



# FCC PART 15C TEST REPORT No. I17Z60308-SRD06

for

**TCL Communication Ltd.**

**LTE / UMTS / GSM mobile phone**

**5085C**

**With**

**FCC ID: 2ACCJH072**

**Hardware Version: 10**

**Software Version: v4F5Z**

**Issued Date: 2017-05-08**



**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.

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## 1. TEST LATORATORY

### 1.1. 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(BDA)

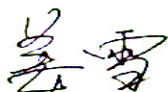
Address: No.18A, Kangding Street, Beijing Economic-Technology  
Development Area, Beijing, P. R. China 100176

### 1.2. Project data

Testing Start Date: 2017-04-13

Testing End Date: 2017-05-08

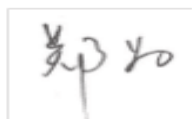
### 1.3. Signature



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Jiang Xue

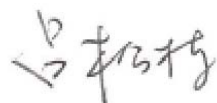
( Prepared this test report )



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Zheng Wei

(Reviewed this test report)



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Lv Songdong

(Approved this test report)

## **2. CLIENT INFORMATION**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd.  
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Contact Person: Shanghai  
Telephone: 201203  
Fax: China

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
Contact Person: Shanghai  
Telephone: 201203  
Fax: China

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

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

|                      |                               |
|----------------------|-------------------------------|
| Description          | LTE / UMTS / GSM mobile phone |
| Model name           | 5085C                         |
| FCC ID               | 2ACCJH072                     |
| WLAN Frequency Range | ISM Band: 5725MHz~5850MHz     |
| Type of modulation   | OFDM                          |
| Voltage              | 3.8V DC by Battery            |

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

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

| <b>EUT ID*</b> | <b>IMEI</b>                         | <b>HW Version</b> | <b>SW Version</b> |
|----------------|-------------------------------------|-------------------|-------------------|
| UT01a          | 014858000202510                     | 10                | v4F5Z             |
| UT02a          | 014858000202502/<br>014858000202411 | 10                | v4F5Z             |

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

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

| <b>AE ID*</b> | <b>Description</b> | <b>SN</b> |
|---------------|--------------------|-----------|
| AE1           | Battery /          | Inbuilt   |
| AE3           | Charger /          | /         |
| AE11          | USB Cable /        | /         |
| AE12          | USB Cable /        | /         |

##### **AE1**

|                 |              |
|-----------------|--------------|
| Model           | TLp027AJ     |
| SN              | CAC2710010CJ |
| Manufacturer    | COSLIGHT     |
| Capacitance     | 2710 mAh     |
| Nominal voltage | /            |

##### **AE3**

|                 |              |
|-----------------|--------------|
| Model           | CBA0058AGAD2 |
| Manufacturer    | TENPAO       |
| Length of cable | /            |

##### **AE11**

|              |              |
|--------------|--------------|
| Model        | CDA0000078CF |
| Manufacturer | LUXSHARE     |



|                 |              |
|-----------------|--------------|
| Length of cable | 98cm         |
| AE12            |              |
| Model           | CDA0000104CF |
| Manufacturer    | LUXSHARE     |
| Length of cable | 98cm         |

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

### 3.4. General Description

Equipment Under Test (EUT) is a LTE / UMTS / GSM mobile 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 CFR 47, Part 15, Subpart C:                                     |      |
|             | 15.205 Restricted bands of operation;                               |      |
| FCC Part15  | 15.209 Radiated emission limits, general requirements;              | 2015 |
|             | Subpart E—Unlicensed National Information Infrastructure<br>Devices |      |
|             | Methods of Measurement of Radio-Noise Emissions from                |      |
| ANSI C63.10 | Low-Voltage Electrical and Electronic Equipment in the              | 2013 |
|             | Range of 9 kHz to 40 GHz  |      |

## 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                            | 15.407 (b)             | /                | P       |
| Transmitter Spurious Emission - Conducted        | 15.407,15.205          | /                | P       |
| Transmitter Spurious Emission - Radiated         | 15.407, 15.205, 15.209 | /                | P       |
| AC Powerline Conducted Emission                  | 15.107, 15.207         | /                | P       |
| 99% Occupied Bandwidth                           | /                      | /                | P       |
| Transmitter Spurious Emission - Radiated < 30MHz | 15.407, 15.209         | /                | 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     | 3.8V |
| Humidity    | 44%  |



## 7. TEST EQUIPMENTS UTILIZED

### Conducted test system

| No. | Equipment              | Model  | Serial Number | Manufacturer    | Calibration date | Calibration Due date |
|-----|------------------------|--------|---------------|-----------------|------------------|----------------------|
| 1   | Vector Signal Analyzer | FSQ40  | 200089        | Rohde & Schwarz | 2016-06-07       | 2017-06-06           |
| 2   | Test Receiver          | ESCI   | 100344        | Rohde & Schwarz | 2017-02-16       | 2018-03-15           |
| 3   | LISN                   | ENV216 | 101200        | Rohde & Schwarz | 2016-07-11       | 2017-07-10           |
| 4   | Shielding Room         | S81    | /             | ETS-Lindgren    | /                | /                    |

### 8. Radiated emission test system

| No. | Equipment                         | Model    | Serial Number | Manufacturer    | Calibration Period | Calibration Due date |
|-----|-----------------------------------|----------|---------------|-----------------|--------------------|----------------------|
| 1   | Test Receiver                     | ESU26    | 100376        | Rohde & Schwarz | 1 year             | 2017-11-30           |
| 2   | BiLog Antenna                     | VULB9163 | 514           | Schwarzbeck     | 3 years            | 2017-11-24           |
| 3   | Dual-Ridge Waveguide Horn Antenna | 3116     | 2661          | ETS-Lindgren    | 3 years            | 2017-06-17           |
| 4   | Dual-Ridge Waveguide Horn Antenna | 3115     | 6914          | ETS-Lindgren    | 3 years            | 2017-09-21           |
| 5   | Vector Signal Analyzer            | FSV      | 101047        | Rohde & Schwarz | 1 year             | 2017-06-28           |
| 6   | Test Receiver                     | ESCI7    | 100948        | Rohde & Schwarz | 1 year             | 2017-07-05           |
| 7   | AMN                               | ESH3-Z5  | 825562/028    | Rohde & Schwarz | 1 year             | 2017-07-06           |

## 9. Measurement Uncertainty

### 9.1. Transmitter Output Power

Measurement Uncertainty: 0.339dB,k=1.96

### 9.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dBm/MHz,k=1.96

### 9.3. Occupied 6dB Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

### 9.4. Band Edges Compliance

Measurement Uncertainty : 0.62dBm,k=1.96

### 9.5. Spurious Emissions

#### Conducted (k=1.96)

| Frequency Range                            | Uncertainty(dBm) |
|--|------------------|
| $30\text{MHz} \leq f \leq 2\text{GHz}$     | 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) |
|---|------------------|
| 9kHz-30MHz                              |                  |
| $30\text{MHz} \leq f \leq 1\text{GHz}$  | 4.86             |
| $1\text{GHz} \leq f \leq 18\text{GHz}$  | 5.26             |
| $18\text{GHz} \leq f \leq 40\text{GHz}$ | 5.28             |

### 9.6. AC Power-line Conducted Emission

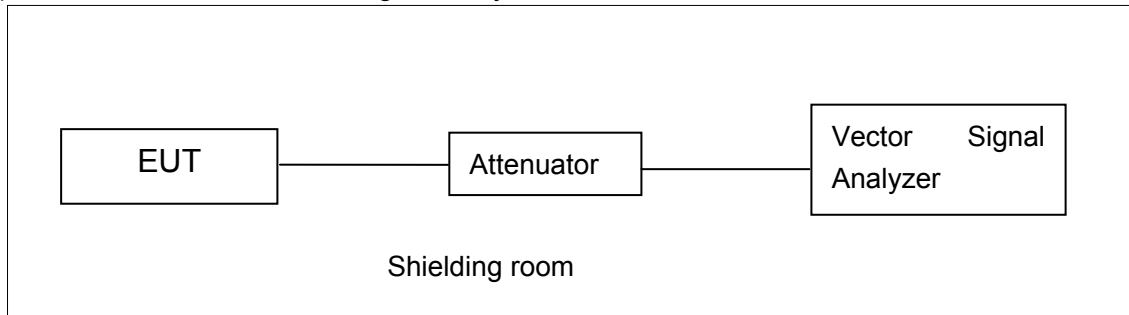
Measurement Uncertainty : 3.38dBm,k=2

## 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

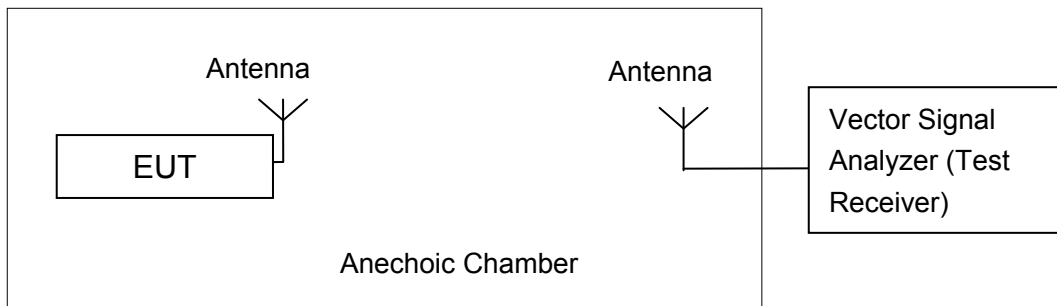


#### A.1.2. Radiated Emission Measurements

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. Maximum Peak Output Power-conducted

#### Measurement Results:

##### 802.11a mode

| Mode    | Data Rate (Mbps) | Test Result (dBm) |                 |                 |
|---------|------------------|-------------------|-----------------|-----------------|
|         |                  | 5745MHz (Ch149)   | 5785MHz (Ch157) | 5825MHz (Ch165) |
| 802.11a | 6                | 21.04             | /               | /               |
|         | 9                | 21.02             | /               | /               |
|         | 12               | 21.29             | /               | /               |
|         | 18               | 21.23             | /               | /               |
|         | 24               | 21.54             | /               | /               |
|         | 36               | 21.52             | /               | /               |
|         | 48               | 21.69             | 20.57           | 21.12           |
|         | 54               | 21.63             | /               | /               |

The data rate 48Mbps is selected as worse 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              | 20.10             | /               | /               |
|                 | MCS1              | 20.14             | /               | /               |
|                 | MCS2              | 20.11             | /               | /               |
|                 | MCS3              | 20.18             | /               | /               |
|                 | MCS4              | 20.05             | /               | /               |
|                 | MCS5              | 20.25             | 19.54           | 19.89           |
|                 | MCS6              | 20.20             | /               | /               |
|                 | MCS7              | 20.16             | /               | /               |

The data rate MCS5 is selected as worse condition, and the following cases are performed with this condition.

**802.11n-HT40 mode**

| Mode               | Data Rate<br>(Index) | Test Result (dBm)  |                    |
|--------------------|----------------------|--------------------|--------------------|
|                    |                      | 5755MHz<br>(Ch151) | 5795MHz<br>(Ch159) |
| 802.11n<br>(40MHz) | MCS0                 | 20.69              | /                  |
|                    | MCS1                 | 20.50              | /                  |
|                    | MCS2                 | 20.45              | /                  |
|                    | MCS3                 | 20.35              | /                  |
|                    | MCS4                 | 20.21              | /                  |
|                    | MCS5                 | 20.30              | /                  |
|                    | MCS6                 | 20.60              | /                  |
|                    | MCS7                 | 20.77              | 20.31              |

The data rate MCS7 is selected as worse condition, and the following cases are performed with this condition.

**Conclusion: PASS**

**A.2.3. Maximum Average Output Power-Conducted****Method of Measurement: See ANSI C63.10-clause 12.3.2.2 Method SA-1****802.11a mode**

| Mode    | Test Result (dBm) |                 |                 |
|---------|-------------------|-----------------|-----------------|
|         | 5745MHz (Ch149)   | 5785MHz (Ch157) | 5825MHz (Ch165) |
| 802.11a | 14.33             | 14.95           | 15.47           |

**802.11n-HT20 mode**

| Mode           | Test Result (dBm) |                 |                |
|----------------|-------------------|-----------------|----------------|
|                | 5745MHz (Ch149)   | 5785MHz (Ch157) | 5825MHz(Ch165) |
| 802.11n(20MHz) | 13.15             | 13.75           | 14.26          |

**802.11n-HT40 mode**

| Mode           | Test Result (dBm) |                |
|----------------|-------------------|----------------|
|                | 5755MHz (Ch151)   | 5795MHz(Ch159) |
| 802.11n(40MHz) | 13.28             | 14.08          |

**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     | 9.55                                     | P          |
|         | 157     | 9.21                                     | P          |
|         | 165     | 9.81                                     | P          |

Note:802.11a was selected as the worst-case of the test case.

**Conclusion: PASS**

### A.4. Occupied 6dB Bandwidth

#### Measurement Limit:

| Standard                  | Limit (kHz) |
|---------------------------|-------------|
| FCC 47 CFR Part 15.407(e) | ≥ 500       |

The measurement is made according to KDB789033 D02 .

#### Measurement Uncertainty:

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

#### Measurement Result:

| Mode            | Channel | Occupied 6dB Bandwidth<br>( MHz) |       | conclusion |
|-----------------|---------|----------------------------------|-------|------------|
| 802.11a         | 149     | Fig.1                            | 16.15 | P          |
|                 | 157     | Fig.2                            | 16.00 | P          |
|                 | 165     | Fig.3                            | 15.95 | P          |
| 802.11n<br>HT20 | 149     | Fig.4                            | 16.85 | P          |
|                 | 157     | Fig.5                            | 17.15 | P          |
|                 | 165     | Fig.6                            | 17.45 | P          |
| 802.11n<br>HT40 | 151     | Fig.7                            | 35.60 | P          |
|                 | 159     | Fig.8                            | 35.92 | P          |

**Conclusion: PASS**

Test graphs as below:

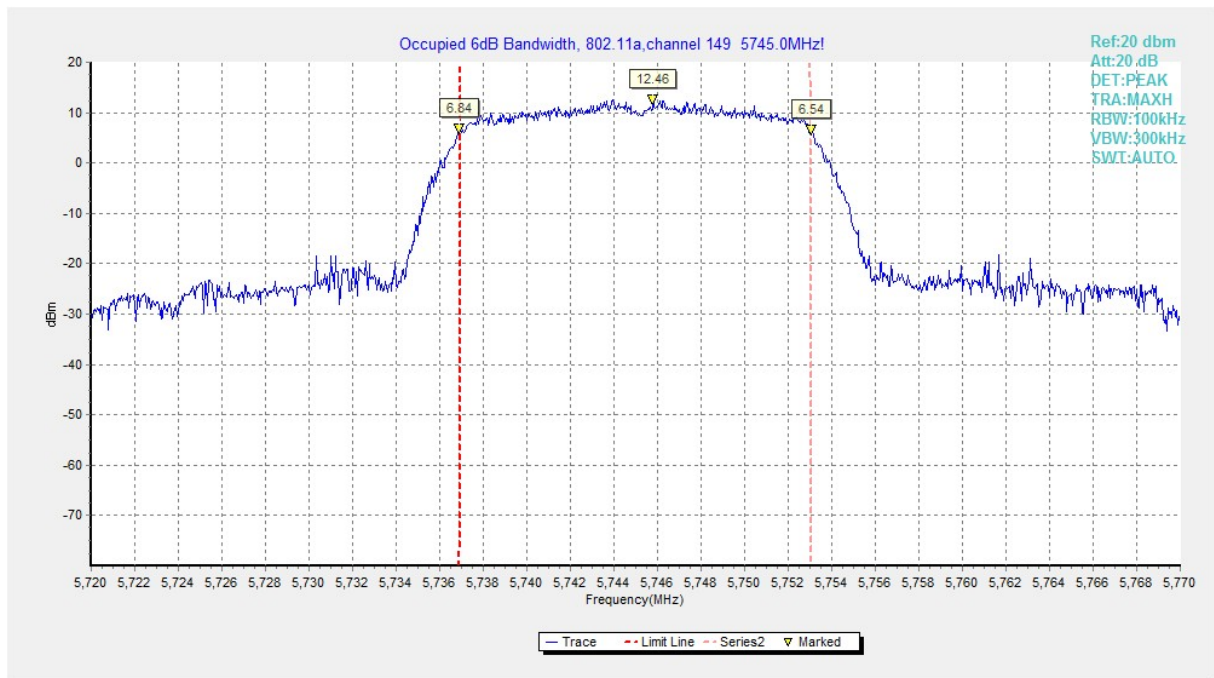


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

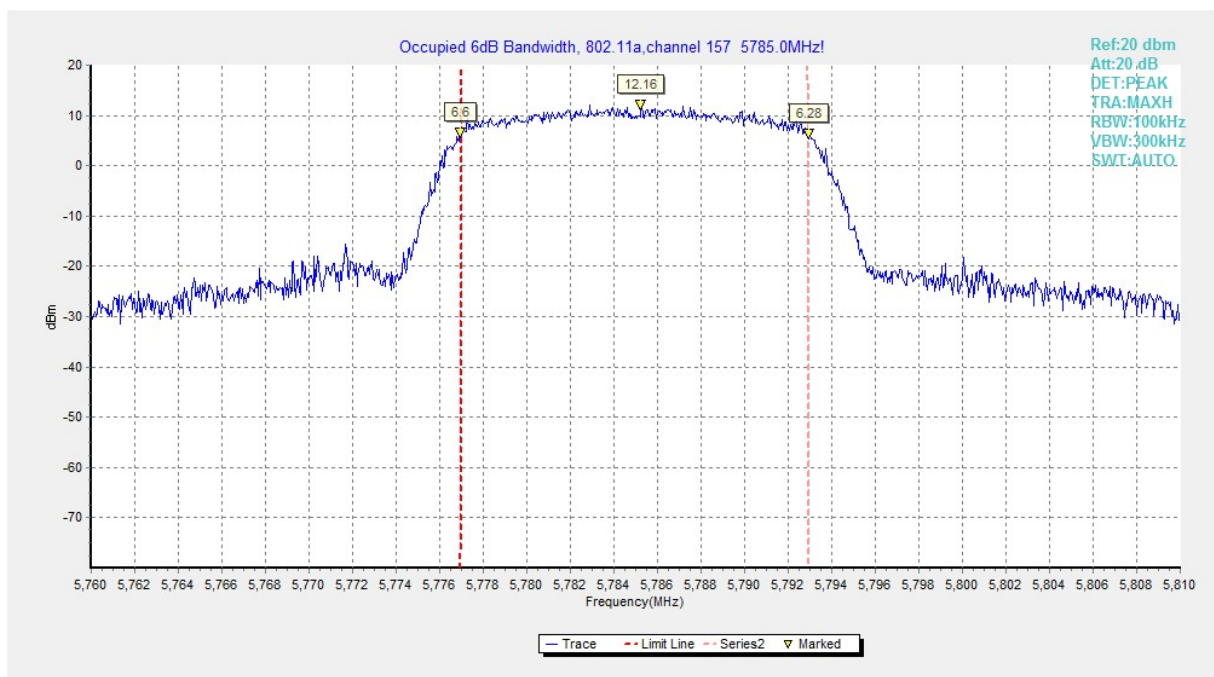


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)



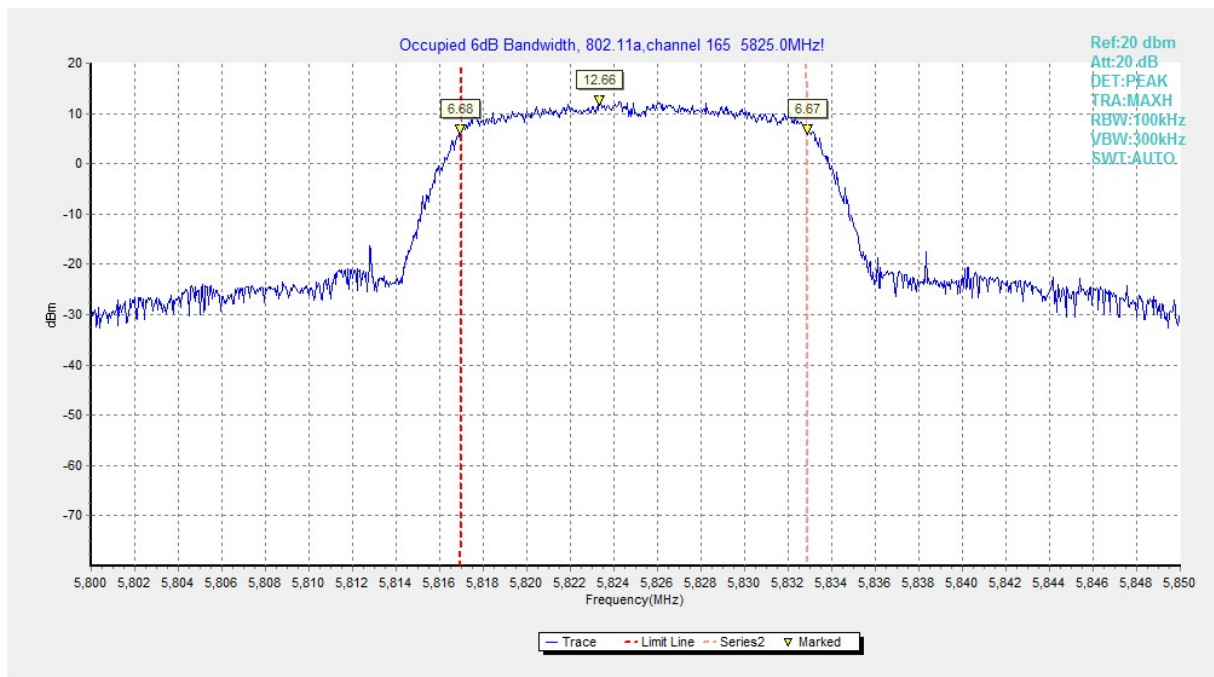


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

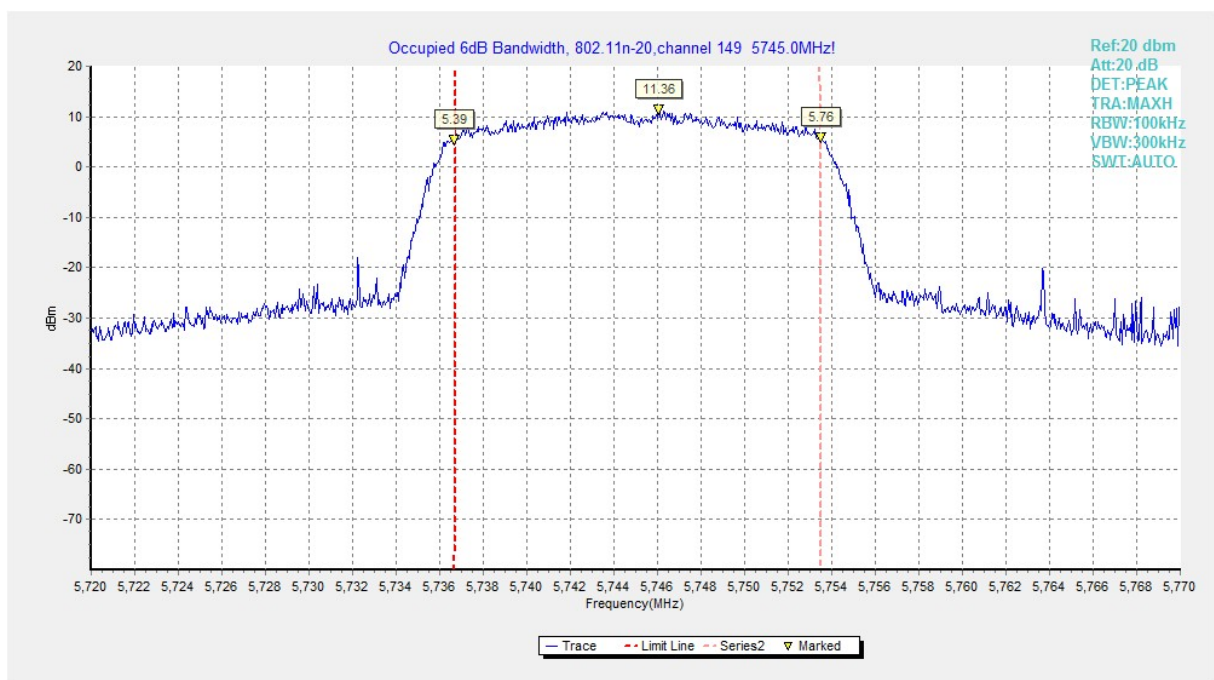


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

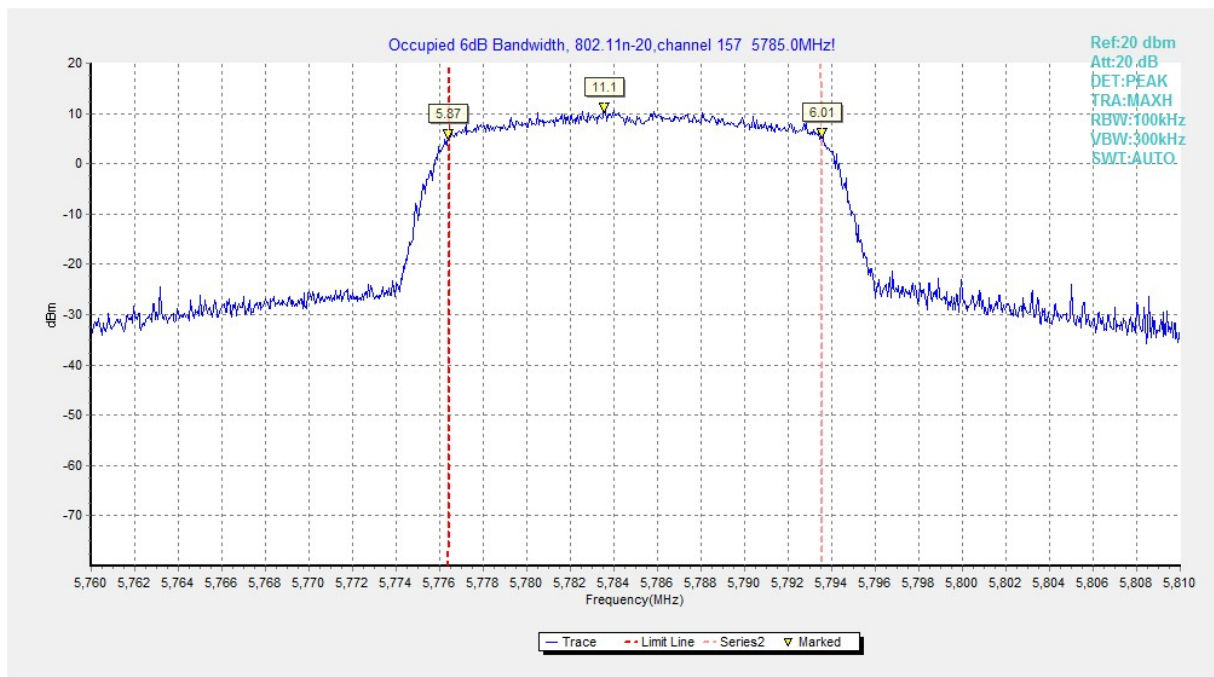


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

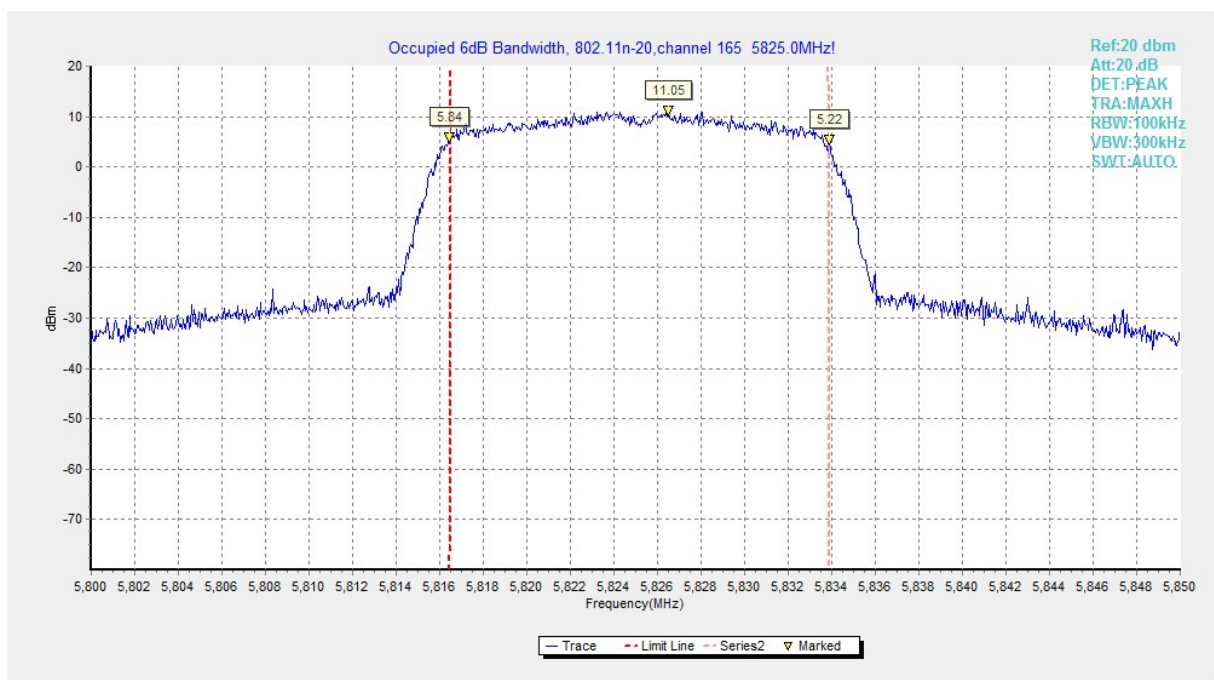
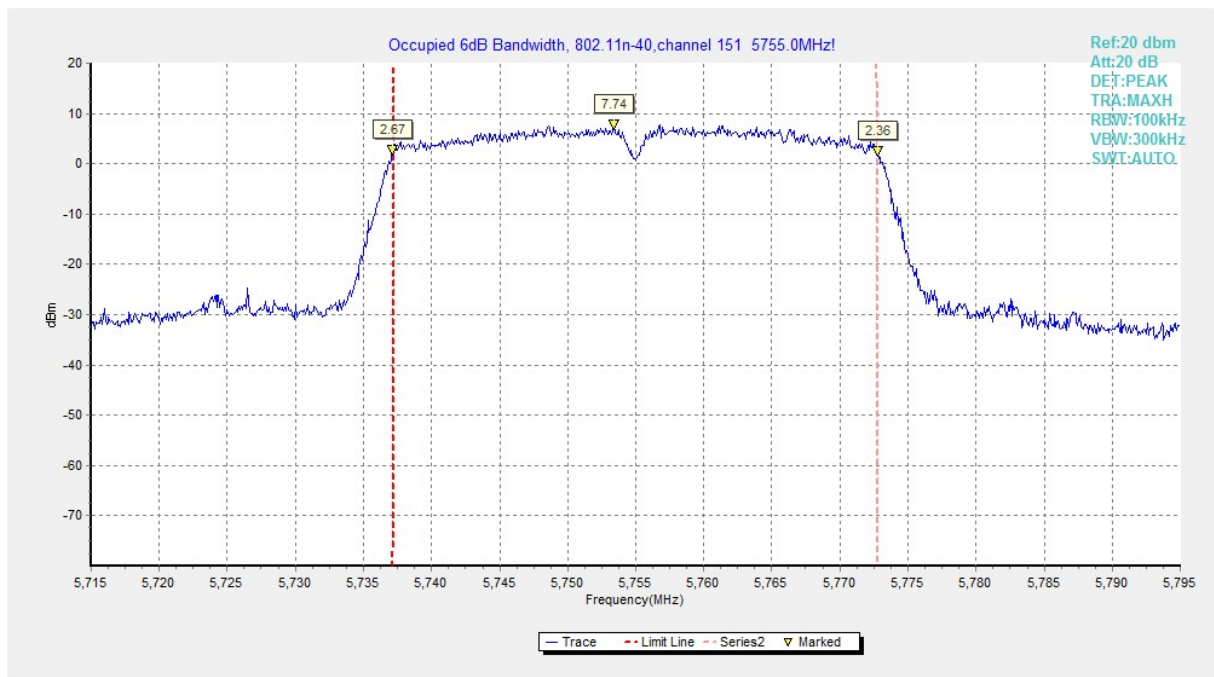
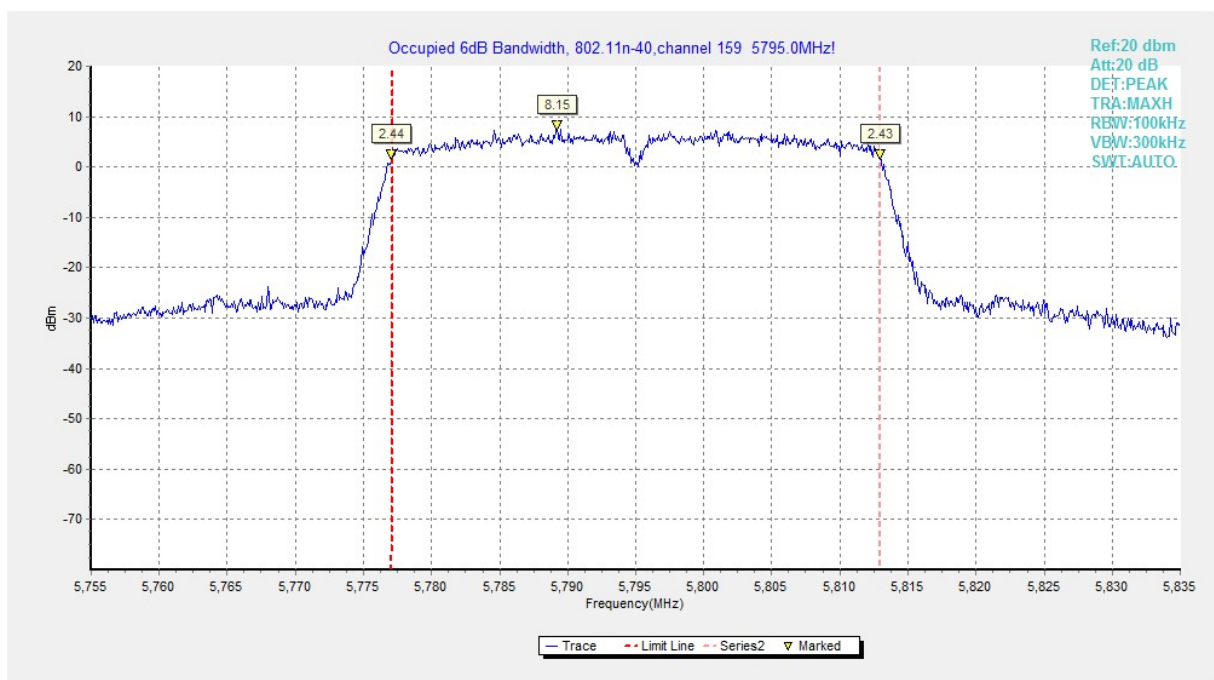


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)



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



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

## A.5. Transmitter Spurious Emission

### Measurement Limit:

| Standard               | Frequency (MHz) | Limit (dBm/MHz) |
|------------------------|-----------------|-----------------|
| FCC 47 CFR Part 15.407 | 5725MHz~5850MHz | < -27           |

The measurement is made according to ANSI C63.10 .

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)).

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

### Measurement Uncertainty:

| Frequency Range  | Uncertainty(dB) |
|------------------|-----------------|
| 30MHz ≤ f ≤ 2GHz | 0.63            |
| 2GHz ≤ f ≤3.6GHz | 0.82            |
| 3.6GHz ≤ f ≤8GHz | 1.55            |
| 8GHz ≤ f ≤20GHz  | 1.86            |
| 20GHz ≤ f ≤22GHz | 1.90            |
| 22GHz ≤ f ≤26GHz | 2.20            |

### A.5.1 Transmitter Spurious Emission - Conducted

#### Measurement Results:

#### 802.11a mode

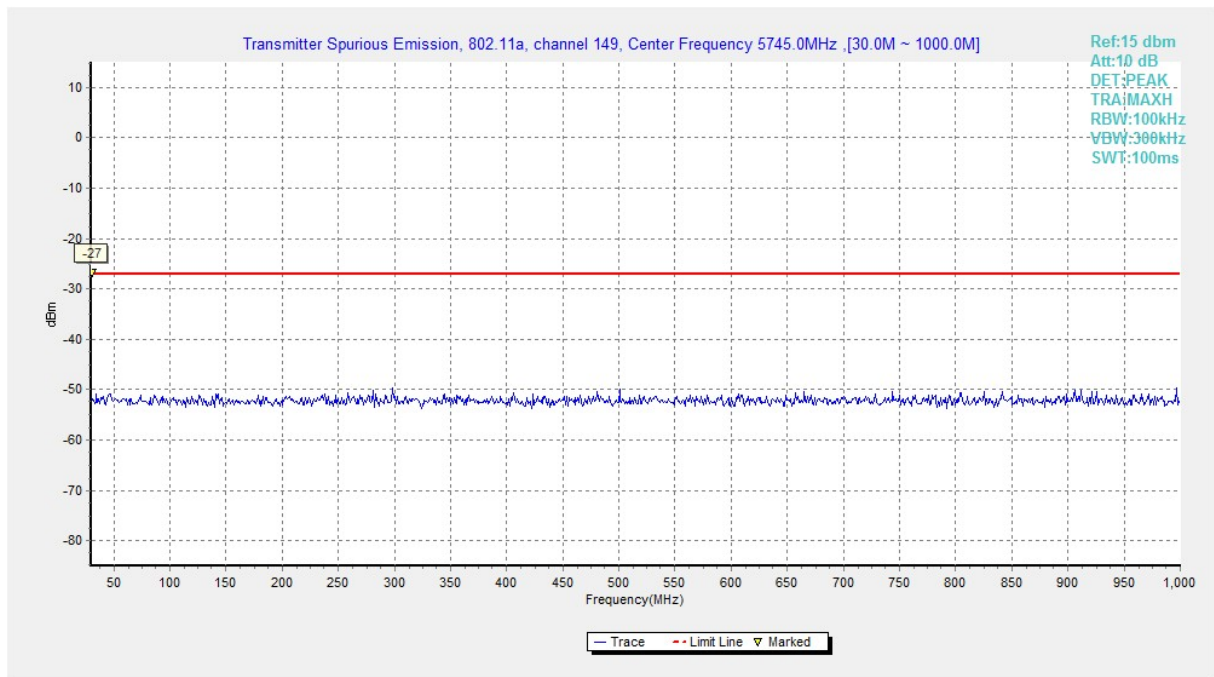
| MODE    | Channel | Frequency Range | Test Results | Conclusion |
|---------|---------|-----------------|--------------|------------|
| 802.11a | 149     | 30 MHz ~ 1 GHz  | Fig.9        | P          |
|         |         | 1 GHz ~ 12 GHz  | Fig.10       | P          |
|         |         | 12 GHz ~ 25 GHz | Fig.11       | P          |
|         |         | 25 GHz ~ 40 GHz | Fig.12       | P          |
|         | 157     | 30 MHz ~ 1 GHz  | Fig.13       | P          |
|         |         | 1 GHz ~ 12 GHz  | Fig.14       | P          |
|         |         | 12 GHz ~ 25 GHz | Fig.15       | P          |
|         |         | 25 GHz ~ 40 GHz | Fig.16       | P          |
|         | 165     | 30 MHz ~ 1 GHz  | Fig.17       | P          |
|         |         | 1 GHz ~ 12 GHz  | Fig.18       | P          |
|         |         | 12 GHz ~ 25 GHz | Fig.19       | P          |
|         |         | 25 GHz ~ 40 GHz | Fig.20       | P          |

Note:802.11a was selected as the worst-case of the test case.

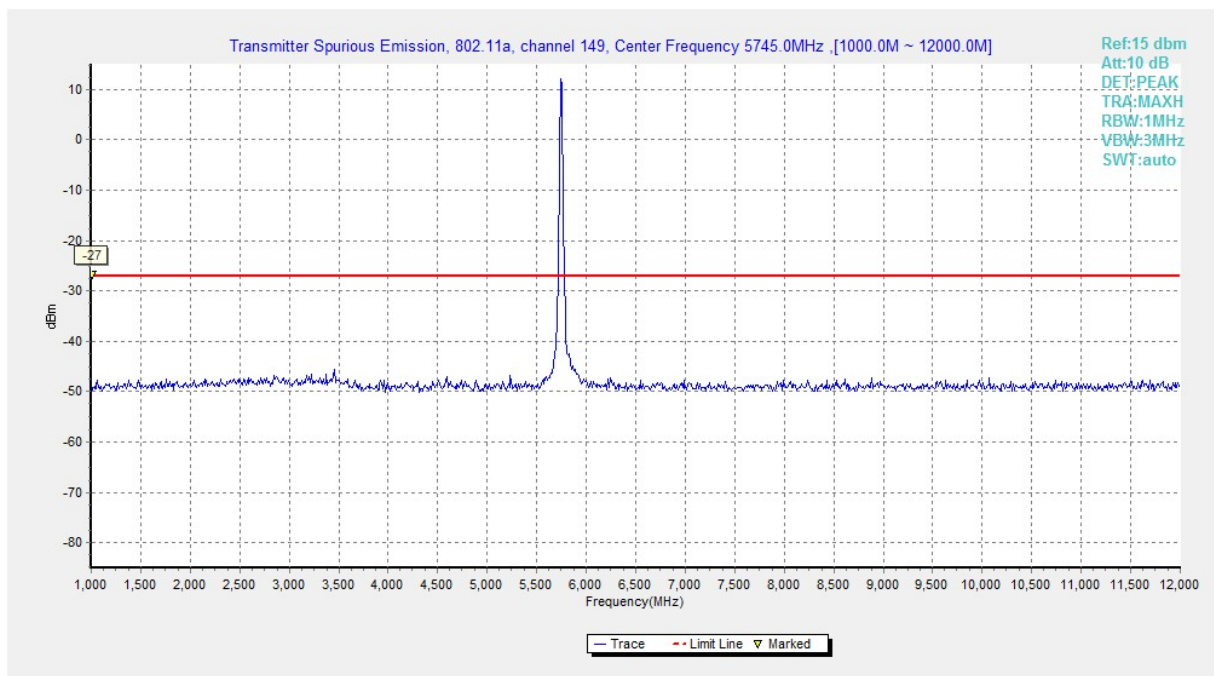


**Conclusion: PASS**

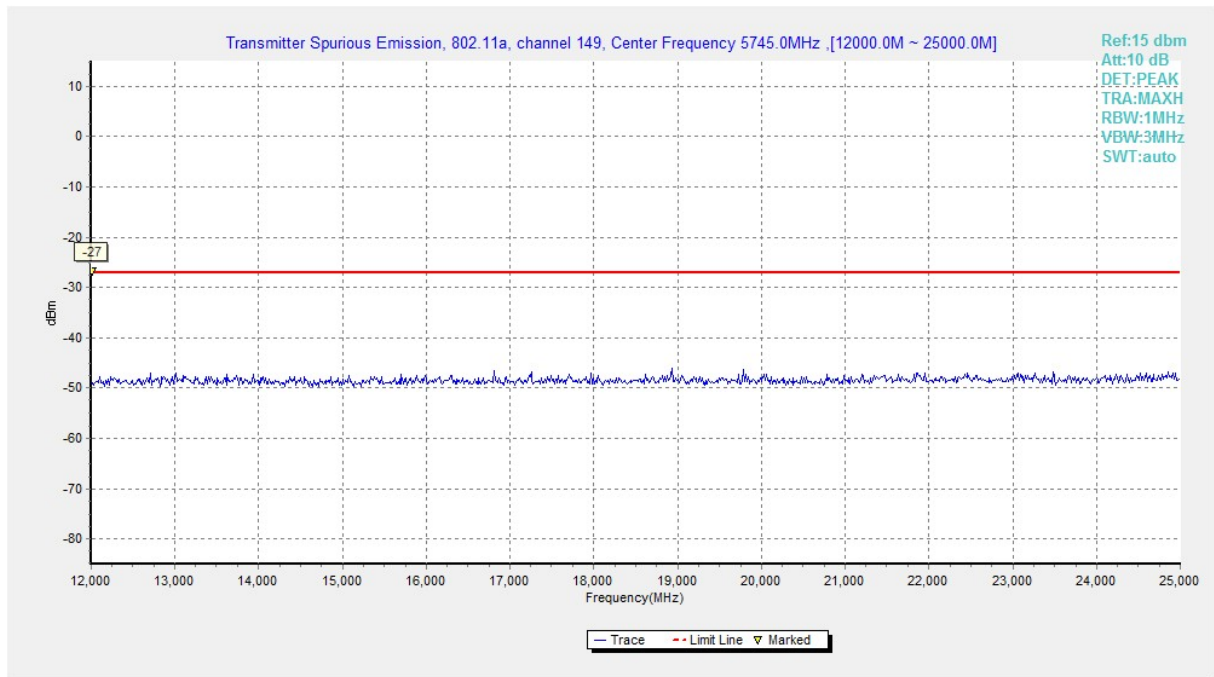
**Test graphs as below:**



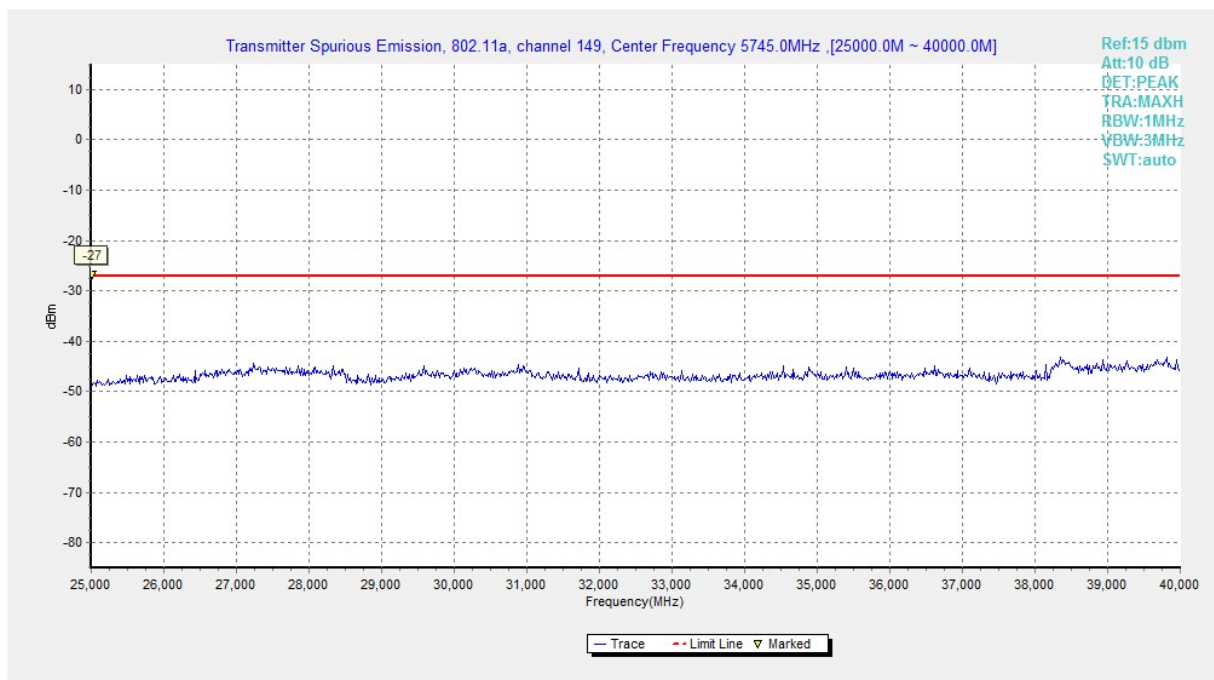
**Fig. 9 Conducted Spurious Emission (802.11a, Ch149, 30 MHz-1 GHz)**



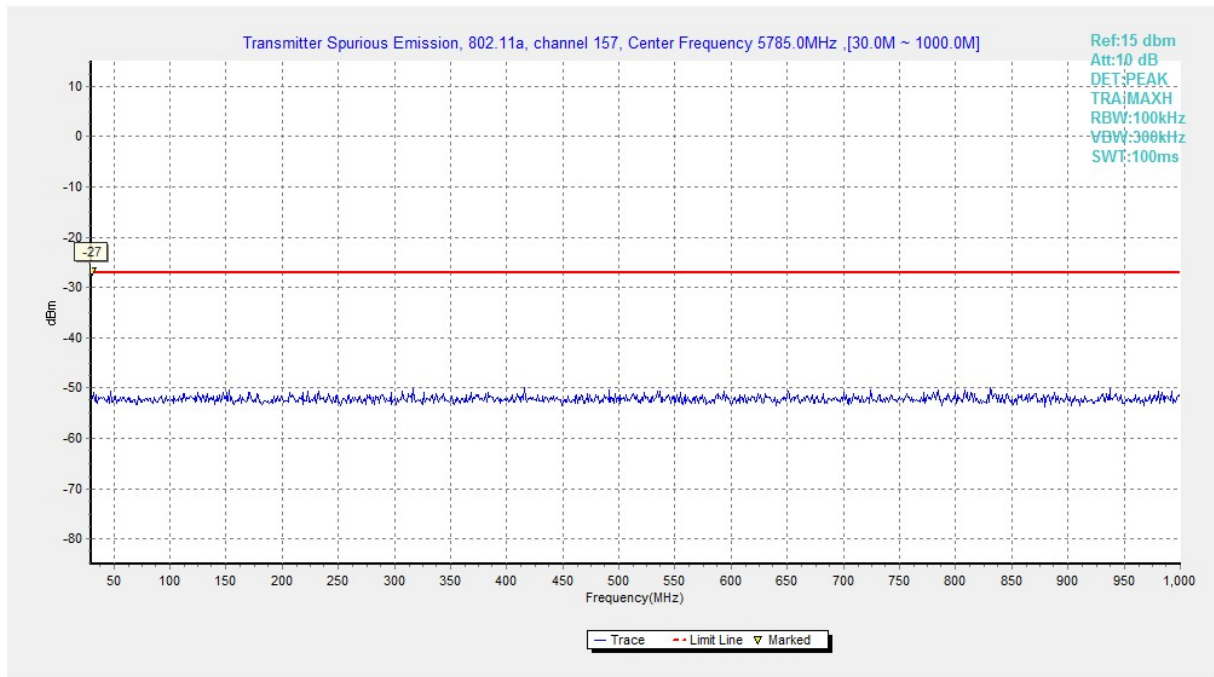
**Fig. 10 Conducted Spurious Emission (802.11a, Ch149, 1 GHz -12 GHz)**



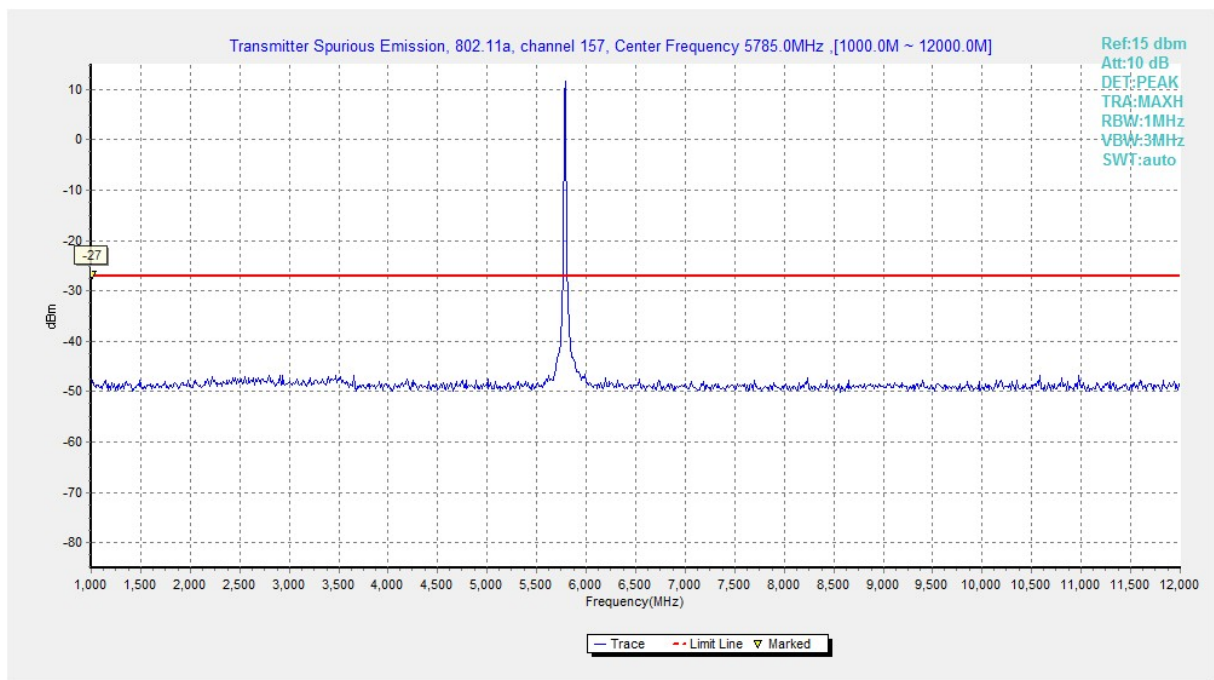
**Fig. 11 Conducted Spurious Emission (802.11a, Ch149, 12 GHz-25 GHz)**



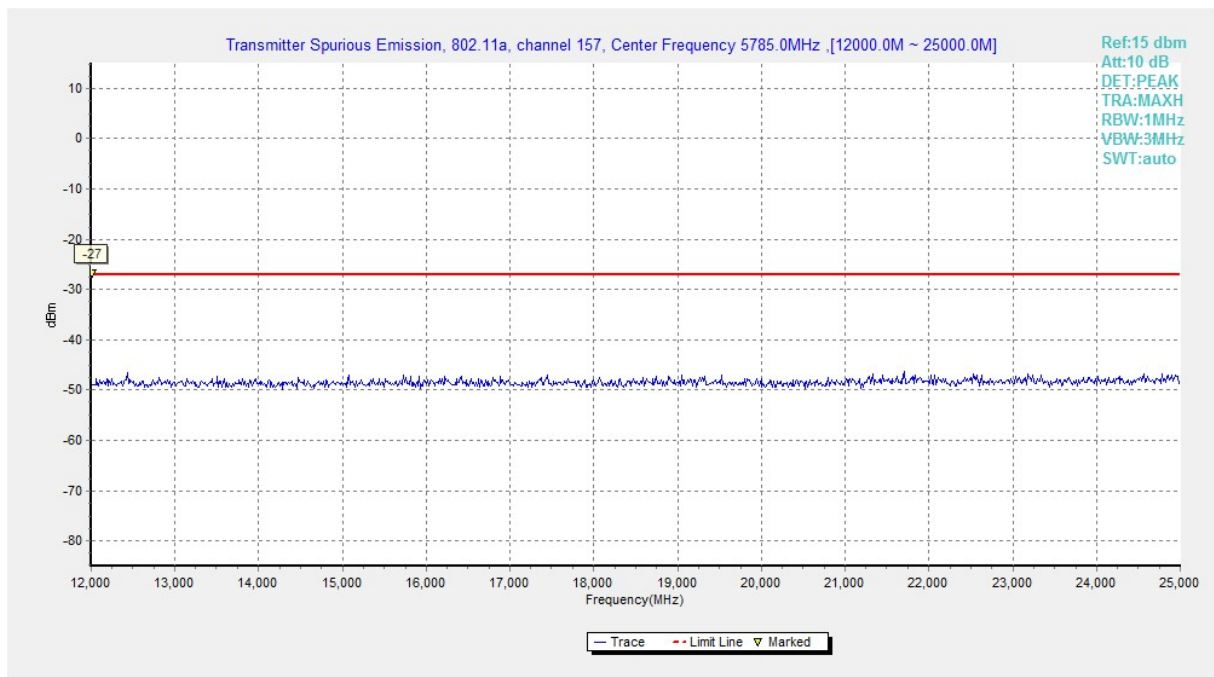
**Fig. 12 Conducted Spurious Emission (802.11a, Ch149, 25 GHz-40 GHz)**



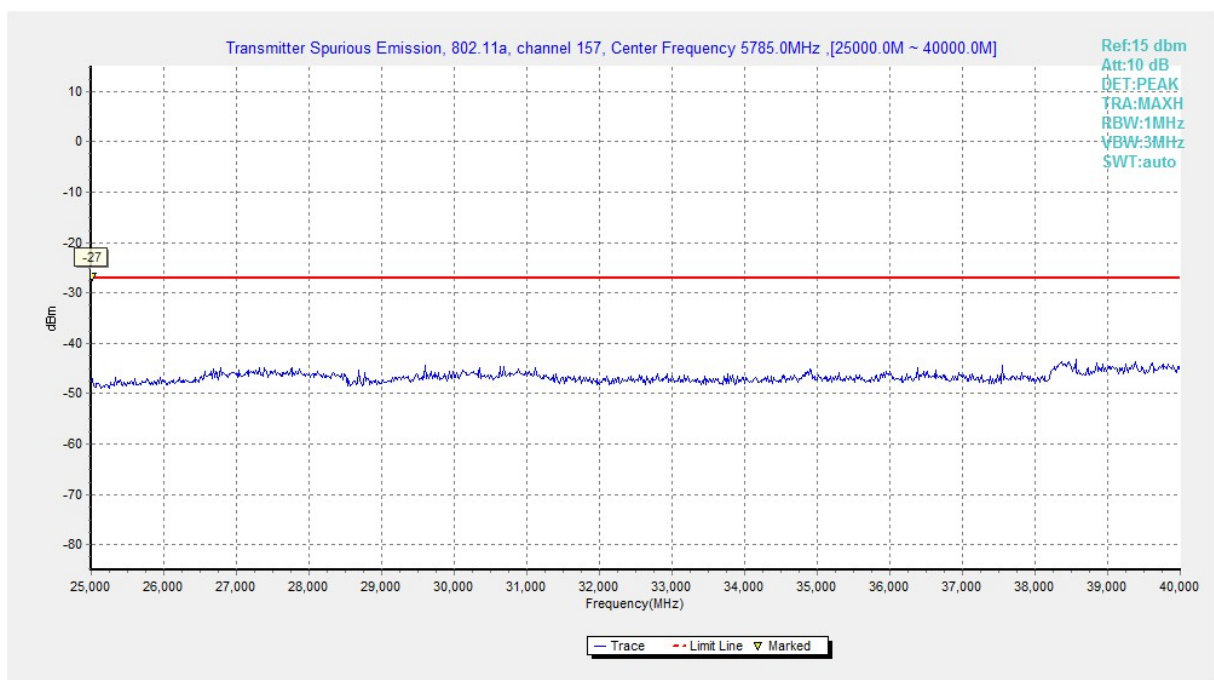
**Fig. 13 Conducted Spurious Emission (802.11a, Ch157, 30 MHz-1 GHz)**



**Fig. 14 Conducted Spurious Emission (802.11a, Ch157, 1 GHz -12 GHz)**

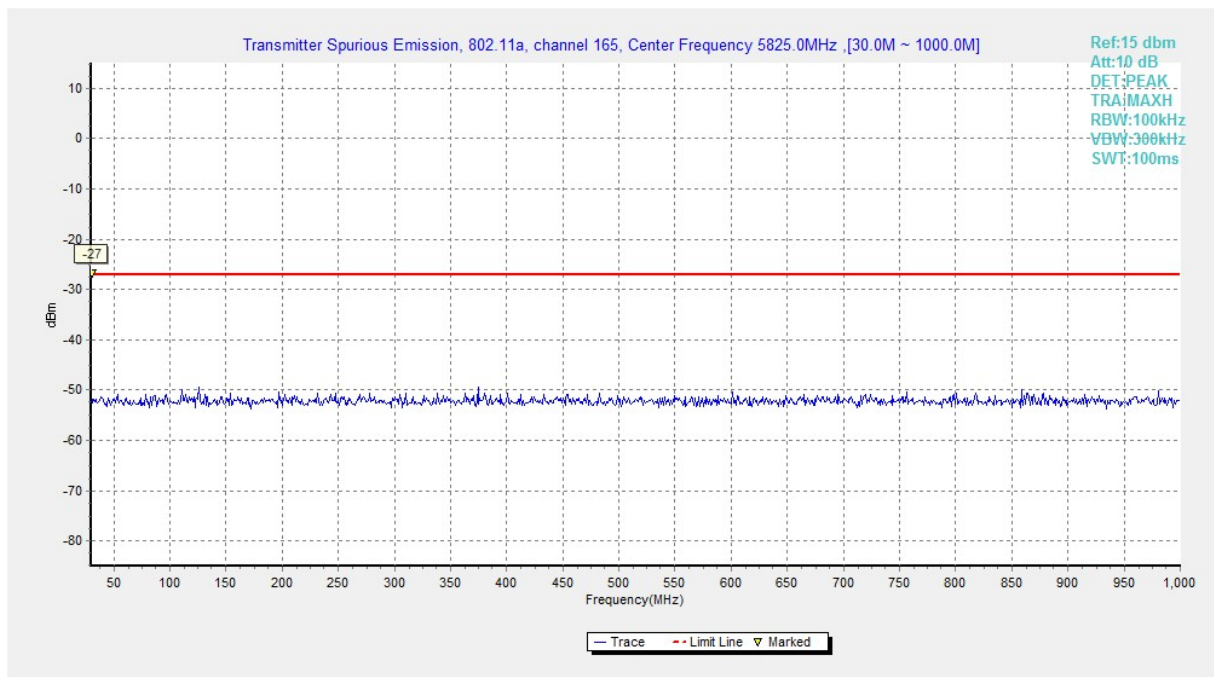


**Fig. 15 Conducted Spurious Emission (802.11a, Ch157, 12 GHz-25 GHz)**

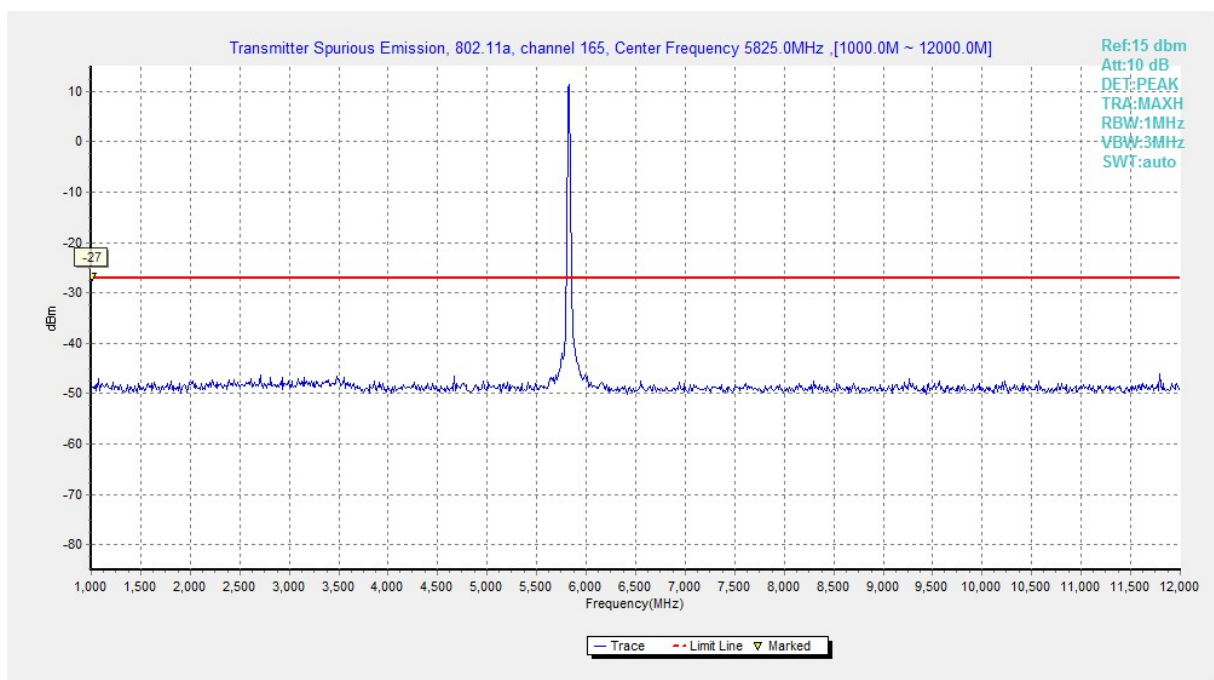


**Fig. 16 Conducted Spurious Emission (802.11a, Ch157, 25 GHz-40 GHz)**

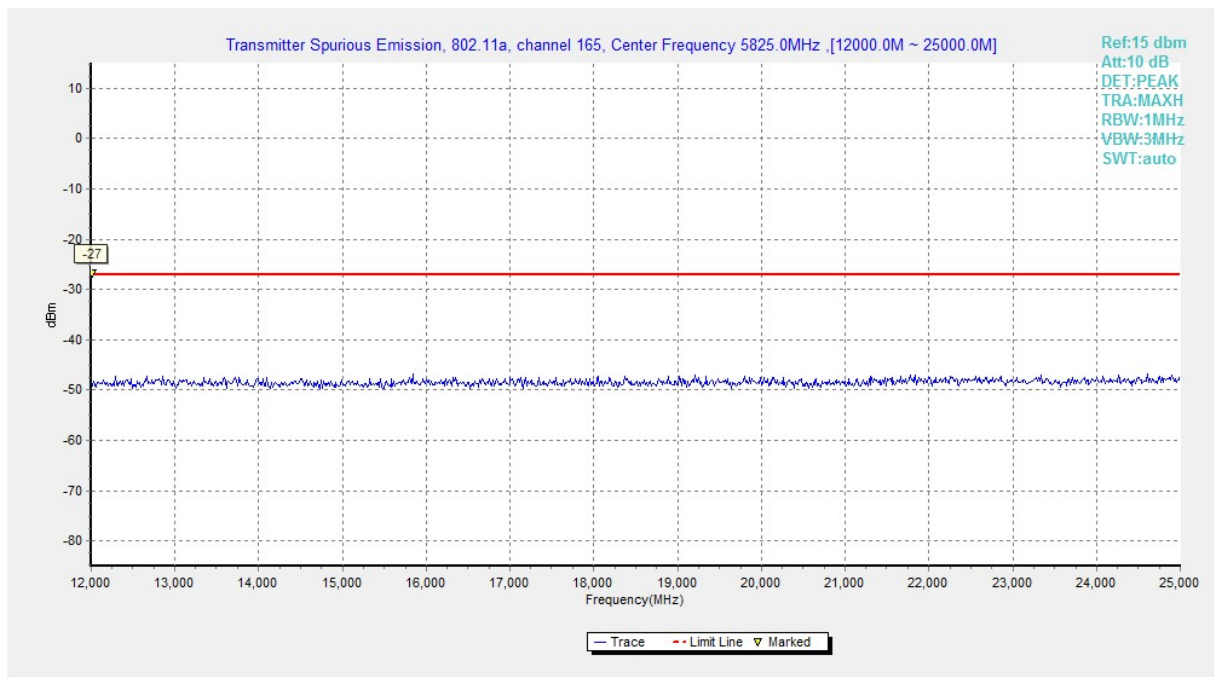




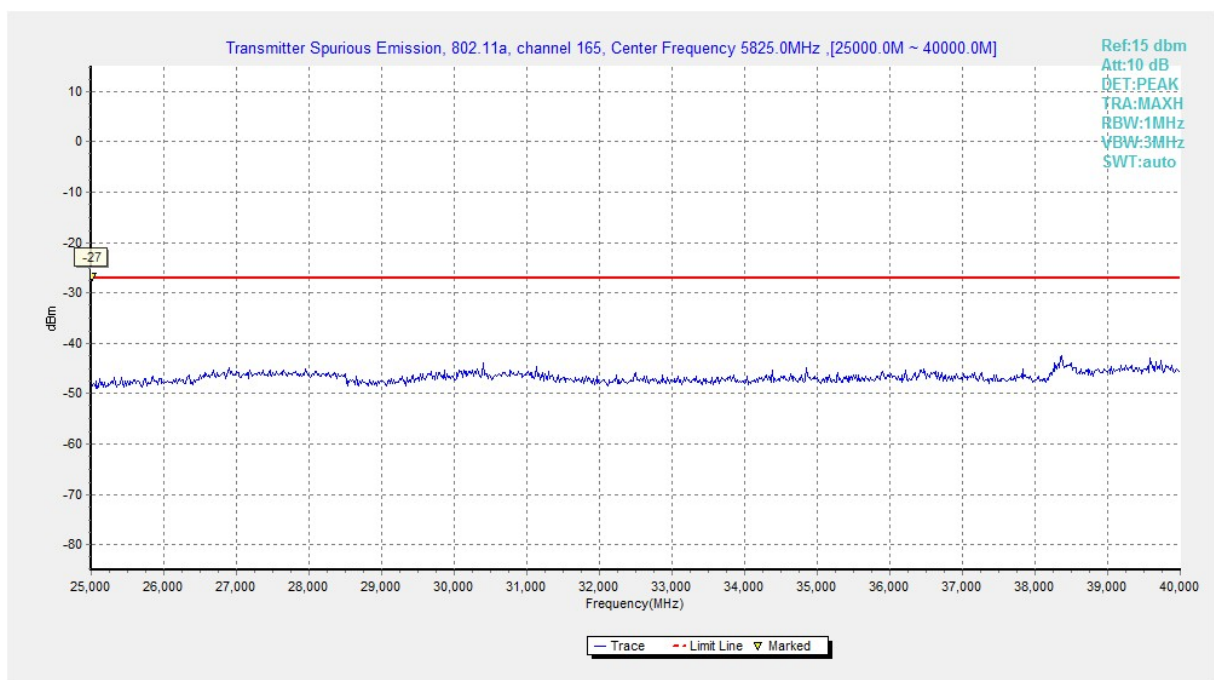
**Fig. 17 Conducted Spurious Emission (802.11a, Ch165, 30 MHz-1 GHz)**



**Fig. 18 Conducted Spurious Emission (802.11a, Ch165, 1 GHz -12 GHz)**



**Fig. 19 Conducted Spurious Emission (802.11a, Ch165, 12 GHz-25 GHz)**



**Fig. 20 Conducted Spurious Emission (802.11a, Ch165, 25 GHz-40 GHz)**

### A.5.2 Transmitter Spurious Emission - Radiated

#### Measurement Uncertainty:

| Frequency Range      | Uncertainty(dB) |
|----------------------|-----------------|
| $f \leq 1\text{GHz}$ | 3.9             |
| $f > 1\text{GHz}$    | 4.3             |

#### Note:

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

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

#### Average:

#### Measurement Results:

##### 802.11a

##### Ch149

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|--------------------|--------------|
| 5724.000       | 45.4            | -33.0          | 34.9           | 43.42              | V            |
| 5724.800       | 46.4            | -33.0          | 34.9           | 44.49              | H            |
| 11490.200      | 35.3            | -30.4          | 38.7           | 26.99              | V            |
| 17234.400      | 39.3            | -25.8          | 41.2           | 23.86              | H            |
| 17802.000      | 40.3            | -23.1          | 41.0           | 22.50              | V            |
| 17886.700      | 39.3            | -24.0          | 40.9           | 22.46              | H            |

##### Ch157

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|--------------------|--------------|
| 5705.200       | 37.3            | -32.8          | 34.9           | 35.16              | H            |
| 5865.200       | 38.1            | -32.2          | 35.1           | 35.14              | H            |
| 11570.500      | 35.2            | -30.5          | 38.8           | 26.84              | V            |
| 17354.300      | 38.8            | -25.6          | 41.2           | 23.28              | V            |
| 17802.000      | 40.2            | -23.1          | 41.0           | 22.31              | H            |
| 17886.700      | 39.2            | -24.0          | 40.9           | 22.36              | V            |

##### Ch165

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | $P_{Mea}$ (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|--------------------|--------------|
| 5850.000       | 38.7            | -32.2          | 35.1           | 35.84              | V            |
| 5905.200       | 38.6            | -32.1          | 35.2           | 35.56              | V            |
| 11649.700      | 35.2            | -30.2          | 38.9           | 26.48              | H            |
| 17474.200      | 40.0            | -25.2          | 41.2           | 24.05              | H            |
| 17802.000      | 40.3            | -23.1          | 41.0           | 22.41              | V            |
| 17883.400      | 39.3            | -24.0          | 40.9           | 22.44              | V            |

##### 802.11n-HT20

## Ch149

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5724.200       | 47.2            | -33.0          | 34.9           | 45.22                     | H            |
| 5724.830       | 48.3            | -33.0          | 34.9           | 46.42                     | V            |
| 11495.700      | 35.3            | -30.4          | 38.7           | 27.02                     | H            |
| 17237.700      | 38.2            | -25.8          | 41.2           | 22.83                     | V            |
| 17805.300      | 40.1            | -23.1          | 41.0           | 22.25                     | H            |
| 17887.800      | 39.3            | -24.0          | 40.9           | 22.43                     | H            |

## Ch157

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5722.400       | 37.6            | -32.9          | 34.9           | 35.63                     | V            |
| 5936.800       | 38.4            | -31.8          | 35.2           | 34.96                     | V            |
| 11570.500      | 34.9            | -30.5          | 38.8           | 26.61                     | H            |
| 17360.900      | 39.7            | -25.6          | 41.2           | 24.10                     | H            |
| 17803.100      | 40.3            | -23.1          | 41.0           | 22.41                     | V            |
| 17886.700      | 39.3            | -24.0          | 40.9           | 22.39                     | H            |

## Ch165

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5850.080       | 39.5            | -32.2          | 35.1           | 36.57                     | H            |
| 5854.820       | 39.0            | -32.2          | 35.1           | 36.11                     | V            |
| 11649.700      | 35.1            | -30.2          | 38.9           | 26.42                     | H            |
| 17475.300      | 38.3            | -25.2          | 41.2           | 22.30                     | V            |
| 17809.700      | 40.3            | -23.0          | 41.0           | 22.39                     | H            |
| 17880.100      | 39.4            | -23.9          | 40.9           | 22.45                     | V            |

## 802.11n-HT40

## Ch151

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5724.820       | 51.9            | -33.0          | 34.9           | 49.95                     | H            |
| 5722.030       | 50.6            | -32.9          | 34.9           | 48.65                     | V            |
| 11510.000      | 34.9            | -30.4          | 38.7           | 26.64                     | H            |
| 17265.200      | 38.1            | -25.9          | 41.2           | 22.80                     | V            |
| 17795.400      | 40.1            | -23.2          | 41.0           | 22.40                     | H            |
| 17885.600      | 39.4            | -24.0          | 40.9           | 22.53                     | V            |

## Ch159

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5850.000       | 38.2            | -32.2          | 35.1           | 35.32                     | V            |
| 5857.200       | 38.0            | -32.2          | 35.1           | 35.10                     | H            |

|           |      |       |      |       |   |
|-----------|------|-------|------|-------|---|
| 11629.900 | 34.4 | -30.4 | 38.9 | 25.86 | V |
| 17444.500 | 38.2 | -25.2 | 41.2 | 22.28 | H |
| 17807.500 | 40.3 | -23.0 | 41.0 | 22.37 | V |
| 17877.900 | 39.3 | -23.9 | 40.9 | 22.29 | H |

**Peak:**

**802.11a**

Ch149

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5723.416       | 66.5            | -32.9          | 34.9           | 64.54                     | V            |
| 5724.750       | 69.7            | -33.0          | 34.9           | 67.75                     | H            |
| 11490.200      | 47.2            | -30.4          | 38.7           | 38.93                     | V            |
| 17044.650      | 52.8            | -25.5          | 41.4           | 36.93                     | H            |
| 17230.550      | 52.2            | -25.8          | 41.2           | 36.81                     | V            |
| 17821.250      | 53.1            | -23.2          | 40.9           | 35.27                     | H            |

Ch157

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5749.800       | 50.6            | -32.9          | 34.9           | 48.58                     | H            |
| 3819.000       | 51.4            | -33.7          | 33.8           | 51.30                     | H            |
| 11569.950      | 47.0            | -30.5          | 38.8           | 38.66                     | V            |
| 17355.400      | 53.7            | -25.6          | 41.2           | 38.11                     | V            |
| 17741.500      | 52.9            | -24.1          | 41.0           | 36.04                     | H            |
| 17815.750      | 53.0            | -23.1          | 40.9           | 35.16                     | V            |

Ch165

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5850.020       | 55.3            | -32.2          | 35.1           | 52.45                     | V            |
| 5852.182       | 54.0            | -32.2          | 35.1           | 51.14                     | V            |
| 11650.250      | 46.1            | -30.2          | 38.9           | 37.40                     | H            |
| 17470.350      | 53.4            | -25.2          | 41.2           | 37.38                     | H            |
| 17743.700      | 52.4            | -24.1          | 41.0           | 35.51                     | V            |
| 17828.950      | 52.8            | -23.3          | 40.9           | 35.09                     | V            |

**802.11n-HT20**

Ch149

| Frequency(MHz) | Result (dBuV/m) | Cable Loss(dB) | Antenna Factor | P <sub>Mea</sub> (dBuV/m) | Polarization |
|----------------|-----------------|----------------|----------------|---------------------------|--------------|
| 5723.600       | 71.1            | -32.9          | 34.9           | 69.14                     | H            |
| 5722.900       | 70.2            | -32.9          | 34.9           | 68.26                     | V            |
| 11490.200      | 46.6            | -30.4          | 38.7           | 38.33                     | H            |
| 16269.700      | 52.4            | -25.4          | 40.6           | 37.08                     | V            |
| 17241.550      | 53.9            | -25.8          | 41.2           | 38.56                     | H            |

|           |      |       |      |       |   |
|-----------|------|-------|------|-------|---|
| 17848.750 | 53.3 | -23.5 | 40.9 | 35.88 | H |
|-----------|------|-------|------|-------|---|

## Ch157

| Frequency(MHz) | Result<br>(dBuV/m) | Cable<br>Loss(dB) | Antenna<br>Factor | P <sub>Mea</sub><br>(dBuV/m) | Polarization |
|----------------|--------------------|-------------------|-------------------|------------------------------|--------------|
| 4656.200       | 49.8               | -33.0             | 34.5              | 48.27                        | V            |
| 5911.200       | 51.3               | -32.1             | 35.2              | 48.21                        | V            |
| 11569.950      | 46.5               | -30.5             | 38.8              | 38.14                        | H            |
| 16551.850      | 51.7               | -25.9             | 41.2              | 36.49                        | H            |
| 17360.900      | 52.7               | -25.6             | 41.2              | 37.12                        | V            |
| 17824.550      | 52.8               | -23.2             | 40.9              | 35.09                        | H            |

## Ch165

| Frequency(MHz) | Result<br>(dBuV/m) | Cable<br>Loss(dB) | Antenna<br>Factor | P <sub>Mea</sub><br>(dBuV/m) | Polarization |
|----------------|--------------------|-------------------|-------------------|------------------------------|--------------|
| 5850.020       | 59.1               | -32.2             | 35.1              | 56.21                        | H            |
| 5850.296       | 55.8               | -32.2             | 35.1              | 52.97                        | V            |
| 11650.250      | 47.2               | -30.2             | 38.9              | 38.47                        | H            |
| 17476.400      | 52.3               | -25.3             | 41.2              | 36.37                        | V            |
| 17714.550      | 52.3               | -24.5             | 41.0              | 35.81                        | H            |
| 17783.300      | 53.2               | -23.4             | 41.0              | 35.69                        | V            |

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

| Frequency(MHz) | Result<br>(dBuV/m) | Cable<br>Loss(dB) | Antenna<br>Factor | P <sub>Mea</sub><br>(dBuV/m) | Polarization |
|----------------|--------------------|-------------------|-------------------|------------------------------|--------------|
| 5724.926       | 70.1               | -33.0             | 34.9              | 68.13                        | H            |
| 5723.738       | 70.6               | -33.0             | 34.9              | 68.65                        | V            |
| 11510.000      | 46.6               | -30.4             | 38.7              | 38.35                        | H            |
| 16571.100      | 51.5               | -25.9             | 41.2              | 36.19                        | V            |
| 17269.600      | 51.3               | -25.9             | 41.2              | 35.99                        | H            |
| 17804.200      | 53.6               | -23.1             | 41.0              | 35.71                        | V            |

**Ch159**

| Frequency(MHz) | Result<br>(dBuV/m) | Cable<br>Loss(dB) | Antenna<br>Factor | P <sub>Mea</sub><br>(dBuV/m) | Polarization |
|----------------|--------------------|-------------------|-------------------|------------------------------|--------------|
| 5850.572       | 52.8               | -32.2             | 35.1              | 49.90                        | V            |
| 5859.260       | 53.5               | -32.2             | 35.1              | 50.58                        | H            |
| 11629.900      | 46.3               | -30.4             | 38.9              | 37.81                        | V            |
| 17445.050      | 49.8               | -25.2             | 41.2              | 33.88                        | H            |
| 17787.700      | 53.4               | -23.3             | 41.0              | 35.80                        | V            |
| 17875.700      | 54.2               | -23.9             | 40.9              | 37.22                        | H            |

## A.6. Band Edges Compliance

### A6.1 Band Edges - conducted

#### Measurement Limit:

| Standard                       | Frequency (MHz)             | Limit (dBm/MHz) |
|--------------------------------|-----------------------------|-----------------|
| FCC 47 CFR Part 15.407 (b) (4) | 5715MHz~5860MHz             | < -17           |
|                                | Below 5715MHz, Above5860MHz | < -27           |

The measurement is made according to KDB 789033 D02

#### Measurement Uncertainty:

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

#### Measurement Result:

| Mode            | Channel  | Test Results | Conclusion |
|-----------------|----------|--------------|------------|
| 802.11n<br>HT40 | 5755 MHz | Fig.21       | P          |
|                 | 5795 MHz | Fig.22       | P          |

Note: 802.11n HT40 was selected as the worst-case of the test case.

#### Conclusion: PASS

#### Test graphs as below:

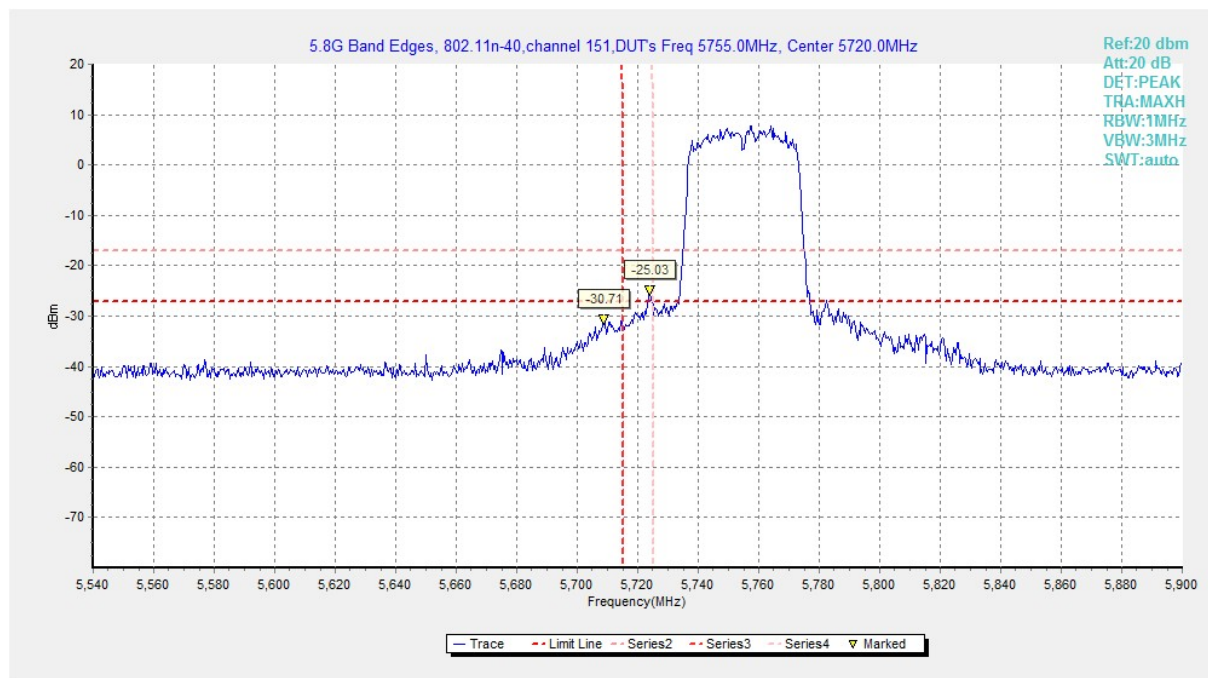


Fig. 21 Band Edges (802.11n-HT40, 5755MHz)



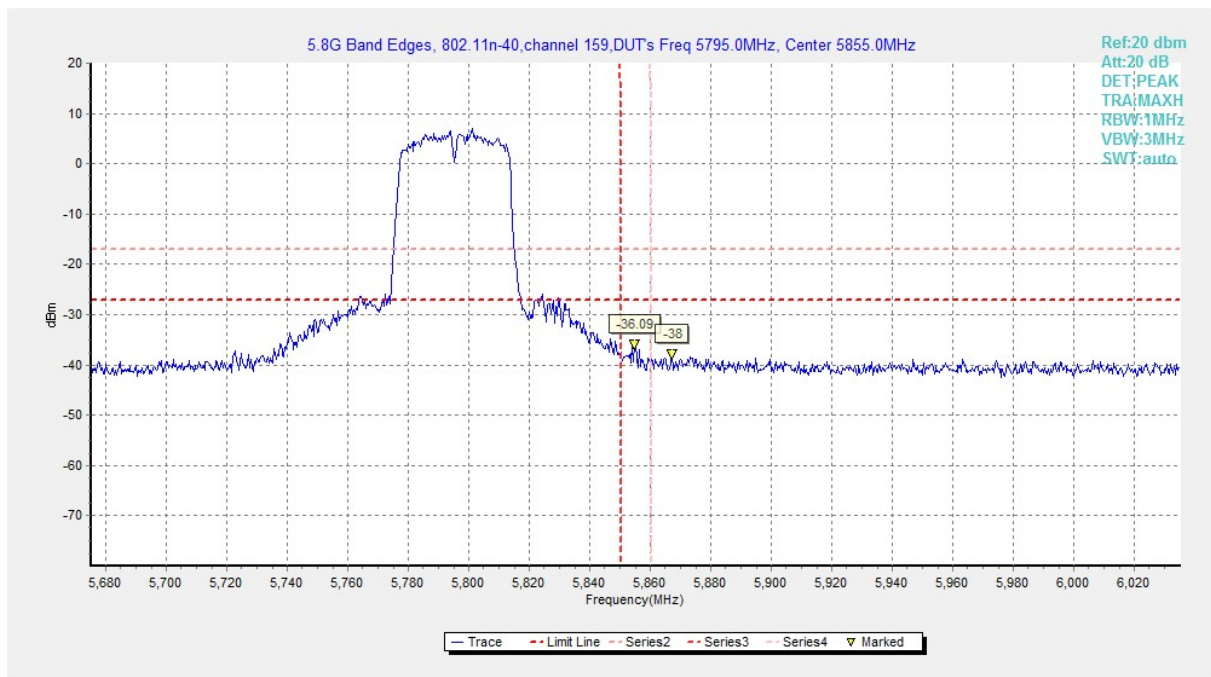


Fig. 22 Band Edges (802.11n-HT40, 5795MHz)

## A6.2 Band Edges - Radiated

### Measurement Limit:

| Standard               | Limit (dB $\mu$ V/m) |    |
|------------------------|----------------------|----|
| FCC 47 CFR Part 15.209 | Peak                 | 74 |
|                        | Average              | 54 |

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)).

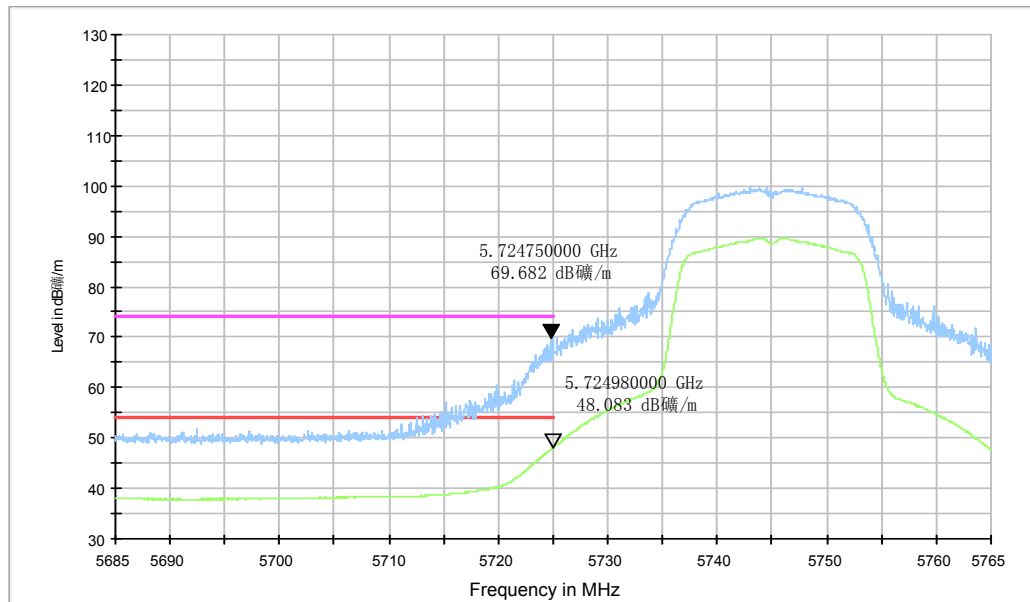
### Measurement Result:

| Mode            | Channel  | Test Results | Conclusion |
|-----------------|----------|--------------|------------|
| 802.11a         | 5745 MHz | Fig.23       | P          |
|                 | 5825 MHz | Fig.24       | P          |
| 802.11n<br>HT20 | 5745 MHz | Fig.25       | P          |
|                 | 5825 MHz | Fig.26       | P          |
| 802.11n<br>HT40 | 5755 MHz | Fig.27       | P          |
|                 | 5795 MHz | Fig.28       | P          |

**Conclusion: PASS**

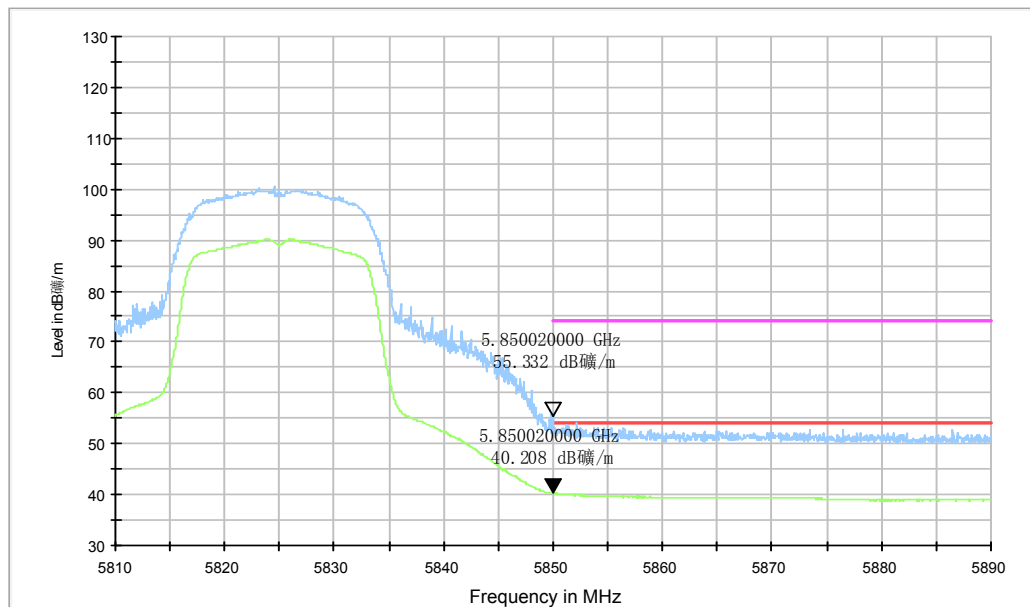
Test graphs as below:

RE - Power-5.650GHz-5.765GHz



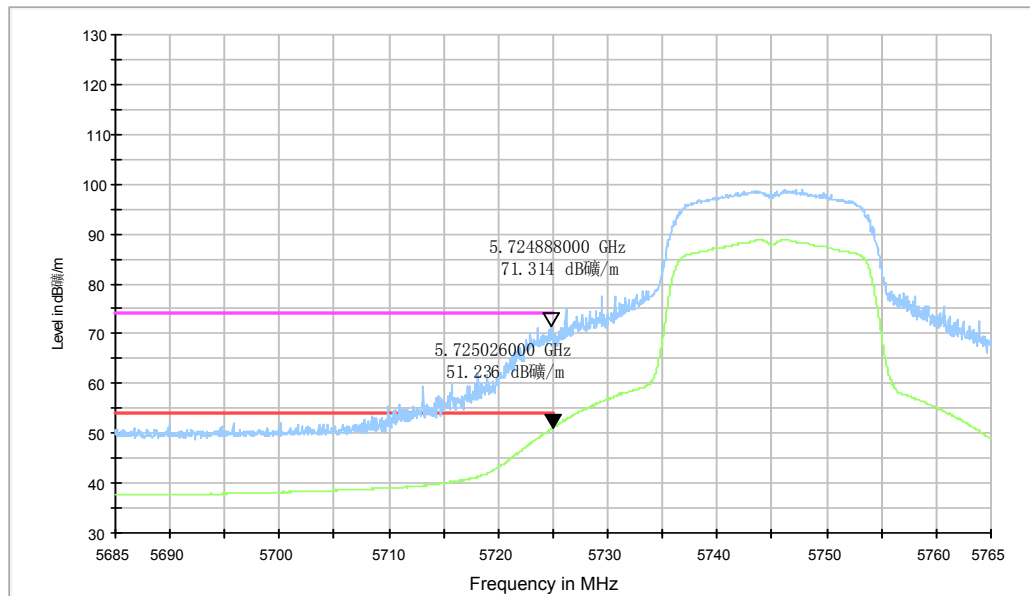
**Fig. 23 Band Edges (802.11a, 5745MHz)**

RE - Power-5.810GHz-5.925GHz



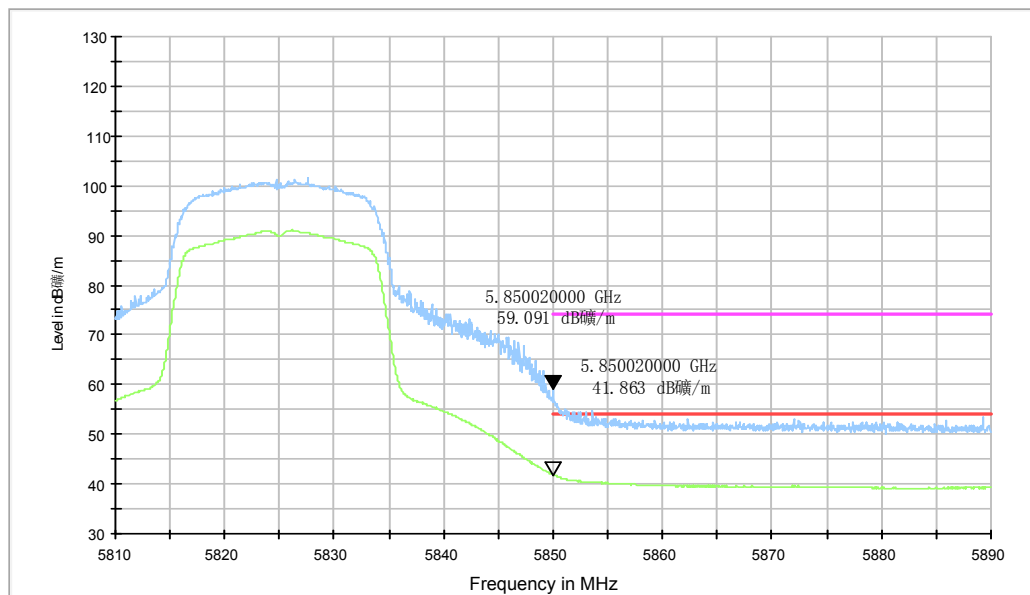
**Fig. 24 Band Edges (802.11a, 5825MHz)**

RE - Power-5.650GHz-5.765GHz



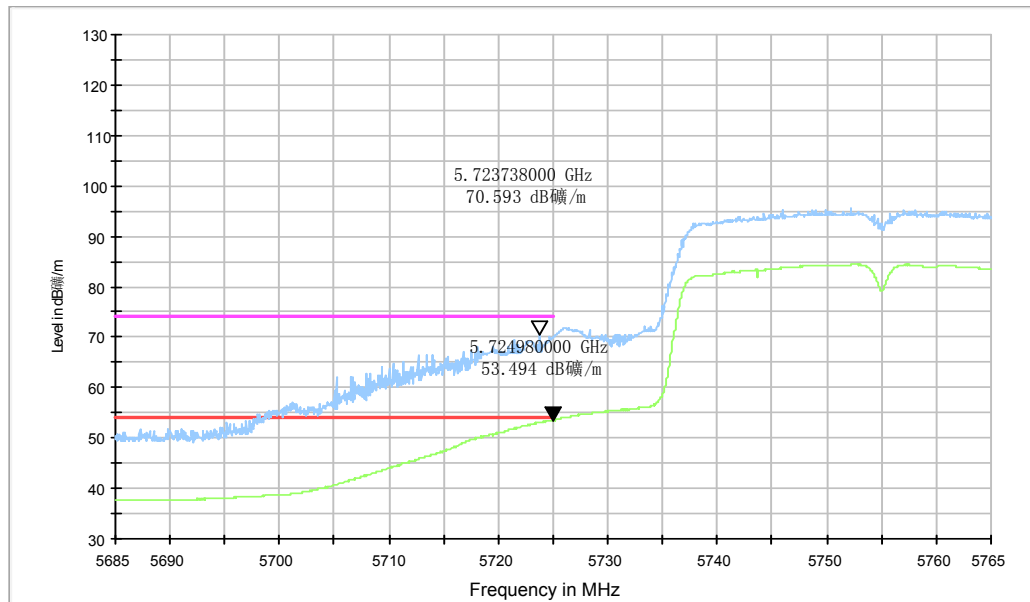
**Fig. 25 Band Edges (802.11n-HT20, 5745MHz)**

RE - Power-5.810GHz-5.925GHz



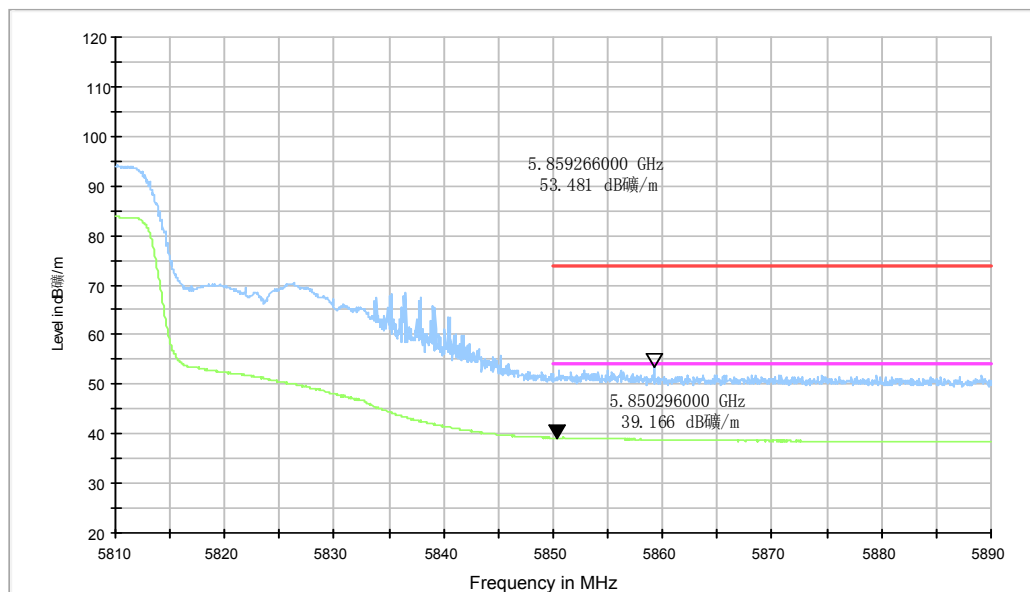
**Fig. 26 Band Edges (802.11n-HT20, 5825MHz)**

RE - Power-5.650GHz-5.765GHz



**Fig. 27 Band Edges (802.11n-HT40, 5755MHz)**

RE - Power-5.810GHz-5.925GHz



**Fig. 28 Band Edges (802.11n-HT40, 5795MHz)**

## A.7. AC Powerline Conducted Emission

### Test Condition:

| Voltage (V) | Frequency (Hz) |
|-------------|----------------|
| 110         | 60             |

### Measurement uncertainty:

Expanded measurement uncertainty for this test item is  $U = 3.2\text{dB}$ ,  $k=2$ .

### Measurement Result and limit:

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.29        | Fig.30 | <b>P</b>   |
| 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. |                            |               |        |            |

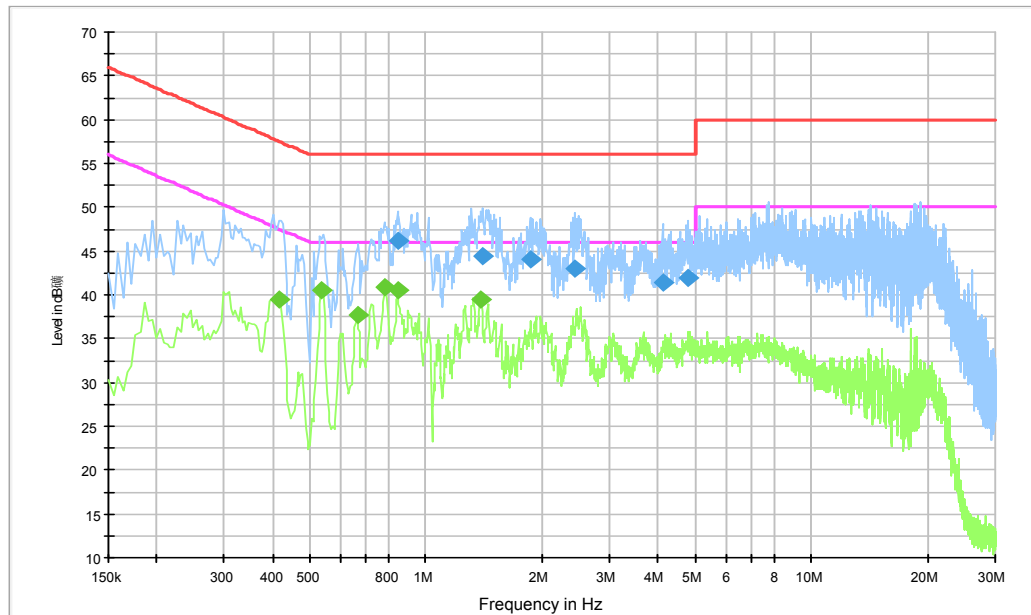
WLAN (Average Limit)

| 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.29        | Fig.30 | 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. |                         |               |        |            |

The measurement is made according to ANSI C63.10 .

**Conclusion: PASS**

Test graphs as below:



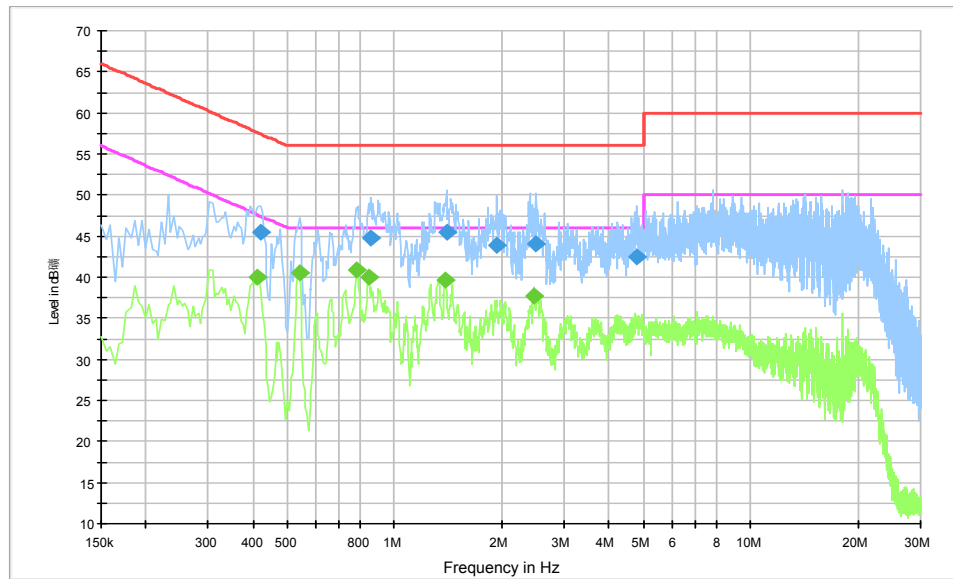
**Fig. 29 AC Powerline Conducted Emission-802.11a**

Final Result 1:

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.843000        | 46.3             | GND | L1   | 10.2       | 9.7         | 56.0         |
| 1.405500        | 44.5             | GND | L1   | 10.2       | 11.5        | 56.0         |
| 1.860000        | 44.1             | GND | L1   | 10.3       | 11.9        | 56.0         |
| 2.431500        | 43.1             | GND | L1   | 10.3       | 12.9        | 56.0         |
| 4.105500        | 41.5             | GND | L1   | 10.4       | 14.5        | 56.0         |
| 4.807500        | 41.9             | GND | L1   | 10.4       | 14.1        | 56.0         |

Final Result 2:

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.415500        | 39.6             | GND | L1   | 10.2       | 8.0         | 47.5         |
| 0.537000        | 40.6             | GND | L1   | 10.2       | 5.4         | 46.0         |
| 0.663000        | 37.6             | GND | L1   | 10.2       | 8.4         | 46.0         |
| 0.784500        | 40.8             | GND | L1   | 10.2       | 5.2         | 46.0         |
| 0.847500        | 40.5             | GND | L1   | 10.2       | 5.5         | 46.0         |
| 1.383000        | 39.5             | GND | L1   | 10.2       | 6.5         | 46.0         |



**Fig. 30 AC Powerline Conducted Emission-Idle**

Final Result 1:

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.420000        | 45.5             | GND | L1   | 10.2       | 11.9        | 57.4         |
| 0.861000        | 44.7             | GND | L1   | 10.2       | 11.3        | 56.0         |
| 1.396500        | 45.5             | GND | L1   | 10.2       | 10.5        | 56.0         |
| 1.941000        | 43.9             | GND | L1   | 10.3       | 12.1        | 56.0         |
| 2.503500        | 44.1             | GND | L1   | 10.3       | 11.9        | 56.0         |
| 4.807500        | 42.4             | GND | L1   | 10.4       | 13.6        | 56.0         |

Final Result 2:

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.411000        | 39.9             | GND | L1   | 10.2       | 7.7         | 47.6         |
| 0.541500        | 40.5             | GND | L1   | 10.2       | 5.5         | 46.0         |
| 0.784500        | 40.8             | GND | L1   | 10.2       | 5.2         | 46.0         |
| 0.843000        | 40.1             | GND | L1   | 10.2       | 5.9         | 46.0         |
| 1.383000        | 39.6             | GND | L1   | 10.2       | 6.4         | 46.0         |
| 2.454000        | 37.7             | GND | L1   | 10.3       | 8.3         | 46.0         |

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