

# FCC TEST REPORT

## (Part 15, Subpart E)

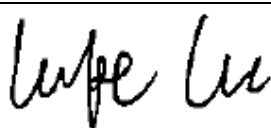
|            |                                                 |
|------------|-------------------------------------------------|
| Applicant: | DataRemote Incorporated                         |
| Address:   | 18001 Old Cutler Rd. Suite 600, Miami, FL 33157 |

|                           |                                                 |
|---------------------------|-------------------------------------------------|
| Manufacturer or Supplier: | DataRemote Incorporated                         |
| Address:                  | 18001 Old Cutler Rd. Suite 600, Miami, FL 33157 |
| Product:                  | LTE Cellular Router                             |
| Brand Name:               | DataRemote                                      |
| Model Name:               | CDS-9010                                        |
| FCC ID:                   | 2AJLF-CDS-9010                                  |
| Date of tests:            | Mar. 23, 2019 ~ Apr. 28, 2019                   |

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart E, Section 15.407**

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

|                                                                                                            |                                                                                                             |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Prepared by Alex Chen<br>Engineer / Mobile Department                                                      | Approved by Luke Lu<br>Manager / Mobile Department                                                          |
| <br>Date: Apr. 30, 2019 | <br>Date: Apr. 30, 2019 |

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**BUREAU**  
**VERITAS**

Test Report No.: RF190322W001-2

## RELEASE CONTROL RECORD

| ISSUE NO.      | REASON FOR CHANGE | DATE ISSUED   |
|----------------|-------------------|---------------|
| RF190322W001-2 | Original release  | Apr. 30, 2019 |

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407) |                                           |        |                                                                                  |
|-----------------------------------------------------------|-------------------------------------------|--------|----------------------------------------------------------------------------------|
| STANDARD SECTION                                          | TEST TYPE AND LIMIT                       | RESULT | REMARK                                                                           |
| 15.407(b)(5)                                              | AC Power Conducted Emission               | PASS   | Meet the requirement of limit. Minimum passing margin is -9.08dB at 0.444000MHz. |
| 15.407(b)(1/2/3/4/6)                                      | Radiated Emission & Band Edge Measurement | PASS   | Meet the requirement of limit. Minimum passing margin is -1.02dB at 5150MHz.     |
| 15.407(a/1/2/3)                                           | Maximum conducted output Power            | PASS   | Meet the requirement of limit.                                                   |
| 15.407(a/1/2/3)                                           | Peak Power Spectral Density               | PASS   | Meet the requirement of limit.                                                   |
| 15.407(e)                                                 | 6 dB Bandwidth                            | PASS   | Meet the requirement of limit. (U-NII-3 Band only)                               |
| 15.407(g)                                                 | Frequency Stability                       | PASS   | Meet the requirement of limit.                                                   |
| 15.203                                                    | Antenna Requirement                       | PASS   | No antenna connector is used.                                                    |

### 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| MEASUREMENT                  | UNCERTAINTY          |
|------------------------------|----------------------|
| AC Power Conducted emissions | $\pm 2.70\text{dB}$  |
| All Radiated emissions       | $\pm 4.48\text{dB}$  |
| Conducted emissions          | $\pm 2\text{ dB}$    |
| Occupied Channel Bandwidth   | $\pm 21.7\text{KHz}$ |
| Conducted Output power       | $\pm 1.03\text{ dB}$ |
| Power Spectral Density       | $\pm 0.95\text{ dB}$ |

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



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                              |                                                                                                                                                                                                        |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT</b>                   | LTE Cellular Router                                                                                                                                                                                    |
| <b>MODEL NO.</b>             | CDS-9010                                                                                                                                                                                               |
| <b>POWER SUPPLY</b>          | 12.0Vdc (adapter or host equipment)<br>7.3Vdc (Li-ion, battery)                                                                                                                                        |
| <b>MODULATION TYPE</b>       | 64QAM, 16QAM, QPSK, BPSK                                                                                                                                                                               |
| <b>MODULATION TECHNOLOGY</b> | OFDM                                                                                                                                                                                                   |
| <b>TRANSFER RATE</b>         | 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps<br>802.11n: up to MCS7<br>802.11ac: up to 390.0Mbps                                                                                          |
| <b>OPERATING FREQUENCY</b>   | 5180 ~ 5240MHz, 5745 ~ 5825MHz                                                                                                                                                                         |
| <b>NUMBER OF CHANNEL</b>     | 5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz)<br>2 for 802.11n (40MHz)<br>1 for 802.11ac (80MHz)<br>5745 ~ 5825MHz: 5 for 802.11a, 802.11n (20MHz)<br>2 for 802.11n (40MHz)<br>1 for 802.11ac (80MHz) |
| <b>AVERAGE POWER</b>         | 81.846mW for 5180 ~ 5240MHz<br>85.901mW for 5745 ~ 5825MHz                                                                                                                                             |
| <b>ANTENNA TYPE</b>          | PCB Antenna with 5.08dBi gain                                                                                                                                                                          |
| <b>HW VERSION</b>            | V1.1                                                                                                                                                                                                   |
| <b>SW VERSION</b>            | V3.10                                                                                                                                                                                                  |
| <b>I/O PORTS</b>             | Refer to user's manual                                                                                                                                                                                 |
| <b>CABLE SUPPLIED</b>        | N/A                                                                                                                                                                                                    |

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapter:

| ADAPTER        |                                                         |
|----------------|---------------------------------------------------------|
| <b>BRAND:</b>  | SHENZHEN GONGJIN ELECTRONICS CO.,LTD Electronic Limited |
| <b>MODEL:</b>  | S24B72-120A200-C4                                       |
| <b>INPUT:</b>  | AC 100-240V, 800mA                                      |
| <b>OUTPUT:</b> | DC 12V, 2000mA                                          |

3. The EUT matched the following Ethernet Cable and Telephone Cables:

| ETHERNET CABLE      |                                          |
|---------------------|------------------------------------------|
| <b>BRAND:</b>       | Shenzhen Eternity Ju Electronic Co., Ltd |
| <b>MODEL:</b>       | RJ45-8P8C                                |
| <b>SIGNAL LINE:</b> | 1500±20mm                                |

| TELEPHONE CABLE 1   |                                          |
|---------------------|------------------------------------------|
| <b>BRAND:</b>       | Shenzhen Eternity Ju Electronic Co., Ltd |
| <b>MODEL:</b>       | RJ11-6P2C                                |
| <b>SIGNAL LINE:</b> | 1500±20mm                                |

| TELEPHONE CABLE 2   |                                          |
|---------------------|------------------------------------------|
| <b>BRAND:</b>       | Shenzhen Eternity Ju Electronic Co., Ltd |
| <b>MODEL:</b>       | RJ11-6P2C                                |
| <b>SIGNAL LINE:</b> | 1500±20mm                                |

4. The EUT incorporates MIMO function. Physically, the EUT provides one completed transmitter and one receiver.

| MODULATION MODE         | TX FUNCTION |
|-------------------------|-------------|
| <b>802.11a</b>          | 1TX /1RX    |
| <b>802.11n (20MHz)</b>  | 2TX /2RX    |
| <b>802.11n (40MHz)</b>  | 2TX /2RX    |
| <b>802.11ac (80MHz)</b> | 2TX /2RX    |

5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

## 2.2 DESCRIPTION OF TEST MODES

### FOR 5150 ~ 5250MHz

4 channels are provided for 802.11a, 802.11n (20MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 36      | 5180 MHz  | 44      | 5220 MHz  |
| 40      | 5200 MHz  | 48      | 5240 MHz  |

2 channels are provided for 802.11n (40MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 38      | 5190 MHz  | 46      | 5230 MHz  |

1 channel is provided for 802.11ac (80MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 42      | 5210 MHz  |         |           |

### FOR 5725 ~ 5825MHz

5 channels are provided for 802.11a, 802.11n (20MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 149     | 5745 MHz  | 161     | 5805 MHz  |
| 153     | 5765 MHz  | 165     | 5825 MHz  |
| 157     | 5785 MHz  |         |           |

2 channels are provided for 802.11n (40MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 151     | 5755 MHz  | 159     | 5795 MHz  |

1 channel is provided for 802.11ac (80MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 155     | 5775 MHz  |         |           |



## 2.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT<br>CONFIGURE<br>MODE | APPLICABLE TO |       |     |      | DESCRIPTION                           |
|--------------------------|---------------|-------|-----|------|---------------------------------------|
|                          | RE $\geq$ 1G  | RE<1G | PLC | APCM |                                       |
| A                        | √             | √     | √   | -    | Powered by Adapter with wifi(5G) link |
| B                        | -             | -     | -   | √    | Powered by Battery with wifi(5G) link |
| C                        | -             | -     | -   | -    | Powered by USB with wifi(5G) link     |

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz  
**RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission  
**APCM**: Antenna Port Conducted Measurement

**NOTE:**

The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

**NOTE:** "-" means no effect.

### RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT<br>CONFIGURE<br>MODE | MODE             | FREQ. BAND<br>(MHz) | AVAILABLE<br>CHANNEL | TESTED<br>CHANNEL | MODULATION<br>TECHNOLOGY | MODULATION<br>TYPE | DATA<br>RATE<br>(Mbps) |
|--------------------------|------------------|---------------------|----------------------|-------------------|--------------------------|--------------------|------------------------|
| A                        | 802.11a          | 5180-5240           | 36 to 48             | 36, 40, 48        | OFDM                     | BPSK               | 6.0                    |
| A                        | 802.11n (20MHz)  |                     | 36 to 48             | 36, 40, 48        | OFDM                     | BPSK               | MCS0                   |
| A                        | 802.11n (40MHz)  |                     | 38 to 46             | 38, 46            | OFDM                     | BPSK               | MCS0                   |
| A                        | 802.11ac (80MHz) |                     | 42                   | 42                | OFDM                     | BPSK               | V0                     |
| A                        | 802.11a          | 5725-5825           | 149 to 165           | 149, 157, 165     | OFDM                     | BPSK               | 6.0                    |
| A                        | 802.11n (20MHz)  |                     | 149 to 165           | 149, 157, 165     | OFDM                     | BPSK               | MCS0                   |
| A                        | 802.11n (40MHz)  |                     | 151 to 159           | 151, 159          | OFDM                     | BPSK               | MCS0                   |
| A                        | 802.11ac (80MHz) |                     | 155                  | 155               | OFDM                     | BPSK               | V0                     |

### RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT<br>CONFIGURE<br>MODE | MODE            | FREQ. BAND<br>(MHz) | AVAILABLE<br>CHANNEL | TESTED<br>CHANNEL | MODULATION<br>TECHNOLOGY | MODULATION<br>TYPE | DATA<br>RATE<br>(Mbps) |
|--------------------------|-----------------|---------------------|----------------------|-------------------|--------------------------|--------------------|------------------------|
| A                        | 802.11n (40MHz) | 5180-5240           | 38 to 46             | 38                | OFDM                     | BPSK               | MCS0                   |

**POWER LINE CONDUCTED EMISSION TEST:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | MODE            | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| A                  | 802.11n (40MHz) | 5180-5240        | 38 to 46          | 38             | OFDM                  | BPSK            | MCS0             |

**BANDEDGE MEASUREMENT:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | MODE             | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|------------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| A                  | 802.11a          | 5180-5240        | 36 to 48          | 36, 48         | OFDM                  | BPSK            | 6.0              |
| A                  | 802.11n (20MHz)  |                  | 36 to 48          | 36, 48         | OFDM                  | BPSK            | MCS0             |
| A                  | 802.11n (40MHz)  |                  | 38 to 46          | 38, 46         | OFDM                  | BPSK            | MCS0             |
| A                  | 802.11ac (80MHz) |                  | 42                | 42             | OFDM                  | BPSK            | V0               |
| A                  | 802.11a          | 5725-5825        | 149 to 165        | 149, 165       | OFDM                  | BPSK            | 6.0              |
| A                  | 802.11n (20MHz)  |                  | 149 to 165        | 149, 165       | OFDM                  | BPSK            | MCS0             |
| A                  | 802.11n (40MHz)  |                  | 151 to 159        | 151, 159       | OFDM                  | BPSK            | MCS0             |
| A                  | 802.11ac (80MHz) |                  | 155               | 155            | OFDM                  | BPSK            | V0               |

**ANTENNA PORT CONDUCTED MEASUREMENT:**

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | MODE             | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|------------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| B                  | 802.11a          | 5180-5240        | 36 to 48          | 36, 40, 48     | OFDM                  | BPSK            | 6.0              |
| B                  | 802.11n (20MHz)  |                  | 36 to 48          | 36, 40, 48     | OFDM                  | BPSK            | MCS0             |
| B                  | 802.11n (40MHz)  |                  | 38 to 46          | 38, 46         | OFDM                  | BPSK            | MCS0             |
| B                  | 802.11ac (80MHz) |                  | 42                | 42             | OFDM                  | BPSK            | V0               |
| B                  | 802.11a          | 5725-5825        | 149 to 165        | 149, 165       | OFDM                  | BPSK            | 6.0              |
| B                  | 802.11n (20MHz)  |                  | 149 to 165        | 149, 165       | OFDM                  | BPSK            | MCS0             |
| B                  | 802.11n (40MHz)  |                  | 151 to 159        | 151, 159       | OFDM                  | BPSK            | MCS0             |
| B                  | 802.11ac (80MHz) |                  | 155               | 155            | OFDM                  | BPSK            | V0               |

**TEST CONDITION:**

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER         | TESTED BY |
|---------------|--------------------------|---------------------|-----------|
| RE<1G         | 23deg. C, 62%RH          | DC 12V from adaptor | Star Le   |
| RE≥1G         | 23deg. C, 62%RH          | DC 12V from adaptor | Star Le   |
| PLC           | 24deg. C, 61%RH          | DC 12V from adaptor | John Wen  |
| APCM          | 23.5deg. C, 60%RH        | 7.3Vdc from battery | Rain Wang |

## 2.3 DUTY CYCLE OF TEST SIGNAL

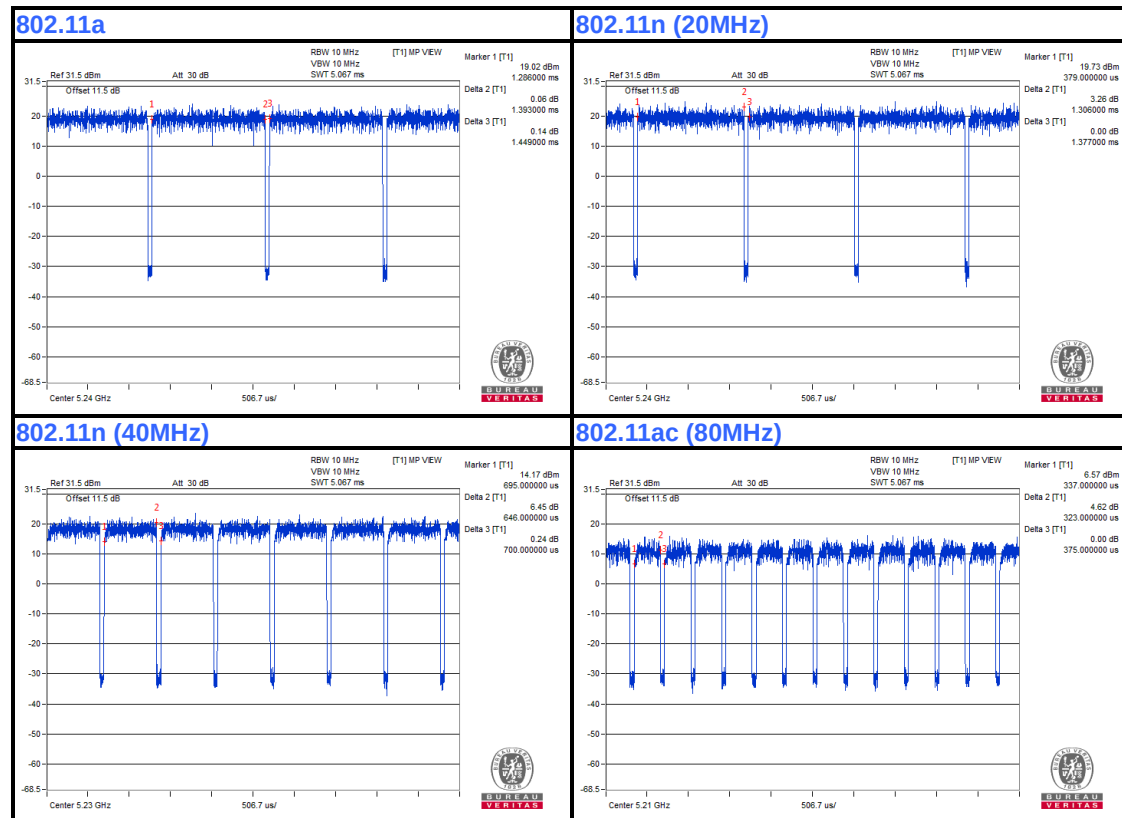
Duty cycle of test signal is < 98%, duty factor shall be considered.

**802.11a:** Duty cycle =  $1.393/1.449 = 0.961$ , Duty factor =  $10 * \log(1/0.961) = 0.17$

**802.11n (20MHz):** Duty cycle =  $1.306 / 1.377 = 0.948$ , Duty factor =  $10 * \log(1/0.948) = 0.23$

**802.11n (40MHz):** Duty cycle =  $0.646/0.700 = 0.923$ , Duty factor =  $10 * \log(1/0.923) = 0.35$

**802.11ac (80MHz):** Duty cycle =  $0.323/0.375 = 0.861$ , Duty factor =  $10 * \log(1/0.861) = 0.65$



## 2.4 DESCRIPTION OF SUPPORT UNITS

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

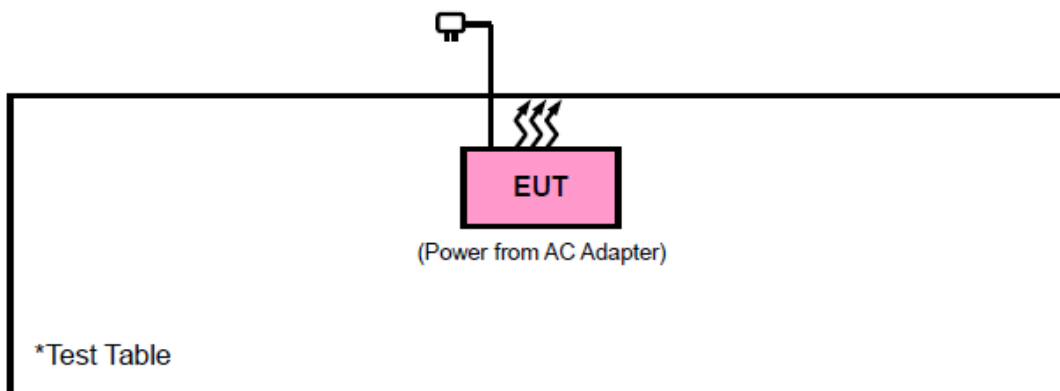
| NO. | PRODUCT   | BRAND    | MODEL NO. | SERIAL NO. | FCC ID |
|-----|-----------|----------|-----------|------------|--------|
| 1   | DC source | LONG WEI | PS-6403D  | 010934269  | N/A    |
| 2   | PC        | HP       | A6608CN   | 3CR83825X3 | N/A    |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|-----------------------------------------------------|
| 1   | DC Line: Unshielded, Detachable 1.0m                |
| 2   | AC Line: Unshielded, Detachable 1.5m                |

### NOTE:

1. All power cords of the above support units are non shielded (1.8m).

### 2.4.1 CONFIGURATION OF SYSTEM UNDER TEST



## 2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart E (15.407)**

**KDB 789033 D02 General U-NII Test Procedures New Rules v02r01**

**ANSI C63.10-2013**

All test items have been performed and recorded as per the above standards.

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (sDoC). The test report has been issued separately.

### 3 TEST TYPES AND RESULTS

#### 3.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

##### 3.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

| FREQUENCIES<br>(MHz) | FIELD STRENGTH<br>(microvolts/meter) | MEASUREMENT DISTANCE<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009 ~ 0.490        | 2400/F(kHz)                          | 300                              |
| 0.490 ~ 1.705        | 24000/F(kHz)                         | 30                               |
| 1.705 ~ 30.0         | 30                                   | 30                               |
| 30 ~ 88              | 100                                  | 3                                |
| 88 ~ 216             | 150                                  | 3                                |
| 216 ~ 960            | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

### 3.1.2 LIMITS OF UNWANTED EMISSION

| RESTRICTED BANDS            | APPLICABLE TO                                                  | LIMIT                         |                                          |
|-----------------------------|----------------------------------------------------------------|-------------------------------|------------------------------------------|
|                             | 789033 D02 General<br>UNII Test Procedures<br>New Rules v01r02 | FIELD STRENGTH AT 3m (dBμV/m) |                                          |
|                             |                                                                | PK : 74                       | AV : 54                                  |
| OUT OF THE RESTRICTED BANDS | APPLICABLE TO                                                  | EIRP LIMIT (dBm/MHz)          | EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m) |
|                             | 15.407(b)(1)                                                   | PK : -27                      | PK : 68.3                                |
|                             | 15.407(b)(2)                                                   |                               |                                          |
|                             | 15.407(b)(3)                                                   |                               |                                          |
|                             | 15.407(b)(4)                                                   | See note 2 (FCC 16-24)        |                                          |

**NOTE:** The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

2. All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.





## 3.1.3 TEST INSTRUMENTS

| Equipment                  | Manufacturer | Model No.                   | Serial No.                  | Last Cal.   | Next Cal.   |
|----------------------------|--------------|-----------------------------|-----------------------------|-------------|-------------|
| 3m Semi-anechoic Chamber   | ETS-LINDGREN | 9m*6m*6m                    | Euroshieldpn-CT0001143-1216 | Feb. 26,19  | Feb. 25,20  |
| Bilog Antenna              | ETS-LINDGREN | 3143B                       | 00161965                    | Feb. 26,19  | Feb. 25,20  |
| Horn Antenna               | ETS-LINDGREN | 3117                        | 00168728                    | Feb. 26,19  | Feb. 25,20  |
| Loop antenna               | Daze         | ZN30900A                    | 0708                        | Oct. 23,18  | Oct. 22, 19 |
| Horn Antenna (18GHz-40GHz) | N/A          | QWH-SL-18-40-K-SG/QMS-00361 | 15433                       | Nov. 21, 18 | Nov. 20, 19 |
| Test Software              | E3           | V 9.160323                  | N/A                         | N/A         | N/A         |
| Test Software              | ADT          | ADT_Radiated_V7.6.15.9.2    | N/A                         | N/A         | N/A         |
| 10dB Attenuator            | JFW/USA      | 50HF-010-SMA                | 1505                        | Jul. 09,18  | Jul. 08,19  |
| MXE EMI Receiver           | KEYSIGHT     | N9038A-544                  | MY54450026                  | Feb. 26,19  | Feb. 25,20  |
| Signal Pre-Amplifier       | EMSI         | EMC 9135                    | 980249                      | Jul. 09,18  | Jul. 08,19  |
| Signal Pre-Amplifier       | EMSI         | EMC 012645B                 | 980257                      | Jul. 09,18  | Jul. 08,19  |
| Signal Pre-Amplifier       | EMSI         | EMC 184045B                 | 980259                      | Jul. 09,18  | Jul. 08,19  |

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 3m Chamber.
3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

### 3.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

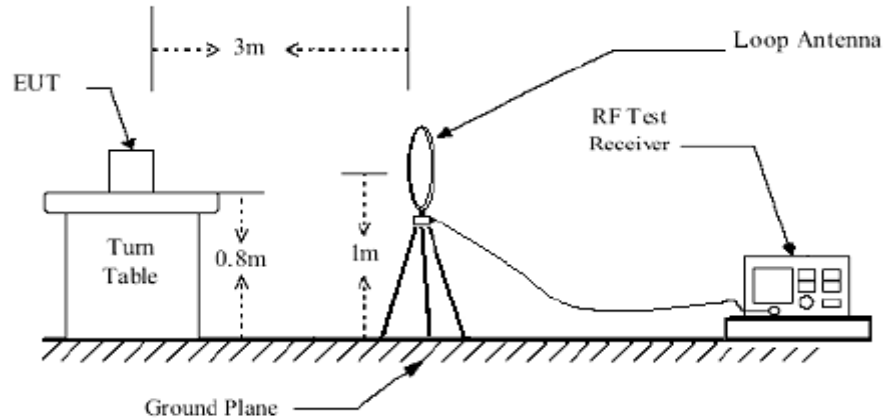
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 3.1.5 DEVIATION FROM TEST STANDARD

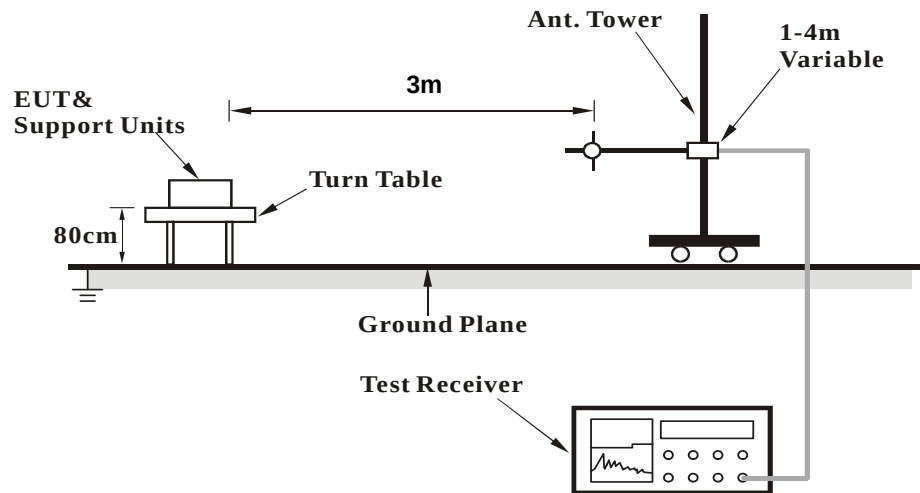
No deviation.

### 3.1.6 TEST SETUP

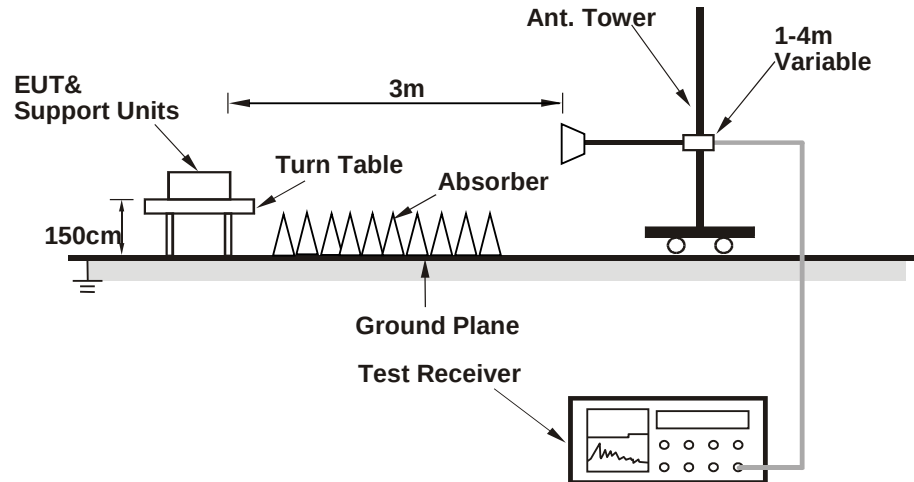
#### < Frequency Range below 30MHz >



#### < Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 3.1.7 EUT OPERATING CONDITION

- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



## 3.1.8 TEST RESULTS

## BELOW 1GHz WORST-CASE DATA:

**9 KHz – 30 MHz data:** the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

**30 MHz – 1GHz data:**

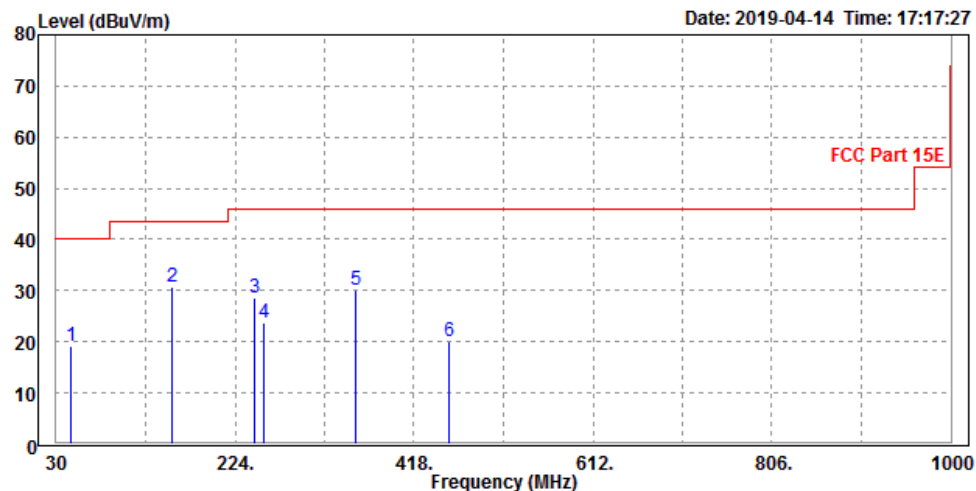
**802.11n (40MHz)**

|                 |               |                   |                 |
|-----------------|---------------|-------------------|-----------------|
| CHANNEL         | TX Channel 38 | DETECTOR FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | 30MHz ~ 1GHz  |                   |                 |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                         |                   |                |             |                        |                 |                    |                     |                      |        |
|-----------------------------------------------------|-------------------------|-------------------|----------------|-------------|------------------------|-----------------|--------------------|---------------------|----------------------|--------|
| FREQ. (MHz)                                         | EMISSION LEVEL (dBuV/m) | READ LEVEL (dBuV) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA FACTOR (dB /m) | CABLE LOSS (dB) | PREAMP FACTOR (dB) | ANTENNA HEIGHT (cm) | TABLE ANGLE (Degree) | REMARK |
| 46.28                                               | 19.06                   | 47.57             | 40             | -20.94      | 7.88                   | 1.03            | 37.42              | 100                 | 360                  | QP     |
| 156.24                                              | 30.73                   | 55.76             | 43.5           | -12.77      | 9.82                   | 1.91            | 36.76              | 100                 | 360                  | QP     |
| 245.31                                              | 28.57                   | 50.49             | 46             | -17.43      | 12.18                  | 2.42            | 36.52              | 100                 | 360                  | QP     |
| 255.65                                              | 23.59                   | 45.16             | 46             | -22.41      | 12.47                  | 2.48            | 36.52              | 100                 | 360                  | QP     |
| 355.21                                              | 30.17                   | 48.51             | 46             | -15.83      | 15.32                  | 2.96            | 36.62              | 100                 | 360                  | QP     |
| 455.63                                              | 19.98                   | 35.64             | 46             | -26.02      | 17.87                  | 3.32            | 36.85              | 100                 | 360                  | QP     |

## REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.





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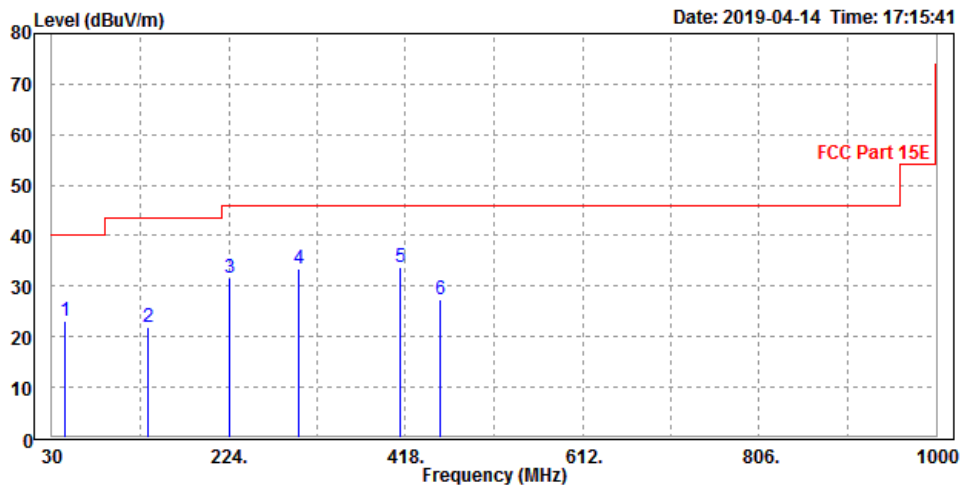
Test Report No.: RF190322W001-2

|                 |              |                   |                 |
|-----------------|--------------|-------------------|-----------------|
| CHANNEL         | Channel 38   | DETECTOR FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | 30MHz ~ 1GHz |                   |                 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|---------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                    | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 45.12                                             | 23.12                         | 51.23                   | 40                | -16.88         | 8.31                         | 1.02                  | 37.44                    | 100                       | 90                         | QP     |
| 135.24                                            | 21.85                         | 49.11                   | 43.5              | -21.65         | 7.81                         | 1.79                  | 36.86                    | 100                       | 90                         | QP     |
| 225.21                                            | 31.71                         | 54.67                   | 46                | -14.29         | 11.26                        | 2.31                  | 36.53                    | 100                       | 90                         | QP     |
| 301.21                                            | 33.42                         | 54.14                   | 46                | -12.58         | 13.05                        | 2.73                  | 36.5                     | 100                       | 90                         | QP     |
| 412.35                                            | 33.91                         | 50.12                   | 46                | -12.09         | 17.35                        | 3.19                  | 36.75                    | 100                       | 90                         | QP     |
| 455.21                                            | 27.49                         | 43.16                   | 46                | -18.51         | 17.86                        | 3.32                  | 36.85                    | 100                       | 90                         | QP     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.





## ABOVE 1GHz WORST-CASE DATA:

**Note:** For higher frequency, the emission is too low to be detected.

## Band 1

## 802.11a

|                 |               |                   |              |
|-----------------|---------------|-------------------|--------------|
| CHANNEL         | TX Channel 36 | DETECTOR FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz  |                   | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.69                         | 51.36                   | 54                | -4.31          | 37.26                        | 7.42                  | 46.35                    | 100                       | 352                        | Average |
| 5150                                                | 58.54                         | 60.21                   | 74                | -15.46         | 37.26                        | 7.42                  | 46.35                    | 100                       | 352                        | Peak    |
| 5180                                                | 104.21                        | 105.86                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 100                       | 352                        | Average |
| 5180                                                | 111.51                        | 113.16                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 100                       | 352                        | Peak    |
| 5350                                                | 49.75                         | 51.24                   | 54                | -4.25          | 37.34                        | 7.47                  | 46.3                     | 100                       | 352                        | Average |
| 5350                                                | 59.05                         | 60.54                   | 74                | -14.95         | 37.34                        | 7.47                  | 46.3                     | 100                       | 352                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 48.45                         | 50.12                   | 54                | -5.55          | 37.26                        | 7.42                  | 46.35                    | 159                       | 175                        | Average |
| 5150                                                | 59.64                         | 61.31                   | 74                | -14.36         | 37.26                        | 7.42                  | 46.35                    | 159                       | 175                        | Peak    |
| 5180                                                | 106.38                        | 108.03                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 159                       | 175                        | Average |
| 5180                                                | 114.32                        | 115.97                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 159                       | 175                        | Peak    |
| 5350                                                | 48.53                         | 50.02                   | 54                | -5.47          | 37.34                        | 7.47                  | 46.3                     | 159                       | 175                        | Average |
| 5350                                                | 59.79                         | 61.28                   | 74                | -14.21         | 37.34                        | 7.47                  | 46.3                     | 159                       | 175                        | Peak    |

## REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5180MHz: Fundamental frequency.



|                 |               |                   |              |
|-----------------|---------------|-------------------|--------------|
| CHANNEL         | TX Channel 40 | DETECTOR FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz  |                   | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.48                         | 51.15                   | 54                | -4.52          | 37.26                        | 7.42                  | 46.35                    | 100                       | 325                        | Average |
| 5150                                                | 58.46                         | 60.13                   | 74                | -15.54         | 37.26                        | 7.42                  | 46.35                    | 100                       | 325                        | Peak    |
| 5200                                                | 100.71                        | 102.34                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 100                       | 325                        | Average |
| 5200                                                | 111.58                        | 113.21                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 100                       | 325                        | Peak    |
| 5350                                                | 48.82                         | 50.31                   | 54                | -5.18          | 37.34                        | 7.47                  | 46.3                     | 100                       | 325                        | Average |
| 5350                                                | 58.18                         | 59.67                   | 74                | -15.82         | 37.34                        | 7.47                  | 46.3                     | 100                       | 325                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 50.22                         | 51.89                   | 54                | -3.78          | 37.26                        | 7.42                  | 46.35                    | 150                       | 185                        | Average |
| 5150                                                | 60.68                         | 62.35                   | 74                | -13.32         | 37.26                        | 7.42                  | 46.35                    | 150                       | 185                        | Peak    |
| 5200                                                | 102.89                        | 104.52                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 150                       | 185                        | Average |
| 5200                                                | 114.49                        | 116.12                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 150                       | 185                        | Peak    |
| 5350                                                | 49.63                         | 51.12                   | 54                | -4.37          | 37.34                        | 7.47                  | 46.3                     | 150                       | 185                        | Average |
| 5350                                                | 58.87                         | 60.36                   | 74                | -15.13         | 37.34                        | 7.47                  | 46.3                     | 150                       | 185                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5200MHz: Fundamental frequency.





|                 |               |                   |              |
|-----------------|---------------|-------------------|--------------|
| CHANNEL         | TX Channel 48 | DETECTOR FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz  |                   | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.59                         | 51.26                   | 54                | -4.41          | 37.26                        | 7.42                  | 46.35                    | 112                       | 315                        | Average |
| 5150                                                | 59.89                         | 61.56                   | 74                | -14.11         | 37.26                        | 7.42                  | 46.35                    | 112                       | 315                        | Peak    |
| 5240                                                | 101.66                        | 103.25                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 112                       | 315                        | Average |
| 5240                                                | 113.09                        | 114.68                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 112                       | 315                        | Peak    |
| 5350                                                | 48.87                         | 50.36                   | 54                | -5.13          | 37.34                        | 7.47                  | 46.3                     | 112                       | 315                        | Average |
| 5350                                                | 60.03                         | 61.52                   | 74                | -13.97         | 37.34                        | 7.47                  | 46.3                     | 112                       | 315                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.71                         | 51.38                   | 54                | -4.29          | 37.26                        | 7.42                  | 46.35                    | 155                       | 336                        | Average |
| 5150                                                | 59.92                         | 61.59                   | 74                | -14.08         | 37.26                        | 7.42                  | 46.35                    | 155                       | 336                        | Peak    |
| 5240                                                | 105.06                        | 106.65                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 155                       | 336                        | Average |
| 5240                                                | 114.99                        | 116.58                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 155                       | 336                        | Peak    |
| 5350                                                | 49.66                         | 51.15                   | 54                | -4.34          | 37.34                        | 7.47                  | 46.3                     | 155                       | 336                        | Average |
| 5350                                                | 59.96                         | 61.45                   | 74                | -14.04         | 37.34                        | 7.47                  | 46.3                     | 155                       | 336                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5240MHz: Fundamental frequency.



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Test Report No.: RF190322W001-2

802.11n (20MHz)

|                        |               |                          |              |
|------------------------|---------------|--------------------------|--------------|
| <b>CHANNEL</b>         | TX Channel 36 | <b>DETECTOR FUNCTION</b> | Peak (PK)    |
| <b>FREQUENCY RANGE</b> | 1GHz ~ 40GHz  |                          | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.95                         | 51.62                   | 54                | -4.05          | 37.26                        | 7.42                  | 46.35                    | 100                       | 316                        | Average |
| 5150                                                | 60.92                         | 62.59                   | 74                | -13.08         | 37.26                        | 7.42                  | 46.35                    | 100                       | 316                        | Peak    |
| 5180                                                | 102.81                        | 104.46                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 100                       | 316                        | Average |
| 5180                                                | 112.25                        | 113.9                   |                   |                | 37.27                        | 7.43                  | 46.35                    | 100                       | 316                        | Peak    |
| 5350                                                | 48.87                         | 50.36                   | 54                | -5.13          | 37.34                        | 7.47                  | 46.3                     | 100                       | 316                        | Average |
| 5350                                                | 60.03                         | 61.52                   | 74                | -13.97         | 37.34                        | 7.47                  | 46.3                     | 100                       | 316                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 50.01                         | 51.68                   | 54                | -3.99          | 37.26                        | 7.42                  | 46.35                    | 155                       | 339                        | Average |
| 5150                                                | 60.87                         | 62.54                   | 74                | -13.13         | 37.26                        | 7.42                  | 46.35                    | 155                       | 339                        | Peak    |
| 5180                                                | 104.84                        | 106.49                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 155                       | 339                        | Average |
| 5180                                                | 113.87                        | 115.52                  |                   |                | 37.27                        | 7.43                  | 46.35                    | 155                       | 339                        | Peak    |
| 5350                                                | 49.72                         | 51.21                   | 54                | -4.28          | 37.34                        | 7.47                  | 46.3                     | 155                       | 339                        | Average |
| 5350                                                | 60.13                         | 61.62                   | 74                | -13.87         | 37.34                        | 7.47                  | 46.3                     | 155                       | 339                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5180MHz: Fundamental frequency.



|                 |               |                   |              |
|-----------------|---------------|-------------------|--------------|
| CHANNEL         | TX Channel 40 | DETECTOR FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz  |                   | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.45                         | 51.12                   | 54                | -4.55          | 37.26                        | 7.42                  | 46.35                    | 100                       | 321                        | Average |
| 5150                                                | 59.56                         | 61.23                   | 74                | -14.44         | 37.26                        | 7.42                  | 46.35                    | 100                       | 321                        | Peak    |
| 5200                                                | 100.93                        | 102.56                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 100                       | 321                        | Average |
| 5200                                                | 111.99                        | 113.62                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 100                       | 321                        | Peak    |
| 5350                                                | 48.87                         | 50.36                   | 54                | -5.13          | 37.34                        | 7.47                  | 46.3                     | 100                       | 321                        | Average |
| 5350                                                | 60.05                         | 61.54                   | 74                | -13.95         | 37.34                        | 7.47                  | 46.3                     | 100                       | 321                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.89                         | 51.56                   | 54                | -4.11          | 37.26                        | 7.42                  | 46.35                    | 145                       | 345                        | Average |
| 5150                                                | 60.31                         | 61.98                   | 74                | -13.69         | 37.26                        | 7.42                  | 46.35                    | 145                       | 345                        | Peak    |
| 5200                                                | 102.89                        | 104.52                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 145                       | 345                        | Average |
| 5200                                                | 114.01                        | 115.64                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 145                       | 345                        | Peak    |
| 5350                                                | 49.74                         | 51.23                   | 54                | -4.26          | 37.34                        | 7.47                  | 46.3                     | 145                       | 345                        | Average |
| 5350                                                | 61.06                         | 62.55                   | 74                | -12.94         | 37.34                        | 7.47                  | 46.3                     | 145                       | 345                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5200MHz: Fundamental frequency.



|                 |               |                   |              |
|-----------------|---------------|-------------------|--------------|
| CHANNEL         | TX Channel 48 | DETECTOR FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz  |                   | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 49.98                         | 51.65                   | 54                | -4.02          | 37.26                        | 7.42                  | 46.35                    | 100                       | 155                        | Average |
| 5150                                                | 59.91                         | 61.58                   | 74                | -14.09         | 37.26                        | 7.42                  | 46.35                    | 100                       | 155                        | Peak    |
| 5240                                                | 100.73                        | 102.32                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 100                       | 155                        | Average |
| 5240                                                | 111.06                        | 112.65                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 100                       | 155                        | Peak    |
| 5350                                                | 49.07                         | 50.56                   | 54                | -4.93          | 37.34                        | 7.47                  | 46.3                     | 100                       | 155                        | Average |
| 5350                                                | 60.9                          | 62.39                   | 74                | -13.1          | 37.34                        | 7.47                  | 46.3                     | 100                       | 155                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 50.46                         | 52.13                   | 54                | -3.54          | 37.26                        | 7.42                  | 46.35                    | 135                       | 316                        | Average |
| 5150                                                | 60.68                         | 62.35                   | 74                | -13.32         | 37.26                        | 7.42                  | 46.35                    | 135                       | 316                        | Peak    |
| 5240                                                | 103.96                        | 105.55                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 135                       | 316                        | Average |
| 5240                                                | 114.93                        | 116.52                  |                   |                | 37.3                         | 7.44                  | 46.33                    | 135                       | 316                        | Peak    |
| 5350                                                | 50.13                         | 51.62                   | 54                | -3.87          | 37.34                        | 7.47                  | 46.3                     | 135                       | 316                        | Average |
| 5350                                                | 59.76                         | 61.25                   | 74                | -14.24         | 37.34                        | 7.47                  | 46.3                     | 135                       | 316                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5240MHz: Fundamental frequency.



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Test Report No.: RF190322W001-2

802.11n (40MHz)

|                        |               |                          |              |
|------------------------|---------------|--------------------------|--------------|
| <b>CHANNEL</b>         | TX Channel 38 | <b>DETECTOR FUNCTION</b> | Peak (PK)    |
| <b>FREQUENCY RANGE</b> | 1GHz ~ 40GHz  |                          | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 50.64                         | 53.62                   | 54                | -3.36          | 35.95                        | 7.42                  | 46.35                    | 100                       | 135                        | Average |
| 5150                                                | 60.6                          | 63.58                   | 74                | -13.4          | 35.95                        | 7.42                  | 46.35                    | 100                       | 135                        | Peak    |
| 5190                                                | 96.75                         | 99.67                   |                   |                | 35.99                        | 7.43                  | 46.34                    | 100                       | 135                        | Average |
| 5190                                                | 103.93                        | 106.85                  |                   |                | 35.99                        | 7.43                  | 46.34                    | 100                       | 135                        | Peak    |
| 5350                                                | 47.45                         | 50.13                   | 54                | -6.55          | 36.15                        | 7.47                  | 46.3                     | 100                       | 135                        | Average |
| 5350                                                | 58.56                         | 61.24                   | 74                | -15.44         | 36.15                        | 7.47                  | 46.3                     | 100                       | 135                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 52.98                         | 54.65                   | 54                | -1.02          | 37.26                        | 7.42                  | 46.35                    | 165                       | 336                        | Average |
| 5150                                                | 62.84                         | 64.51                   | 74                | -11.16         | 37.26                        | 7.42                  | 46.35                    | 165                       | 336                        | Peak    |
| 5190                                                | 99.61                         | 101.24                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 165                       | 336                        | Average |
| 5190                                                | 107.34                        | 108.97                  |                   |                | 37.28                        | 7.43                  | 46.34                    | 165                       | 336                        | Peak    |
| 5350                                                | 48.85                         | 50.34                   | 54                | -5.15          | 37.34                        | 7.47                  | 46.3                     | 165                       | 336                        | Average |
| 5350                                                | 59.74                         | 61.23                   | 74                | -14.26         | 37.34                        | 7.47                  | 46.3                     | 165                       | 336                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5190MHz: Fundamental frequency.



|                 |               |                   |              |
|-----------------|---------------|-------------------|--------------|
| CHANNEL         | TX Channel 46 | DETECTOR FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz  |                   | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 50.55                         | 52.22                   | 54                | -3.45          | 37.26                        | 7.42                  | 46.35                    | 105                       | 320                        | Average |
| 5150                                                | 64.51                         | 66.18                   | 74                | -9.49          | 37.26                        | 7.42                  | 46.35                    | 105                       | 320                        | Peak    |
| 5230                                                | 98.63                         | 100.23                  |                   |                | 37.29                        | 7.44                  | 46.33                    | 105                       | 320                        | Average |
| 5230                                                | 108.05                        | 109.65                  |                   |                | 37.29                        | 7.44                  | 46.33                    | 105                       | 320                        | Peak    |
| 5350                                                | 51.15                         | 52.64                   | 54                | -2.85          | 37.34                        | 7.47                  | 46.3                     | 105                       | 320                        | Average |
| 5350                                                | 63.85                         | 65.34                   | 74                | -10.15         | 37.34                        | 7.47                  | 46.3                     | 105                       | 320                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 52.88                         | 54.55                   | 54                | -1.12          | 37.26                        | 7.42                  | 46.35                    | 100                       | 127                        | Average |
| 5150                                                | 63.4                          | 65.07                   | 74                | -10.6          | 37.26                        | 7.42                  | 46.35                    | 100                       | 127                        | Peak    |
| 5230                                                | 103.65                        | 105.25                  |                   |                | 37.29                        | 7.44                  | 46.33                    | 100                       | 127                        | Average |
| 5230                                                | 110.26                        | 111.86                  |                   |                | 37.29                        | 7.44                  | 46.33                    | 100                       | 127                        | Peak    |
| 5350                                                | 52.87                         | 54.36                   | 54                | -1.13          | 37.34                        | 7.47                  | 46.3                     | 100                       | 127                        | Average |
| 5350                                                | 64.29                         | 65.78                   | 74                | -9.71          | 37.34                        | 7.47                  | 46.3                     | 100                       | 127                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5230MHz: Fundamental frequency.



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Test Report No.: RF190322W001-2

802.11ac (80MHz)

|                        |               |                          |              |
|------------------------|---------------|--------------------------|--------------|
| <b>CHANNEL</b>         | TX Channel 42 | <b>DETECTOR FUNCTION</b> | Peak (PK)    |
| <b>FREQUENCY RANGE</b> | 1GHz ~ 40GHz  |                          | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 50.04                         | 53.02                   | 54                | -3.96          | 35.95                        | 7.42                  | 46.35                    | 155                       | 312                        | Average |
| 5150                                                | 61.17                         | 64.15                   | 74                | -12.83         | 35.95                        | 7.42                  | 46.35                    | 155                       | 312                        | Peak    |
| 5210                                                | 96.35                         | 99.24                   |                   |                | 36.01                        | 7.44                  | 46.34                    | 155                       | 312                        | Average |
| 5210                                                | 104.23                        | 107.12                  |                   |                | 36.01                        | 7.44                  | 46.34                    | 155                       | 312                        | Peak    |
| 5350                                                | 49.43                         | 52.11                   | 54                | -4.57          | 36.15                        | 7.47                  | 46.3                     | 155                       | 312                        | Average |
| 5350                                                | 50.8                          | 53.48                   | 74                | -23.2          | 36.15                        | 7.47                  | 46.3                     | 155                       | 312                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5150                                                | 52.84                         | 54.51                   | 54                | -1.16          | 37.26                        | 7.42                  | 46.35                    | 100                       | 135                        | Average |
| 5150                                                | 63.22                         | 64.89                   | 74                | -10.78         | 37.26                        | 7.42                  | 46.35                    | 100                       | 135                        | Peak    |
| 5210                                                | 99.62                         | 101.24                  |                   |                | 37.28                        | 7.44                  | 46.34                    | 100                       | 135                        | Average |
| 5210                                                | 106.91                        | 108.53                  |                   |                | 37.28                        | 7.44                  | 46.34                    | 100                       | 135                        | Peak    |
| 5350                                                | 50.4                          | 51.89                   | 54                | -3.6           | 37.34                        | 7.47                  | 46.3                     | 100                       | 135                        | Average |
| 5350                                                | 61.19                         | 62.68                   | 74                | -12.81         | 37.34                        | 7.47                  | 46.3                     | 100                       | 135                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5210MHz: Fundamental frequency.



## Band 4

## 802.11a

|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 149 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5745                                                | 98.71                         | 99.59                   |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 311                        | Average |
| 5745                                                | 109.33                        | 110.21                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 311                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5745                                                | 103.65                        | 104.53                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 125                        | Average |
| 5745                                                | 111.57                        | 112.45                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 125                        | Peak    |

## REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5745MHz: Fundamental frequency.





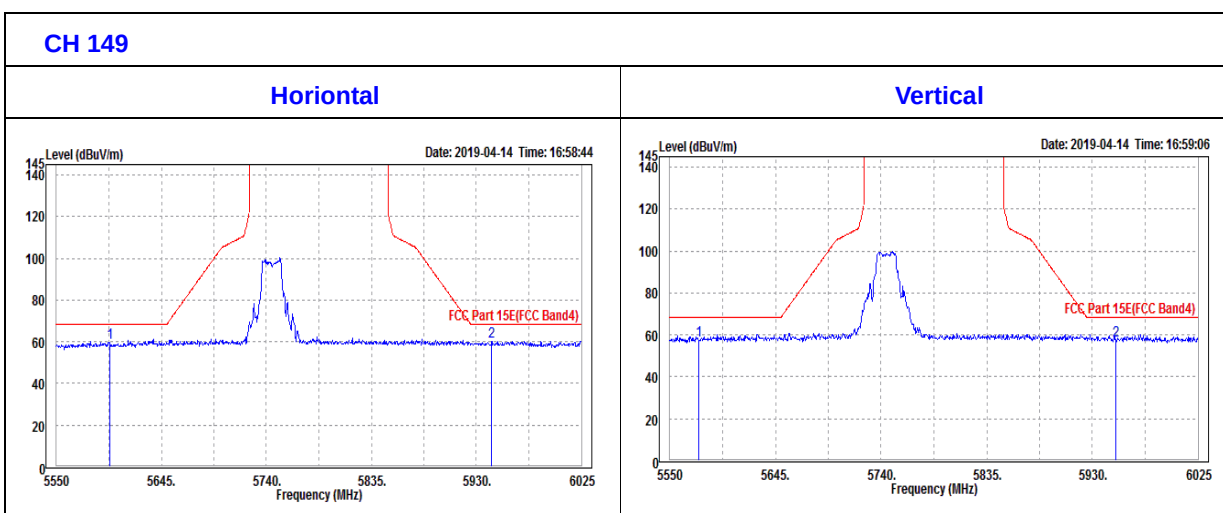
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Test Report No.: RF190322W001-2

## OOBE DATA

### 802.11a

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5597.98                                             | 59.8                          | 60.96                   | 68.3              | -8.5           | 37.46                        | 7.6                   | 46.22                    | 200                       | 360                        | Peak   |
| 5943.78                                             | 60.29                         | 60.8                    | 68.3              | -8.01          | 37.67                        | 7.95                  | 46.13                    | 200                       | 360                        | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5575.65                                             | 57.21                         | 58.41                   | 68.3              | -11.09         | 37.45                        | 7.58                  | 46.23                    | 100                       | 360                        | Peak   |
| 5950.9                                              | 57.57                         | 58.06                   | 68.3              | -10.73         | 37.67                        | 7.96                  | 46.12                    | 100                       | 360                        | Peak   |





|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 157 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5785                                                | 101.24                        | 102.05                  |                   |                | 37.57                        | 7.79                  | 46.17                    | 100                       | 172                        | Average |
| 5785                                                | 109.44                        | 110.25                  |                   |                | 37.57                        | 7.79                  | 46.17                    | 100                       | 172                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5785                                                | 100.75                        | 102.46                  |                   |                | 36.67                        | 7.79                  | 46.17                    | 152                       | 323                        | Average |
| 5785                                                | 110.53                        | 112.24                  |                   |                | 36.67                        | 7.79                  | 46.17                    | 152                       | 323                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5785MHz: Fundamental frequency.



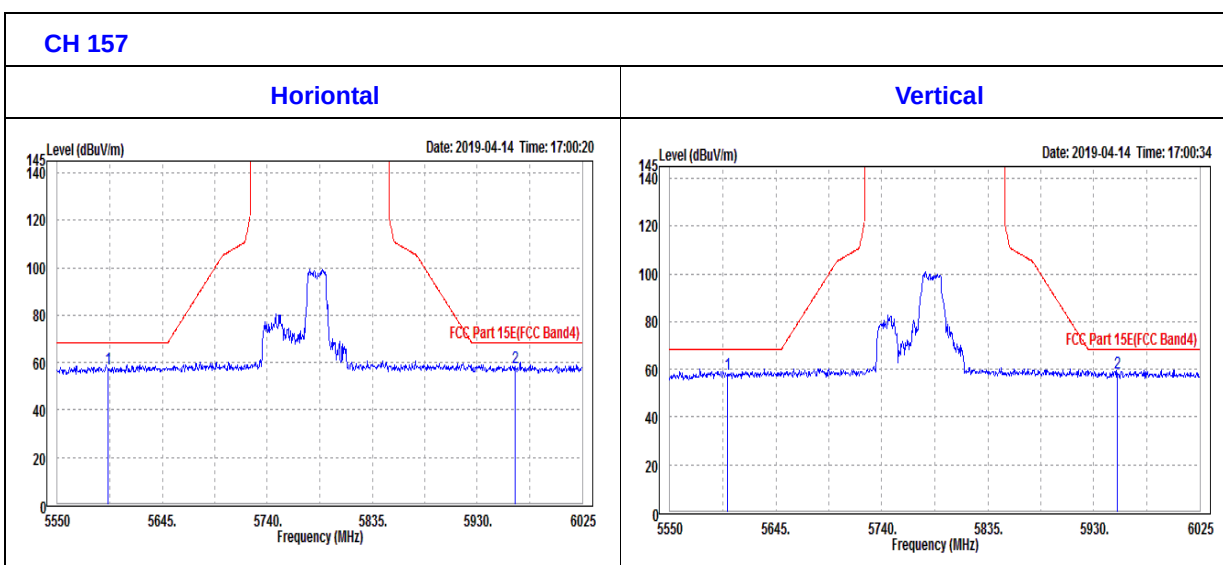
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Test Report No.: RF190322W001-2

## OOBE DATA

### 802.11a

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5596.08                                             | 57.55                         | 58.71                   | 68.3              | -10.75         | 37.46                        | 7.6                   | 46.22                    | 100                       | 360                        | Peak   |
| 5964.68                                             | 58.03                         | 58.5                    | 68.3              | -10.27         | 37.68                        | 7.97                  | 46.12                    | 100                       | 360                        | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5601.78                                             | 57.62                         | 58.78                   | 68.3              | -10.68         | 37.46                        | 7.6                   | 46.22                    | 100                       | 0                          | Peak   |
| 5951.38                                             | 58.25                         | 58.74                   | 68.3              | -10.05         | 37.67                        | 7.96                  | 46.12                    | 100                       | 0                          | Peak   |





|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 165 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5825                                                | 100.59                        | 101.32                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 100                       | 305                        | Average |
| 5825                                                | 109.84                        | 110.57                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 100                       | 305                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5825                                                | 103.85                        | 104.58                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 104                       | 68                         | Average |
| 5825                                                | 112.02                        | 112.75                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 104                       | 68                         | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5825MHz: Fundamental frequency.



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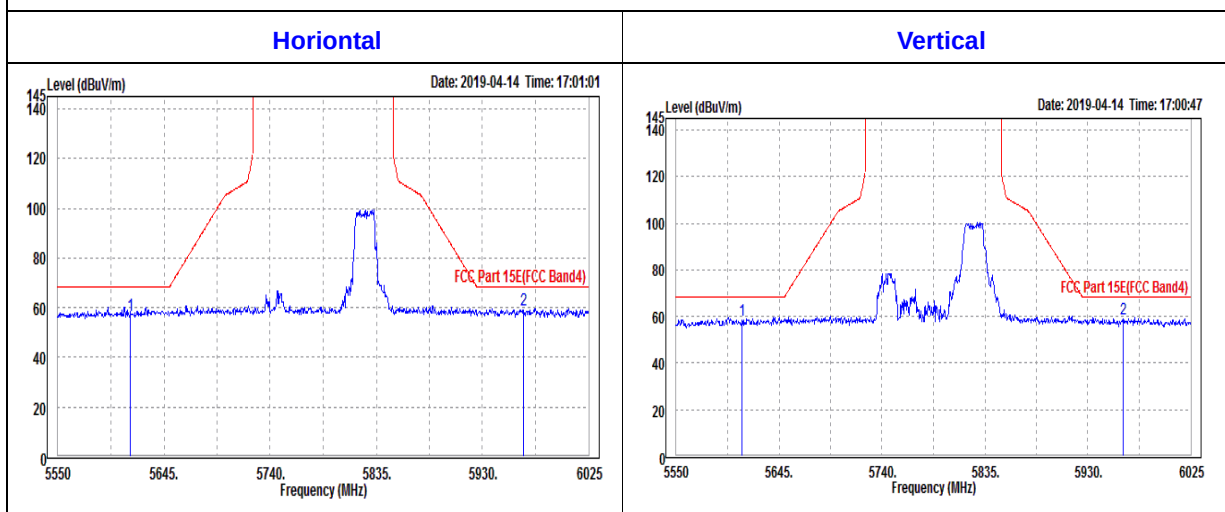
Test Report No.: RF190322W001-2

## OOBE DATA

### 802.11a

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5614.6                                              | 56.97                         | 58.1                    | 68.3              | -11.33         | 37.47                        | 7.62                  | 46.22                    | 100                       | 0                          | Peak   |
| 5967.05                                             | 58.92                         | 59.38                   | 68.3              | -9.38          | 37.68                        | 7.98                  | 46.12                    | 100                       | 0                          | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5610.8                                              | 58.27                         | 59.41                   | 68.3              | -10.03         | 37.47                        | 7.61                  | 46.22                    | 100                       | 360                        | Peak   |
| 5962.78                                             | 59.22                         | 59.69                   | 68.3              | -9.08          | 37.68                        | 7.97                  | 46.12                    | 100                       | 360                        | Peak   |

## CH 165





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Test Report No.: RF190322W001-2

802.11n (20MHz)

|                        |                |                              |              |
|------------------------|----------------|------------------------------|--------------|
| <b>CHANNEL</b>         | TX Channel 149 | <b>DETECTOR<br/>FUNCTION</b> | Peak (PK)    |
| <b>FREQUENCY RANGE</b> | 1GHz ~ 40GHz   |                              | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5745                                                | 100.66                        | 101.54                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 342                        | Average |
| 5745                                                | 110.53                        | 111.41                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 342                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5745                                                | 102.25                        | 103.13                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 23                         | Average |
| 5745                                                | 111.79                        | 112.67                  |                   |                | 37.55                        | 7.75                  | 46.18                    | 100                       | 23                         | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5745MHz: Fundamental frequency.



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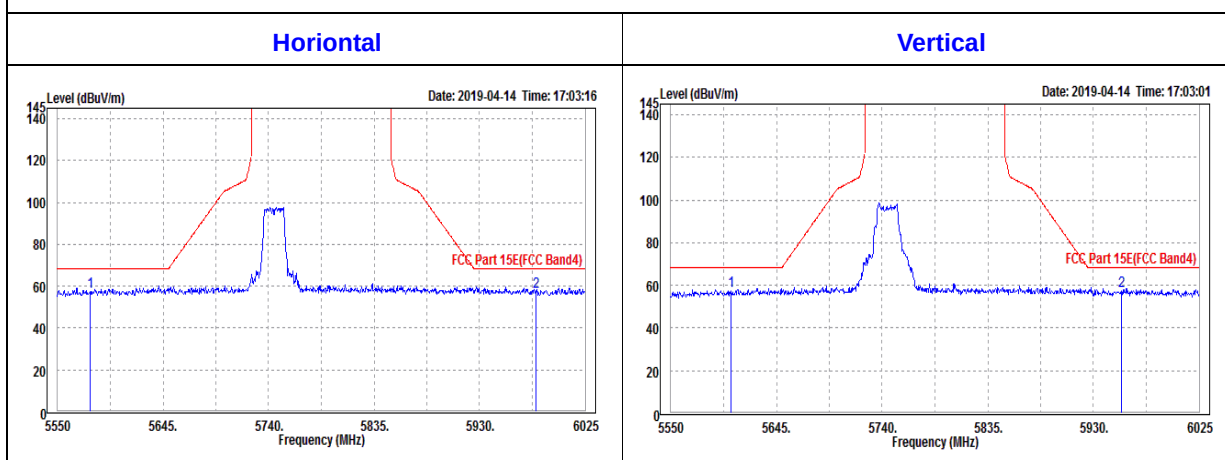
Test Report No.: RF190322W001-2

## OOBE DATA

802.11n (20MHZ)

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5578.98                                             | 57.25                         | 58.45                   | 68.3              | -11.05         | 37.45                        | 7.58                  | 46.23                    | 100                       | 0                          | Peak   |
| 5980.83                                             | 57.36                         | 57.8                    | 68.3              | -10.94         | 37.69                        | 7.99                  | 46.12                    | 100                       | 0                          | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5604.15                                             | 57.08                         | 59.13                   | 68.3              | -11.22         | 36.56                        | 7.61                  | 46.22                    | 100                       | 360                        | Peak   |
| 5955.18                                             | 57.15                         | 58.54                   | 68.3              | -11.15         | 36.77                        | 7.96                  | 46.12                    | 100                       | 360                        | Peak   |

## CH 149





|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 157 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5785                                                | 99.05                         | 99.86                   |                   |                | 37.57                        | 7.79                  | 46.17                    | 100                       | 177                        | Average |
| 5785                                                | 111.61                        | 112.42                  |                   |                | 37.57                        | 7.79                  | 46.17                    | 100                       | 177                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5785                                                | 100.64                        | 102.35                  |                   |                | 36.67                        | 7.79                  | 46.17                    | 148                       | 315                        | Average |
| 5785                                                | 111.91                        | 113.62                  |                   |                | 36.67                        | 7.79                  | 46.17                    | 148                       | 315                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5785MHz: Fundamental frequency.





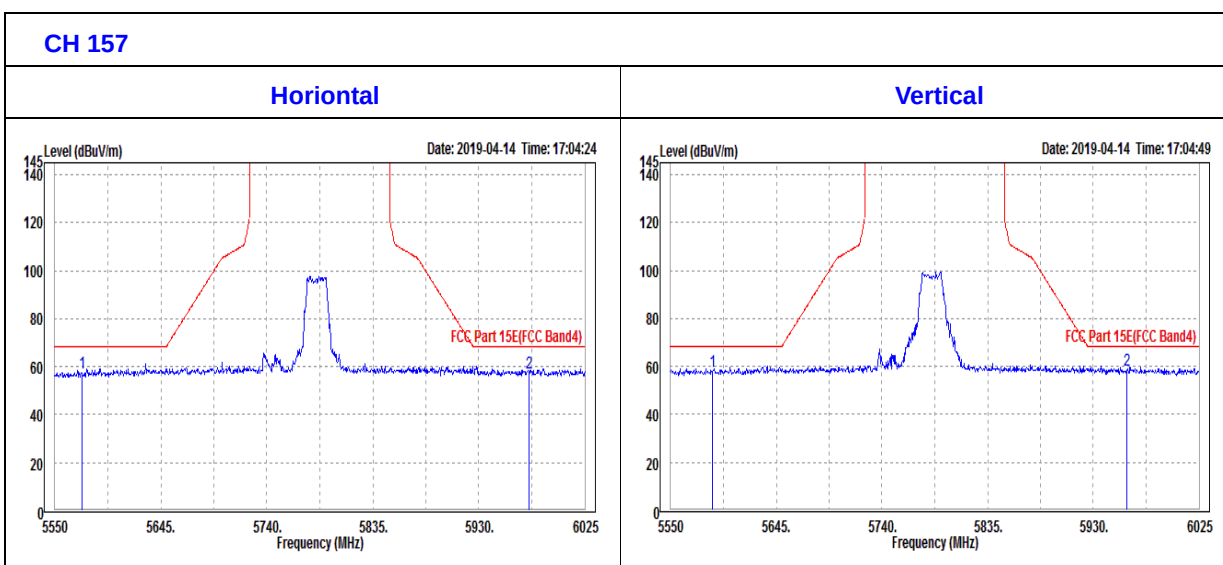
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VERITAS**

Test Report No.: RF190322W001-2

## OOBE DATA

802.11n (20MHZ)

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5574.23                                             | 57.3                          | 58.51                   | 68.3              | -11            | 37.44                        | 7.58                  | 46.23                    | 100                       | 0                          | Peak   |
| 5975.13                                             | 57.27                         | 57.72                   | 68.3              | -11.03         | 37.69                        | 7.98                  | 46.12                    | 100                       | 0                          | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5587.53                                             | 57.9                          | 59.09                   | 68.3              | -10.4          | 37.45                        | 7.59                  | 46.23                    | 100                       | 360                        | Peak   |
| 5959.93                                             | 58.33                         | 58.8                    | 68.3              | -9.97          | 37.68                        | 7.97                  | 46.12                    | 100                       | 360                        | Peak   |





|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 165 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5825                                                | 101.72                        | 102.45                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 100                       | 304                        | Average |
| 5825                                                | 110.39                        | 111.12                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 100                       | 304                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5825                                                | 103.63                        | 104.36                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 108                       | 79                         | Average |
| 5825                                                | 112.84                        | 113.57                  |                   |                | 37.6                         | 7.83                  | 46.16                    | 108                       | 79                         | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5825MHz: Fundamental frequency.



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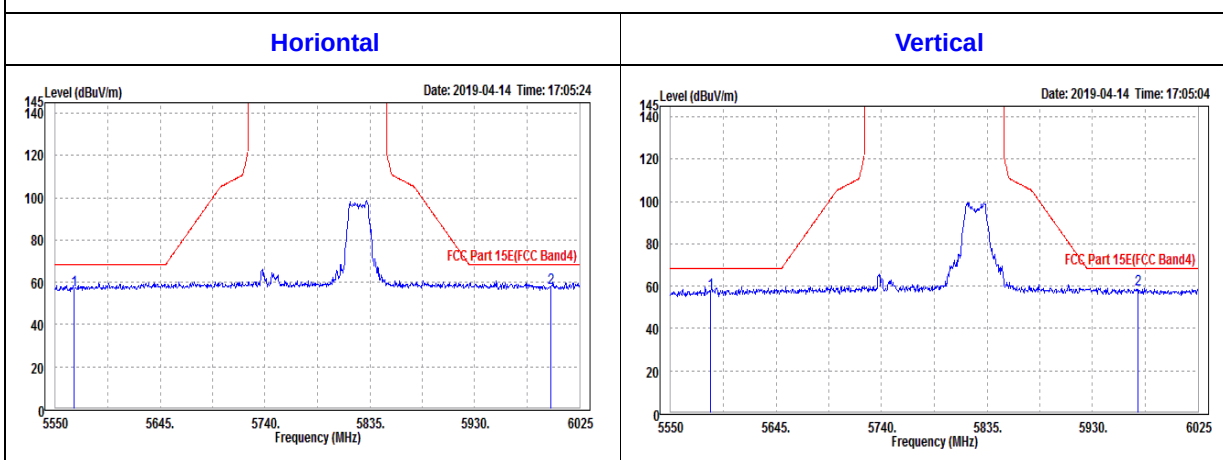
Test Report No.: RF190322W001-2

## OOBE DATA

802.11n (20MHZ)

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5566.63                                             | 56.31                         | 57.53                   | 68.3              | -11.99         | 37.44                        | 7.57                  | 46.23                    | 100                       | 360                        | Peak   |
| 5998.88                                             | 57.49                         | 57.89                   | 68.3              | -10.81         | 37.7                         | 8.01                  | 46.11                    | 100                       | 360                        | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5586.1                                              | 56.91                         | 58.1                    | 68.3              | -11.39         | 37.45                        | 7.59                  | 46.23                    | 100                       | 0                          | Peak   |
| 5970.85                                             | 58.55                         | 59.01                   | 68.3              | -9.75          | 37.68                        | 7.98                  | 46.12                    | 100                       | 0                          | Peak   |

## CH 165





## 802.11n (40MHz)

|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 151 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5755                                                | 103.39                        | 104.26                  |                   |                | 37.55                        | 7.76                  | 46.18                    | 100                       | 309                        | Average |
| 5755                                                | 113.34                        | 114.21                  |                   |                | 37.55                        | 7.76                  | 46.18                    | 100                       | 309                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5755                                                | 103.65                        | 105.42                  |                   |                | 36.65                        | 7.76                  | 46.18                    | 183                       | 321                        | Average |
| 5755                                                | 113.9                         | 115.67                  |                   |                | 36.65                        | 7.76                  | 46.18                    | 183                       | 321                        | Peak    |

## REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5755MHz: Fundamental frequency.



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VERITAS**

Test Report No.: RF190322W001-2

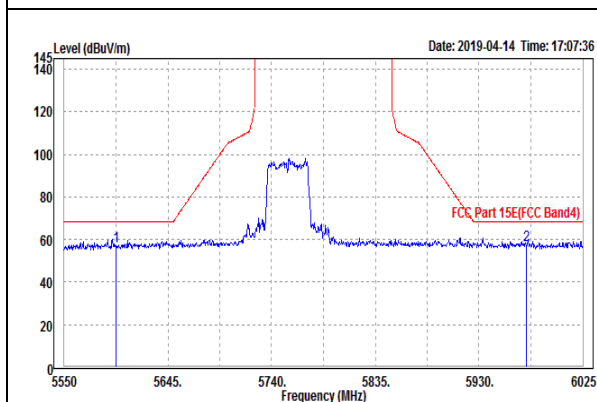
## Oobe Data

802.11n (40MHz)

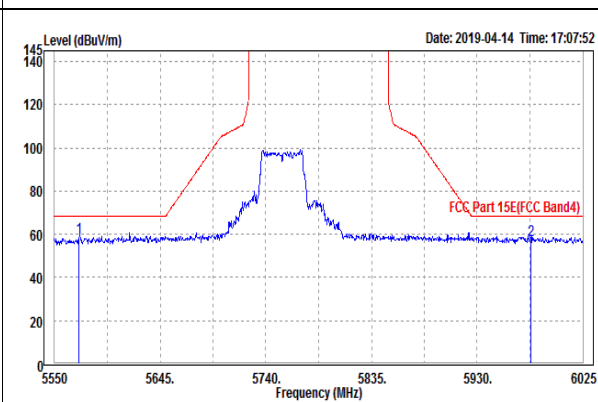
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5597.5                                              | 56.62                         | 57.78                   | 68.3              | -11.68         | 37.46                        | 7.6                   | 46.22                    | 100                       | 0                          | 5597.5  |
| 5973.23                                             | 57.24                         | 57.7                    | 68.3              | -11.06         | 37.68                        | 7.98                  | 46.12                    | 100                       | 0                          | 5973.23 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5571.85                                             | 58.67                         | 59.89                   | 68.3              | -9.63          | 37.44                        | 7.57                  | 46.23                    | 100                       | 360                        | Peak    |
| 5978.45                                             | 57.48                         | 57.92                   | 68.3              | -10.82         | 37.69                        | 7.99                  | 46.12                    | 100                       | 360                        | Peak    |

## CH 151

### Horizontal



### Vertical





|                 |                |                      |              |
|-----------------|----------------|----------------------|--------------|
| CHANNEL         | TX Channel 159 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 40GHz   |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5795                                                | 103.73                        | 104.52                  |                   |                | 37.58                        | 7.8                   | 46.17                    | 100                       | 308                        | Average |
| 5795                                                | 113.83                        | 114.62                  |                   |                | 37.58                        | 7.8                   | 46.17                    | 100                       | 308                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5795                                                | 104.45                        | 105.24                  |                   |                | 37.58                        | 7.8                   | 46.17                    | 175                       | 321                        | Average |
| 5795                                                | 114.8                         | 115.59                  |                   |                | 37.58                        | 7.8                   | 46.17                    | 175                       | 321                        | Peak    |

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5795MHz: Fundamental frequency.



**BUREAU  
VERITAS**

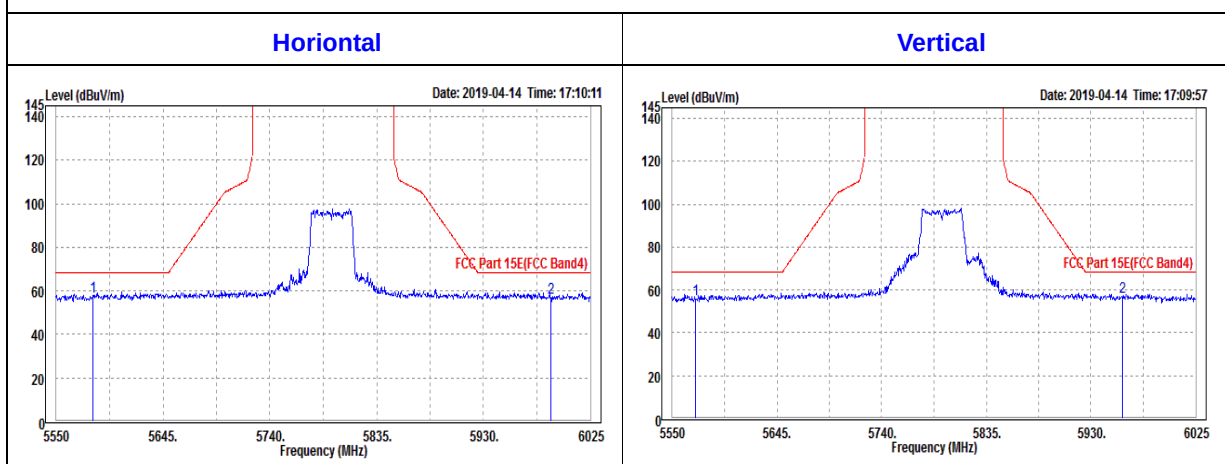
Test Report No.: RF190322W001-2

## OOBE DATA

802.11n (40MHZ)

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5582.3                                              | 57.09                         | 58.29                   | 68.3              | -11.21         | 37.45                        | 7.58                  | 46.23                    | 100                       | 360                        | Peak   |
| 5989.85                                             | 56.88                         | 57.3                    | 68.3              | -11.42         | 37.69                        | 8                     | 46.11                    | 100                       | 360                        | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5570.9                                              | 55.5                          | 57.62                   | 68.3              | -12.8          | 36.54                        | 7.57                  | 46.23                    | 100                       | 0                          | Peak   |
| 5958.5                                              | 57.01                         | 58.38                   | 68.3              | -11.29         | 36.78                        | 7.97                  | 46.12                    | 100                       | 0                          | Peak   |

## CH 159





**BUREAU  
VERITAS**

Test Report No.: RF190322W001-2

**802.11ac (80MHz)**

|                        |                |                              |              |
|------------------------|----------------|------------------------------|--------------|
| <b>CHANNEL</b>         | TX Channel 155 | <b>DETECTOR<br/>FUNCTION</b> | Peak (PK)    |
| <b>FREQUENCY RANGE</b> | 1GHz ~ 40GHz   |                              | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|---------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5775                                                | 103.53                        | 104.35                  |                   |                | 37.57                        | 7.78                  | 46.17                    | 100                       | 308                        | Average |
| 5775                                                | 113.43                        | 114.25                  |                   |                | 37.57                        | 7.78                  | 46.17                    | 100                       | 308                        | Peak    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |         |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK  |
| 5775                                                | 103.96                        | 105.68                  |                   |                | 36.67                        | 7.78                  | 46.17                    | 162                       | 323                        | Average |
| 5775                                                | 113.48                        | 115.2                   |                   |                | 36.67                        | 7.78                  | 46.17                    | 162                       | 323                        | Peak    |

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5775MHz: Fundamental frequency.





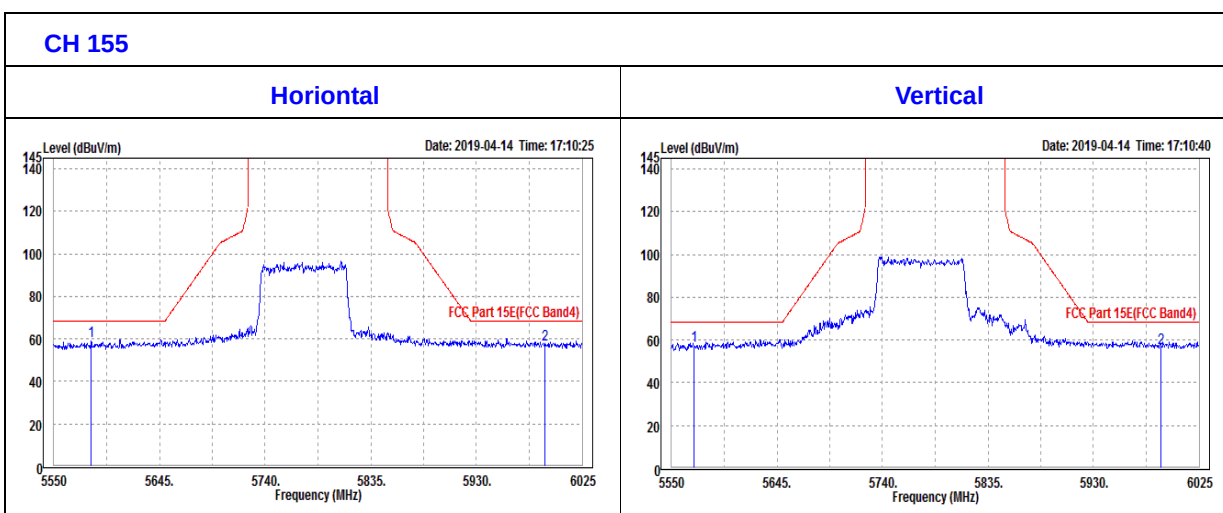
**BUREAU  
VERITAS**

Test Report No.: RF190322W001-2

## OOBE DATA

802.11ac (80MHZ)

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
|-----------------------------------------------------|-------------------------------|-------------------------|-------------------|----------------|------------------------------|-----------------------|--------------------------|---------------------------|----------------------------|--------|
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5583.73                                             | 59.26                         | 60.45                   | 68.3              | -9.04          | 37.45                        | 7.59                  | 46.23                    | 100                       | 0                          | Peak   |
| 5991.75                                             | 57.16                         | 57.57                   | 68.3              | -11.14         | 37.7                         | 8                     | 46.11                    | 100                       | 0                          | Peak   |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                               |                         |                   |                |                              |                       |                          |                           |                            |        |
| FREQ.<br>(MHz)                                      | EMISSION<br>LEVEL<br>(dBuV/m) | READ<br>LEVEL<br>(dBuV) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>FACTOR<br>(dB /m) | CABLE<br>LOSS<br>(dB) | PREAMP<br>FACTOR<br>(dB) | ANTENNA<br>HEIGHT<br>(cm) | TABLE<br>ANGLE<br>(Degree) | REMARK |
| 5570.43                                             | 57.45                         | 58.67                   | 68.3              | -10.85         | 37.44                        | 7.57                  | 46.23                    | 100                       | 360                        | Peak   |
| 5990.8                                              | 56.45                         | 56.87                   | 68.3              | -11.85         | 37.69                        | 8                     | 46.11                    | 100                       | 360                        | Peak   |



## 3.2 CONDUCTED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB $\mu$ V) |          |
|-----------------------------|------------------------------|----------|
|                             | Quasi-peak                   | Average  |
| 0.15 ~ 0.5                  | 66 to 56                     | 56 to 46 |
| 0.5 ~ 5                     | 56                           | 46       |
| 5 ~ 30                      | 60                           | 50       |

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 3.2.2 TEST INSTRUMENTS

| Equipment           | Manufacturer  | Model No. | Serial No. | Last Cal.  | Next Cal.   |
|---------------------|---------------|-----------|------------|------------|-------------|
| EMI Test Receiver   | Rohde&Schwarz | ESR3      | 101900     | Feb. 26,19 | Feb. 25, 20 |
| EMC32 test software | Rohde&Schwarz | EMC32     | NA         | NA         | NA          |
| LISN network        | Rohde&Schwarz | ENV216    | 101922     | Feb. 26,19 | Feb. 25, 20 |

- NOTE:**
1. The test was performed in CE shielded room.
  2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

### 3.2.3 TEST PROCEDURES

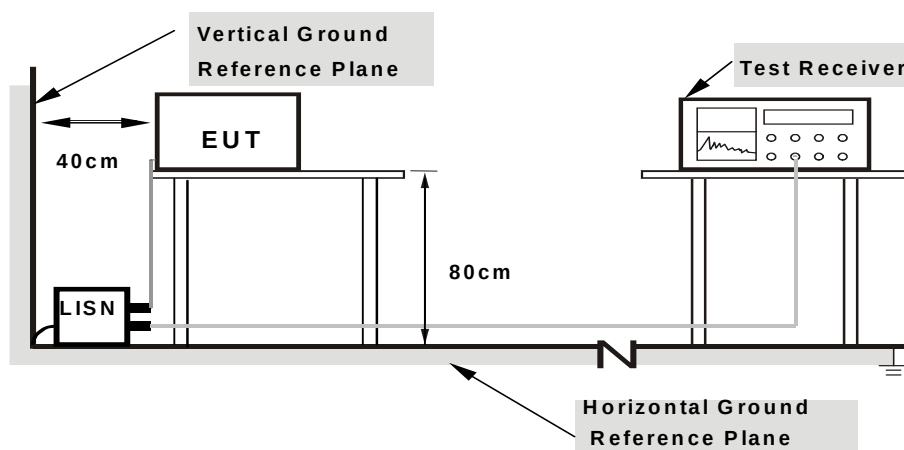
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

### 3.2.5 TEST SETUP



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 3.2.6 EUT OPERATING CONDITIONS

Same as 3.1.6.



## 3.2.7 TEST RESULTS

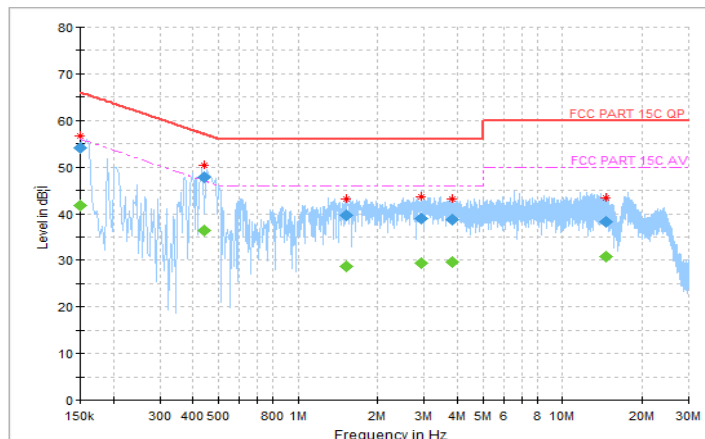
## CONDUCTED WORST-CASE DATA :

|                 |                |                                          |                                       |
|-----------------|----------------|------------------------------------------|---------------------------------------|
| Frequency Range | 150KHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9 kHz |
| Input Power     | 120Vac, 60Hz   | Environmental Conditions                 | 24deg. C, 55RH                        |
| Tested By       | John Wen       | TEST DATE                                | 2019/03/27                            |

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB)  | Line     | Filter    | Corr. (dB)  |
|-----------------|------------------|-----------------|--------------|--------------|----------|-----------|-------------|
| 0.150000        | 54.08            | ---             | 66.00        | -11.92       | L        | ON        | 9.9         |
| 0.150000        | ---              | 41.67           | 56.00        | -14.33       | L        | ON        | 9.9         |
| <b>0.444000</b> | <b>47.91</b>     | ---             | <b>56.99</b> | <b>-9.08</b> | <b>L</b> | <b>ON</b> | <b>10.0</b> |
| 0.444000        | ---              | 36.35           | 46.99        | -10.64       | L        | ON        | 10.0        |
| 1.520000        | 39.76            | ---             | 56.00        | -16.24       | L        | ON        | 10.1        |
| 1.520000        | ---              | 28.68           | 46.00        | -17.32       | L        | ON        | 10.1        |
| 2.908000        | 38.89            | ---             | 56.00        | -17.11       | L        | ON        | 10.2        |
| 2.908000        | ---              | 29.36           | 46.00        | -16.64       | L        | ON        | 10.2        |
| 3.816000        | 38.72            | ---             | 56.00        | -17.28       | L        | ON        | 10.2        |
| 3.816000        | ---              | 29.69           | 46.00        | -16.31       | L        | ON        | 10.2        |
| 14.652000       | ---              | 30.84           | 50.00        | -19.16       | L        | ON        | 10.5        |
| 14.652000       | 38.17            | ---             | 60.00        | -21.83       | L        | ON        | 10.5        |

- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. Correction factor = Insertion loss + Cable loss  
6. Emission Level = Correction Factor + Reading Value.

Full Spectrum

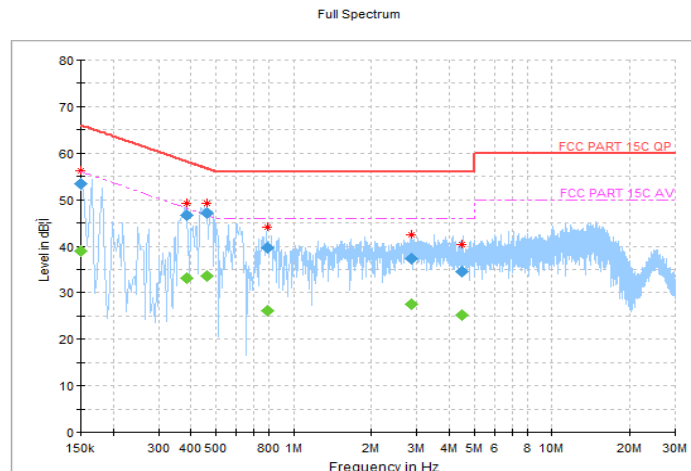




|                 |                |                                          |                                       |
|-----------------|----------------|------------------------------------------|---------------------------------------|
| Frequency Range | 150KHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9 kHz |
| Input Power     | 120Vac, 60Hz   | Environmental Conditions                 | 24deg. C, 55RH                        |
| Tested By       | John Wen       | TEST DATE                                | 2019/03/27                            |

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|------|--------|------------|
| 0.150000        | ---              | 38.99           | 56.00        | -17.01      | N    | ON     | 9.9        |
| 0.150000        | 53.52            | ---             | 66.00        | -12.48      | N    | ON     | 9.9        |
| 0.384000        | ---              | 33.16           | 48.19        | -15.03      | N    | ON     | 9.9        |
| 0.384000        | 46.69            | ---             | 58.19        | -11.50      | N    | ON     | 9.9        |
| 0.460000        | ---              | 33.62           | 46.69        | -13.08      | N    | ON     | 9.9        |
| 0.460000        | 47.00            | ---             | 56.69        | -9.69       | N    | ON     | 9.9        |
| 0.796000        | ---              | 26.19           | 46.00        | -19.81      | N    | ON     | 9.9        |
| 0.796000        | 39.60            | ---             | 56.00        | -16.40      | N    | ON     | 9.9        |
| 2.864000        | ---              | 27.53           | 46.00        | -18.47      | N    | ON     | 10.1       |
| 2.864000        | 37.30            | ---             | 56.00        | -18.70      | N    | ON     | 10.1       |
| 4.464000        | ---              | 25.23           | 46.00        | -20.77      | N    | ON     | 10.1       |
| 4.464000        | 34.50            | ---             | 56.00        | -21.50      | N    | ON     | 10.1       |

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



### 3.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

#### 3.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

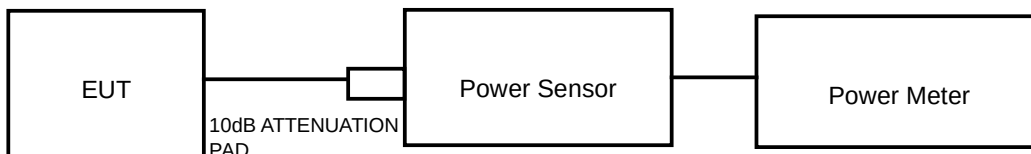
| Operation Band | EUT Category |                                   | LIMIT                                                                                                                       |
|----------------|--------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| U-NII-1        |              | Outdoor Access Point              | 1 Watt (30 dBm)<br>(Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon) |
|                |              | Fixed point-to-point Access Point | 1 Watt (30 dBm)                                                                                                             |
|                | √            | Indoor Access Point               | 1 Watt (30 dBm)                                                                                                             |
|                |              | Client devices                    | 250mW (24 dBm)                                                                                                              |
| U-NII-2A       | -            |                                   | 250mW (24 dBm) or 11 dBm+10 log B*                                                                                          |
| U-NII-2C       | -            |                                   | 250mW (24 dBm) or 11 dBm+10 log B*                                                                                          |
| U-NII-3        | √            |                                   | 1 Watt (30 dBm)                                                                                                             |

**NOTE:** Where B is the 26dB emission bandwidth in MHz.

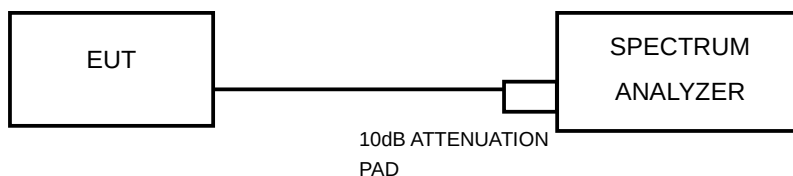
### 3.3.2 TEST SETUP

#### FOR POWER OUTPUT MEASUREMENT

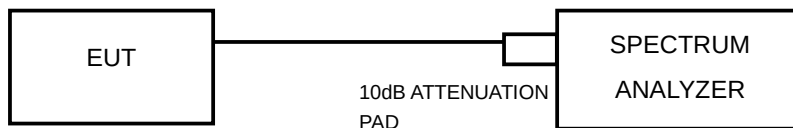
##### 802.11a, 802.11n (20MHz), 802.11n (40MHz) TEST CONFIGURATION



##### 11ac TEST CONFIGURATION



#### FOR 26dB BANDWIDTH



### 3.3.3 TEST INSTRUMENTS

| Equipment           | Manufacturer | Model No.  | Serial No. | Last Cal.  | Next Cal.   |
|---------------------|--------------|------------|------------|------------|-------------|
| Power Meter         | ANRITSU      | ML2495A    | 1506002    | Feb. 26,19 | Feb. 25, 20 |
| EXA Signal Analyzer | KEYSIGHT     | N9010A-526 | MY54510523 | Feb. 26,19 | Feb. 25, 20 |
| EXA Signal Analyzer | KEYSIGHT     | N9010A-544 | MY54510332 | Feb. 26,19 | Feb. 25, 20 |
| Power Sensor        | ANRITSU      | MA2411B    | 1339352    | Feb. 26,19 | Feb. 25, 20 |

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

### 3.3.4 TEST PROCEDURE

#### FOR POWER MEASUREMENT

##### For 802.11a, 802.11n (20MHz), 802.11n (40MHz)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

##### For 802.11ac (80MHz)

1. Measure the duty cycle,  $x$ , of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz.
4. Set VBW  $\geq$  3 MHz.
5. Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ . (This ensures that bin-to-bin spacing is  $\leq \text{RBW}/2$ , so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
8. Do not use sweep triggering. Allow the sweep to “free run.”
9. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
10. Add  $10 \log (1/x)$ , where  $x$  is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \log (1/0.25) = 6 \text{ dB}$  if the duty cycle is 25%.



#### FOR 99 PERCENT OCCUPIED BANDWIDTH

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

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

#### FOR 26dB BANDWIDTH

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

#### FOR 6dB BANDWIDTH

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



### 3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

### 3.3.7 TEST RESULTS

#### OUTPUT POWER:

##### 802.11a

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | AVERAGE<br>POWER (dBm) | AVERAGE<br>POWER (mW) | POWER LIMIT<br>(dBm) | PASS/FAIL |
|---------|-------------------------------|------------------------|-----------------------|----------------------|-----------|
| 36      | 5180                          | 16.28                  | 42.462                | 30                   | PASS      |
| 40      | 5200                          | 16.19                  | 41.591                | 30                   | PASS      |
| 48      | 5240                          | 16.30                  | 42.658                | 30                   | PASS      |
| 149     | 5745                          | 16.40                  | 43.652                | 30                   | PASS      |
| 157     | 5785                          | 16.34                  | 43.053                | 30                   | PASS      |
| 165     | 5825                          | 16.18                  | 41.495                | 30                   | PASS      |

##### 802.11n (20MHz)

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | AVERAGE POWER (dBm) |        | TOTAL<br>POWER<br>(dBm) | TOTAL<br>POWER<br>(mW) | POWER<br>LIMIT<br>(dBm) | PASS/FAIL |
|---------|-------------------------------|---------------------|--------|-------------------------|------------------------|-------------------------|-----------|
|         |                               | CHAIN0              | CHAIN1 |                         |                        |                         |           |
| 36      | 5180                          | 16.10               | 16.10  | 19.11                   | 81.470                 | 30                      | PASS      |
| 44      | 5220                          | 16.07               | 16.00  | 19.05                   | 80.353                 | 30                      | PASS      |
| 48      | 5240                          | 16.22               | 16.01  | 19.13                   | <b>81.846</b>          | 30                      | PASS      |
| 149     | 5745                          | 16.15               | 16.19  | 19.31                   | 85.310                 | 30                      | PASS      |
| 157     | 5785                          | 16.13               | 16.32  | 19.34                   | <b>85.901</b>          | 30                      | PASS      |
| 165     | 5825                          | 16.04               | 16.10  | 19.15                   | 82.224                 | 30                      | PASS      |

##### 802.11n (40MHz)

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | AVERAGE POWER (dBm) |        | TOTAL<br>POWER<br>(dBm) | TOTAL<br>POWER<br>(mW) | POWER<br>LIMIT<br>(dBm) | PASS/FAIL |
|---------|-------------------------------|---------------------|--------|-------------------------|------------------------|-------------------------|-----------|
|         |                               | CHAIN0              | CHAIN1 |                         |                        |                         |           |
| 38      | 5190                          | 6.80                | 6.62   | 9.72                    | 9.376                  | 30                      | PASS      |
| 46      | 5230                          | 12.26               | 12.10  | 15.19                   | 33.037                 | 30                      | PASS      |
| 151     | 5755                          | 16.36               | 16.09  | 19.24                   | 83.946                 | 30                      | PASS      |
| 159     | 5795                          | 16.39               | 16.22  | 19.32                   | 85.507                 | 30                      | PASS      |

##### 802.11ac (80MHz)

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | AVERAGE POWER(dBm) |        | TOTAL<br>POWER<br>(dBm) | TOTAL<br>POWER<br>(mW) | POWER<br>LIMIT<br>(dBm) | PASS/FAIL |
|---------|-------------------------------|--------------------|--------|-------------------------|------------------------|-------------------------|-----------|
|         |                               | CHAIN0             | CHAIN1 |                         |                        |                         |           |
| 42      | 5210                          | 6.18               | 6.89   | 9.56                    | 9.036                  | 30                      | PASS      |
| 155     | 5775                          | 16.20              | 16.12  | 19.17                   | 82.604                 | 30                      | PASS      |

**99% OCCUPIED BANDWIDTH & 26dB BANDWIDTH/6dB BANDWIDTH:**

**802.11a**

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 26dB<br>BANDWIDTH<br>(MHz) | PASS/FAIL |
|---------|-------------------------------|---------------------------|----------------------------|-----------|
| 36      | 5180                          | 16.38                     | 20.02                      | PASS      |
| 40      | 5200                          | 16.50                     | 19.85                      | PASS      |
| 48      | 5240                          | 16.38                     | 19.68                      | PASS      |
| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 6dB<br>BANDWIDTH<br>(MHz)  | PASS/FAIL |
| 149     | 5745                          | 16.44                     | 15.98                      | PASS      |
| 157     | 5785                          | 16.50                     | 16.01                      | PASS      |
| 165     | 5825                          | 16.38                     | 16.34                      | PASS      |

**802.11n (20MHz)**

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 26dB<br>BANDWIDTH<br>(MHz) | PASS/FAIL |
|---------|-------------------------------|---------------------------|----------------------------|-----------|
| 36      | 5180                          | 17.64                     | 20.44                      | PASS      |
| 40      | 5200                          | 17.70                     | 20.46                      | PASS      |
| 48      | 5240                          | 17.70                     | 20.41                      | PASS      |
| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 6dB<br>BANDWIDTH<br>(MHz)  | PASS/FAIL |
| 149     | 5745                          | 17.58                     | 16.60                      | PASS      |
| 157     | 5785                          | 17.58                     | 16.62                      | PASS      |
| 165     | 5825                          | 17.58                     | 16.93                      | PASS      |

**802.11n (40MHz)**

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 26dB<br>BANDWIDTH<br>(MHz) | PASS/FAIL |
|---------|-------------------------------|---------------------------|----------------------------|-----------|
| 38      | 5190                          | 36.60                     | 71.34                      | PASS      |
| 46      | 5230                          | 36.78                     | 72.77                      | PASS      |
| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 6dB<br>BANDWIDTH<br>(MHz)  | PASS/FAIL |
| 151     | 5755                          | 36.18                     | 35.14                      | PASS      |
| 159     | 5795                          | 36.30                     | 35.14                      | PASS      |

**802.11ac (80MHz)**

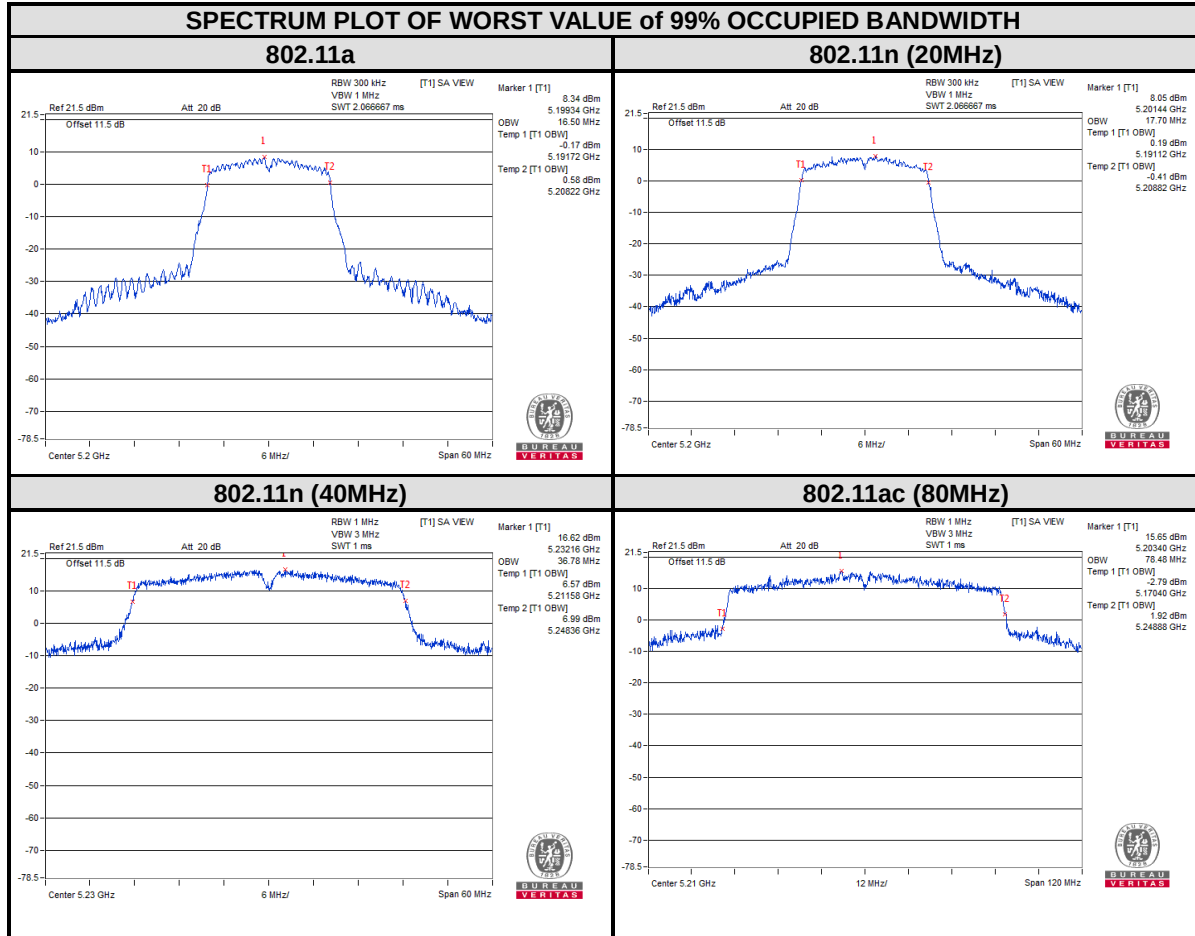
| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 26dB<br>BANDWIDTH<br>(MHz) | PASS/FAIL |
|---------|-------------------------------|---------------------------|----------------------------|-----------|
| 42      | 5210                          | 78.48                     | 81.52                      | PASS      |
| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH | 6dB<br>BANDWIDTH<br>(MHz)  | PASS/FAIL |
| 155     | 5775                          | 75.60                     | 75.12                      | PASS      |

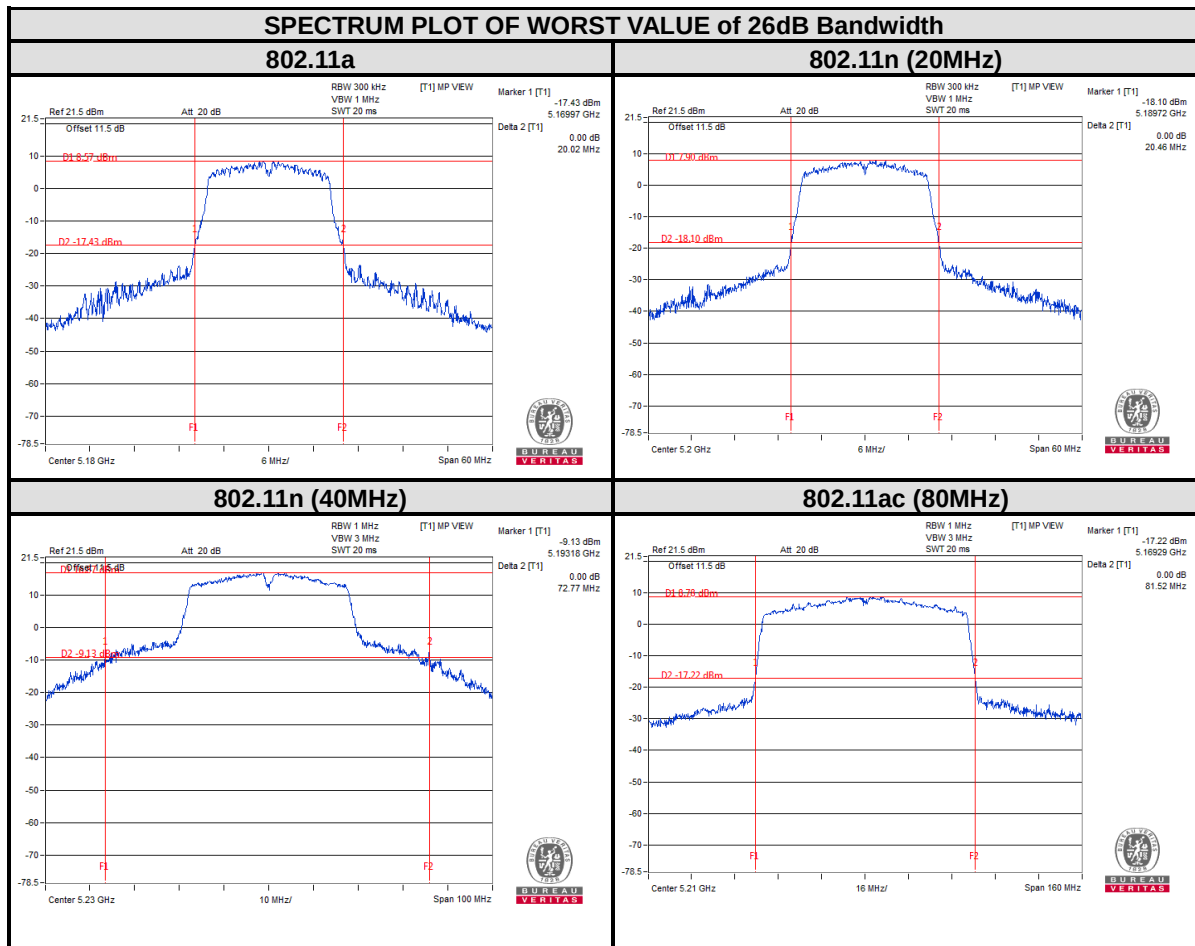


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Test Report No.: RF190322W001-2

For U-NII-1:



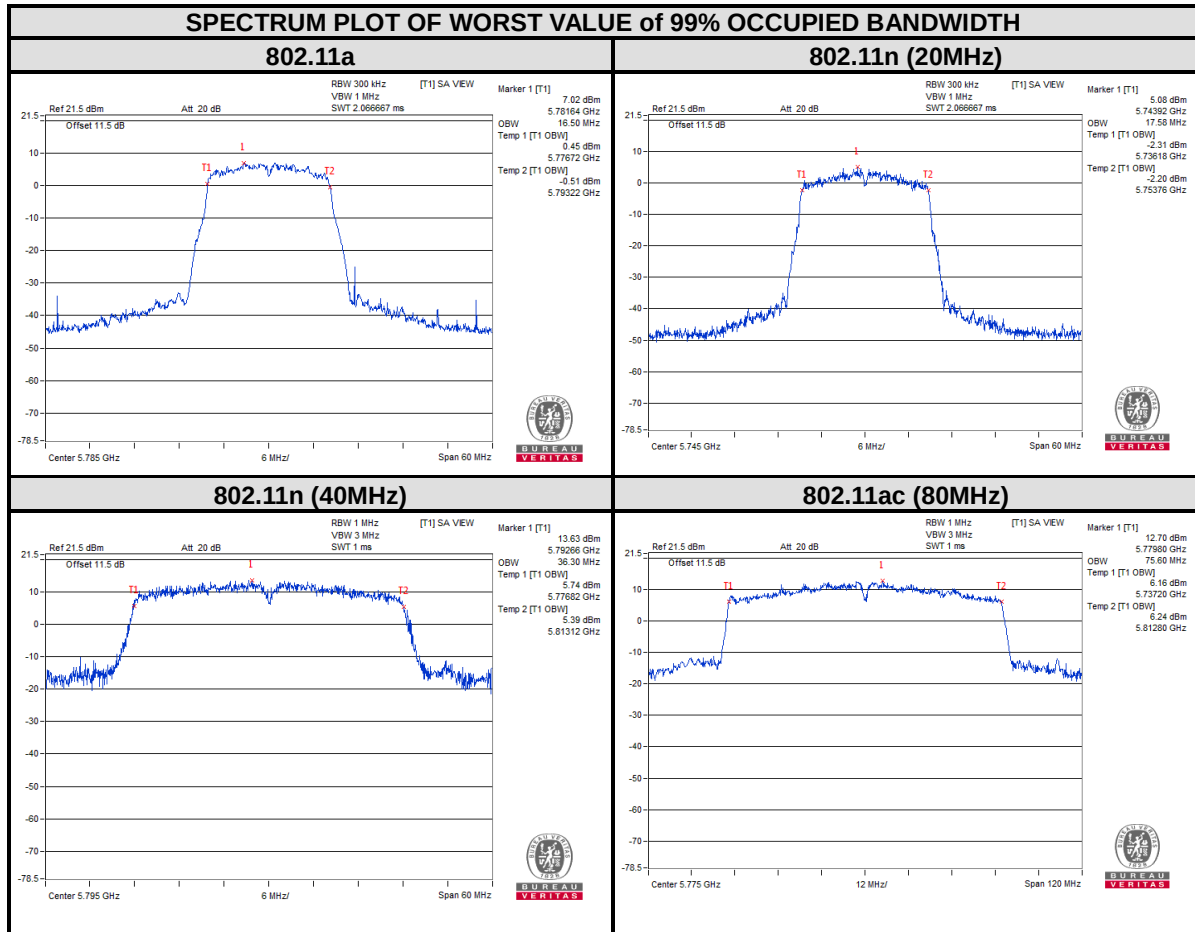




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Test Report No.: RF190322W001-2

For U-NII-3:

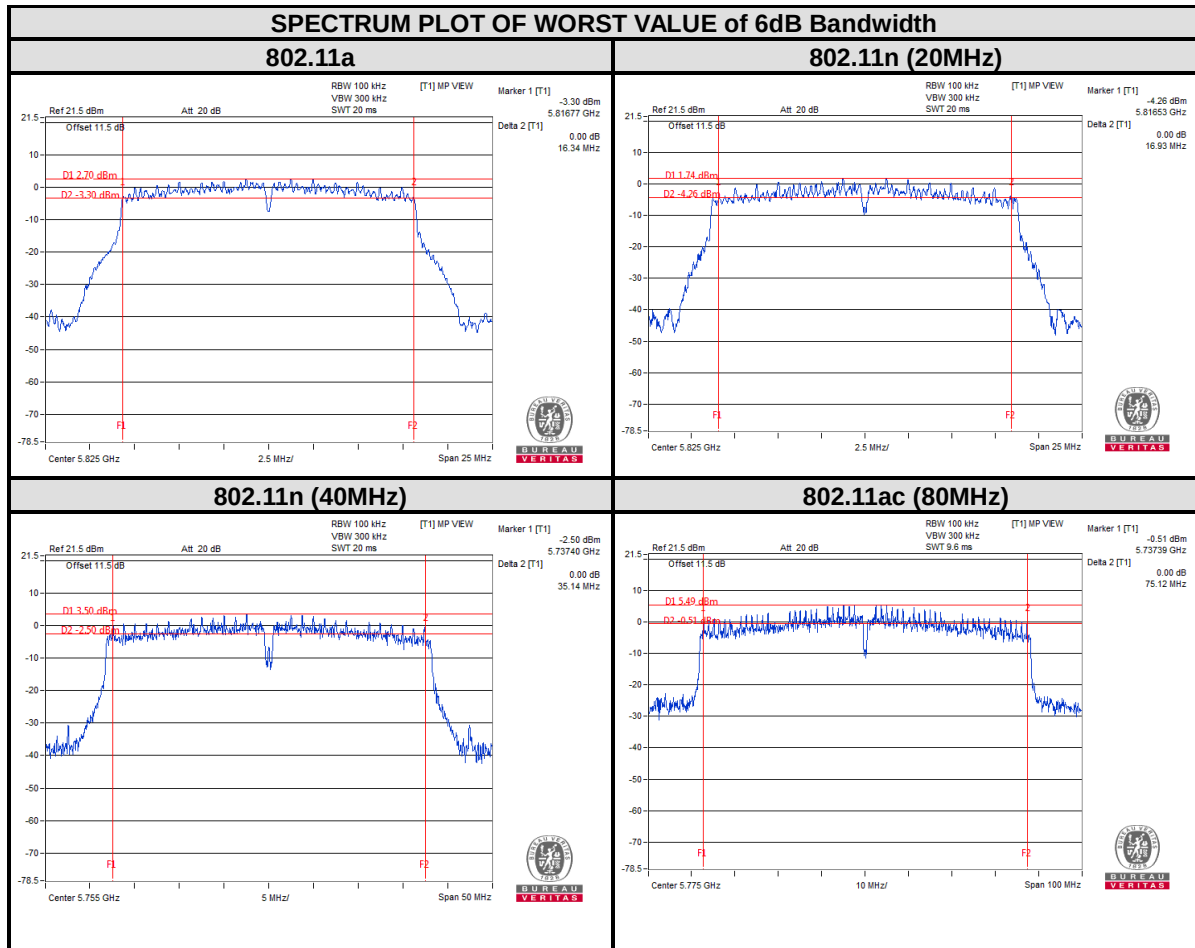






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Test Report No.: RF190322W001-2

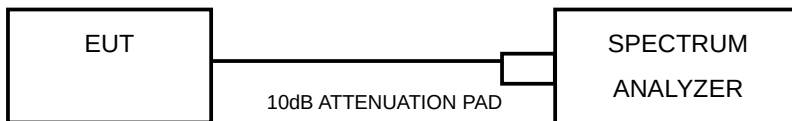


### 3.4 MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

#### 3.4.1 LIMITS OF MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

| Operation Band | EUT Category |                                   | LIMIT         |
|----------------|--------------|-----------------------------------|---------------|
| U-NII-1        |              | Outdoor Access Point              | 17dBm/ MHz    |
|                |              | Fixed point-to-point Access Point |               |
|                | √            | Indoor Access Point               |               |
|                |              | Client devices                    | 11dBm/ MHz    |
| U-NII-2A       | -            |                                   | 11dBm/ MHz    |
| U-NII-2C       | -            |                                   | 11dBm/ MHz    |
| U-NII-3        | √            |                                   | 30dBm/ 500kHz |

#### 3.4.2 TEST SETUP



#### 3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

#### 3.4.4 TEST PROCEDURES

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1 MHz, Set VBW  $\geq$  3 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Add  $10 \log (1/x)$ , where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).
- 7) Record the max value

#### 3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 3.4.6 EUT OPERATING CONDITIONS

Same as 3.1.6.

### 3.4.7 TEST RESULTS

For U-NII-1 & U-NII-2A:

#### 802.11a

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) | Duty Factor | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|-------------|--------------------------------|-------------------------|-----------|
| 36      | 5180            | 4.98                          | 0.17        | 5.15                           | 17                      | PASS      |
| 40      | 5200            | 4.62                          | 0.17        | 4.79                           | 17                      | PASS      |
| 48      | 5240            | 5.01                          | 0.17        | 5.18                           | 17                      | PASS      |

#### 802.11n (20MHz)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) |         | Total PSD w/o Duty Factor (dBm/MHz) | Duty Factor | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|---------|-------------------------------------|-------------|--------------------------------|-------------------------|-----------|
|         |                 | Chain 0                       | Chain 1 |                                     |             |                                |                         |           |
| 36      | 5180            | 4.69                          | 5.69    | 8.23                                | 0.23        | 8.46                           | 17                      | PASS      |
| 40      | 5200            | 4.96                          | 5.73    | 8.37                                | 0.23        | 8.60                           | 17                      | PASS      |
| 48      | 5240            | 5.58                          | 6.13    | 8.87                                | 0.23        | 9.10                           | 17                      | PASS      |

#### 802.11n (40MHz)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) |         | Total PSD w/o Duty Factor (dBm/MHz) | Duty Factor | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|---------|-------------------------------------|-------------|--------------------------------|-------------------------|-----------|
|         |                 | Chain 0                       | Chain 1 |                                     |             |                                |                         |           |
| 38      | 5190            | 6.57                          | 1.91    | 7.85                                | 0.35        | 8.20                           | 17                      | PASS      |
| 46      | 5230            | 7.57                          | 2.51    | 8.75                                | 0.35        | 9.10                           | 17                      | PASS      |

#### 802.11ac (80MHz)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) |         | Total PSD w/o Duty Factor (dBm/MHz) | Duty Factor | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|---------|-------------------------------------|-------------|--------------------------------|-------------------------|-----------|
|         |                 | Chain 0                       | Chain 1 |                                     |             |                                |                         |           |
| 42      | 5210            | 5.52                          | 5.96    | 8.76                                | 0.65        | 9.41                           | 17                      | PASS      |



## For U-NII-3:

## 802.11a

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) | PSD w/o Duty Factor (dBm/500kHz) | Duty Factor | PSD with Duty Factor (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|---------|-----------------|-------------------------------|----------------------------------|-------------|-----------------------------------|--------------------|------------|
| 149     | 5745            | -0.47                         | -3.48                            | 0.17        | -3.31                             | 30                 | PASS       |
| 157     | 5785            | -0.48                         | -3.49                            | 0.17        | -3.32                             | 30                 | PASS       |
| 165     | 5825            | -1.08                         | -4.09                            | 0.17        | -3.92                             | 30                 | PASS       |

## 802.11n (20MHz)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/500kHz) |         | Total PSD w/o Duty Factor (dBm/500kHz) | Duty Factor | PSD with Duty Factor (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|---------|-----------------|----------------------------------|---------|----------------------------------------|-------------|-----------------------------------|--------------------|------------|
|         |                 | Chain 0                          | Chain 1 |                                        |             |                                   |                    |            |
| 149     | 5745            | -5.34                            | -5.52   | -2.42                                  | 0.23        | -2.19                             | 30                 | PASS       |
| 157     | 5785            | -5.14                            | -5.50   | -2.31                                  | 0.23        | -2.08                             | 30                 | PASS       |
| 165     | 5825            | -5.22                            | -5.70   | -2.44                                  | 0.23        | -2.21                             | 30                 | PASS       |

## 802.11n (40MHz)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/500kHz) |         | Total PSD w/o Duty Factor (dBm/500kHz) | Duty Factor | PSD with Duty Factor (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|---------|-----------------|----------------------------------|---------|----------------------------------------|-------------|-----------------------------------|--------------------|------------|
|         |                 | Chain 0                          | Chain 1 |                                        |             |                                   |                    |            |
| 151     | 5755            | -5.37                            | -9.48   | -3.95                                  | 0.35        | -3.60                             | 30                 | PASS       |
| 159     | 5795            | -2.82                            | -8.97   | -1.88                                  | 0.35        | -1.53                             | 30                 | PASS       |

## 802.11ac (80MHz)

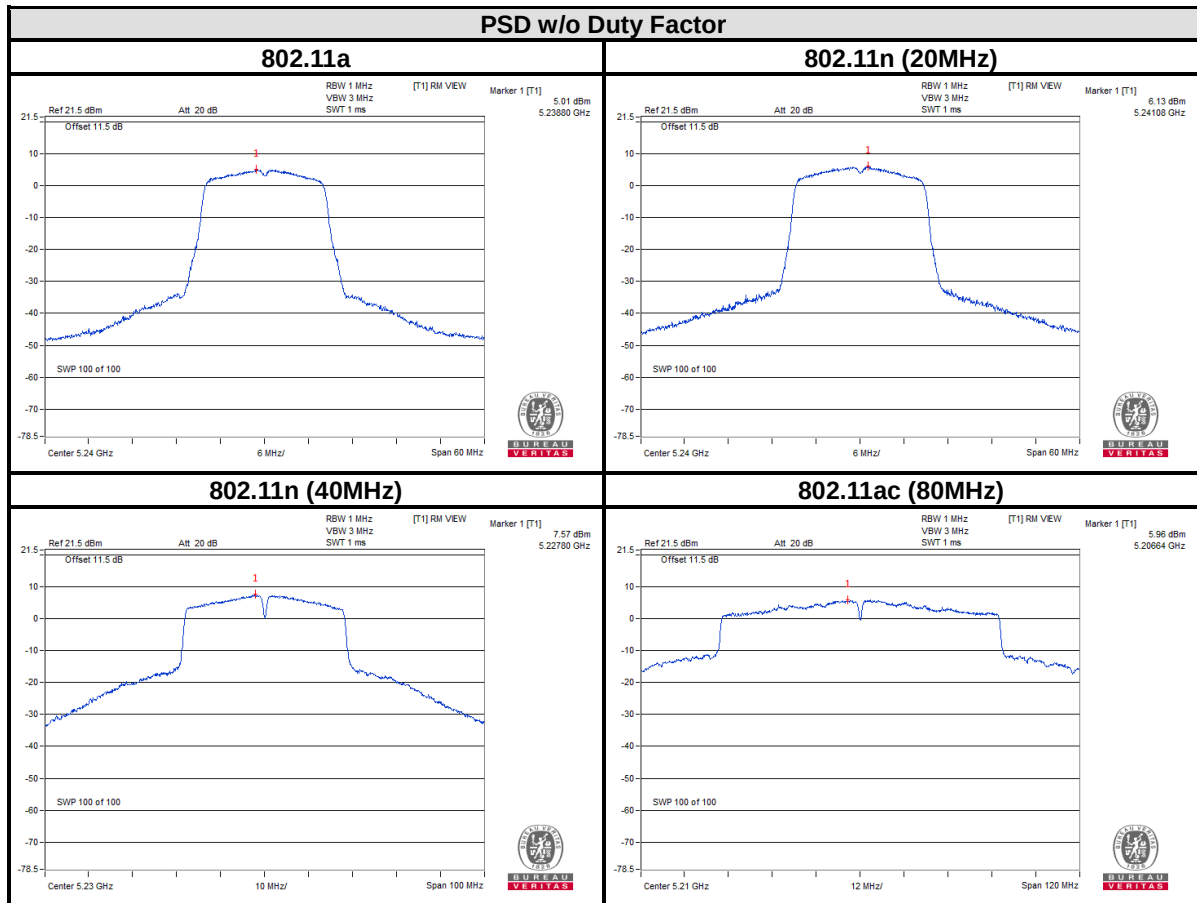
| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/500kHz) |         | Total PSD w/o Duty Factor (dBm/500kHz) | Duty Factor | PSD with Duty Factor (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|---------|-----------------|----------------------------------|---------|----------------------------------------|-------------|-----------------------------------|--------------------|------------|
|         |                 | Chain 0                          | Chain 1 |                                        |             |                                   |                    |            |
| 155     | 5775            | -5.19                            | -3.02   | -0.96                                  | 0.65        | -0.31                             | 30                 | PASS       |



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Test Report No.: RF190322W001-2

For 5180~5240MHz

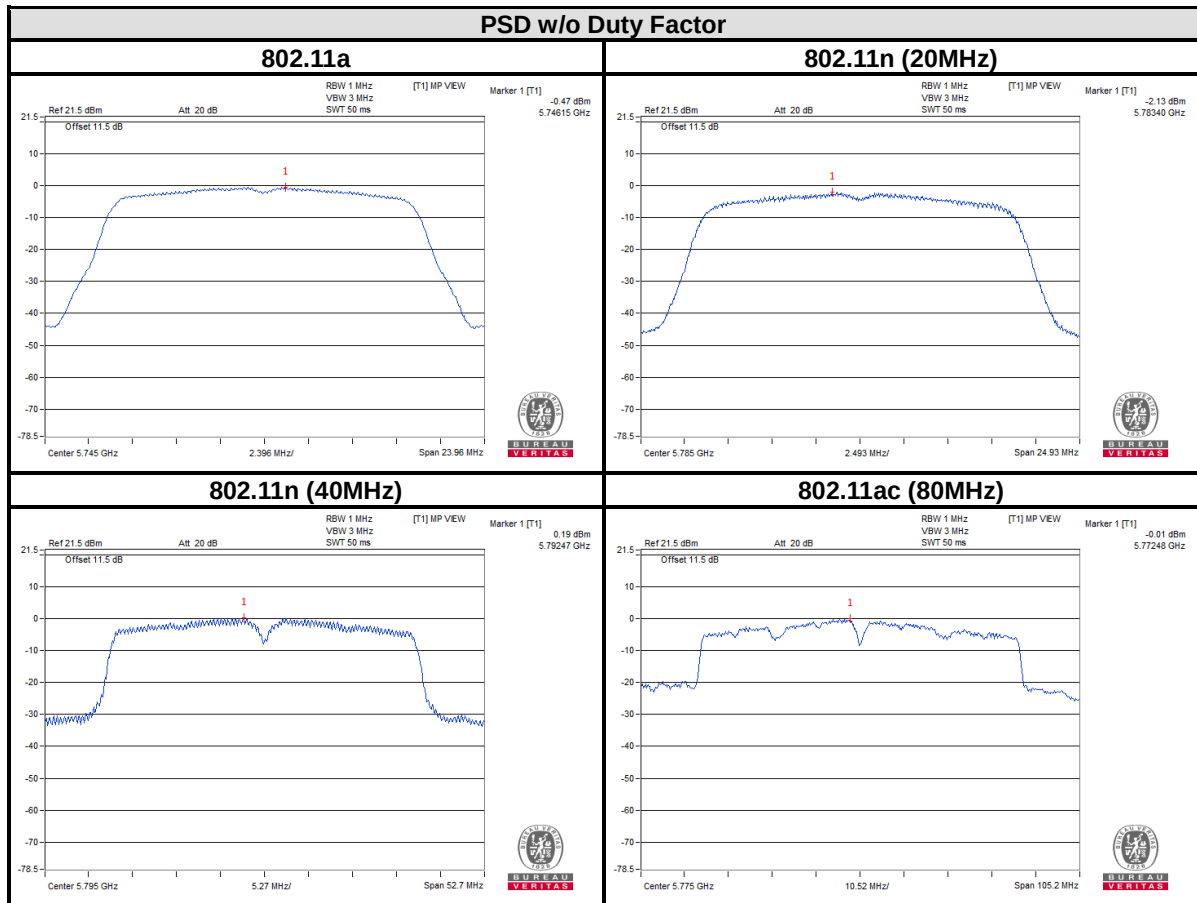




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Test Report No.: RF190322W001-2

For 5745~5825MHz

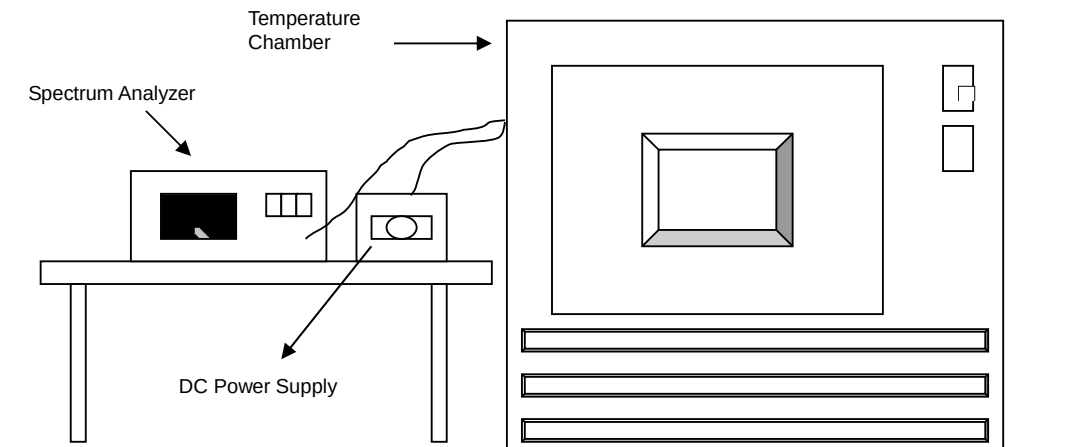


### 3.5 FREQUENCY STABILITY

#### 3.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation

#### 3.5.2 TEST SETUP



#### 3.5.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.



#### 3.5.4 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

#### 3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 3.5.6 EUT OPERATING CONDITION

Set the EUT transmit at un-modulation mode to test frequency stability.

### 3.5.7 TEST RESULTS

| FREQUENCY STABILITY VERSUS TEMP. |                          |                                |                             |                                |                             |                                |                             |                                |                             | RESULT |
|----------------------------------|--------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------|
| OPERATING FREQUENCY: 5180MHz     |                          |                                |                             |                                |                             |                                |                             |                                |                             |        |
| TEMP.<br>(°C)                    | Power<br>Supply<br>(Vdc) | 0 MINUTE                       |                             | 2 MINUTES                      |                             | 5 MINUTES                      |                             | 10 MINUTE                      |                             |        |
|                                  |                          | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) |        |
| 50                               | 120                      | 5180.0297                      | 5.734                       | 5180.0197                      | 3.803                       | 5180.026                       | 5.019                       | 5180.0287                      | 5.541                       | PASS   |
| 40                               | 120                      | 5179.9882                      | -2.278                      | 5179.9908                      | -1.776                      | 5179.9811                      | -3.649                      | 5179.9823                      | -3.417                      | PASS   |
| 30                               | 120                      | 5179.9819                      | -3.494                      | 5179.9808                      | -3.707                      | 5179.9863                      | -2.645                      | 5179.9882                      | -2.278                      | PASS   |
| 20                               | 120                      | 5179.9777                      | -4.305                      | 5179.9721                      | -5.386                      | 5179.9751                      | -4.807                      | 5179.9753                      | -4.768                      | PASS   |
| 10                               | 120                      | 5180.0172                      | 3.320                       | 5180.0133                      | 2.568                       | 5180.0183                      | 3.533                       | 5180.0151                      | 2.915                       | PASS   |
| 0                                | 120                      | 5179.9824                      | -3.398                      | 5179.9846                      | -2.973                      | 5179.9823                      | -3.417                      | 5179.9855                      | -2.799                      | PASS   |
| -10                              | 120                      | 5179.9903                      | -1.873                      | 5179.9955                      | -0.869                      | 5179.9893                      | -2.066                      | 5179.9935                      | -1.255                      | PASS   |
| -20                              | 120                      | 5179.9949                      | -0.985                      | 5179.9968                      | -0.618                      | 5179.995                       | -0.965                      | 5179.9948                      | -1.004                      | PASS   |
| -30                              | 120                      | 5180.0092                      | 1.776                       | 5180.0161                      | 3.108                       | 5180.0146                      | 2.819                       | 5180.0151                      | 2.915                       | PASS   |

| FREQUENCY STABILITY VERSUS VOLTAGE |                    |                          |                       |                          |                       |                          |                       |                          |                       | RESULT |
|------------------------------------|--------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------|
| OPERATING FREQUENCY: 5180MHz       |                    |                          |                       |                          |                       |                          |                       |                          |                       |        |
| TEMP.<br>(°C)                      | Power Supply (Vdc) | 0 MINUTE                 |                       | 2 MINUTE                 |                       | 5 MINUTE                 |                       | 10 MINUTE                |                       |        |
|                                    |                    | Measured Frequency (MHz) | Frequency Drift (ppm) | Measured Frequency (MHz) | Frequency Drift (ppm) | Measured Frequency (MHz) | Frequency Drift (ppm) | Measured Frequency (MHz) | Frequency Drift (ppm) |        |
| 20                                 | 138                | 5179.9787                | -4.112                | 5179.9728                | -5.251                | 5179.976                 | -4.633                | 5179.9739                | -5.039                | PASS   |
|                                    | 120                | 5179.9777                | -4.305                | 5179.9721                | -5.386                | 5179.9751                | -4.807                | 5179.9753                | -4.768                | PASS   |
|                                    | 102                | 5179.9794                | -3.977                | 5179.9729                | -5.232                | 5179.9766                | -4.517                | 5179.9741                | -5.000                | PASS   |



| FREQUENCY STABILITY VERSUS TEMP. |                          |                                |                             |                                |                             |                                |                             |                                |                             | RESULT |
|----------------------------------|--------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------|
| OPERATING FREQUENCY: 5825MHz     |                          |                                |                             |                                |                             |                                |                             |                                |                             |        |
| TEMP.<br>(°C)                    | Power<br>Supply<br>(Vdc) | 0 MINUTE                       |                             | 2 MINUTES                      |                             | 5 MINUTES                      |                             | 10 MINUTE                      |                             |        |
|                                  |                          | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) |        |
| 50                               | 120                      | 5825.0171                      | 2.936                       | 5825.0162                      | 2.781                       | 5825.013                       | 2.232                       | 5825.0169                      | 2.901                       | PASS   |
| 40                               | 120                      | 5824.9854                      | -2.506                      | 5824.9811                      | -3.245                      | 5824.9817                      | -3.142                      | 5824.9812                      | -3.227                      | PASS   |
| 30                               | 120                      | 5825.0015                      | 0.258                       | 5825.0013                      | 0.223                       | 5824.9996                      | -0.069                      | 5824.9995                      | -0.086                      | PASS   |
| 20                               | 120                      | 5824.9767                      | -4.000                      | 5824.9824                      | -3.021                      | 5824.9835                      | -2.833                      | 5824.983                       | -2.918                      | PASS   |
| 10                               | 120                      | 5824.9792                      | -3.571                      | 5824.9781                      | -3.760                      | 5824.9831                      | -2.901                      | 5824.9764                      | -4.052                      | PASS   |
| 0                                | 120                      | 5824.9754                      | -4.223                      | 5824.9759                      | -4.137                      | 5824.9693                      | -5.270                      | 5824.9773                      | -3.897                      | PASS   |
| -10                              | 120                      | 5825.0226                      | 3.880                       | 5825.0231                      | 3.966                       | 5825.0171                      | 2.936                       | 5825.0202                      | 3.468                       | PASS   |
| -20                              | 120                      | 5825.022                       | 3.777                       | 5825.0202                      | 3.468                       | 5825.0244                      | 4.189                       | 5825.0224                      | 3.845                       | PASS   |
| -30                              | 120                      | 5824.996                       | -0.687                      | 5824.9955                      | -0.773                      | 5824.9982                      | -0.309                      | 5824.9949                      | -0.876                      | PASS   |

| FREQUENCY STABILITY VERSUS VOLTAGE |                          |                                |                             |                                |                             |                                |                             |                                |                             | RESULT |
|------------------------------------|--------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--------|
| OPERATING FREQUENCY: 5180MHz       |                          |                                |                             |                                |                             |                                |                             |                                |                             |        |
| TEMP.<br>(°C)                      | Power<br>Supply<br>(Vdc) | 0 MINUTE                       |                             | 2 MINUTE                       |                             | 5 MINUTE                       |                             | 10 MINUTE                      |                             |        |
|                                    |                          | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Frequency<br>Drift<br>(ppm) |        |
| 20                                 | 138                      | 5824.9777                      | -3.828                      | 5824.9824                      | -3.021                      | 5824.9846                      | -2.644                      | 5824.9825                      | -3.004                      | PASS   |
|                                    | 120                      | 5824.9767                      | -4.000                      | 5824.9824                      | -3.021                      | 5824.9835                      | -2.833                      | 5824.983                       | -2.918                      | PASS   |
|                                    | 102                      | 5824.9763                      | -4.069                      | 5824.9836                      | -2.815                      | 5824.9833                      | -2.867                      | 5824.9823                      | -3.039                      | PASS   |

## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

## **5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No modifications were made to the EUT by the lab during the test.

**---END---**