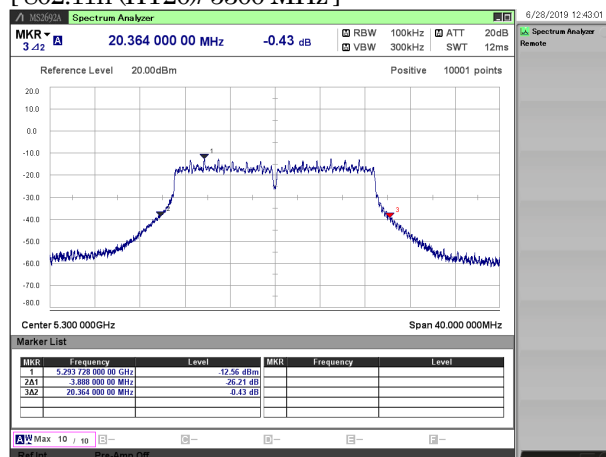
## [ 802.11a/ 5720 MHz ]



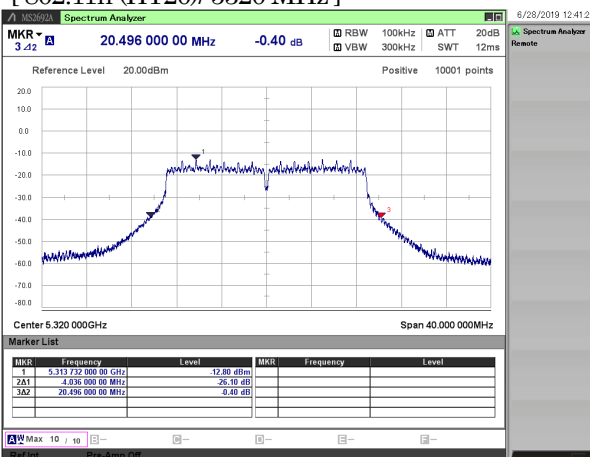
## [ 802.11n (HT20)/ 5260 MHz ]



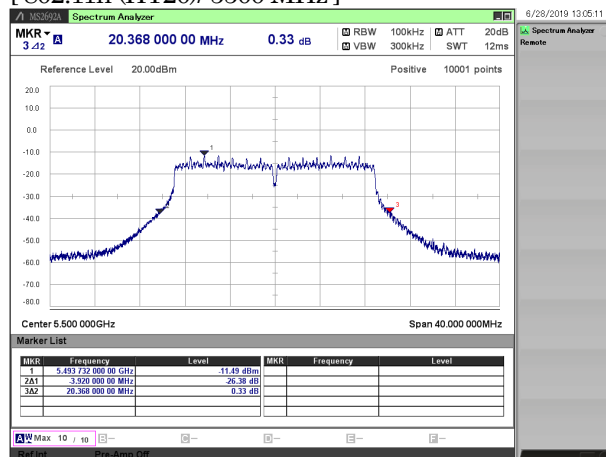
## [ 802.11n (HT20)/ 5300 MHz ]



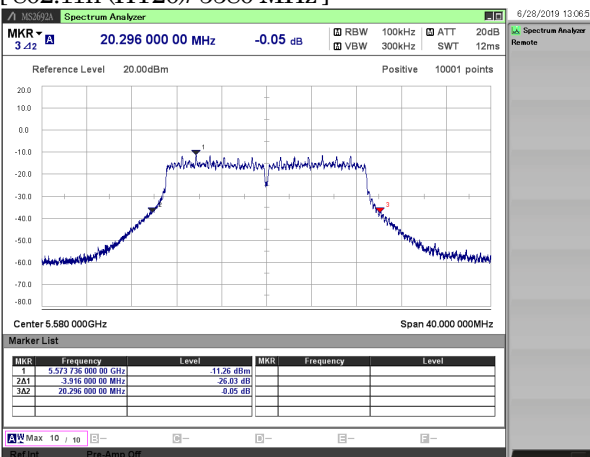
## [ 802.11n (HT20)/ 5320 MHz ]



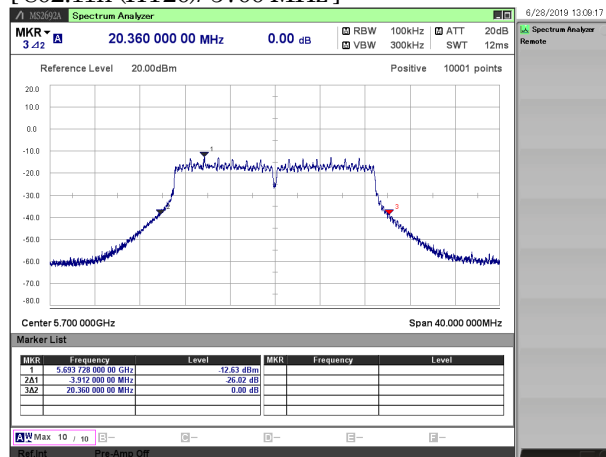
## [ 802.11n (HT20)/ 5500 MHz ]



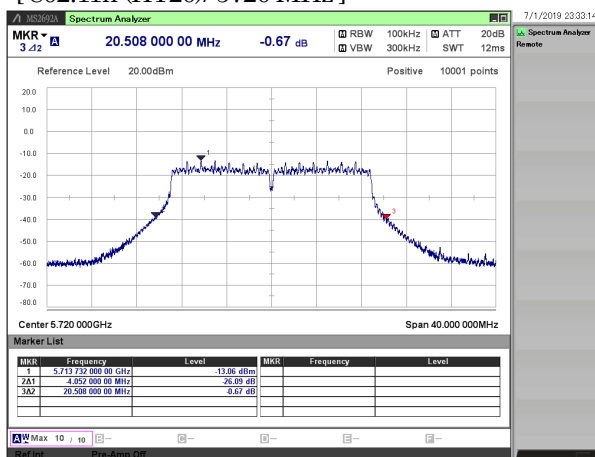
## [ 802.11n (HT20)/ 5580 MHz ]



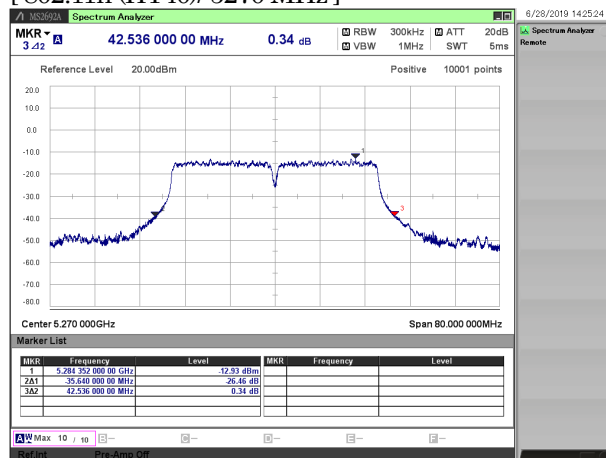
## [ 802.11n (HT20)/ 5700 MHz ]



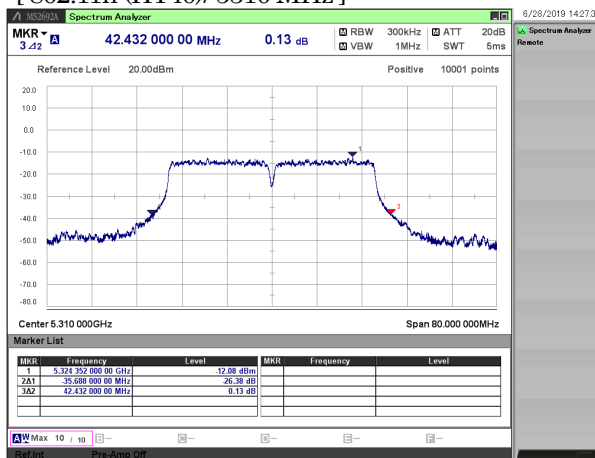
## [ 802.11n (HT20)/ 5720 MHz ]



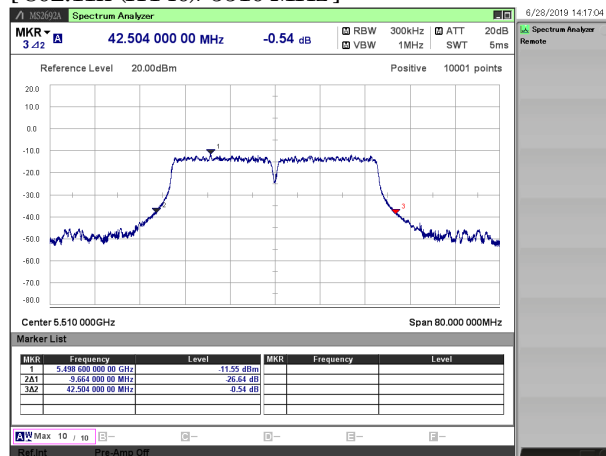
## [ 802.11n (HT40)/ 5270 MHz ]



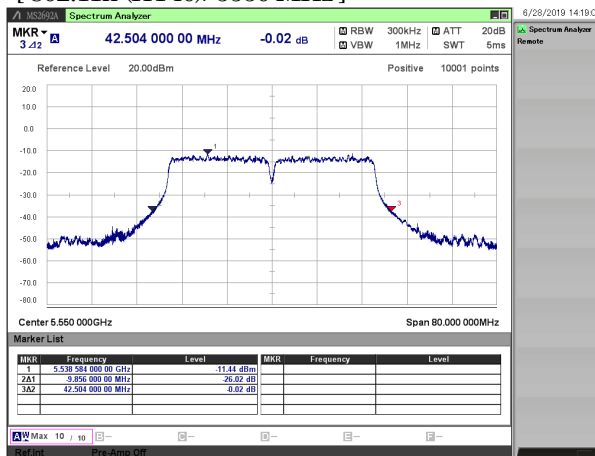
## [ 802.11n (HT40)/ 5310 MHz ]



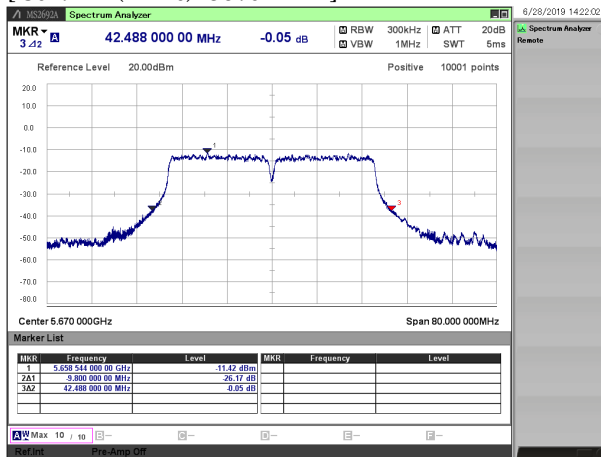
## [ 802.11n (HT40)/ 5510 MHz ]



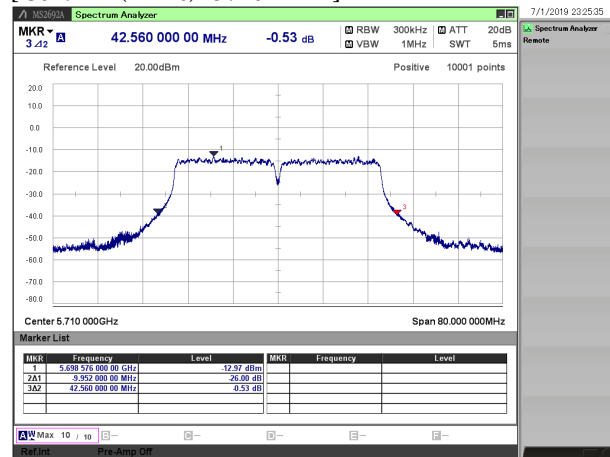
## [ 802.11n (HT40)/ 5550 MHz ]



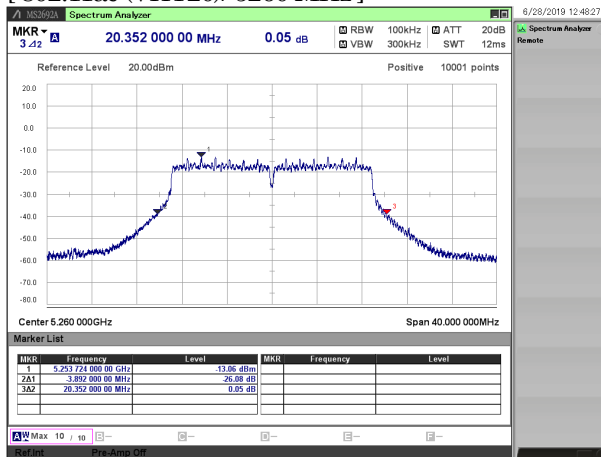
## [ 802.11n (HT40)/ 5670 MHz ]



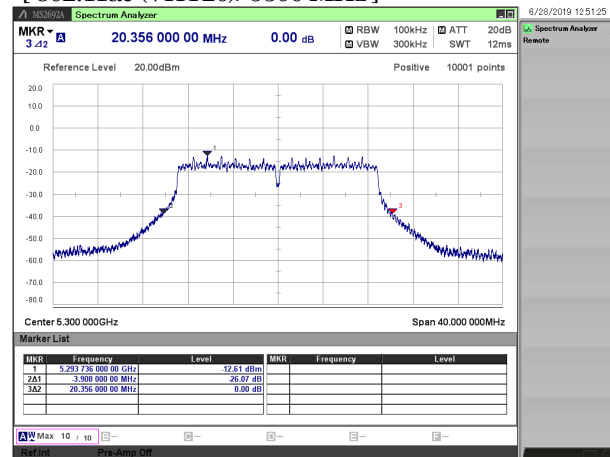
## [ 802.11n (HT40)/ 5710 MHz ]



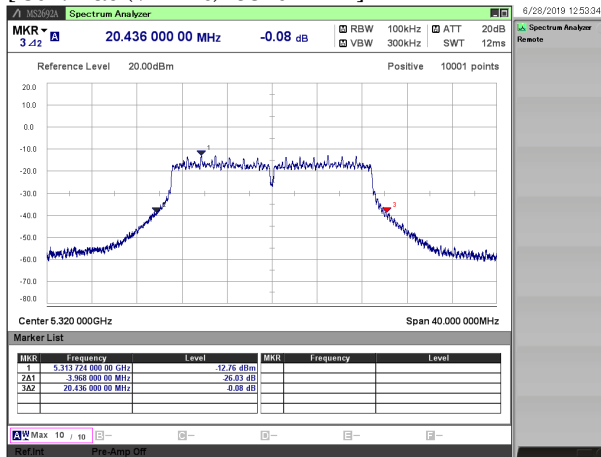
## [ 802.11ac (VHT20)/ 5260 MHz ]



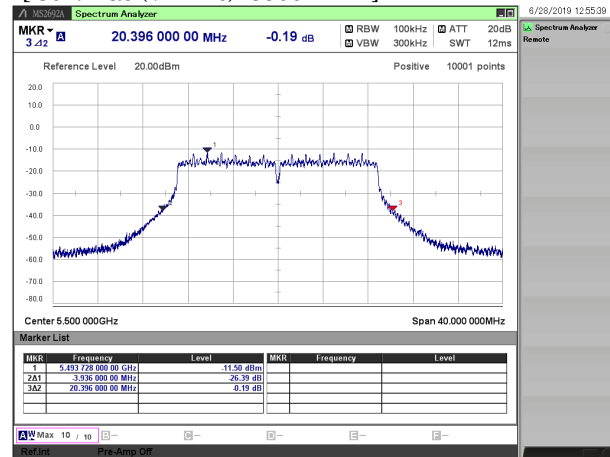
## [ 802.11ac (VHT20)/ 5300 MHz ]



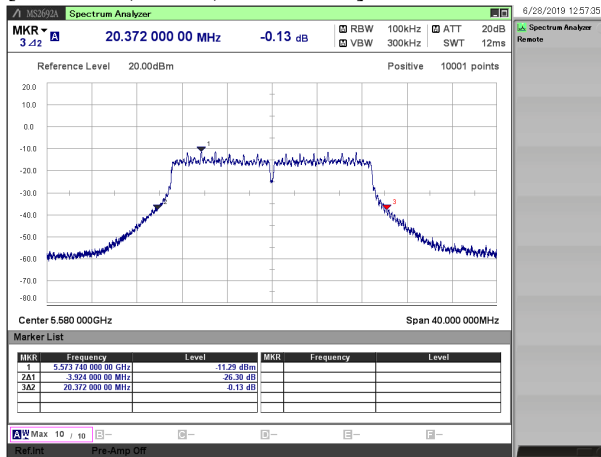
## [ 802.11ac (VHT20)/ 5320 MHz ]



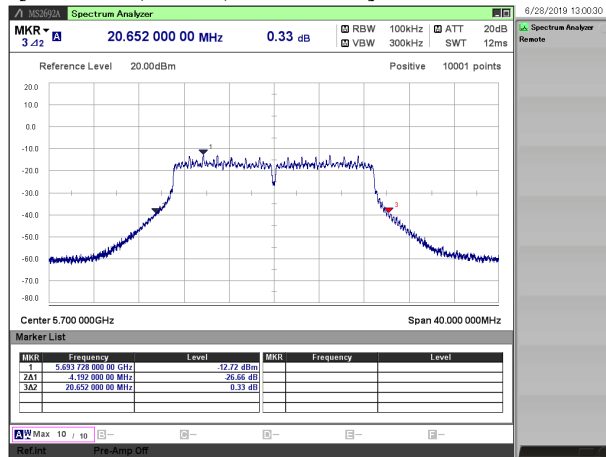
## [ 802.11ac (VHT20)/ 5500 MHz ]



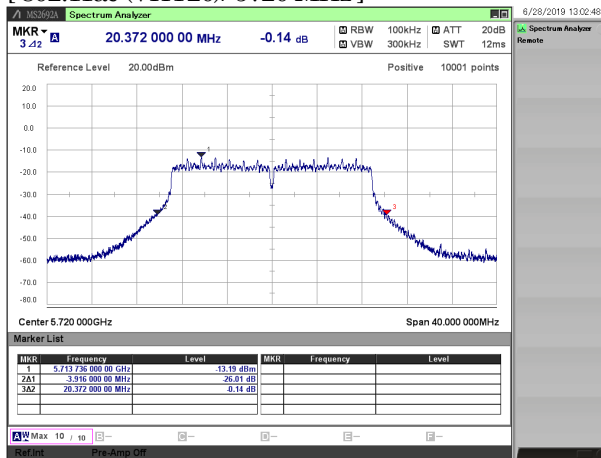
## [ 802.11ac (VHT20)/ 5580 MHz ]



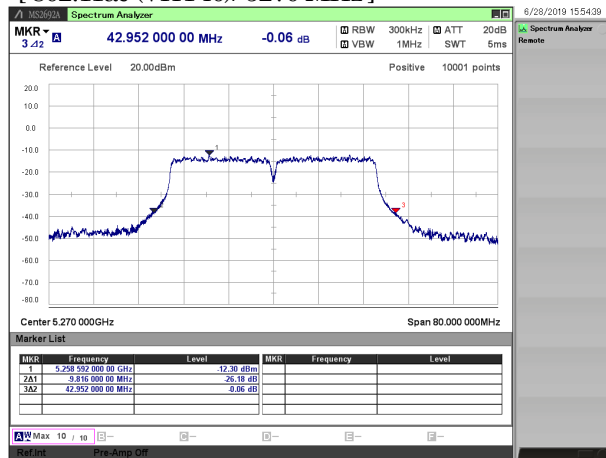
## [ 802.11ac (VHT20)/ 5700 MHz ]



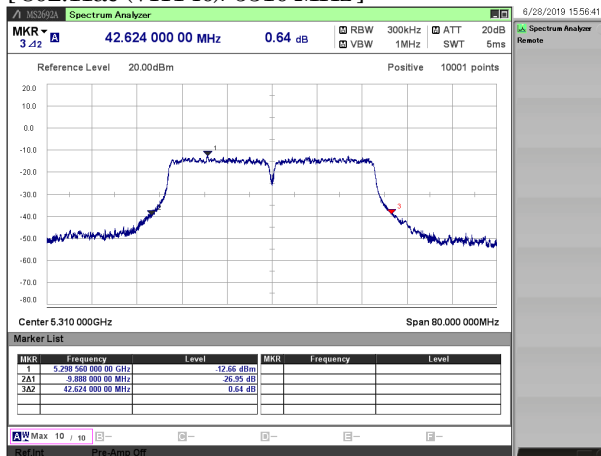
## [ 802.11ac (VHT20)/ 5720 MHz ]



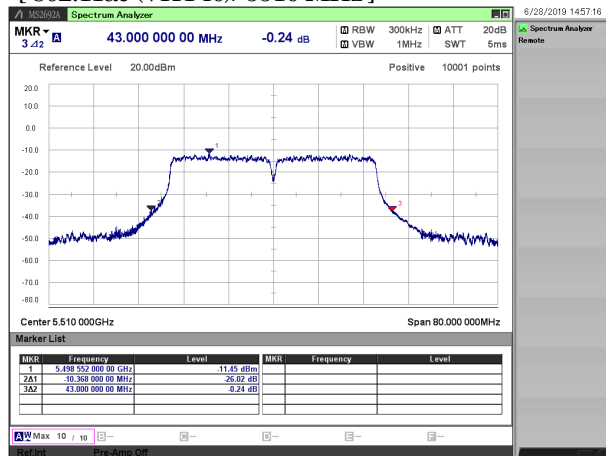
## [ 802.11ac (VHT40)/ 5270 MHz ]



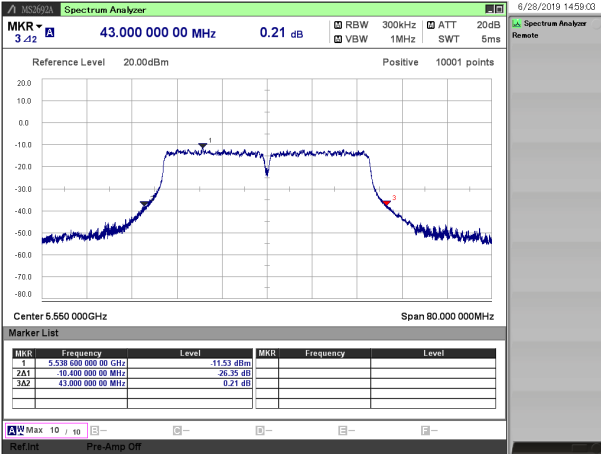
## [ 802.11ac (VHT40)/ 5310 MHz ]



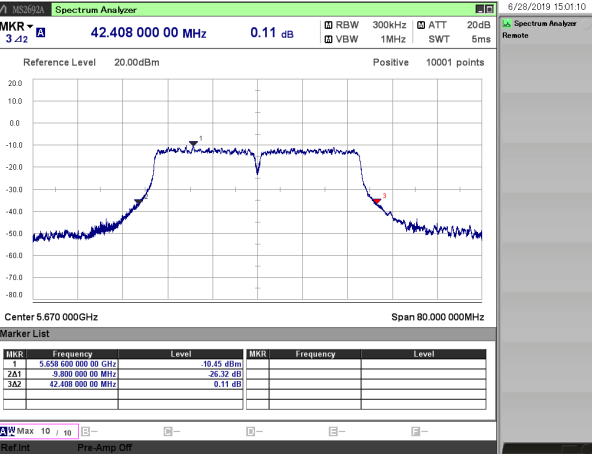
## [ 802.11ac (VHT40)/ 5510 MHz ]



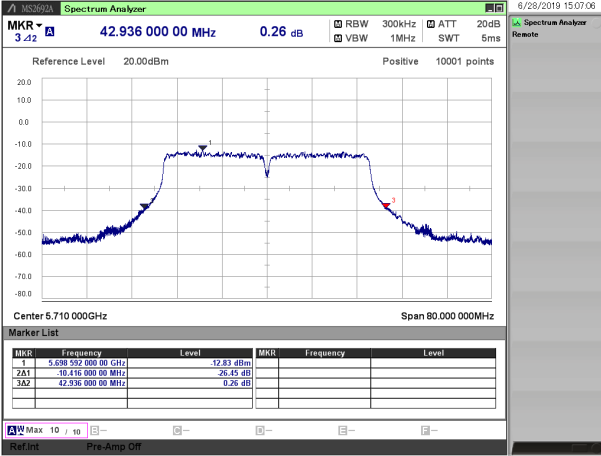
[ 802.11ac (VHT40)/ 5550 MHz ]



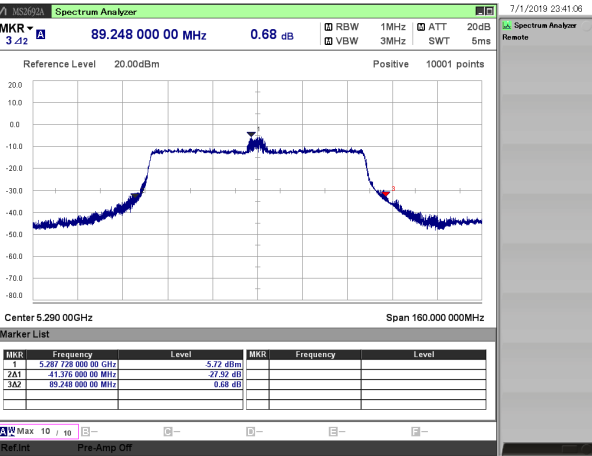
[ 802.11ac (VHT40)/ 5670 MHz ]



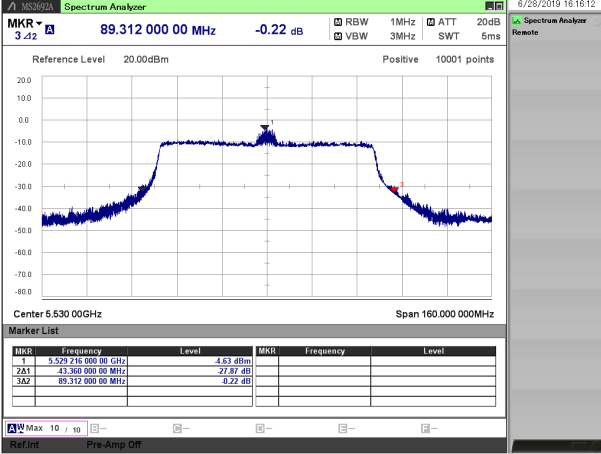
[ 802.11ac (VHT40)/ 5710 MHz ]



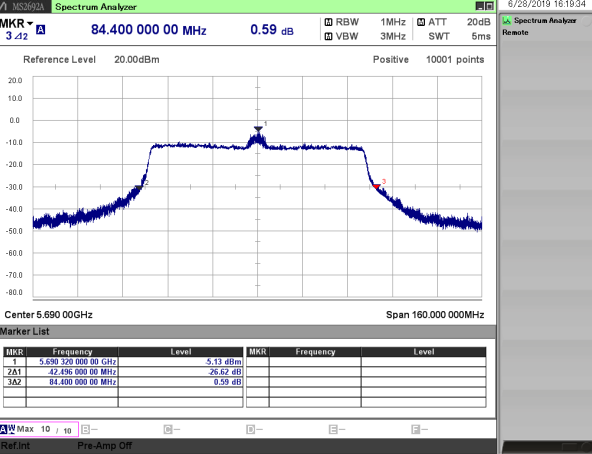
[ 802.11ac (VHT80)/ 5290 MHz ]



[ 802.11ac (VHT80)/ 5530 MHz ]



[ 802.11ac (VHT80)/ 5690 MHz ]



3.3. 6dB Emission Bandwidth

- 1) Ambient temperature

2) Relative humidity

3) Date of measurement

4) Measured by

5) Operating mode
- : 21.1 deg.C

: 62.0 %

: June 26, 2019

: M.KOUGA

: Transmitting mode
- 20.0 deg.C

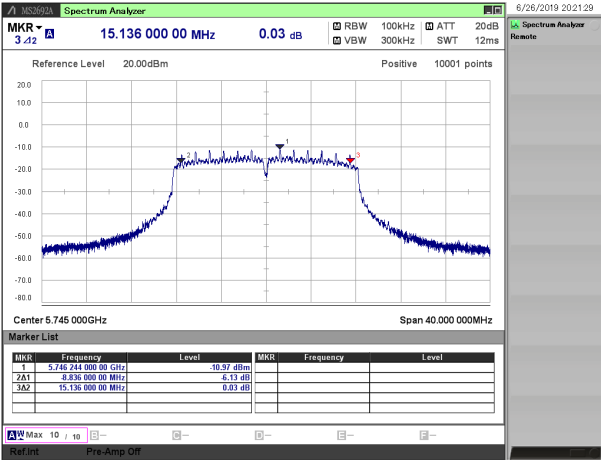
59.5 %

June 28, 2019

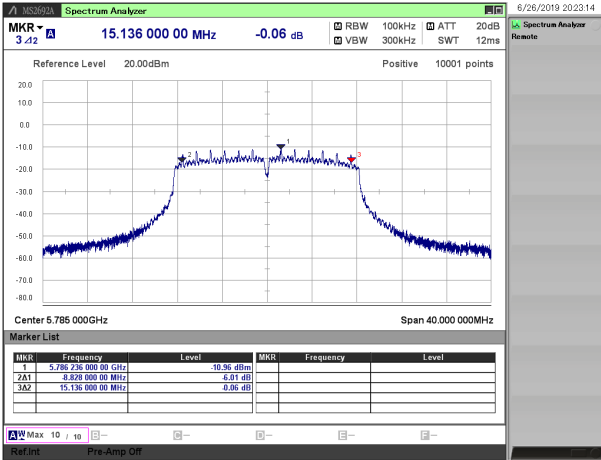
M.KOUGA

| Mode         | Rate [Mbps] | Channel [MHz] | Result [MHz] | Limit [MHz] |
|--------------|-------------|---------------|--------------|-------------|
| 11a          | 18          | 5745          | 15.136       | 0.500       |
|              |             | 5785          | 15.136       | 0.500       |
|              |             | 5825          | 15.140       | 0.500       |
| 11n (HT20)   | MCS4        | 5745          | 17.656       | 0.500       |
|              |             | 5785          | 17.648       | 0.500       |
|              |             | 5825          | 17.652       | 0.500       |
| 11n (HT40)   | MCS4        | 5755          | 36.464       | 0.500       |
|              |             | 5795          | 36.432       | 0.500       |
| 11ac (VHT20) | MCS4        | 5745          | 17.652       | 0.500       |
|              |             | 5785          | 17.652       | 0.500       |
|              |             | 5825          | 17.684       | 0.500       |
| 11ac (VHT40) | MCS4        | 5755          | 36.432       | 0.500       |
|              |             | 5795          | 36.432       | 0.500       |
| 11ac (VHT80) | MCS4        | 5775          | 76.096       | 0.500       |

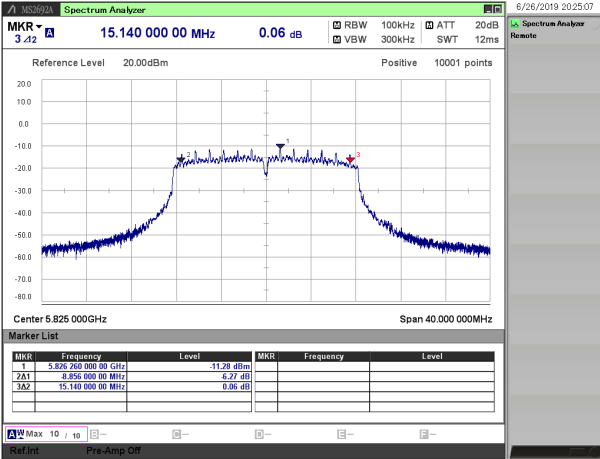
[ 802.11a/ 5745 MHz ]



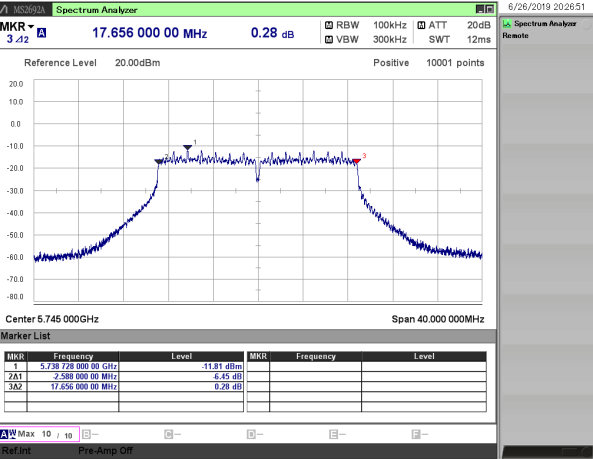
[ 802.11a/ 5785 MHz ]



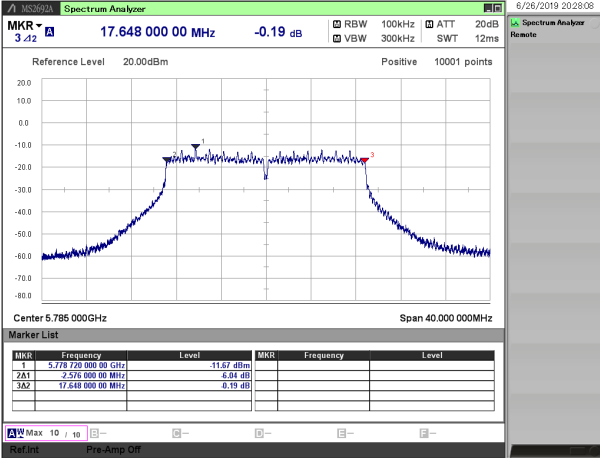
[ 802.11a/ 5825 MHz ]



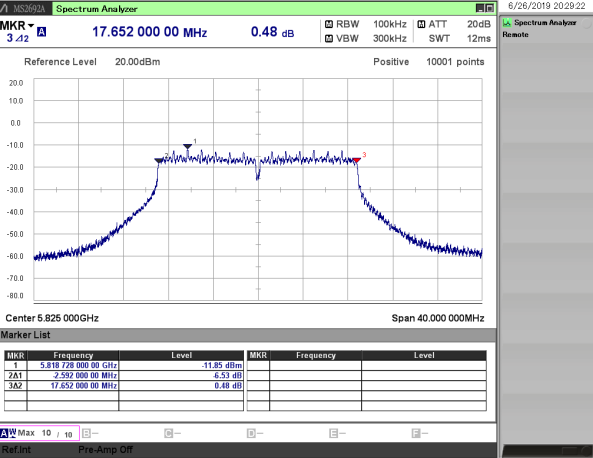
[ 802.11n (HT20)/ 5745 MHz ]



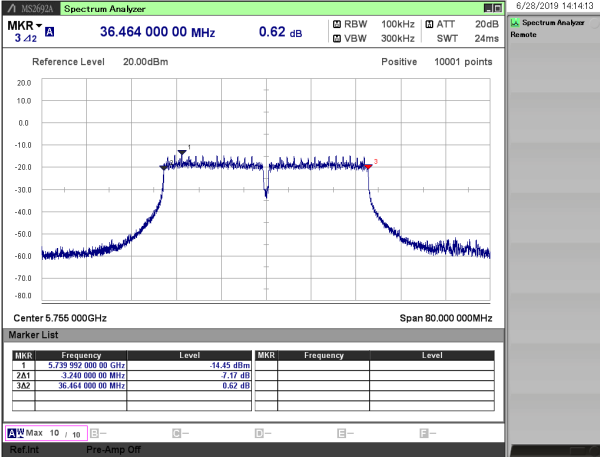
[ 802.11n (HT20)/ 5785 MHz ]



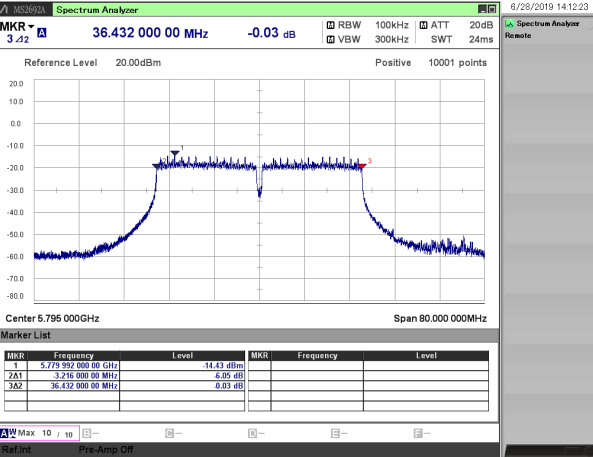
[ 802.11n (HT20)/ 5825 MHz ]



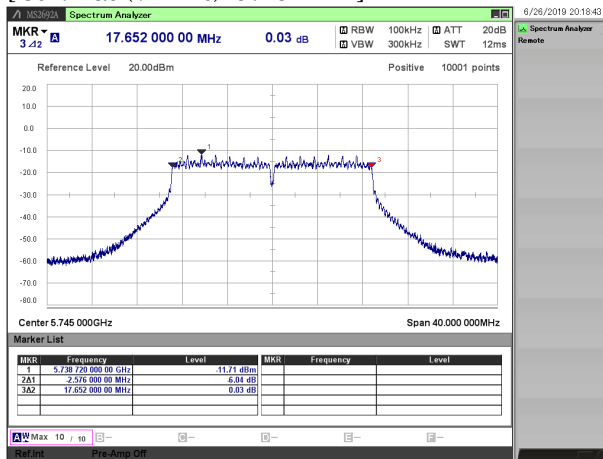
[ 802.11n (HT40)/ 5755 MHz ]



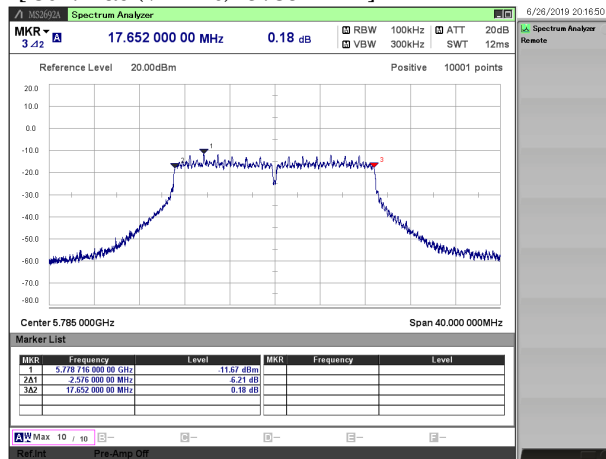
[ 802.11n (HT40)/ 5795 MHz ]



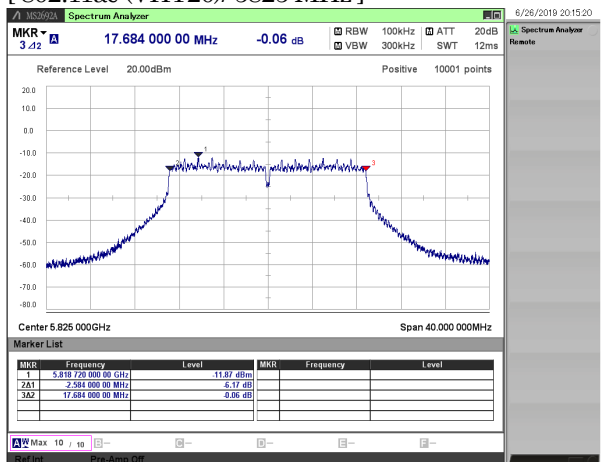
## [ 802.11ac (VHT20)/ 5745 MHz ]



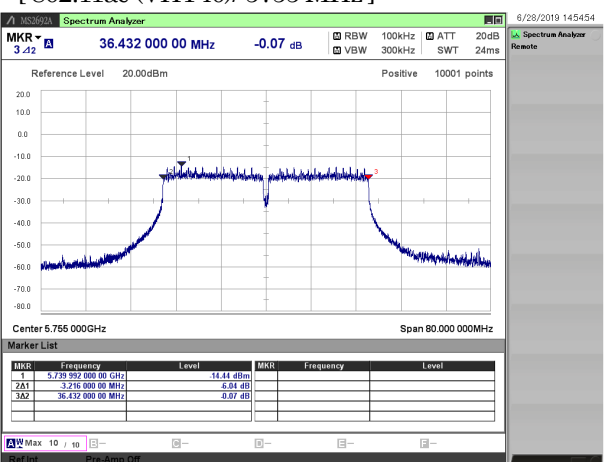
## [ 802.11ac (VHT20)/ 5785 MHz ]



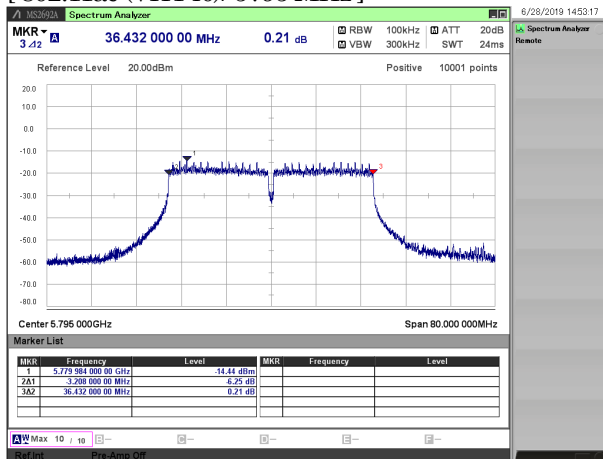
## [ 802.11ac (VHT20)/ 5825 MHz ]



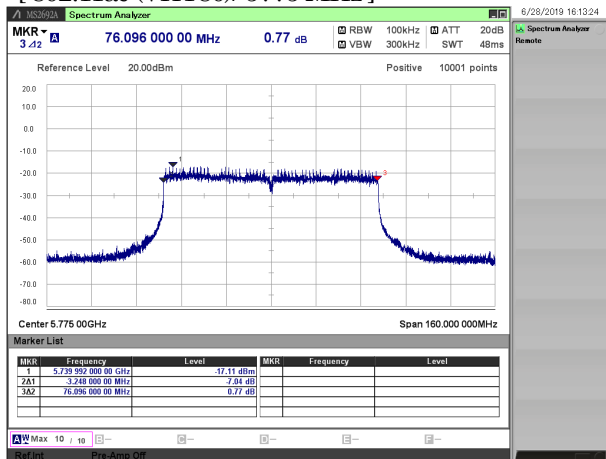
## [ 802.11ac (VHT40)/ 5755 MHz ]



## [ 802.11ac (VHT40)/ 5795 MHz ]



## [ 802.11ac (VHT80)/ 5775 MHz ]



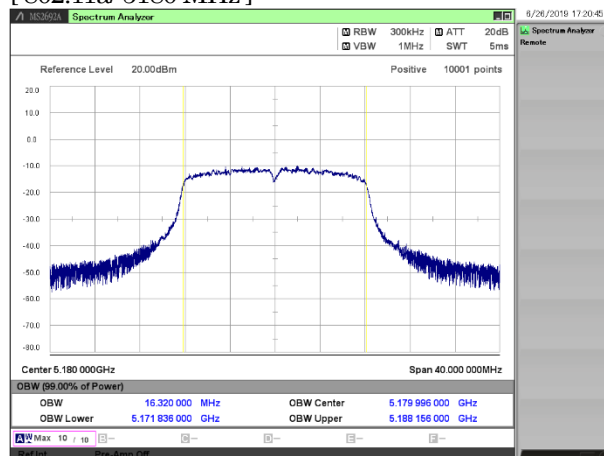
### 3.4. 99% Occupied Bandwidth

- |                        |                     |               |              |
|------------------------|---------------------|---------------|--------------|
| 1) Ambient temperature | : 21.1 deg.C        | 20.0 deg.C    | 20.2 deg.C   |
| 2) Relative humidity   | : 62.0 %            | 59.0 %        | 63.0 %       |
| 3) Date of measurement | : June 28, 2019     | June 28, 2019 | July 1, 2019 |
| 4) Measured by         | : M.KOUGA           | M.KOUGA       | M.KOUGA      |
| 5) Operating mode      | : Transmitting mode |               |              |

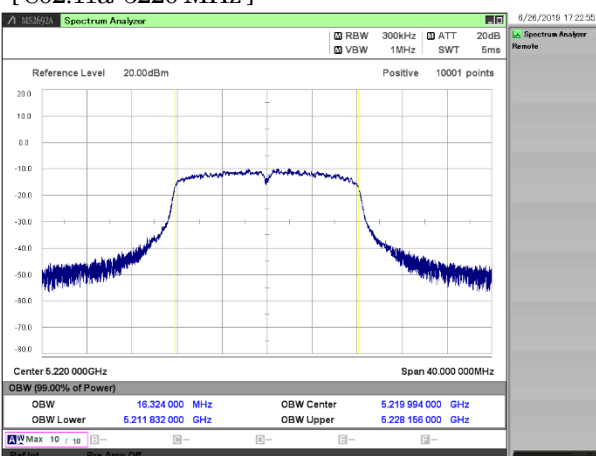
| Mode          | Rate<br>[Mbps] | Channel<br>[MHz] | Result<br>[MHz] | Limit<br>[MHz] |
|---------------|----------------|------------------|-----------------|----------------|
| 11a           | 18             | 5180             | 16.320          | -              |
|               |                | 5220             | 16.324          | -              |
|               |                | 5240             | 16.316          | -              |
|               |                | 5260             | 16.320          | -              |
|               |                | 5300             | 16.312          | -              |
|               |                | 5320             | 16.324          | -              |
|               |                | 5500             | 16.304          | -              |
|               |                | 5580             | 16.300          | -              |
|               |                | 5700             | 16.308          | -              |
|               |                | 5720             | 16.320          | -              |
|               |                | 5745             | 16.320          | -              |
|               |                | 5785             | 16.316          | -              |
|               |                | 5825             | 16.320          | -              |
| 11n<br>(HT20) | MCS4           | 5180             | 17.996          | -              |
|               |                | 5220             | 18.008          | -              |
|               |                | 5240             | 18.008          | -              |
|               |                | 5260             | 18.008          | -              |
|               |                | 5300             | 18.012          | -              |
|               |                | 5320             | 18.000          | -              |
|               |                | 5500             | 18.008          | -              |
|               |                | 5580             | 18.004          | -              |
|               |                | 5700             | 18.008          | -              |
|               |                | 5720             | 18.012          | -              |
|               |                | 5745             | 18.008          | -              |
|               |                | 5785             | 18.016          | -              |
| 11n<br>(HT40) | MCS4           | 5190             | 37.056          | -              |
|               |                | 5230             | 37.088          | -              |
|               |                | 5270             | 37.080          | -              |
|               |                | 5310             | 37.080          | -              |
|               |                | 5510             | 37.048          | -              |
|               |                | 5550             | 37.088          | -              |
|               |                | 5670             | 37.056          | -              |
|               |                | 5710             | 37.112          | -              |
|               |                | 5755             | 37.048          | -              |
|               |                | 5795             | 37.056          | -              |

| Mode         | Rate [Mbps] | Channel [MHz] | Result [MHz] | Limit [MHz] |
|--------------|-------------|---------------|--------------|-------------|
| 11ac (VHT20) | MCS4        | 5180          | 18.004       | -           |
|              |             | 5220          | 18.008       | -           |
|              |             | 5240          | 18.004       | -           |
|              |             | 5260          | 18.004       | -           |
|              |             | 5300          | 18.012       | -           |
|              |             | 5320          | 17.996       | -           |
|              |             | 5500          | 18.004       | -           |
|              |             | 5580          | 18.000       | -           |
|              |             | 5700          | 18.004       | -           |
|              |             | 5720          | 18.012       | -           |
|              |             | 5745          | 18.008       | -           |
|              |             | 5785          | 18.016       | -           |
|              |             | 5825          | 18.012       | -           |
| 11ac (VHT40) | MCS4        | 5190          | 37.048       | -           |
|              |             | 5230          | 37.072       | -           |
|              |             | 5270          | 37.056       | -           |
|              |             | 5310          | 37.056       | -           |
|              |             | 5510          | 37.048       | -           |
|              |             | 5550          | 37.064       | -           |
|              |             | 5670          | 37.040       | -           |
|              |             | 5710          | 37.040       | -           |
|              |             | 5755          | 37.040       | -           |
| 11ac (VHT80) | MCS4        | 5210          | 76.384       | -           |
|              |             | 5290          | 76.352       | -           |
|              |             | 5530          | 76.304       | -           |
|              |             | 5690          | 76.320       | -           |
|              |             | 5775          | 76.320       | -           |

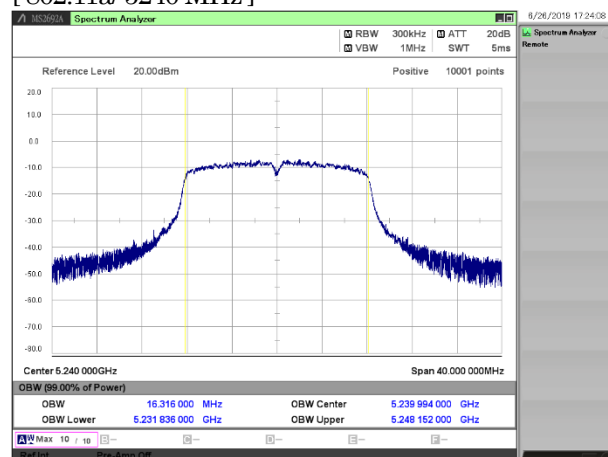
[ 802.11a/ 5180 MHz ]



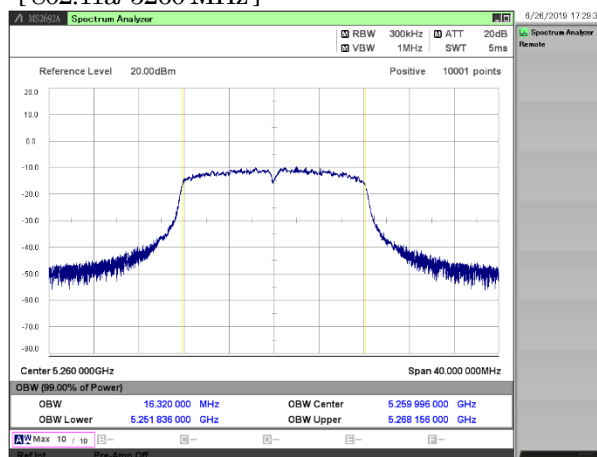
[ 802.11a/ 5220 MHz ]



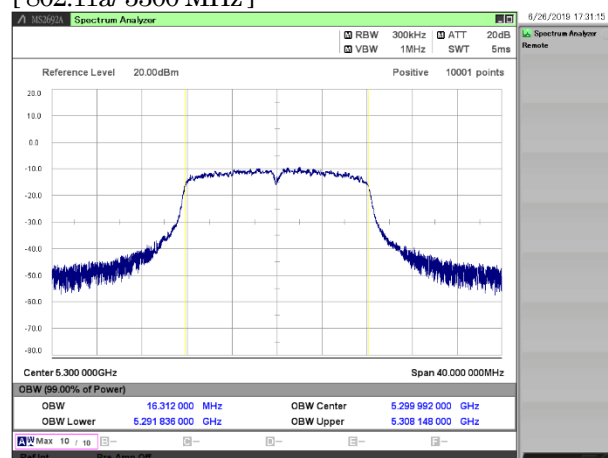
[ 802.11a/ 5240 MHz ]



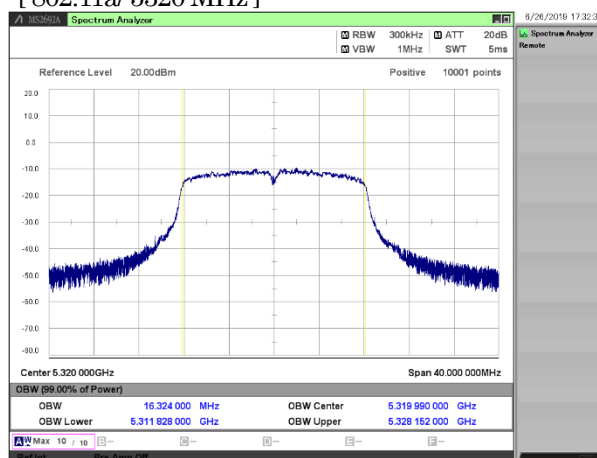
[ 802.11a/ 5260 MHz ]



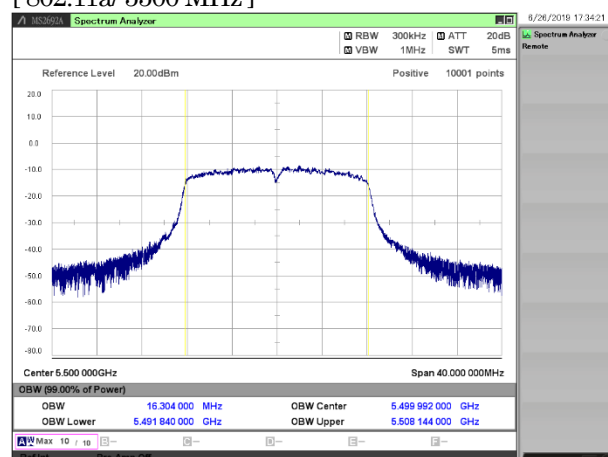
[ 802.11a/ 5300 MHz ]



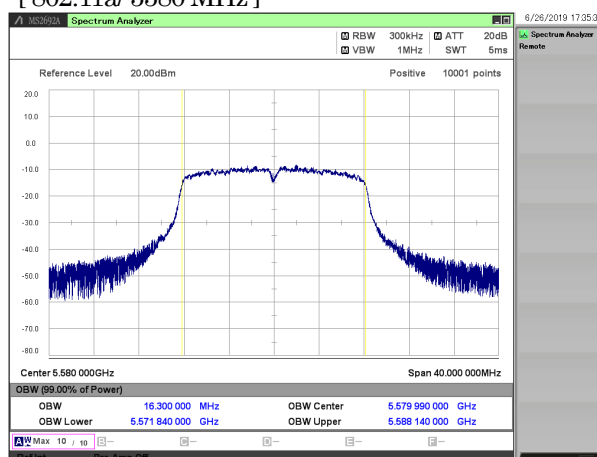
[ 802.11a/ 5320 MHz ]



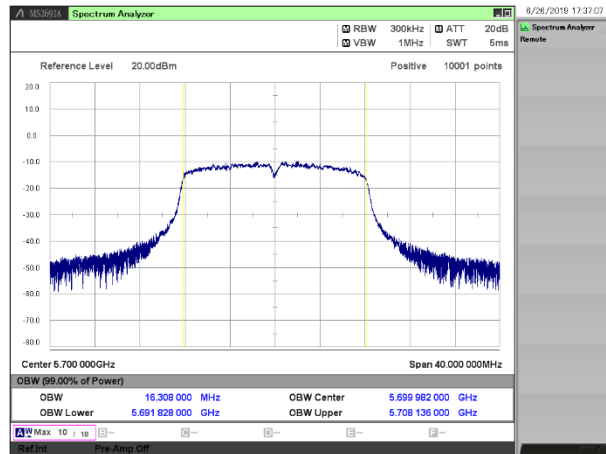
[ 802.11a/ 5500 MHz ]



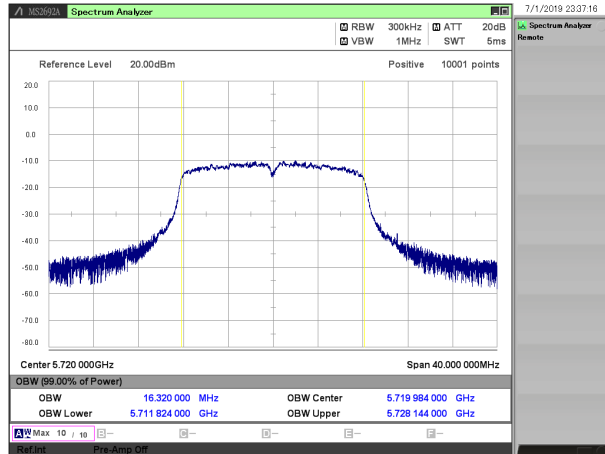
[ 802.11a/ 5580 MHz ]



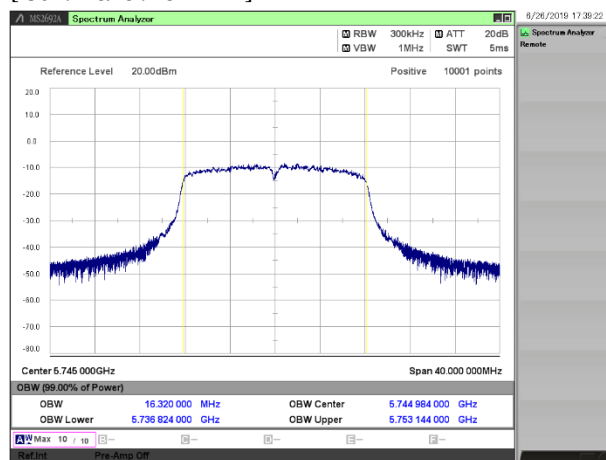
[ 802.11a/ 5700 MHz ]



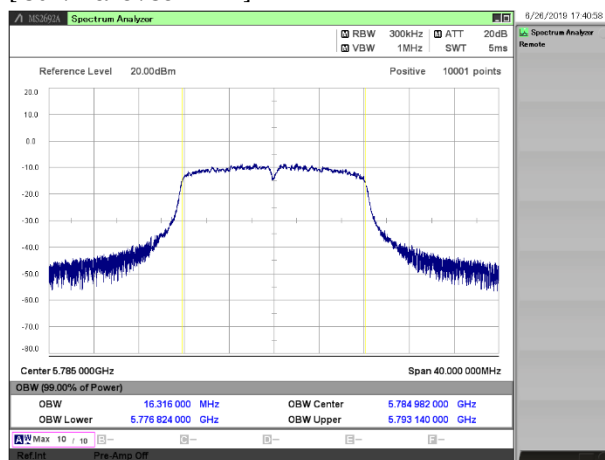
[ 802.11a/ 5720 MHz ]



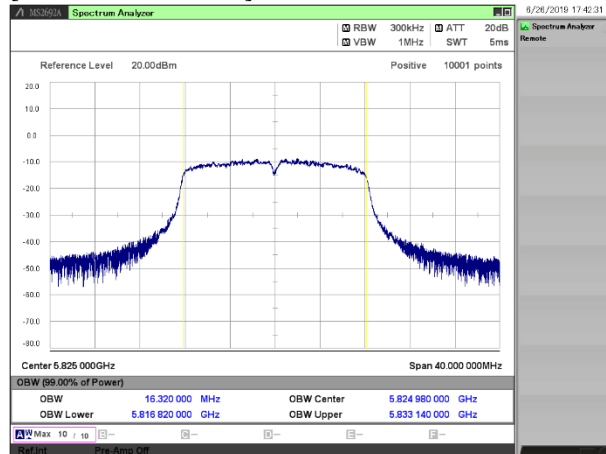
[ 802.11a/ 5745 MHz ]



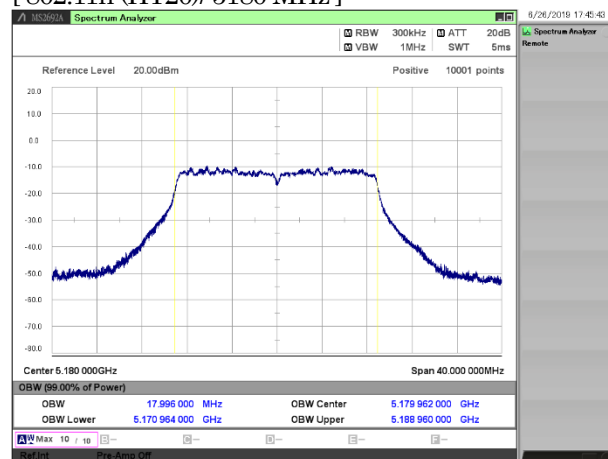
[ 802.11a/ 5785 MHz ]



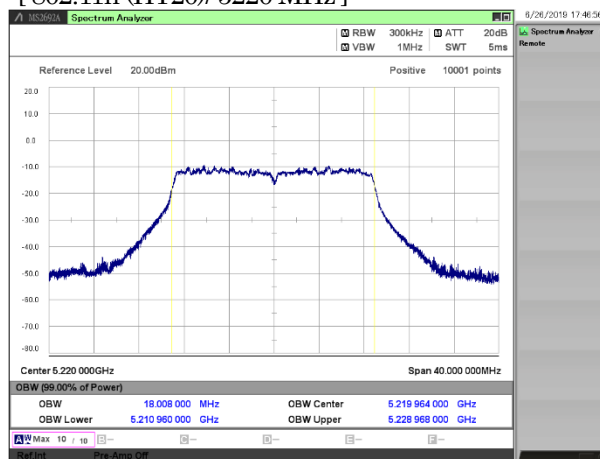
[ 802.11a/ 5825 MHz ]



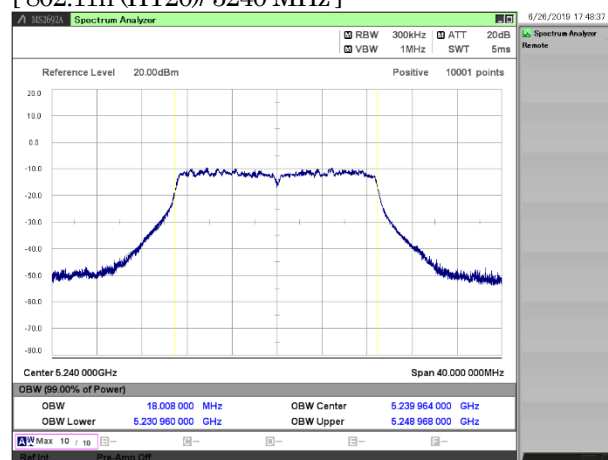
[ 802.11n (HT20)/ 5180 MHz ]



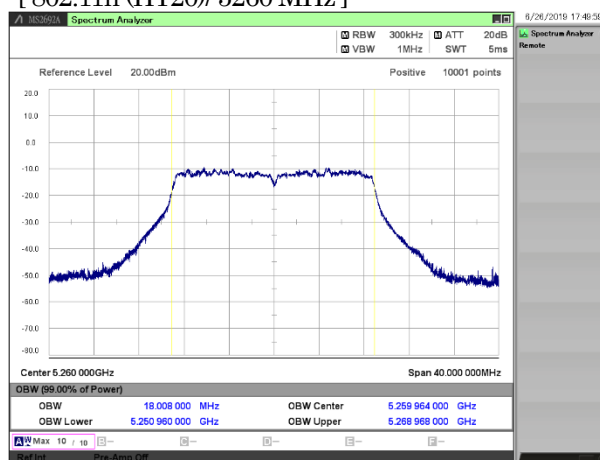
[ 802.11n (HT20)/ 5220 MHz ]



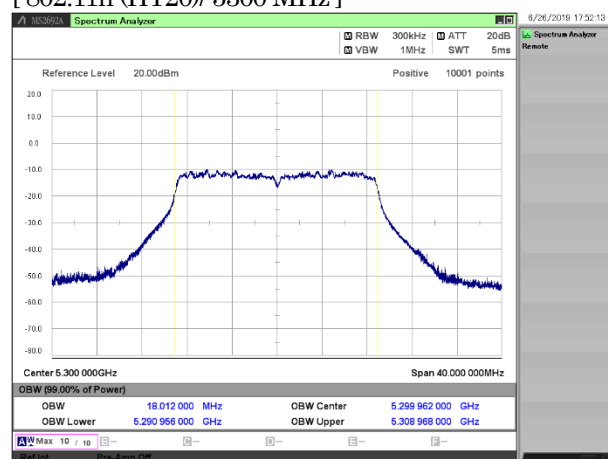
[ 802.11n (HT20)/ 5240 MHz ]



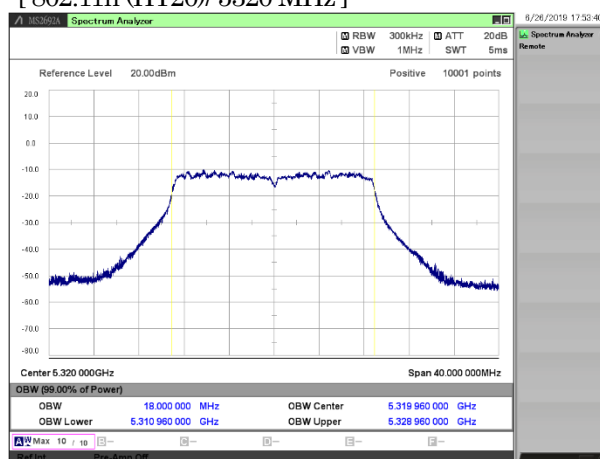
[ 802.11n (HT20)/ 5260 MHz ]



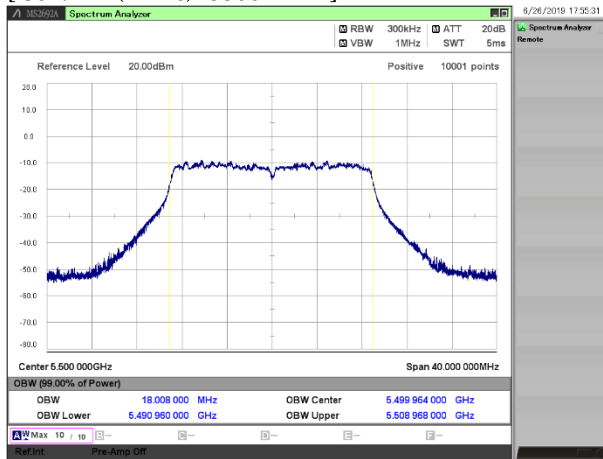
[ 802.11n (HT20)/ 5300 MHz ]



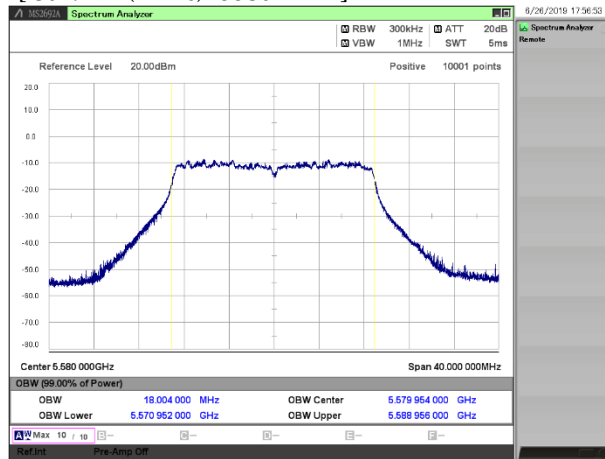
[ 802.11n (HT20)/ 5320 MHz ]



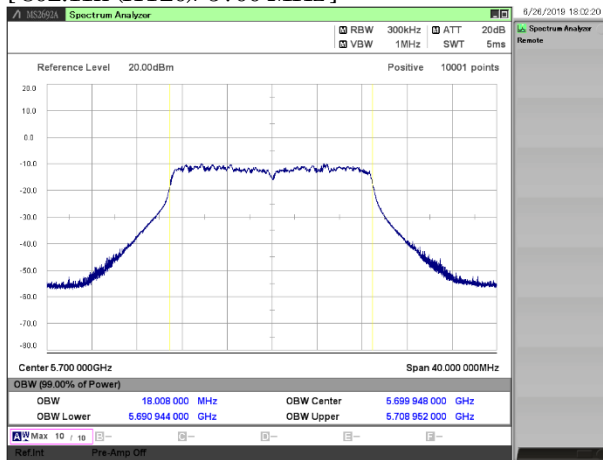
[ 802.11n (HT20)/ 5500 MHz ]



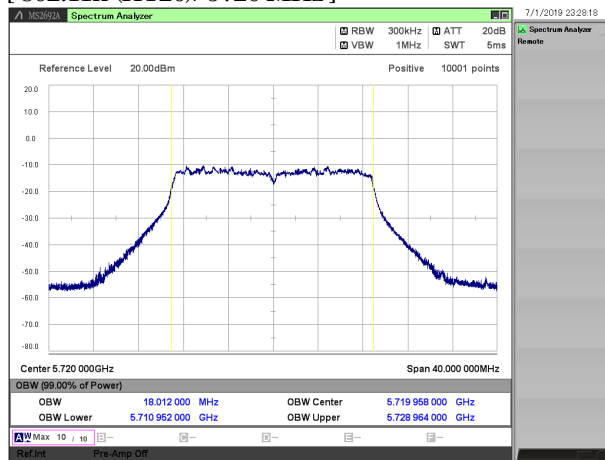
[ 802.11n (HT20)/ 5580 MHz ]



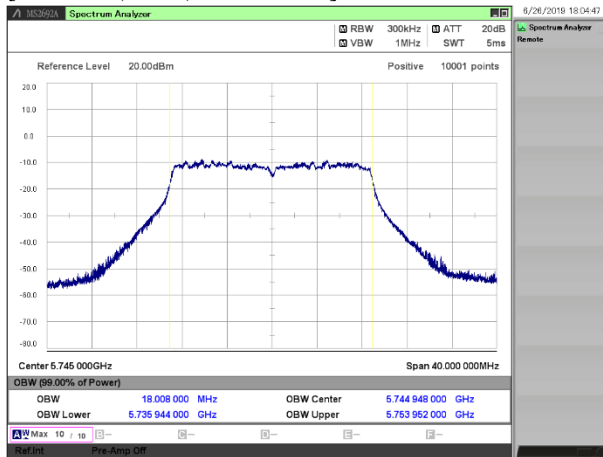
[ 802.11n (HT20)/ 5700 MHz ]



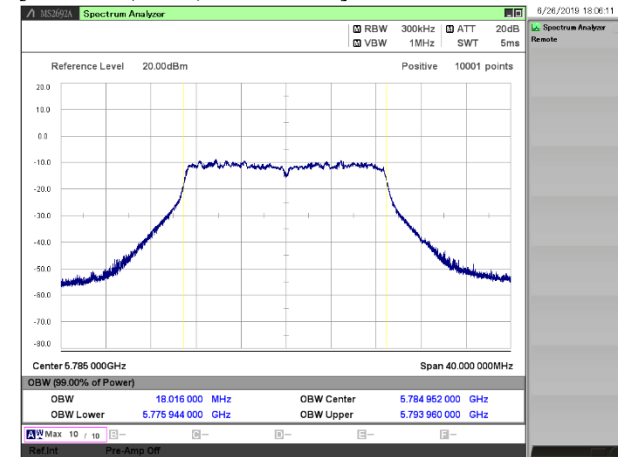
[ 802.11n (HT20)/ 5720 MHz ]



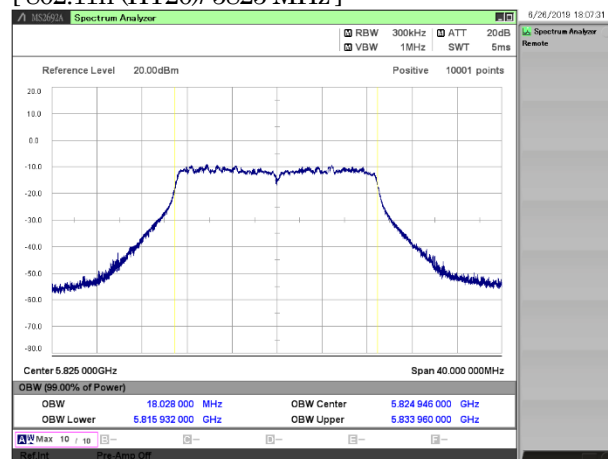
[ 802.11n (HT20)/ 5745 MHz ]



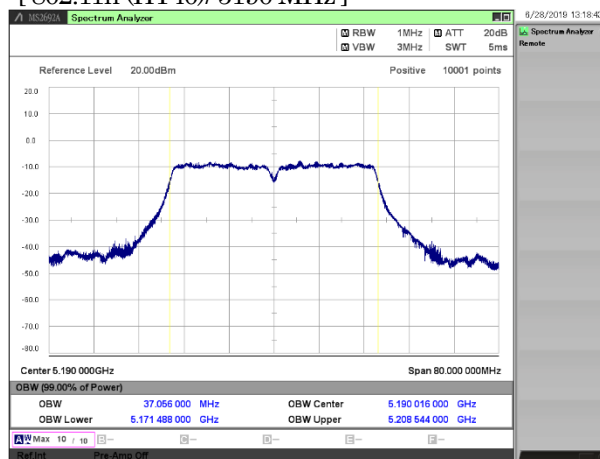
[ 802.11n (HT20)/ 5785 MHz ]



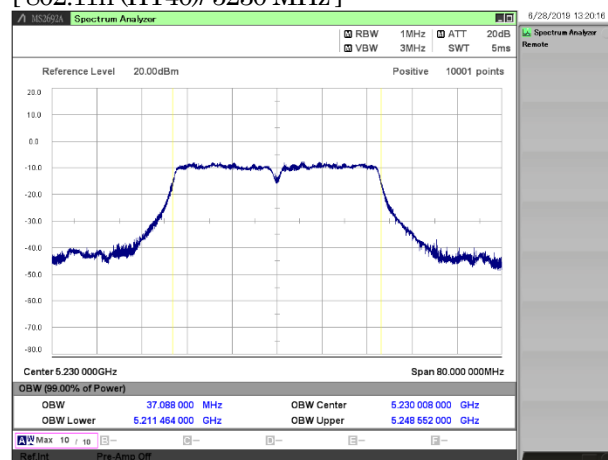
[ 802.11n (HT20)/ 5825 MHz ]



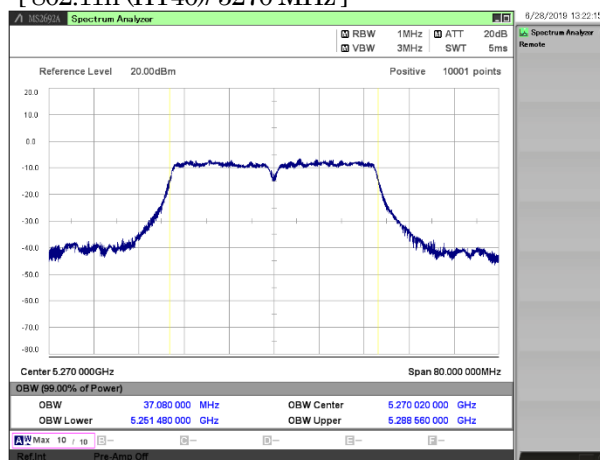
[ 802.11n (HT40)/ 5190 MHz ]



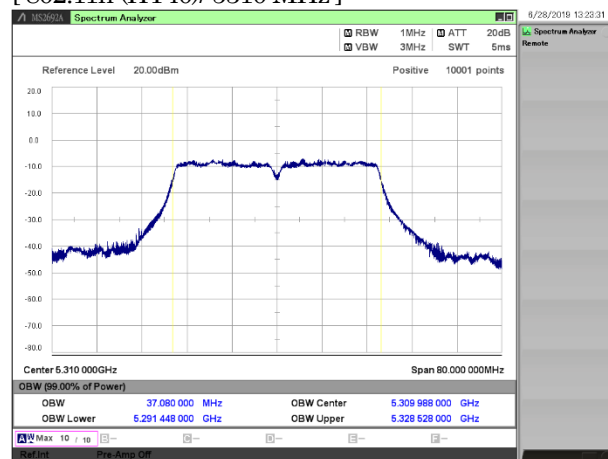
[ 802.11n (HT40)/ 5230 MHz ]



[ 802.11n (HT40)/ 5270 MHz ]



[ 802.11n (HT40)/ 5310 MHz ]



[ 802.11n (HT40)/ 5510 MHz ]

