

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

**FCC PART 15 SUBPART C TEST REPORT****FCC PART 15.407****Report Reference No. .... : GTS20200303006-1-22****FCC ID. .... : 2AQAA-EZPADPRO8**

Compiled by

( position+printed name+signature) : File administrators Tracy Hu

Supervised by

( position+printed name+signature) : Test Engineer Moon Tan

Approved by

( position+printed name+signature) : Manager Simon Hu

Date of issue..... : Apr. 14, 2020

**Representative Laboratory Name : Shenzhen Global Test Service Co.,Ltd.**

Address ..... : No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

**Applicant's name ..... : SHENZHEN JUMPER TECHNOLOGY CO.,LTD**

Address ..... : 101, 102, 201, 301 No.13-2 Pingxi South Rd., Pingxi Community, Pingdi Street, Longgang District, Shenzhen, Guangdong

**Test specification..... :**Standard..... : **FCC Part 15.407: UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES**

TRF Originator..... : Shenzhen Global Test Service Co.,Ltd.

Master TRF..... : Dated 2014-12

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**Test item description..... : Portable computer**

Trade Mark..... : N/A

Manufacturer ..... : **SHENZHEN JUMPER TECHNOLOGY CO.,LTD**

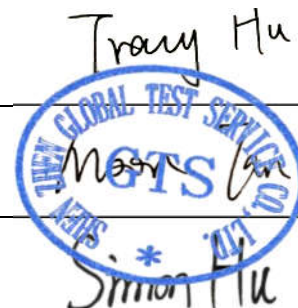
Model/Type reference..... : EZpad Pro8

Listed Models ..... : EZpad Pro 8S,EZpad Pro 8D,EZpad Pro 9,EZpad Pro 9S, EZpad Pro 9D

Operation Frequency..... : From 5180MHz to 5240MHz/ 5745MHz to 5825MHz

Rating..... : DC 7.6V by battery

Recharged by DC 12V/3A

**Result..... : PASS**

**TEST REPORT**

|                          |                            |               |
|--------------------------|----------------------------|---------------|
| <b>Test Report No. :</b> | <b>GTS20200303006-1-22</b> | Apr. 14, 2020 |
|                          |                            | Date of issue |

Equipment under Test : Portable computer

Model /Type : EZpad Pro8

Listed model : EZpad Pro 8S,EZpad Pro 8D,EZpad Pro 9,EZpad Pro 9S,  
EZpad Pro 9D

**Applicant** : **SHENZHEN JUMPER TECHNOLOGY CO.,LTD**

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Address : 101, 102, 201, 301 No.13-2 Pingxi South Rd., Pingxi Community,  
Pingdi Street, Longgang District, Shenzhen, Guangdong

|                     |             |
|---------------------|-------------|
| <b>Test Result:</b> | <b>PASS</b> |
|---------------------|-------------|

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## **1. TEST STANDARDS**

The tests were performed according to following standards:

[FCC Rules Part 15.407](#): UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB 789033 D02](#): GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

## 2. SUMMARY

### 2.1. General Remarks

|                                |   |               |
|--------------------------------|---|---------------|
| Date of receipt of test sample | : | Apr. 3, 2020  |
|                                | : |               |
| Testing commenced on           | : | Apr. 4, 2020  |
|                                | : |               |
| Testing concluded on           | : | Apr. 14, 2020 |

### 2.2. Product Description

|                       |                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:         | Portable computer                                                                                                                                                                                                                                                                                                                                                                                 |
| Trade Mark:           | N/A                                                                                                                                                                                                                                                                                                                                                                                               |
| Model/Type reference: | EZpad Pro8                                                                                                                                                                                                                                                                                                                                                                                        |
| List Model:           | EZpad Pro 8S,EZpad Pro 8D,EZpad Pro 9,EZpad Pro 9S, EZpad Pro 9D                                                                                                                                                                                                                                                                                                                                  |
| Power supply:         | DC 7.6V form battery                                                                                                                                                                                                                                                                                                                                                                              |
| <b>WIFI</b>           |                                                                                                                                                                                                                                                                                                                                                                                                   |
| WLAN                  | Supported 802.11 a/b/g/n/ac                                                                                                                                                                                                                                                                                                                                                                       |
| Modulation Type       | IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)<br>IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac20/40/80: OFDM(256QAM,64QAM, 16QAM, QPSK, BPSK)                                                                                     |
| Operation frequency   | IEEE 802.11a:5180-5240MHz 5745-5825MHz<br>IEEE 802.11b:2412-2462MHz<br>IEEE 802.11g:2412-2462MHz<br>IEEE 802.11n HT20:2412-2462MHz, 5180-5240MHz 5745-5825MHz<br>IEEE 802.11n HT40:2422-2452MHz, 5190-5230MHz 5755-5795MHz<br>IEEE 802.11ac20:5180-5240MHz 5745-5825MHz<br>IEEE 802.11ac40:5190-5230MHz 5755-5795MHz<br>IEEE 802.11ac80:5210MHz 5775MHz                                           |
| Channel number        | 11 Channels for WIFI 20MHz Bandwidth(802.11b/g/n-HT20)<br>7 Channels for WIFI 40MHz Bandwidth(802.11n-HT40)<br>4 channels for 20MHz bandwidth(5180-5240MHz)<br>2 channels for 40MHz bandwidth(5190~5230MHz)<br>1 channels for 80MHz bandwidth(5210MHz)<br>5 channels for 20MHz bandwidth(5745-5825MHz)<br>2 channels for 40MHz bandwidth(5755~5795MHz)<br>1 channels for 80MHz bandwidth(5775MHz) |
| <b>BT</b>             |                                                                                                                                                                                                                                                                                                                                                                                                   |
| Operation frequency   | 2402-2480MHz                                                                                                                                                                                                                                                                                                                                                                                      |
| Channel Number        | 79 channels for Bluetooth (DSS)<br>40 channels for Bluetooth (DTS)                                                                                                                                                                                                                                                                                                                                |
| Channel Spacing       | 1MHz for Bluetooth (DSS)<br>2MHz for Bluetooth (DTS)                                                                                                                                                                                                                                                                                                                                              |
| Modulation Type       | GFSK, $\pi/4$ DQPSK, 8DPSK for Bluetooth (DSS)<br>GFSK for Bluetooth (DTS)                                                                                                                                                                                                                                                                                                                        |
| Antenna Description   | Two same FPC Antenna, but not support MIMO technology<br>ANT0 used for Bluetooth & WIFI TX/RX, 1.87dBi(Max.) for 2.4G Band and 1.85dBi(Max.) for 5G Band<br>ANT1 used for WIFI TX/RX, 1.87dBi(Max.) for 2.4G Band and 1.85dBi(Max.) for 5G Band                                                                                                                                                   |

### 2.3. Equipment Under Test

#### Power supply system utilised

|                      |   |                                                                   |                                   |
|----------------------|---|-------------------------------------------------------------------|-----------------------------------|
| Power supply voltage | : | <input type="radio"/> 230V / 50 Hz                                | <input type="radio"/> 120V / 60Hz |
|                      |   | <input type="radio"/> 12 V DC                                     | <input type="radio"/> 24 V DC     |
|                      |   | <input checked="" type="radio"/> Other (specified in blank below) |                                   |

DC 7.6V form battery

### 2.4. Short description of the Equipment under Test (EUT)

This is a Portable computer.

For more details, refer to the user's manual of the EUT.

### 2.5. EUT operation mode

The application provider specific test software to control sample in continuous TX and RX.

#### NOTE:

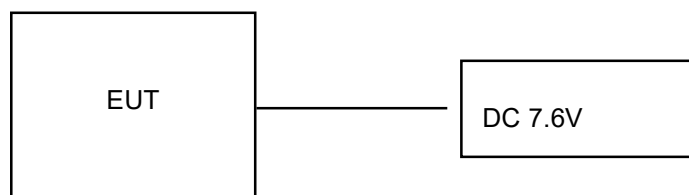
**Equipment with 2 diversity antennas operating in switched diversity mode by which at any moment in time only 1 antenna is used.**

IEEE 802.11a/ac20/ac40/ac80/n20/n40:

| U-NI-1  |                 | U-NI-1  |                 | U-NI-1  |                 |
|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36      | 5180            | 38      | 5190            | 42      | 5210            |
| 40      | 5200            | 46      | 5230            |         |                 |
| 44      | 5220            |         |                 |         |                 |
| 48      | 5240            |         |                 |         |                 |

| U-NI-3     |                 | U-NI-3  |                 | U-NI-3  |                 |
|------------|-----------------|---------|-----------------|---------|-----------------|
| Channel    | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| <b>149</b> | <b>5745</b>     | 151     | 5755            | 155     | 5775            |
| 153        | 5765            | 159     | 5795            |         |                 |
| <b>157</b> | <b>5785</b>     |         |                 |         |                 |
| 161        | 5805            |         |                 |         |                 |
| <b>165</b> | <b>5825</b>     |         |                 |         |                 |

### 2.6. Block Diagram of Test Setup



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

This submittal(s) (test report) is intended for **FCC ID:2AQAA-EZPADPRO8** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

**2.8. Special Accessories**

| Manufacturer                     | Description | Model                 | Serial Number | Certificate |
|----------------------------------|-------------|-----------------------|---------------|-------------|
| Shenzhen Jihongda Power Co.,Ltd. | Adapter     | JHD-AP036U-120300AA-A | --            | SDOC        |

**2.9. Modifications**

No modifications were implemented to meet testing criteria.

### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

#### **3.2. Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

#### **3.3. Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

|                       |              |
|-----------------------|--------------|
| Temperature:          | 15-35 ° C    |
|                       |              |
| Humidity:             | 30-60 %      |
|                       |              |
| Atmospheric pressure: | 950-1050mbar |

### 3.4. Test Description

| Test Specification clause | Test case                               | Test Mode                                        | Test Channel                                                                                                                            | Recorded In Report                               |                                                                                                                                         | Pass                                                                                                              | Fail                     | NA                                  | NP                       | Remark   |
|---------------------------|-----------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|----------|
| §15.203                   | Antenna gain                            | 802.11ac                                         | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | 802.11ac                                         | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(a)                | Power spectral density                  | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(a)                | Spectrum bandwidth – 26 dB bandwidth    | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>                                        | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(e)                | Spectrum bandwidth – 6 dB bandwidth     | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>                                        | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(a)                | Maximum output power                    | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(b)                | Band edge compliance conducted          | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Highest                                               | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Highest                                               | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>                                        | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(b)                | Band edge compliance radiated           | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Highest                                               | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Highest                                               | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(a)                | TX spurious emissions conducted         | -/-                                              | -/-                                                                                                                                     | -/-                                              | -/-                                                                                                                                     | <input type="checkbox"/>                                                                                          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | complies |
| §15.407(a)                | TX spurious emissions radiated          | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | 802.11a/ac20/a<br>c40/ac80<br>802.11n<br>HT20/40 | <input checked="" type="checkbox"/> Lowest<br><input checked="" type="checkbox"/> Middle<br><input checked="" type="checkbox"/> Highest | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.407(g)                | Frequency Stability                     | -/-                                              | -/-                                                                                                                                     | -/-                                              | -/-                                                                                                                                     | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.109                   | RX spurious emissions radiated          | -/-                                              | -/-                                                                                                                                     | -/-                                              | -/-                                                                                                                                     | <input type="checkbox"/>                                                                                          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | complies |
| §15.209(a)                | TX spurious Emissions radiated < 30 MHz | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | -/-                                                                                                                                     | 802.11ac                                         | -/-                                                                                                                                     | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |
| §15.107(a)<br>§15.207     | Conducted Emissions < 30 MHz            | 802.11a/ac20/<br>ac40/ac80<br>802.11n<br>HT20/40 | -/-                                                                                                                                     | 802.11ac                                         | -/-                                                                                                                                     | <input checked="" type="checkbox"/>                                                                               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | complies |

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items                                                                     | Mode                                    | Data Rate |
|--------------------------------------------------------------------------------|-----------------------------------------|-----------|
| Maximum Peak Conducted Output Power                                            | 802.11a                                 | 6 Mbps    |
| Power Spectral Density                                                         | 802.11ac20/ac40/ac80<br>802.11n HT20/40 | MCS0      |
| 6dB Bandwidth                                                                  |                                         |           |
| 26dB Bandwidth                                                                 |                                         |           |
| Radiated Emission30M~1GHz&<br>Radiated Emission 1GHz~10 <sup>th</sup> Harmonic | 802.11a                                 | 6 Mbps    |
| Band Edge                                                                      | 802.11ac20/ac40/ac80<br>802.11n HT20/40 | MCS0      |

### 3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

| Test                  | Range      | Measurement Uncertainty | Notes |
|-----------------------|------------|-------------------------|-------|
| Radiated Emission     | 30~1000MHz | 4.10 dB                 | (1)   |
| Radiated Emission     | 1~18GHz    | 4.32 dB                 | (1)   |
| Radiated Emission     | 18-40GHz   | 5.54 dB                 | (1)   |
| Conducted Disturbance | 0.15~30MHz | 3.12 dB                 | (1)   |

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

**3.6. Equipments Used during the Test**

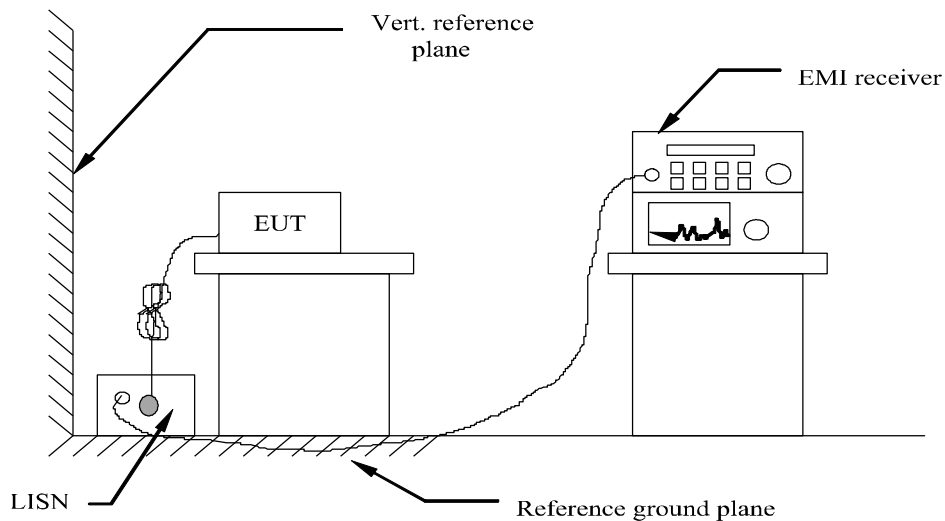
| Test Equipment             | Manufacturer                      | Model No.             | Serial No.      | Calibration Date | Calibration Due Date |
|----------------------------|-----------------------------------|-----------------------|-----------------|------------------|----------------------|
| LISN                       | R&S                               | ENV216                | 3560.6550.08    | 2019/09/20       | 2020/09/19           |
| LISN                       | R&S                               | ESH2-Z5               | 893606/008      | 2019/09/20       | 2020/09/19           |
| EMI Test Receiver          | R&S                               | ESPI3                 | 101841-cd       | 2019/09/20       | 2020/09/19           |
| EMI Test Receiver          | R&S                               | ESCI7                 | 101102          | 2019/09/20       | 2020/09/19           |
| Spectrum Analyzer          | Agilent                           | N9020A                | MY48010425      | 2019/09/20       | 2020/09/19           |
| Spectrum Analyzer          | R&S                               | FSV40                 | 100019          | 2019/09/20       | 2020/09/19           |
| Vector Signal generator    | Agilent                           | N5181A                | MY49060502      | 2019/09/20       | 2020/09/19           |
| Signal generator           | Agilent                           | E4421B                | 3610AO1069      | 2019/09/20       | 2020/09/19           |
| Climate Chamber            | ESPEC                             | EL-10KA               | A20120523       | 2019/09/20       | 2020/09/19           |
| Controller                 | EM Electronics                    | Controller EM 1000    | N/A             | N/A              | N/A                  |
| Horn Antenna               | Schwarzbeck                       | BBHA 9120D            | 01622           | 2019/09/23       | 2020/09/22           |
| Active Loop Antenna        | Beijing Da Ze Technology Co.,Ltd. | ZN30900C              | 15006           | 2019/10/12       | 2020/10/11           |
| Bilog Antenna              | Schwarzbeck                       | VULB9163              | 000976          | 2019/05/26       | 2020/05/25           |
| Broadband Horn Antenna     | SCHWARZBECK                       | BBHA 9170             | 791             | 2019/09/20       | 2020/09/19           |
| Amplifier                  | Schwarzbeck                       | BBV 9743              | #202            | 2019/09/20       | 2020/09/19           |
| Amplifier                  | Schwarzbeck                       | BBV9179               | 9719-025        | 2019/09/20       | 2020/09/19           |
| Amplifier                  | EMCI                              | EMC051845B            | 980355          | 2019/09/20       | 2020/09/19           |
| Temperature/Humidity Meter | Gangxing                          | CTH-608               | 02              | 2019/09/20       | 2020/09/19           |
| High-Pass Filter           | K&L                               | 9SH10-2700/X12750-O/O | KL142031        | 2019/09/20       | 2020/09/19           |
| High-Pass Filter           | K&L                               | 41H10-1375/U12750-O/O | KL142032        | 2019/09/20       | 2020/09/19           |
| RF Cable(below 1GHz)       | HUBER+SUHNER                      | RG214                 | RE01            | 2019/09/20       | 2020/09/19           |
| RF Cable(above 1GHz)       | HUBER+SUHNER                      | RG214                 | RE02            | 2019/09/20       | 2020/09/19           |
| Data acquisition card      | Agilent                           | U2531A                | TW53323507      | 2019/09/20       | 2020/09/19           |
| Power Sensor               | Agilent                           | U2021XA               | MY5365004       | 2019/09/20       | 2020/09/19           |
| Test Control Unit          | Tonscend                          | JS0806-1              | 178060067       | 2019/06/20       | 2020/06/19           |
| Automated filter bank      | Tonscend                          | JS0806-F              | 19F8060177      | 2019/06/20       | 2020/06/19           |
| EMI Test Software          | Tonscend                          | JS1120-1              | Ver 2.6.8.0518  | /                | /                    |
| EMI Test Software          | Tonscend                          | JS1120-3              | Ver 2.5.77.0418 | /                | /                    |
| EMI Test Software          | Tonscend                          | JS32-CE               | Ver 2.5         | /                | /                    |
| EMI Test Software          | Tonscend                          | JS32-RE               | Ver 2.5.1.8     | /                | /                    |

Note: The Cal.Interval was one year.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. AC Power Conducted Emission

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
- 2 Support equipment, if needed, was placed as per ANSI C63.10-2013
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
- 4 The EUT received DC 5V power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

#### AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

| Frequency range (MHz) | Limit (dBuV) |           |
|-----------------------|--------------|-----------|
|                       | Quasi-peak   | Average   |
| 0.15-0.5              | 66 to 56*    | 56 to 46* |
| 0.5-5                 | 56           | 46        |
| 5-30                  | 60           | 50        |

\* Decreases with the logarithm of the frequency.

#### TEST RESULTS

Remark: We measured Conducted Emission at all mode in AC 120V/60Hz, the worst case was recorded .

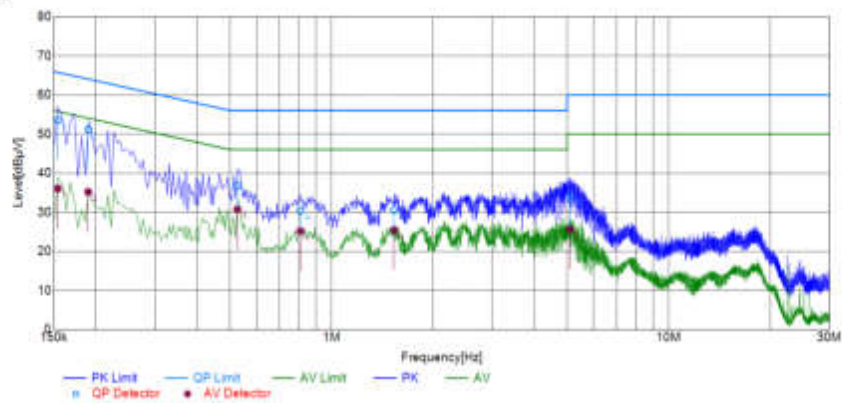
Power supply:

AC 120V/60Hz

Polarization

L

Test Graph



Final Data List

| NO. | Frequency<br>[MHz] | QP<br>Reading<br>[dBμV] | AVG.<br>Reading<br>[dBμV] | Factor<br>[dB] | QP<br>Result<br>[dBμV] | AVG.<br>Result<br>[dBμV] | QP<br>Limit<br>[dBμV] | AVG.<br>Limit<br>[dBμV] | QP<br>Margin<br>[dB] | AVG.<br>Margin<br>[dB] | Line | Remark |
|-----|--------------------|-------------------------|---------------------------|----------------|------------------------|--------------------------|-----------------------|-------------------------|----------------------|------------------------|------|--------|
| 1   | 0.1543             | 43.20                   | 25.72                     | 10.33          | 53.53                  | 36.05                    | 65.77                 | 55.77                   | 12.24                | 19.72                  | L1   | PASS   |
| 2   | 0.1899             | 41.01                   | 25.02                     | 10.16          | 51.17                  | 35.18                    | 64.04                 | 54.04                   | 12.87                | 18.86                  | L1   | PASS   |
| 3   | 0.5259             | 26.57                   | 20.51                     | 10.23          | 36.80                  | 30.74                    | 56.00                 | 46.00                   | 19.20                | 15.26                  | L1   | PASS   |
| 4   | 0.8089             | 20.11                   | 14.94                     | 10.25          | 30.36                  | 25.19                    | 56.00                 | 46.00                   | 25.64                | 20.81                  | L1   | PASS   |
| 5   | 1.5330             | 20.33                   | 15.24                     | 10.24          | 30.57                  | 25.48                    | 56.00                 | 46.00                   | 25.43                | 20.52                  | L1   | PASS   |
| 6   | 5.0988             | 23.74                   | 15.30                     | 10.36          | 34.10                  | 25.66                    | 60.00                 | 50.00                   | 25.90                | 24.34                  | L1   | PASS   |

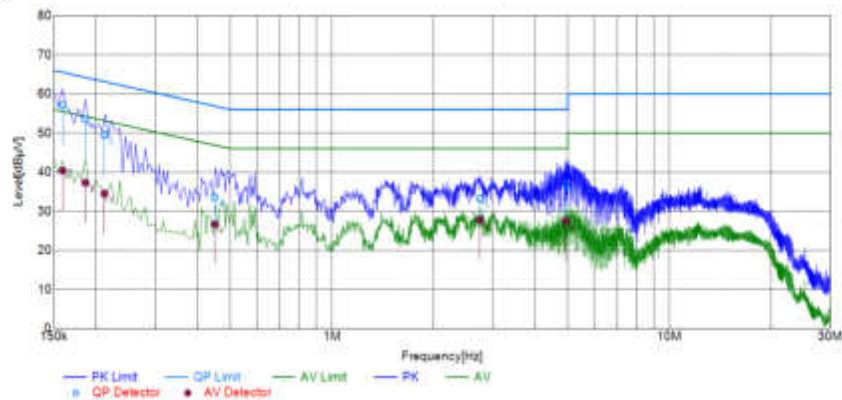
Power supply:

AC 120V/60Hz

Polarization

N

Test Graph



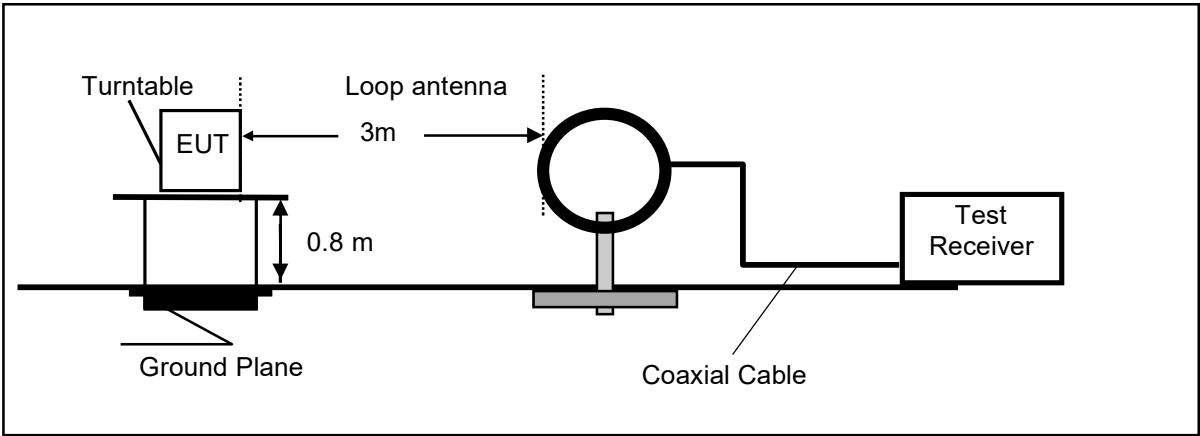
Final Data List

| NO. | Frequency<br>[MHz] | QP<br>Reading<br>[dBμV] | AVG.<br>Reading<br>[dBμV] | Factor<br>[dB] | QP<br>Result<br>[dBμV] | AVG.<br>Result<br>[dBμV] | QP<br>Limit<br>[dBμV] | AVG.<br>Limit<br>[dBμV] | QP<br>Margin<br>[dB] | AVG.<br>Margin<br>[dB] | Line | Remark |
|-----|--------------------|-------------------------|---------------------------|----------------|------------------------|--------------------------|-----------------------|-------------------------|----------------------|------------------------|------|--------|
| 1   | 0.1595             | 46.82                   | 30.05                     | 10.31          | 57.13                  | 40.36                    | 65.49                 | 55.49                   | 8.36                 | 15.13                  | N    | PASS   |
| 2   | 0.1859             | 43.30                   | 27.10                     | 10.18          | 53.48                  | 37.28                    | 64.22                 | 54.22                   | 10.74                | 16.94                  | N    | PASS   |
| 3   | 0.2119             | 39.40                   | 24.37                     | 10.14          | 49.54                  | 34.51                    | 63.13                 | 53.13                   | 13.59                | 18.62                  | N    | PASS   |
| 4   | 0.4498             | 23.34                   | 16.46                     | 10.21          | 33.55                  | 26.67                    | 56.88                 | 46.88                   | 23.33                | 20.21                  | N    | PASS   |
| 5   | 2.7462             | 22.95                   | 17.56                     | 10.32          | 33.27                  | 27.88                    | 56.00                 | 46.00                   | 22.73                | 18.12                  | N    | PASS   |
| 6   | 4.9416             | 26.57                   | 17.16                     | 10.34          | 36.91                  | 27.50                    | 56.00                 | 46.00                   | 19.09                | 18.50                  | N    | PASS   |

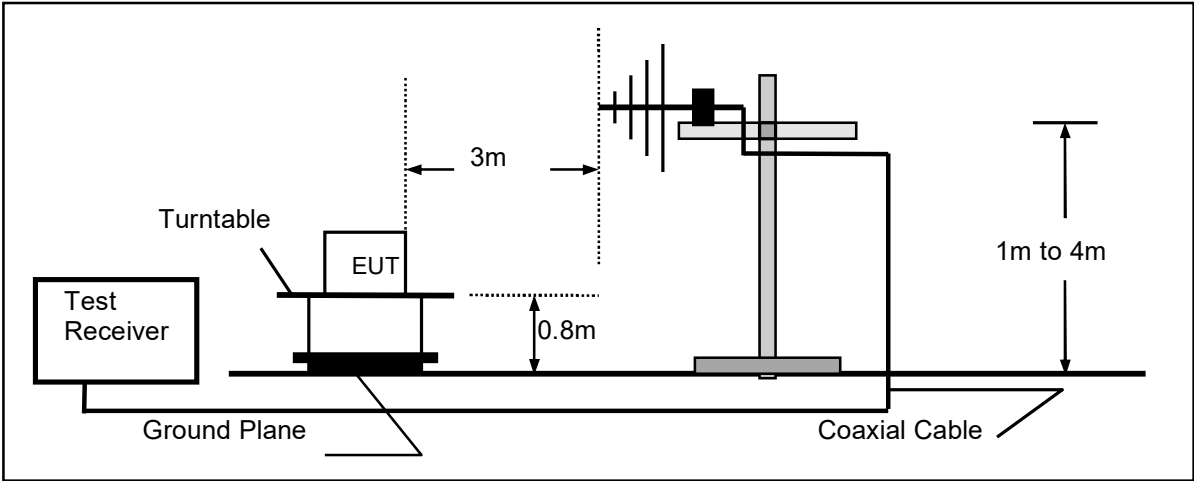
4.2. Radiated Emission

TEST CONFIGURATION

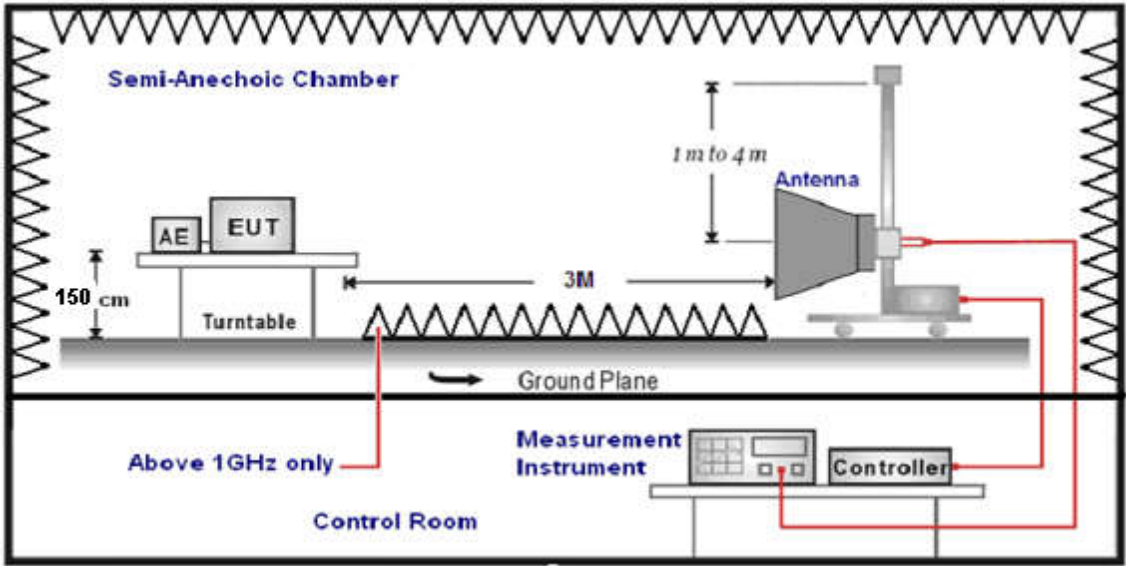
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz



**TEST PROCEDURE**

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing above 1GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 24MHz and maximum operation frequency was 5825MHz.so radiated emission test frequency band from 9KHz to 40GHz.
6. The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type          | Test Distance |
|----------------------|----------------------------|---------------|
| 9KHz-30MHz           | Active Loop Antenna        | 3             |
| 30MHz-1GHz           | Ultra-Broadband Antenna    | 3             |
| 1GHz-18GHz           | Double Ridged Horn Antenna | 3             |
| 18GHz-25GHz          | Horn Antenna               | 1             |

7. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting                                                                            | Detector |
|----------------------|-----------------------------------------------------------------------------------------------------------|----------|
| 9KHz-150KHz          | RBW=200Hz/VBW=3KHz,Sweep time=Auto                                                                        | QP       |
| 150KHz-30MHz         | RBW=9KHz/VBW=100KHz,Sweep time=Auto                                                                       | QP       |
| 30MHz-1GHz           | RBW=120KHz/VBW=1000KHz,Sweep time=Auto                                                                    | QP       |
| 1GHz-40GHz           | Peak Value: RBW=1MHz/VBW=3MHz,<br>Sweep time=Auto<br>Average Value: RBW=1MHz/VBW=10Hz,<br>Sweep time=Auto | Peak     |

**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

$$\text{Transd}=AF +CL-AG$$

**RADIATION LIMIT**

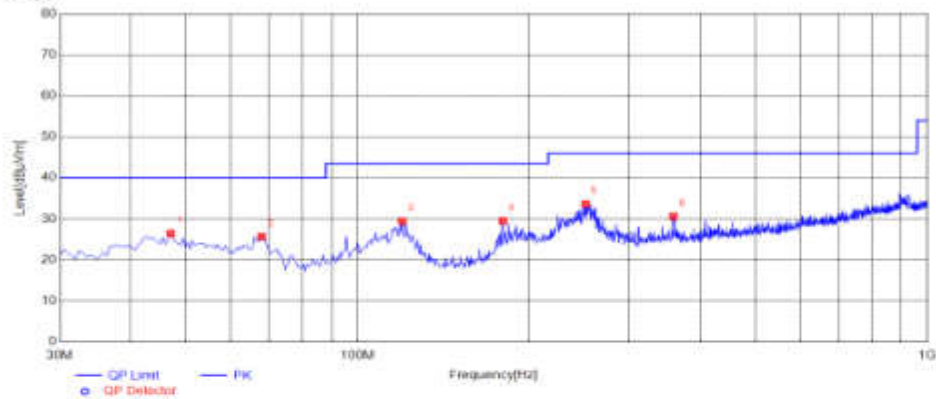
According to §15.407 (b): Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits

| Frequency (MHz) | EIRP Limit (dBm)                   | Equivalent Field Strength at 3m (dBμV/m) |
|-----------------|------------------------------------|------------------------------------------|
| 5150-5250       | -27                                | 68.2                                     |
| 5250-5350       | -27                                | 68.2                                     |
| 5470-5725       | -27                                | 68.2                                     |
| 5725-5850       | -27 (beyond 10MHz of the bandedge) | 68.2                                     |
|                 | -17 (within 10 MHz of band edge)   | 78.2                                     |

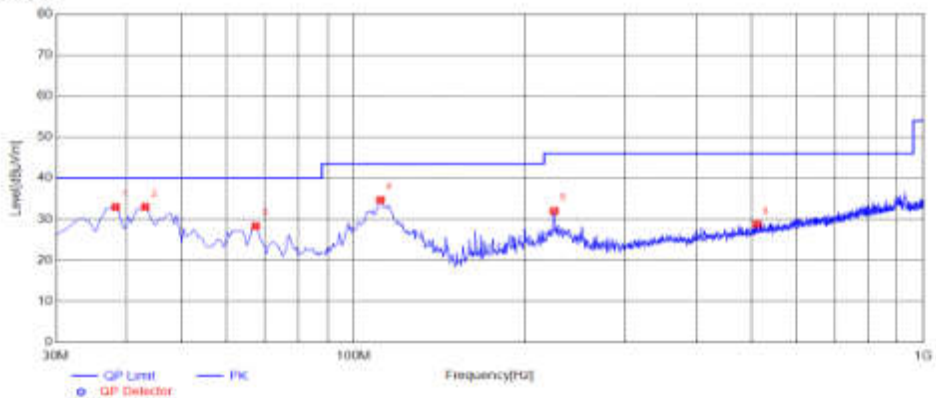
| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m)                          | Radiated (μV/m)       |
|-----------------|-------------------|--------------------------------------------|-----------------------|
| 0.009-0.49      | 3                 | $20\log(2400/F(\text{KHz}))+40\log(300/3)$ | $2400/F(\text{KHz})$  |
| 0.49-1.705      | 3                 | $20\log(24000/F(\text{KHz}))+40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30        | 3                 | $20\log(30)+40\log(30/3)$                  | 30                    |
| 30-88           | 3                 | 40.0                                       | 100                   |
| 88-216          | 3                 | 43.5                                       | 150                   |
| 216-960         | 3                 | 46.0                                       | 200                   |
| Above 960       | 3                 | 54.0                                       | 500                   |

**TEST RESULTS**

Remark: We measured Radiated Emission at all mode from 30MHz to 25GHz in AC 120V/60Hz and the worst case was recorded.

**For 30MHz-1GHz****Horizontal****Test Graph****Suspected List**

| NO. | Frequency [MHz] | Reading [dBμV/m] | Factor [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity   | Remark |
|-----|-----------------|------------------|-------------|-----------------|----------------|-------------|-------------|-----------|----------|------------|--------|
| 1   | 46.9750         | 32.93            | -6.52       | 26.41           | 40.00          | 13.59       | 100         | 285       | PK       | Horizontal | PASS   |
| 2   | 67.8300         | 35.02            | -9.34       | 25.68           | 40.00          | 14.32       | 100         | 306       | PK       | Horizontal | PASS   |
| 3   | 119.7250        | 40.22            | -10.80      | 29.42           | 43.50          | 14.08       | 100         | 42        | PK       | Horizontal | PASS   |
| 4   | 179.8650        | 40.76            | -11.24      | 29.52           | 43.50          | 13.98       | 100         | 288       | PK       | Horizontal | PASS   |
| 5   | 251.1600        | 41.97            | -8.34       | 33.63           | 46.00          | 12.37       | 100         | 347       | PK       | Horizontal | PASS   |
| 6   | 358.3450        | 36.63            | -6.03       | 30.60           | 46.00          | 15.40       | 100         | 257       | PK       | Horizontal | PASS   |

**Vertical****Test Graph****Suspected List**

| NO. | Frequency [MHz] | Reading [dBμV/m] | Factor [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity | Remark |
|-----|-----------------|------------------|-------------|-----------------|----------------|-------------|-------------|-----------|----------|----------|--------|
| 1   | 38.2450         | 40.81            | -7.85       | 32.96           | 40.00          | 7.04        | 100         | 137       | PK       | Vertical | PASS   |
| 2   | 43.0950         | 39.56            | -6.56       | 33.00           | 40.00          | 7.00        | 100         | 300       | PK       | Vertical | PASS   |
| 3   | 67.3450         | 37.72            | -9.39       | 28.33           | 40.00          | 11.67       | 100         | 11        | PK       | Vertical | PASS   |
| 4   | 111.4800        | 43.46            | -8.79       | 34.67           | 43.50          | 8.83        | 100         | 268       | PK       | Vertical | PASS   |
| 5   | 224.9700        | 41.06            | -9.07       | 31.99           | 46.00          | 14.01       | 100         | 294       | PK       | Vertical | PASS   |
| 6   | 510.6350        | 32.01            | -3.25       | 28.76           | 46.00          | 17.24       | 100         | 166       | PK       | Vertical | PASS   |

For 1GHz to 40GHz

NOTE:the worst case was ant 0.

5150-5250MHz:

**802.11a Mode Channel 36 5180 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10360      | 40.60             | 38.55                 | 33.13         | 11.26           | 57.28                 | 68.20               | -10.92      | Peak     | Horizontal   |
| 1           | 10360      | 31.76             | 38.55                 | 33.13         | 11.26           | 48.44                 | 54.00               | -5.56       | AV       | Horizontal   |
| 1           | 10360      | 40.17             | 38.55                 | 33.13         | 11.26           | 56.85                 | 68.20               | -11.35      | Peak     | Vertical     |
| 1           | 10360      | 29.71             | 38.55                 | 33.13         | 11.26           | 46.39                 | 54.00               | -7.61       | AV       | Vertical     |

**802.11a Mode Channel 40 5200 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10400      | 40.68             | 38.55                 | 33.13         | 11.26           | 57.36                 | 68.20               | -10.84      | Peak     | Horizontal   |
| 1           | 10400      | 31.04             | 38.55                 | 33.13         | 11.26           | 47.72                 | 54.00               | -6.28       | AV       | Horizontal   |
| 1           | 10400      | 40.50             | 38.55                 | 33.13         | 11.26           | 57.18                 | 68.20               | -11.02      | Peak     | Vertical     |
| 1           | 10400      | 29.82             | 38.55                 | 33.13         | 11.26           | 46.50                 | 54.00               | -7.50       | AV       | Vertical     |

**802.11a Mode Channel 48 5240 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10480      | 40.48             | 38.55                 | 33.13         | 11.26           | 57.16                 | 68.20               | -11.04      | Peak     | Horizontal   |
| 1           | 10480      | 30.19             | 38.55                 | 33.13         | 11.26           | 46.87                 | 54.00               | -7.13       | AV       | Horizontal   |
| 1           | 10480      | 41.88             | 38.55                 | 33.13         | 11.26           | 58.56                 | 68.20               | -9.64       | Peak     | Vertical     |
| 1           | 10480      | 29.22             | 38.55                 | 33.13         | 11.26           | 45.90                 | 54.00               | -8.10       | AV       | Vertical     |

**802.11n20 Mode Channel 36 5180 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10360      | 39.21             | 38.55                 | 33.13         | 11.26           | 55.89                 | 68.20               | -12.31      | Peak     | Horizontal   |
| 1           | 10360      | 30.04             | 38.55                 | 33.13         | 11.26           | 46.72                 | 54.00               | -7.28       | AV       | Horizontal   |
| 1           | 10360      | 41.26             | 38.55                 | 33.13         | 11.26           | 57.94                 | 68.20               | -10.26      | Peak     | Vertical     |
| 1           | 10360      | 28.91             | 38.55                 | 33.13         | 11.26           | 45.59                 | 54.00               | -8.41       | AV       | Vertical     |

**802.11n20 Mode Channel 40 5200 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10400      | 40.38             | 38.55                 | 33.13         | 11.26           | 57.06                 | 68.20               | -11.14      | Peak     | Horizontal   |
| 1           | 10400      | 31.38             | 38.55                 | 33.13         | 11.26           | 48.06                 | 54.00               | -5.94       | AV       | Horizontal   |
| 1           | 10400      | 41.86             | 38.55                 | 33.13         | 11.26           | 58.54                 | 68.20               | -9.66       | Peak     | Vertical     |
| 1           | 10400      | 29.60             | 38.55                 | 33.13         | 11.26           | 46.28                 | 54.00               | -7.72       | AV       | Vertical     |

**802.11n20 Mode Channel 48 5240 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10480      | 40.82             | 38.55                 | 33.13         | 11.26           | 57.50                 | 68.20               | -10.70      | Peak     | Horizontal   |
| 1           | 10480      | 31.62             | 38.55                 | 33.13         | 11.26           | 48.30                 | 54.00               | -5.70       | AV       | Horizontal   |
| 1           | 10480      | 41.64             | 38.55                 | 33.13         | 11.26           | 58.32                 | 68.20               | -9.88       | Peak     | Vertical     |
| 1           | 10480      | 29.44             | 38.55                 | 33.13         | 11.26           | 46.12                 | 54.00               | -7.88       | AV       | Vertical     |

**802.11n40 Mode Channel 38 5190 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10380      | 40.82             | 38.55                 | 33.13         | 11.26           | 57.50                 | 68.20               | -10.70      | Peak     | Horizontal   |
| 1           | 10380      | 31.12             | 38.55                 | 33.13         | 11.26           | 47.80                 | 54.00               | -6.20       | AV       | Horizontal   |
| 1           | 10380      | 40.12             | 38.55                 | 33.13         | 11.26           | 56.80                 | 68.20               | -11.40      | Peak     | Vertical     |
| 1           | 10380      | 29.36             | 38.55                 | 33.13         | 11.26           | 46.04                 | 54.00               | -7.96       | AV       | Vertical     |

**802.11n40 Mode Channel 46 5230 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10460      | 40.59             | 38.55                 | 33.13         | 11.26           | 57.27                 | 68.20               | -10.93      | Peak     | Horizontal   |
| 1           | 10460      | 31.93             | 38.55                 | 33.13         | 11.26           | 48.61                 | 54.00               | -5.39       | AV       | Horizontal   |
| 1           | 10460      | 40.73             | 38.55                 | 33.13         | 11.26           | 57.41                 | 68.20               | -10.79      | Peak     | Vertical     |
| 1           | 10460      | 29.52             | 38.55                 | 33.13         | 11.26           | 46.20                 | 54.00               | -7.80       | AV       | Vertical     |

**802.11ac20 Mode Channel 36 5180 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10360      | 39.54             | 38.55                 | 33.13         | 11.26           | 56.22                 | 68.20               | -11.98      | Peak     | Horizontal   |
| 1           | 10360      | 30.39             | 38.55                 | 33.13         | 11.26           | 47.07                 | 54.00               | -6.93       | AV       | Horizontal   |
| 1           | 10360      | 40.42             | 38.55                 | 33.13         | 11.26           | 57.10                 | 68.20               | -11.10      | Peak     | Vertical     |
| 1           | 10360      | 29.31             | 38.55                 | 33.13         | 11.26           | 45.99                 | 54.00               | -8.01       | AV       | Vertical     |

**802.11ac20 Mode Channel 40 5200 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10400      | 39.58             | 38.55                 | 33.13         | 11.26           | 56.26                 | 68.20               | -11.94      | Peak     | Horizontal   |
| 1           | 10400      | 31.53             | 38.55                 | 33.13         | 11.26           | 48.21                 | 54.00               | -5.79       | AV       | Horizontal   |
| 1           | 10400      | 40.24             | 38.55                 | 33.13         | 11.26           | 56.92                 | 68.20               | -11.28      | Peak     | Vertical     |
| 1           | 10400      | 29.02             | 38.55                 | 33.13         | 11.26           | 45.70                 | 54.00               | -8.30       | AV       | Vertical     |

**802.11ac20 Mode Channel 48 5240 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10480      | 39.77             | 38.55                 | 33.13         | 11.26           | 56.45                 | 68.20               | -11.75      | Peak     | Horizontal   |
| 1           | 10480      | 30.12             | 38.55                 | 33.13         | 11.26           | 46.80                 | 54.00               | -7.20       | AV       | Horizontal   |
| 1           | 10480      | 41.43             | 38.55                 | 33.13         | 11.26           | 58.11                 | 68.20               | -10.09      | Peak     | Vertical     |
| 1           | 10480      | 28.84             | 38.55                 | 33.13         | 11.26           | 45.52                 | 54.00               | -8.48       | AV       | Vertical     |

**802.11ac40 Mode Channel 38 5190 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10380      | 40.05             | 38.55                 | 33.13         | 11.26           | 56.73                 | 68.20               | -11.47      | Peak     | Horizontal   |
| 1           | 10380      | 30.54             | 38.55                 | 33.13         | 11.26           | 47.22                 | 54.00               | -6.78       | AV       | Horizontal   |
| 1           | 10380      | 41.99             | 38.55                 | 33.13         | 11.26           | 58.67                 | 68.20               | -9.53       | Peak     | Vertical     |
| 1           | 10380      | 29.86             | 38.55                 | 33.13         | 11.26           | 46.54                 | 54.00               | -7.46       | AV       | Vertical     |

**802.11ac40 Mode Channel 46 5230 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10460      | 40.01             | 38.55                 | 33.13         | 11.26           | 56.69                 | 68.20               | -11.51      | Peak     | Horizontal   |
| 1           | 10460      | 30.33             | 38.55                 | 33.13         | 11.26           | 47.01                 | 54.00               | -6.99       | AV       | Horizontal   |
| 1           | 10460      | 40.40             | 38.55                 | 33.13         | 11.26           | 57.08                 | 68.20               | -11.12      | Peak     | Vertical     |
| 1           | 10460      | 28.75             | 38.55                 | 33.13         | 11.26           | 45.43                 | 54.00               | -8.57       | AV       | Vertical     |

**802.11ac80 Mode Channel 42 5210 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 10420      | 39.47             | 38.55                 | 33.13         | 11.26           | 56.15                 | 68.20               | -12.05      | Peak     | Horizontal   |
| 1           | 10420      | 31.92             | 38.55                 | 33.13         | 11.26           | 48.60                 | 54.00               | -5.40       | AV       | Horizontal   |
| 1           | 10420      | 40.59             | 38.55                 | 33.13         | 11.26           | 57.27                 | 68.20               | -10.93      | Peak     | Vertical     |
| 1           | 10420      | 28.11             | 38.55                 | 33.13         | 11.26           | 44.79                 | 54.00               | -9.21       | AV       | Vertical     |

**5725-5850MHz:****802.11a Mode Channel 149 5745 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11490      | 40.42             | 38.55                 | 33.13         | 11.26           | 57.10                 | 68.20               | -11.10      | Peak     | Horizontal   |
| 1           | 11490      | 30.38             | 38.55                 | 33.13         | 11.26           | 47.06                 | 54.00               | -6.94       | AV       | Horizontal   |
| 1           | 11490      | 41.34             | 38.55                 | 33.13         | 11.26           | 58.02                 | 68.20               | -10.18      | Peak     | Vertical     |
| 1           | 11490      | 29.58             | 38.55                 | 33.13         | 11.26           | 46.26                 | 54.00               | -7.74       | AV       | Vertical     |

**802.11a Mode Channel 157 5785 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11570      | 39.62             | 38.55                 | 33.13         | 11.26           | 56.30                 | 68.20               | -11.90      | Peak     | Horizontal   |
| 1           | 11570      | 31.47             | 38.55                 | 33.13         | 11.26           | 48.15                 | 54.00               | -5.85       | AV       | Horizontal   |
| 1           | 11570      | 40.92             | 38.55                 | 33.13         | 11.26           | 57.60                 | 68.20               | -10.60      | Peak     | Vertical     |
| 1           | 11570      | 29.14             | 38.55                 | 33.13         | 11.26           | 45.82                 | 54.00               | -8.18       | AV       | Vertical     |

**802.11a Mode Channel 165 5825 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11650      | 39.64             | 38.55                 | 33.13         | 11.26           | 56.32                 | 68.20               | -11.88      | Peak     | Horizontal   |
| 1           | 11650      | 31.62             | 38.55                 | 33.13         | 11.26           | 48.30                 | 54.00               | -5.70       | AV       | Horizontal   |
| 1           | 11650      | 41.48             | 38.55                 | 33.13         | 11.26           | 58.16                 | 68.20               | -10.04      | Peak     | Vertical     |
| 1           | 11650      | 28.13             | 38.55                 | 33.13         | 11.26           | 44.81                 | 54.00               | -9.19       | AV       | Vertical     |

**802.11n20 Mode Channel 149 5745 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11490      | 39.53             | 38.55                 | 33.13         | 11.26           | 56.21                 | 68.20               | -11.99      | Peak     | Horizontal   |
| 1           | 11490      | 31.45             | 38.55                 | 33.13         | 11.26           | 48.13                 | 54.00               | -5.87       | AV       | Horizontal   |
| 1           | 11490      | 41.36             | 38.55                 | 33.13         | 11.26           | 58.04                 | 68.20               | -10.16      | Peak     | Vertical     |
| 1           | 11490      | 28.87             | 38.55                 | 33.13         | 11.26           | 45.55                 | 54.00               | -8.45       | AV       | Vertical     |

**802.11n20 Mode Channel 157 5785 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11570      | 40.16             | 38.55                 | 33.13         | 11.26           | 56.84                 | 68.20               | -11.36      | Peak     | Horizontal   |
| 1           | 11570      | 31.50             | 38.55                 | 33.13         | 11.26           | 48.18                 | 54.00               | -5.82       | AV       | Horizontal   |
| 1           | 11570      | 40.57             | 38.55                 | 33.13         | 11.26           | 57.25                 | 68.20               | -10.95      | Peak     | Vertical     |
| 1           | 11570      | 28.07             | 38.55                 | 33.13         | 11.26           | 44.75                 | 54.00               | -9.25       | AV       | Vertical     |

**802.11n20 Mode Channel 165 5825 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11650      | 40.14             | 38.55                 | 33.13         | 11.26           | 56.82                 | 68.20               | -11.38      | Peak     | Horizontal   |
| 1           | 11650      | 30.90             | 38.55                 | 33.13         | 11.26           | 47.58                 | 54.00               | -6.42       | AV       | Horizontal   |
| 1           | 11650      | 40.96             | 38.55                 | 33.13         | 11.26           | 57.64                 | 68.20               | -10.56      | Peak     | Vertical     |
| 1           | 11650      | 28.69             | 38.55                 | 33.13         | 11.26           | 45.37                 | 54.00               | -8.63       | AV       | Vertical     |

**802.11n40 Mode Channel 151 5755 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11510      | 40.97             | 38.55                 | 33.13         | 11.26           | 57.65                 | 68.20               | -10.55      | Peak     | Horizontal   |
| 1           | 11510      | 30.92             | 38.55                 | 33.13         | 11.26           | 47.60                 | 54.00               | -6.40       | AV       | Horizontal   |
| 1           | 11510      | 40.15             | 38.55                 | 33.13         | 11.26           | 56.83                 | 68.20               | -11.37      | Peak     | Vertical     |
| 1           | 11510      | 28.84             | 38.55                 | 33.13         | 11.26           | 45.52                 | 54.00               | -8.48       | AV       | Vertical     |

**802.11n40 Mode Channel 159 5795MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11590      | 40.16             | 38.55                 | 33.13         | 11.26           | 56.84                 | 68.20               | -11.36      | Peak     | Horizontal   |
| 1           | 11590      | 31.43             | 38.55                 | 33.13         | 11.26           | 48.11                 | 54.00               | -5.89       | AV       | Horizontal   |
| 1           | 11590      | 41.77             | 38.55                 | 33.13         | 11.26           | 58.45                 | 68.20               | -9.75       | Peak     | Vertical     |
| 1           | 11590      | 28.86             | 38.55                 | 33.13         | 11.26           | 45.54                 | 54.00               | -8.46       | AV       | Vertical     |

**802.11ac20 Mode Channel 149 5745 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11490      | 40.18             | 38.55                 | 33.13         | 11.26           | 56.86                 | 68.20               | -11.34      | Peak     | Horizontal   |
| 1           | 11490      | 31.71             | 38.55                 | 33.13         | 11.26           | 48.39                 | 54.00               | -5.61       | AV       | Horizontal   |
| 1           | 11490      | 40.79             | 38.55                 | 33.13         | 11.26           | 57.47                 | 68.20               | -10.73      | Peak     | Vertical     |
| 1           | 11490      | 29.58             | 38.55                 | 33.13         | 11.26           | 46.26                 | 54.00               | -7.74       | AV       | Vertical     |

**802.11ac20 Mode Channel 157 5785 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11570      | 39.26             | 38.55                 | 33.13         | 11.26           | 55.94                 | 68.20               | -12.26      | Peak     | Horizontal   |
| 1           | 11570      | 31.56             | 38.55                 | 33.13         | 11.26           | 48.24                 | 54.00               | -5.76       | AV       | Horizontal   |
| 1           | 11570      | 40.65             | 38.55                 | 33.13         | 11.26           | 57.33                 | 68.20               | -10.87      | Peak     | Vertical     |
| 1           | 11570      | 29.02             | 38.55                 | 33.13         | 11.26           | 45.70                 | 54.00               | -8.30       | AV       | Vertical     |

**802.11ac20 Mode Channel 165 5825 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11650      | 40.12             | 38.55                 | 33.13         | 11.26           | 56.80                 | 68.20               | -11.40      | Peak     | Horizontal   |
| 1           | 11650      | 31.53             | 38.55                 | 33.13         | 11.26           | 48.21                 | 54.00               | -5.79       | AV       | Horizontal   |
| 1           | 11650      | 40.02             | 38.55                 | 33.13         | 11.26           | 56.70                 | 68.20               | -11.50      | Peak     | Vertical     |
| 1           | 11650      | 29.26             | 38.55                 | 33.13         | 11.26           | 45.94                 | 54.00               | -8.06       | AV       | Vertical     |

**802.11ac40 Mode Channel 151 5755 MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11510      | 39.74             | 38.55                 | 33.13         | 11.26           | 56.42                 | 68.20               | -11.78      | Peak     | Horizontal   |
| 1           | 11510      | 30.52             | 38.55                 | 33.13         | 11.26           | 47.20                 | 54.00               | -6.80       | AV       | Horizontal   |
| 1           | 11510      | 41.55             | 38.55                 | 33.13         | 11.26           | 58.23                 | 68.20               | -9.97       | Peak     | Vertical     |
| 1           | 11510      | 28.08             | 38.55                 | 33.13         | 11.26           | 44.76                 | 54.00               | -9.24       | AV       | Vertical     |

**802.11ac40 Mode Channel 159 5795MHz**

| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11590      | 39.55             | 38.55                 | 33.13         | 11.26           | 56.23                 | 68.20               | -11.97      | Peak     | Horizontal   |
| 1           | 11590      | 30.85             | 38.55                 | 33.13         | 11.26           | 47.53                 | 54.00               | -6.47       | AV       | Horizontal   |
| 1           | 11590      | 41.96             | 38.55                 | 33.13         | 11.26           | 58.64                 | 68.20               | -9.56       | Peak     | Vertical     |
| 1           | 11590      | 29.73             | 38.55                 | 33.13         | 11.26           | 46.41                 | 54.00               | -7.59       | AV       | Vertical     |

**802.11ac80 Mode Channel 155 5775 MHz**

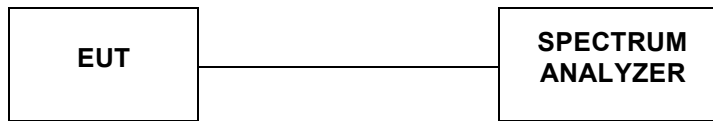
| Item (Mark) | Freq (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
|-------------|------------|-------------------|-----------------------|---------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| 1           | 11550      | 39.23             | 38.55                 | 33.13         | 11.26           | 55.91                 | 68.20               | -12.29      | Peak     | Horizontal   |
| 1           | 11550      | 30.84             | 38.55                 | 33.13         | 11.26           | 47.52                 | 54.00               | -6.48       | AV       | Horizontal   |
| 1           | 11550      | 41.97             | 38.55                 | 33.13         | 11.26           | 58.65                 | 68.20               | -9.55       | Peak     | Vertical     |
| 1           | 11550      | 28.78             | 38.55                 | 33.13         | 11.26           | 45.46                 | 54.00               | -8.54       | AV       | Vertical     |

**REMARKS:**

1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. The other emission levels were very low against the limit.
3. Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=10Hz/Sweep time=Auto/Detector=Peak;

### 4.3. Duty Cycle

#### TEST CONFIGURATION



#### TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 B Duty Cycle (x), Transmission Duration (T):

- A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal
- The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set  $RBW \geq EBW$  if possible; otherwise, set RBW to the largest available value. Set  $VBW \geq RBW$ . Set detector = peak or average. The zerospan measurement method shall not be used unless both RBW and VBW are  $> 50/T$ , where T is defined in section II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if  $T \leq 16.7$  microseconds.)

#### TEST RESULTS

Antenna 0:

##### 802.11a Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 40      | 5200            | 0.976      | 0.11             |

##### 802.11n HT20 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 40      | 5200            | 0.974      | 0.11             |

##### 802.11ac20 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 40      | 5200            | 0.974      | 0.11             |

##### 802.11n HT40 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 38      | 5190            | 0.947      | 0.24             |

##### 802.11ac40 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 38      | 5190            | 0.949      | 0.23             |

##### 802.11ac80 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 42      | 5210            | 0.892      | 0.50             |

## Antenna 1:

## 802.11a Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 40      | 5200            | 0.976      | 0.11             |

## 802.11n HT20 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 40      | 5200            | 0.974      | 0.11             |

## 802.11ac20 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 40      | 5200            | 0.974      | 0.11             |

## 802.11n HT40 Test Mode

| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 38      | 5190            | 0.948      | 0.23             |

## 802.11ac40 Test Mode

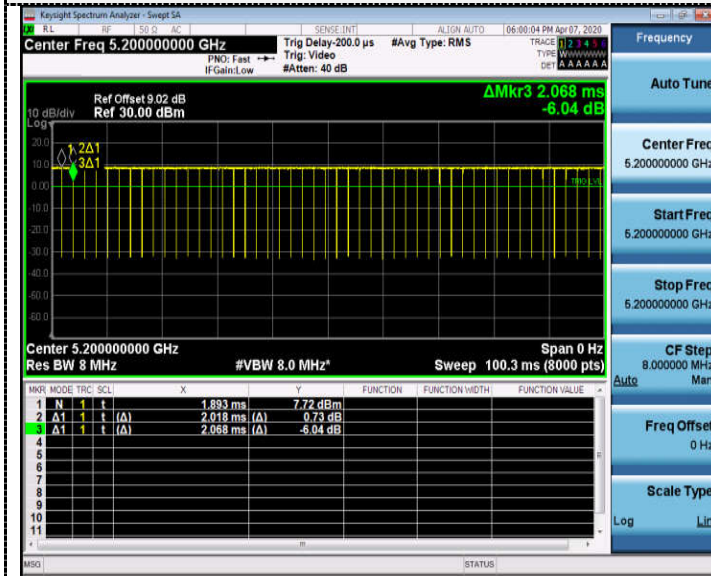
| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 38      | 5190            | 0.948      | 0.23             |

## 802.11ac80 Test Mode

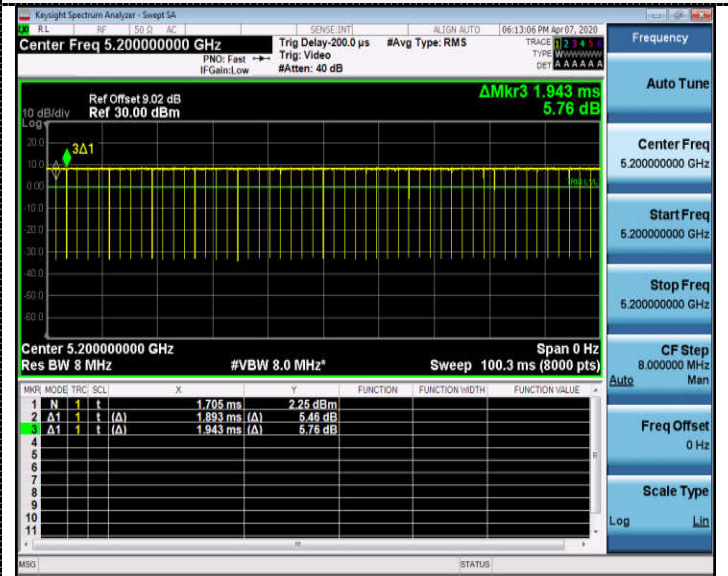
| Channel | Frequency (MHz) | Duty Cycle | Duty factor (dB) |
|---------|-----------------|------------|------------------|
| 42      | 5210            | 0.892      | 0.50             |

## Antenna 0:

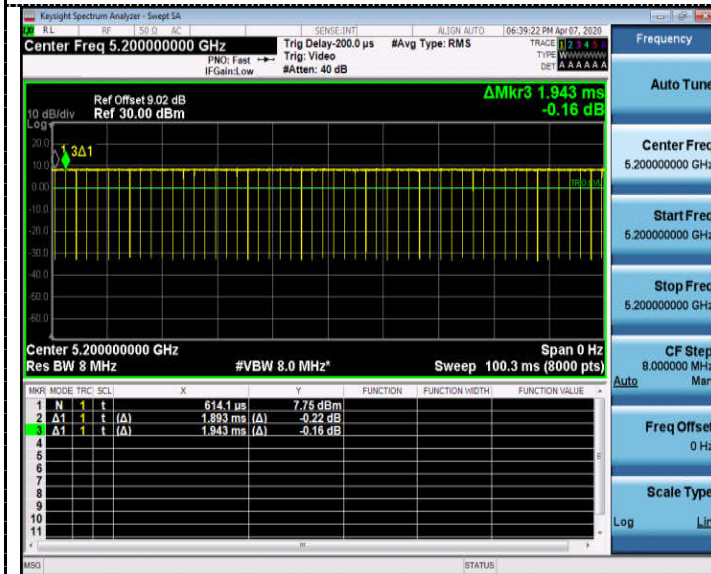
## 802.11a



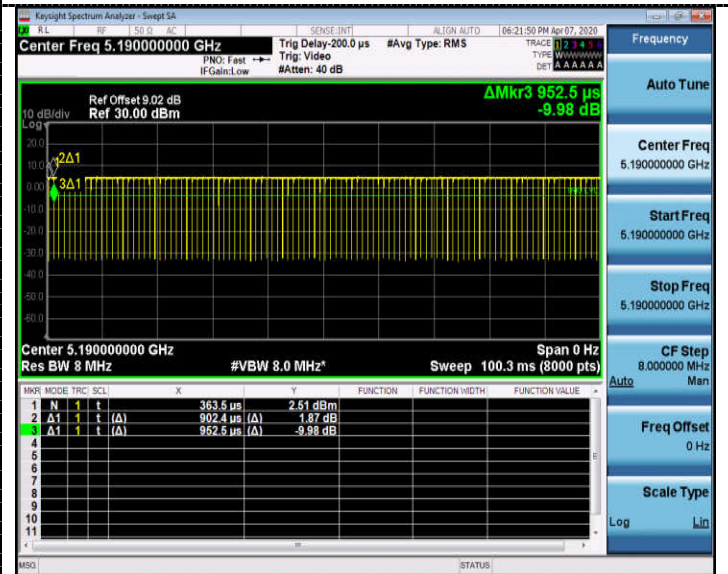
## 802.11n HT20



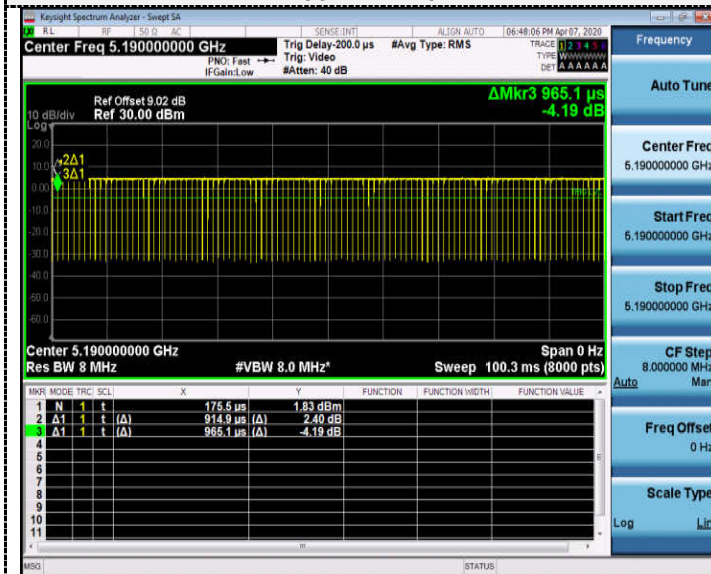
## 802.11ac20



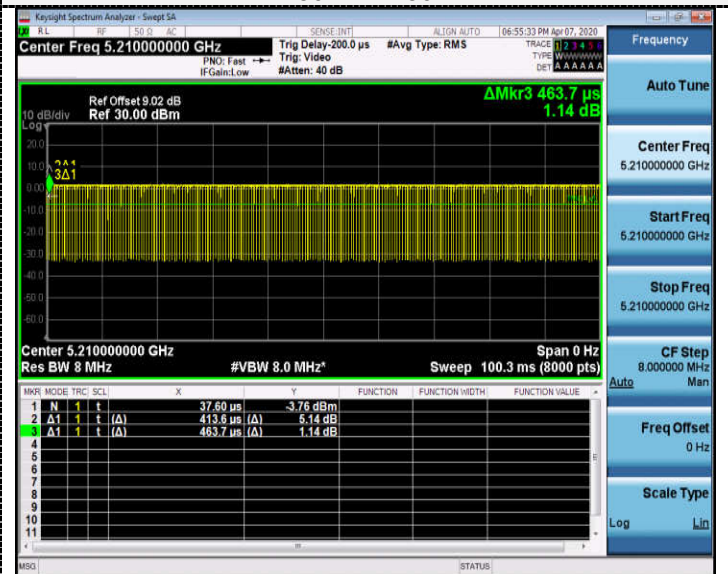
## 802.11n HT40



## 802.11ac40

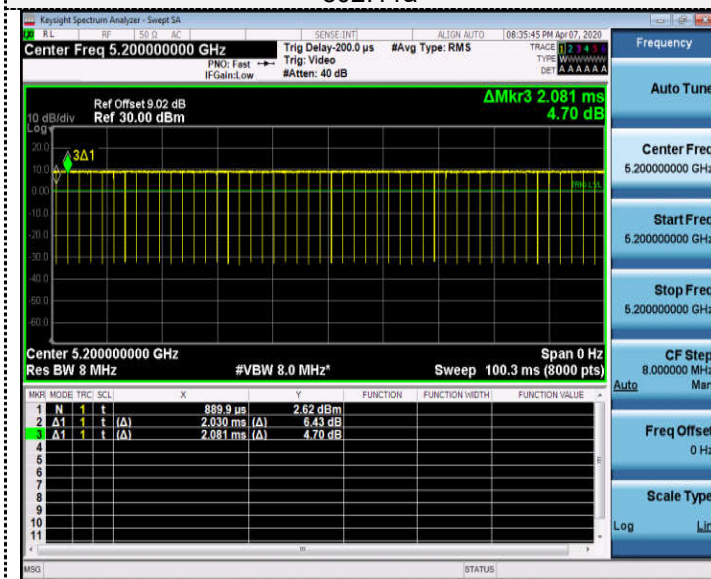


## 802.11ac80

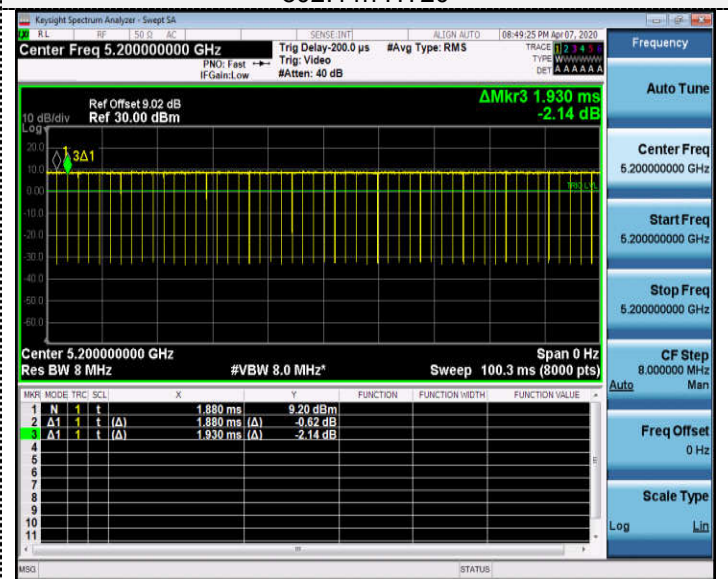


## Antenna 1:

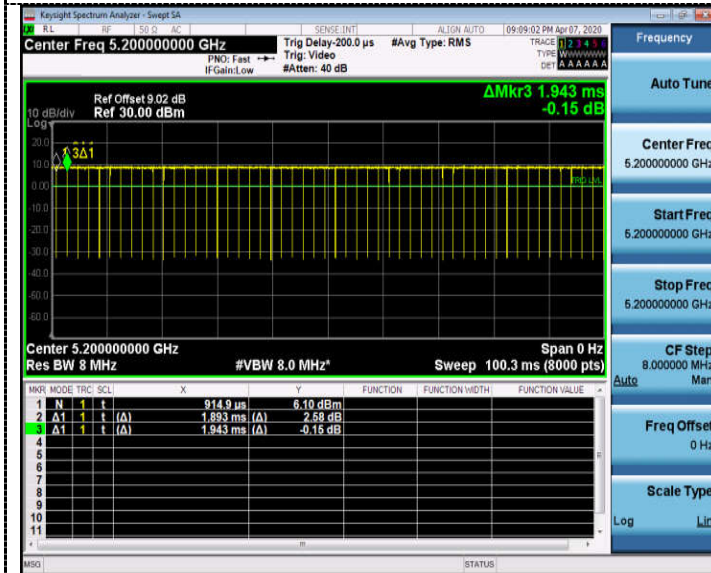
## 802.11a



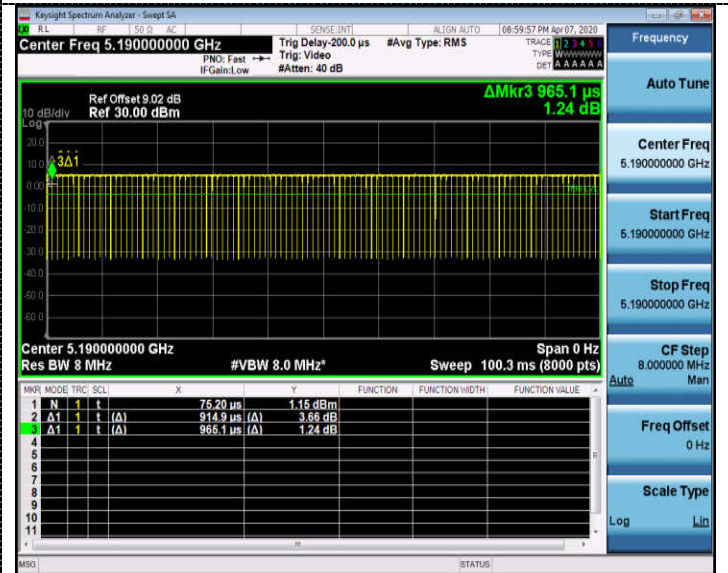
## 802.11n HT20



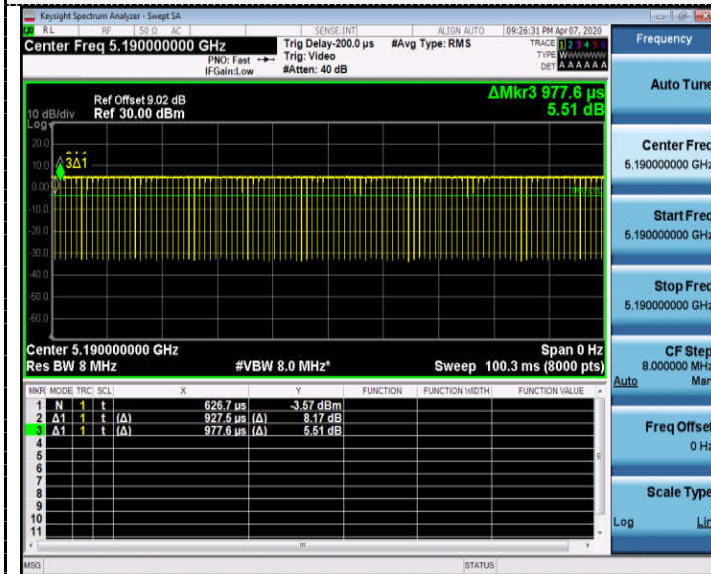
## 802.11ac20



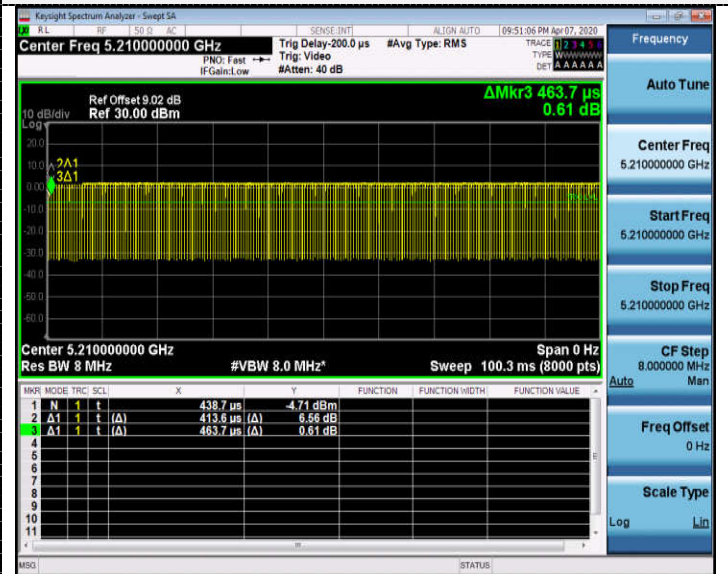
## 802.11n HT40



## 802.11ac40

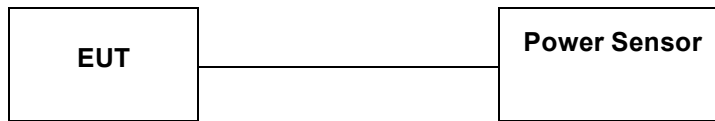


## 802.11ac80



#### 4.4. Maximum Average Output Power

##### TEST CONFIGURATION



##### TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 Section E3 Measurement using a Power Meter (PM):

- a. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied
  1. The EUT is configured to transmit continuously or to transmit with a constant duty cycle
  2. At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
  3. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- b. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B
- c. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

Adjust the measurement in dBm by adding  $10 \log(1/x)$  where x is the duty cycle (e.g.,  $10 \log(1/0.25)$  if the duty cycle is 25 percent).

##### LIMIT

According to §15.407(a): The maximum output power should be not exceed follow:

| Frequency Range (MHz)                                                                                                       | Limit                                                       |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 5150-5250                                                                                                                   | Fixed: 1 Watt (30dBm)<br>Mobile and portable: 250mW (24dBm) |
| 5250-5350                                                                                                                   | 250mW (24dBm)                                               |
| 5470-5725                                                                                                                   | 250mW (24dBm)                                               |
| 5725-5850                                                                                                                   | 1 Watt (30dBm)                                              |
| Note: The maximum e.i.r.p at any elevation angle above 30 degrees as measured from the horizon must not exceed 125mW(21dBm) |                                                             |

##### TEST RESULTS

## Antenna 0:

## 5150-5250MHz:

| Channel    | Frequency (MHz) | Output Power AV (dBm) | Duty factor (dB) | Output Power AV + Duty factor (dBm) | Limits (dBm) | Verdict |
|------------|-----------------|-----------------------|------------------|-------------------------------------|--------------|---------|
| 802.11a    |                 |                       |                  |                                     |              |         |
| 36         | 5180            | 15.37                 | 0.11             | 15.48                               | 24.00        | PASS    |
| 40         | 5200            | 15.34                 | 0.11             | 15.45                               | 24.00        | PASS    |
| 48         | 5240            | 15.41                 | 0.11             | 15.52                               | 24.00        | PASS    |
| 802.11n20  |                 |                       |                  |                                     |              |         |
| 36         | 5180            | 15.15                 | 0.11             | 15.26                               | 24.00        | PASS    |
| 40         | 5200            | 15.21                 | 0.11             | 15.32                               | 24.00        | PASS    |
| 48         | 5240            | 15.14                 | 0.11             | 15.25                               | 24.00        | PASS    |
| 802.11ac20 |                 |                       |                  |                                     |              |         |
| 36         | 5180            | 15.07                 | 0.11             | 15.18                               | 24.00        | PASS    |
| 40         | 5200            | 15.05                 | 0.11             | 15.16                               | 24.00        | PASS    |
| 48         | 5240            | 15.17                 | 0.11             | 15.28                               | 24.00        | PASS    |
| 802.11n40  |                 |                       |                  |                                     |              |         |
| 38         | 5190            | 15.28                 | 0.24             | 15.52                               | 24.00        | PASS    |
| 46         | 5230            | 15.24                 | 0.24             | 15.48                               | 24.00        | PASS    |
| 802.11ac40 |                 |                       |                  |                                     |              |         |
| 38         | 5190            | 15.03                 | 0.23             | 15.26                               | 24.00        | PASS    |
| 46         | 5230            | 15.07                 | 0.23             | 15.30                               | 24.00        | PASS    |
| 802.11ac80 |                 |                       |                  |                                     |              |         |
| 42         | 5210            | 14.97                 | 0.50             | 15.47                               | 24.00        | 24.00   |

## 5725-5850MHz:

| Channel    | Frequency (MHz) | Output Power AV (dBm) | Duty factor (dB) | Output Power AV + Duty factor (dBm) | Limits (dBm) | Verdict |
|------------|-----------------|-----------------------|------------------|-------------------------------------|--------------|---------|
| 802.11a    |                 |                       |                  |                                     |              |         |
| 149        | 5745            | 15.31                 | 0.11             | 15.42                               | 30.00        | PASS    |
| 157        | 5785            | 15.28                 | 0.11             | 15.39                               | 30.00        | PASS    |
| 165        | 5825            | 15.40                 | 0.11             | 15.51                               | 30.00        | PASS    |
| 802.11n20  |                 |                       |                  |                                     |              |         |
| 149        | 5745            | 15.19                 | 0.11             | 15.30                               | 30.00        | PASS    |
| 157        | 5785            | 15.11                 | 0.11             | 15.22                               | 30.00        | PASS    |
| 165        | 5825            | 15.08                 | 0.11             | 15.19                               | 30.00        | PASS    |
| 802.11ac20 |                 |                       |                  |                                     |              |         |
| 149        | 5745            | 15.01                 | 0.11             | 15.12                               | 30.00        | PASS    |
| 157        | 5785            | 14.96                 | 0.11             | 15.07                               | 30.00        | PASS    |
| 165        | 5825            | 15.13                 | 0.11             | 15.24                               | 30.00        | PASS    |
| 802.11n40  |                 |                       |                  |                                     |              |         |
| 151        | 5755            | 15.21                 | 0.24             | 15.45                               | 30.00        | PASS    |
| 159        | 5795            | 15.29                 | 0.24             | 15.53                               | 30.00        | PASS    |
| 802.11ac40 |                 |                       |                  |                                     |              |         |
| 151        | 5755            | 14.95                 | 0.23             | 15.18                               | 30.00        | PASS    |
| 159        | 5795            | 15.02                 | 0.23             | 15.25                               | 30.00        | PASS    |
| 802.11ac80 |                 |                       |                  |                                     |              |         |
| 155        | 5775            | 14.99                 | 0.50             | 15.49                               | 30.00        | PASS    |

## Antenna 1:

## 5150-5250MHz:

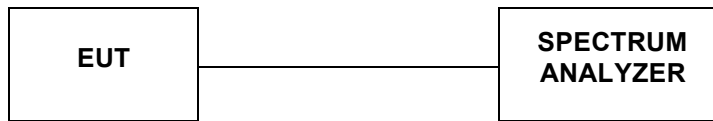
| Channel    | Frequency (MHz) | Output Power AV (dBm) | Duty factor (dB) | Output Power AV + Duty factor (dBm) | Limits (dBm) | Verdict |
|------------|-----------------|-----------------------|------------------|-------------------------------------|--------------|---------|
| 802.11a    |                 |                       |                  |                                     |              |         |
| 36         | 5180            | 15.35                 | 0.11             | 15.46                               | 24.00        | PASS    |
| 40         | 5200            | 15.45                 | 0.11             | 15.56                               | 24.00        | PASS    |
| 48         | 5240            | 15.29                 | 0.11             | 15.40                               | 24.00        | PASS    |
| 802.11n20  |                 |                       |                  |                                     |              |         |
| 36         | 5180            | 15.16                 | 0.11             | 15.27                               | 24.00        | PASS    |
| 40         | 5200            | 15.11                 | 0.11             | 15.22                               | 24.00        | PASS    |
| 48         | 5240            | 15.12                 | 0.11             | 15.23                               | 24.00        | PASS    |
| 802.11ac20 |                 |                       |                  |                                     |              |         |
| 36         | 5180            | 15.17                 | 0.11             | 15.28                               | 24.00        | PASS    |
| 40         | 5200            | 15.18                 | 0.11             | 15.29                               | 24.00        | PASS    |
| 48         | 5240            | 15.10                 | 0.11             | 15.21                               | 24.00        | PASS    |
| 802.11n40  |                 |                       |                  |                                     |              |         |
| 38         | 5190            | 15.28                 | 0.23             | 15.51                               | 24.00        | PASS    |
| 46         | 5230            | 15.25                 | 0.23             | 15.48                               | 24.00        | PASS    |
| 802.11ac40 |                 |                       |                  |                                     |              |         |
| 38         | 5190            | 15.03                 | 0.23             | 15.26                               | 24.00        | PASS    |
| 46         | 5230            | 14.90                 | 0.23             | 15.13                               | 24.00        | PASS    |
| 802.11ac80 |                 |                       |                  |                                     |              |         |
| 42         | 5210            | 15.01                 | 0.50             | 15.51                               | 24.00        | PASS    |

## 5725-5850MHz:

| Channel    | Frequency (MHz) | Output Power AV (dBm) | Duty factor (dB) | Output Power AV + Duty factor (dBm) | Limits (dBm) | Verdict |
|------------|-----------------|-----------------------|------------------|-------------------------------------|--------------|---------|
| 802.11a    |                 |                       |                  |                                     |              |         |
| 149        | 5745            | 15.44                 | 0.11             | 15.55                               | 30.00        | PASS    |
| 157        | 5785            | 15.28                 | 0.11             | 15.39                               | 30.00        | PASS    |
| 165        | 5825            | 15.37                 | 0.11             | 15.48                               | 30.00        | PASS    |
| 802.11n20  |                 |                       |                  |                                     |              |         |
| 149        | 5745            | 15.07                 | 0.11             | 15.18                               | 30.00        | PASS    |
| 157        | 5785            | 15.08                 | 0.11             | 15.19                               | 30.00        | PASS    |
| 165        | 5825            | 15.14                 | 0.11             | 15.25                               | 30.00        | PASS    |
| 802.11ac20 |                 |                       |                  |                                     |              |         |
| 149        | 5745            | 15.11                 | 0.11             | 15.22                               | 30.00        | PASS    |
| 157        | 5785            | 15.03                 | 0.11             | 15.14                               | 30.00        | PASS    |
| 165        | 5825            | 15.15                 | 0.11             | 15.26                               | 30.00        | PASS    |
| 802.11n40  |                 |                       |                  |                                     |              |         |
| 151        | 5755            | 15.24                 | 0.23             | 15.47                               | 30.00        | PASS    |
| 159        | 5795            | 15.23                 | 0.23             | 15.46                               | 30.00        | PASS    |
| 802.11ac40 |                 |                       |                  |                                     |              |         |
| 151        | 5755            | 14.97                 | 0.23             | 15.20                               | 30.00        | PASS    |
| 159        | 5795            | 15.09                 | 0.23             | 15.32                               | 30.00        | PASS    |
| 802.11ac80 |                 |                       |                  |                                     |              |         |
| 155        | 5775            | 14.95                 | 0.50             | 15.45                               | 30.00        | PASS    |

## 4.5. Power Spectral Density

### TEST CONFIGURATION



### TEST PROCEDURE

According to KDB 789033 D02 General UNII Test Procedures New Rules v01 F: The rules requires "maximum power spectral density" measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission

- a. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
- b. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
- c. Make the following adjustments to the peak value of the spectrum, if applicable:
  1. If Method SA-2 or SA-2 Alternative was used, add  $10 \log(1/x)$ , where  $x$  is the duty cycle, to the peak of the spectrum.
  2. ) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging
- d. The result is the Maximum PSD over 1 MHz reference bandwidth.
- e. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:
  1. Set  $RBW \geq 1/T$ , where  $T$  is defined in section II.B.I.a).
  2. Set  $VBW \geq 3 RBW$ .
  3. If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10\log(500\text{kHz}/RBW)$  to the measured result, whereas  $RBW (< 500 \text{ KHz})$  is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
  4. If measurement bandwidth of Maximum PSD is specified in 1 MHz, add  $10\log(1\text{MHz}/RBW)$  to the measured result, whereas  $RBW (< 1 \text{ MHz})$  is the reduced resolution bandwidth of spectrum analyzer set during measurement.
  5. Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since  $RBW=100 \text{ KHz}$  is available on nearly all spectrum analyzers.
- f. Adjust the measurement in dBm by adding  $10 \log(1/x)$  where  $x$  is the duty cycle (e.g.,  $10 \log(1/0.25)$  if the duty cycle is 25 percent).

### LIMIT

According to §15.407(a): The maximum output power should be not exceed follow:

| Frequency Range (MHz) | Limit                                                                     |
|-----------------------|---------------------------------------------------------------------------|
| 5150-5250             | Other then Mobile and portable:17dBm/MHz<br>Mobile and portable:11dBm/MHz |
| 5250-5350             | 11dBm/MHz                                                                 |
| 5470-5725             | 11dBm/MHz                                                                 |
| 5725-5850             | 30dBm/500kHz                                                              |

**TEST RESULTS**

Antenna 0:

5150-5250MHz:

**802.11a Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 36      | 5180            | 6.05                  | 0.11             | 0               | 6.16                                           | 11                | PASS    |
| 40      | 5200            | 5.94                  | 0.11             | 0               | 6.05                                           | 11                | PASS    |
| 48      | 5240            | 5.85                  | 0.11             | 0               | 5.96                                           | 11                | PASS    |

**802.11n HT20 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 36      | 5180            | 5.40                  | 0.11             | 0               | 5.51                                           | 11                | PASS    |
| 40      | 5200            | 5.64                  | 0.11             | 0               | 5.75                                           | 11                | PASS    |
| 48      | 5240            | 5.09                  | 0.11             | 0               | 5.20                                           | 11                | PASS    |

**802.11ac20 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 36      | 5180            | 5.62                  | 0.11             | 0               | 5.73                                           | 11                | PASS    |
| 40      | 5200            | 5.77                  | 0.11             | 0               | 5.88                                           | 11                | PASS    |
| 48      | 5240            | 5.25                  | 0.11             | 0               | 5.36                                           | 11                | PASS    |

**802.11n40 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 38      | 5190            | 2.48                  | 0.24             | 0               | 2.72                                           | 11                | PASS    |
| 46      | 5230            | 2.67                  | 0.24             | 0               | 2.91                                           | 11                | PASS    |

**802.11ac40 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 38      | 5190            | 2.53                  | 0.23             | 0               | 2.76                                           | 11                | PASS    |
| 46      | 5230            | 2.47                  | 0.23             | 0               | 2.70                                           | 11                | PASS    |

**802.11ac80 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 42      | 5210            | -0.11                 | 0.50             | 0               | 0.39                                           | 11                | PASS    |

**5725-5850MHz:****802.11a Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5745            | 3.47                    | 0.11             | 2.2             | 5.78                                             | 30                  | PASS    |
| 157     | 5785            | 4.05                    | 0.11             | 2.2             | 6.36                                             | 30                  | PASS    |
| 165     | 5825            | 5.19                    | 0.11             | 2.2             | 7.50                                             | 30                  | PASS    |

**802.11n HT20 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5745            | 3.17                    | 0.11             | 2.2             | 5.48                                             | 30                  | PASS    |
| 157     | 5785            | 3.52                    | 0.11             | 2.2             | 5.83                                             | 30                  | PASS    |
| 165     | 5825            | 4.22                    | 0.11             | 2.2             | 6.53                                             | 30                  | PASS    |

**802.11ac20 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5745            | 3.65                    | 0.11             | 2.2             | 5.96                                             | 30                  | PASS    |
| 157     | 5785            | 4.00                    | 0.11             | 2.2             | 6.31                                             | 30                  | PASS    |
| 165     | 5825            | 4.84                    | 0.11             | 2.2             | 7.15                                             | 30                  | PASS    |

**802.11n40Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5755            | 0.04                    | 0.24             | 2.2             | 2.48                                             | 30                  | PASS    |
| 157     | 5795            | 0.76                    | 0.24             | 2.2             | 3.20                                             | 30                  | PASS    |

**802.11ac40 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5755            | -0.58                   | 0.23             | 2.2             | 1.85                                             | 30                  | PASS    |
| 157     | 5795            | 0.67                    | 0.23             | 2.2             | 3.10                                             | 30                  | PASS    |

**802.11ac80 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 155     | 5775            | -3.47                   | 0.50             | 2.2             | -0.77                                            | 30                  | PASS    |

## Antenna 1:

## 5150-5250MHz:

## 802.11a Test Mode

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 36      | 5180            | 6.19                  | 0.11             | 0               | 6.30                                           | 11                | PASS    |
| 40      | 5200            | 6.51                  | 0.11             | 0               | 6.62                                           | 11                | PASS    |
| 48      | 5240            | 5.97                  | 0.11             | 0               | 6.08                                           | 11                | PASS    |

## 802.11n HT20 Test Mode

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 36      | 5180            | 5.75                  | 0.11             | 0               | 5.86                                           | 11                | PASS    |
| 40      | 5200            | 6.43                  | 0.11             | 0               | 6.54                                           | 11                | PASS    |
| 48      | 5240            | 5.63                  | 0.11             | 0               | 5.74                                           | 11                | PASS    |

## 802.11ac20 Test Mode

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 36      | 5180            | 5.78                  | 0.11             | 0               | 5.89                                           | 11                | PASS    |
| 40      | 5200            | 6.30                  | 0.11             | 0               | 6.41                                           | 11                | PASS    |
| 48      | 5240            | 5.63                  | 0.11             | 0               | 5.74                                           | 11                | PASS    |

## 802.11n40 Test Mode

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 38      | 5190            | 3.18                  | 0.23             | 0               | 3.41                                           | 11                | PASS    |
| 46      | 5230            | 2.65                  | 0.23             | 0               | 2.88                                           | 11                | PASS    |

## 802.11ac40 Test Mode

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 38      | 5190            | 2.62                  | 0.23             | 0               | 2.85                                           | 11                | PASS    |
| 46      | 5230            | 2.64                  | 0.23             | 0               | 2.87                                           | 11                | PASS    |

## 802.11ac80 Test Mode

| Channel | Frequency (MHz) | Report PSD (dBm/1MHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/1MHz) | Limits (dBm/1MHz) | Verdict |
|---------|-----------------|-----------------------|------------------|-----------------|------------------------------------------------|-------------------|---------|
| 42      | 5210            | 0.26                  | 0.50             | 0               | 0.76                                           | 11                | PASS    |

**5725-5850MHz:****802.11a Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5745            | 3.89                    | 0.11             | 2.2             | 6.20                                             | 30                  | PASS    |
| 157     | 5785            | 4.57                    | 0.11             | 2.2             | 6.88                                             | 30                  | PASS    |
| 165     | 5825            | 4.74                    | 0.11             | 2.2             | 7.05                                             | 30                  | PASS    |

**802.11n HT20 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5745            | 3.84                    | 0.11             | 2.2             | 6.15                                             | 30                  | PASS    |
| 157     | 5785            | 4.38                    | 0.11             | 2.2             | 6.69                                             | 30                  | PASS    |
| 165     | 5825            | 4.88                    | 0.11             | 2.2             | 7.19                                             | 30                  | PASS    |

**802.11ac20 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5745            | 3.29                    | 0.11             | 2.2             | 5.60                                             | 30                  | PASS    |
| 157     | 5785            | 3.55                    | 0.11             | 2.2             | 5.86                                             | 30                  | PASS    |
| 165     | 5825            | 5.14                    | 0.11             | 2.2             | 7.45                                             | 30                  | PASS    |

**802.11n40Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5755            | 0.22                    | 0.23             | 2.2             | 2.65                                             | 30                  | PASS    |
| 157     | 5795            | 1.07                    | 0.23             | 2.2             | 3.50                                             | 30                  | PASS    |

**802.11ac40 Test Mode**

| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 149     | 5755            | 0.25                    | 0.23             | 2.2             | 2.68                                             | 30                  | PASS    |
| 157     | 5795            | 1.44                    | 0.23             | 2.2             | 3.87                                             | 30                  | PASS    |

**802.11ac80 Test Mode**

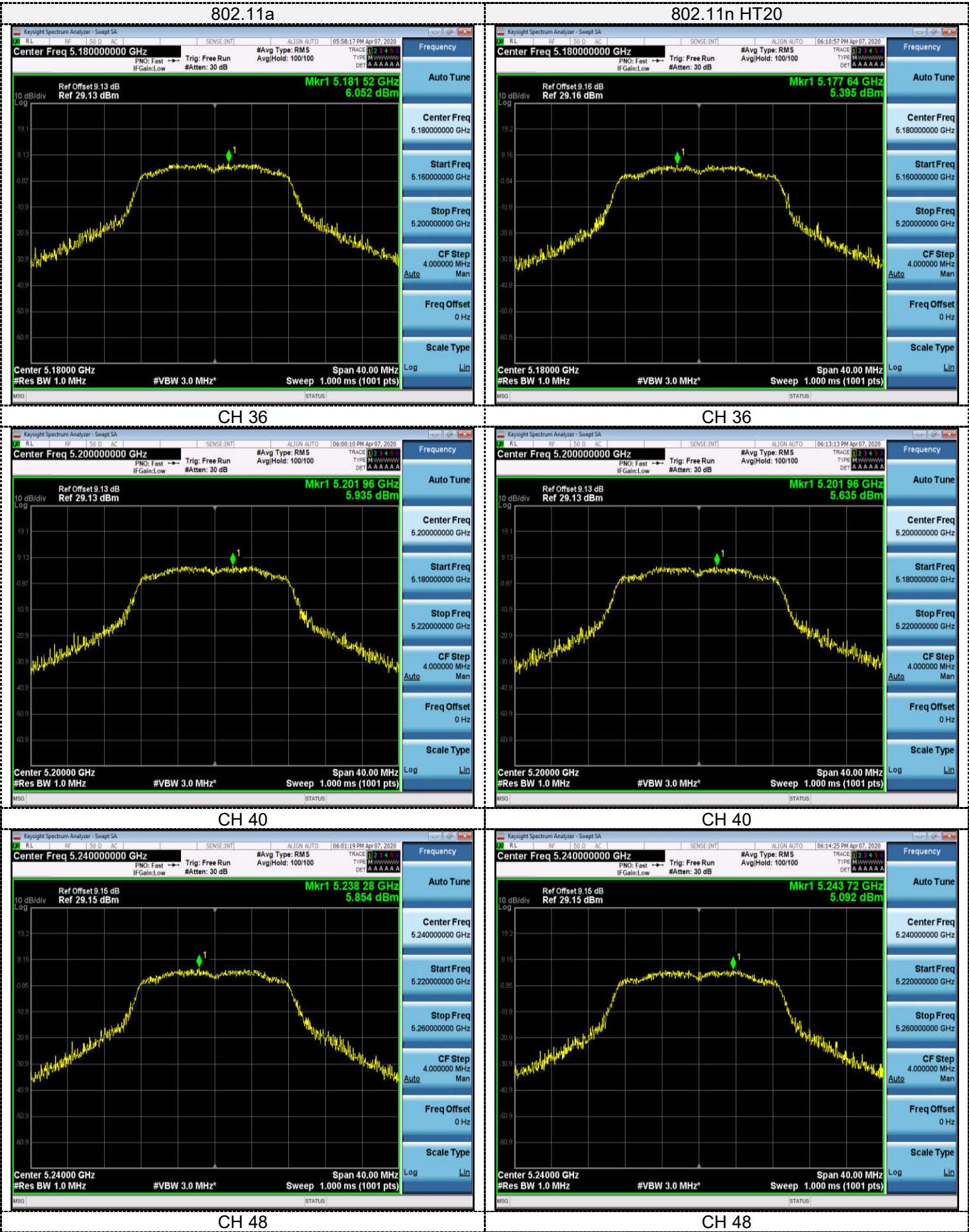
| Channel | Frequency (MHz) | Report PSD (dBm/300KHz) | Duty factor (dB) | RBW factor (dB) | Report PSD+ Duty factor+ RBW factor (dBm/500kHz) | Limits (dBm/500kHz) | Verdict |
|---------|-----------------|-------------------------|------------------|-----------------|--------------------------------------------------|---------------------|---------|
| 155     | 5775            | -2.8                    | 0.50             | 2.2             | -0.1                                             | 30                  | PASS    |

Note:

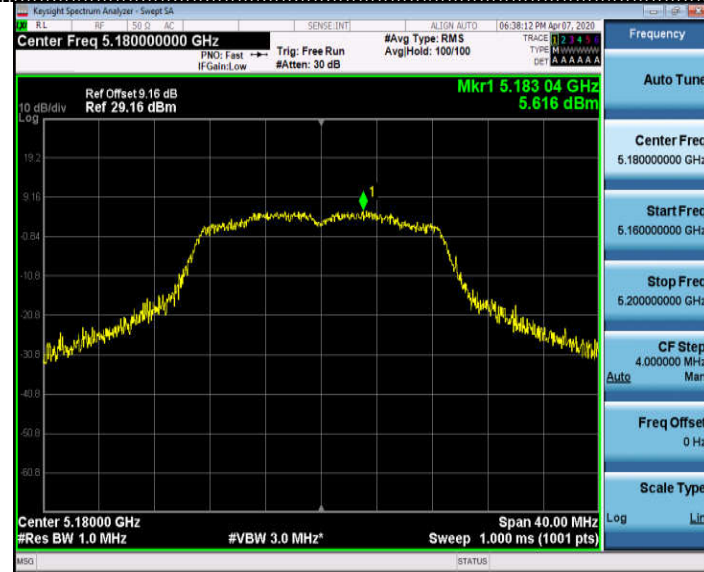
1. The test results including the cable lose.

Antenna 0:

5150-5250MHz:



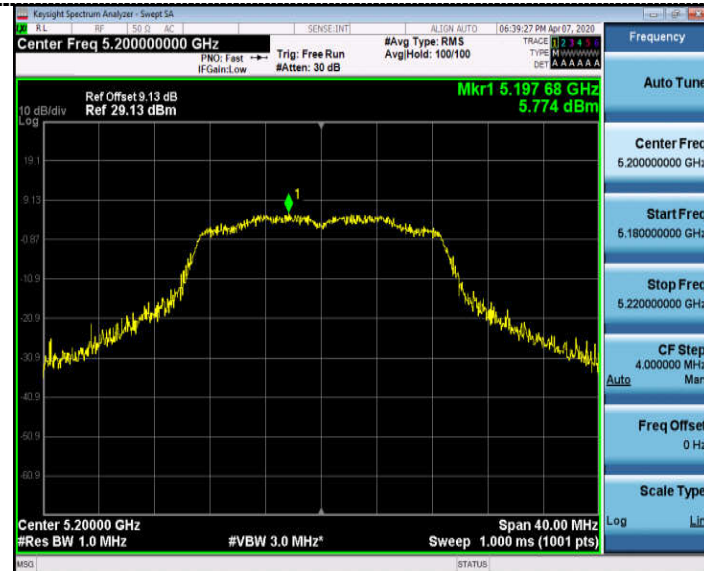
802.11ac20



802.11n HT40



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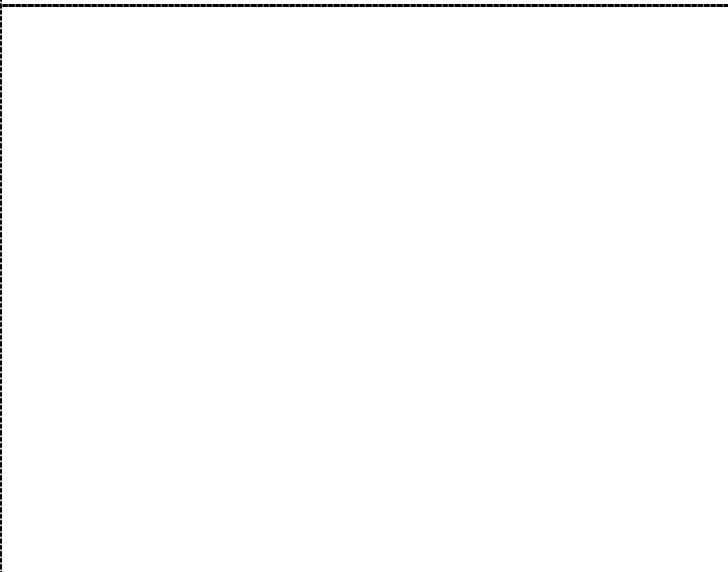
CH 38



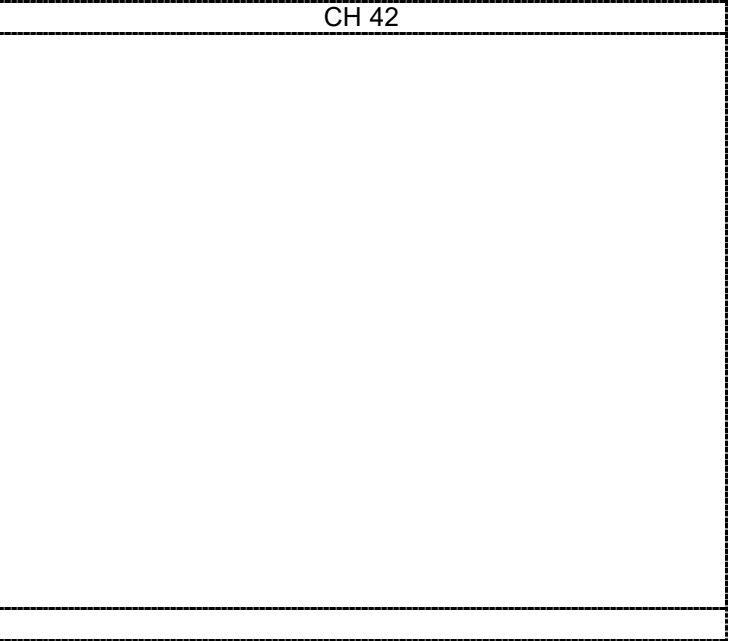
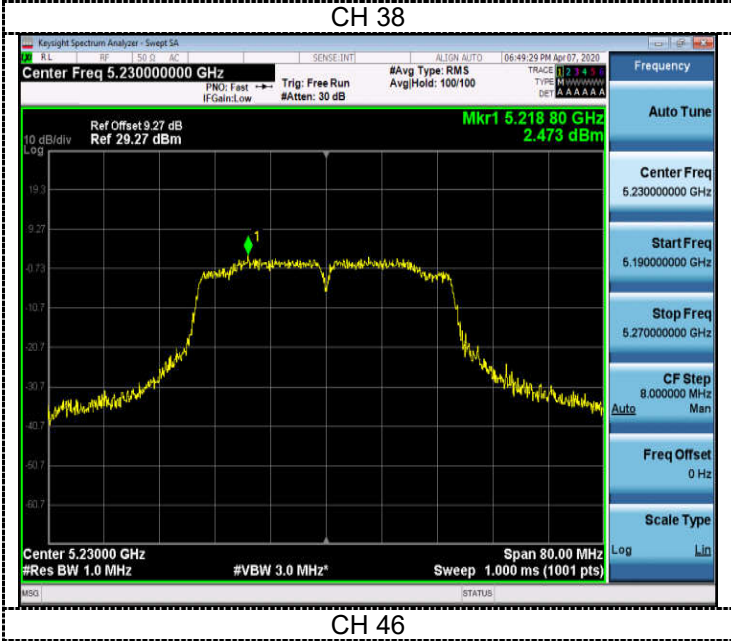
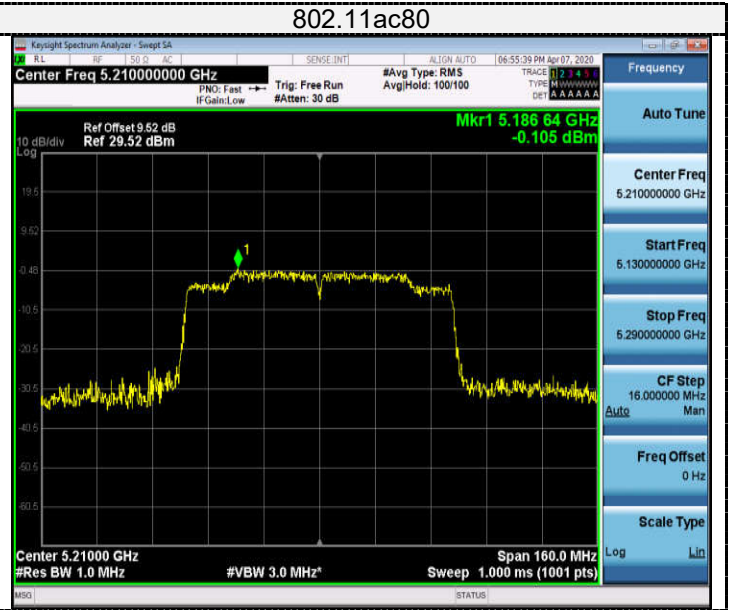
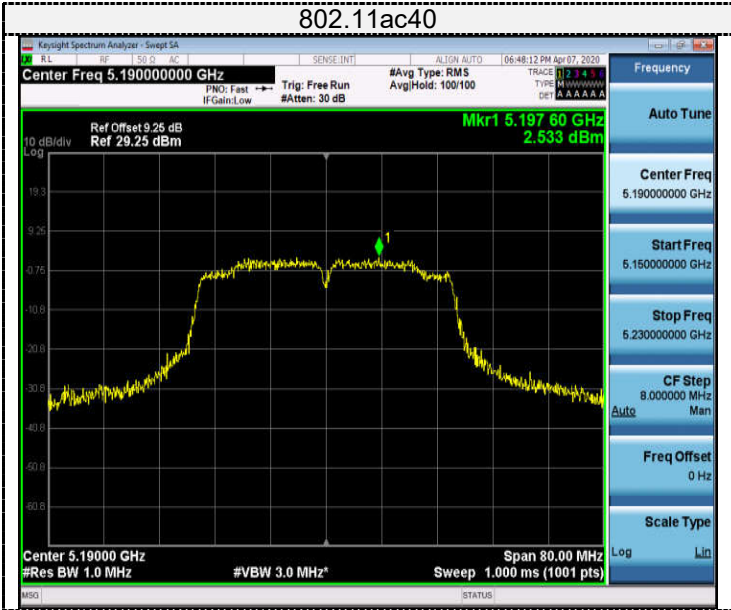
CH 40



CH 46



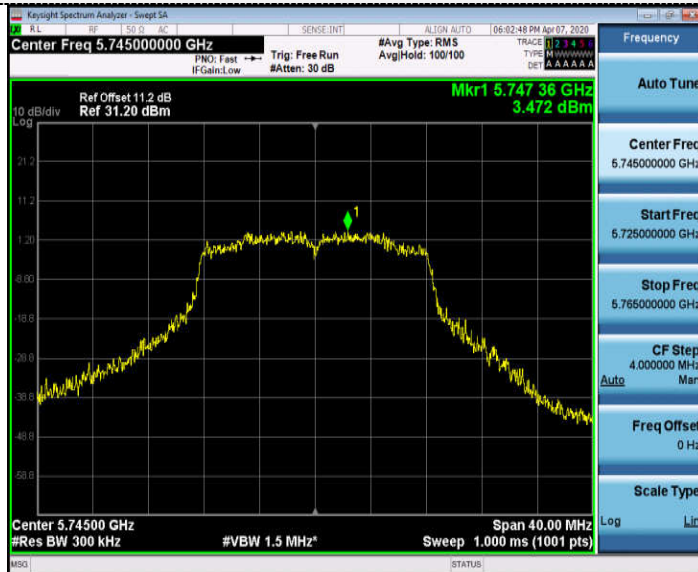
CH 48



5725-5850MHz:

802.11a

802.11n HT20



CH 149

CH 149



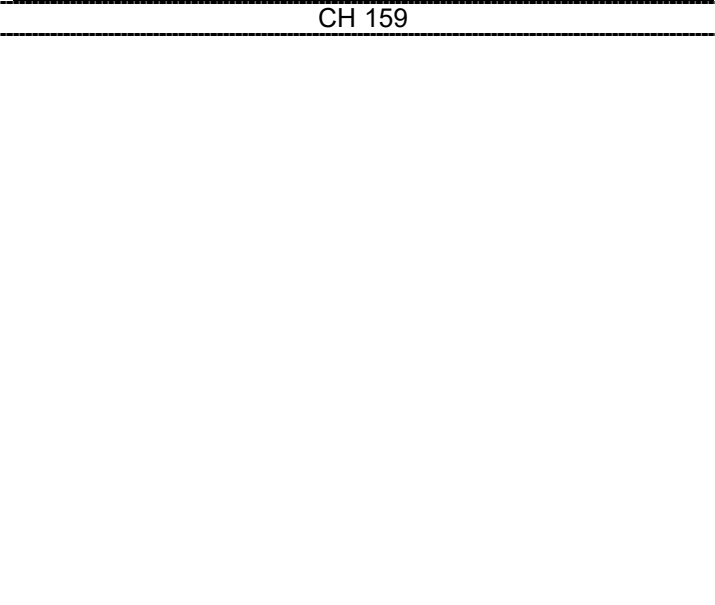
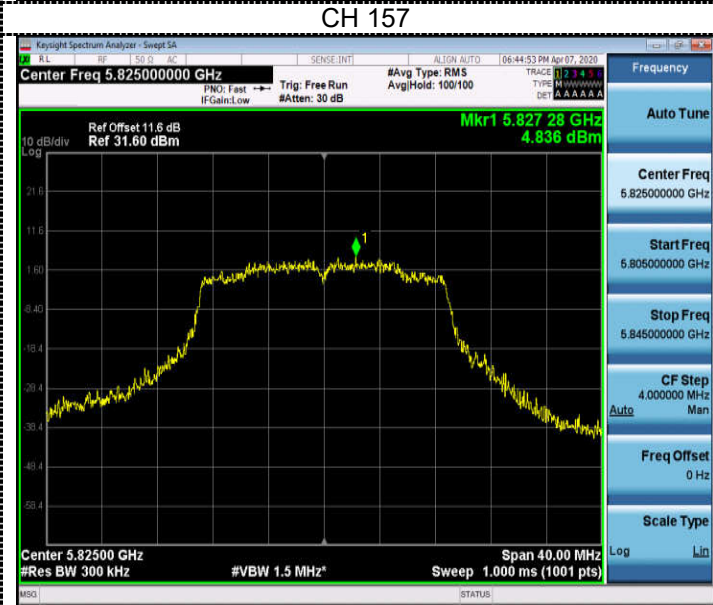
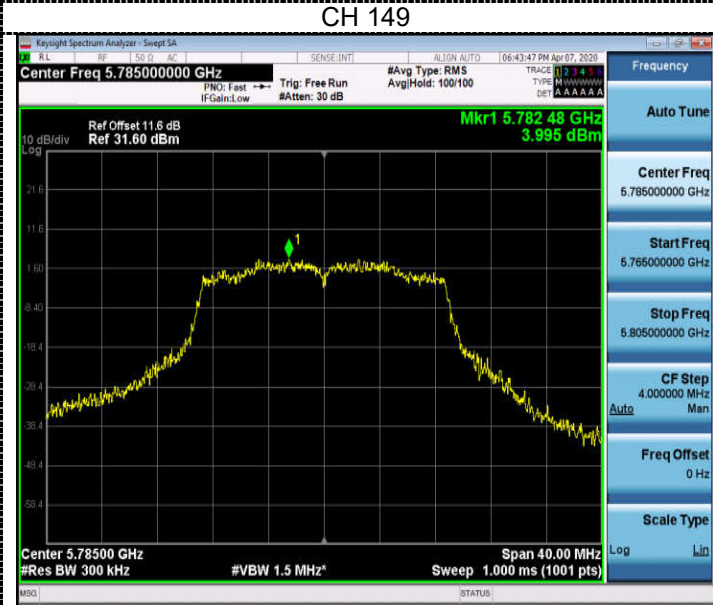
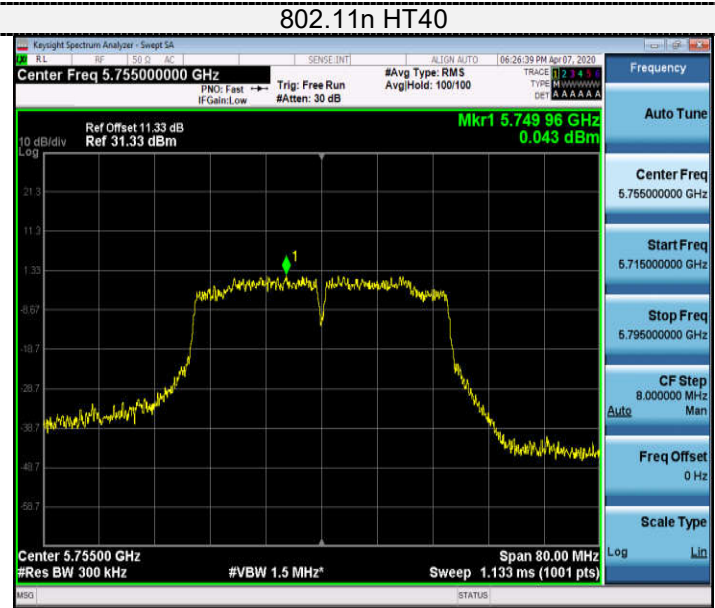
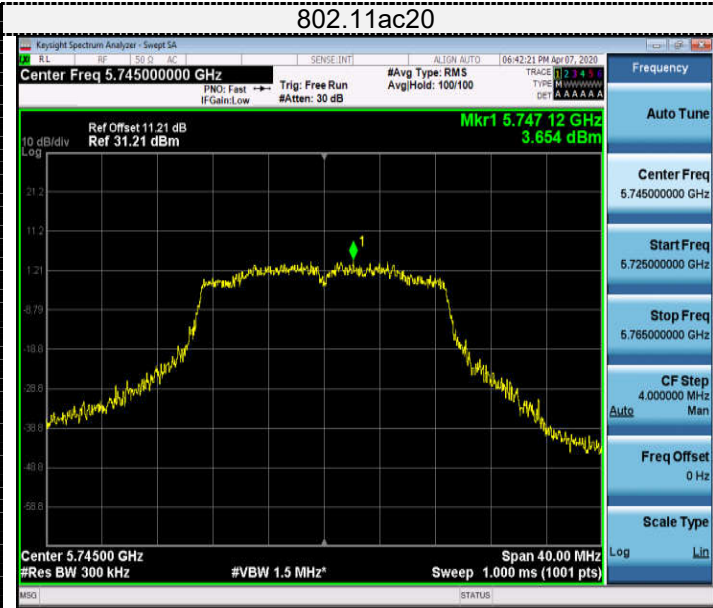
CH 157

CH 157



CH 165

CH 165



802.11ac40



802.11ac80



CH 151



CH 155

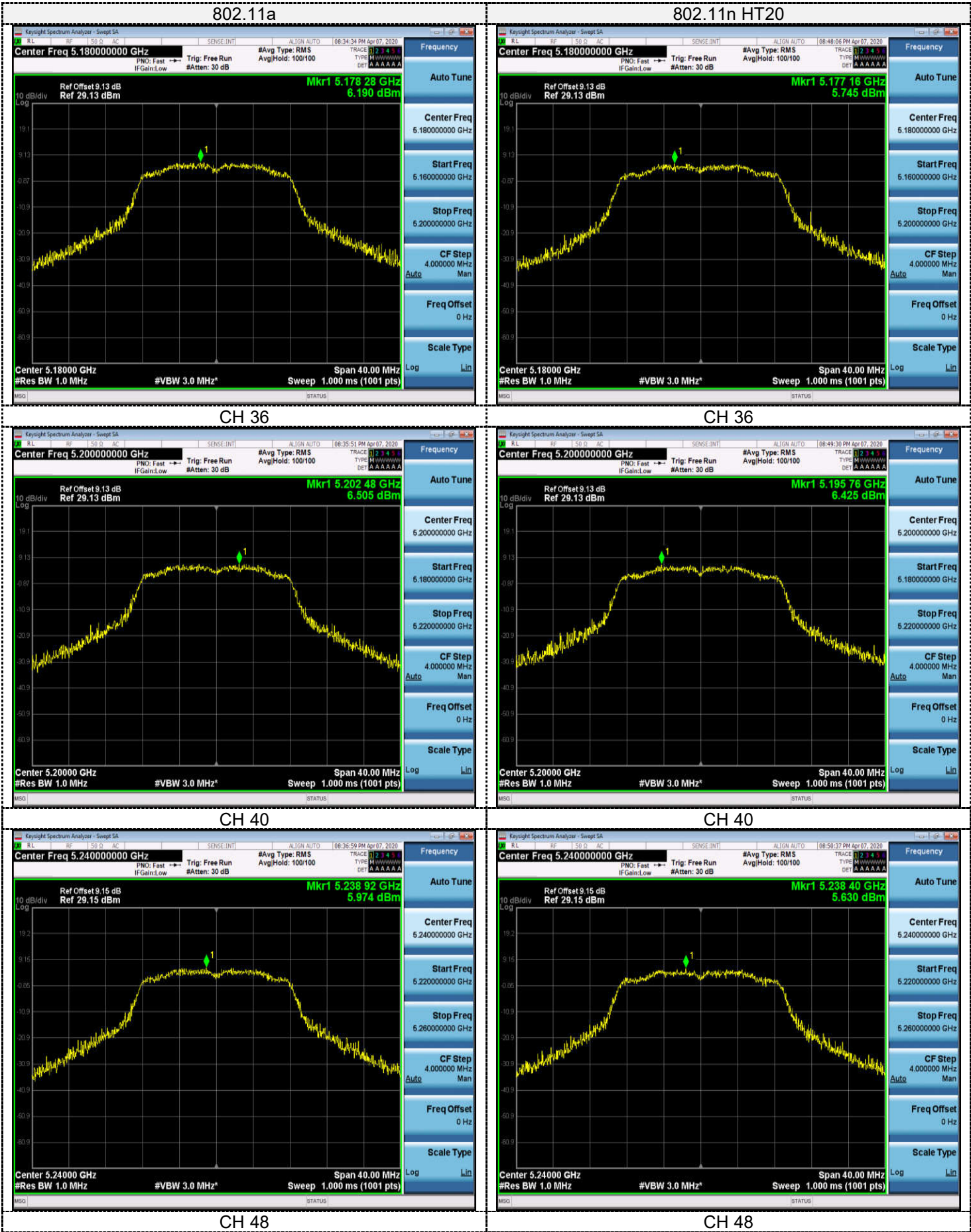


CH 159



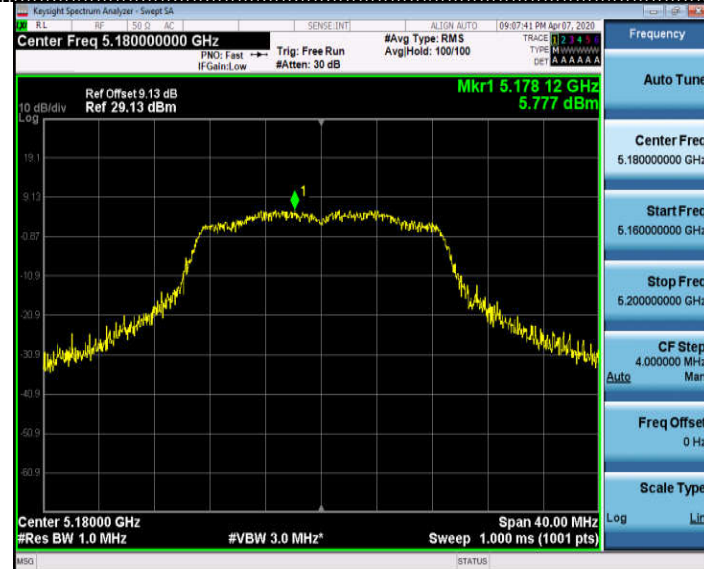
Antenna 1:

5150-5250MHz:



CH 36

802.11ac20



802.11n HT40



CH 36



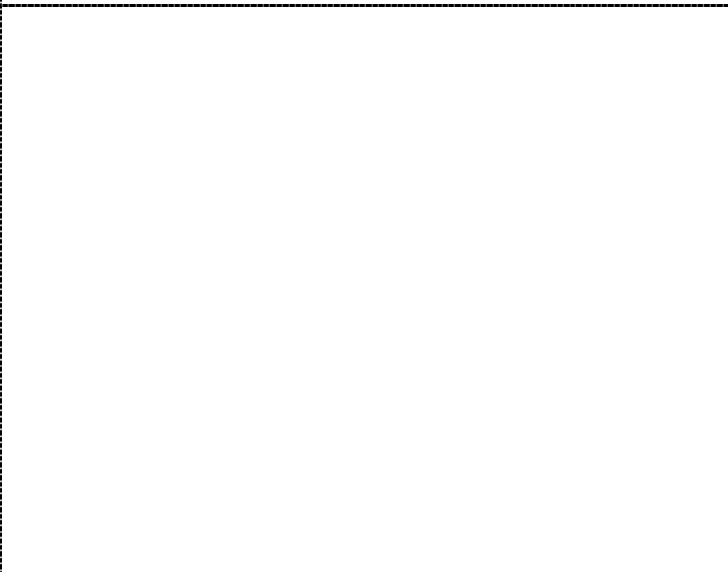
CH 38



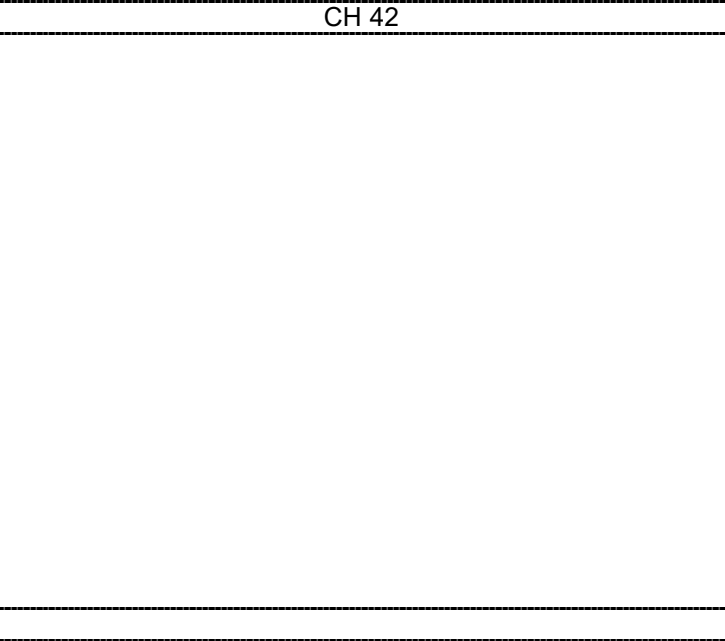
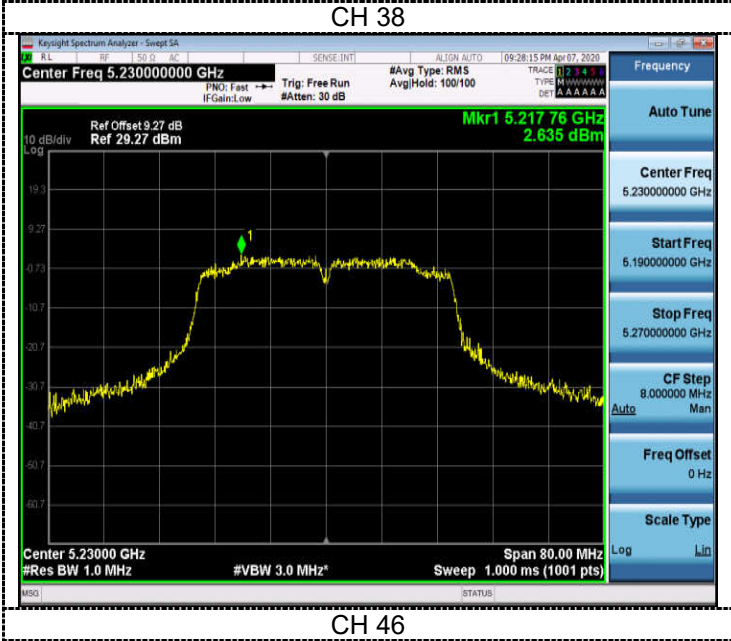
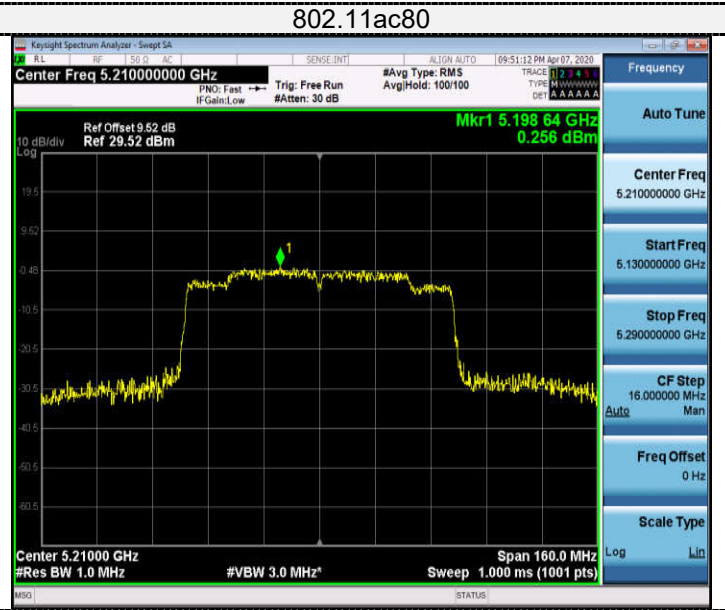
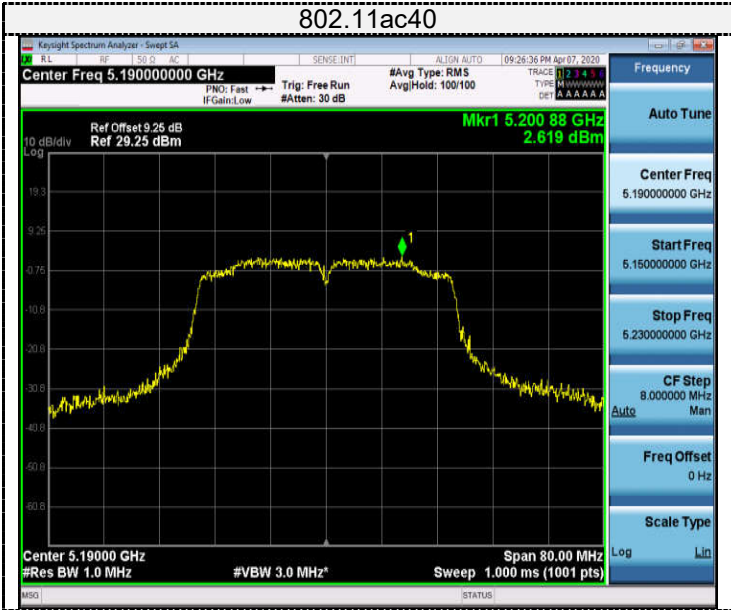
CH 40



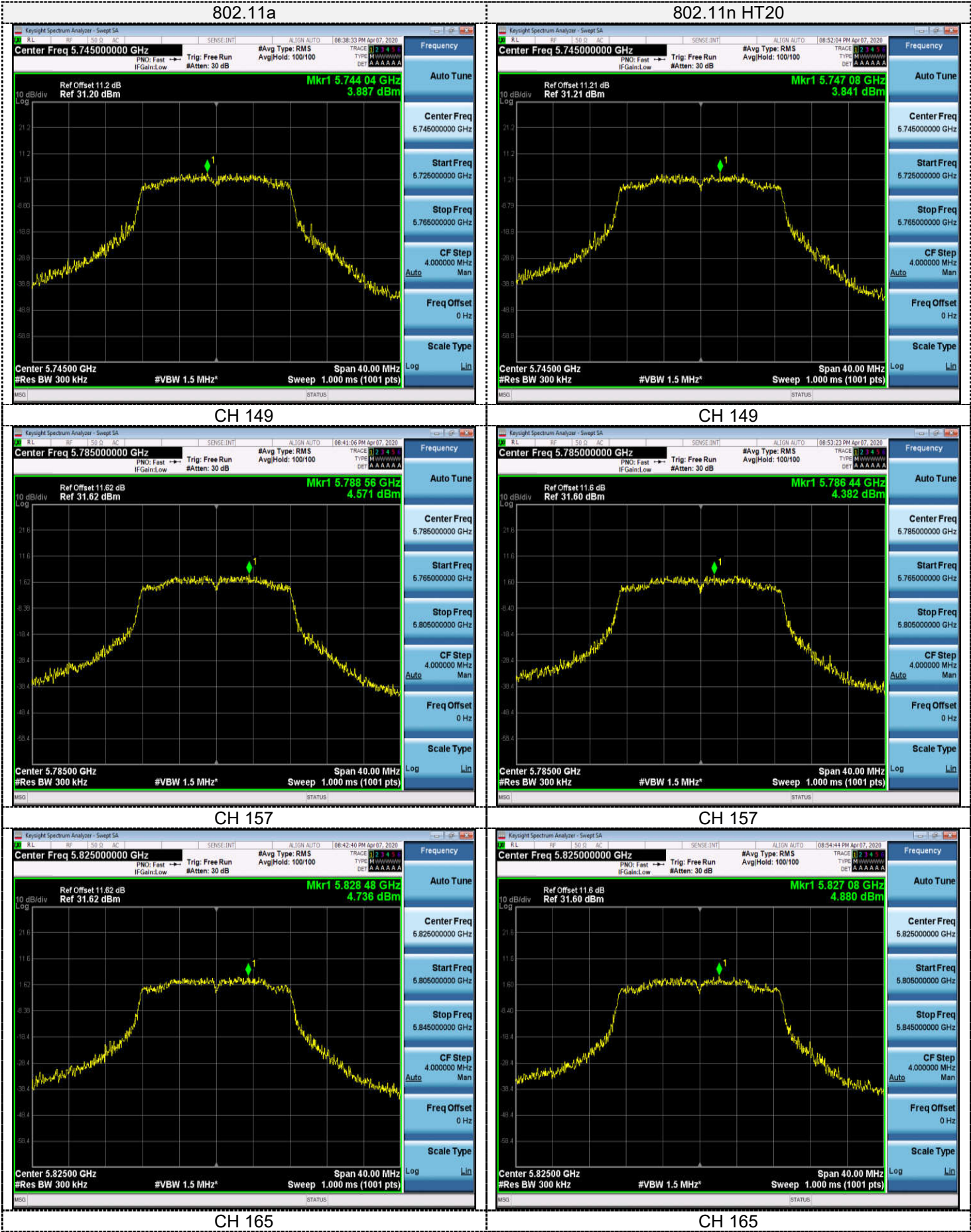
CH 46



CH 48



5725-5850MHz:



802.11ac20



802.11n HT40



CH 149



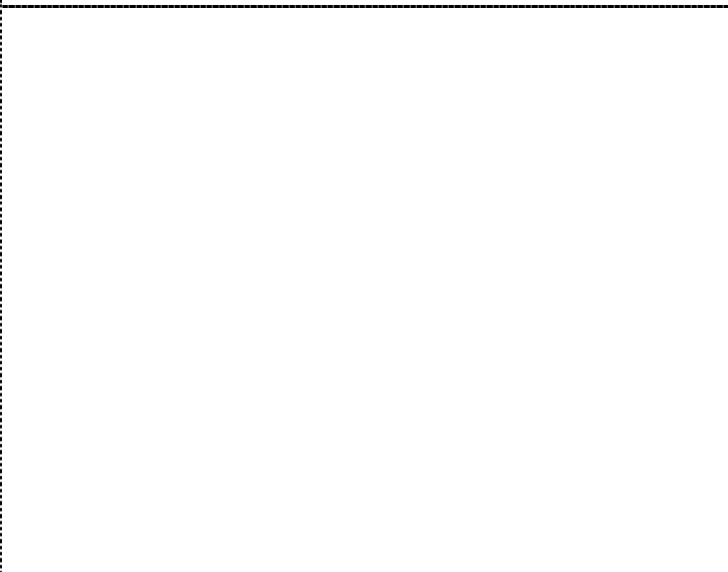
CH 151



CH 157



CH 159



CH 165