



**FCC PART 15 SUBPART C**  
**CERTIFICATION TEST REPORT**

*For*

**Portable Air-Condition**

**MODEL NUMBER: TAC-10CPA/HN, TAC-14CPA/KC**

**FCC ID: 2AHH3TAC3TYJW2-KNKA**

**REPORT NUMBER: 4788426378.1-1**

**ISSUE DATE: 26 Feb. 2018**

*Prepared for*

**TCL Delonghi Home Appliances (zhongshan) Co., Ltd.  
Shenghui North Industrial District, Nantou Zhongshan,Guangdong,China**

*Prepared by*

**UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch  
Room 101, Building 10, Innovation Technology Park,  
Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China**  
Tel: +86 769 33817100  
Fax: +86 769 33244054  
Website: [www.ul.com](http://www.ul.com)

Revision History

| Rev. | Issue Date | Revisions     | Revised By |
|------|------------|---------------|------------|
| 0    | 2/26/2018  | Initial Issue | --         |

| Summary of Test Results |   |  |              |
|-------------------------|---|--|--------------|
| Clause                  | Test Items                                | FCC/IC Rules                               | Test Results |
| 1                       | 6dB Bandwidth and 99% Bandwidth           | FCC 15.247 (a) (2)                         | Pass         |
| 2                       | Peak Conducted Output Power               | FCC 15.247 (b) (3)                         | Pass         |
| 3                       | Power Spectral Density                    | FCC 15.247 (e)                             | Pass         |
| 4                       | Conducted Bandedge and Spurious Emission  | FCC 15.247 (d)                             | Pass         |
| 5                       | Radiated Bandedge and Spurious Emission   | FCC 15.247 (d)<br>FCC 15.209<br>FCC 15.205 | Pass         |
| 6                       | Conducted Emission Test For AC Power Port | FCC 15.207                                 | Pass         |
| 7                       | Antenna Requirement                       | FCC 15.203                                 | Pass         |

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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: TCL Delonghi Home Appliances (zhongshan) Co., Ltd.  
Address: Shenghui North Industrial District, Nantou  
Zhongshan,Guangdong,China

### Manufacturer Information

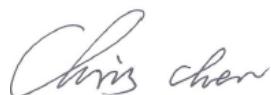
Company Name: TCL Delonghi Home Appliances (zhongshan) Co., Ltd.  
Address: Shenghui North Industrial District, Nantou  
Zhongshan,Guangdong,China

### EUT Description

EUT Name: Portable Air-Condition  
Model: TAC-10CPA/HN( with ASN83E1VBZ1 compressor and A design display),  
TAC-14CPA/KC, (with 44A281B compressor and B design display), performance below 1GHz test.  
Brand Name: N/A  
Sample Status: Normal  
Sample ID: 1102464  
Sample Received Date: 01 Dec. 2017  
Date of Tested: 01 Dec. 2017 ~ 26 Feb. 2018

| APPLICABLE STANDARDS  |              |
|-----------------------|--------------|
| STANDARD              | TEST RESULTS |
| FCC Part 15 Subpart C | PASS         |

Tested By:



Chris chen  
Engineer Project Associate  
Approved By:



Stephen Guo  
Laboratory Manager

Checked By:



Shawn Wen  
Laboratory Leader

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with 558074 D01 DTS Meas Guidance v04, 414788 D01 Radiated Test Site v01, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and ANSI C63.10-2013.

## 3. FACILITIES AND ACCREDITATION

|                           |   |
|---------------------------|---|
| Accreditation Certificate | <p><b>A2LA (Certificate No.: 4338.01)</b><br/>Shenzhen STS Test Services Co., Ltd.<br/>has been assessed and proved to be in compliance with A2LA.</p> <p><b>CNAS (Registration No.: L7649)</b><br/>Shenzhen STS Test Services Co., Ltd.<br/>has been assessed and proved to be in compliance with CNAS.</p> <p><b>FCC (FCC Designation No.: 625569)</b><br/>Shenzhen STS Test Services Co., Ltd.<br/>has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p><b>IC(Company No.: 12108A)</b><br/>Shenzhen STS Test Services Co., Ltd.<br/>has been registered and fully described in a report filed with Industry Canada. The Company Number is 12108A.</p> |
|---------------------------|---|

Note 1: All tests measurement facilities used to collect the measurement data are located at 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

Note 2: The test anechoic chamber in Shenzhen STS Test Services Co., Ltd. had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

### 4.2. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 % .

| No. | Item                                    | Uncertainty         |
|-----|---|---------------------|
| 1   | Conducted Emission (9KHz-150KHz)        | $\pm 2.88\text{dB}$ |
| 2   | Conducted Emission (150KHz-30MHz)       | $\pm 2.67\text{dB}$ |
| 3   | RF power,conducted                      | $\pm 0.71\text{dB}$ |
| 4   | Spurious emissions,conducted            | $\pm 0.63\text{dB}$ |
| 5   | All emissions,radiated (9KHz-30MHz)     | $\pm 3.02\text{dB}$ |
| 6   | All emissions,radiated (30MHz-200MHz)   | $\pm 3.80\text{dB}$ |
| 7   | All emissions,radiated (200MHz-1000MHz) | $\pm 3.97\text{dB}$ |
| 8   | All emissions,radiated(>1G)             | $\pm 3.03\text{dB}$ |

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

|                     |  |
|---------------------|--|
| EUT Name            | Portable Air-Condition   |
| EUT Description     | N/A  |
| Model               | TAC-10CPA/HN   |
| Series Model        | TAC-12CHPA/KN, TAC-14CHPA/KN, TAC-12CHPA/KA, TAC-12CDPA/KA, TAC-14CDPA/KA, TAC-10CPA/HA, TAC-08CPA/HA, TAC-08CPA/HN, TAC-08CPA/HC, TAC-10CPA/HC, TAC-12CPA/KN, TAC-12CPA/KA, TAC-14CPA/KN, TAC-14CPA/KA, TAC-12CPA/KC, TAC-14CPA/KC  |
| Model Difference    | <p>There are appearance, working function , display panel and compressor different, one of these parts model have electrical heating &amp; cooling or cooling only. Therefore used the most complicated model tested representative.</p> <ul style="list-style-type: none"><li>• This series all used the same wireless module.</li><li>• This series used 4 compressor alternately( model:ASN83E1VBZ1,39B171H,39A231A,44A281B)</li><li>• This series used 2 display panel alternately(A design , B design).</li></ul> |
| Radio Technology    | IEEE802.11b/g/n HT20   |
| Operation frequency | IEEE 802.11b: 2412MHz—2462MHz<br>IEEE 802.11g: 2412MHz—2462MHz<br>IEEE 802.11n HT20: 2412MHz—2462MHz   |
| Modulation          | IEEE 802.11b: DSSS(CCK)<br>IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)   |
| Power Supply        | Input: AC 120V, 60Hz   |
| Hardware Version    | 1.1.1  |
| Software Version    | 1.0  |

### 5.2. MAXIMUM OUTPUT POWER

| Frequency Range (MHz) | Number of Transmit Chains (NTX) | IEE Std. 802.11  | Frequency (MHz) | Channel Number | Max PK Conducted Power (dBm) |
|-----------------------|---------------------------------|------------------|-----------------|----------------|------------------------------|
| 2400-2483.5           | 1                               | IEEE 802.11b     | 2412-2462       | 1-11[11]       | 16.48                        |
| 2400-2483.5           | 1                               | IEEE 802.11g     | 2412-2462       | 1-11[11]       | 15.51                        |
| 2400-2483.5           | 1                               | IEEE 802.11nHT20 | 2412-2462       | 1-11[11]       | 15.47                        |

### 5.3. CHANNEL LIST

| Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 1       | 2412            | 4       | 2425            | 7       | 2442            | 10      | 2457            |
| 2       | 2417            | 5       | 2432            | 8       | 2447            | 11      | 2462            |
| 3       | 2422            | 6       | 2437            | 9       | 2452            | N/A     | N/A             |

### 5.4. TEST CHANNEL CONFIGURATION

| Test Mode             | Test Channel      | Frequency                 |
|-----------------------|-------------------|---------------------------|
| WiFi TX(802.11b)      | CH 1, CH 6, CH 11 | 2412MHz, 2437MHz, 2462MHz |
| WiFi TX(802.11g)      | CH 1, CH 6, CH 11 | 2412MHz, 2437MHz, 2462MHz |
| WiFi TX(802.11n HT20) | CH 1, CH 6, CH 11 | 2412MHz, 2437MHz, 2462MHz |

### 5.5. THE WORSE CASE CONFIGURATIONS

| The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band |                         |               |         |         |            |      |       |
|--|-------------------------|---------------|---------|---------|------------|------|-------|
| Test Software Version  |                         | SecureCRT.exe |         |         |            |      |       |
| Modulation Mode  | Transmit Antenna Number | Test Channel  |         |         |            |      |       |
|  |                         | NCB: 20MHz    |         |         | NCB: 40MHz |      |       |
|  |                         | CH 1          | CH 6    | CH 11   | CH 3       | CH 7 | CH 11 |
| 802.11b  | 1                       | Default       | Default | Default | N/A        |      |       |
| 802.11g  | 1                       | Default       | Default | Default |            |      |       |
| 802.11n HT20   | 1                       | Default       | Default | Default |            |      |       |

### 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Ant. | Frequency (MHz) | Antenna Type | Antenna Gain (dBi) |
|------|-----------------|--------------|--------------------|
| 1    | 2412-2462       | PCB Antenna  | 0                  |

| Test Mode         | Transmit and Receive Mode                    | Description  |
|-------------------|--|--|
| IEEE 802.11b      | <input checked="" type="checkbox"/> 1TX, 1RX | Chain 1 can be used as transmitting/receiving antenna. |
| IEEE 802.11g      | <input checked="" type="checkbox"/> 1TX, 1RX | Chain 1 can be used as transmitting/receiving antenna. |
| IEEE 802.11n HT20 | <input checked="" type="checkbox"/> 1TX, 1RX | Chain 1 can be used as transmitting/receiving antenna. |

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Item | Equipment | Brand Name | Model Name | P/N |
|------|-----------|------------|------------|-----|
| 1    | PC        | HP         | 500-320cx  | N/A |

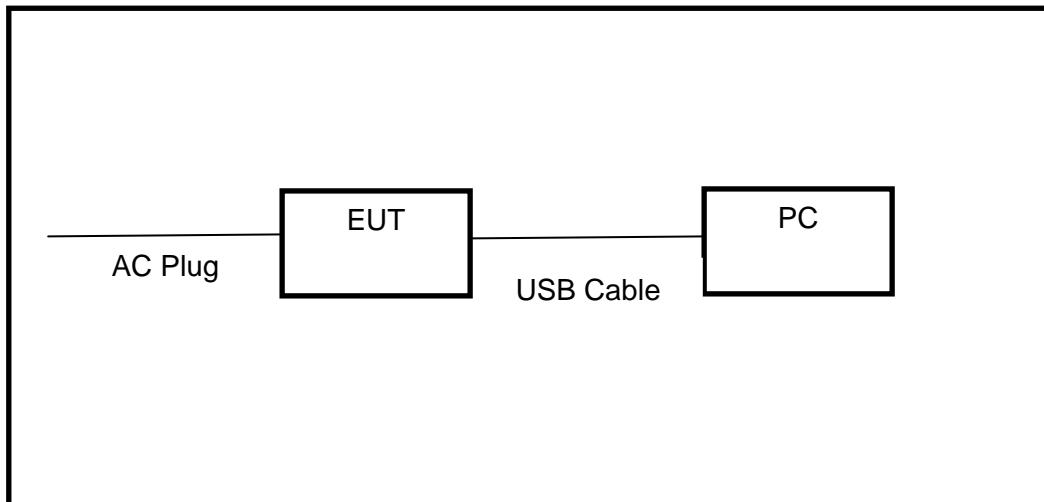
### I/O CABLES

| Cable No | Port      | Connector Type | Cable Type | Cable Length(cm) | Remarks |
|----------|-----------|----------------|------------|------------------|---------|
| 1        | USB Cable | N/A            | N/A        | 100              | N/A     |

### TEST SETUP

The EUT can work in engineering mode with firmware QRCT from QUALCOMM through a Laptop.

### SETUP DIAGRAM FOR TESTS



## 6. MEASURING INSTRUMENT AND SOFTWARE USED

| Conducted Emissions |   |               |             |              |            |            |
|---------------------|---|---------------|-------------|--------------|------------|------------|
| Used                | Equipment                                   | Manufacturer  | Model No.   | Serial No.   | Last Cal.  | Next Cal.  |
| ●                   | Test Receiver                               | R&S           | ESCI        | 101427       | 2017.10.15 | 2018.10.14 |
| ●                   | LISN  | R&S           | ENV216      | 101242       | 2017.10.15 | 2018.10.14 |
| ●                   | Conduction Cable                            | EM            | C01         | N/A          | 2017.03.12 | 2018.03.11 |
| ●                   | Temperature & Humidity                      | Mieo          | HH660       | N/A          | 2017.10.15 | 2018.10.14 |
| Radiated Emissions  |   |               |             |              |            |            |
| Used                | Equipment                                   | Manufacturer  | Model No.   | Serial No.   | Last Cal.  | Next Cal.  |
| ●                   | EMI Test Receiver                           | R&S           | ESW         | 101535       | 2017.06.01 | 2018.05.31 |
| ●                   | Bilog Antenna                               | TESEQ         | CBL6111D    | 34678        | 2017.03.24 | 2018.03.23 |
| ●                   | Horn Antenna                                | Schwarzbeck   | BBHA 9120D  | 9120D-1343   | 2017.03.06 | 2018.03.05 |
| ●                   | SHF-EHF Horn Antenna (15G-40GHz)            | BBHA 9170     | SCHWARZBECK | BBHA9170 367 | 2017.05.02 | 2018.05.01 |
| ●                   | Temperature & Humidity                      | HH660         | Mieo        | N/A          | 2017.10.15 | 2018.10.14 |
| ●                   | Temperature & Humidity                      | HH660         | Mieo        | N/A          | 2017.10.15 | 2018.10.14 |
| ●                   | Pre-mplifier (0.1M-3GHz)                    | EM            | EM330       | 60538        | 2017.03.12 | 2018.03.11 |
| ●                   | PreAmplifier (1G-26.5GHz)                   | Agilent       | 8449B       | 60538        | 2017.10.15 | 2018.10.14 |
| ●                   | Pre-mplifier (18G-40G)                      | MINI-CIRCUITS | AP-040G     | 1382501      | 2017.05.15 | 2018.05.14 |
| ●                   | Operational Manual Passive Loop (9K--30MHz) | ETS           | 6512        | 00165355     | 2017.03.06 | 2018.03.05 |
| ●                   | Low frequency cable                         | EM            | R01         | N/A          | 2017.03.12 | 2018.03.11 |
| ●                   | Low frequency cable                         | EM            | R06         | N/A          | 2017.03.12 | 2018.03.11 |
| ●                   | High frequency cable                        | SCHWARZBEC K  | R04         | N/A          | 2017.03.12 | 2018.03.11 |
| ●                   | High frequency cable                        | SCHWARZBEC K  | R02         | N/A          | 2017.03/12 | 2018.03.11 |
| ●                   | Semi-anechoic chamber                       | Changling     | 966         | N/A          | 2017.10.15 | 2018.10.14 |
| ●                   | trun table                                  | EM            | SC100_1     | 60531        | N/A        | N/A        |
| ●                   | Antenna mast                                | EM            | SC100       | N/A          | N/A        | N/A        |
| ●                   | Max-full Antenna Corp                       | MF            | MFA-440H    | N/A          | N/A        | N/A        |

| Other instruments |                     |              |           |               |            |            |
|-------------------|---------------------|--------------|-----------|---------------|------------|------------|
| Used              | Equipment           | Manufacturer | Model No. | Serial No.    | Last Cal.  | Next Cal.  |
| ■                 | USB RF power sensor | DARE         | RPR3006 W | 15I00041SNO03 | 2017.10.15 | 2018.10.14 |
| ■                 | Power Meter         | R&S          | NRP       | 100510        | 2017.10.15 | 2018.10.14 |
| ■                 | Spectrum Analyzer   | Agilent      | E4407B    | MY50140340    | 2017.03.11 | 2018.03.10 |
| ■                 | Signal Analyzer     | Agilent      | N9020A    | MY49100060    | 2017.03.11 | 2018.03.10 |

## 7. MEASUREMENT METHODS

| No. | Test Item                                     | KDB Name                             | Section |
|-----|---|--------------------------------------|---------|
| 1   | 6dB Bandwidth and 99% Bandwidth               | KDB 558074 D01 DTS Meas Guidance v04 | 8.0     |
| 2   | Peak Output Power                             | KDB 558074 D01 DTS Meas Guidance v04 | 9.1.3   |
| 3   | Power Spectral Density                        | KDB 558074 D01 DTS Meas Guidance v04 | 10.2    |
| 4   | Out-of-band emissions in non-restricted bands | KDB 558074 D01 DTS Meas Guidance v04 | 11.0    |
| 5   | Out-of-band emissions in restricted bands     | KDB 558074 D01 DTS Meas Guidance v04 | 12.1    |
| 6   | Band-edge                                     | KDB 558074 D01 DTS Meas Guidance v04 | 13.3.2  |
| 7   | Conducted Emission Test For AC Power Port     | ANSI C63.10-2013                     | 7.3     |

## 8. ANTENNA PORT TEST RESULTS

### 8.1. ON TIME AND DUTY CYCLE

#### LIMITS

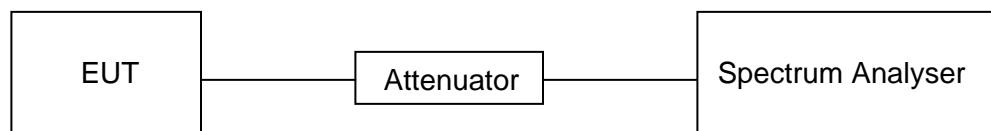
None; for reporting purposes only

#### PROCEDURE

a

KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 25°C   | Relative Humidity | 60%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

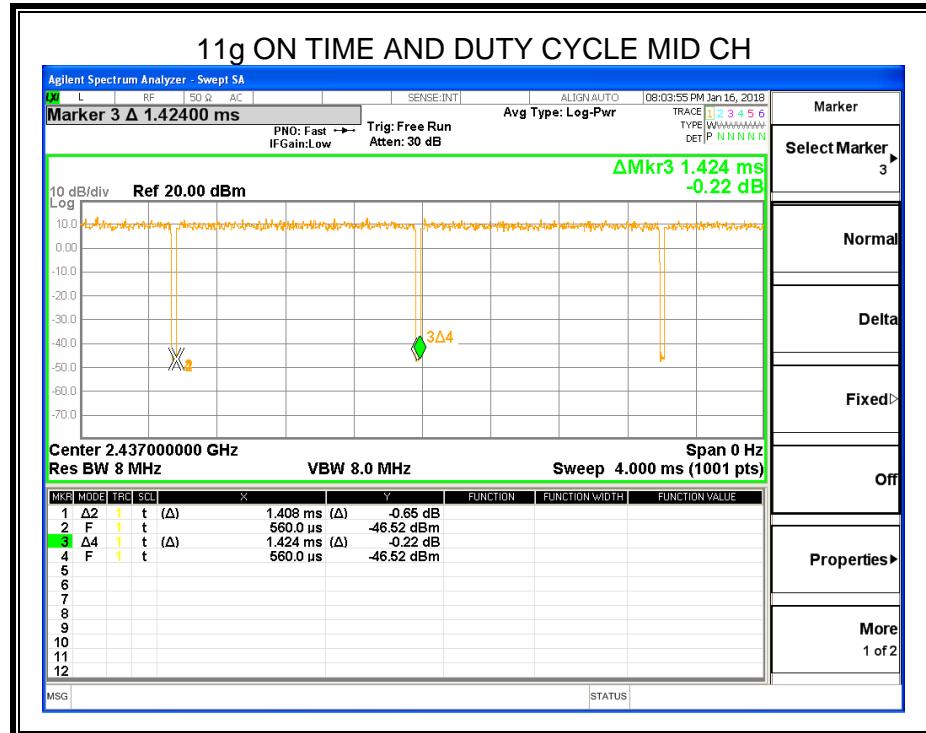
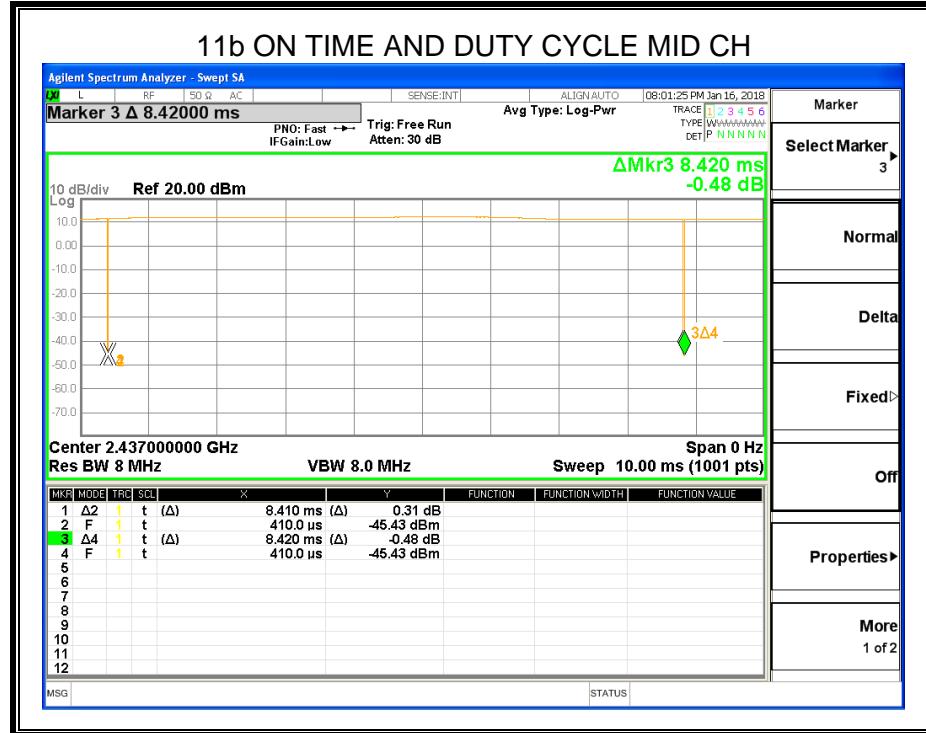
#### RESULTS

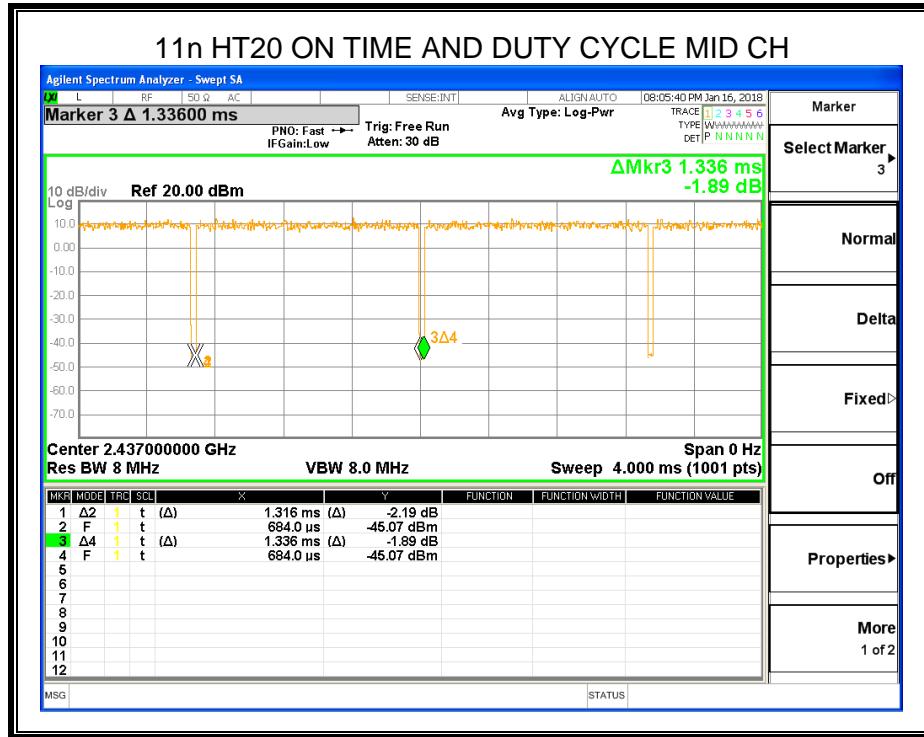
| Mode  | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) | 1/B Minimum VBW (KHz) |
|-------|----------------|---------------|-----------------------|----------------|-----------------------------------|-----------------------|
| 11b   | 8.410          | 8.420         | 0.9988                | 99.88          | 0.01                              | 0.12                  |
| 11g   | 1.408          | 1.424         | 0.9888                | 98.88          | 0.05                              | 0.71                  |
| 11n20 | 1.316          | 1.336         | 0.9850                | 98.50          | 0.07                              | 0.76                  |

Note: Duty Cycle Correction Factor=10log(1/x).

Where: x is Duty Cycle(Linear)

Where: B is On Time





## 8.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

### LIMITS

| FCC Part15 (15.247) Subpart C |                |           |                       |
|-------------------------------|----------------|-----------|-----------------------|
| Section                       | Test Item      | Limit     | Frequency Range (MHz) |
| FCC 15.247(a)(2)              | 6 dB Bandwidth | >= 500KHz | 2400-2483.5           |

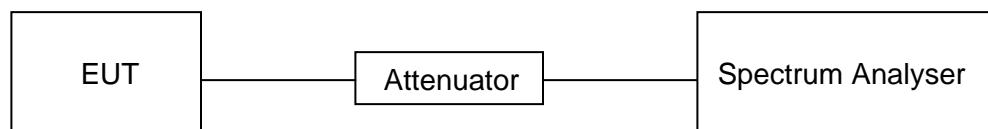
### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

|                  |  |
|------------------|--|
| Center Frequency | The centre frequency of the channel under test                                     |
| Detector         | Peak   |
| RBW              | For 6dB Bandwidth :100K<br>For 99% Bandwidth :1% to 5% of the occupied bandwidth   |
| VBW              | For 6dB Bandwidth : $\geq 3 \times$ RBW<br>For 99% Bandwidth : approximately 3xRBW |
| Trace            | Max hold   |
| Sweep            | Auto couple  |

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB and 99% relative to the maximum level measured in the fundamental emission.

### TEST SETUP

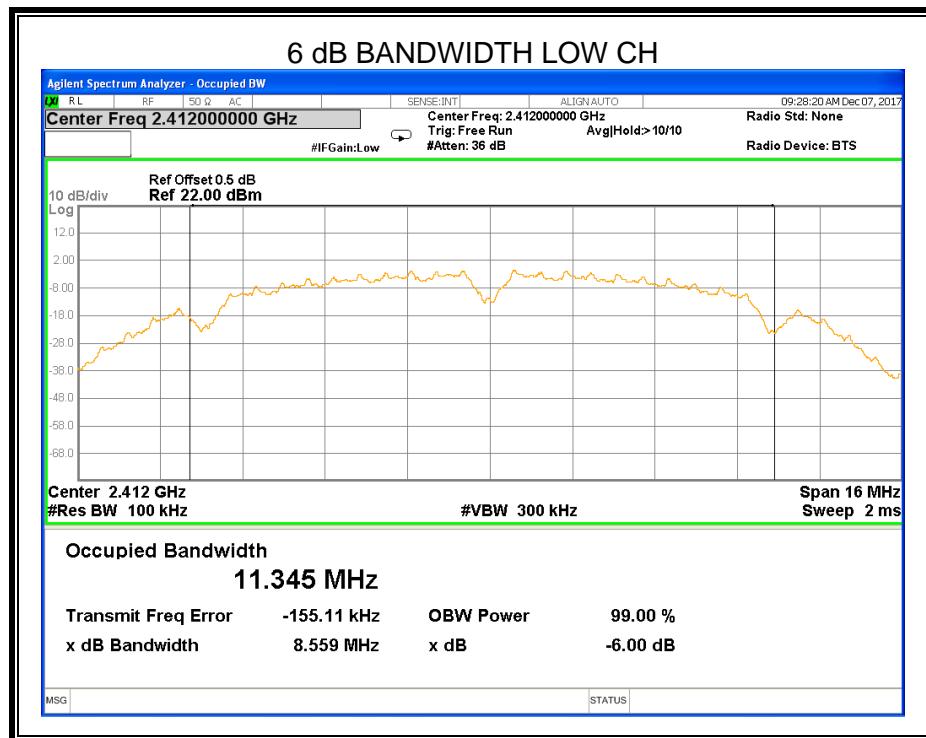


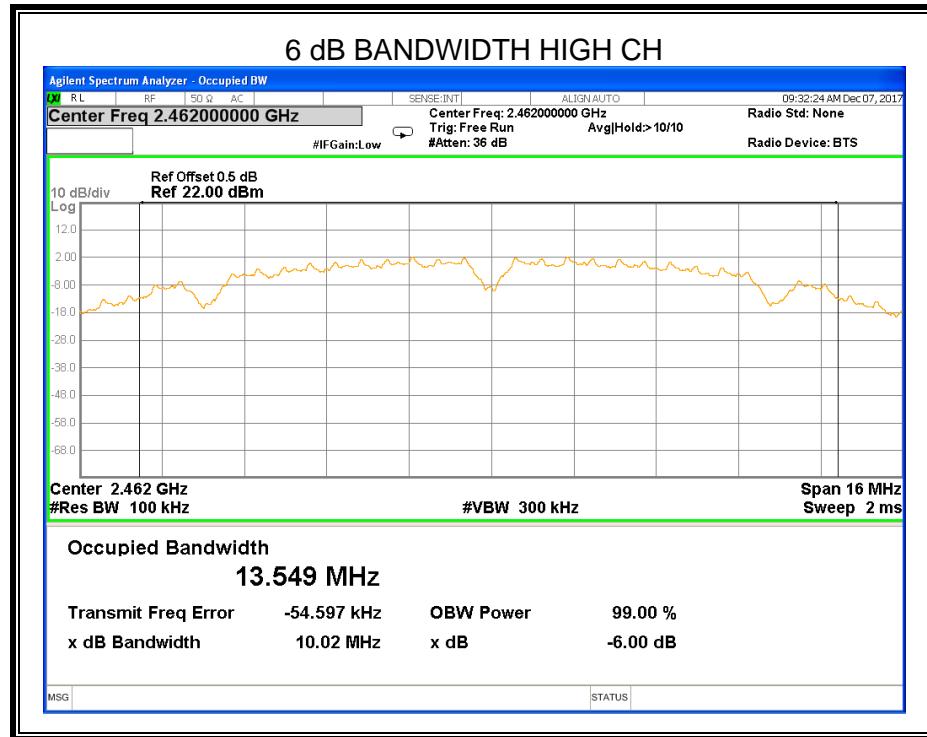
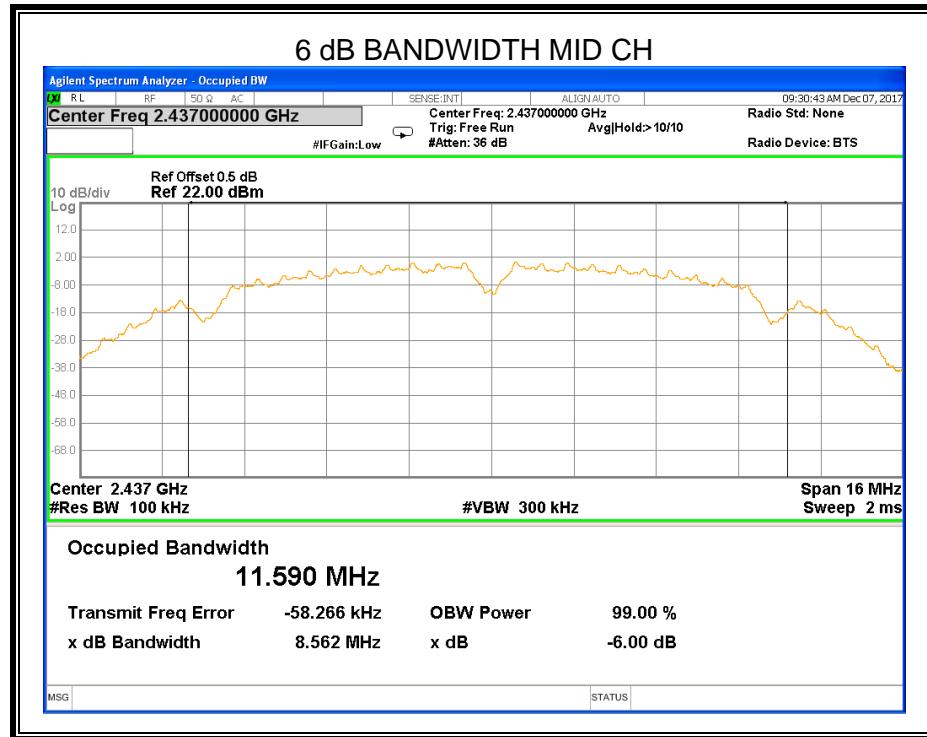
**TEST ENVIRONMENT**

|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 25°C   | Relative Humidity | 60%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

**RESULTS****8.2.1. 802.11b MODE**

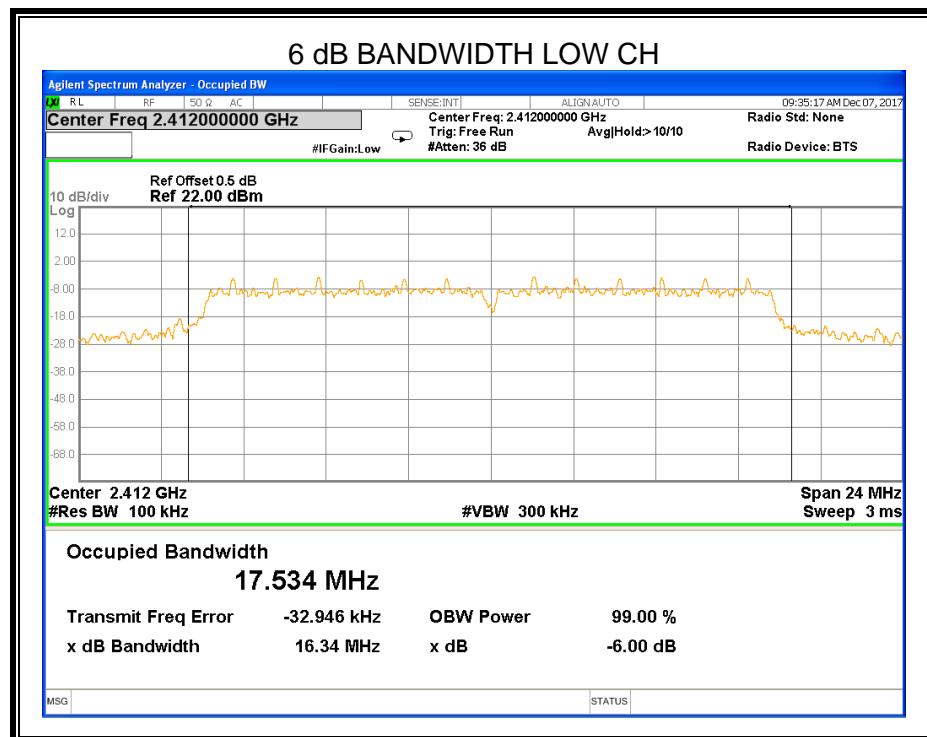
| Channel | Frequency (MHz) | 6dB bandwidth (MHz) | Limit (kHz) | Result |
|---------|-----------------|---------------------|-------------|--------|
| Low     | 2412            | 8.559               | 500         | Pass   |
| Middle  | 2437            | 8.562               | 500         | Pass   |
| High    | 2462            | 10.02               | 500         | Pass   |

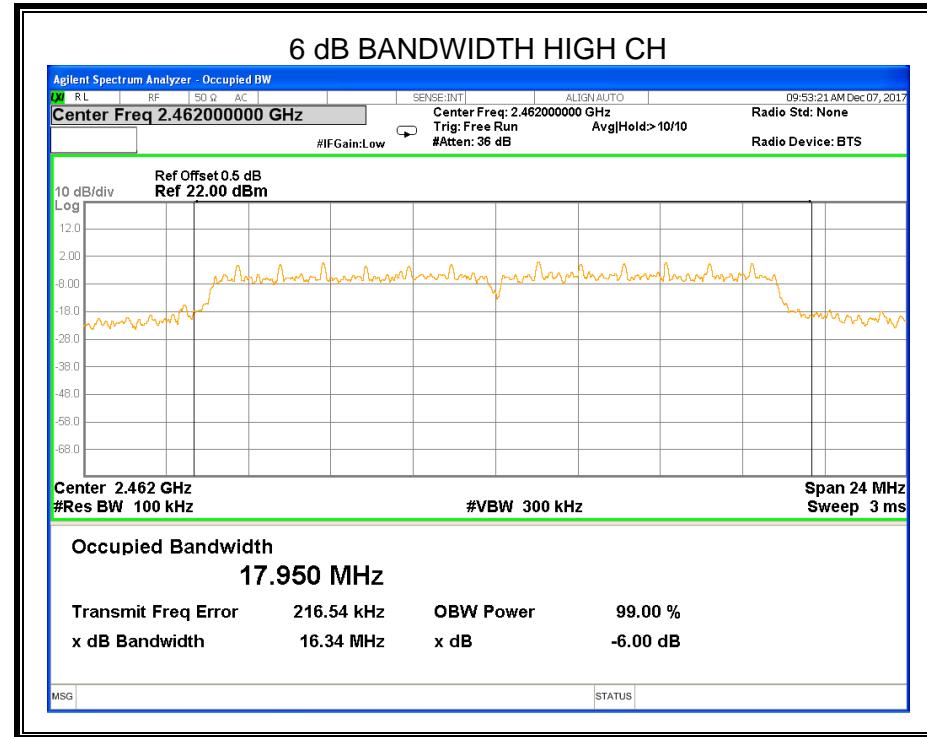
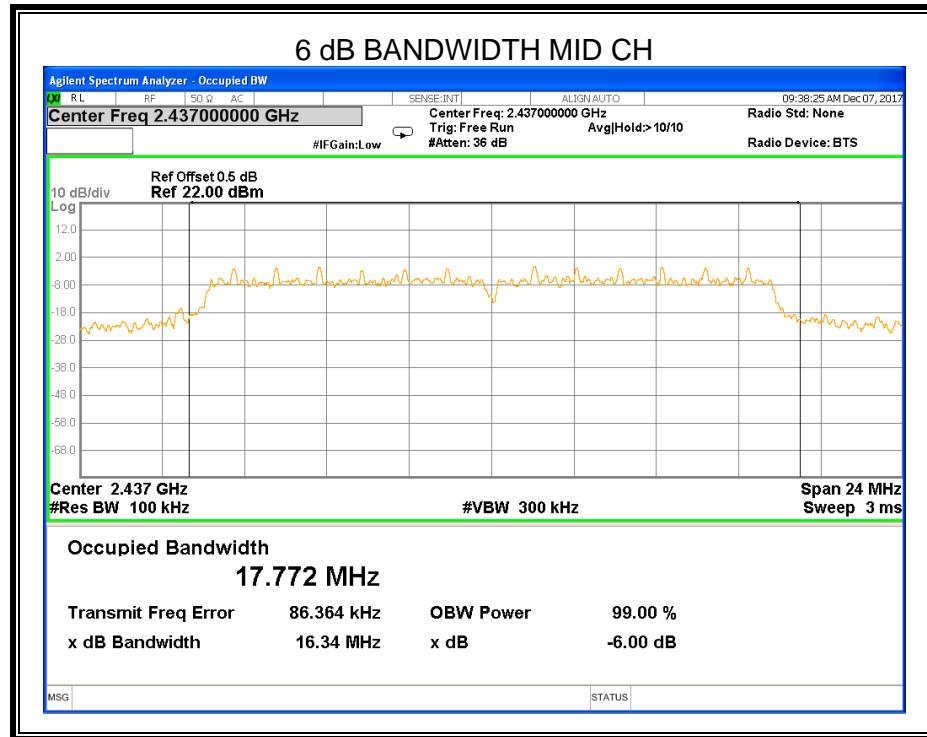




## 8.2.2. 802.11g MODE

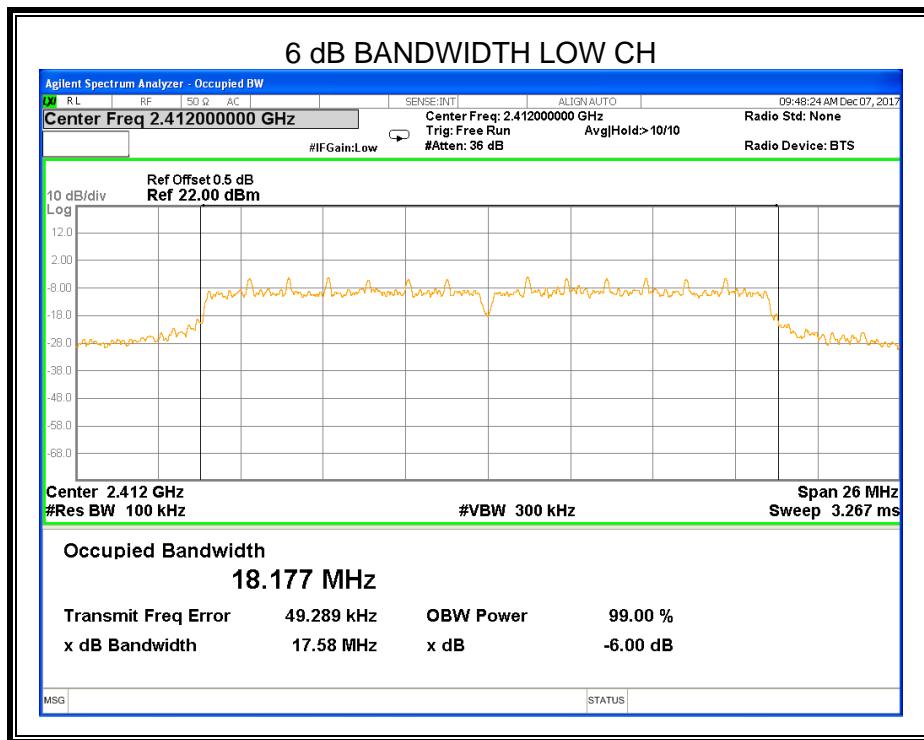
| Channel | Frequency (MHz) | 6dB bandwidth (MHz) | Limit (kHz) | Result |
|---------|-----------------|---------------------|-------------|--------|
| Low     | 2412            | 16.34               | 500         | Pass   |
| Middle  | 2437            | 16.34               | 500         | Pass   |
| High    | 2462            | 16.34               | 500         | Pass   |

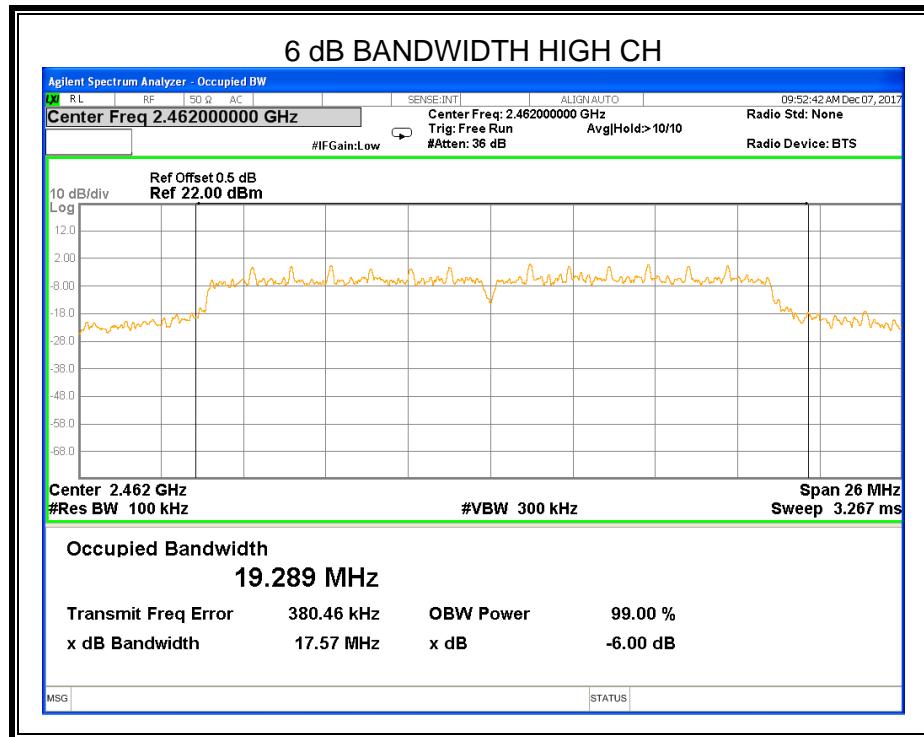
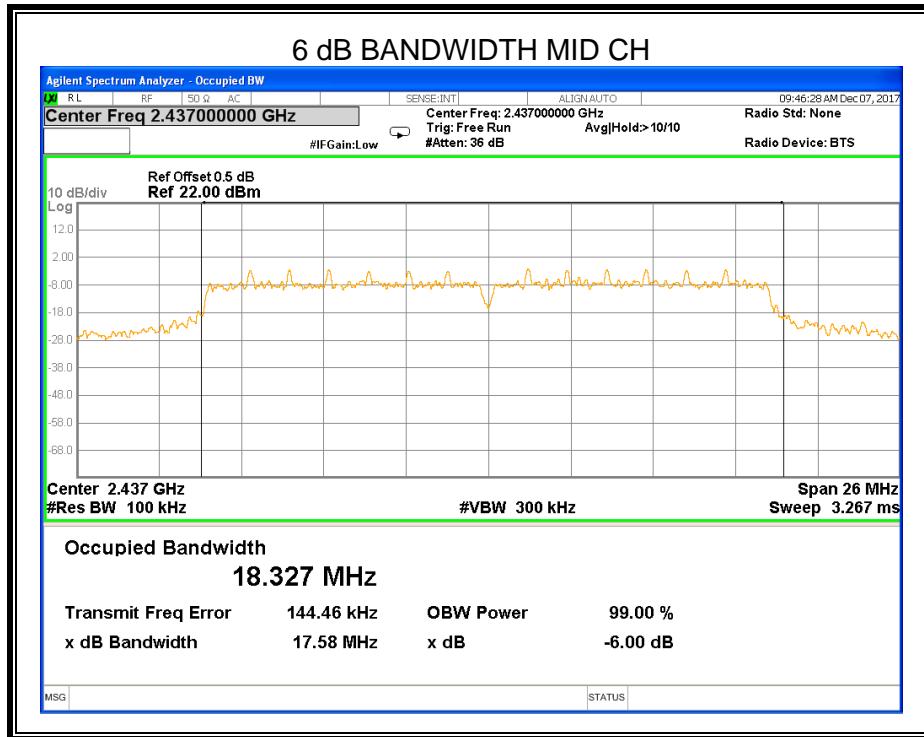




## 8.2.3. 802.11n HT20 MODE

| Channel | Frequency (MHz) | 6dB bandwidth (MHz) | Limit (kHz) | Result |
|---------|-----------------|---------------------|-------------|--------|
| Low     | 2412            | 17.58               | 500         | Pass   |
| Middle  | 2437            | 17.58               | 500         | Pass   |
| High    | 2462            | 17.57               | 500         | Pass   |





### 8.3. PEAK CONDUCTED OUTPUT POWER

#### LIMITS

| FCC Part15 (15.247) Subpart C |                   |                 |                       |
|-------------------------------|-------------------|-----------------|-----------------------|
| Section                       | Test Item         | Limit           | Frequency Range (MHz) |
| FCC 15.247(b)(3)              | Peak Output Power | 1 watt or 30dBm | 2400-2483.5           |

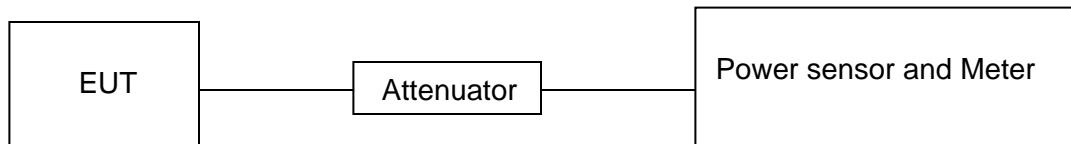
#### TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure peak power each channel.

#### TEST SETUP



#### TEST ENVIRONMENT

|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 25°C   | Relative Humidity | 60%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

## RESULTS

### 8.3.1. 802.11b MODE

| Test Channel | Frequency | Maximum Conducted Output Power(PK) | LIMIT |
|--------------|-----------|------------------------------------|-------|
|              | (MHz)     | (dBm)                              | dBm   |
| Low          | 2412      | 15.42                              | 30    |
| Middle       | 2437      | 15.27                              | 30    |
| High         | 2462      | 16.48                              | 30    |

### 8.3.2. 802.11g MODE

| Test Channel | Frequency | Maximum Conducted Output Power(PK) | LIMIT |
|--------------|-----------|------------------------------------|-------|
|              | (MHz)     | (dBm)                              | dBm   |
| Low          | 2412      | 13.75                              | 30    |
| Middle       | 2437      | 14.58                              | 30    |
| High         | 2462      | 15.51                              | 30    |

### 8.3.3. 802.11n HT20 MODE

| Test Channel | Frequency | Maximum Conducted Output Power(PK) | LIMIT |
|--------------|-----------|------------------------------------|-------|
|              | (MHz)     | (dBm)                              | dBm   |
| Low          | 2412      | 13.61                              | 30    |
| Middle       | 2437      | 14.42                              | 30    |
| High         | 2462      | 15.47                              | 30    |

## 8.4. POWER SPECTRAL DENSITY

### LIMITS

| FCC Part15 (15.247) Subpart C |                        |                         |                       |
|-------------------------------|------------------------|-------------------------|-----------------------|
| Section                       | Test Item              | Limit                   | Frequency Range (MHz) |
| FCC §15.247 (e)               | Power Spectral Density | 8 dBm in any 3 kHz band | 2400-2483.5           |

### TEST PROCEDURE

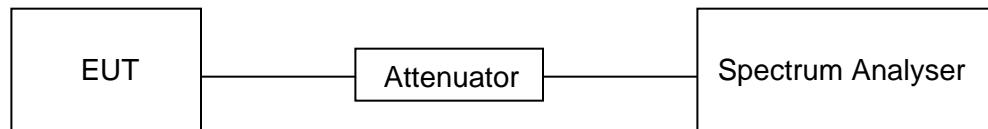
Connect the UUT to the spectrum analyser and use the following settings:

|                  |  |
|------------------|--|
| Center Frequency | The centre frequency of the channel under test       |
| Detector         | Peak   |
| RBW              | $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ |
| VBW              | $\geq 3 \times \text{RBW}$                           |
| Span             | $1.5 \times \text{DTS}$ bandwidth                    |
| Trace            | Max hold   |
| Sweep time       | Auto couple.   |

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### TEST SETUP



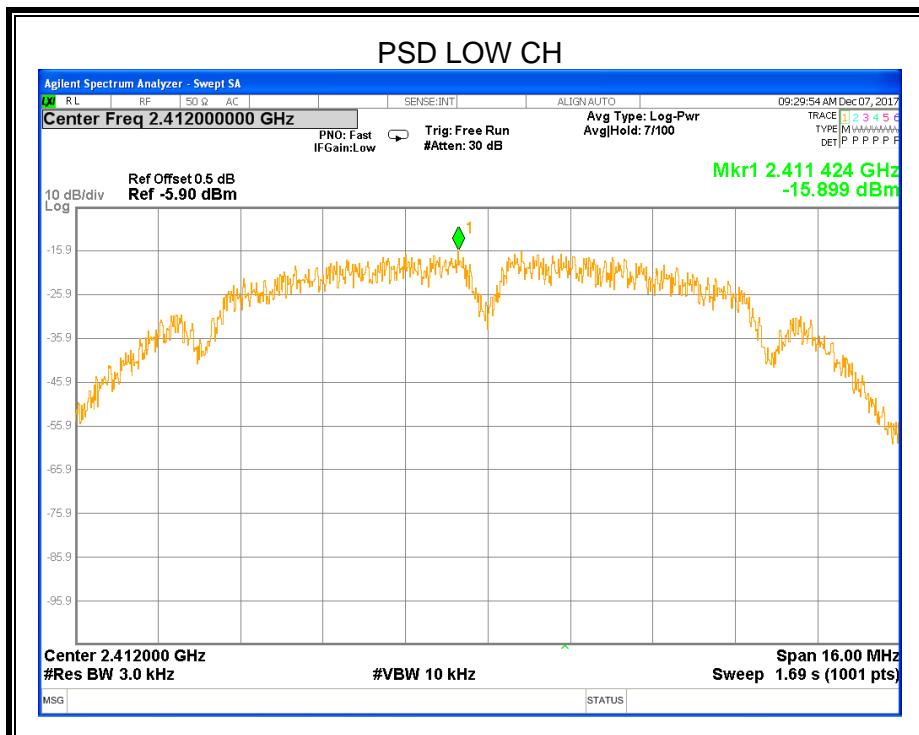
### TEST ENVIRONMENT

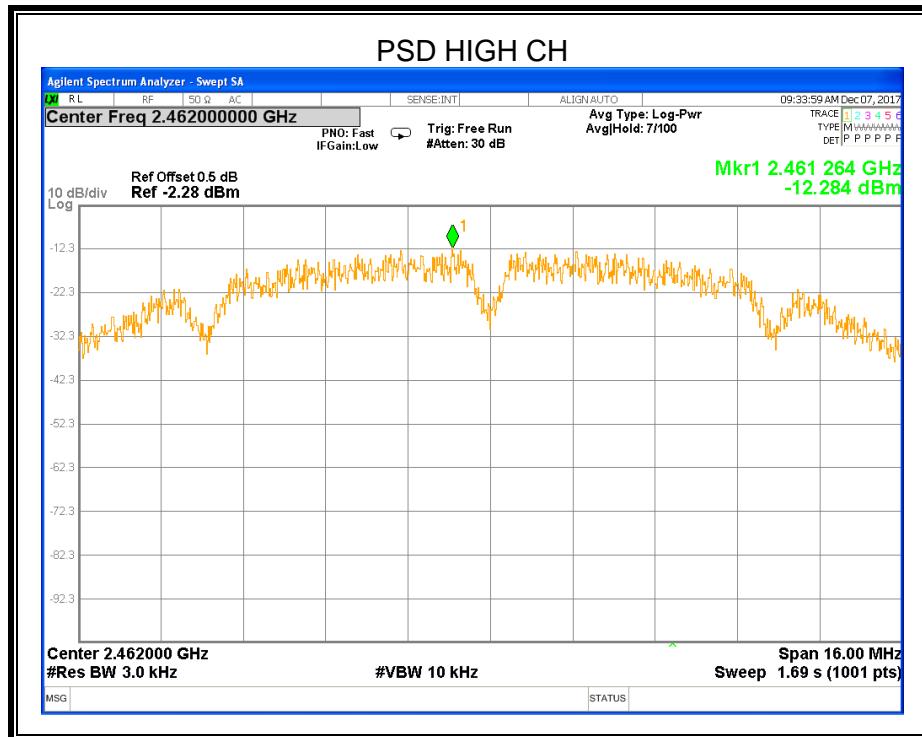
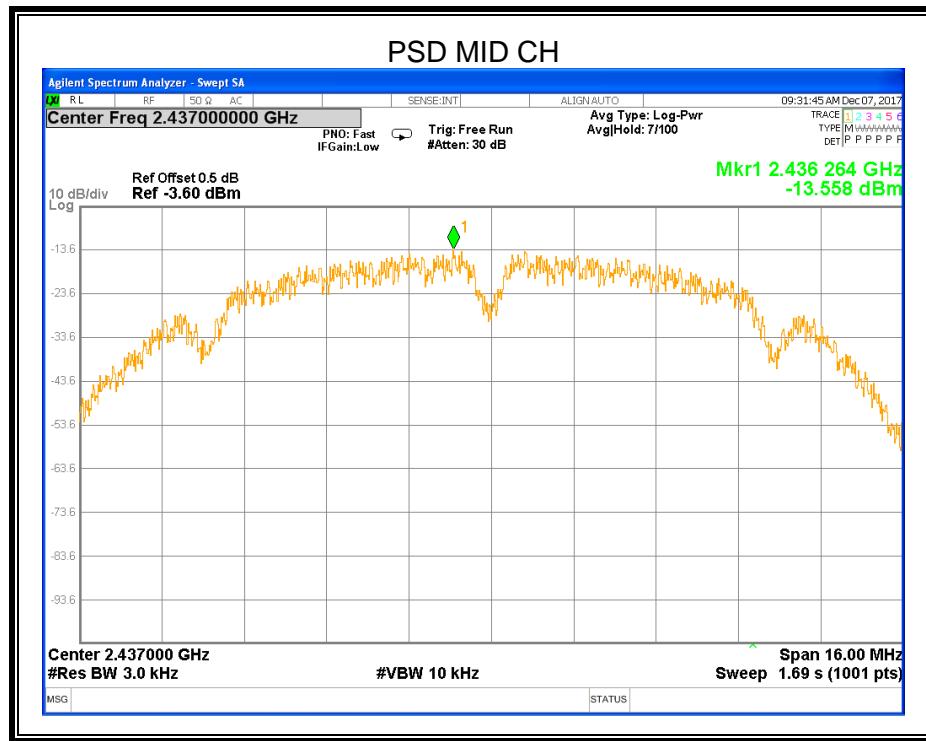
|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 25°C   | Relative Humidity | 60%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

## **RESULTS**

#### 8.4.1. 802.11b MODE

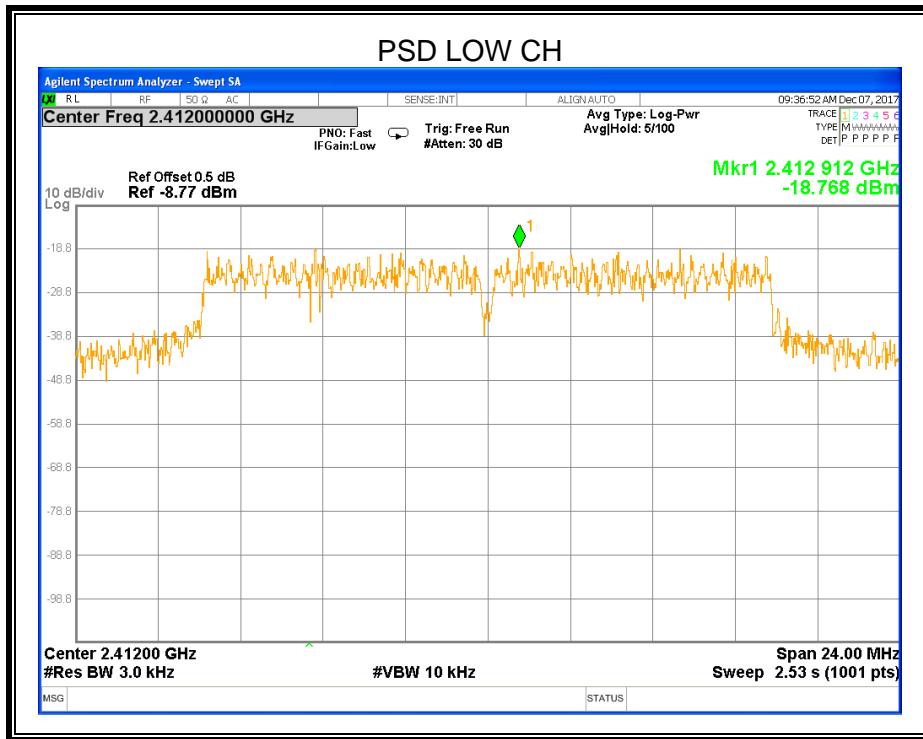
| Test Channel | Frequency | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|--------------|-----------|-----------------------------------|------------------|--------|
| Low          | 2412MHz   | -15.899                           | 8                | PASS   |
| Middle       | 2437MHz   | -13.558                           | 8                | PASS   |
| High         | 2462MHz   | -12.284                           | 8                | PASS   |

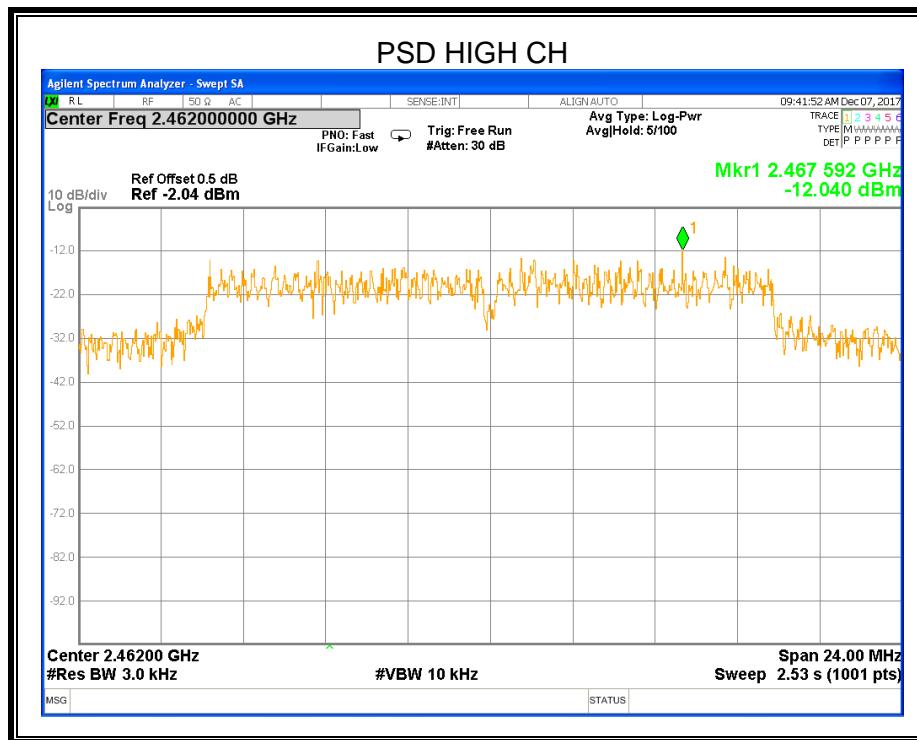
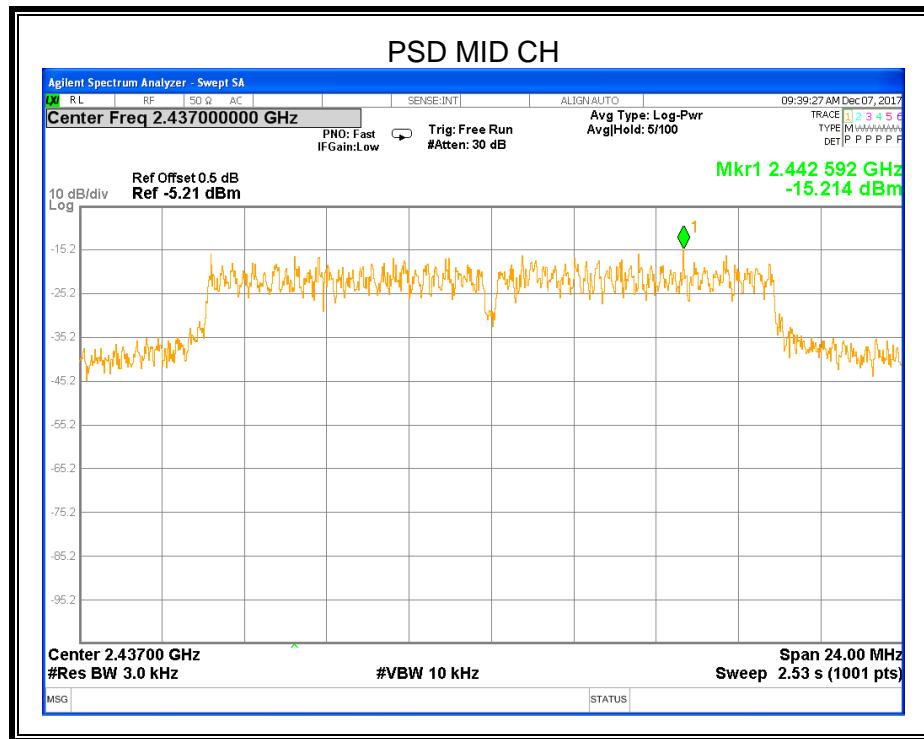




## 8.4.2. 802.11g MODE

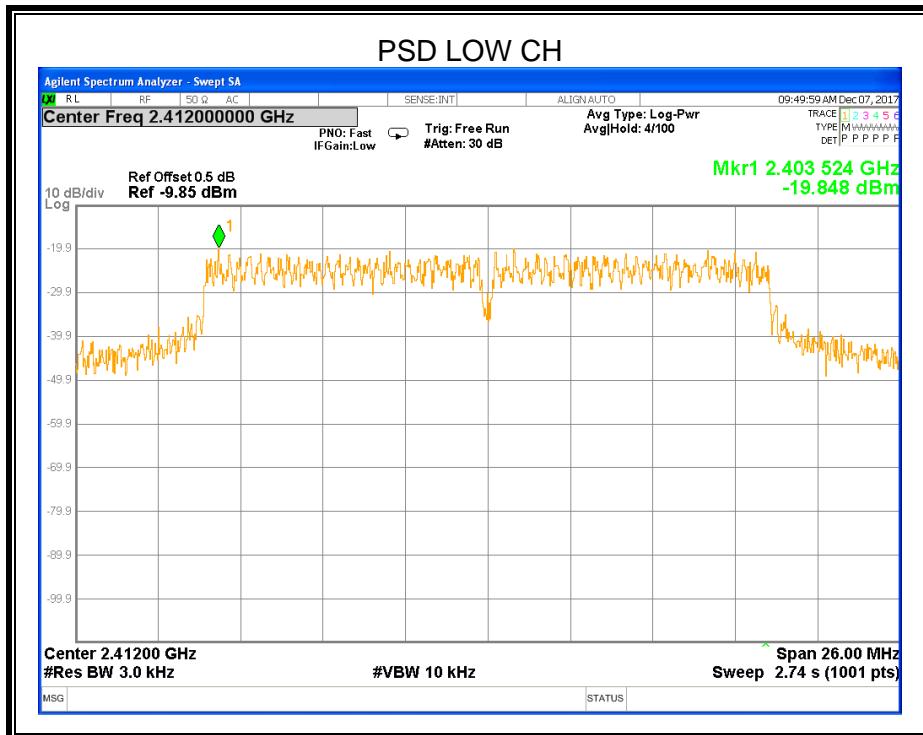
| Test Channel | Frequency | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|--------------|-----------|-----------------------------------|------------------|--------|
| Low          | 2412MHz   | -18.768                           | 8                | PASS   |
| Middle       | 2437MHz   | -15.214                           | 8                | PASS   |
| High         | 2462MHz   | -12.040                           | 8                | PASS   |

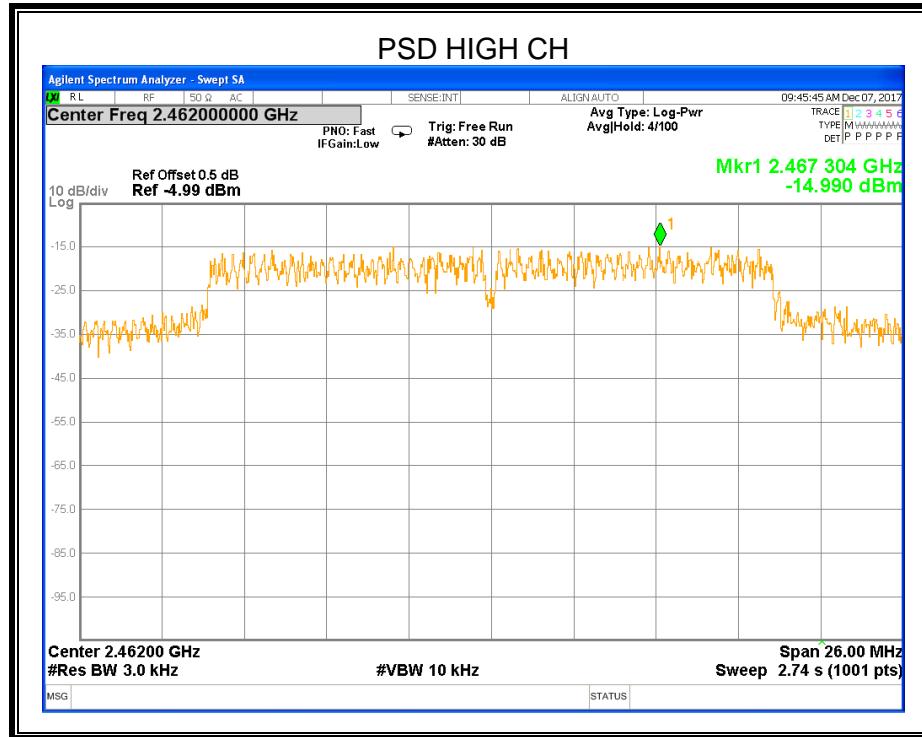
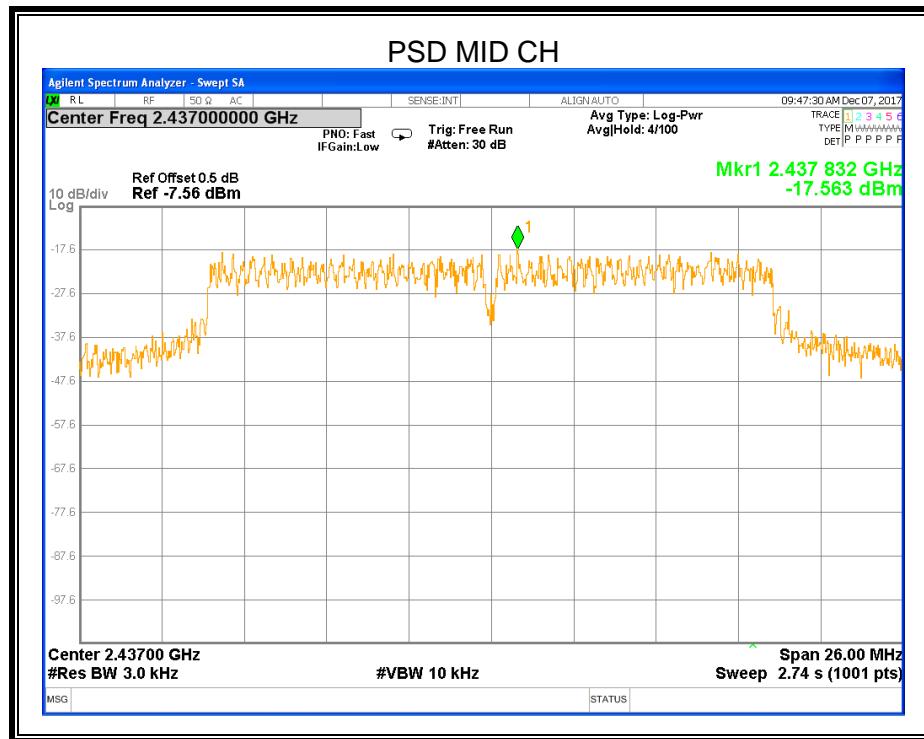




### 8.4.3. 802.11n HT20 MODE

| Test Channel | Frequency | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|--------------|-----------|-----------------------------------|------------------|--------|
| Low          | 2412MHz   | -19.848                           | 8                | PASS   |
| Middle       | 2437MHz   | -17.563                           | 8                | PASS   |
| High         | 2462MHz   | -14.990                           | 8                | PASS   |





## 8.5. CONDUCTED BANDEdge AND SPURIOUS EMISSIONS

### LIMITS

| FCC Part15 (15.247) Subpart C |   |   |
|-------------------------------|---|---|
| Section                       | Test Item                                       | Limit   |
| FCC §15.247 (d)               | Conducted<br>Bandedge and<br>Spurious Emissions | at least 20 dB below that in the 100 kHz<br>bandwidth within the band that contains the<br>highest level of the desired power |

### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

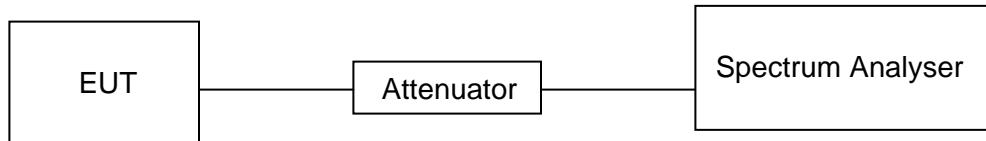
|                  |  |
|------------------|--|
| Center Frequency | The centre frequency of the channel under test |
| Detector         | Peak   |
| RBW              | 100K   |
| VBW              | $\geq 3 \times$ RBW                            |
| Span             | 1.5 x DTS bandwidth                            |
| Trace            | Max hold                                       |
| Sweep time       | Auto couple.                                   |

Use the peak marker function to determine the maximum PSD level.

|                    |   |
|--------------------|---|
| Span               | Set the center frequency and span to encompass frequency range to be measured |
| Detector           | Peak  |
| RBW                | 100K  |
| VBW                | $\geq 3 \times$ RBW   |
| measurement points | $\geq$ span/RBW   |
| Trace              | Max hold  |
| Sweep time         | Auto couple.  |

Use the peak marker function to determine the maximum amplitude level.

## TEST SETUP

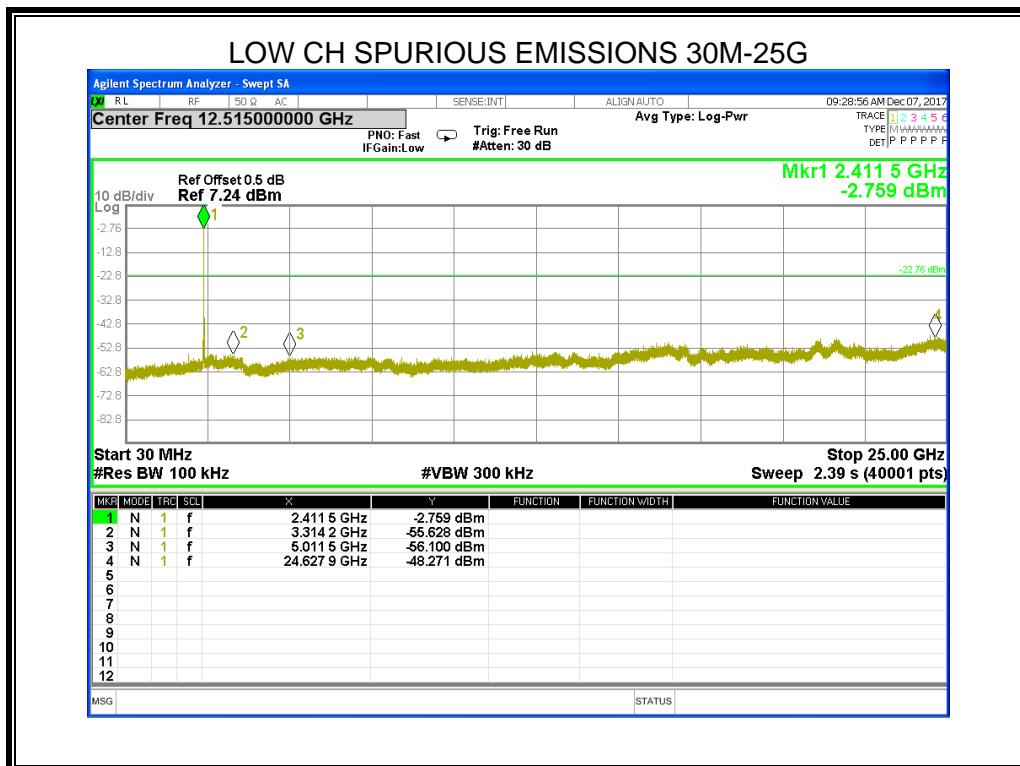


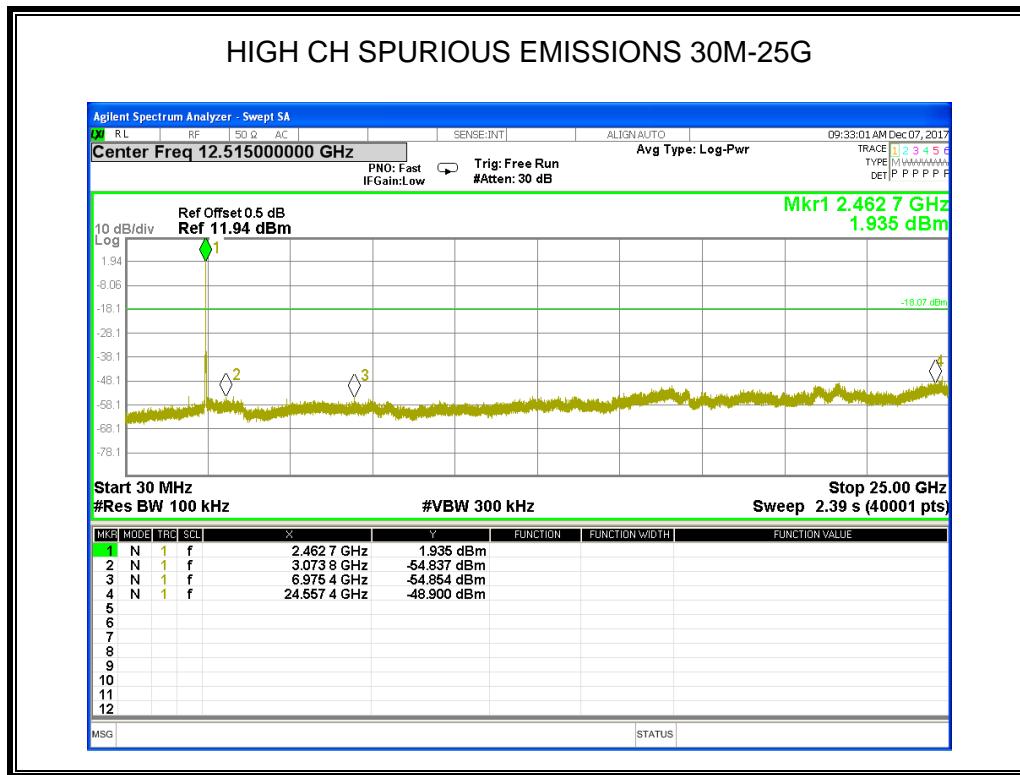
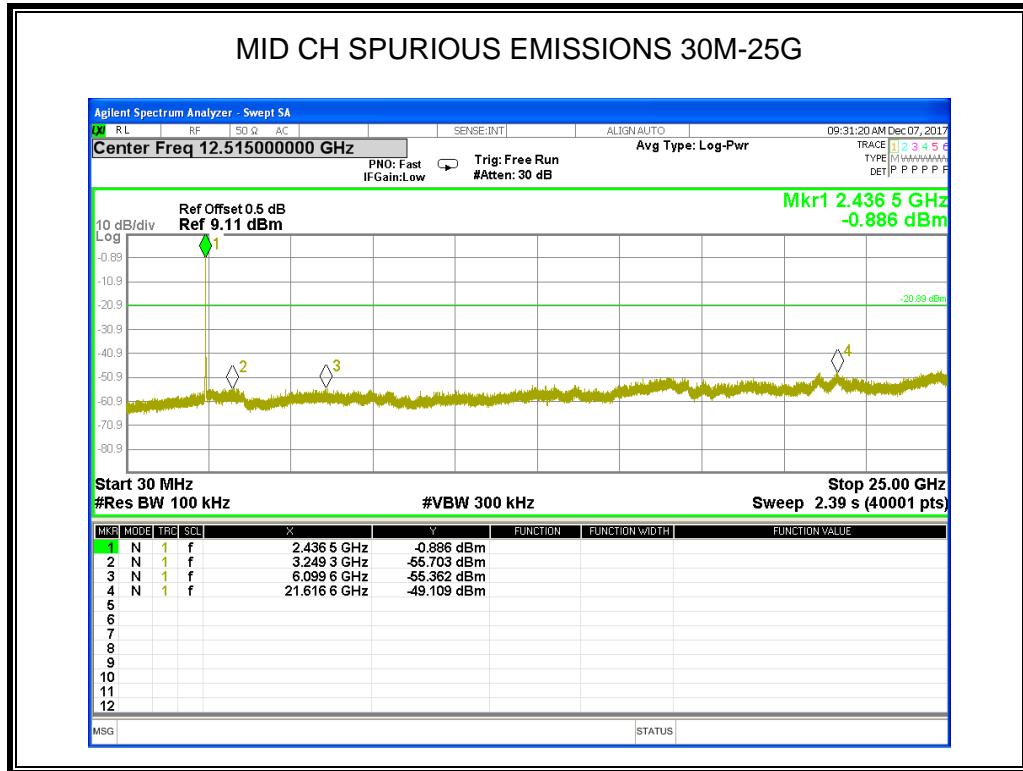
## TEST ENVIRONMENT

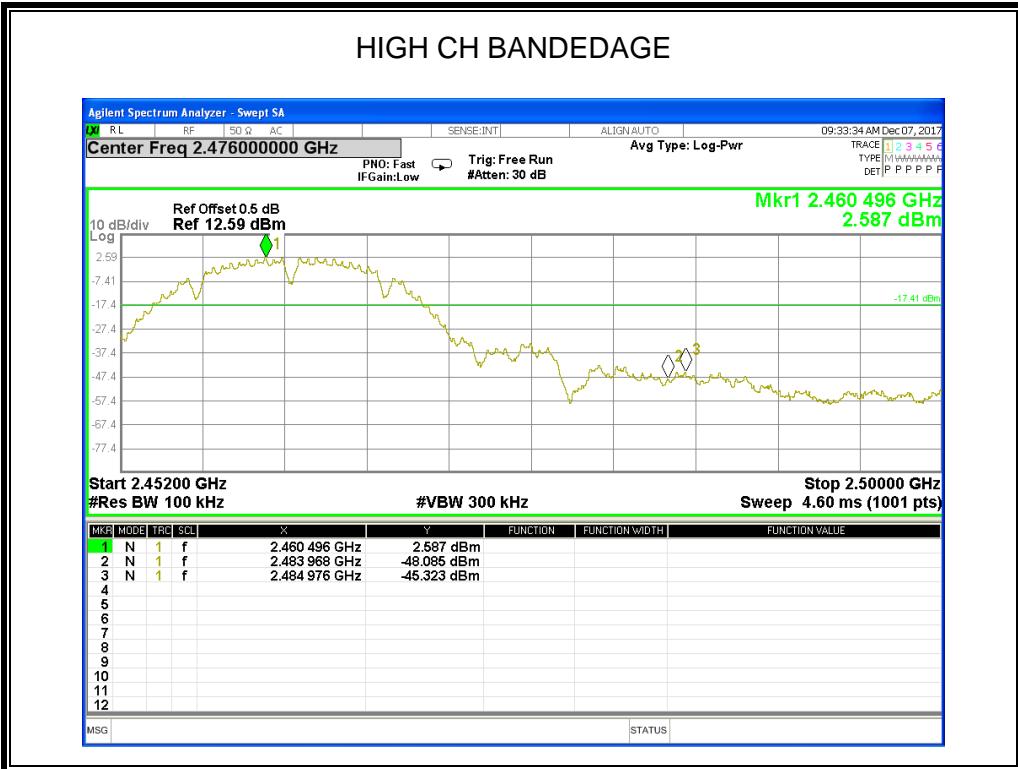
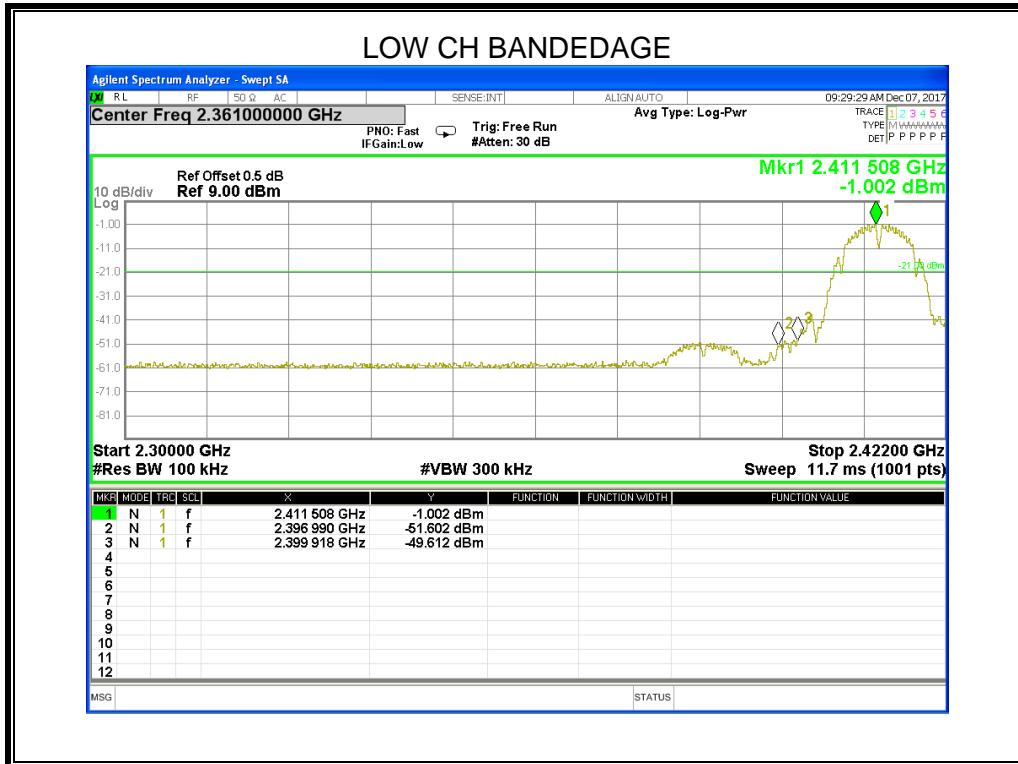
|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 25°C   | Relative Humidity | 60%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

## RESULTS

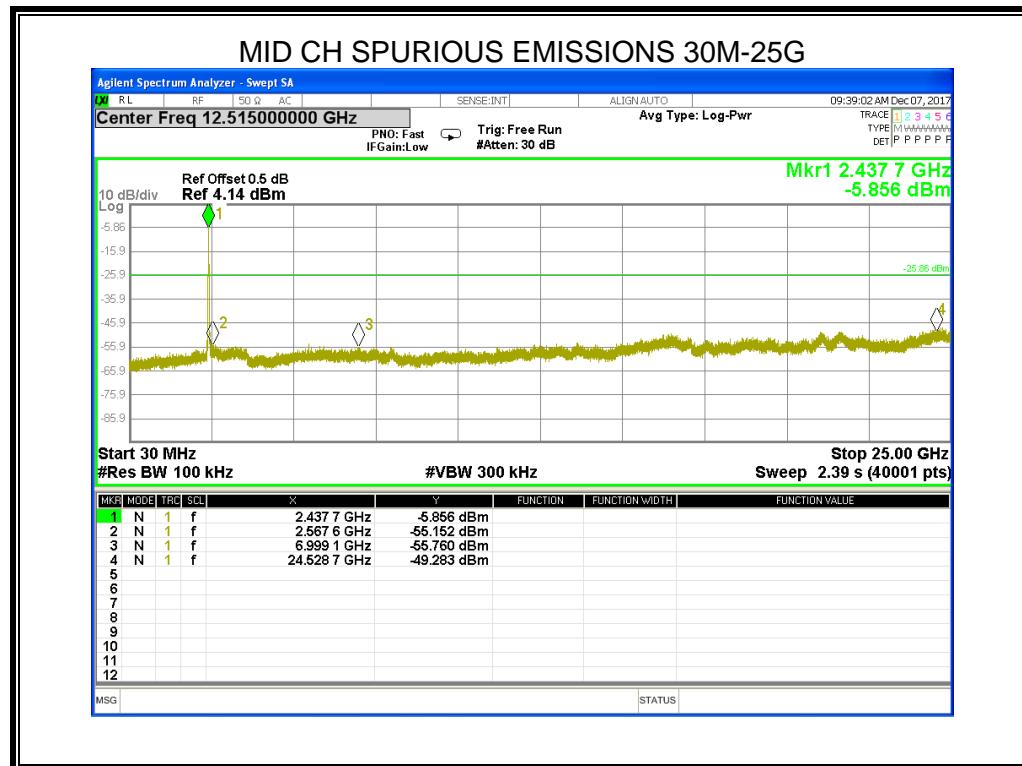
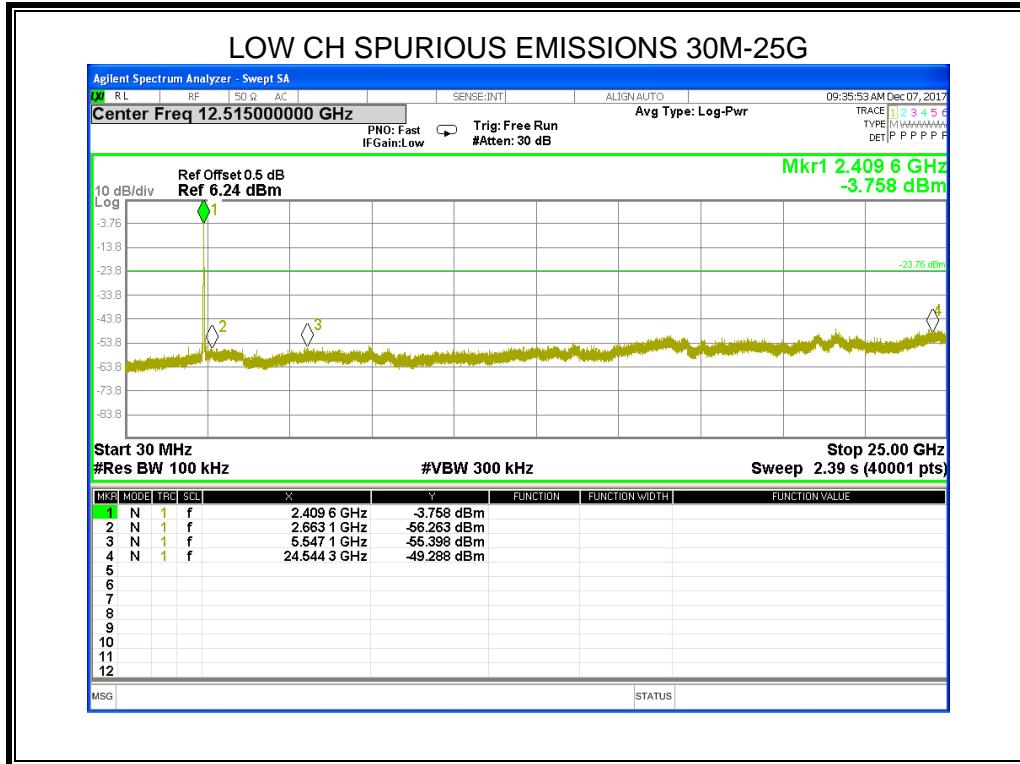
### 8.5.1. 802.11b MODE

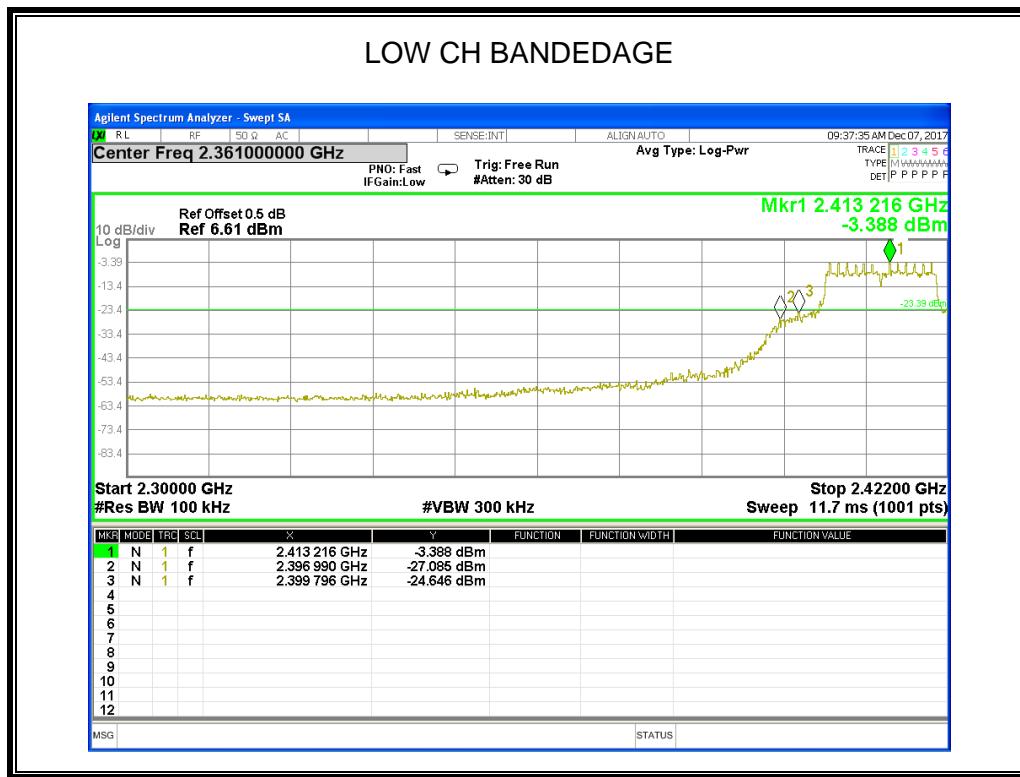
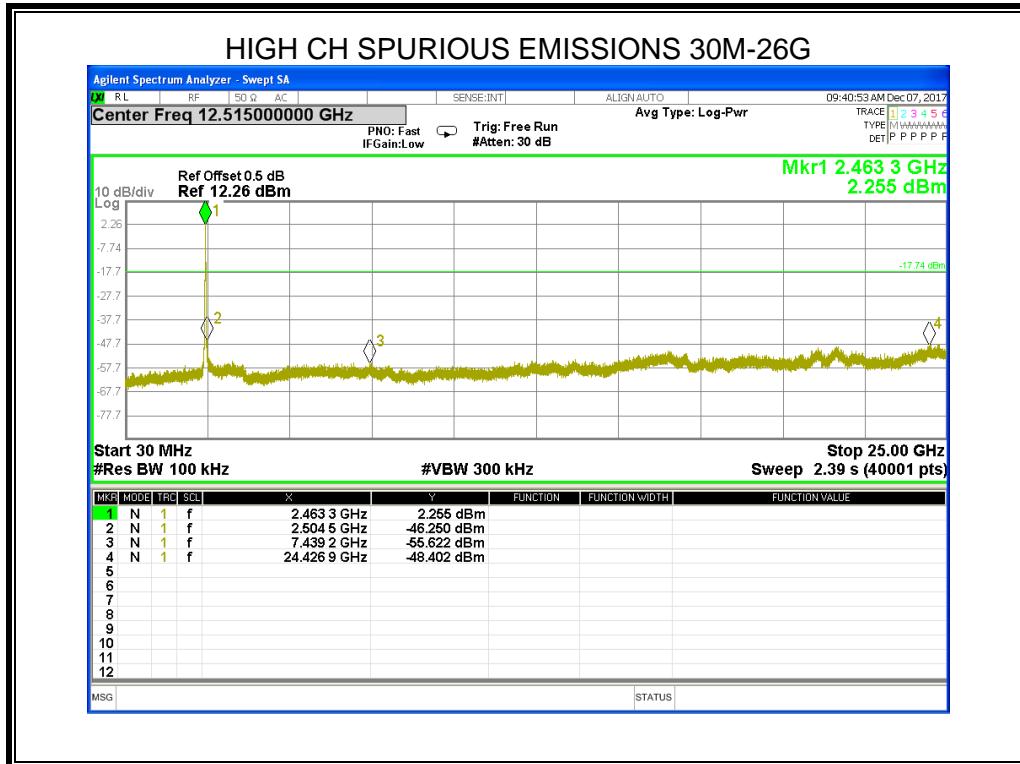


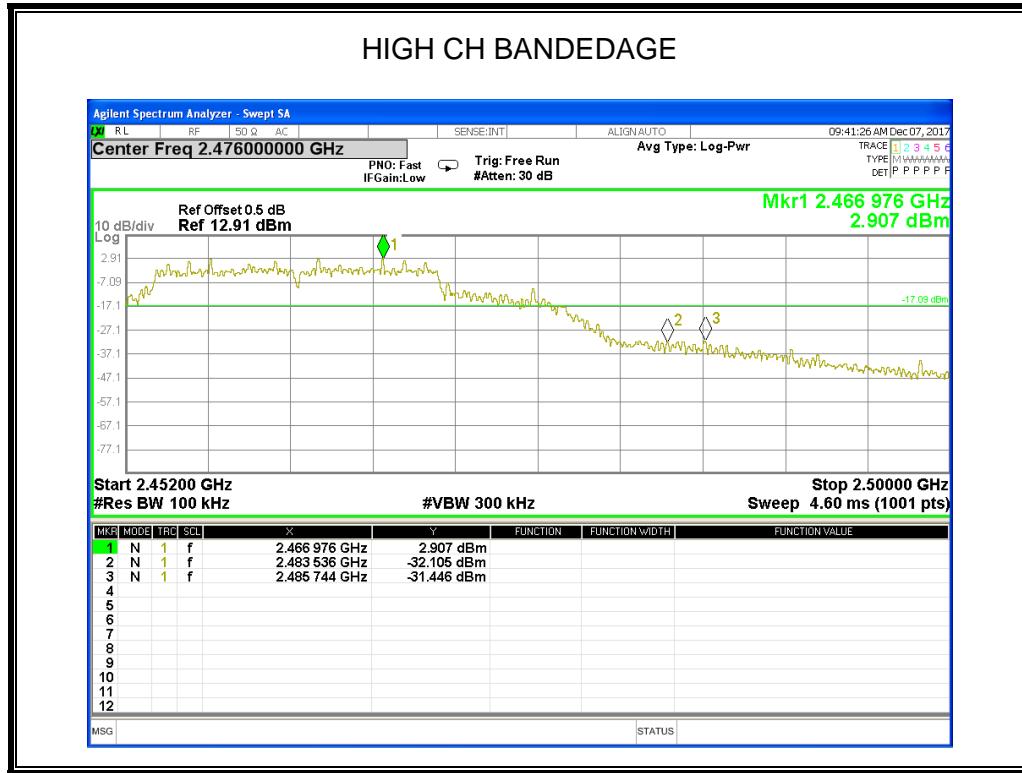




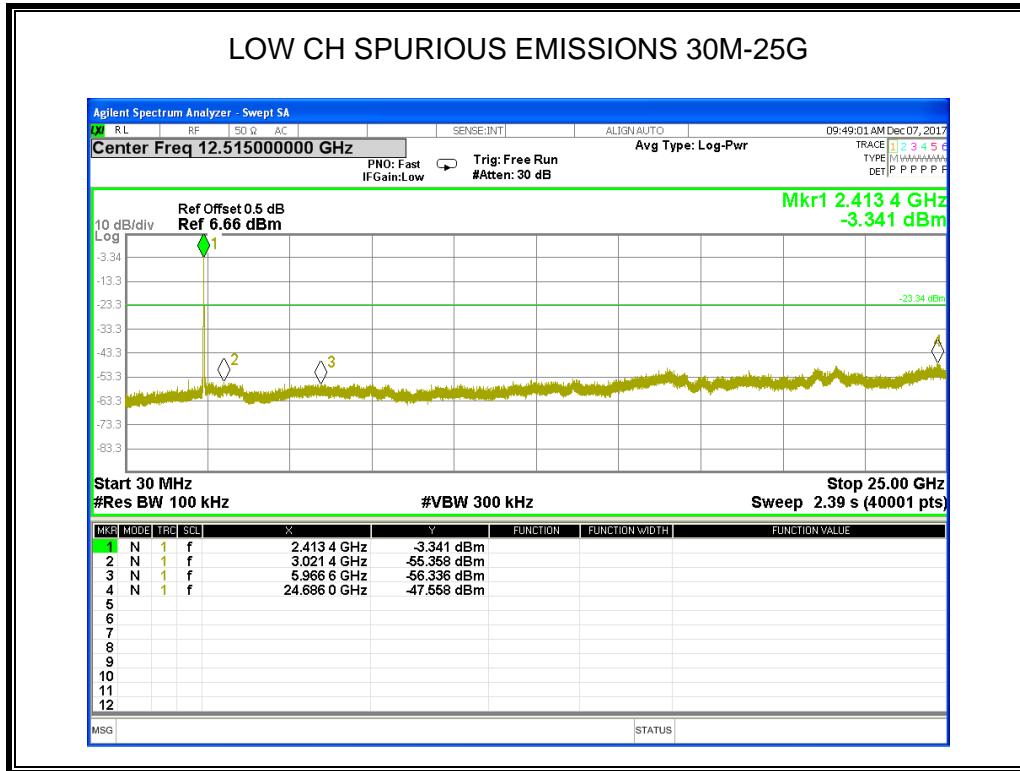
## 8.5.2. 802.11g MODE

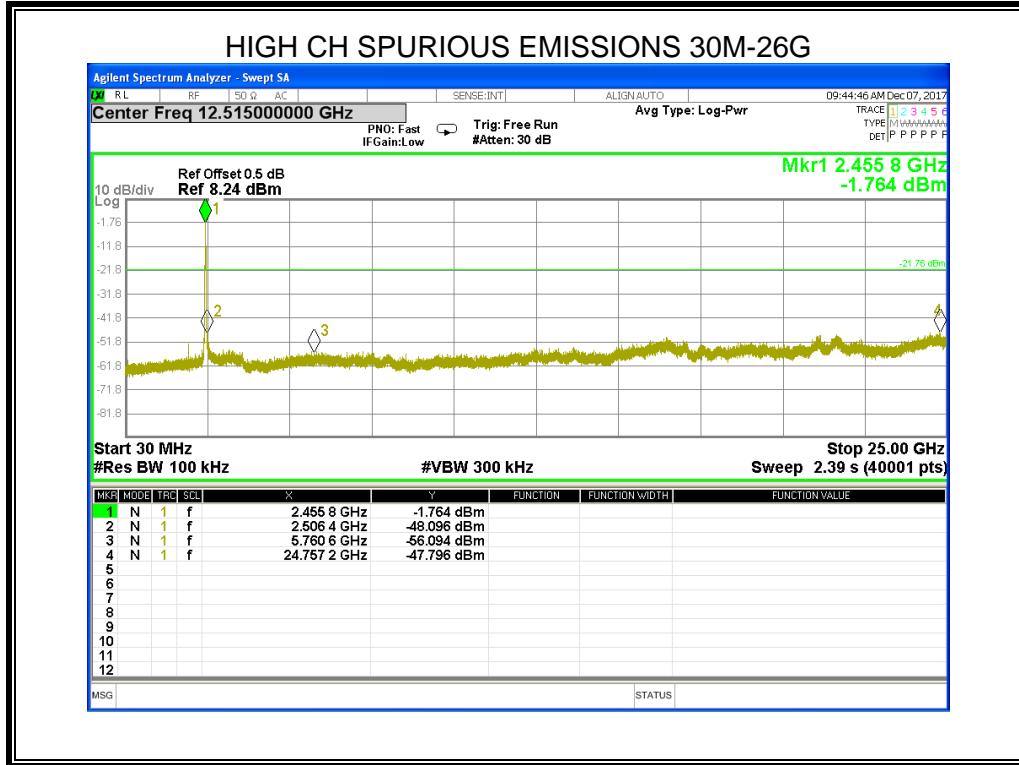
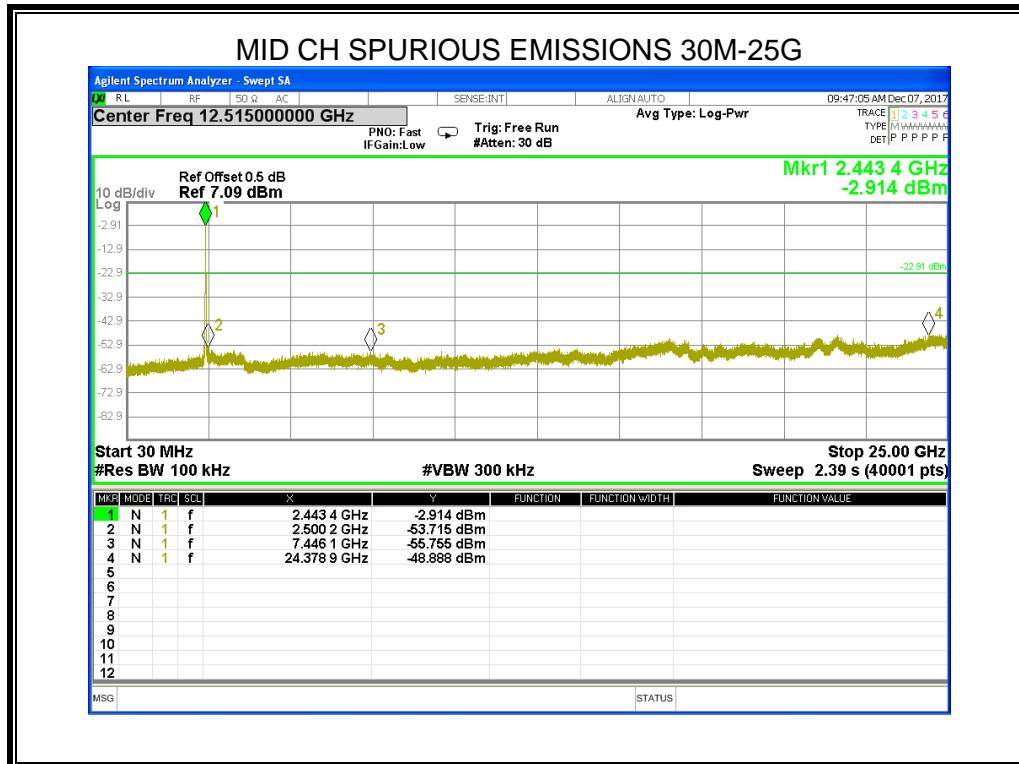


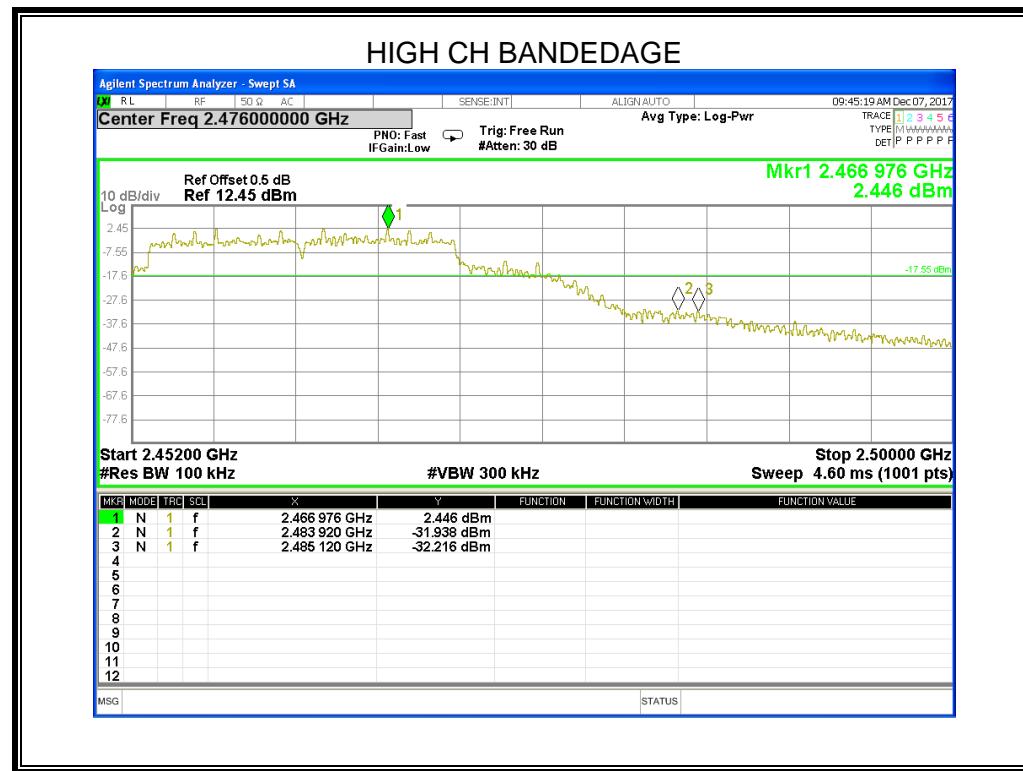
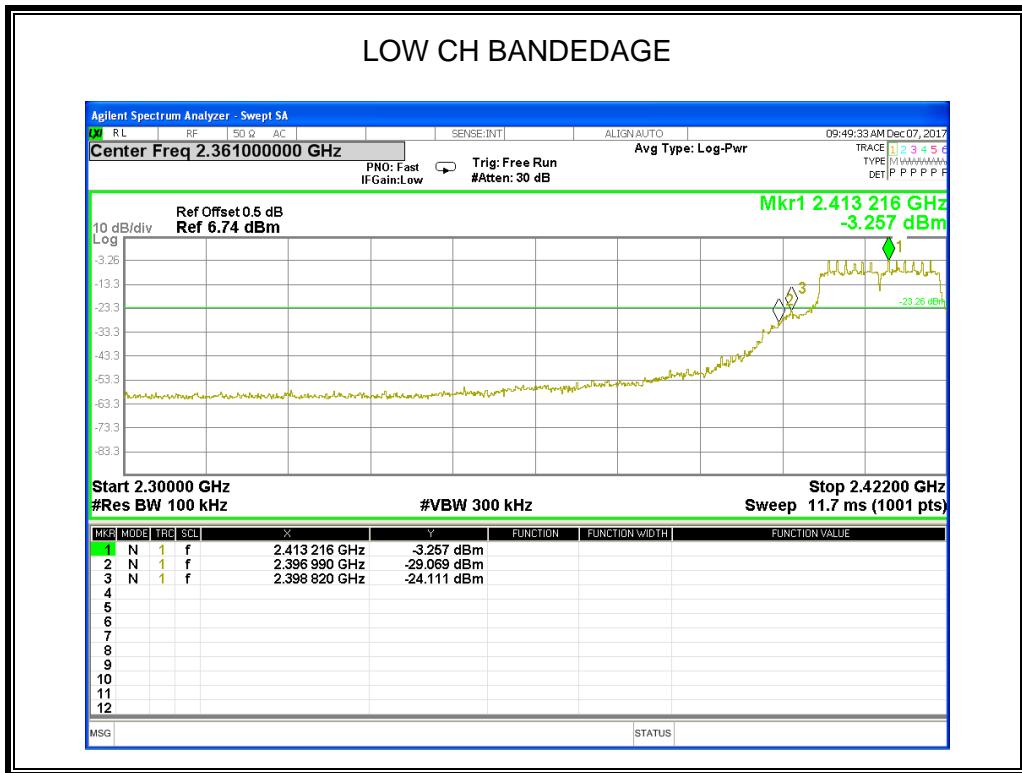




## 8.5.3. 802.11n HT20 MODE







## 9. RADIATED TEST RESULTS

### LIMITS

Please refer to FCC §15.205 and §15.209

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009~0.490     | 2400/F(KHz)                       | 300                           |
| 0.490~1.705     | 24000/F(KHz)                      | 30                            |
| 1.705~30.0      | 30                                | 30                            |
| 30~88           | 100                               | 3                             |
| 88~216          | 150                               | 3                             |
| 216~960         | 200                               | 3                             |
| 960~1000        | 500                               | 3                             |

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

Radiation Disturbance Test Limit for FCC (Above 1G)

| Frequency (MHz) | dB(uV/m) (at 3 meters) |         |
|-----------------|------------------------|---------|
|                 | Peak                   | Average |
| Above 1000      | 74                     | 54      |

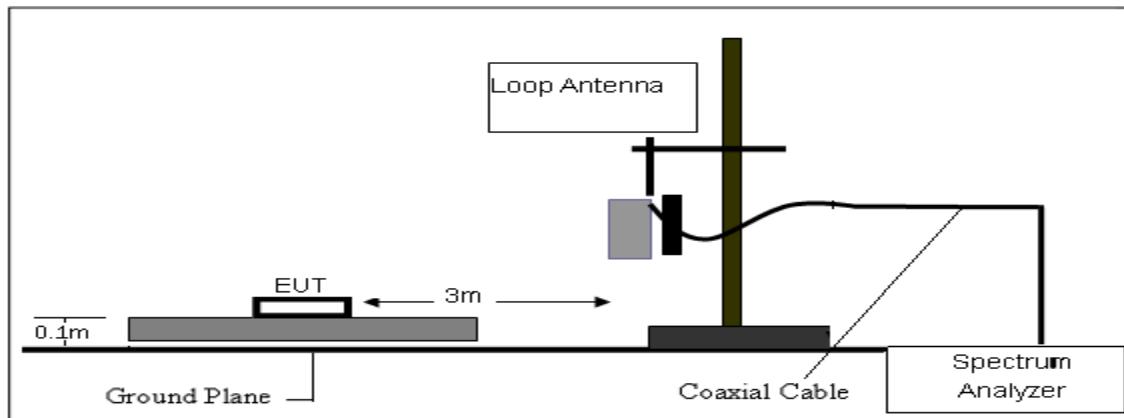
## Restricted bands of operation

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.17725-4.17775          | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.20725-4.20775          | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

Note: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.<sup>2</sup>Above 38.6c

## TEST SETUP AND PROCEDURE

Below 30MHz

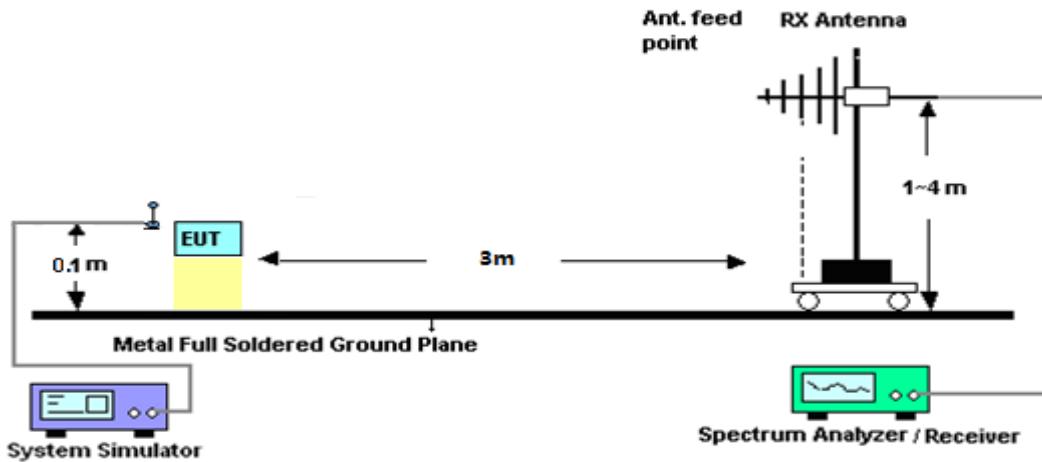


The setting of the spectrum analyser

|          |  |
|----------|--|
| RBW      | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| VBW      | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| Sweep    | Auto   |
| Detector | Peak/QP/ Average   |
| Trace    | Max hold   |

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.1 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G

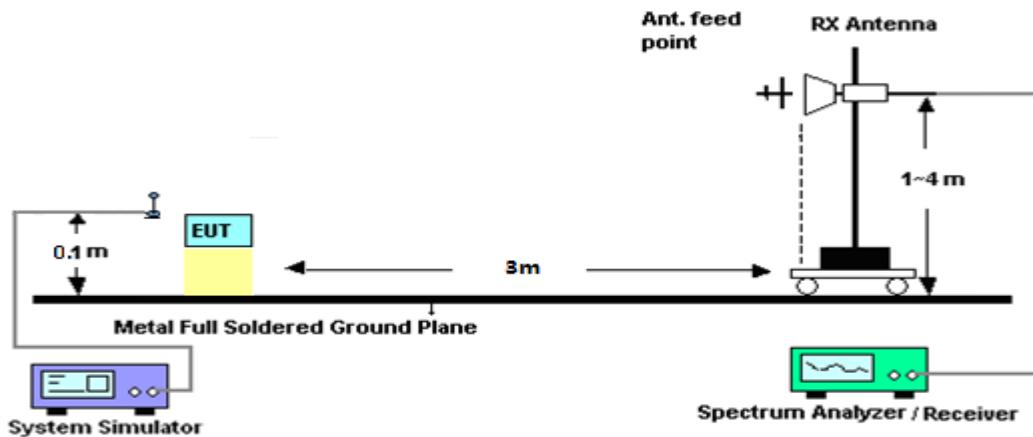


The setting of the spectrum analyser

|          |          |
|----------|----------|
| RBW      | 120K     |
| VBW      | 300K     |
| Sweep    | Auto     |
| Detector | Peak/QP  |
| Trace    | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.1 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

ABOVE 1G

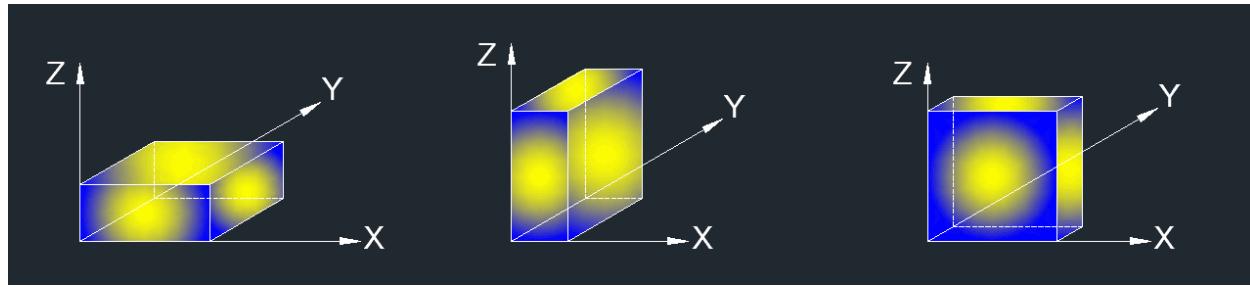


The setting of the spectrum analyser

|          |                             |
|----------|-----------------------------|
| RBW      | 1M                          |
| VBW      | PEAK: 3M<br>AVG: see note 6 |
| Sweep    | Auto                        |
| Detector | Peak                        |
| Trace    | Max hold                    |

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.1m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:



8. The EUT as shown in Figure 1 is the worst mode, the report only shown the worst mode data.

#### **TEST ENVIRONMENT**

|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 25°C   | Relative Humidity | 60%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

## 9.1. RESTRICTED BANDEDGE

| Frequency<br>(MHz)  | Reading<br>(dB $\mu$ V) | Amplifier<br>(dB) | Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Corrected<br>Factor<br>(dB) | Emission<br>Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) | Detector<br>Type | Comment    |
|---|-------------------------|-------------------|--------------|-----------------------------|-----------------------------|-------------------------------------|--------------------------|----------------|------------------|------------|
| 802.11b   |                         |                   |              |                             |                             |                                     |                          |                |                  |            |
| 2390.00   | 67.89                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 54.90                               | 74.00                    | -19.10         | PK               | Vertical   |
| 2390.00   | 54.26                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 41.27                               | 54.00                    | -12.73         | AV               | Vertical   |
| 2390.00   | 68.76                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 55.77                               | 74.00                    | -18.23         | PK               | Horizontal |
| 2390.00   | 52.86                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 39.87                               | 54.00                    | -14.13         | AV               | Horizontal |
| 2483.50   | 69.61                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 56.83                               | 74.00                    | -17.17         | PK               | Vertical   |
| 2483.50   | 52.41                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 39.63                               | 54.00                    | -14.37         | AV               | Vertical   |
| 2483.50   | 70.30                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 57.52                               | 74.00                    | -16.48         | PK               | Horizontal |
| 2483.50   | 53.42                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 40.64                               | 54.00                    | -13.36         | AV               | Horizontal |
| 802.11g   |                         |                   |              |                             |                             |                                     |                          |                |                  |            |
| 2390.00   | 67.11                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 54.12                               | 74.00                    | -19.88         | PK               | Vertical   |
| 2390.00   | 53.54                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 40.55                               | 54.00                    | -13.45         | AV               | Vertical   |
| 2390.00   | 65.88                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 52.89                               | 74.00                    | -21.11         | PK               | Horizontal |
| 2390.00   | 53.70                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 40.71                               | 54.00                    | -13.29         | AV               | Horizontal |
| 2483.50   | 65.49                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 52.71                               | 74.00                    | -21.29         | PK               | Vertical   |
| 2483.50   | 53.33                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 40.55                               | 54.00                    | -13.45         | AV               | Vertical   |
| 2483.50   | 66.29                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 53.51                               | 74.00                    | -20.49         | PK               | Horizontal |
| 2483.50   | 52.68                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 39.90                               | 54.00                    | -14.10         | AV               | Horizontal |
| 802.11n20   |                         |                   |              |                             |                             |                                     |                          |                |                  |            |
| 2390.00   | 67.42                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 54.43                               | 74.00                    | -19.57         | PK               | Vertical   |
| 2390.00   | 52.38                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 39.39                               | 54.00                    | -14.61         | AV               | Vertical   |
| 2390.00   | 65.61                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 52.62                               | 74.00                    | -21.38         | PK               | Horizontal |
| 2390.00   | 53.33                   | 43.80             | 4.91         | 25.90                       | -12.99                      | 40.34                               | 54.00                    | -13.66         | AV               | Horizontal |
| 2483.50   | 65.35                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 52.57                               | 74.00                    | -21.43         | PK               | Vertical   |
| 2483.50   | 53.05                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 40.27                               | 54.00                    | -13.73         | AV               | Vertical   |
| 2483.50   | 65.51                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 52.73                               | 74.00                    | -21.27         | PK               | Horizontal |
| 2483.50   | 52.45                   | 43.80             | 5.12         | 25.90                       | -12.78                      | 39.67                               | 54.00                    | -14.33         | AV               | Horizontal |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.<br>Low measurement frequencies is range from 2300 to 2412 MHz, high measurement frequencies is range from 2462 to 2500 MHz.<br>Only show the worst point data of the emissions in the frequency 2300-2412 MHz and 2462-2500 MHz.<br>Video bandwidth for average measurements is 1KHz. |                         |                   |              |                             |                             |                                     |                          |                |                  |            |

## 9.2. SPURIOUS EMISSIONS (9KHz-30MHz)

| Freq.<br>(MHz) | Reading<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | State |
|----------------|---------------------|-------------------|----------------|-------|
| --             | --                  | --                | --             | P/F   |
| --             | --                  | --                | --             | PASS  |

Note:

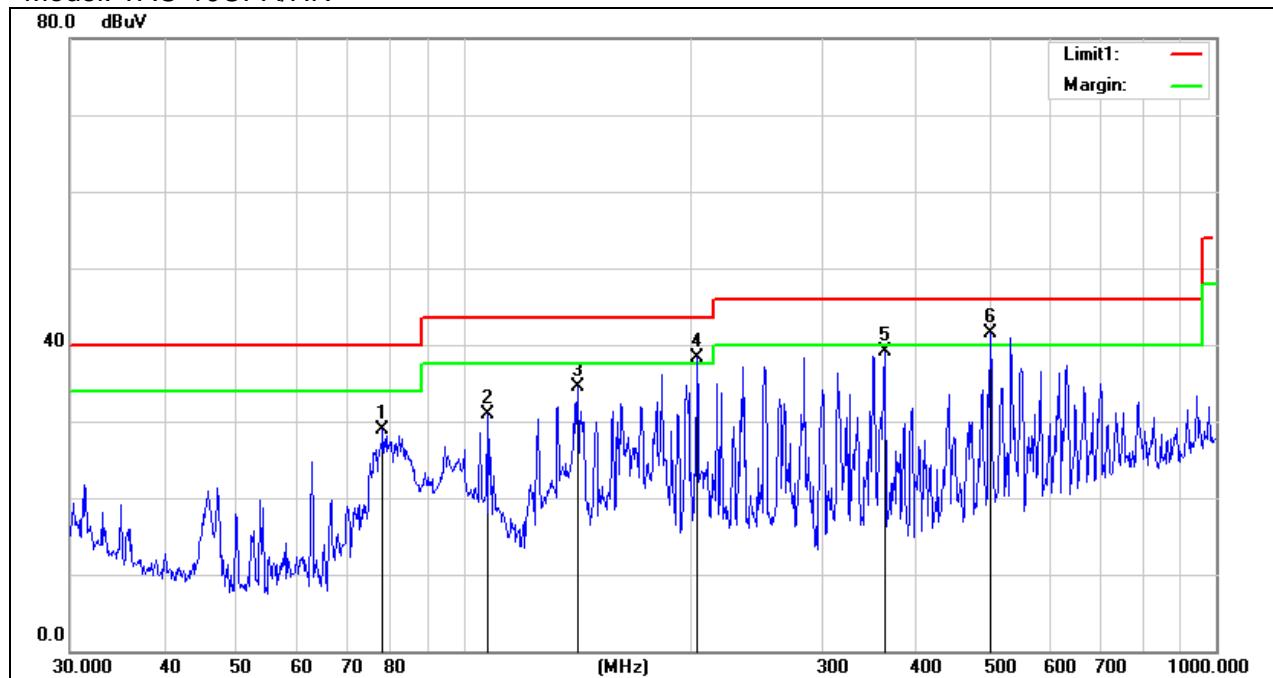
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);  
Limit line = specific limits(dBuv) + distance extrapolation factor.

### 9.3. SPURIOUS EMISSIONS (30-1GHz)

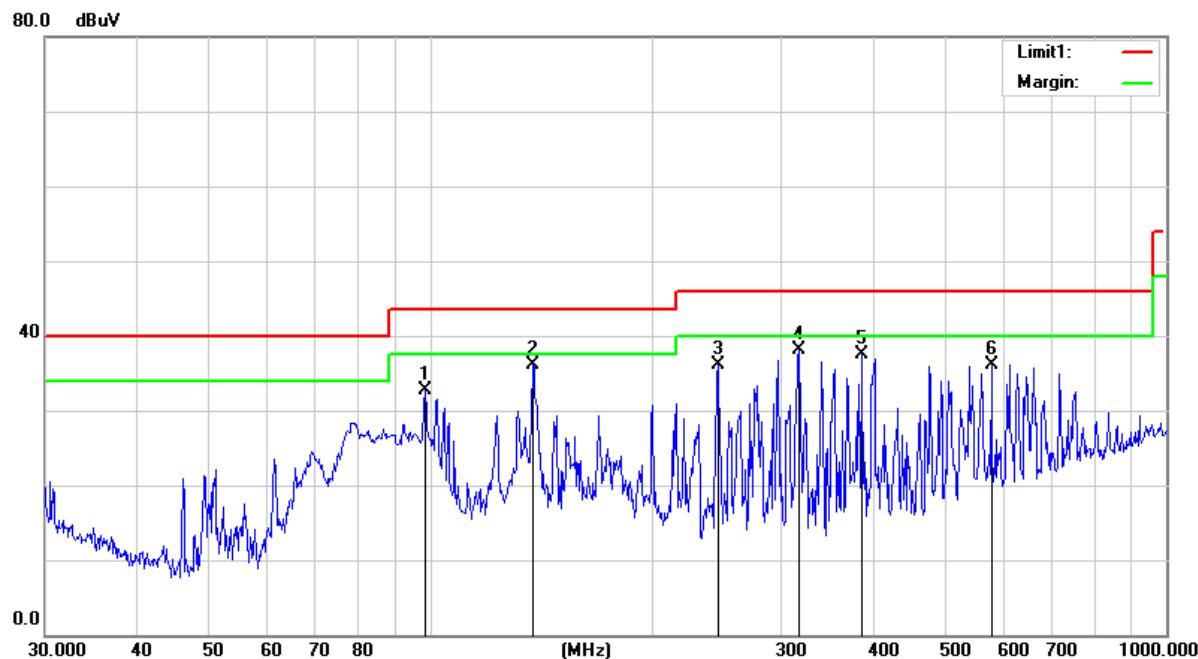
#### HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

Model: TAC-10CPA/HN



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1   | 78.1390            | 51.90               | -22.95          | 28.95              | 40.00             | -11.05         | QP     |
| 2   | 107.5100           | 49.46               | -18.55          | 30.91              | 43.50             | -12.59         | QP     |
| 3   | 141.8262           | 52.04               | -17.59          | 34.45              | 43.50             | -9.05          | QP     |
| 4   | 204.2375           | 58.26               | -19.99          | 38.27              | 43.50             | -5.23          | QP     |
| 5   | 362.9844           | 52.19               | -13.06          | 39.13              | 46.00             | -6.87          | QP     |
| 6   | 501.1790           | 50.36               | -8.90           | 41.46              | 46.00             | -4.54          | QP     |

Model: TAC-14CPA/KC

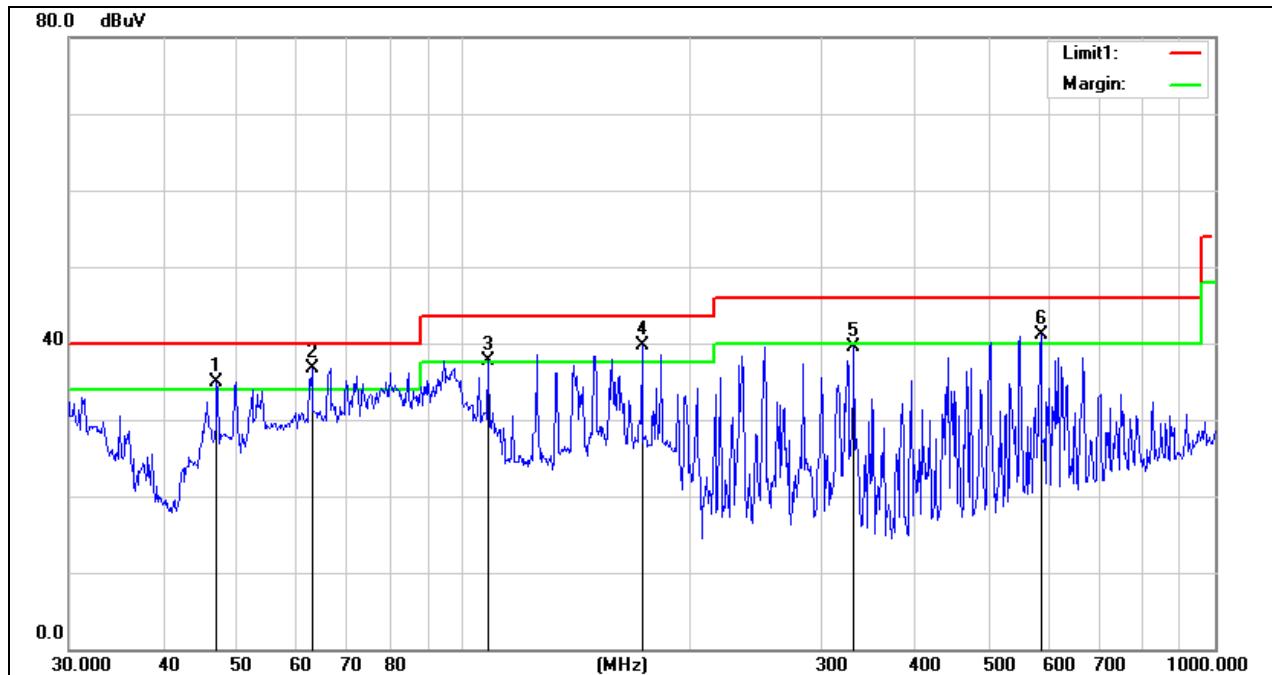


| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------|---------------|--------------|-------------|--------|
| 1   | 98.4866         | 52.06          | -19.35             | 32.71         | 43.50        | -10.79      | QP     |
| 2   | 137.9028        | 53.60          | -17.52             | 36.08         | 43.50        | -7.42       | QP     |
| 3   | 245.9510        | 52.96          | -16.91             | 36.05         | 46.00        | -9.95       | QP     |
| 4   | 317.7011        | 52.40          | -14.25             | 38.15         | 46.00        | -7.85       | QP     |
| 5   | 385.2805        | 49.77          | -12.26             | 37.51         | 46.00        | -8.49       | QP     |
| 6   | 578.6700        | 42.88          | -6.70              | 36.18         | 46.00        | -9.82       | QP     |

Note: Measurement = Reading Level + Correct Factor.

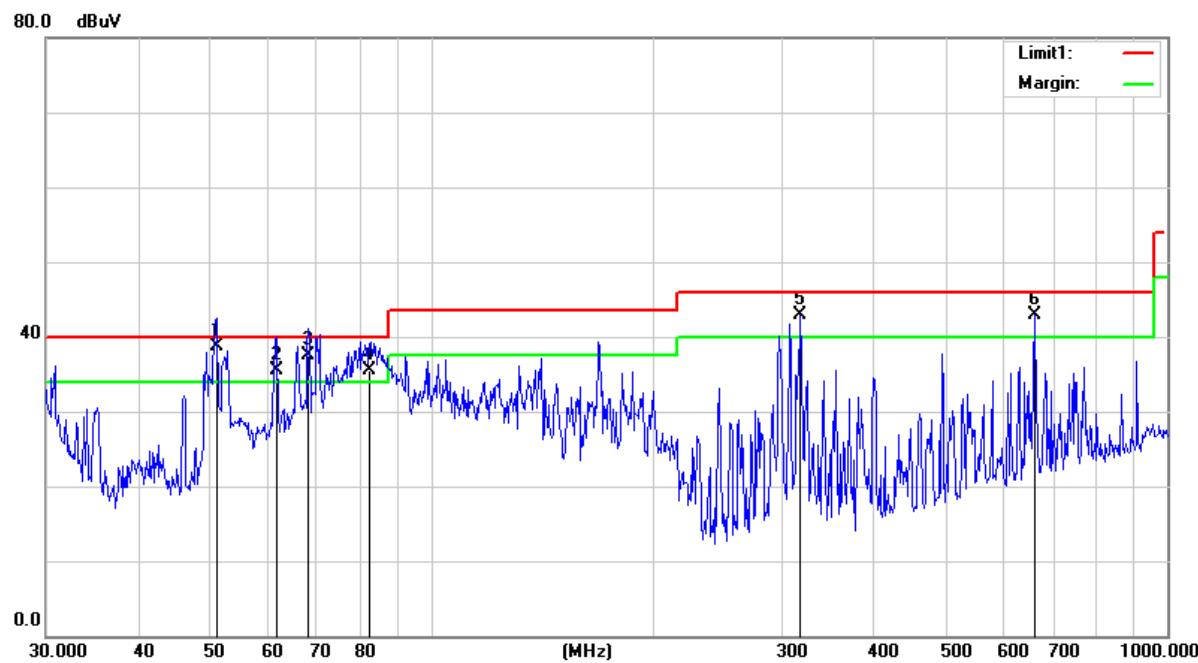
HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)

Model: TAC-10CPA/HN



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1   | 47.1600            | 54.87               | -20.01          | 34.86              | 40.00             | -5.14          | QP     |
| 2   | 63.0915            | 61.00               | -24.27          | 36.73              | 40.00             | -3.27          | QP     |
| 3   | 108.2667           | 56.27               | -18.49          | 37.78              | 43.50             | -5.72          | QP     |
| 4   | 173.2050           | 58.98               | -19.36          | 39.62              | 43.50             | -3.88          | QP     |
| 5   | 331.3546           | 53.58               | -14.08          | 39.50              | 46.00             | -6.50          | QP     |
| 6   | 586.8437           | 48.02               | -6.87           | 41.15              | 46.00             | -4.85          | QP     |

Model: TAC-14CPA/KC



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------|---------------|--------------|-------------|--------|
| 1   | 51.1210         | 60.51          | -21.80             | 38.71         | 40.00        | -1.29       | QP     |
| 2   | 61.7781         | 59.74          | -24.30             | 35.44         | 40.00        | -4.56       | QP     |
| 3   | 68.2914         | 61.74          | -24.14             | 37.60         | 40.00        | -2.40       | QP     |
| 4   | 82.5185         | 57.48          | -22.07             | 35.41         | 40.00        | -4.59       | QP     |
| 5   | 317.7010        | 57.10          | -14.25             | 42.85         | 46.00        | -3.15       | QP     |
| 6   | 661.1503        | 49.13          | -6.23              | 42.90         | 46.00        | -3.10       | QP     |

Note: Measurement = Reading Level + Correct Factor.

## 9.4. SPURIOUS EMISSIONS (Above 1GHz)

### 802.11b Low Channel

| Frequency<br>(MHz)     | Reading<br>(dB $\mu$ V) | Amplifier<br>(dB) | Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Corrected<br>Factor<br>(dB) | Emission<br>Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) | Detector<br>Type | Comment    |
|------------------------|-------------------------|-------------------|--------------|-----------------------------|-----------------------------|-------------------------------------|--------------------------|----------------|------------------|------------|
| Low Channel (2412 MHz) |                         |                   |              |                             |                             |                                     |                          |                |                  |            |
| 3264.87                | 49.15                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 39.35                               | 74.00                    | -34.65         | PK               | Vertical   |
| 3264.87                | 39.57                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 29.77                               | 54.00                    | -24.23         | AV               | Vertical   |
| 3264.85                | 49.22                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 39.42                               | 74.00                    | -34.58         | PK               | Horizontal |
| 3264.85                | 37.83                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 28.03                               | 54.00                    | -25.97         | AV               | Horizontal |
| 4824.34                | 58.73                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 55.17                               | 74.00                    | -18.83         | PK               | Vertical   |
| 4824.34                | 38.42                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 34.86                               | 54.00                    | -19.14         | AV               | Vertical   |
| 4824.42                | 59.17                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 55.61                               | 74.00                    | -18.39         | PK               | Horizontal |
| 4824.42                | 38.25                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 34.69                               | 54.00                    | -19.31         | AV               | Horizontal |
| 5359.73                | 46.21                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 43.87                               | 74.00                    | -30.13         | PK               | Vertical   |
| 5359.73                | 38.27                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 35.93                               | 54.00                    | -18.07         | AV               | Vertical   |
| 5359.60                | 45.94                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 43.60                               | 74.00                    | -30.40         | PK               | Horizontal |
| 5359.60                | 37.94                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 35.60                               | 54.00                    | -18.40         | AV               | Horizontal |
| 7235.69                | 50.89                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 54.29                               | 74.00                    | -19.71         | PK               | Vertical   |
| 7235.69                | 33.20                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 36.60                               | 54.00                    | -17.40         | AV               | Vertical   |
| 7235.84                | 51.24                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 54.64                               | 74.00                    | -19.36         | PK               | Horizontal |
| 7235.71                | 51.17                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 36.53                               | 54.00                    | -17.47         | AV               | Horizontal |

## 802.11b Mid Channel

| Frequency<br>(MHz)     | Reading<br>(dB $\mu$ V) | Amplifier<br>(dB) | Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Corrected<br>Factor<br>(dB) | Emission<br>Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) | Detector<br>Type | Comment    |
|------------------------|-------------------------|-------------------|--------------|-----------------------------|-----------------------------|-------------------------------------|--------------------------|----------------|------------------|------------|
| Mid Channel (2437 MHz) |                         |                   |              |                             |                             |                                     |                          |                |                  |            |
| 3264.83                | 48.98                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 39.18                               | 74.00                    | -34.82         | PK               | Vertical   |
| 3264.83                | 39.07                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 29.27                               | 54.00                    | -24.73         | AV               | Vertical   |
| 3264.75                | 48.01                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 38.21                               | 74.00                    | -35.79         | PK               | Horizontal |
| 3264.75                | 38.78                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 28.98                               | 54.00                    | -25.02         | AV               | Horizontal |
| 4874.52                | 59.02                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 55.46                               | 74.00                    | -18.54         | PK               | Vertical   |
| 4874.52                | 38.18                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 34.62                               | 54.00                    | -19.38         | AV               | Vertical   |
| 4874.47                | 59.21                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 55.65                               | 74.00                    | -18.35         | PK               | Horizontal |
| 4874.47                | 38.52                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 34.96                               | 54.00                    | -19.04         | AV               | Horizontal |
| 5359.73                | 45.42                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 43.08                               | 74.00                    | -30.92         | PK               | Vertical   |
| 5359.73                | 37.90                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 35.56                               | 54.00                    | -18.44         | AV               | Vertical   |
| 5359.80                | 45.20                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 42.86                               | 74.00                    | -31.14         | PK               | Horizontal |
| 5359.80                | 38.14                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 35.80                               | 54.00                    | -18.20         | AV               | Horizontal |
| 7310.87                | 50.83                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 54.23                               | 74.00                    | -19.77         | PK               | Vertical   |
| 7310.87                | 33.13                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 36.53                               | 54.00                    | -17.47         | AV               | Vertical   |
| 7310.67                | 50.81                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 54.21                               | 74.00                    | -19.79         | PK               | Horizontal |
| 7310.67                | 33.52                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 36.92                               | 54.00                    | -17.08         | AV               | Horizontal |

## 802.11b High Channel

| Frequency<br>(MHz)      | Reading<br>(dB $\mu$ V) | Amplifier<br>(dB) | Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Corrected<br>Factor<br>(dB) | Emission<br>Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) | Detector<br>Type | Comment    |
|-------------------------|-------------------------|-------------------|--------------|-----------------------------|-----------------------------|-------------------------------------|--------------------------|----------------|------------------|------------|
| High Channel (2462 MHz) |                         |                   |              |                             |                             |                                     |                          |                |                  |            |
| 3264.88                 | 49.25                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 39.45                               | 74.00                    | -34.55         | PK               | Vertical   |
| 3264.88                 | 38.61                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 28.81                               | 54.00                    | -25.19         | AV               | Vertical   |
| 3264.68                 | 48.20                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 38.40                               | 74.00                    | -35.60         | PK               | Horizontal |
| 3264.68                 | 38.17                   | 44.70             | 6.70         | 28.20                       | -9.80                       | 28.37                               | 54.00                    | -25.63         | AV               | Horizontal |
| 4924.39                 | 59.40                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 55.84                               | 74.00                    | -18.16         | PK               | Vertical   |
| 4924.39                 | 39.15                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 35.59                               | 54.00                    | -18.41         | AV               | Vertical   |
| 4924.60                 | 58.70                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 55.14                               | 74.00                    | -18.86         | PK               | Horizontal |
| 4924.60                 | 38.31                   | 44.20             | 9.04         | 31.60                       | -3.56                       | 34.75                               | 54.00                    | -19.25         | AV               | Horizontal |
| 5359.87                 | 45.59                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 43.25                               | 74.00                    | -30.75         | PK               | Vertical   |
| 5359.87                 | 37.49                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 35.15                               | 54.00                    | -18.85         | AV               | Vertical   |
| 5359.69                 | 46.17                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 43.83                               | 74.00                    | -30.17         | PK               | Horizontal |
| 5359.69                 | 37.64                   | 44.20             | 9.86         | 32.00                       | -2.34                       | 35.30                               | 54.00                    | -18.70         | AV               | Horizontal |
| 7385.95                 | 50.87                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 54.27                               | 74.00                    | -19.73         | PK               | Vertical   |
| 7385.95                 | 32.76                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 36.16                               | 54.00                    | -17.84         | AV               | Vertical   |
| 7385.67                 | 51.22                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 54.62                               | 74.00                    | -19.38         | PK               | Horizontal |
| 7385.67                 | 33.62                   | 43.50             | 11.40        | 35.50                       | 3.40                        | 37.02                               | 54.00                    | -16.98         | AV               | Horizontal |

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11b, 802.11g, 802.11n (HT-20) the worst case is 802.11b.
3. Emission Level = Reading + Factor
4. Margin = Limit - Emission Level
5. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.
6. Video bandwidth for average measurements is 1KHz.

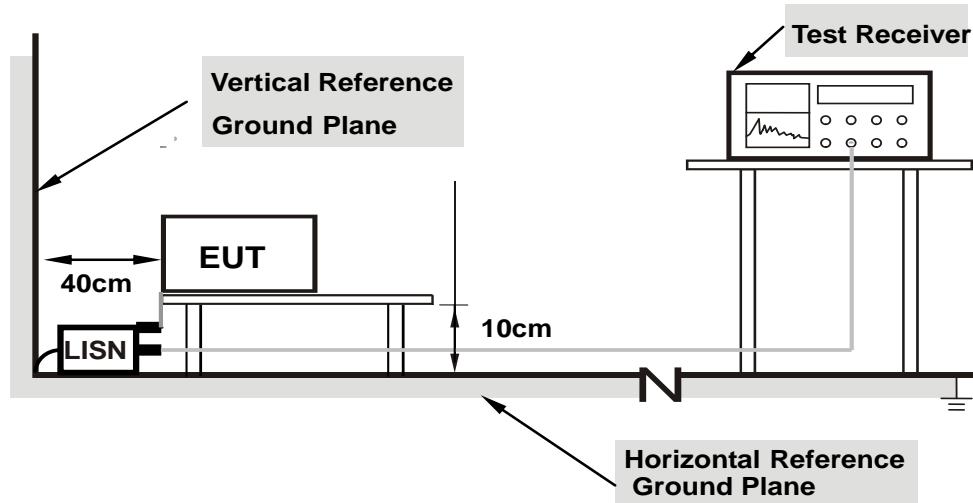
## 10. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

Please refer to FCC §15.207 (a)

| FREQUENCY (MHz) | Class A (dBuV) |         | Class B (dBuV) |           |
|-----------------|----------------|---------|----------------|-----------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average   |
| 0.15 -0.5       | 79.00          | 66.00   | 66 - 56 *      | 56 - 46 * |
| 0.50 -5.0       | 73.00          | 60.00   | 56.00          | 46.00     |
| 5.0 -30.0       | 73.00          | 60.00   | 60.00          | 50.00     |

### TEST SETUP AND PROCEDURE



**Note:**

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

The EUT is put on a table of non-conducting material that is 10cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

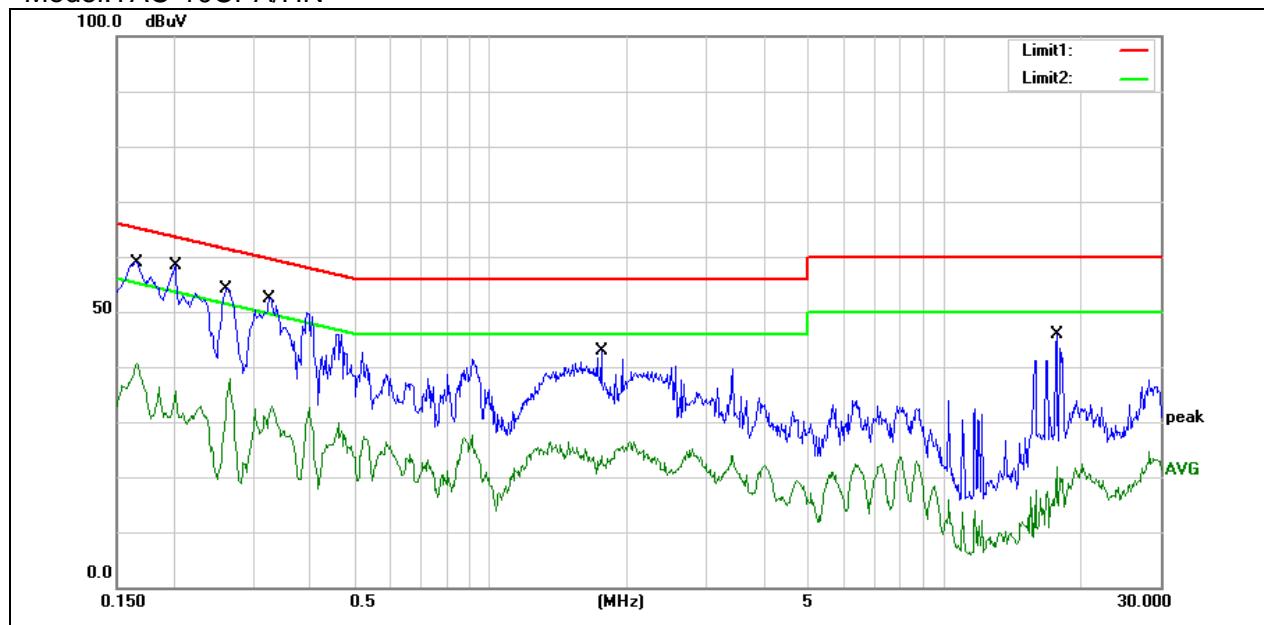
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

### TEST ENVIRONMENT

|                     |        |                   |              |
|---------------------|--------|-------------------|--------------|
| Temperature         | 23.5°C | Relative Humidity | 59%          |
| Atmosphere Pressure | 101kPa | Test Voltage      | AC 120V/60Hz |

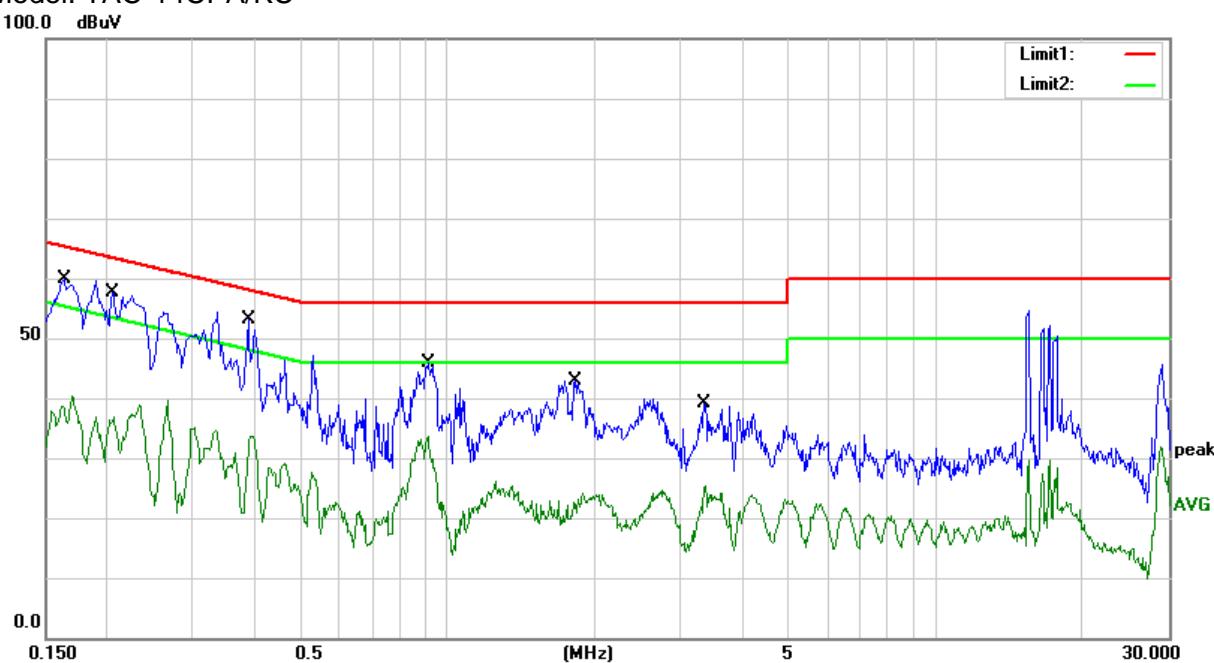
TEST RESULTS
LINE N RESULTS

Model:TAC-10CPA/HN



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>dB | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|---------------|------------------|-----------------|----------------|--------|
| 1   | 0.1675             | 48.94             | 9.79          | 58.73            | 65.08           | -6.35          | QP     |
| 2   | 0.1675             | 27.98             | 9.79          | 37.77            | 55.08           | -17.31         | AVG    |
| 3   | 0.2020             | 48.37             | 9.88          | 58.25            | 63.53           | -5.28          | QP     |
| 4   | 0.2020             | 20.98             | 9.88          | 30.86            | 53.53           | -22.67         | AVG    |
| 5   | 0.2620             | 44.12             | 10.12         | 54.24            | 61.37           | -7.13          | QP     |
| 6   | 0.2620             | 26.26             | 10.12         | 36.38            | 51.37           | -14.99         | AVG    |
| 7   | 0.3260             | 42.09             | 10.21         | 52.30            | 59.55           | -7.25          | QP     |
| 8   | 0.3260             | 21.95             | 10.21         | 32.16            | 49.55           | -17.39         | AVG    |
| 9   | 1.7580             | 32.96             | 9.85          | 42.81            | 56.00           | -13.19         | QP     |
| 10  | 1.7580             | 11.68             | 9.85          | 21.53            | 46.00           | -24.47         | AVG    |
| 11  | 17.7100            | 35.65             | 10.29         | 45.94            | 60.00           | -14.06         | QP     |
| 12  | 17.7100            | 8.86              | 10.29         | 19.15            | 50.00           | -30.85         | AVG    |

Model: TAC-14CPA/KC

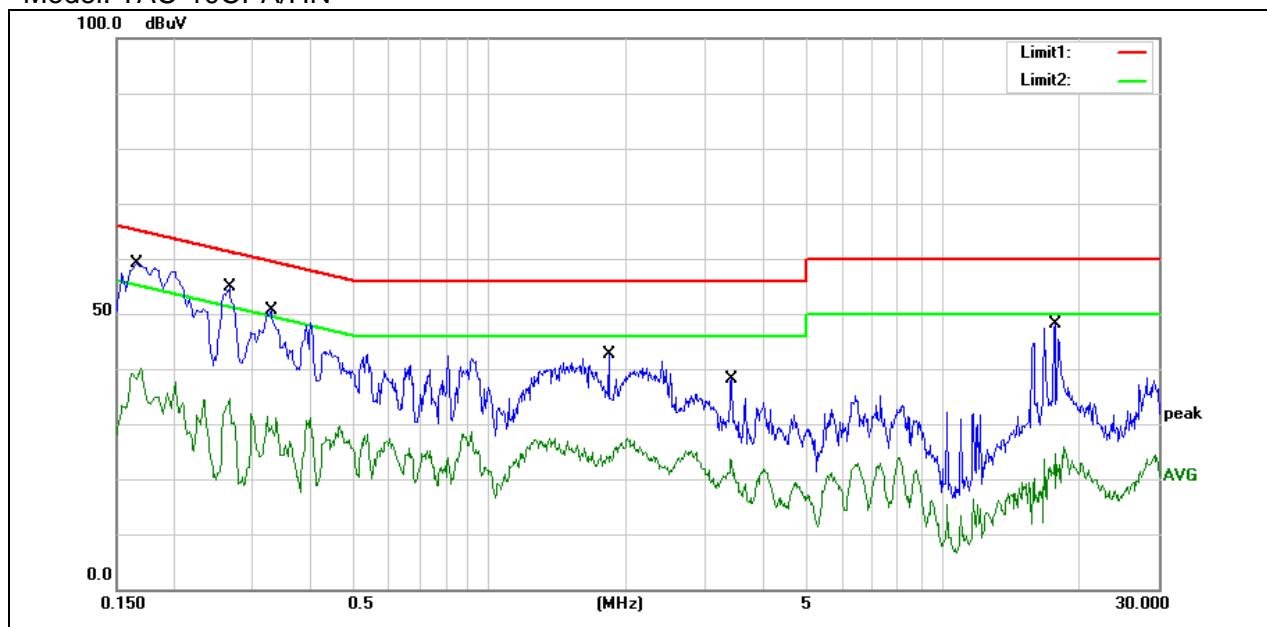


| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------|---------------|--------------|-------------|--------|
| 1   | 0.1633          | 49.98          | 9.78               | 59.76         | 65.29        | -5.53       | QP     |
| 2   | 0.1633          | 27.98          | 9.78               | 37.76         | 55.29        | -17.53      | AVG    |
| 3   | 0.2060          | 47.83          | 9.89               | 57.72         | 63.37        | -5.65       | QP     |
| 4   | 0.2060          | 26.12          | 9.89               | 36.01         | 53.37        | -17.36      | AVG    |
| 5   | 0.3900          | 43.06          | 10.08              | 53.14         | 58.06        | -4.92       | QP     |
| 6   | 0.3900          | 22.81          | 10.08              | 32.89         | 48.06        | -15.17      | AVG    |
| 7   | 0.9140          | 35.97          | 9.82               | 45.79         | 56.00        | -10.21      | QP     |
| 8   | 0.9140          | 22.79          | 9.82               | 32.61         | 46.00        | -13.39      | AVG    |
| 9   | 1.8260          | 33.11          | 9.86               | 42.97         | 56.00        | -13.03      | QP     |
| 10  | 1.8260          | 12.46          | 9.86               | 22.32         | 46.00        | -23.68      | AVG    |
| 11  | 3.3540          | 29.33          | 9.92               | 39.25         | 56.00        | -16.75      | QP     |
| 12  | 3.3540          | 14.99          | 9.92               | 24.91         | 46.00        | -21.09      | AVG    |

Note: 1. Result = Reading +Correct Factor.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

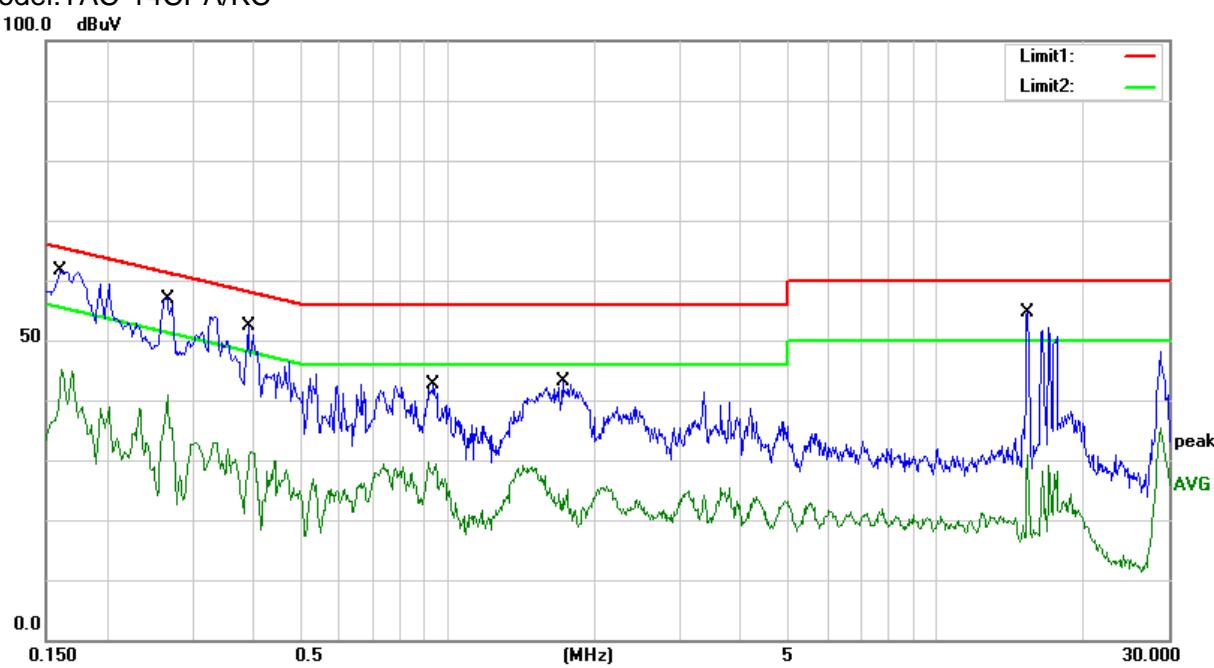
LINE L RESULTS

Model: TAC-10CPA/HN



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>dB | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|---------------|------------------|-----------------|----------------|--------|
| 1   | 0.1660             | 49.46             | 9.79          | 59.25            | 65.16           | -5.91          | QP     |
| 2   | 0.1660             | 28.32             | 9.79          | 38.11            | 55.16           | -17.05         | AVG    |
| 3   | 0.2660             | 44.73             | 10.08         | 54.81            | 61.24           | -6.43          | QP     |
| 4   | 0.2660             | 20.05             | 10.08         | 30.13            | 51.24           | -21.11         | AVG    |
| 5   | 0.3300             | 40.40             | 10.17         | 50.57            | 59.45           | -8.88          | QP     |
| 6   | 0.3300             | 18.52             | 10.17         | 28.69            | 49.45           | -20.76         | AVG    |
| 7   | 1.8380             | 32.83             | 9.78          | 42.61            | 56.00           | -13.39         | QP     |
| 8   | 1.8380             | 14.40             | 9.78          | 24.18            | 46.00           | -21.82         | AVG    |
| 9   | 3.4180             | 28.31             | 9.82          | 38.13            | 56.00           | -17.87         | QP     |
| 10  | 3.4180             | 10.86             | 9.82          | 20.68            | 46.00           | -25.32         | AVG    |
| 11  | 17.7020            | 37.73             | 10.35         | 48.08            | 60.00           | -11.92         | QP     |
| 12  | 17.7020            | 7.98              | 10.35         | 18.33            | 50.00           | -31.67         | AVG    |

Model:TAC-14CPA/KC



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-----------------------|------------------|-----------------|----------------|--------|
| 1   | 0.1607             | 51.80             | 9.79                  | 61.59            | 65.43           | -3.84          | QP     |
| 2   | 0.1607             | 33.08             | 9.79                  | 42.87            | 55.43           | -12.56         | AVG    |
| 3   | 0.2660             | 46.85             | 10.08                 | 56.93            | 61.24           | -4.31          | QP     |
| 4   | 0.2660             | 29.15             | 10.08                 | 39.23            | 51.24           | -12.01         | AVG    |
| 5   | 0.3900             | 42.27             | 10.05                 | 52.32            | 58.06           | -5.74          | QP     |
| 6   | 0.3900             | 20.22             | 10.05                 | 30.27            | 48.06           | -17.79         | AVG    |
| 7   | 0.9340             | 32.76             | 9.81                  | 42.57            | 56.00           | -13.43         | QP     |
| 8   | 0.9340             | 18.15             | 9.81                  | 27.96            | 46.00           | -18.04         | AVG    |
| 9   | 1.7220             | 33.44             | 9.79                  | 43.23            | 56.00           | -12.77         | QP     |
| 10  | 1.7220             | 12.20             | 9.79                  | 21.99            | 46.00           | -24.01         | AVG    |
| 11  | 15.4660            | 44.28             | 10.26                 | 54.54            | 60.00           | -5.46          | QP     |
| 12  | 15.4660            | 12.49             | 10.26                 | 22.75            | 50.00           | -27.25         | AVG    |

Note: 1. Result = Reading +Correct Factor.  
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

## 11. ANTENNA REQUIREMENTS

### APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### ANTENNA CONNECTOR

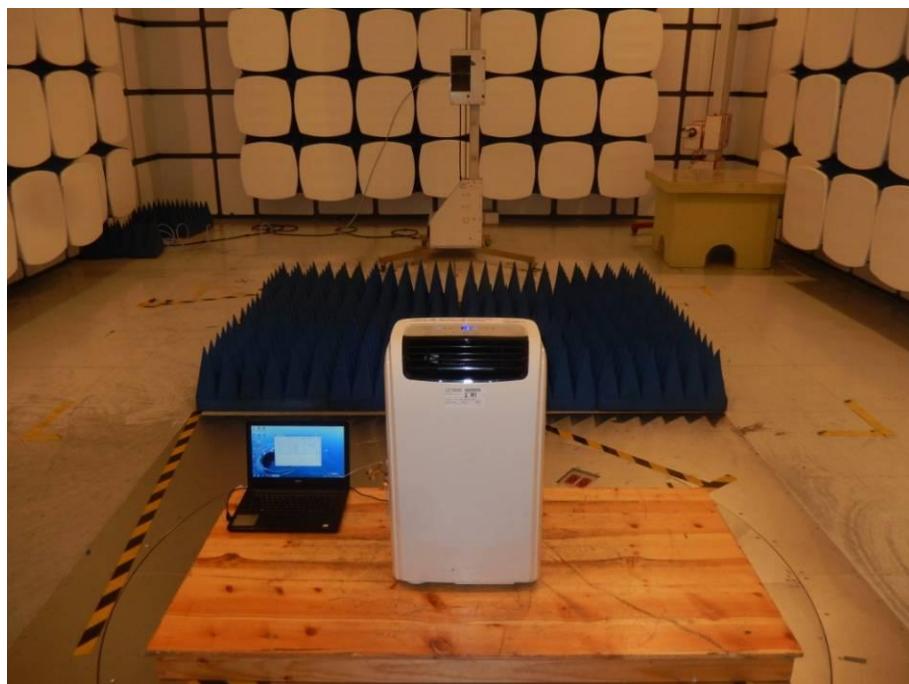
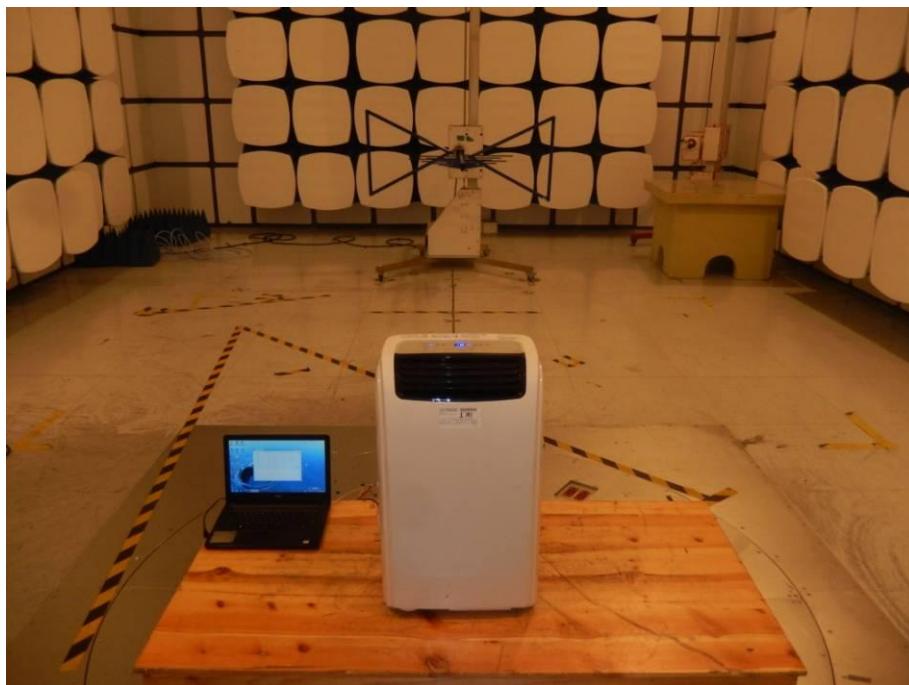
EUT has a PCB Antenna without antenna connector.

### ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

## Test photos

### Radiation



## Conduction



**END OF REPORT**