



# FCC PART 15C TEST REPORT No.I22Z61444-IOT06

for

**FIH CO., LTD.**

**Smart phone**

**EABF22206A, ECBF22208A**

With

**FCC ID: RYQEABF22206A**

**Hardware Version: 1.0**

**Software Version: EABF22206A\_2140U; ECBF22208A\_2140U**

**Issued Date: 2022-09-16**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

**Test Laboratory:**

**CTTL-Telecommunication Technology Labs, CAICT**

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: [ctl\\_terminals@caict.ac.cn](mailto:ctl_terminals@caict.ac.cn), website: [www.caict.ac.cn](http://www.caict.ac.cn)

## **REPORT HISTORY**

| Report Number   | Revision | Description | Issue Date |
|-----------------|----------|-------------|------------|
| I22Z61444-IOT06 | Rev.0    | 1st edition | 2022-09-16 |

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## **1. TEST LATORATORY**

### **1.1. Introduction & Accreditation**

**Telecommunication Technology Labs, CAICT** is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

### **1.2. Testing Location**

Conducted testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China100191

Radiated testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China100191

### **1.3. TestingEnvironment**

Normal Temperature: 15-35°C

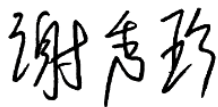
Relative Humidity: 20-75%

### **1.4. Project date**

Testing Start Date: 2022-08-01

Testing End Date: 2022-09-16

### 1.5. Signature



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Xie Xiuzhen  
( Prepared this test report )



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Zheng Wei  
(Reviewed this test report)



---

Pang Shuai  
(Approved this test report)

## **2. CLIENT INFORMATION**

### **2.1 Applicant Information**

Company Name: FIH CO., LTD.  
Address: No.4, Minsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan  
Contact: Hu Dongji  
Country: China  
Email: dongji.hu@fih-foxconn.com  
Telephone: 0086-1067869988 Ext.26442  
Fax: /

### **2.2 Manufacturer Information**

Company Name: FIH CO., LTD.  
Address: No.4, Minsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan  
Contact: Hu Dongji  
Country: China  
Email: dongji.hu@fih-foxconn.com  
Telephone: 0086-1067869988 Ext.26442  
Fax: /

### **3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT(AE)**

#### **3.1. About EUT**

|                     |                           |
|---------------------|---------------------------|
| Description         | Smart phone               |
| Model name          | EABF22206A, ECBF22208A    |
| FCC ID              | RYQEABF22206A             |
| WLAN Frequency Band | ISM Band: 5725MHz~5850MHz |
| Type of modulation  | OFDM                      |
| Voltage             | 3.85V                     |

#### **3.2. Internal Identification of EUT used during the test**

| EUT ID* | IMEI            | HW Version | SW Version                        |
|---------|-----------------|------------|-----------------------------------|
| UT41a   | 350702820001540 | 1.0        | EABF22206A_2140U;ECBF22208A_2140U |
| UT43a   | 350702820001722 | 1.0        | EABF22206A_2140U;ECBF22208A_2140U |

\*EUT ID: is used to identify the test sample in the lab internally.

#### **3.3. Internal Identification of AE used during the test**

| AE ID* | Description | Type | SN |
|--------|-------------|------|----|
| AE1    | Battery     | /    | /  |
| AE3    | Charger     | /    | /  |
| AE5    | USB Cable   | /    | /  |

##### **AE1**

|              |                                     |
|--------------|-------------------------------------|
| Model        | HE401                               |
| Manufacturer | ZHONGSHAN TIANMAO BATTERY CO., LTD. |
| Capacity     | 3500mAh                             |
| Voltage      | 3.85V                               |

##### **AE3**

|              |                                |
|--------------|--------------------------------|
| Model        | RT-C6                          |
| Manufacturer | RongTaiFeng Technology Co.,Ltd |

##### **AE5**

|              |                                |
|--------------|--------------------------------|
| Model        | USB2.0 Type C cable_2A         |
| Manufacturer | RongTaiFeng Technology Co.,Ltd |

\*AE ID: is used to identify the test sample in the lab internally.

#### **3.4. General Description**

Equipment Under Test (EUT) is a model of Smart phone with integrated antenna. It consists of normal options: Battery and Charger.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.

## **4. REFERENCE DOCUMENTS**

### **4.1. Documents supplied by applicant**

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

### **4.2. Reference Documents for testing**

The following documents listed in this section are referred for testing.

|                         |                                                        |         |
|-------------------------|--------------------------------------------------------|---------|
| FCC Part15              | FCC CFR 47, Part 15, Subpart C and E:                  |         |
|                         | 15.205 Restricted bands of operation;                  | 2018    |
|                         | 15.209 Radiated emission limits, general requirements; |         |
| ANSI C63.10             | 15.407 General technical requirements                  |         |
|                         | Methods of Measurement of Radio-Noise Emissions from   |         |
|                         | Low-Voltage Electrical and Electronic Equipment in the | 2013    |
| UNII: KDB 789033<br>D02 | Range of 9 kHz to 40 GHz                               |         |
|                         | General U-NII Test Procedures New Rules v02r01         | 2017-12 |

## **5. LABORATORY ENVIRONMENT**

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

## 6. SUMMARY OF TEST RESULTS

### 6.1. Summary of Test Results

| SUMMARY OF MEASUREMENT RESULTS              | Sub-clause of Part15C  | Sub-clause of IC | Verdict |
|---------------------------------------------|------------------------|------------------|---------|
| Maximum Peak Output Power                   | 15.407 (a)             | /                | P       |
| Peak Power Spectral Density                 | 15.407 (a)             | /                | P       |
| Occupied 6dB Bandwidth                      | 15.407 (e)             | /                | P       |
| Band Edges Compliance - Conducted& Radiated | 15.407 (b)             | /                | P       |
| Transmitter Spurious Emission - Conducted   | 15.407                 | /                | P       |
| Transmitter Spurious Emission - Radiated    | 15.407, 15.205, 15.209 | /                | P       |
| AC Powerline Conducted Emission             | 15.107, 15.207         | /                | P       |

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

|    |                                                                               |
|----|-------------------------------------------------------------------------------|
| P  | Pass, The EUT complies with the essential requirements in the standard.       |
| NM | Not measured, The test was not measured by CTTL                               |
| NA | Not Applicable, The test was not applicable                                   |
| F  | Fail, The EUT does not comply with the essential requirements in the standard |

### 6.2. Statements

CTTL has evaluated the test cases requested by the client/manufacture as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

### 6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

|             |       |
|-------------|-------|
| Temperature | 26°C  |
| Voltage     | 3.85V |
| Humidity    | 44%   |

## 7. TEST EQUIPMENTS UTILIZED

### Conducted test system

| No. | Equipment              | Model  | Serial Number | Manufacturer    | Calibration Period | Calibration Due date |
|-----|------------------------|--------|---------------|-----------------|--------------------|----------------------|
| 1   | Vector Signal Analyzer | FSQ40  | 200089        | Rohde & Schwarz | 1 year             | 2023-05-15           |
| 2   | LISN                   | ENV216 | 101200        | Rohde & Schwarz | 1 year             | 2023-06-29           |
| 3   | Test Receiver          | ESCI   | 100344        | Rohde & Schwarz | 1 year             | 2023-03-21           |
| 4   | Shielding Room         | S81    | /             | ETS-Lindgren    | /                  | /                    |

### Radiated emission test system

| No. | Equipment                         | Model    | Serial Number | Manufacturer    | Calibration Period | Calibration Due date |
|-----|-----------------------------------|----------|---------------|-----------------|--------------------|----------------------|
| 1   | Test Receiver                     | ESW44    | 103023        | Rohde & Schwarz | 1 year             | 2022-10-28           |
| 2   | BiLog Antenna                     | VULB9163 | 302           | Schwarzbeck     | 1 year             | 2022-12-28           |
| 3   | Dual-Ridge Waveguide Horn Antenna | 3116     | 2661          | ETS-Lindgren    | 1 year             | 2023-02-08           |
| 4   | EMI Antenna                       | 3115     | 6914          | ETS-Lindgren    | 1 year             | 2023-01-20           |

## 8. Measurement Uncertainty

### 8.1. Transmitter Output Power

Measurement Uncertainty: 0.387dB,k=1.96

### 8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

### 8.3. Occupied 6dB Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

### 8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

### 8.5. Spurious Emissions

#### Conducted (k=1.96)

| Frequency Range                            | Uncertainty(dB) |
|--------------------------------------------|-----------------|
| $30\text{MHz} \leq f \leq 2\text{GHz}$     | 1.22            |
| $2\text{GHz} \leq f \leq 3.6\text{GHz}$    | 1.22            |
| $3.6\text{GHz} \leq f \leq 8\text{GHz}$    | 1.22            |
| $8\text{GHz} \leq f \leq 12.75\text{GHz}$  | 1.51            |
| $12.75\text{GHz} \leq f \leq 26\text{GHz}$ | 1.51            |
| $26\text{GHz} \leq f \leq 40\text{GHz}$    | 1.59            |

#### Radiated (k=2)

| Frequency Range                         | Uncertainty(dBm) (k=2) |
|-----------------------------------------|------------------------|
| 9kHz-30MHz                              | 4.92                   |
| $30\text{MHz} \leq f \leq 1\text{GHz}$  | 5.18                   |
| $1\text{GHz} \leq f \leq 18\text{GHz}$  | 5.54                   |
| $18\text{GHz} \leq f \leq 40\text{GHz}$ | 5.26                   |

### 8.6. AC Power-line Conducted Emission

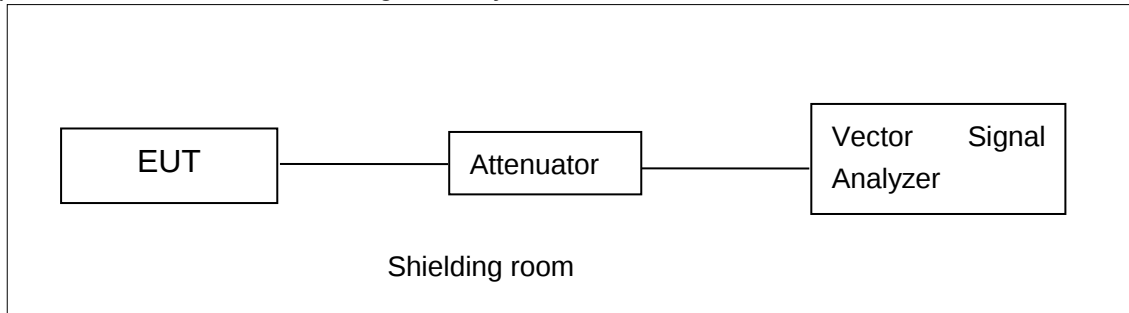
Measurement Uncertainty : 3.08dB,k=2

## ANNEX A: MEASUREMENT RESULTS

### A.1. Measurement Method

#### A.1.1. Conducted Measurements

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode.
- 3). Set the EUT to the required channel.
- 4). Set the spectrum analyzer to start measurement.
- 5). Record the values. Vector Signal Analyzer

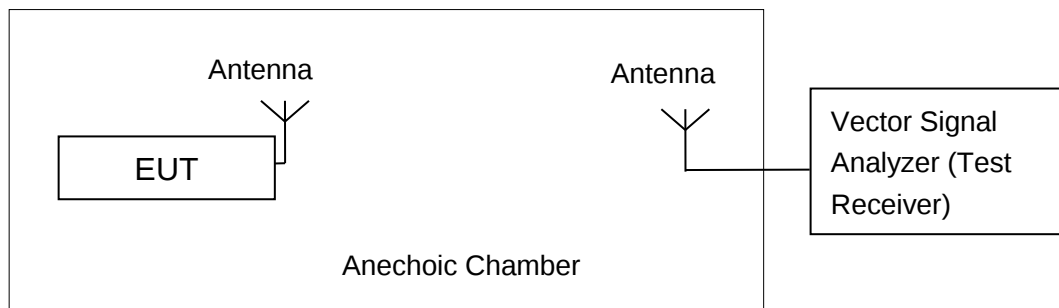


#### A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to ANSI C63.10.

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

## A.2. Maximum Peak Output Power

### Measurement Limit and Method:

| Standard               | Limit (dBm) |
|------------------------|-------------|
| FCC CRF Part 15.407(a) | < 30        |

### A.2.1 Antenna Gain

Antenna gain is 0.4dBi and the value is supplied by the applicant or manufacturer.

### A.2.2. Maximum Average Output Power-conducted

### Measurement Results:

#### 802.11a mode

| Mode    | Data Rate (Mbps) | Test Result (dBm) |                 |                 |
|---------|------------------|-------------------|-----------------|-----------------|
|         |                  | 5745MHz (Ch149)   | 5785MHz (Ch157) | 5825MHz (Ch165) |
| 802.11a | 6                | 12.89             | 12.64           | 11.80           |

The data rate 6Mbps is selected as worst condition, and the following cases are performed with this condition.

#### 802.11n-HT20 mode

| Mode            | Data Rate (Index) | Test Result (dBm) |                 |                 |
|-----------------|-------------------|-------------------|-----------------|-----------------|
|                 |                   | 5745MHz (Ch149)   | 5785MHz (Ch157) | 5825MHz (Ch165) |
| 802.11n (20MHz) | MCS0              | 11.93             | 11.27           | 11.09           |

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

#### 802.11ac-HT20 mode

| Mode             | Data Rate (Index) | Test Result (dBm) |                 |                 |
|------------------|-------------------|-------------------|-----------------|-----------------|
|                  |                   | 5745MHz (Ch149)   | 5785MHz (Ch157) | 5825MHz (Ch165) |
| 802.11ac (20MHz) | MCS0              | 10.37             | 10.35           | 10.06           |

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

#### 802.11n-HT40 mode

| Mode            | Data Rate (Index) | Test Result (dBm) |                 |
|-----------------|-------------------|-------------------|-----------------|
|                 |                   | 5755MHz (Ch151)   | 5795MHz (Ch159) |
| 802.11n (40MHz) | MCS0              | 10.69             | 10.63           |

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

#### 802.11ac-HT40 mode

| Mode                | Data Rate<br>(Index) | Test Result (dBm)  |                    |
|---------------------|----------------------|--------------------|--------------------|
|                     |                      | 5755MHz<br>(Ch151) | 5795MHz<br>(Ch159) |
| 802.11ac<br>(40MHz) | MCS0                 | 10.62              | 10.64              |

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

#### 802.11ac-HT80 mode

| Mode                | Data Rate<br>(Index) | Test Result (dBm)  |
|---------------------|----------------------|--------------------|
|                     |                      | 5775MHz<br>(Ch155) |
| 802.11ac<br>(80MHz) | MCS0                 | 9.17               |

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

**Conclusion: PASS**

### A.3. Peak Power Spectral Density

#### Measurement Limit:

| Standard                  | Limit            |
|---------------------------|------------------|
| FCC 47 CFR Part 15.407(a) | < 30 dBm/500 kHz |

The measurement is made according to ANSI C63.10 and KDB789033 D02

#### Measurement Uncertainty:

|                         |        |
|-------------------------|--------|
| Measurement Uncertainty | 0.75dB |
|-------------------------|--------|

#### Measurement Results:

| Mode            | Channel | Power Spectral Density<br>( dBm/500kHz ) | Conclusion |
|-----------------|---------|------------------------------------------|------------|
| 802.11a         | 149     | -1.15                                    | P          |
|                 | 157     | -1.06                                    | P          |
|                 | 165     | -1.45                                    | P          |
| 802.11n<br>HT20 | 149     | -1.39                                    | P          |
|                 | 157     | -1.37                                    | P          |
|                 | 165     | -1.52                                    | P          |
| 802.11n<br>HT40 | 151     | -5.54                                    | P          |
|                 | 159     | -5.43                                    | P          |
| 802.11ac HT80   | 155     | -9.58                                    | P          |

**Conclusion: PASS**

#### A.4. Occupied 6dB Bandwidth

##### Measurement Limit:

| Standard                   | Limit (kHz) |
|----------------------------|-------------|
| FCC 47 CFR Part 15.407 (e) | $\geq 500$  |

The measurement is made according to KDB789033 D02 .

##### Measurement Uncertainty:

|                         |         |
|-------------------------|---------|
| Measurement Uncertainty | 60.80Hz |
|-------------------------|---------|

##### Measurement Result:

| Mode            | Channel | Occupied 6dB Bandwidth ( MHz) |       | conclusion |
|-----------------|---------|-------------------------------|-------|------------|
| 802.11a         | 149     | Fig.1                         | 16.35 | P          |
|                 | 157     | Fig.2                         | 16.30 | P          |
|                 | 165     | Fig.3                         | 16.35 | P          |
| 802.11n<br>HT20 | 149     | Fig.4                         | 17.60 | P          |
|                 | 157     | Fig.5                         | 17.60 | P          |
|                 | 165     | Fig.6                         | 17.50 | P          |
| 802.11n<br>HT40 | 151     | Fig.7                         | 36.32 | P          |
|                 | 159     | Fig.8                         | 36.32 | P          |
| 802.11ac HT80   | 155     | Fig.9                         | 76.00 | P          |

#### Conclusion: PASS

#### Test graphs as below:

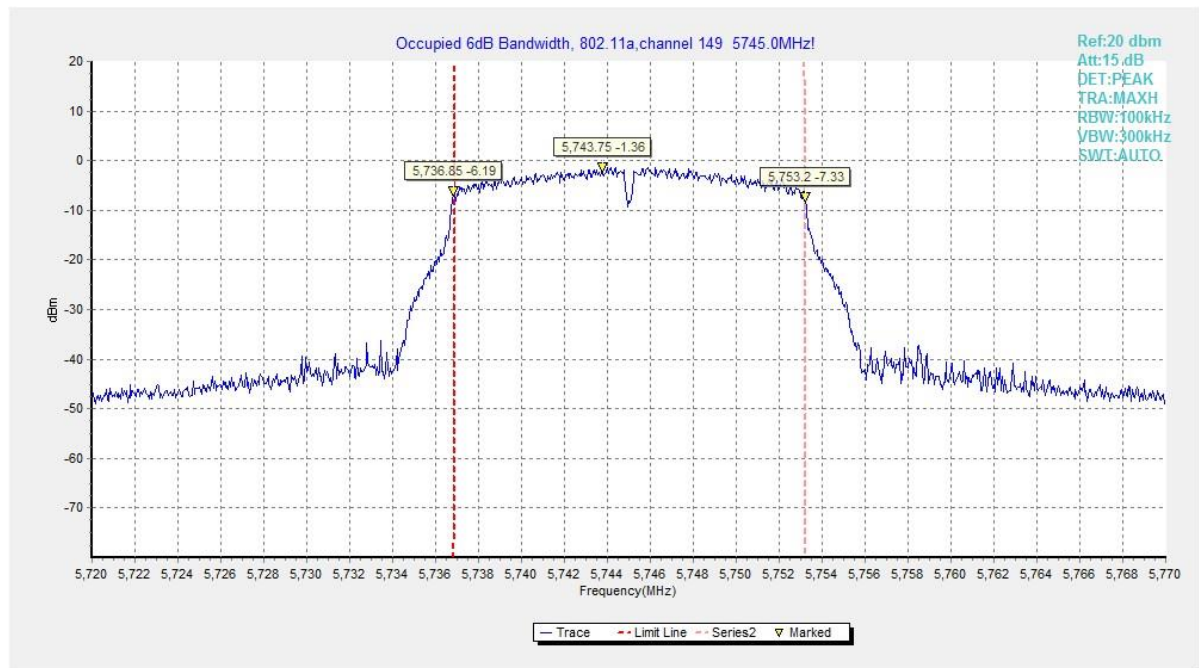
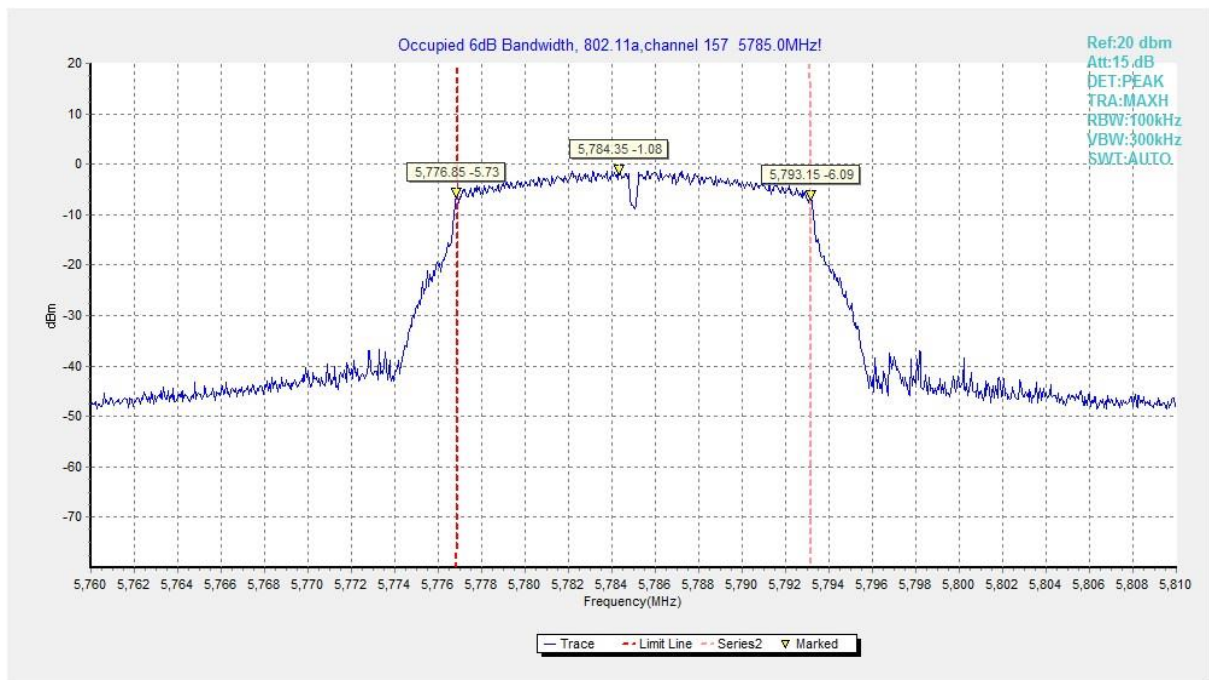
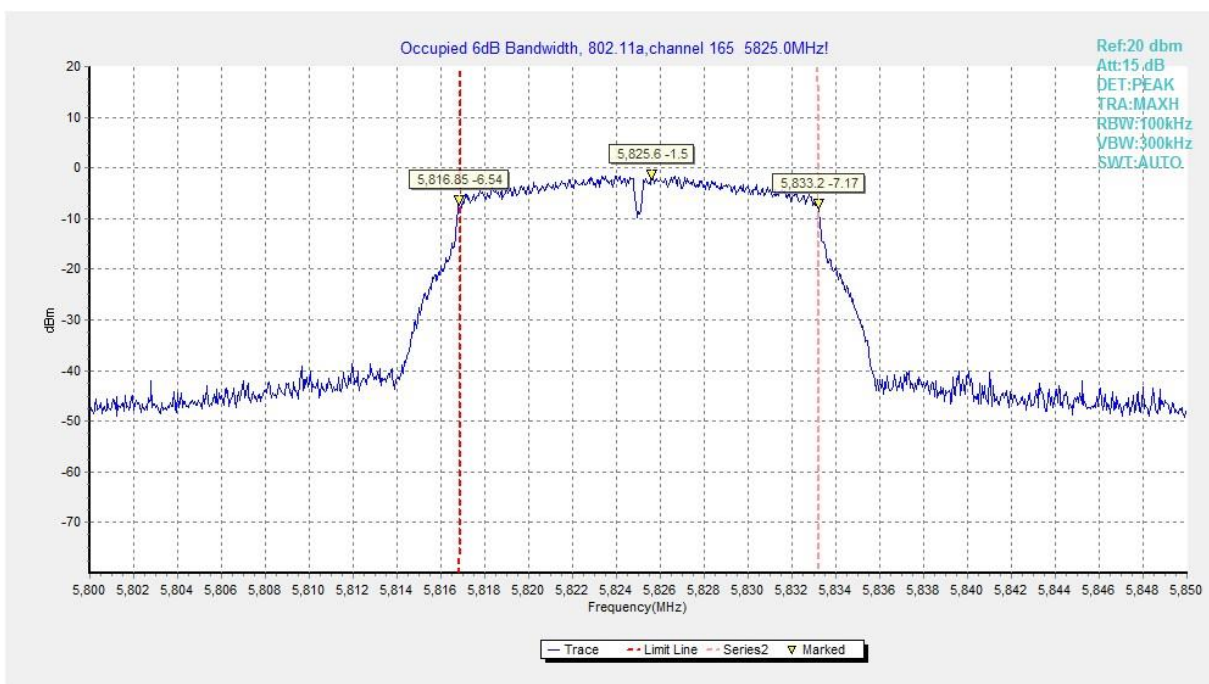


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)



**Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)**



**Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)**

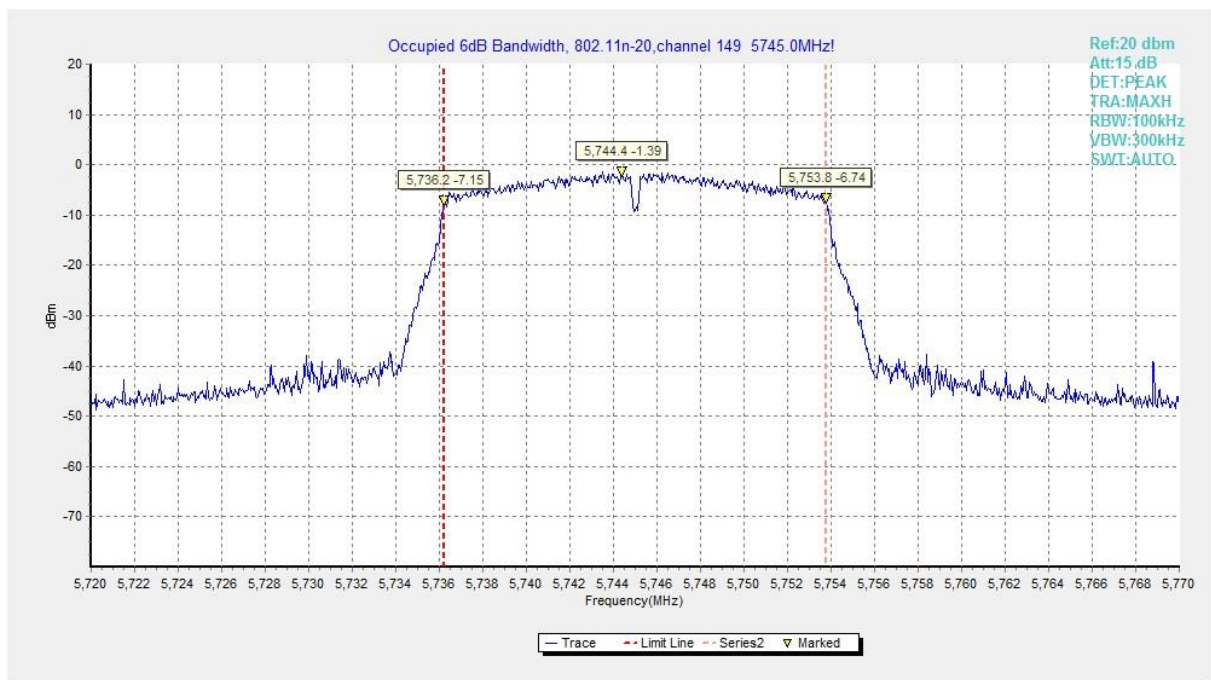
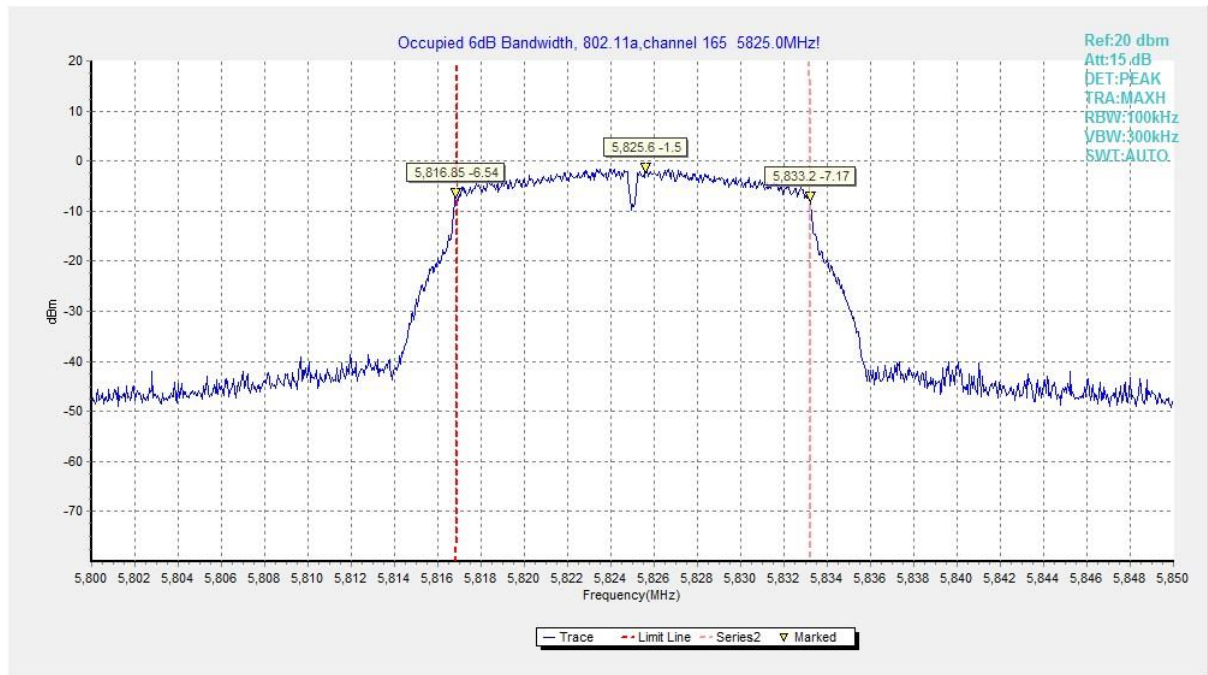


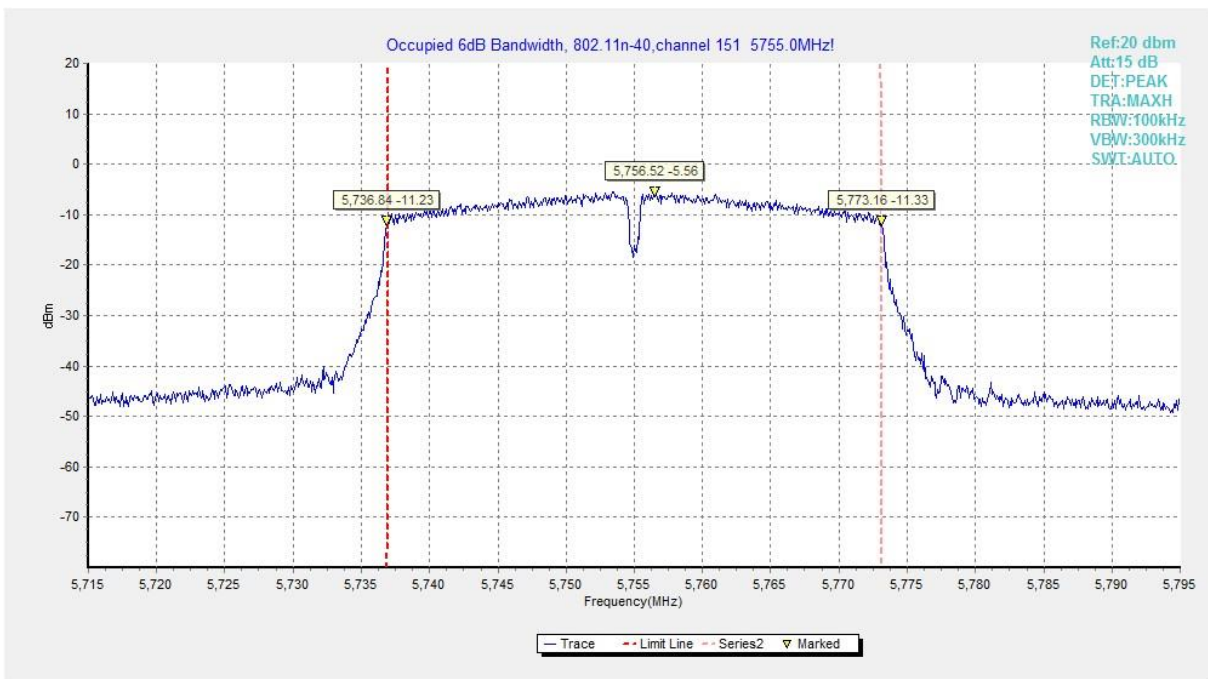
Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)



Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)



**Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)**



**Fig. 7 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)**

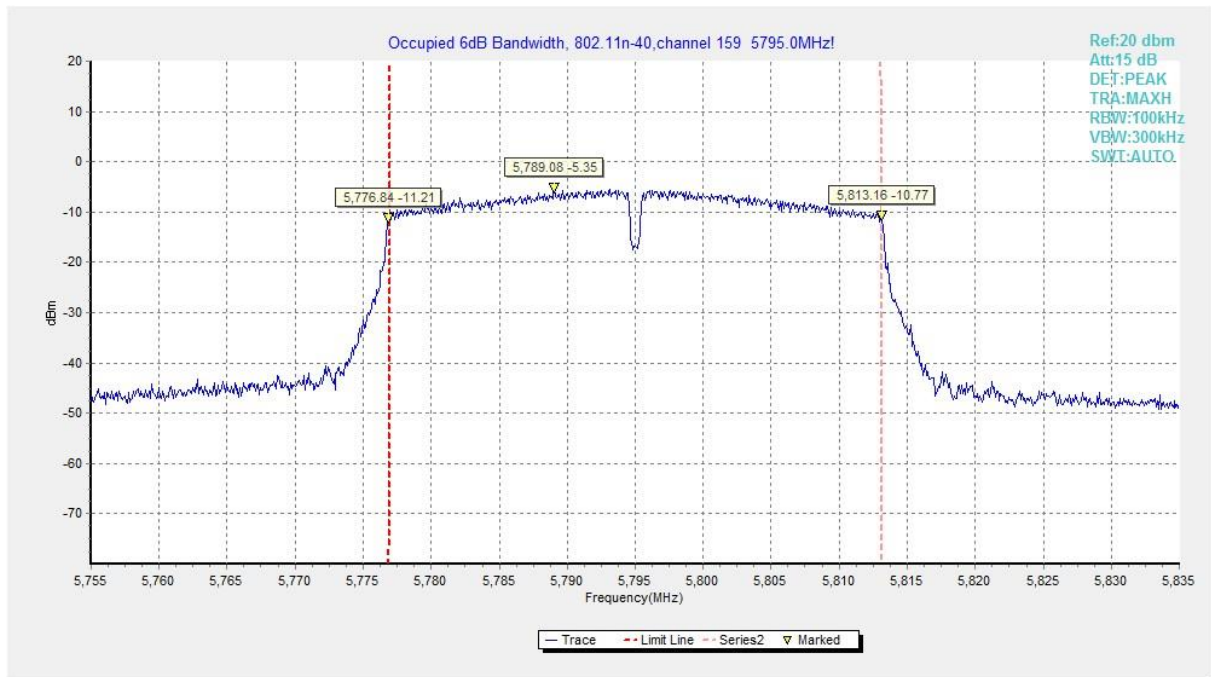


Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

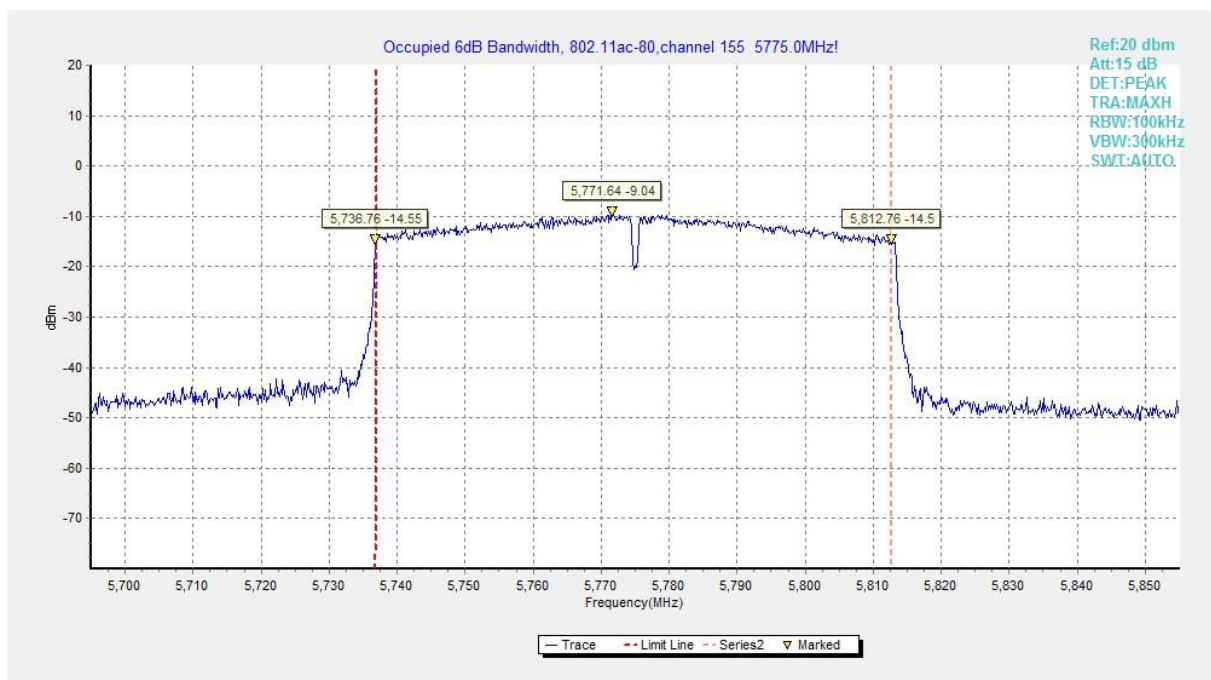


Fig. 9 Occupied 6dB Bandwidth (802.11ac-HT80, Ch 155)

## A.5. Transmitter Spurious Emission

### A.5.1 Transmitter Spurious Emission - Radiated

**Method of Measurement:** See ANSI C63.10-2013-clause 6.4 & 6.5 & 6.6

**Measurement Limit:**

| Standard                               | Limit                        |
|----------------------------------------|------------------------------|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB below peak output power |

radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

**Limit in restricted band:**

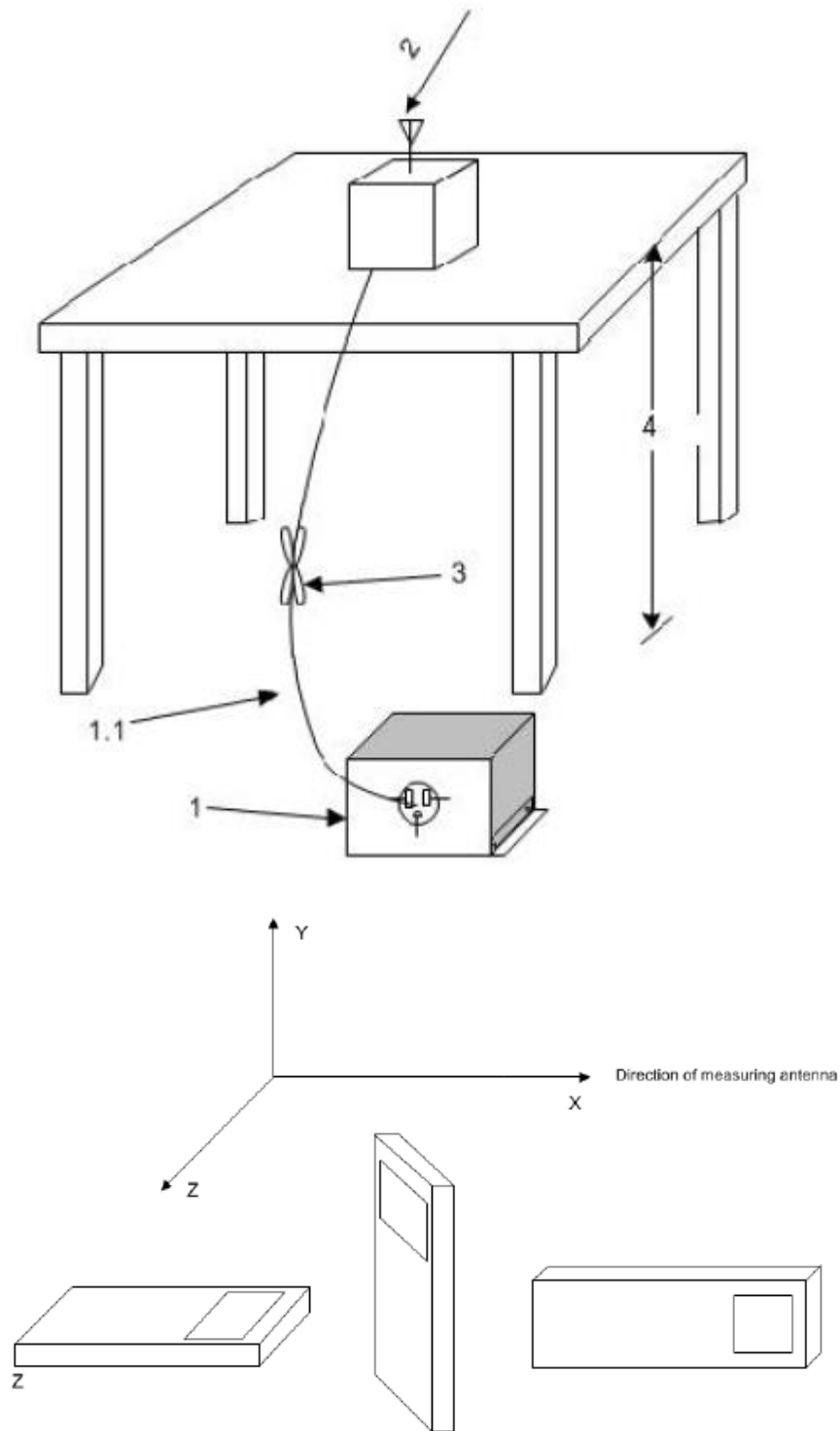
| Frequency (MHz) | Field strength( $\mu$ V/m) | Measurement distance (m) |
|-----------------|----------------------------|--------------------------|
| 0.009 - 0.490   | 2400/F(kHz)                | 300                      |
| 0.490 - 1.705   | 24000/F(kHz)               | 30                       |
| 1.705 – 30.0    | 30                         | 30                       |

| Frequency of emission (MHz) | Field strength( $\mu$ V/m) | Field strength(dBuV/m) |
|-----------------------------|----------------------------|------------------------|
| 30-88                       | 100                        | 40                     |
| 88-216                      | 150                        | 43.5                   |
| 216-960                     | 200                        | 46                     |
| Above 960                   | 500                        | 54                     |

**Set up:**

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m

The EUT and transmitting antenna shall be centered on the turntable.



### Test Condition

The EUT shall be tested 1 near top, 1 near middle, and 1 near bottom. Set the unlicensed wireless device to operate in continuous transmit mode. For unlicensed wireless devices unable to be configured for 100% duty cycle even in test mode, configure the system for the maximum duty cycle supported.

When required for unlicensed wireless devices, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the

nominal rated supply voltage.

### **Exploratory radiated emissions measurements**

Exploratory radiated measurements shall be performed at the measurement distance or at a closer distance than that specified for compliance to determine the emission characteristics of the EUT and, if applicable, the EUT configuration that produces the maximum level of emissions. The frequencies of maximum emission may be determined by manually positioning the antenna close to the EUT, and then moving the antenna over all sides of the EUT while observing a spectral display. It is advantageous to have prior knowledge of the frequencies of emissions, although this may be determined from such a near-field scan. The near-field scan shall only be used to determine the frequency but not the amplitude of the emissions. Where exploratory measurements are not adequate to determine the worst-case operating modes and are used only to identify the frequencies of the highest emissions, additional preliminary tests can be required.

For emissions from the EUT, the maximum level shall be determined by rotating the EUT and its antenna through 0° to 360°. For each mode of operation required to be tested, the frequency spectrum (based on findings from exploratory measurements) shall be monitored.

Broadband antennas and a spectrum analyzer or a radio-noise meter with a panoramic display are often useful in this type of test. If either antenna height or EUT azimuth are not fully measured during exploratory testing, then complete testing can be required at the OATS or semi-anechoic chamber when the final full spectrum testing is performed.

### **Final radiated emissions measurements**

The final measurements are using the orientation and equipment arrangement of the EUT based on the measurement results found during the preliminary (exploratory) measurements, the EUT arrangement, appropriate modulation, and modes of operation that produce the emissions that have the highest amplitude relative to the limit shall be selected for the final measurement.

For each mode of operation required to be tested, the frequency spectrum (based on findings from exploratory measurements) shall be monitored. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

For each mode selected, record the frequency and amplitude of the highest fundamental emission (if applicable), as well as the frequency and amplitude of the six highest spurious emissions relative to the limit. Emissions more than 20 dB below the limit do not need to be reported.

This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

#### **The receiver references:**

| Frequency of emission<br>(MHz) | RBW/VBW       | Sweep Time(s) |
|--------------------------------|---------------|---------------|
| 30-1000                        | 100KHz/300KHz | 5             |
| 1000-4000                      | 1MHz/3MHz     | 15            |
| 4000-18000                     | 1MHz/3MHz     | 40            |
| 18000-40000                    | 1MHz/3MHz     | 20            |

$P_{Mea}$  is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result=  $P_{Mea}$  + Cable Loss + Antenna Factor

Where:

$P_{Mea}$  field strength recorded from the instrument

**Conclusion: PASS**

**EUT ID: UT41a**

**Average Results:**

**Average Results:**

**802.11a**

Ch149

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17939.500          | 37.53                             | -25.50                | 46.66                       | 16.37                         | 54.00             | 16.47          | V                        |
| 17769.000          | 37.37                             | -25.50                | 46.66                       | 16.21                         | 54.00             | 16.63          | H                        |
| 12674.900          | 35.69                             | -30.47                | 39.06                       | 27.10                         | 54.00             | 18.31          | H                        |
| 14480.000          | 35.49                             | -28.59                | 42.46                       | 21.62                         | 54.00             | 18.51          | H                        |
| 7315.700           | 34.76                             | -35.00                | 36.55                       | 33.21                         | 54.00             | 19.24          | V                        |
| 11296.050          | 34.74                             | -32.36                | 38.77                       | 28.34                         | 54.00             | 19.26          | V                        |

Ch157

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17971.950          | 37.14                             | -25.50                | 46.66                       | 15.98                         | 54.00             | 16.86          | V                        |
| 17866.900          | 37.01                             | -25.50                | 46.66                       | 15.85                         | 54.00             | 16.99          | H                        |
| 14479.450          | 35.48                             | -28.59                | 42.46                       | 21.61                         | 54.00             | 18.52          | H                        |
| 13392.100          | 35.47                             | -29.49                | 39.71                       | 25.25                         | 54.00             | 18.53          | V                        |
| 11138.200          | 34.94                             | -32.60                | 38.75                       | 28.80                         | 54.00             | 19.06          | H                        |
| 10967.150          | 34.73                             | -32.82                | 38.70                       | 28.85                         | 54.00             | 19.27          | H                        |

Ch165

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17996.700          | 37.32                             | -25.50                | 46.66                       | 16.16                         | 54.00             | 16.68          | V                        |
| 17978.000          | 36.95                             | -25.50                | 46.66                       | 15.79                         | 54.00             | 17.05          | V                        |
| 13300.800          | 35.54                             | -29.49                | 39.71                       | 25.32                         | 54.00             | 18.46          | V                        |
| 13381.650          | 35.43                             | -29.49                | 39.71                       | 25.21                         | 54.00             | 18.57          | H                        |
| 11925.800          | 34.89                             | -31.48                | 39.09                       | 27.28                         | 54.00             | 19.11          | H                        |

|          |       |        |       |       |       |       |   |
|----------|-------|--------|-------|-------|-------|-------|---|
| 9497.550 | 34.77 | -33.19 | 37.93 | 30.04 | 54.00 | 19.23 | H |
|----------|-------|--------|-------|-------|-------|-------|---|

## 802.11n-HT20

### Ch149

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17746.450       | 36.84                       | -25.50          | 46.66                 | 15.68                   | 54.00          | 17.16       | H                  |
| 17996.150       | 36.36                       | -25.50          | 46.66                 | 15.20                   | 54.00          | 17.64       | V                  |
| 13329.950       | 35.21                       | -29.49          | 39.71                 | 24.99                   | 54.00          | 18.79       | V                  |
| 13331.050       | 35.16                       | -29.49          | 39.71                 | 24.94                   | 54.00          | 18.84       | V                  |
| 11880.700       | 34.88                       | -31.85          | 39.05                 | 27.68                   | 54.00          | 19.12       | H                  |
| 11924.700       | 34.76                       | -31.48          | 39.09                 | 27.15                   | 54.00          | 19.24       | H                  |

### Ch157

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17939.500       | 36.59                       | -25.50          | 46.66                 | 15.43                   | 54.00          | 17.41       | H                  |
| 17992.850       | 36.55                       | -25.50          | 46.66                 | 15.39                   | 54.00          | 17.45       | V                  |
| 13382.200       | 35.10                       | -29.49          | 39.71                 | 24.88                   | 54.00          | 18.90       | V                  |
| 13393.200       | 35.01                       | -29.49          | 39.71                 | 24.79                   | 54.00          | 18.99       | H                  |
| 7293.150        | 34.72                       | -35.00          | 36.55                 | 33.17                   | 54.00          | 19.28       | H                  |
| 7292.050        | 34.57                       | -35.00          | 36.55                 | 33.02                   | 54.00          | 19.43       | H                  |

### Ch165

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17700.250       | 36.97                       | -25.74          | 45.95                 | 16.76                   | 54.00          | 17.03       | H                  |
| 17709.600       | 36.65                       | -25.74          | 45.95                 | 16.44                   | 54.00          | 17.35       | H                  |
| 13381.100       | 35.49                       | -29.49          | 39.71                 | 25.27                   | 54.00          | 18.51       | V                  |
| 13397.050       | 35.30                       | -29.49          | 39.71                 | 25.08                   | 54.00          | 18.70       | H                  |
| 11920.300       | 34.68                       | -31.48          | 39.09                 | 27.07                   | 54.00          | 19.32       | H                  |
| 11908.750       | 34.62                       | -31.85          | 39.05                 | 27.42                   | 54.00          | 19.38       | V                  |

**802.11n-HT40**
**Ch151**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17988.450       | 36.83                       | -25.50          | 46.66                 | 15.67                   | 54.00          | 17.17       | H                  |
| 17703.000       | 36.77                       | -25.74          | 45.95                 | 16.56                   | 54.00          | 17.23       | V                  |
| 13396.500       | 35.77                       | -29.49          | 39.71                 | 25.55                   | 54.00          | 18.23       | H                  |
| 13337.100       | 35.74                       | -29.49          | 39.71                 | 25.52                   | 54.00          | 18.26       | H                  |
| 10738.900       | 34.76                       | -32.77          | 38.49                 | 29.04                   | 54.00          | 19.24       | V                  |
| 11893.900       | 34.65                       | -31.85          | 39.05                 | 27.45                   | 54.00          | 19.35       | H                  |

**Ch159**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17714.550       | 36.87                       | -25.74          | 45.95                 | 16.66                   | 54.00          | 17.13       | H                  |
| 17717.300       | 36.55                       | -25.74          | 45.95                 | 16.34                   | 54.00          | 17.45       | H                  |
| 11909.300       | 35.28                       | -31.85          | 39.05                 | 28.08                   | 54.00          | 18.72       | V                  |
| 13360.750       | 35.24                       | -29.49          | 39.71                 | 25.02                   | 54.00          | 18.76       | V                  |
| 13339.850       | 35.17                       | -29.49          | 39.71                 | 24.95                   | 54.00          | 18.83       | V                  |
| 11891.700       | 34.74                       | -31.85          | 39.05                 | 27.54                   | 54.00          | 19.26       | V                  |

**802.11ac-HT20**
**Ch149**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17705.750       | 36.32                       | -25.74          | 45.95                 | 16.11                   | 54.00          | 17.68       | V                  |
| 17703.550       | 36.28                       | -25.74          | 45.95                 | 16.07                   | 54.00          | 17.72       | H                  |
| 13294.750       | 35.77                       | -29.49          | 39.71                 | 25.55                   | 54.00          | 18.23       | H                  |
| 13323.900       | 35.23                       | -29.49          | 39.71                 | 25.01                   | 54.00          | 18.77       | H                  |
| 7325.600        | 34.62                       | -35.13          | 36.65                 | 33.10                   | 54.00          | 19.38       | V                  |
| 11891.150       | 34.61                       | -31.85          | 39.05                 | 27.41                   | 54.00          | 19.39       | V                  |

## Ch157

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17712.350          | 36.82                             | -25.74                | 45.95                       | 16.61                         | 54.00             | 17.18          | H                        |
| 17703.550          | 36.39                             | -25.74                | 45.95                       | 16.18                         | 54.00             | 17.61          | V                        |
| 13389.900          | 35.19                             | -29.49                | 39.71                       | 24.97                         | 54.00             | 18.81          | V                        |
| 13397.600          | 35.15                             | -29.49                | 39.71                       | 24.93                         | 54.00             | 18.85          | V                        |
| 9489.850           | 35.00                             | -33.19                | 37.93                       | 30.27                         | 54.00             | 19.00          | H                        |
| 11033.150          | 34.78                             | -32.49                | 38.72                       | 28.54                         | 54.00             | 19.22          | H                        |

## Ch165

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17996.150          | 36.50                             | -25.50                | 46.66                       | 15.34                         | 54.00             | 17.50          | H                        |
| 17714.000          | 36.48                             | -25.74                | 45.95                       | 16.27                         | 54.00             | 17.52          | V                        |
| 13377.250          | 36.03                             | -29.49                | 39.71                       | 25.81                         | 54.00             | 17.97          | V                        |
| 13357.450          | 35.50                             | -29.49                | 39.71                       | 25.28                         | 54.00             | 18.50          | H                        |
| 11908.750          | 35.02                             | -31.85                | 39.05                       | 27.82                         | 54.00             | 18.98          | V                        |
| 11936.800          | 34.84                             | -31.48                | 39.09                       | 27.23                         | 54.00             | 19.16          | V                        |

## 802.11ac-HT40

## Ch151

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17997.250          | 37.18                             | -25.50                | 46.66                       | 16.02                         | 54.00             | 16.82          | H                        |
| 17845.450          | 36.94                             | -25.50                | 46.66                       | 15.78                         | 54.00             | 17.06          | H                        |
| 13331.050          | 35.61                             | -29.49                | 39.71                       | 25.39                         | 54.00             | 18.39          | V                        |
| 13329.950          | 35.49                             | -29.49                | 39.71                       | 25.27                         | 54.00             | 18.51          | V                        |
| 11869.150          | 34.71                             | -31.85                | 39.05                       | 27.51                         | 54.00             | 19.29          | H                        |
| 11923.600          | 34.70                             | -31.48                | 39.09                       | 27.09                         | 54.00             | 19.30          | V                        |

## Ch159

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17998.350       | 36.97                       | -25.50          | 46.66                 | 15.81                   | 54.00          | 17.03       | V                  |
| 17711.800       | 36.72                       | -25.74          | 45.95                 | 16.51                   | 54.00          | 17.28       | V                  |
| 13329.950       | 35.46                       | -29.49          | 39.71                 | 25.24                   | 54.00          | 18.54       | V                  |
| 13325.000       | 35.44                       | -29.49          | 39.71                 | 25.22                   | 54.00          | 18.56       | H                  |
| 11840.000       | 34.92                       | -31.85          | 39.05                 | 27.72                   | 54.00          | 19.08       | V                  |
| 11910.950       | 34.60                       | -31.85          | 39.05                 | 27.40                   | 54.00          | 19.40       | V                  |

## 802.11ac-HT80

## Ch155

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17728.850       | 36.97                       | -25.74          | 45.95                 | 16.76                   | 54.00          | 17.03       | V                  |
| 17710.150       | 36.36                       | -25.74          | 45.95                 | 16.15                   | 54.00          | 17.64       | H                  |
| 13328.850       | 35.40                       | -29.49          | 39.71                 | 25.18                   | 54.00          | 18.60       | V                  |
| 13399.250       | 35.03                       | -29.49          | 39.71                 | 24.81                   | 54.00          | 18.97       | V                  |
| 11940.650       | 34.75                       | -31.48          | 39.09                 | 27.14                   | 54.00          | 19.25       | V                  |
| 7311.300        | 34.66                       | -35.00          | 36.55                 | 33.11                   | 54.00          | 19.34       | V                  |

## Peak Results:

## 802.11a

## Ch149

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17313.050       | 48.87                       | -25.95          | 44.35                 | 30.46                   | 68.20          | 19.33       | H                  |
| 17787.700       | 48.41                       | -25.50          | 46.66                 | 27.25                   | 74.00          | 25.59       | H                  |
| 16936.300       | 47.48                       | -26.32          | 42.36                 | 31.43                   | 68.20          | 20.72       | V                  |
| 14077.950       | 47.04                       | -29.44          | 41.66                 | 34.82                   | 68.20          | 21.16       | V                  |
| 10505.150       | 45.99                       | -32.99          | 38.27                 | 40.70                   | 68.20          | 22.21       | H                  |
| 10737.800       | 45.28                       | -32.77          | 38.49                 | 39.56                   | 74.00          | 28.72       | V                  |

## Ch157

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17120.550          | 49.03                             | -26.60                | 43.36                       | 32.27                         | 68.20             | 19.17          | H                        |
| 17303.150          | 48.86                             | -25.95                | 44.35                       | 30.45                         | 68.20             | 19.34          | V                        |
| 16963.250          | 47.49                             | -26.32                | 42.36                       | 31.44                         | 68.20             | 20.71          | H                        |
| 14574.050          | 46.80                             | -27.29                | 41.90                       | 32.19                         | 68.20             | 21.40          | V                        |
| 8653.300           | 45.33                             | -34.38                | 37.93                       | 41.78                         | 68.20             | 22.87          | H                        |
| 10460.600          | 45.24                             | -33.22                | 38.19                       | 40.27                         | 68.20             | 22.96          | H                        |

## Ch165

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17335.600          | 48.17                             | -25.95                | 44.35                       | 29.76                         | 68.20             | 20.03          | H                        |
| 17237.150          | 47.77                             | -25.95                | 44.35                       | 29.36                         | 68.20             | 20.43          | H                        |
| 13917.350          | 47.49                             | -29.51                | 41.30                       | 35.70                         | 68.20             | 20.71          | H                        |
| 16946.200          | 47.27                             | -26.32                | 42.36                       | 31.22                         | 68.20             | 20.93          | V                        |
| 9339.150           | 45.89                             | -33.91                | 37.97                       | 41.83                         | 74.00             | 28.11          | V                        |
| 10137.750          | 45.51                             | -33.45                | 38.13                       | 40.83                         | 68.20             | 22.69          | H                        |

## 802.11n-HT20

## Ch149

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17316.900          | 47.69                             | -25.95                | 44.35                       | 29.28                         | 68.20             | 20.51          | V                        |
| 17349.900          | 47.56                             | -25.95                | 44.35                       | 29.15                         | 68.20             | 20.64          | V                        |
| 16938.500          | 46.26                             | -26.32                | 42.36                       | 30.21                         | 68.20             | 21.94          | H                        |
| 14321.050          | 46.23                             | -28.42                | 42.34                       | 32.31                         | 68.20             | 21.97          | V                        |
| 11928.550          | 45.42                             | -31.48                | 39.09                       | 37.81                         | 74.00             | 28.58          | V                        |
| 9096.600           | 45.39                             | -33.76                | 38.13                       | 41.02                         | 74.00             | 28.61          | H                        |

## Ch157

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17222.300          | 48.56                             | -25.95                | 44.35                       | 30.15                         | 68.20             | 19.64          | V                        |
| 17232.750          | 47.82                             | -25.95                | 44.35                       | 29.41                         | 68.20             | 20.38          | V                        |
| 13828.800          | 46.61                             | -29.10                | 40.86                       | 34.84                         | 68.20             | 21.59          | H                        |
| 16856.550          | 46.24                             | -26.62                | 41.49                       | 31.37                         | 68.20             | 21.96          | V                        |
| 11942.850          | 45.91                             | -31.48                | 39.09                       | 38.30                         | 74.00             | 28.09          | V                        |
| 11929.650          | 45.60                             | -31.48                | 39.09                       | 37.99                         | 74.00             | 28.40          | H                        |

## Ch165

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17265.200          | 47.74                             | -25.95                | 44.35                       | 29.33                         | 68.20             | 20.46          | H                        |
| 17203.600          | 47.29                             | -26.60                | 43.36                       | 30.53                         | 68.20             | 20.91          | H                        |
| 14332.600          | 46.55                             | -28.42                | 42.34                       | 32.63                         | 68.20             | 21.65          | V                        |
| 14377.150          | 46.04                             | -28.42                | 42.34                       | 32.12                         | 68.20             | 22.16          | H                        |
| 10578.300          | 45.17                             | -32.76                | 38.38                       | 39.55                         | 68.20             | 23.03          | V                        |
| 10470.500          | 45.04                             | -32.99                | 38.27                       | 39.75                         | 68.20             | 23.16          | V                        |

## 802.11n-HT40

## Ch151

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17146.400          | 47.52                             | -26.60                | 43.36                       | 30.76                         | 68.20             | 20.68          | V                        |
| 17289.400          | 47.36                             | -25.95                | 44.35                       | 28.95                         | 68.20             | 20.84          | V                        |
| 12717.800          | 46.90                             | -30.47                | 39.06                       | 38.31                         | 68.20             | 21.30          | V                        |
| 14389.250          | 46.43                             | -28.42                | 42.34                       | 32.51                         | 68.20             | 21.77          | H                        |
| 7289.850           | 45.56                             | -35.00                | 36.55                       | 44.01                         | 74.00             | 28.44          | V                        |
| 10446.850          | 45.47                             | -33.22                | 38.19                       | 40.50                         | 68.20             | 22.73          | H                        |

## Ch159

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17238.800          | 47.56                             | -25.95                | 44.35                       | 29.15                         | 68.20             | 20.64          | H                        |
| 17256.950          | 47.38                             | -25.95                | 44.35                       | 28.97                         | 68.20             | 20.82          | H                        |
| 13279.350          | 46.11                             | -29.67                | 39.55                       | 36.23                         | 74.00             | 27.89          | V                        |
| 16841.700          | 46.06                             | -26.62                | 41.49                       | 31.19                         | 68.20             | 22.14          | H                        |
| 10359.400          | 44.89                             | -33.68                | 38.17                       | 40.39                         | 68.20             | 23.31          | V                        |
| 10429.800          | 44.82                             | -33.22                | 38.19                       | 39.85                         | 68.20             | 23.38          | H                        |

## 802.11ac-HT20

## Ch149

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17141.450          | 47.64                             | -26.60                | 43.36                       | 30.88                         | 68.20             | 20.56          | V                        |
| 17143.100          | 47.49                             | -26.60                | 43.36                       | 30.73                         | 68.20             | 20.71          | H                        |
| 12732.100          | 45.81                             | -30.47                | 39.06                       | 37.22                         | 68.20             | 22.39          | H                        |
| 12860.250          | 45.73                             | -30.69                | 39.14                       | 37.28                         | 68.20             | 22.47          | V                        |
| 11841.100          | 45.46                             | -31.85                | 39.05                       | 38.26                         | 74.00             | 28.54          | H                        |
| 10491.400          | 45.28                             | -32.99                | 38.27                       | 39.99                         | 68.20             | 22.92          | V                        |

## Ch157

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 7313.500           | 47.19                             | -35.00                | 36.55                       | 45.64                         | 74.00             | 26.81          | V                        |
| 17684.300          | 47.11                             | -25.74                | 45.95                       | 26.90                         | 68.20             | 21.09          | V                        |
| 17248.700          | 47.05                             | -25.95                | 44.35                       | 28.64                         | 68.20             | 21.15          | H                        |
| 13911.300          | 45.97                             | -29.51                | 41.30                       | 34.18                         | 68.20             | 22.23          | H                        |
| 14329.300          | 45.84                             | -28.42                | 42.34                       | 31.92                         | 68.20             | 22.36          | V                        |
| 10494.150          | 45.27                             | -32.99                | 38.27                       | 39.98                         | 68.20             | 22.93          | V                        |

## Ch165

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17984.600          | 47.12                             | -25.50                | 46.66                       | 25.96                         | 74.00             | 26.88          | V                        |
| 17689.250          | 46.92                             | -25.74                | 45.95                       | 26.71                         | 68.20             | 21.28          | V                        |
| 14332.600          | 46.45                             | -28.42                | 42.34                       | 32.53                         | 68.20             | 21.75          | H                        |
| 16770.200          | 46.11                             | -26.62                | 41.49                       | 31.24                         | 68.20             | 22.09          | V                        |
| 10540.900          | 45.77                             | -32.99                | 38.27                       | 40.48                         | 68.20             | 22.43          | V                        |
| 11925.250          | 45.42                             | -31.48                | 39.09                       | 37.81                         | 74.00             | 28.58          | V                        |

## 802.11ac-HT40

## Ch151

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17671.650          | 48.36                             | -25.74                | 45.95                       | 28.15                         | 68.20             | 19.84          | V                        |
| 17232.200          | 47.93                             | -25.95                | 44.35                       | 29.52                         | 68.20             | 20.27          | V                        |
| 14332.600          | 46.73                             | -28.42                | 42.34                       | 32.81                         | 68.20             | 21.47          | H                        |
| 14360.650          | 46.71                             | -28.42                | 42.34                       | 32.79                         | 68.20             | 21.49          | H                        |
| 9420.000           | 45.27                             | -32.95                | 37.91                       | 40.30                         | 74.00             | 28.73          | V                        |
| 10776.300          | 45.12                             | -32.77                | 38.49                       | 39.40                         | 74.00             | 28.88          | V                        |

## Ch159

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17344.950          | 48.04                             | -25.95                | 44.35                       | 29.63                         | 68.20             | 20.16          | V                        |
| 17268.500          | 48.03                             | -25.95                | 44.35                       | 29.62                         | 68.20             | 20.17          | V                        |
| 14395.850          | 46.95                             | -28.59                | 42.46                       | 33.08                         | 68.20             | 21.25          | V                        |
| 16887.900          | 46.93                             | -26.32                | 42.36                       | 30.88                         | 68.20             | 21.27          | V                        |
| 10371.500          | 46.53                             | -33.22                | 38.19                       | 41.56                         | 68.20             | 21.67          | V                        |
| 10486.450          | 45.31                             | -32.99                | 38.27                       | 40.02                         | 68.20             | 22.89          | H                        |

**802.11ac-HT80**
**Ch155**

| Frequency<br>(MHz) | Measurement<br>Result<br>(dBμV/m) | Cable<br>loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Receiver<br>Reading<br>(dBμV) | Limit<br>(dBμV/m) | Margin<br>(dB) | Antenna<br>Pol.<br>(H/V) |
|--------------------|-----------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------|----------------|--------------------------|
| 17819.050          | 47.31                             | -25.50                | 46.66                       | 26.15                         | 74.00             | 26.69          | H                        |
| 17230.550          | 47.10                             | -25.95                | 44.35                       | 28.69                         | 68.20             | 21.10          | V                        |
| 16868.650          | 45.95                             | -26.62                | 41.49                       | 31.08                         | 68.20             | 22.25          | H                        |
| 16234.500          | 45.79                             | -27.10                | 39.31                       | 33.58                         | 68.20             | 22.41          | H                        |
| 10269.750          | 45.39                             | -33.68                | 38.17                       | 40.89                         | 68.20             | 22.81          | H                        |
| 10151.500          | 45.01                             | -33.45                | 38.13                       | 40.33                         | 68.20             | 23.19          | H                        |

Sample calculation: 802.11ac 80MHz CH155–Peak, 17819.050MHz

$$\text{Peak ERP} = P_{\text{Mea}}(26.15\text{dBuV/m}) + \text{Cable Loss}(-25.50\text{dB}) + \text{Antenna Factor}(46.66\text{dB/m}) = 47.31 \text{ dBuV/m}$$

## A.6. Band Edges Compliance

### A6.1 Band Edges - Radiated

#### Measurement Limit:

| Standard                  | Limit (dBm/MHz)                                |      |
|---------------------------|------------------------------------------------|------|
| FCC 47 CFR<br>Part 15.407 | at the band edge                               | 27   |
|                           | at 5 MHz above or below the band edge          | 15.6 |
|                           | at 25 MHz above or below the band edge         | 10   |
|                           | at 75 MHz or more above or below the band edge | -27  |
|                           | Note: increasing linearly from point to point. |      |

The measurement is made according to KDB 789033 D02

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

#### Measurement Result:

| Mode             | Channel  | Test Results | Conclusion |
|------------------|----------|--------------|------------|
| 802.11a          | 5745 MHz | Fig.10       | P          |
|                  | 5825 MHz | Fig.11       | P          |
| 802.11n<br>HT20  | 5745 MHz | Fig.12       | P          |
|                  | 5825 MHz | Fig.13       | P          |
| 802.11ac<br>HT20 | 5745 MHz | Fig.14       | P          |
|                  | 5825 MHz | Fig.15       | P          |

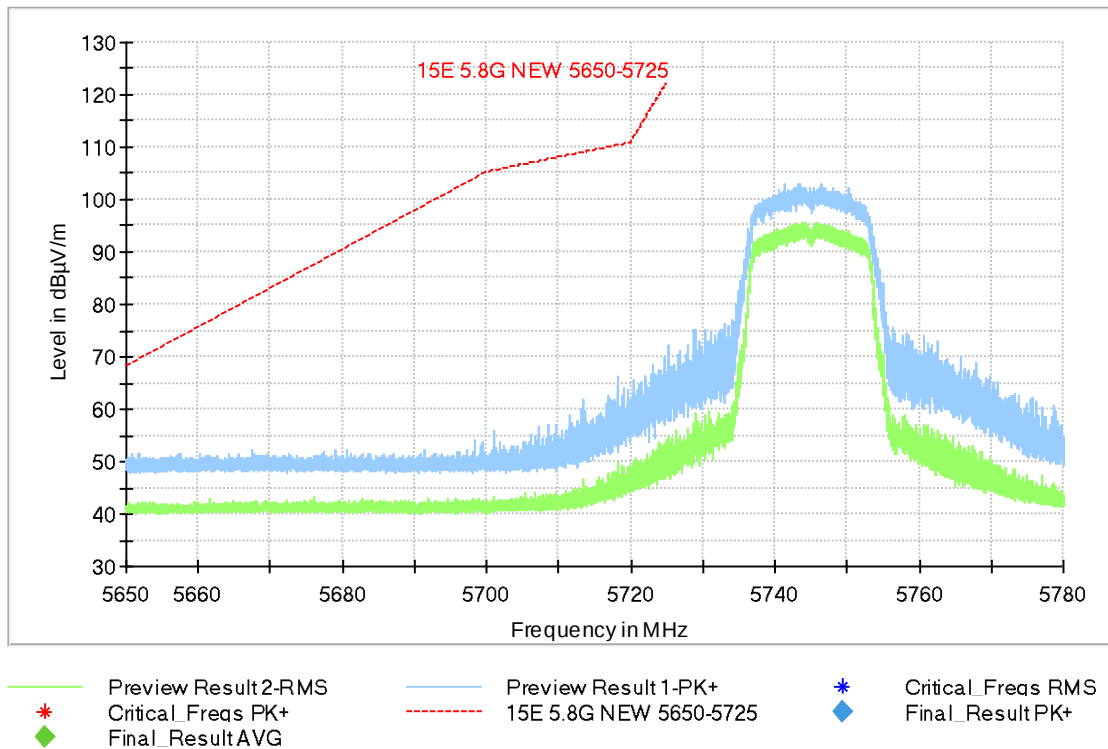
|                  |          |        |   |
|------------------|----------|--------|---|
| 802.11n<br>HT40  | 5755 MHz | Fig.16 | P |
|                  | 5795 MHz | Fig.17 | P |
| 802.11ac<br>HT40 | 5755 MHz | Fig.18 | P |
|                  | 5795 MHz | Fig.19 | P |
| 802.11ac HT80    | 5775 MHz | Fig.20 | P |
|                  | 5775 MHz | Fig.21 | P |

**Conclusion: PASS**

**EUT ID: UT41a**

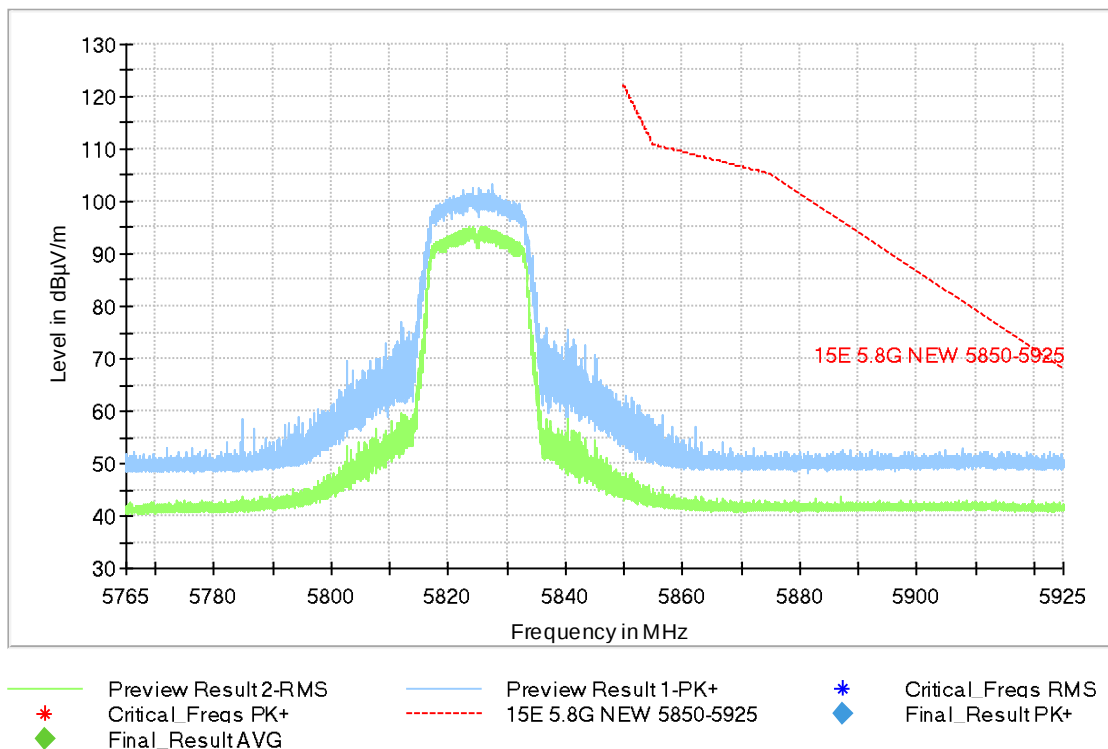
**Test graphs as below:**

Full Spectrum



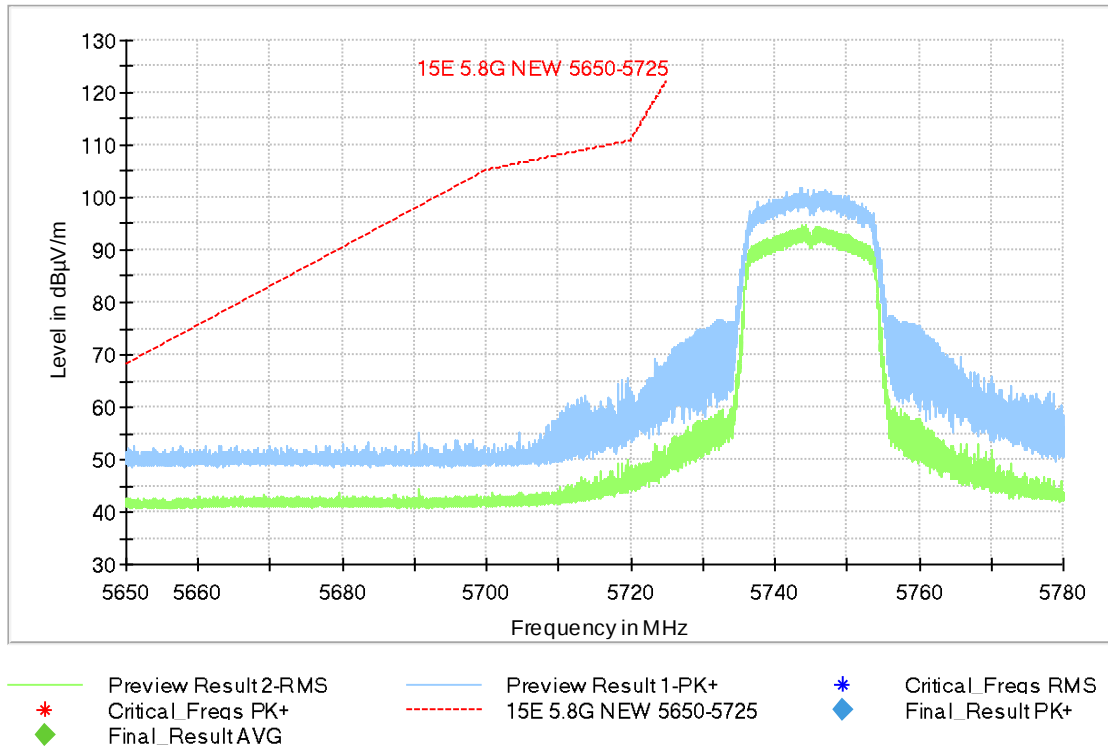
**Fig. 10 Band Edges (802.11a, 5745MHz)**

Full Spectrum



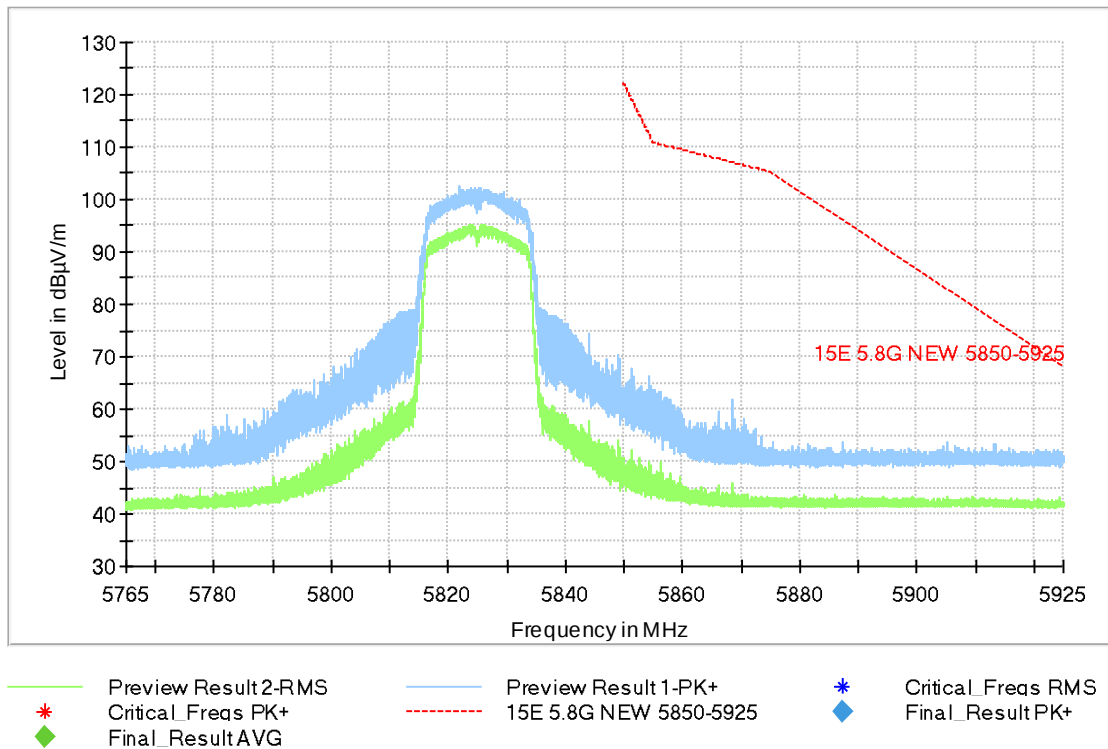
**Fig. 11 Band Edges (802.11a, 5825MHz)**

Full Spectrum



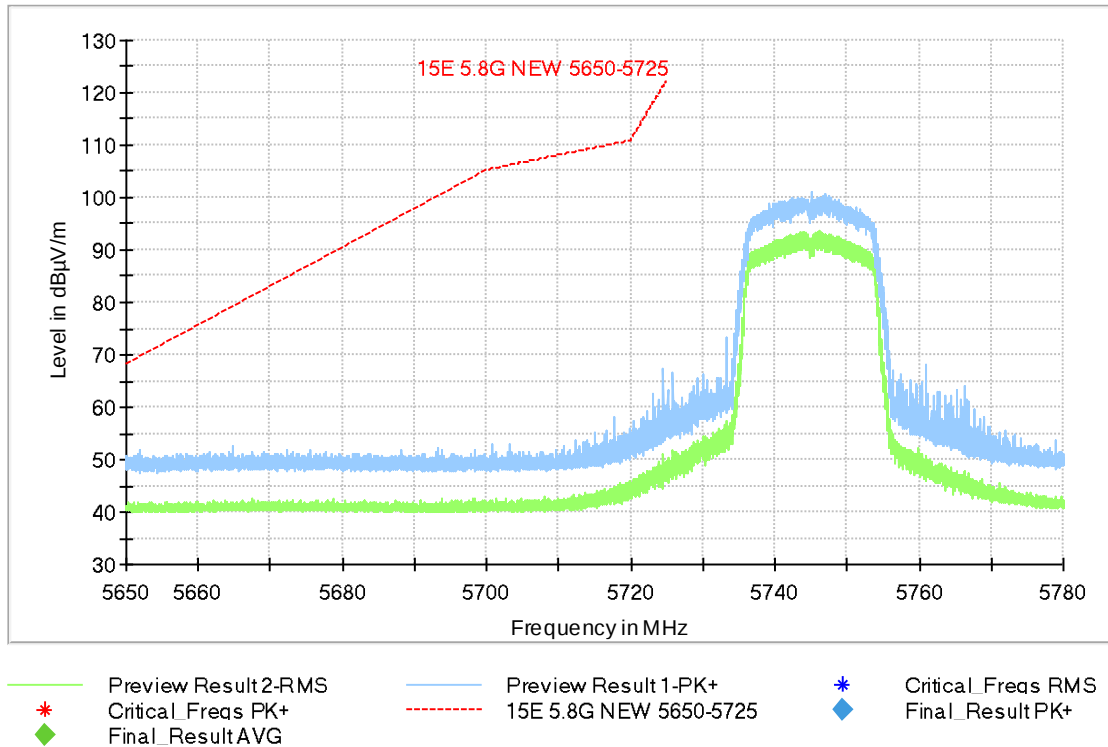
**Fig. 12 Band Edges (802.11n-HT20, 5745MHz)**

Full Spectrum



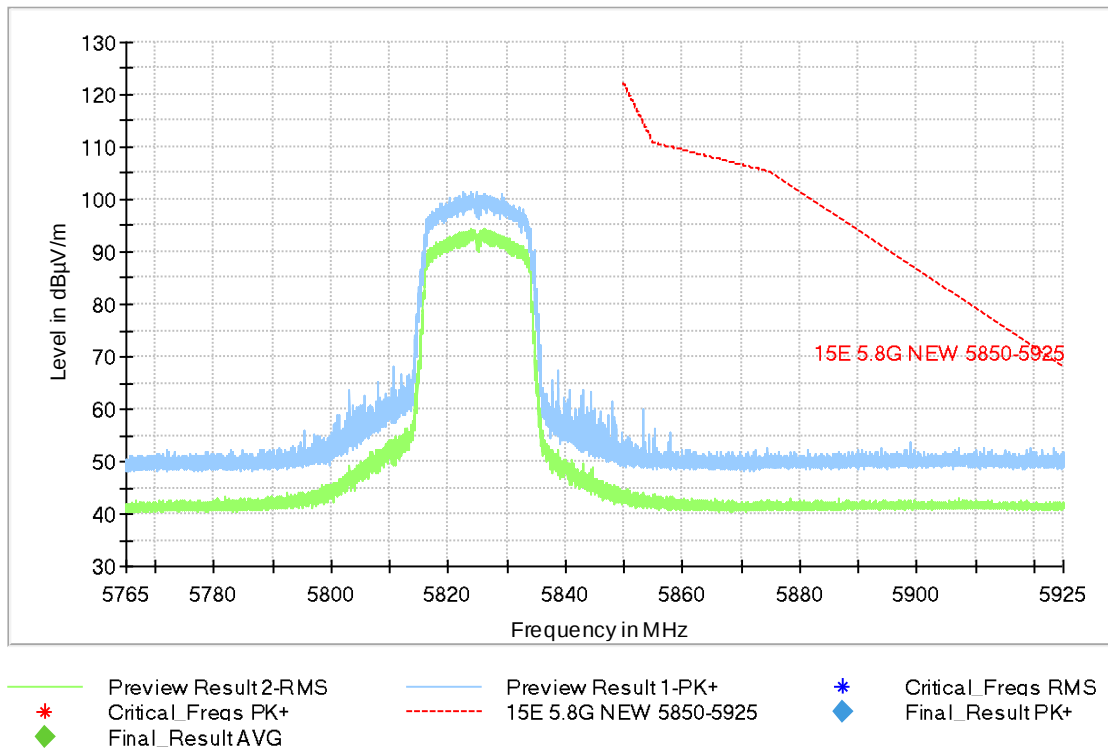
**Fig. 13 Band Edges (802.11n-HT20, 5825MHz)**

Full Spectrum



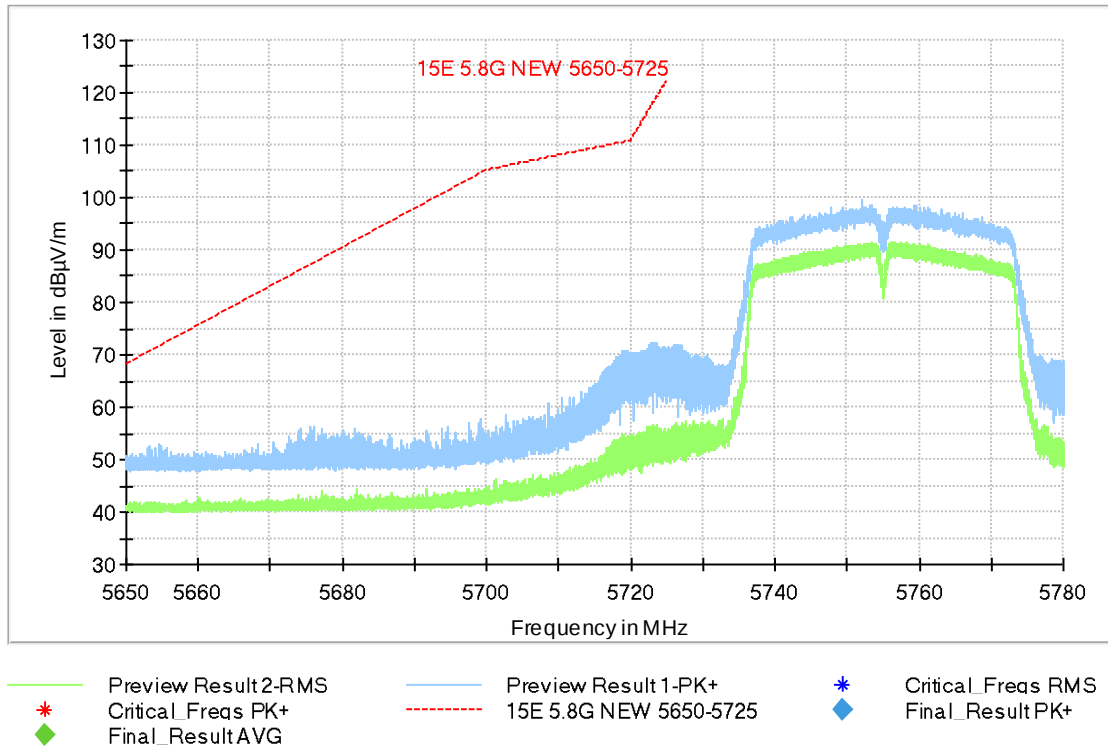
**Fig. 14 Band Edges (802.11ac-HT20, 5745MHz)**

Full Spectrum



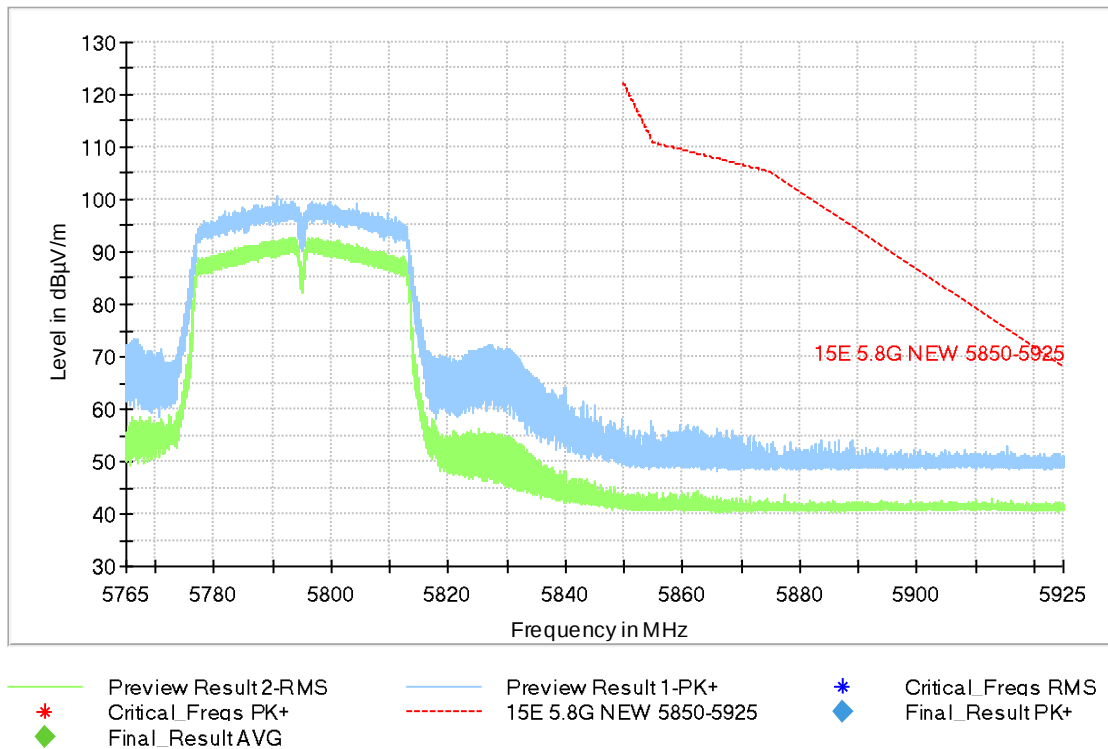
**Fig. 15 Band Edges (802.11ac-HT20, 5825MHz)**

Full Spectrum



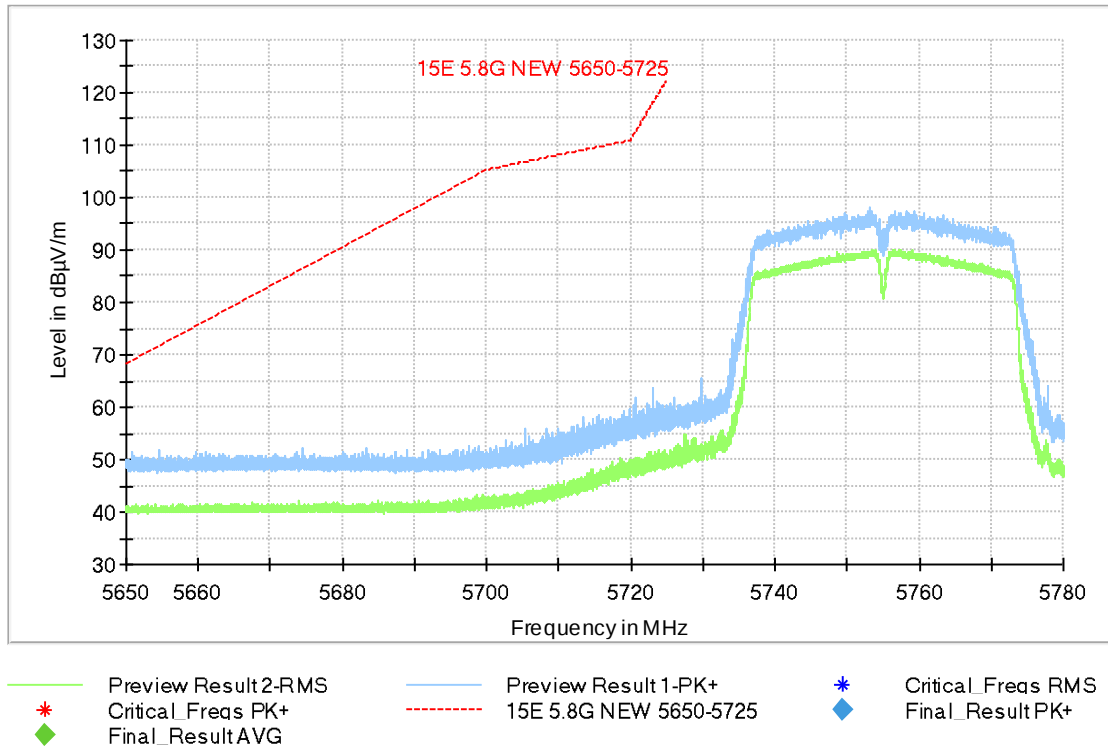
**Fig. 16 Band Edges (802.11n-HT40, 5755MHz)**

Full Spectrum



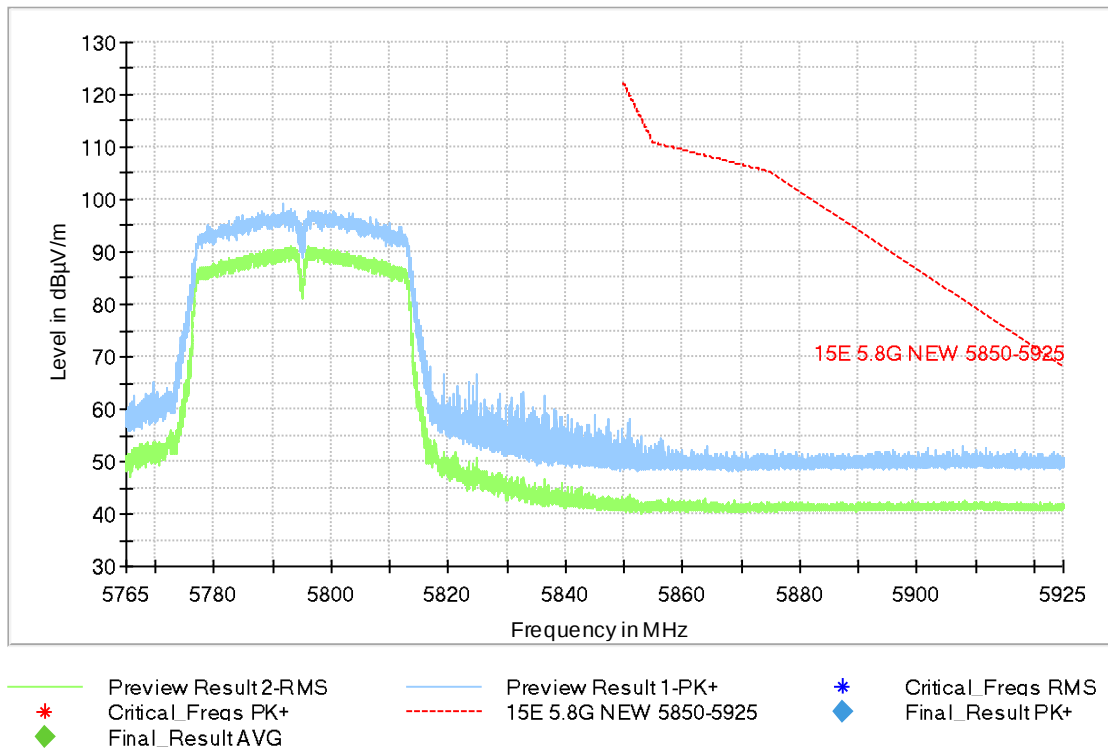
**Fig. 17 Band Edges (802.11n-HT40, 5795MHz)**

Full Spectrum



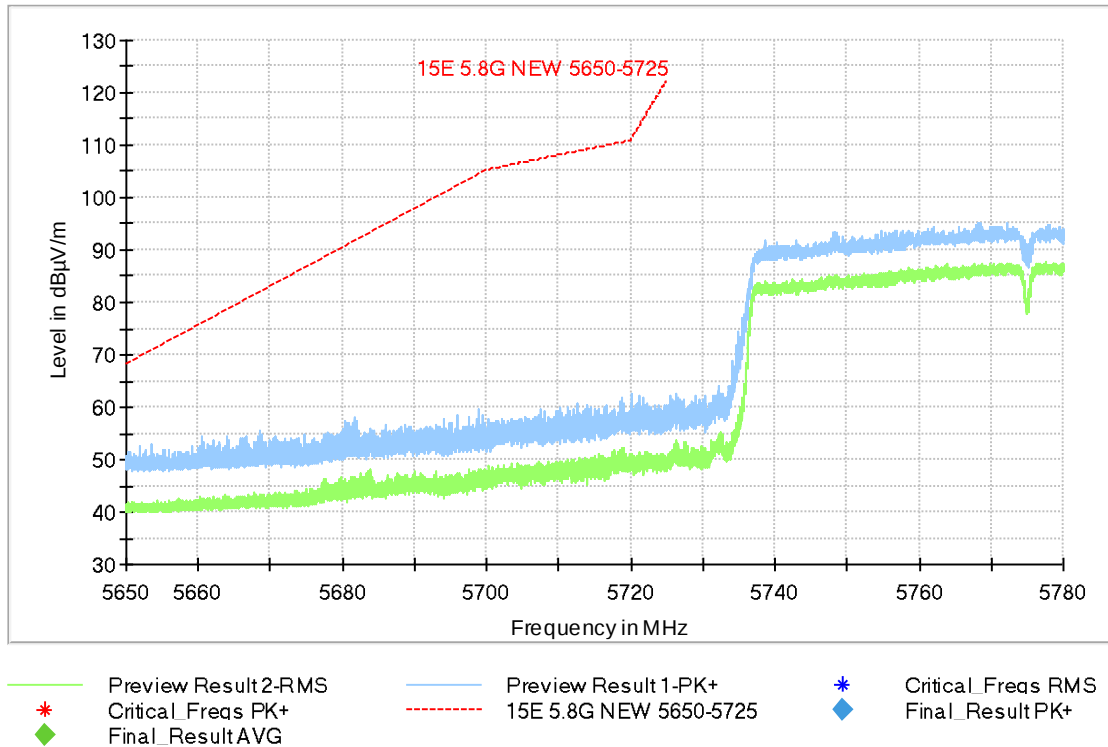
**Fig. 18 Band Edges (802.11ac-HT40, 5755MHz)**

Full Spectrum



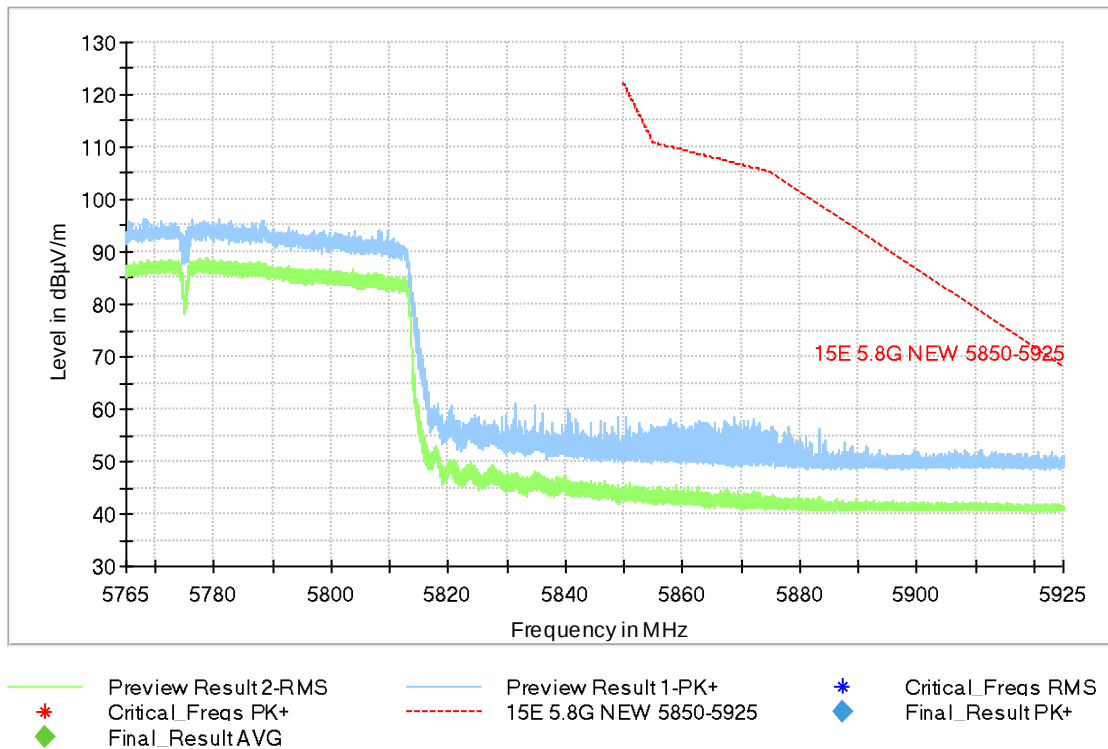
**Fig. 19 Band Edges (802.11ac-HT40, 5795MHz)**

Full Spectrum



**Fig. 20 Band Edges (802.11ac-HT80, 5775MHz)**

Full Spectrum



**Fig. 21 Band Edges (802.11ac-HT80, 5775MHz)**

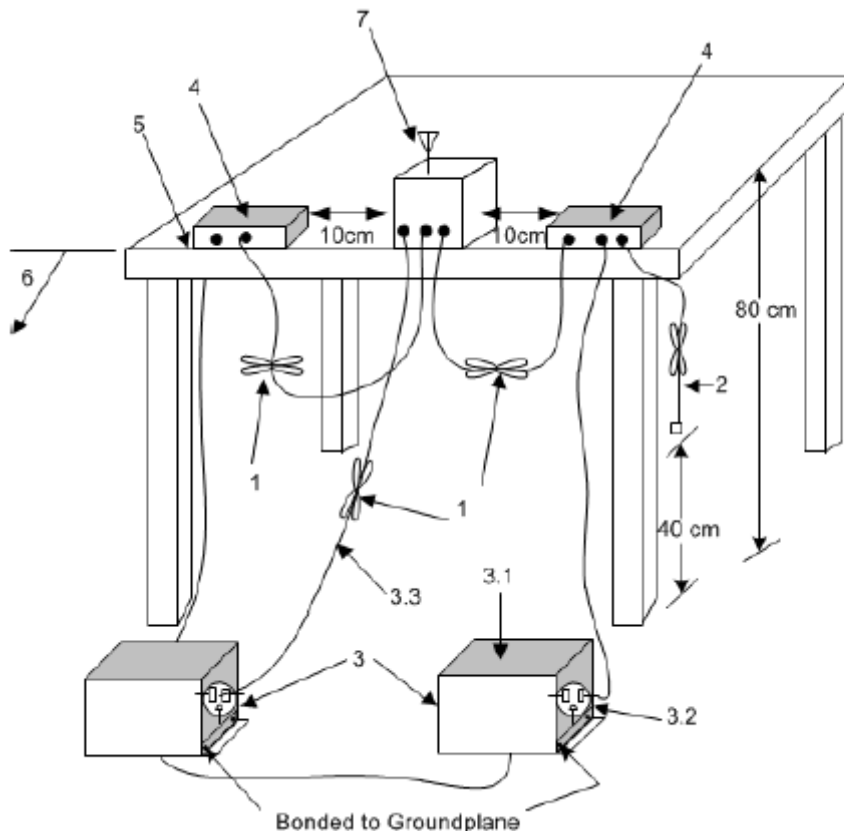
## A.7. AC Powerline Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2

### Setup:

A stand-alone EUT shall be placed in the center along the back edge of the tabletop. For multiunit tabletop systems, the EUT shall be centered laterally (left to right facing the tabletop) on the tabletop and its rear shall be flush with the rear of the table.

Accessories that are part of an EUT system tested on a tabletop shall be placed in a test arrangement on one or both sides of the host with a 10 cm separation between the nearest points of the cabinets. The rear of the host and accessories shall be flush with the back of the supporting tabletop unless that would not be typical of normal use. If more than two accessories are present, then an equipment test arrangement shall be chosen that maintains 10 cm spacing between cabinets unless the equipment is normally located closer together.



### Exploratory ac power-line conducted emission measurements

Exploratory measurements shall be used to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement. For each mode of operation and for each ac power current-carrying conductor, cable manipulation shall be performed within the range of likely configurations. For this measurement or series of measurements, the frequency spectrum of interest shall be monitored looking for the emission that has the highest amplitude relative to the limit. Once that emission is found for each current-carrying conductor of each power cord associated with the EUT (but not the cords associated with non-EUT equipment in the overall system), the one configuration and arrangement and mode of operation that produces the emission closest to the limit over all of the

measured conductors shall be recorded.

### Final ac power-line conducted emission measurements

Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation. If the EUT is composed of equipment units that have their own separate ac power connections (e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network), then each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be measured separately. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

### Test Condition:

| Voltage (V) | Frequency (Hz) |
|-------------|----------------|
| 120         | 60             |

### Measurement Result and limit:

EUT ID:UT41a

WLAN (Quasi-peak Limit)

| Frequency range<br>(MHz) | Quasi-peak<br>Limit (dBμV) | Result (dBμV) |        | Conclusion |
|--------------------------|----------------------------|---------------|--------|------------|
|                          |                            | With charger  |        |            |
|                          |                            | 802.11a       | Idle   |            |
| 0.15 to 0.5              | 66 to 56                   | Fig.22        | Fig.23 | P          |
| 0.5 to 5                 | 56                         |               |        |            |
| 5 to 30                  | 60                         |               |        |            |

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

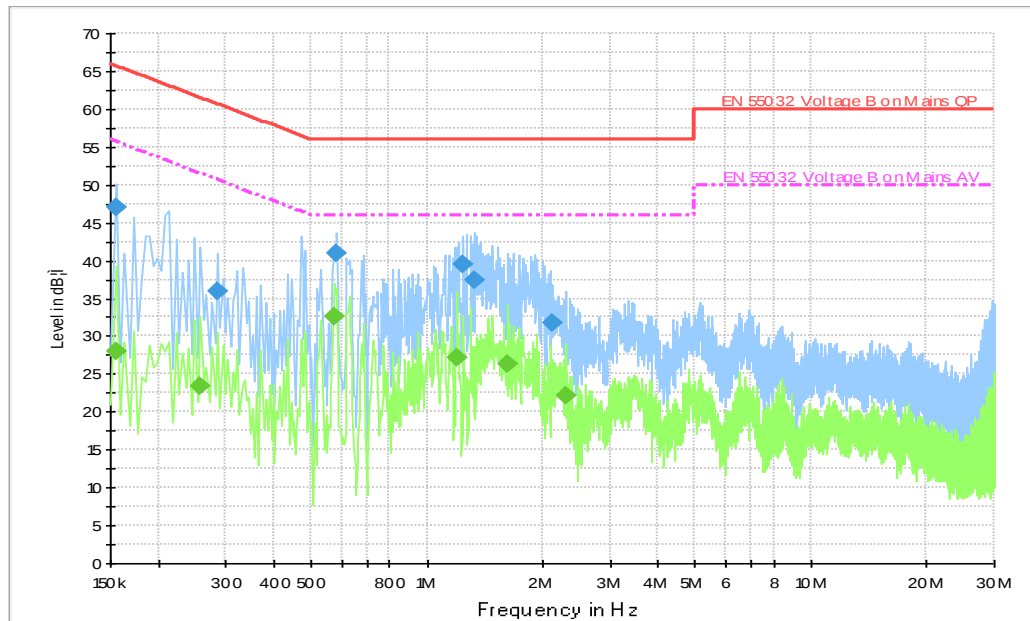
WLAN (Average Limit)

| Frequency range<br>(MHz) | Average Limit<br>(dBμV) | Result (dBμV) |        | Conclusion |
|--------------------------|-------------------------|---------------|--------|------------|
|                          |                         | With charger  |        |            |
|                          |                         | 802.11a       | Idle   |            |
| 0.15 to 0.5              | 56 to 46                | Fig.22        | Fig.23 | P          |
| 0.5 to 5                 | 46                      |               |        |            |
| 5 to 30                  | 50                      |               |        |            |

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

**Conclusion: PASS**

Test graphs as below:



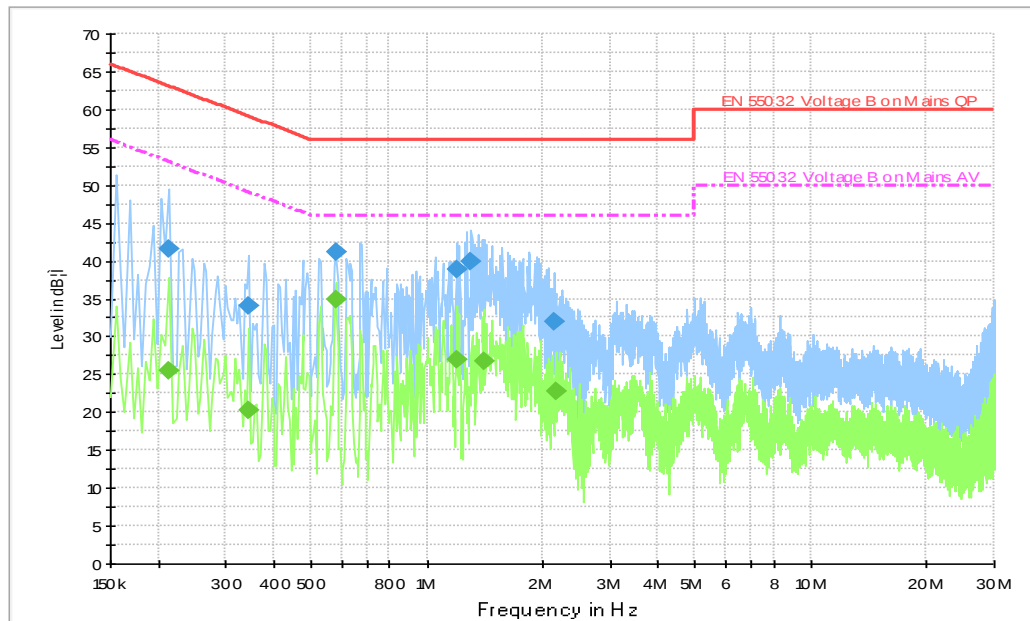
**Fig. 22 AC Powerline Conducted Emission-802.11a**

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBuV) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|------------------|------|------------|-------------|--------------|
| 0.154500        | 47.0             | N    | 10.0       | 18.8        | 65.8         |
| 0.285000        | 36.0             | N    | 10.0       | 24.6        | 60.7         |
| 0.582000        | 40.9             | N    | 9.9        | 15.1        | 56.0         |
| 1.243500        | 39.5             | L1   | 10.0       | 16.5        | 56.0         |
| 1.329000        | 37.3             | N    | 10.0       | 18.7        | 56.0         |
| 2.130000        | 31.8             | L1   | 10.0       | 24.2        | 56.0         |

**Final Result 2**

| Frequency (MHz) | Average (dBuV) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|----------------|------|------------|-------------|--------------|
| 0.154500        | 28.0           | N    | 10.0       | 27.7        | 55.8         |
| 0.258000        | 23.4           | L1   | 10.0       | 28.1        | 51.5         |
| 0.573000        | 32.5           | L1   | 10.0       | 13.5        | 46.0         |
| 1.198500        | 27.1           | N    | 10.0       | 18.9        | 46.0         |
| 1.630500        | 26.4           | N    | 10.0       | 19.6        | 46.0         |
| 2.305500        | 22.1           | L1   | 10.1       | 23.9        | 46.0         |



**Fig. 23 AC Powerline Conducted Emission-Idle**

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBuV) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|------------------|------|------------|-------------|--------------|
| 0.213000        | 41.5             | N    | 10.0       | 21.6        | 63.1         |
| 0.343500        | 34.1             | N    | 10.0       | 25.0        | 59.1         |
| 0.577500        | 41.2             | L1   | 10.0       | 14.8        | 56.0         |
| 1.198500        | 38.9             | N    | 10.0       | 17.1        | 56.0         |
| 1.306500        | 39.9             | L1   | 10.0       | 16.1        | 56.0         |
| 2.148000        | 32.0             | L1   | 10.0       | 24.0        | 56.0         |

**Final Result 2**

| Frequency (MHz) | Average (dBuV) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|----------------|------|------------|-------------|--------------|
| 0.213000        | 25.5           | N    | 10.0       | 27.6        | 53.1         |
| 0.343500        | 20.4           | N    | 10.0       | 28.7        | 49.1         |
| 0.577500        | 34.9           | L1   | 10.0       | 11.1        | 46.0         |
| 1.198500        | 27.0           | N    | 10.0       | 19.0        | 46.0         |
| 1.410000        | 26.8           | N    | 10.0       | 19.2        | 46.0         |
| 2.161500        | 22.8           | N    | 10.0       | 23.2        | 46.0         |

## ANNEX B: EUT parameters

Disclaimer: The worse case and antenna gain provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

## ANNEX C: Accreditation Certificate



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