



**CFR 47 FCC PART 15 SUBPART C  
ISED RSS-247 ISSUE 2**

**TEST REPORT**

*For*

**Kami Wire-Free Outdoor Camera**

**MODEL NUMBER: YWS.1029**

**FCC ID: 2AFIB-YWS1029  
IC: 20436-YWS1029**

**PROJECT NUMBER: 4789135124**

**REPORT NUMBER: 4789135124-1**

**ISSUE DATE: Oct. 16, 2019**

*Prepared for*

**Shanghai Xiaoyi Technology Co., Ltd.**

*Prepared by*

**UL-CCIC COMPANY LIMITED  
No. 2, Chengwan Road, Suzhou Industrial Park, People's Republic of China  
Tel: +86 512 6808 6400  
Fax: +86 512 6808 4099  
Website: [www.ul.com](http://www.ul.com)**



Revision History

| Rev. | Issue Date | Revisions     | Revised By |
|------|------------|---------------|------------|
| V0   | 10/16/2019 | Initial Issue |            |



| Summary of Test Results                                                                                                                                                                                                                   |                                           |                                                                                                       |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------|
| Clause                                                                                                                                                                                                                                    | Test Items                                | FCC/IC Rules                                                                                          | Test Results |
| 1                                                                                                                                                                                                                                         | 6dB Bandwidth and 99% Occupied Bandwidth  | FCC Part 15.247 (a) (2)<br>RSS-247 Clause 5.2 (a)<br>ISED RSS-Gen Clause 6.7                          | Pass         |
| 2                                                                                                                                                                                                                                         | Peak Conducted Output Power               | FCC Part 15.247 (b) (3)<br>RSS-247 Clause 5.4 (e)                                                     | Pass         |
| 3                                                                                                                                                                                                                                         | Power Spectral Density                    | FCC Part 15.247 (e)<br>RSS-247 Clause 5.2 (b)                                                         | Pass         |
| 4                                                                                                                                                                                                                                         | Conducted Bandedge and Spurious Emission  | FCC Part 15.247 (d)<br>RSS-247 Clause 5.5                                                             | Pass         |
| 5                                                                                                                                                                                                                                         | Radiated Bandedge and Spurious Emission   | FCC Part 15.247 (d)<br>FCC Part 15.209<br>FCC Part 15.205<br>RSS-247 Clause 5.5<br>RSS-GEN Clause 8.9 | Pass         |
| 6                                                                                                                                                                                                                                         | Conducted Emission Test For AC Power Port | FCC Part 15.207<br>RSS-GEN Clause 8.8                                                                 | N/A          |
| 7                                                                                                                                                                                                                                         | Antenna Requirement                       | FCC Part 15.203<br>RSS-GEN Clause 8.3                                                                 | Pass         |
| Remark:<br>1) The measurement result for the sample received is <Pass> according to < ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15C> when <Accuracy Method> decision rule is applied.<br>2) The product is powered by battery. |                                           |                                                                                                       |              |



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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Shanghai Xiaoyi Technology Co., Ltd.  
Address: 6F, Building E, No. 2889, Jinke Road Shanghai, China

### Manufacturer Information

Company Name: Shanghai Xiaoyi Technology Co., Ltd.  
Address: 6F, Building E, No. 2889, Jinke Road Shanghai, China

### EUT Description

EUT Name: Kami Wire-Free Outdoor Camera  
Model: YWS.1029  
Sample Status: Normal  
Sample Received Date: August 9, 2019  
Date of Tested: August 19~ September 30, 2019

| APPLICABLE STANDARDS         |              |
|------------------------------|--------------|
| STANDARD                     | TEST RESULTS |
| CFR 47 FCC PART 15 SUBPART C | PASS         |
| ISED RSS-247 Issue 2         | PASS         |
| ISED RSS-GEN Issue 5         | PASS         |

Tested By:

*Tom Tang*

Tom Tang  
Engineer Project Associate

Reviewed By:

*Chris Zhong*

Chris Zhong  
Senior Project Engineer

Authorized By:

*Scholl Zhang*

Scholl Zhang  
Laboratory Leader



## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

## 3. FACILITIES AND ACCREDITATION

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accreditation Certificate | <b>A2LA (Certificate No.: 4829.01)</b><br><b>UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA.</b><br><b>FCC (FCC Designation No.: CN1247)</b><br><b>UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.</b><br><b>IC (IC Designation No.: 25056)</b><br><b>UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.</b> |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED 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

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Item                                                                                                                                     | Uncertainty           |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Conduction emission                                                                                                                           | 3.00dB                |
| Radiation Emission test(include Fundamental emission)<br>(9kHz-30MHz)                                                                         | 3.32dB                |
| Radiation Emission test(include Fundamental emission)<br>(30MHz-1GHz)                                                                         | 3.27dB                |
| Radiation Emission test<br>(1GHz to 26GHz)( include Fundamental emission)                                                                     | 3.80dB (1GHz-18Gz)    |
|                                                                                                                                               | 4.11dB (18GHz-26.5Gz) |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                       |



## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

|                     |                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT Name            | Kami Wire-Free Outdoor Camera                                                                                                                                                     |
| Model               | YWS.1029                                                                                                                                                                          |
| Radio Technology    | IEEE802.11b/g/n HT20&HT40                                                                                                                                                         |
| Operation frequency | IEEE 802.11b: 2412MHz—2462MHz<br>IEEE 802.11g: 2412MHz—2462MHz<br>IEEE 802.11n HT20: 2412MHz—2462MHz<br>IEEE 802.11n HT40: 2422MHz—2452MHz                                        |
| 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)<br>IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK) |
| Power Supply        | DC 3.7V * 4                                                                                                                                                                       |

### 5.2. MAXIMUM OUTPUT POWER

| Number of Transmit Chains (NTX) | IEE Std. 802.11  | Frequency (MHz) | Channel Number | Max PK Conducted Power (dBm) |
|---------------------------------|------------------|-----------------|----------------|------------------------------|
| 1                               | IEEE 802.11b     | 2412-2462       | 1-11[11]       | 14.35                        |
| 1                               | IEEE 802.11g     | 2412-2462       | 1-11[11]       | 22.10                        |
| 1                               | IEEE 802.11nHT20 | 2412-2462       | 1-11[11]       | 22.37                        |
| 1                               | IEEE 802.11nHT40 | 2422-2452       | 3-9[7]         | 21.40                        |



### 5.3. CHANNEL LIST

| Channel List for 802.11b/g/n (20 MHz) |                 |         |                 |         |                 |         |                 |
|---------------------------------------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel                               | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 1                                     | 2412            | 4       | 2427            | 7       | 2442            | 10      | 2457            |
| 2                                     | 2417            | 5       | 2432            | 8       | 2447            | 11      | 2462            |
| 3                                     | 2422            | 6       | 2437            | 9       | 2452            | /       | /               |

| Channel List for 802.11n (40 MHz) |                 |         |                 |         |                 |         |                 |
|-----------------------------------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel                           | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 3                                 | 2422            | 5       | 2432            | 7       | 2442            | 9       | 2452            |
| 4                                 | 2427            | 6       | 2437            | 8       | 2447            | /       | /               |

### 5.4. TEST CHANNEL CONFIGURATION

| Test Mode             | Test Channel  | Frequency                 |
|-----------------------|---------------|---------------------------|
| WiFi TX(802.11b)      | LCH, MCH, HCH | 2412MHz, 2437MHz, 2462MHz |
| WiFi TX(802.11g)      | LCH, MCH, HCH | 2412MHz, 2437MHz, 2462MHz |
| WiFi TX(802.11n HT20) | LCH, MCH, HCH | 2412MHz, 2437MHz, 2462MHz |
| WiFi TX(802.11n HT40) | LCH, MCH, HCH | 2422MHz, 2437MHz, 2452MHz |

### 5.5. THE WORSE CASE CONFIGURATIONS

| The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band |                         |              |     |     |            |     |     |
|--------------------------------------------------------------------|-------------------------|--------------|-----|-----|------------|-----|-----|
| Test Software                                                      |                         | SmartTools   |     |     |            |     |     |
| Modulation Mode                                                    | Transmit Antenna Number | Test Channel |     |     |            |     |     |
|                                                                    |                         | NCB: 20MHz   |     |     | NCB: 40MHz |     |     |
|                                                                    |                         | LCH          | MCH | HCH | LCH        | MCH | HCH |
| 802.11b                                                            | 1                       | N/A          | N/A | N/A | /          |     |     |
| 802.11g                                                            | 1                       | N/A          | N/A | N/A |            |     |     |
| 802.11n HT20                                                       | 1                       | N/A          | N/A | N/A |            |     |     |
| 802.11n HT40                                                       | 1                       | /            |     |     | N/A        | N/A | N/A |



## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Antenna | Frequency (MHz) | Antenna Type   | MAX Antenna Gain (dBi) |
|---------|-----------------|----------------|------------------------|
| 1       | 2412-2462       | Dipole Antenna | 2.35                   |

| Test Mode         | Transmit and Receive Mode                    | Description                                          |
|-------------------|----------------------------------------------|------------------------------------------------------|
| IEEE 802.11b      | <input checked="" type="checkbox"/> 1TX, 1RX | ANT 1 can be used as transmitting/receiving antenna. |
| IEEE 802.11g      | <input checked="" type="checkbox"/> 1TX, 1RX | ANT 1 can be used as transmitting/receiving antenna. |
| IEEE 802.11n HT20 | <input checked="" type="checkbox"/> 1TX, 1RX | ANT 1 can be used as transmitting/receiving antenna. |
| IEEE 802.11n HT40 | <input checked="" type="checkbox"/> 1TX, 1RX | ANT 1 can be used as transmitting/receiving antenna. |

## 5.7. THE WORSE CASE CONFIGURATIONS

For the product, there is only one transmission antenna, so only the worst data for the antenna1 is recorded in the report.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps  
802.11b mode: 6 Mbps  
802.11n HT20 mode: MCS0  
802.11n HT40 mode: MCS0



## 5.8. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Item | Equipment | Brand Name | Model Name | P/N |
|------|-----------|------------|------------|-----|
| 1    | Laptop    | ThinkPad   | E550c      | N/A |

### I/O CABLES

| Cable No | Port       | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|------------|----------------|------------|-----------------|---------|
| 1        | USB to TTL | USB to TTL     | USB        | 1               | N/A     |
| 2        | USB        | N/A            | N/A        | 1               | N/A     |

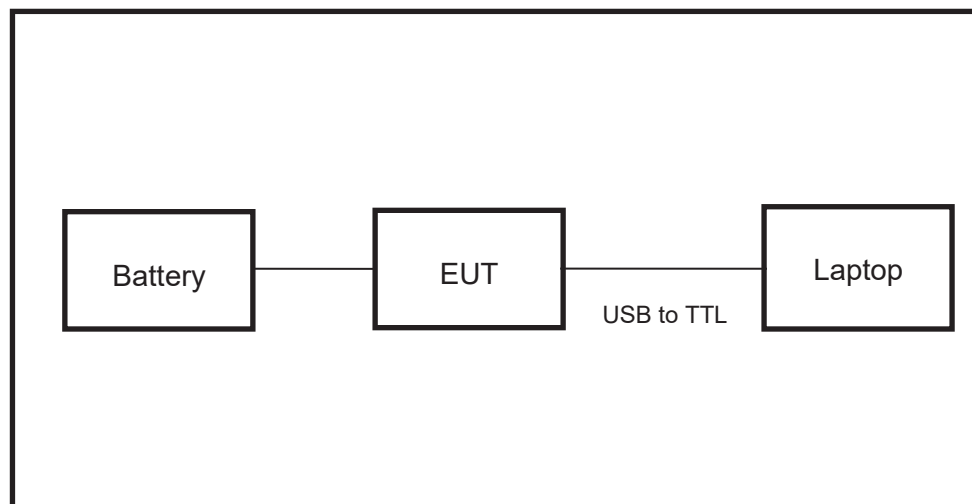
### ACCESSORIES

| Item | Accessory | Brand Name | Model Name | Description |
|------|-----------|------------|------------|-------------|
| 1    | N/A       | N/A        | N/A        | N/A         |

### TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

### SETUP DIAGRAM FOR TESTS





## 6. MEASURING INSTRUMENT AND SOFTWARE USED

| Conducted Emissions (Instrument)    |                                         |                                  |                                     |             |                 |            |            |
|-------------------------------------|-----------------------------------------|----------------------------------|-------------------------------------|-------------|-----------------|------------|------------|
| Used                                | Equipment                               | Manufacturer                     | Model No.                           | Serial No.  | Upper Last Cal. | Last Cal.  | Next Cal.  |
| <input checked="" type="checkbox"/> | EMI Test Receiver                       | R&S                              | ESR3                                | 126700      | 2017-12-14      | 2018-12-13 | 2019-12-12 |
| <input checked="" type="checkbox"/> | Two-Line V-Network                      | R&S                              | ENV216                              | 126701      | 2017-12-14      | 2018-12-13 | 2019-12-12 |
| <input checked="" type="checkbox"/> | Artificial Mains Networks               | R&S                              | ENY81                               | 126711      | 2017-12-14      | 2018-12-13 | 2019-12-12 |
| Software                            |                                         |                                  |                                     |             |                 |            |            |
| Used                                | Description                             |                                  | Manufacturer                        |             | Name            | Version    |            |
| <input checked="" type="checkbox"/> | Test Software for Conducted disturbance |                                  | R&S                                 |             | EMC32           | Ver. 9.25  |            |
| Radiated Emissions (Instrument)     |                                         |                                  |                                     |             |                 |            |            |
| Used                                | Equipment                               | Manufacturer                     | Model No.                           | Serial No.  | Upper Last Cal. | Last Cal.  | Next Cal.  |
| <input checked="" type="checkbox"/> | Spectrum Analyzer                       | Keysight                         | N9010B                              | MY57110128  | 2018-05-30      | 2019-05-29 | 2020-05-28 |
| <input checked="" type="checkbox"/> | EMI test receiver                       | R&S                              | ESR26                               | 1267603     | 2017-12-14      | 2018-12-13 | 2019-12-22 |
| <input checked="" type="checkbox"/> | Receiver Antenna (9kHz-30MHz)           | Schwarzbeck                      | FMZB 1513                           | 513-265     | 2018-06-17      | 2019-06-16 | 2020-06-15 |
| <input checked="" type="checkbox"/> | Receiver Antenna (30MHz-1GHz)           | SunAR RF Motion                  | JB1                                 | 126704      | N/A             | 2019-01-28 | 2022-01-27 |
| <input checked="" type="checkbox"/> | Receiver Antenna (1GHz-18GHz)           | R&S                              | HF907                               | 126705      | 2018-01-27      | 2019-01-26 | 2020-01-26 |
| <input checked="" type="checkbox"/> | Receiver Antenna (18GHz-26.5GHz)        | Schwarzbeck                      | BBHA9170                            | 126706      | 2018-02-07      | 2019-02-06 | 2020-02-05 |
| <input checked="" type="checkbox"/> | Receiver Antenna (26.5GHz-40GHz)        | TOYO                             | HAP 26-40W                          | 00000012    | 2018-07-25      | 2019-07-24 | 2020-07-23 |
| <input checked="" type="checkbox"/> | Pre-amplification (To 1GHz)             | R&S                              | SCU-03D                             | 134666      | 2018-02-07      | 2019-02-06 | 2020-02-05 |
| <input checked="" type="checkbox"/> | Pre-amplification (To 18GHz)            | Compliance Direction System Inc. | PAP-1G18-50                         | 14140-13467 | N/A             | 2019-03-18 | 2020-03-17 |
| <input checked="" type="checkbox"/> | Pre-amplification (To 26.5GHz)          | R&S                              | SCU-26D                             | 134668      | 2018-02-07      | 2019-02-06 | 2020-02-05 |
| <input checked="" type="checkbox"/> | Band Reject Filter                      | Wainwright                       | WRCJV8-2350-2400-2483.5-2533.5-40SS | 1           | 2018-05-30      | 2019-05-29 | 2020-05-28 |
| <input checked="" type="checkbox"/> | Highpass Filter                         | Wainwright                       | WHKX10-2700-3000-18000-40SS         | 2           | 2018-05-30      | 2019-05-29 | 2020-05-28 |
| Software                            |                                         |                                  |                                     |             |                 |            |            |
| Used                                | Description                             |                                  | Manufacturer                        |             | Name            | Version    |            |
| <input checked="" type="checkbox"/> | Test Software for Radiated disturbance  |                                  | Tonscend                            |             | JS32            | V1.0       |            |
| Other instruments                   |                                         |                                  |                                     |             |                 |            |            |
| Used                                | Equipment                               | Manufacturer                     | Model No.                           | Serial No.  | Upper Last Cal. | Next Cal.  |            |
| <input checked="" type="checkbox"/> | Spectrum Analyzer                       | Keysight                         | N9010B                              | MY57110128  | 2018-05-30      | 2019-05-29 | 2020-05-28 |
| <input checked="" type="checkbox"/> | Power Sensor                            | Keysight                         | U2021XA                             | MY57110002  | 2018-06-13      | 2019-06-12 | 2020-06-11 |



## 7. MEASUREMENT METHODS

| No. | Test Item                                     | KDB Name                                      | Section         |
|-----|-----------------------------------------------|-----------------------------------------------|-----------------|
| 1   | 6dB Bandwidth                                 | KDB 558074 D01 15.247<br>Meas Guidance v05r02 | 8.2             |
| 2   | Peak Output Power                             | KDB 558074 D01 15.247<br>Meas Guidance v05r02 | 8.3.1.3/8.3.2.3 |
| 3   | Power Spectral Density                        | KDB 558074 D01 15.247<br>Meas Guidance v05r02 | 8.4             |
| 4   | Out-of-band emissions in non-restricted bands | KDB 558074 D01 15.247<br>Meas Guidance v05r02 | 8.5             |
| 5   | Out-of-band emissions in restricted bands     | KDB 558074 D01 15.247<br>Meas Guidance v05r02 | 8.6             |
| 6   | Band-edge                                     | KDB 558074 D01 15.247<br>Meas Guidance v05r02 | 8.7             |
| 7   | 99% Bandwidth                                 | ANSI C63.10-2013                              | 6.9.3           |



## 8. ANTENNA PORT TEST RESULTS

### 8.1. ON TIME AND DUTY CYCLE

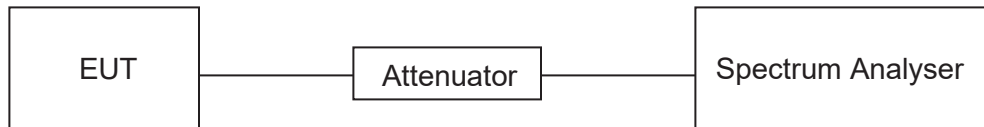
#### LIMITS

None; for reporting purposes only

#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

|                     |        |                   |             |
|---------------------|--------|-------------------|-------------|
| Temperature         | 20°C   | Relative Humidity | 56%         |
| Atmosphere Pressure | 101kPa | Test Voltage      | DC 3.7V * 4 |

#### RESULTS

| Mode  | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) | 1/T Minimum VBW (KHz) | Final setting For VBW (KHz) |
|-------|----------------|---------------|-----------------------|----------------|-----------------------------------|-----------------------|-----------------------------|
| 11B   | 16.410         | 16.455        | 0.9973                | 99.73%         | 0.012                             | 0.061                 | 0.1                         |
| 11G   | 2.726          | 2.767         | 0.9852                | 98.52%         | 0.065                             | 0.367                 | 1                           |
| 11N20 | 2.522          | 2.563         | 0.9840                | 98.40%         | 0.070                             | 0.397                 | 1                           |
| 11N40 | 1.227          | 1.266         | 0.9692                | 96.92%         | 0.136                             | 0.815                 | 1                           |

Note:

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

Where: x is Duty Cycle (Linear)

Where: T is On Time

If that calculated VBW is not available on the analyzer then the next higher value should be used.



### 11B ON TIME AND DUTY CYCLE MID CH (WORSE CASE)



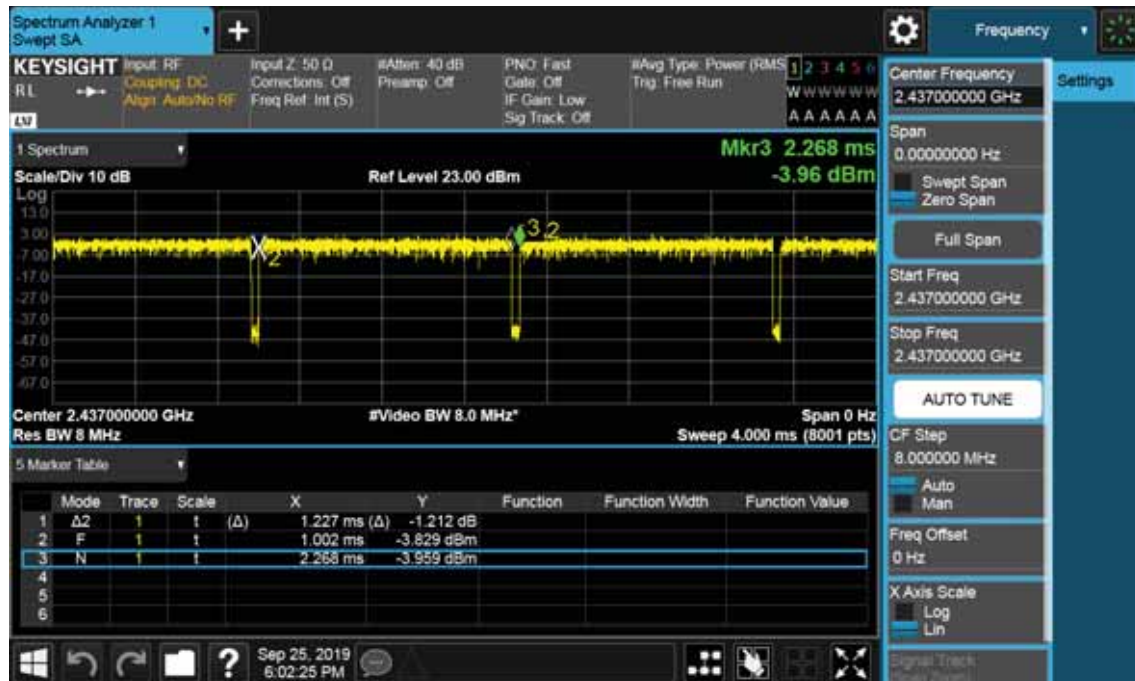
### 11G ON TIME AND DUTY CYCLE MID CH (WORSE CASE)



### 11N HT20 ON TIME AND DUTY CYCLE MID CH (WORSE CASE)



### 11N HT40 ON TIME AND DUTY CYCLE MID CH (WORSE CASE)





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

### LIMITS

| CFR 47 FCC Part15 (15.247) Subpart C<br>ISED RSS-247 ISSUE 2 |                        |                              |                       |
|--------------------------------------------------------------|------------------------|------------------------------|-----------------------|
| Section                                                      | Test Item              | Limit                        | Frequency Range (MHz) |
| CFR 47 FCC 15.247(a)(2)<br>ISED RSS-247 5.2 (a)              | 6 dB Bandwidth         | $\geq 500\text{KHz}$         | 2400-2483.5           |
| ISED RSS-Gen Clause 6.7                                      | 99% Occupied Bandwidth | For reporting purposes only. | 2400-2483.5           |

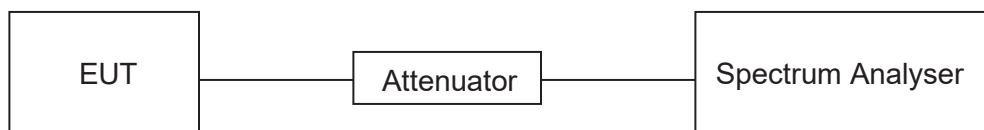
### TEST PROCEDURE

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% Occupied Bandwidth :1% to 5% of the occupied bandwidth                          |
| VBW              | For 6dB Bandwidth : $\geq 3 \times \text{RBW}$<br>For 99% Occupied Bandwidth : approximately $3 \times \text{RBW}$ |
| 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**

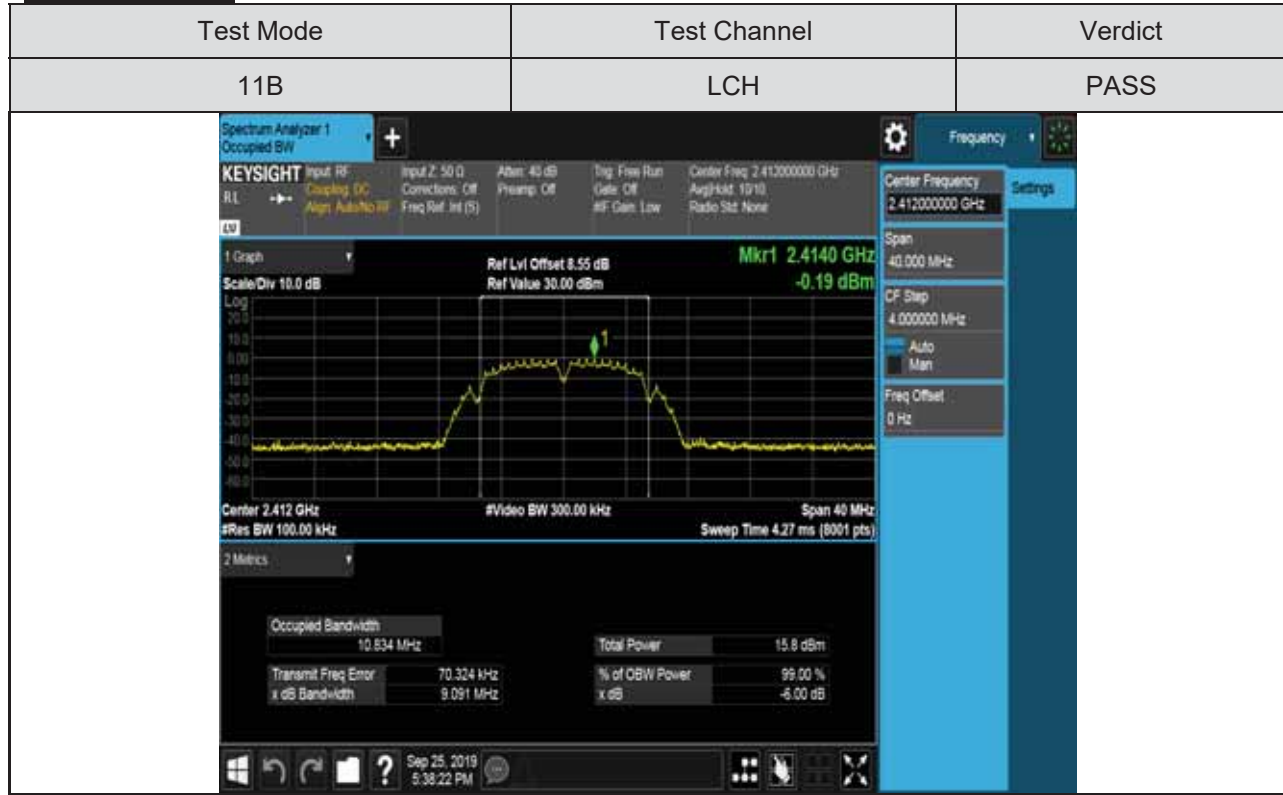
|                     |        |                   |             |
|---------------------|--------|-------------------|-------------|
| Temperature         | 20°C   | Relative Humidity | 56%         |
| Atmosphere Pressure | 101kPa | Test Voltage      | DC 3.7V * 4 |

## **RESULTS**

| Test Mode | Test Channel | 6dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|-----------|--------------|---------------------|---------------------|--------|
| 11B       | LCH          | 9.091               | 11.047              | Pass   |
|           | MCH          | 9.095               | 10.983              | Pass   |
|           | HCH          | 9.099               | 11.034              | Pass   |
| 11G       | LCH          | 16.37               | 16.535              | Pass   |
|           | MCH          | 16.37               | 16.517              | Pass   |
|           | HCH          | 16.37               | 16.518              | Pass   |
| 11N20     | LCH          | 17.59               | 17.624              | Pass   |
|           | MCH          | 17.59               | 17.605              | Pass   |
|           | HCH          | 17.60               | 17.627              | Pass   |
| 11N40     | LCH          | 35.68               | 35.988              | Pass   |
|           | MCH          | 35.55               | 35.959              | Pass   |
|           | HCH          | 35.44               | 36.032              | Pass   |



**Test Graphs**  
**6dB bandwidth**





| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11B                                                                                 | HCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11G                                                                                  | LCH          | PASS    |
|  |              |         |



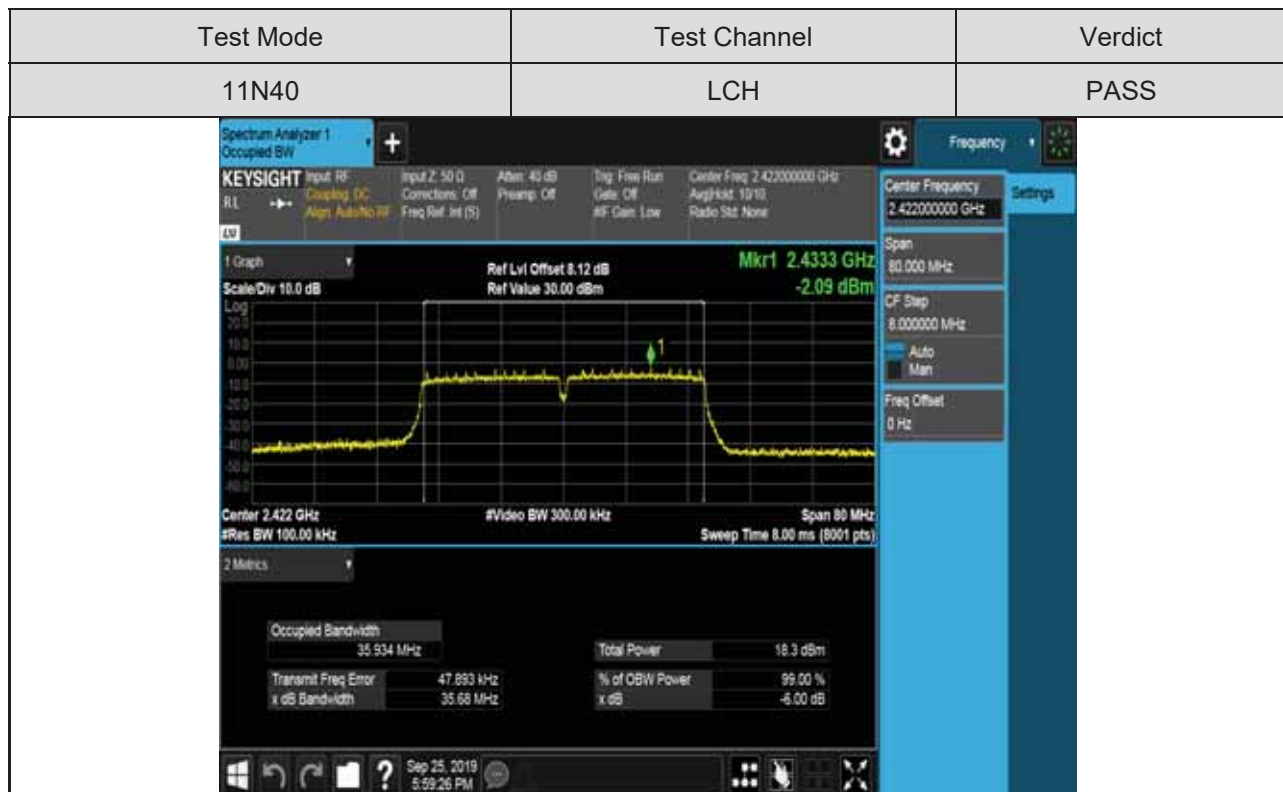
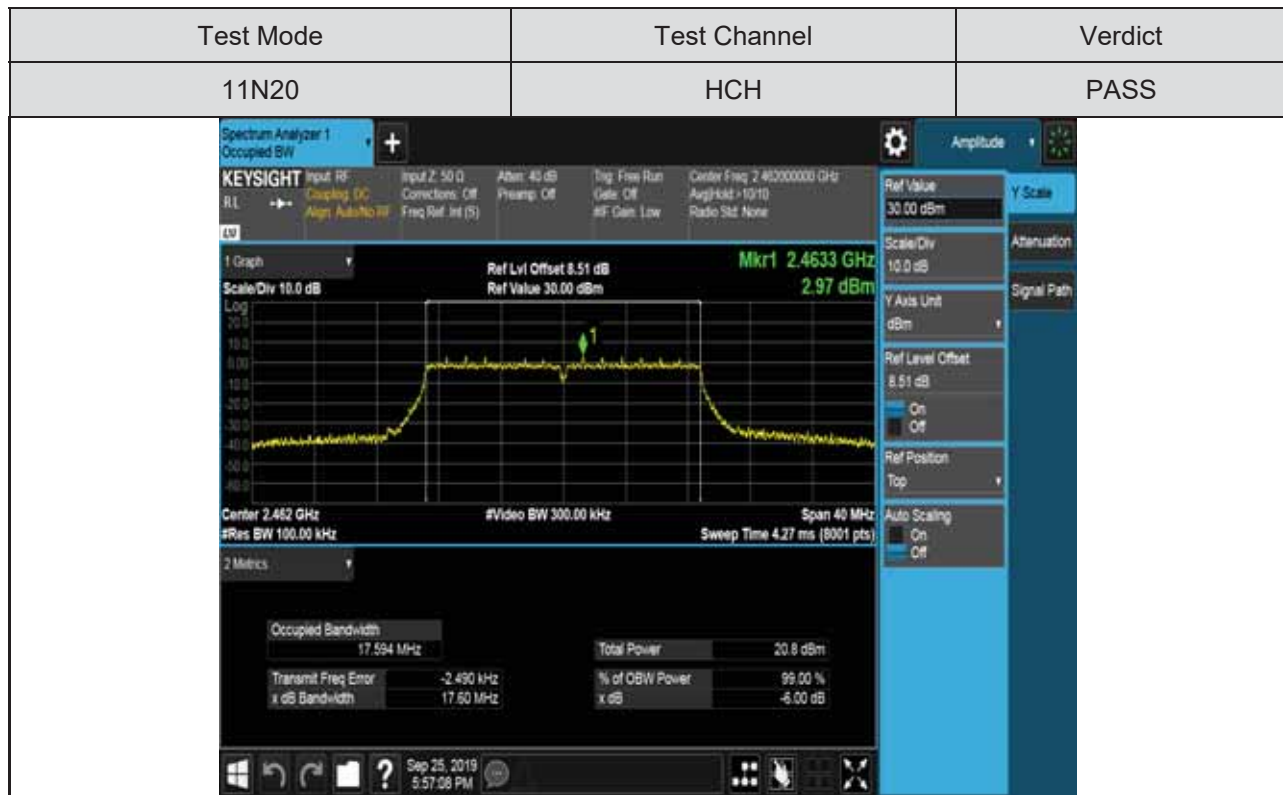
| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11G                                                                                 | MCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11G                                                                                  | HCH          | PASS    |
|  |              |         |



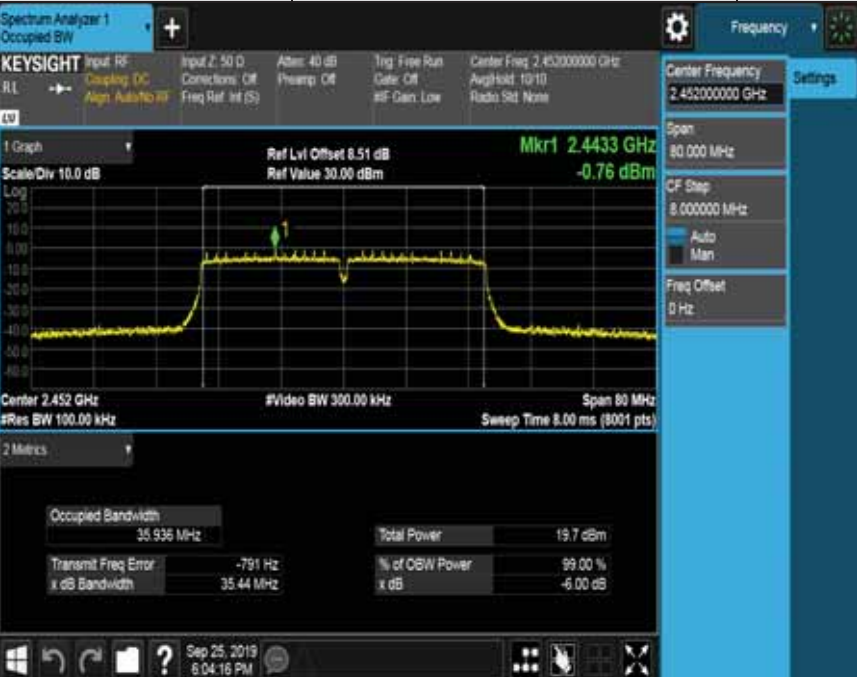
| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11N20                                                                               | LCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11N20                                                                                | MCH          | PASS    |
|  |              |         |





| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11N40                                                                               | MCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11N40                                                                                | HCH          | PASS    |
|  |              |         |



### 99% bandwidth

| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11B                                                                                 | LCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11B                                                                                  | MCH          | PASS    |
|  |              |         |

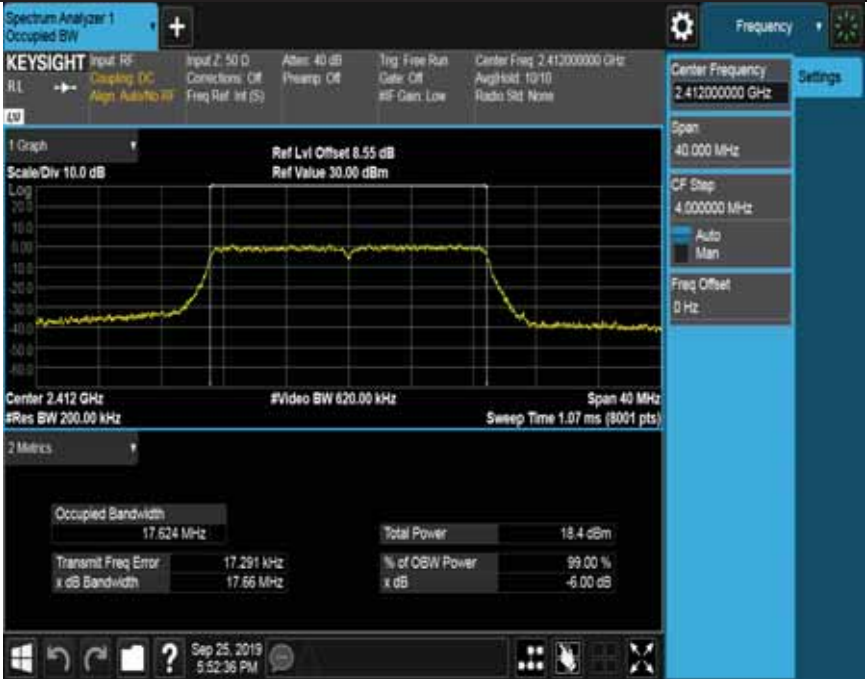


| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11B                                                                                 | HCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11G                                                                                  | LCH          | PASS    |
|  |              |         |

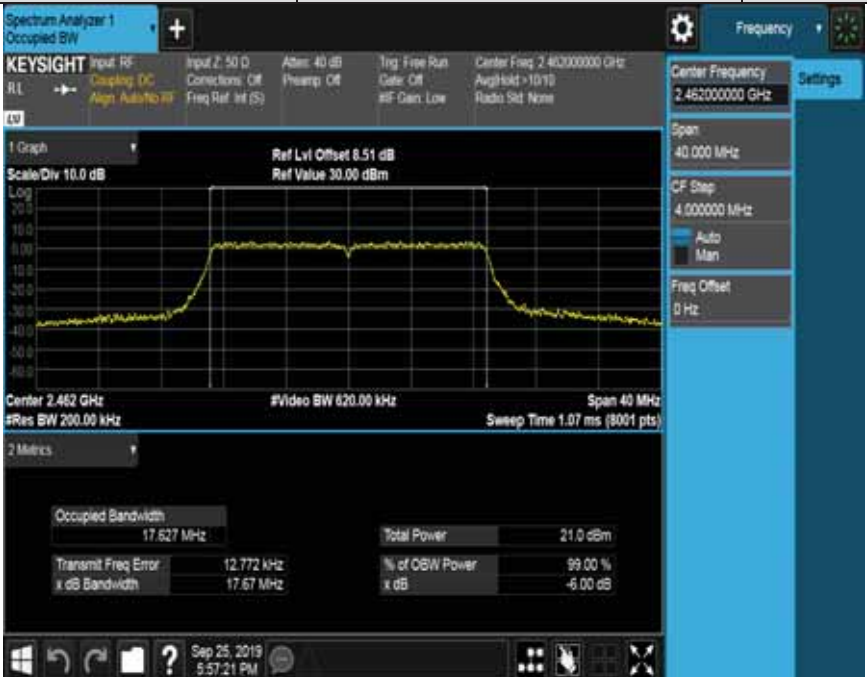




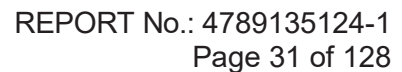
| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11N20                                                                               | LCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11N20                                                                                | MCH          | PASS    |
|  |              |         |



| Test Mode                                                                           | Test Channel | Verdict |
|-------------------------------------------------------------------------------------|--------------|---------|
| 11N20                                                                               | HCH          | PASS    |
|  |              |         |

| Test Mode                                                                            | Test Channel | Verdict |
|--------------------------------------------------------------------------------------|--------------|---------|
| 11N40                                                                                | LCH          | PASS    |
|  |              |         |





### 8.3. PEAK CONDUCTED OUTPUT POWER

#### LIMITS

| CFR 47 FCC Part15 (15.247) Subpart C<br>ISED RSS-247 ISSUE 2                                                                                                                                                                                                            |                   |                                |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------|--------------------------|
| Section                                                                                                                                                                                                                                                                 | Test Item         | Limit                          | Frequency Range<br>(MHz) |
| CFR 47 FCC 15.247(b)(3)<br>ISED RSS-247 5.4 (e)                                                                                                                                                                                                                         | Peak Output Power | 1 watt or 30dBm<br>(See note1) | 2400-2483.5              |
| <b>Note:</b><br>1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. |                   |                                |                          |

#### 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 the power of each channel.  
Peak Detector use for Peak result.  
AVG Detector use for AVG result.

#### TEST SETUP



#### TEST ENVIRONMENT

|                     |        |                   |             |
|---------------------|--------|-------------------|-------------|
| Temperature         | 20°C   | Relative Humidity | 56%         |
| Atmosphere Pressure | 101kPa | Test Voltage      | DC 3.7V * 4 |



**RESULTS**

| Test Mode | Test Channel | Maximum Peak Conducted Output Power(dBm) | Result |
|-----------|--------------|------------------------------------------|--------|
| 11B       | LCH          | 11.54                                    | Pass   |
|           | MCH          | 12.98                                    | Pass   |
|           | HCH          | 14.35                                    | Pass   |
| 11G       | LCH          | 19.58                                    | Pass   |
|           | MCH          | 20.89                                    | Pass   |
|           | HCH          | 22.10                                    | Pass   |
| 11N20     | LCH          | 19.75                                    | Pass   |
|           | MCH          | 21.12                                    | Pass   |
|           | HCH          | 22.37                                    | Pass   |
| 11N40     | LCH          | 19.94                                    | Pass   |
|           | MCH          | 21.33                                    | Pass   |
|           | HCH          | 21.40                                    | Pass   |



## 8.4. POWER SPECTRAL DENSITY

### LIMITS

| CFR 47 FCC Part15 (15.247) Subpart C<br>ISED RSS-247 ISSUE 2                                                                                                                                                                                                            |                        |                            |                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|-----------------------|
| Section                                                                                                                                                                                                                                                                 | Test Item              | Limit                      | Frequency Range (MHz) |
| CFR 47 FCC §15.247 (e)<br>ISED RSS-247 5.2 (b)                                                                                                                                                                                                                          | Power Spectral Density | 8 dBm/3 kHz<br>(See note1) | 2400-2483.5           |
| <b>Note:</b><br>1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. |                        |                            |                       |

### TEST PROCEDURE

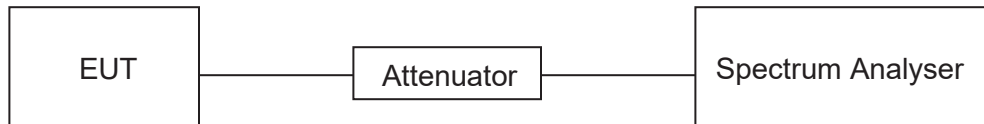
Connect the UUT to the spectrum analyser and use the following settings:

|                  |                                                      |
|------------------|------------------------------------------------------|
| 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 x 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         | 20°C   | Relative Humidity | 56%         |
| Atmosphere Pressure | 101kPa | Test Voltage      | DC 3.7V * 4 |



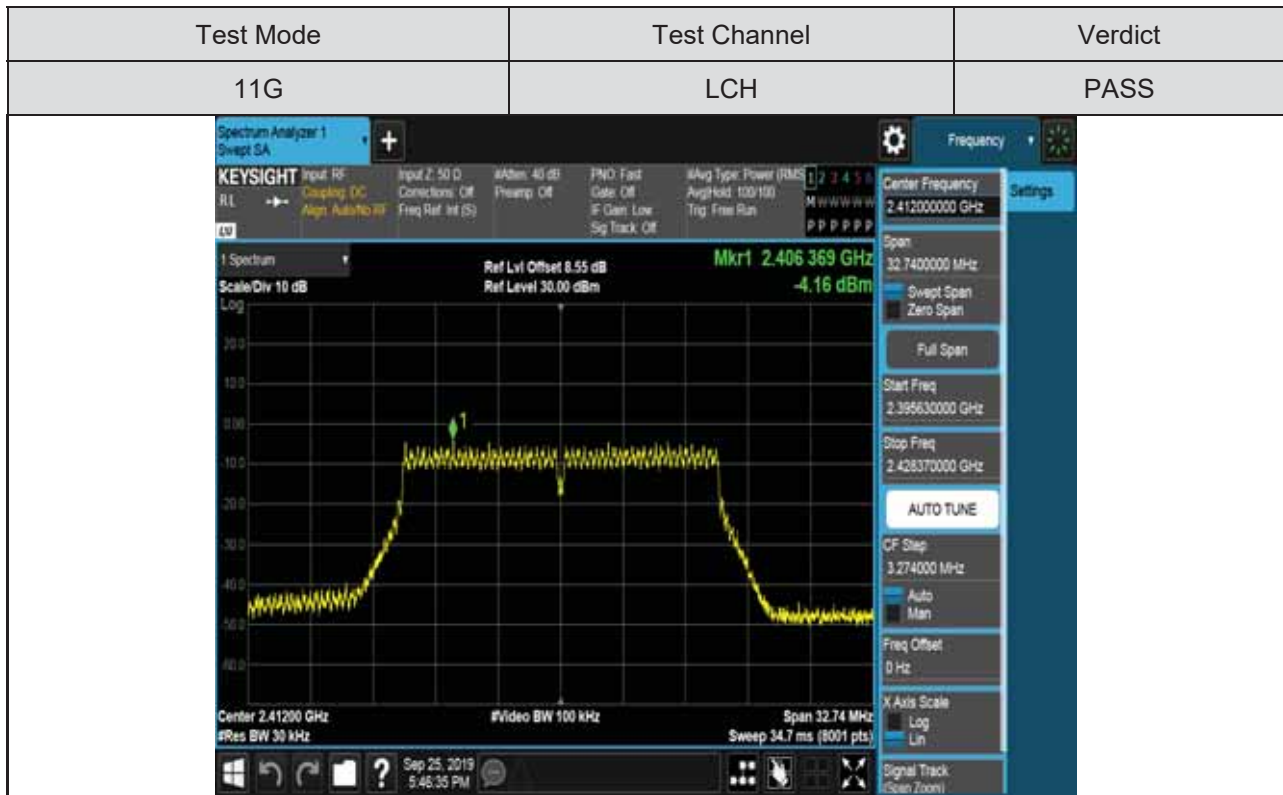
## **RESULTS**

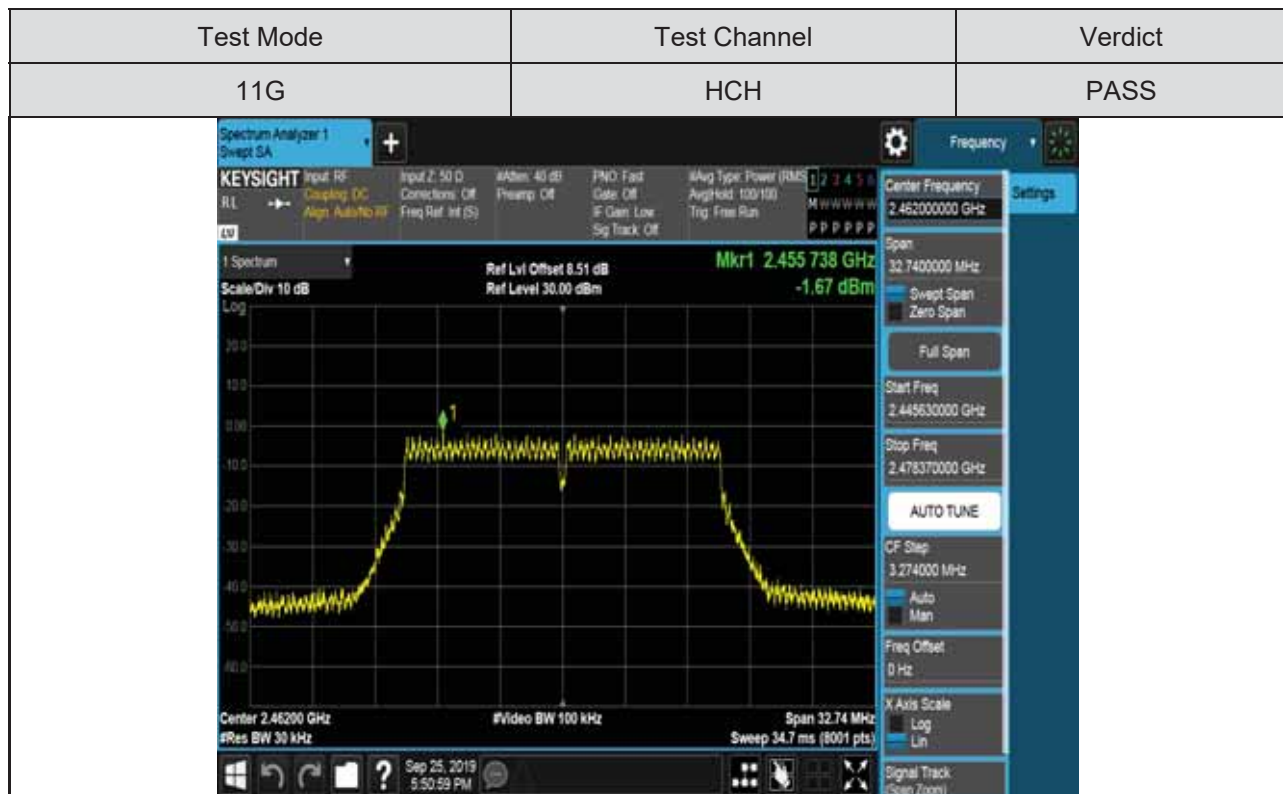
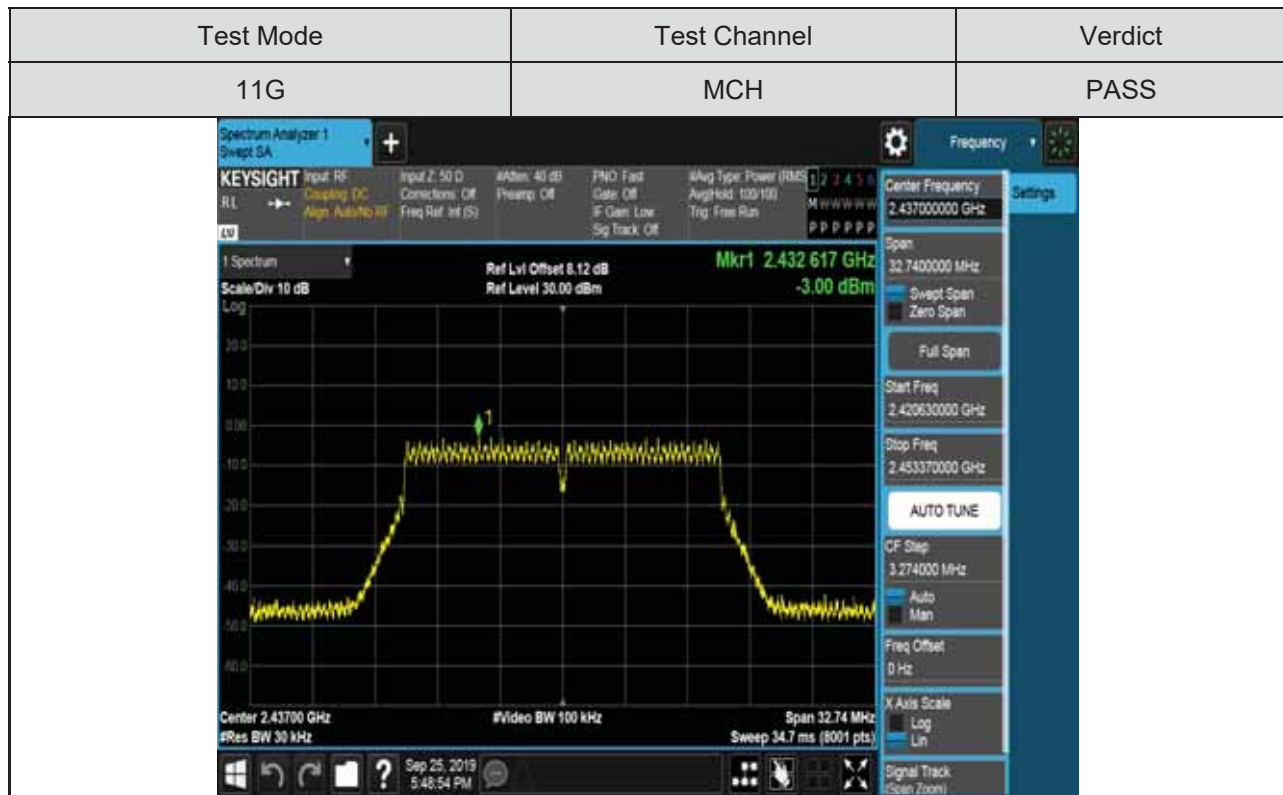
| Test Mode | Test Channel | Maximum Peak power spectral density (dBm/30kHz) | Result |
|-----------|--------------|-------------------------------------------------|--------|
| 11B       | LCH          | -3.78                                           | Pass   |
|           | MCH          | -1.95                                           | Pass   |
|           | HCH          | -0.91                                           | Pass   |
| 11G       | LCH          | -4.16                                           | Pass   |
|           | MCH          | -3.00                                           | Pass   |
|           | HCH          | -1.67                                           | Pass   |
| 11N20     | LCH          | -4.68                                           | Pass   |
|           | MCH          | -2.70                                           | Pass   |
|           | HCH          | -1.93                                           | Pass   |
| 11N40     | LCH          | -6.95                                           | Pass   |
|           | MCH          | -5.63                                           | Pass   |
|           | HCH          | -5.75                                           | Pass   |

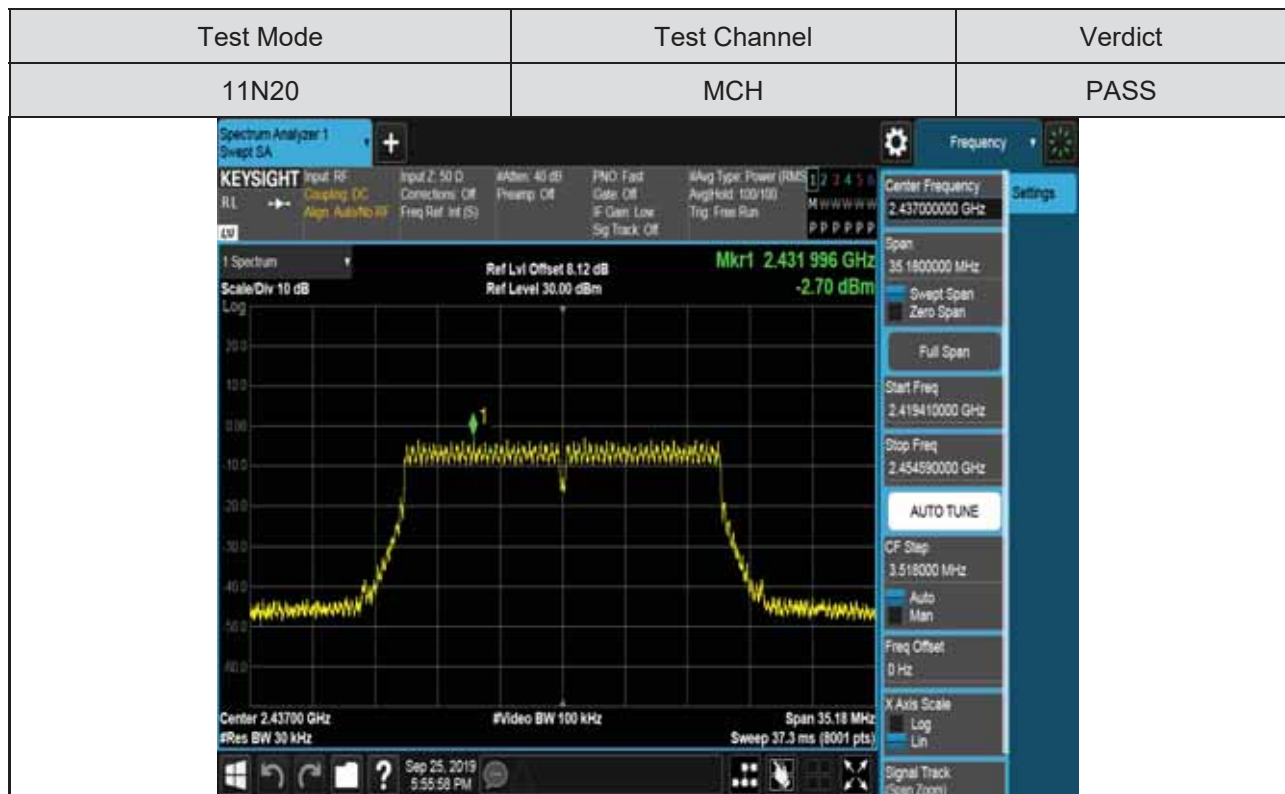
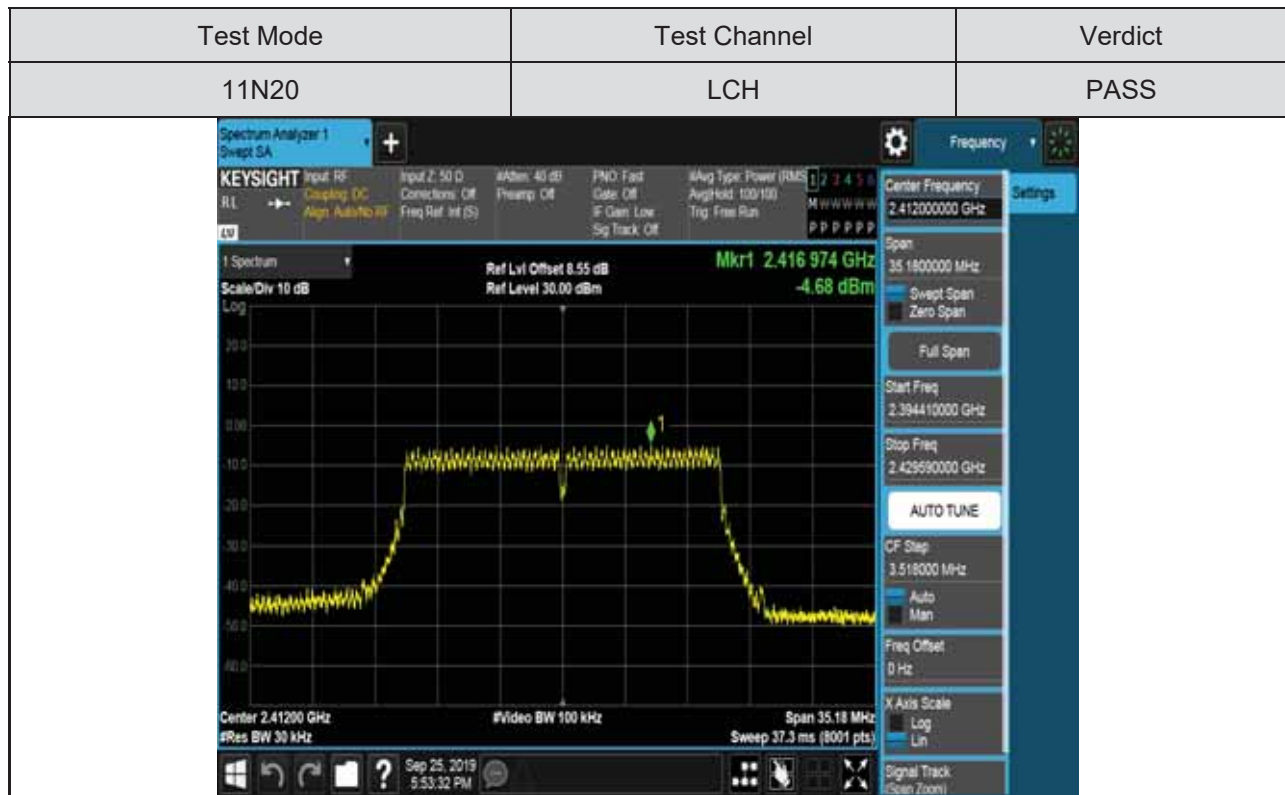


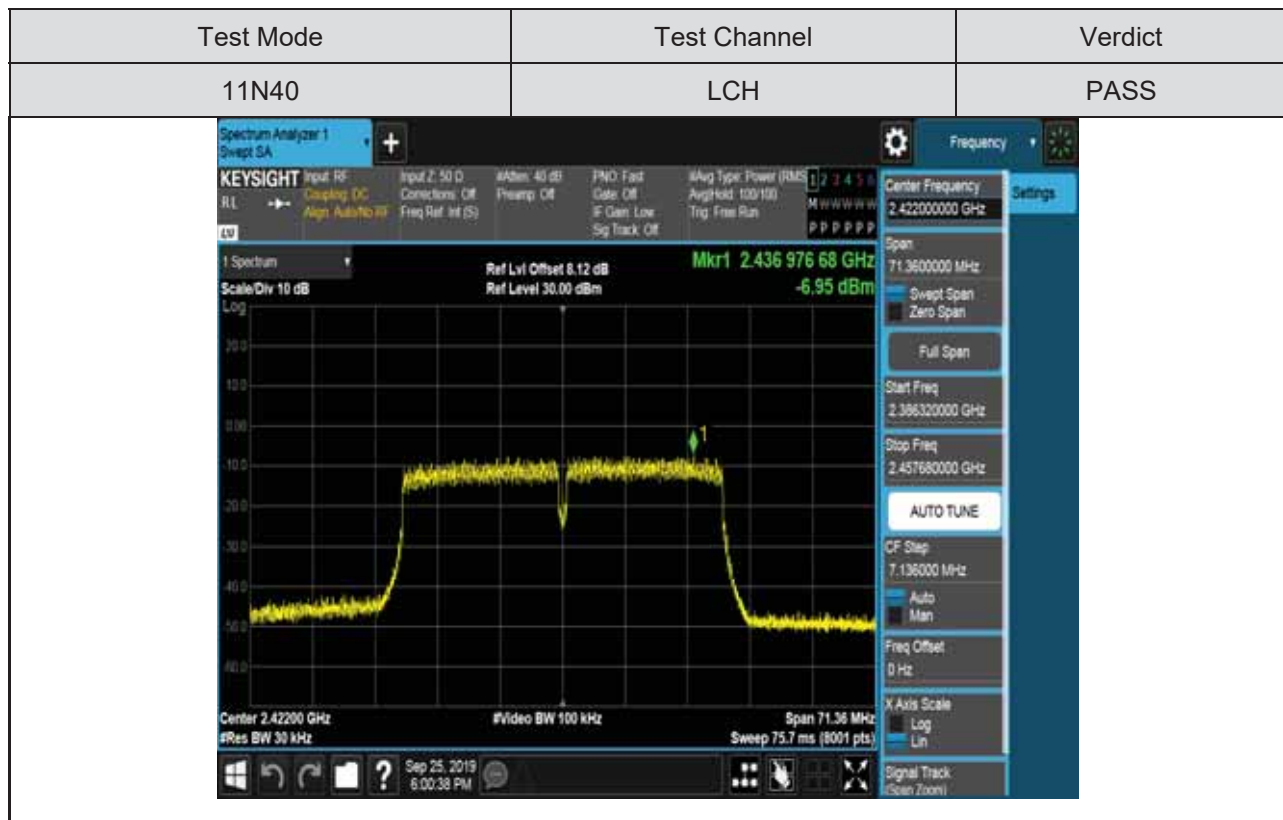
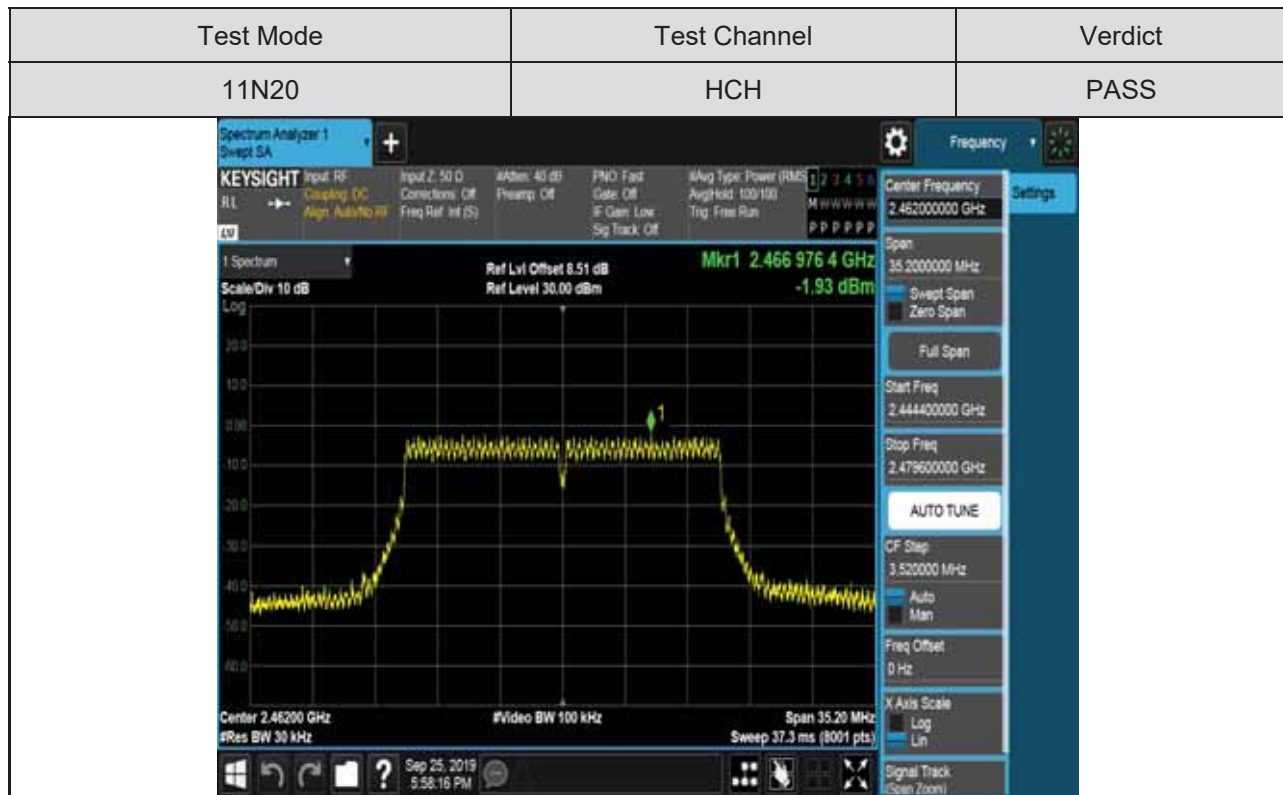
**Test Graphs:**

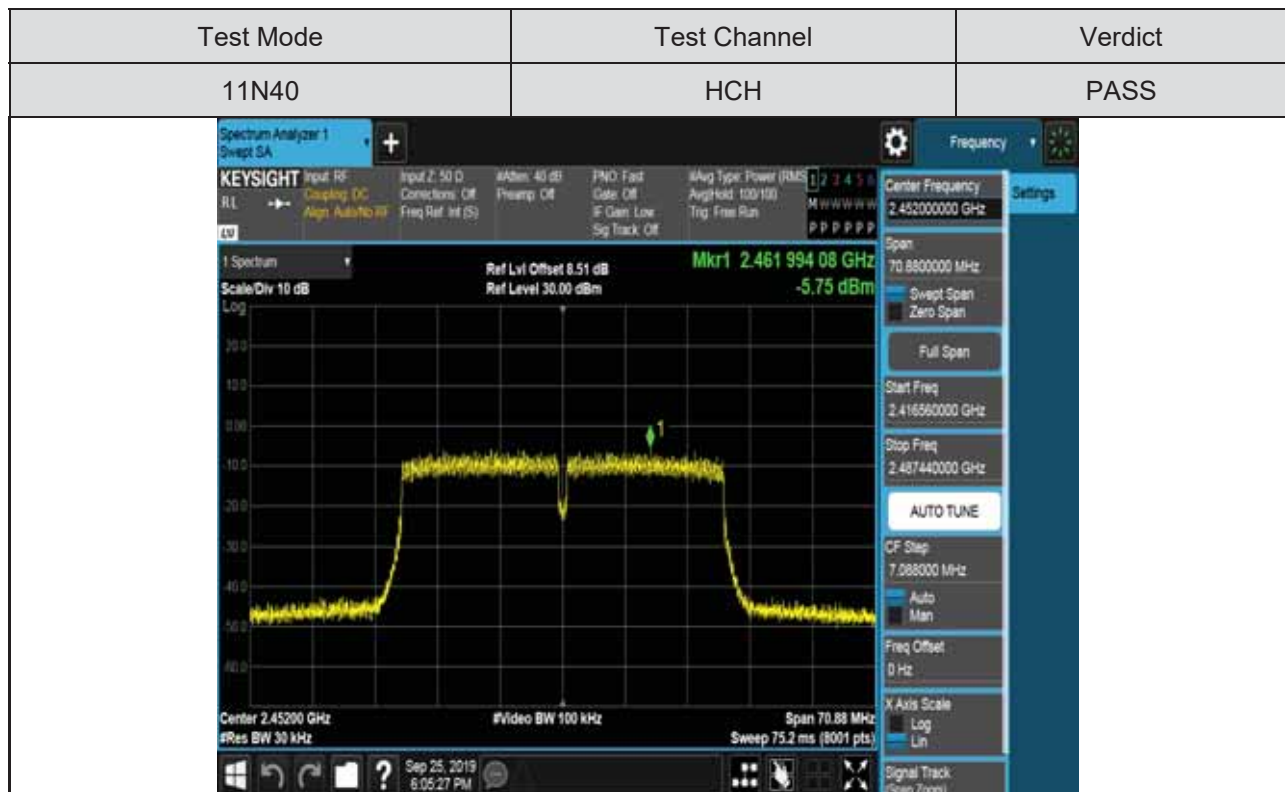
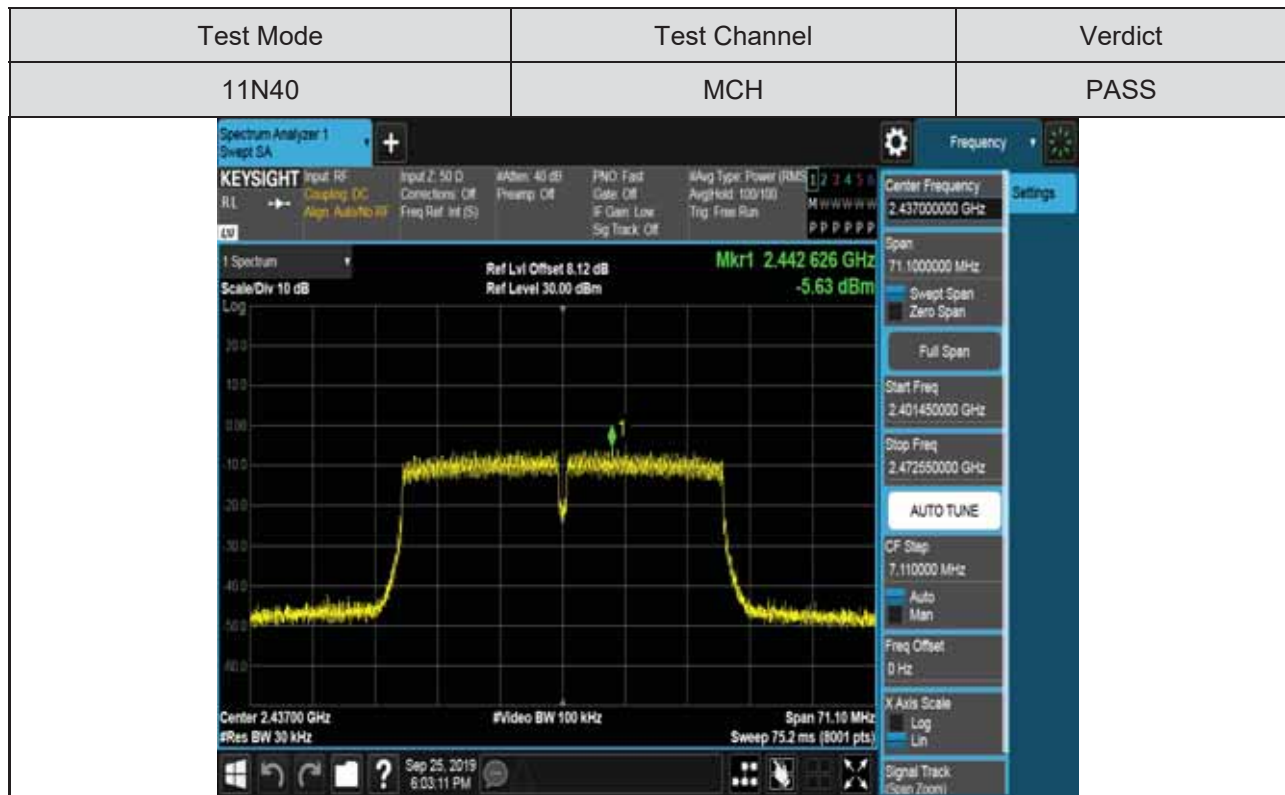














## 8.5. CONDUCTED BANDEGE AND SPURIOUS EMISSIONS

### LIMITS

| CFR 47 FCC Part15 (15.247) Subpart C<br>ISED RSS-247 ISSUE 2 |                                                 |                                                                                                                               |
|--------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Section                                                      | Test Item                                       | Limit                                                                                                                         |
| CFR 47 FCC §15.247 (d)<br>ISED RSS-247 5.5                   | Conducted<br>Bandedge and<br>Spurious Emissions | at least 20 dB below that in the 100 kHz<br>bandwidth within the band that contains<br>the 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              | $\geq 3 \times \text{RBW}$                     |
| Span             | 1.5 x DTS bandwidth                            |
| Trace            | Max hold                                       |
| Sweep time       | Auto couple.                                   |

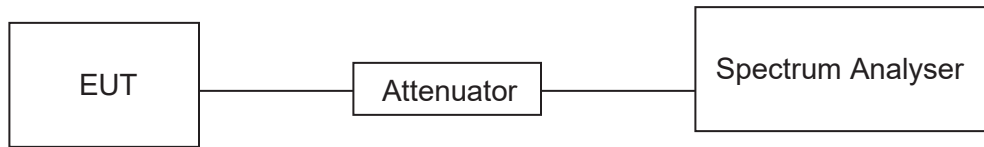
Use the peak marker function to determine the maximum PSD level.

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

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



### TEST SETUP



### TEST ENVIRONMENT

|                     |        |                   |             |
|---------------------|--------|-------------------|-------------|
| Temperature         | 20°C   | Relative Humidity | 56%         |
| Atmosphere Pressure | 101kPa | Test Voltage      | DC 3.7V * 4 |



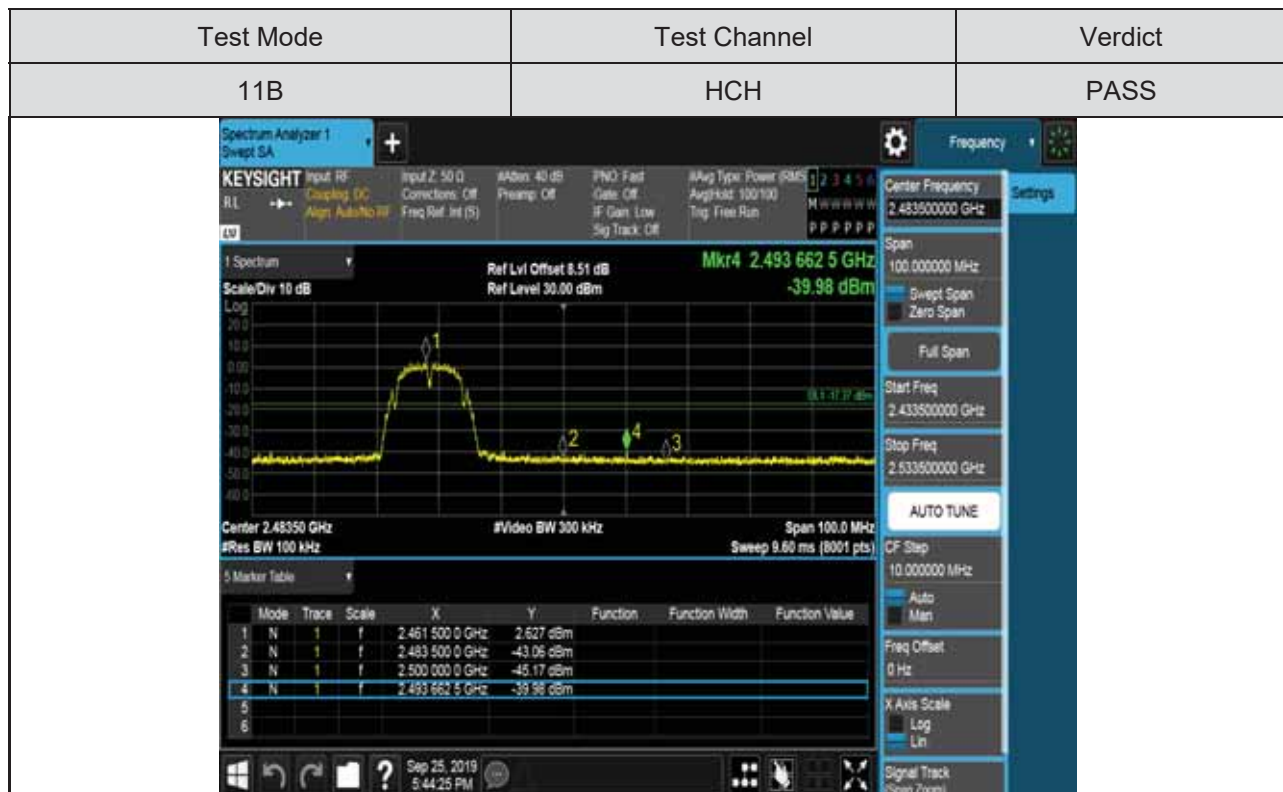
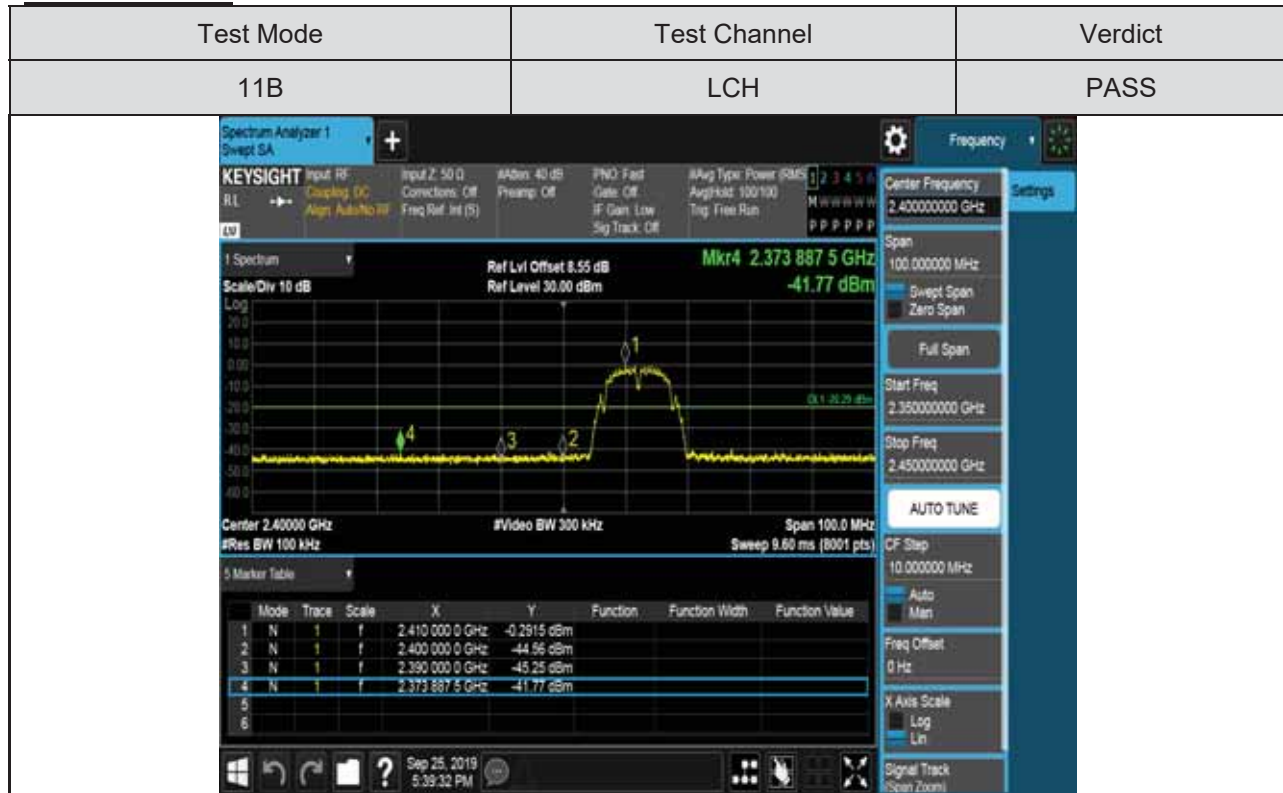
**Part I :Conducted Bandedge**

**RESULTS**

| Test Mode | Test Channel | Carrier Power [dBm] | Max. Spurious Level [dBm] | Limit [dBm] | Verdict |
|-----------|--------------|---------------------|---------------------------|-------------|---------|
| 11B       | LCH          | -0.2915             | -41.77                    | -20.29      | PASS    |
|           | MCH          | 2.627               | -39.98                    | -17.37      | PASS    |
| 11G       | HCH          | 0.3932              | -40.96                    | -19.61      | PASS    |
|           | LCH          | 2.642               | -40.29                    | -17.36      | PASS    |
| 11N20     | MCH          | 0.2909              | -40.10                    | -19.71      | PASS    |
|           | HCH          | 2.543               | -39.46                    | -17.46      | PASS    |
| 11N40     | LCH          | -1.694              | -38.64                    | -21.69      | PASS    |
|           | MCH          | -0.6744             | -39.34                    | -20.67      | PASS    |



## TEST GRAPHS











**Part II :Conducted Emission**

**Test Result Table**

| Test Mode | Channel | Pref(dBm) | Puw(dBm) | Verdict |
|-----------|---------|-----------|----------|---------|
| 11B       | LCH     | -0.36     | <Limit   | PASS    |
|           | MCH     | 1.24      | <Limit   | PASS    |
|           | HCH     | 2.53      | <Limit   | PASS    |
| 11G       | LCH     | 0.14      | <Limit   | PASS    |
|           | MCH     | 1.46      | <Limit   | PASS    |
|           | HCH     | 2.66      | <Limit   | PASS    |
| 11N20     | LCH     | 0.47      | <Limit   | PASS    |
|           | MCH     | 1.49      | <Limit   | PASS    |
|           | HCH     | 2.96      | <Limit   | PASS    |
| 11N40     | LCH     | -2.36     | <Limit   | PASS    |
|           | MCH     | -0.82     | <Limit   | PASS    |
|           | HCH     | -0.90     | <Limit   | PASS    |



## Test Plots

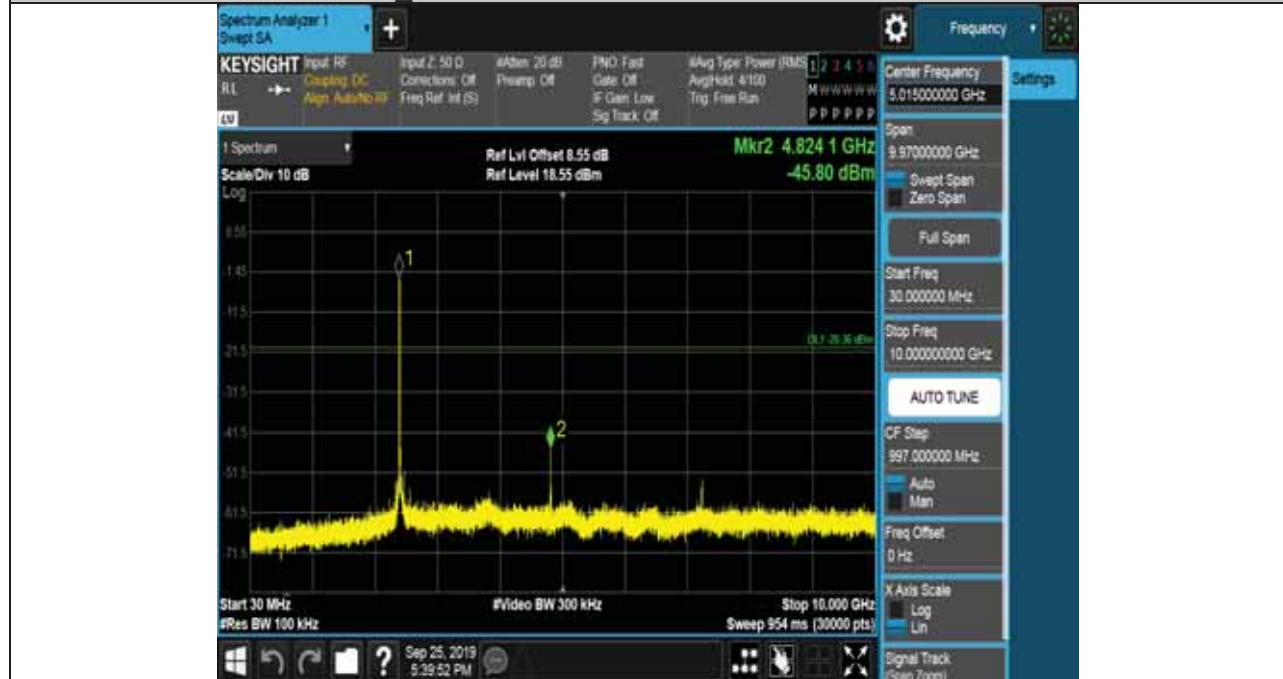
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11B       | LCH     | PASS    |

### Pref test Plot



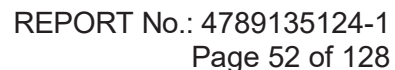
# Puw test Plot

## LCH SPURIOUS EMISSION 30MHz~10GHz



## LCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11B       | MCH     | PASS    |

### Pref test Plot

## MCH SPURIOUS EMISSION



Puw test Plot

MCH SPURIOUS EMISSION 30MHz~10GHz



MCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11B       | HCH     | PASS    |

### Pref test Plot

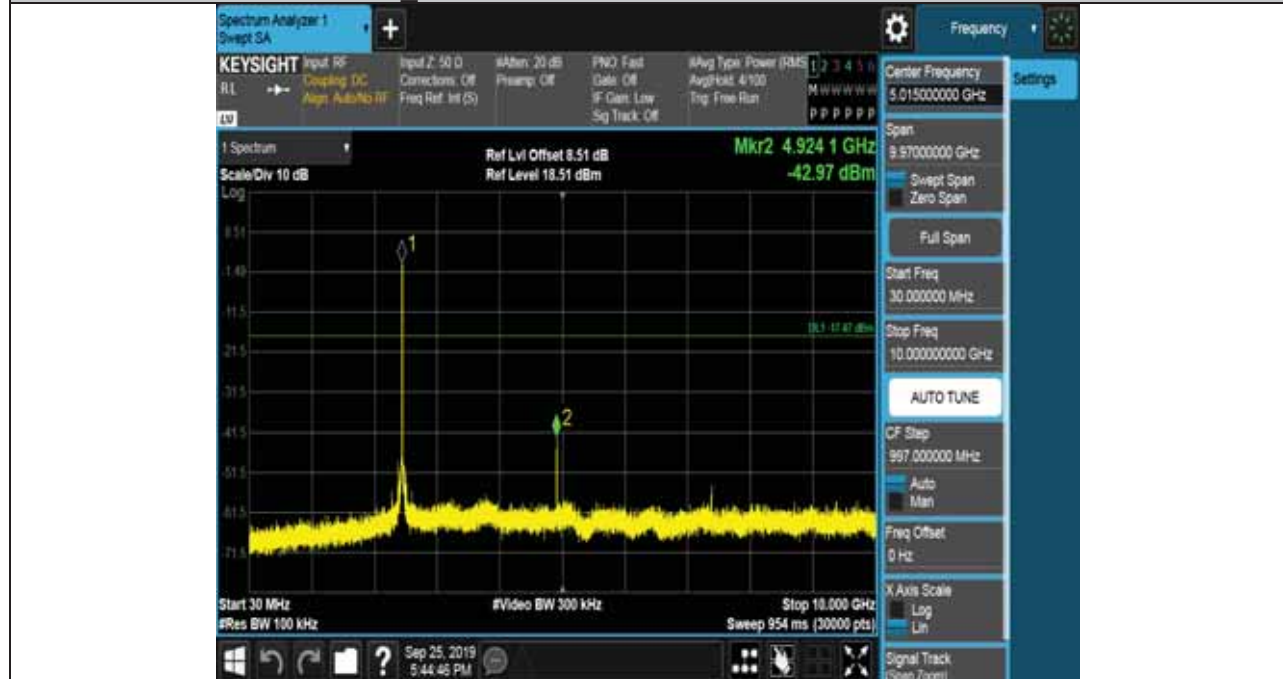
### HCH SPURIOUS EMISSION





Puw test Plot

HCH SPURIOUS EMISSION 30MHz~10GHz



HCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11G       | LCH     | PASS    |

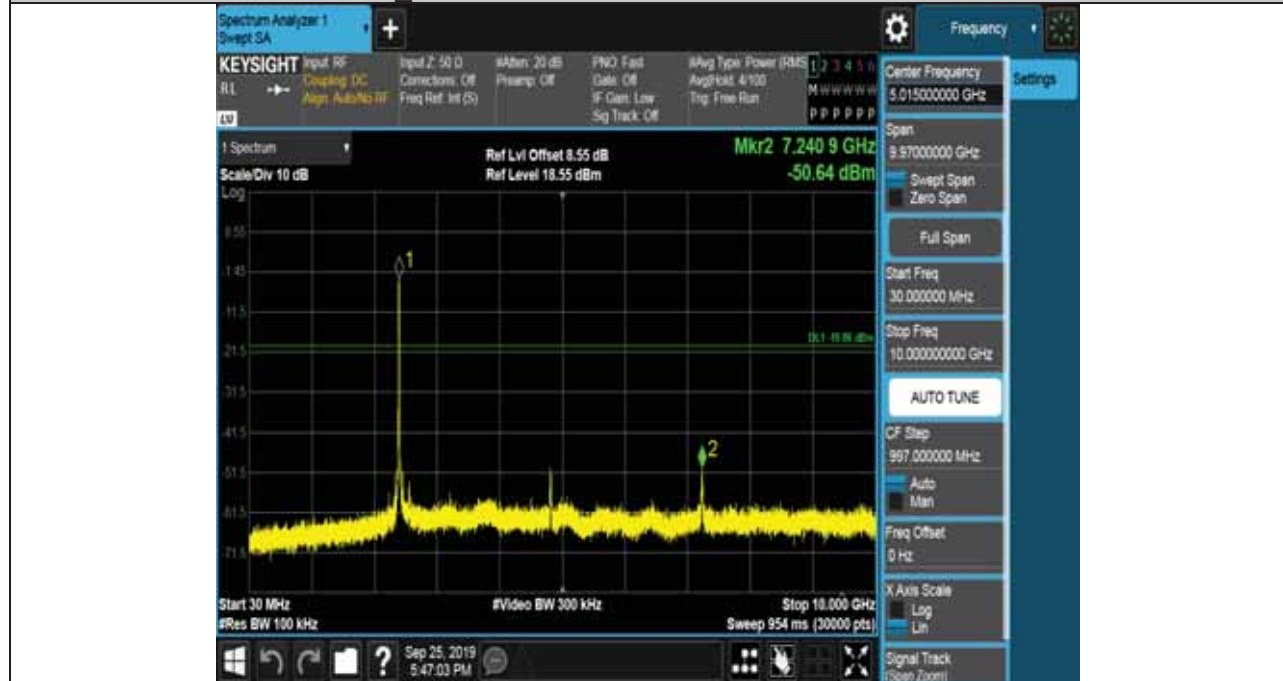
#### Pref test Plot

#### LCH SPURIOUS EMISSION



Puw test Plot

LCH SPURIOUS EMISSION 30MHz~10GHz



LCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11G       | MCH     | PASS    |

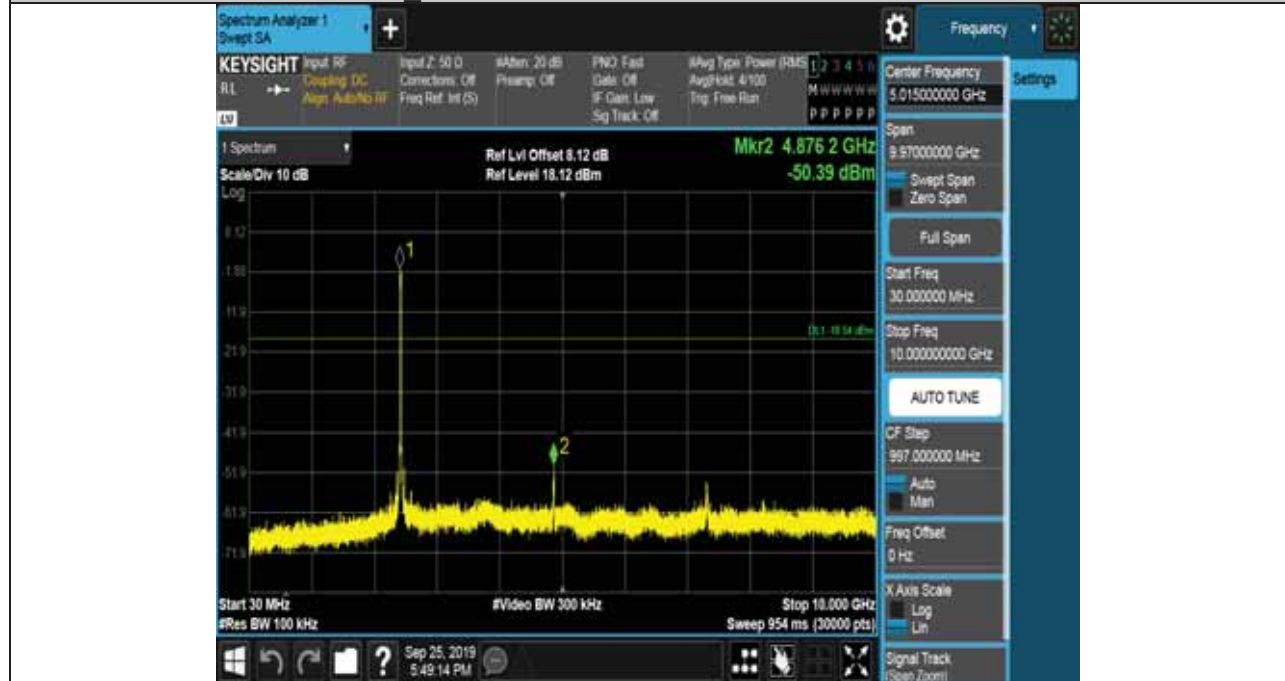
#### Pref test Plot

#### MCH SPURIOUS EMISSION



# Puw test Plot

## MCH SPURIOUS EMISSION 30MHz~10GHz



## MCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11G       | HCH     | PASS    |

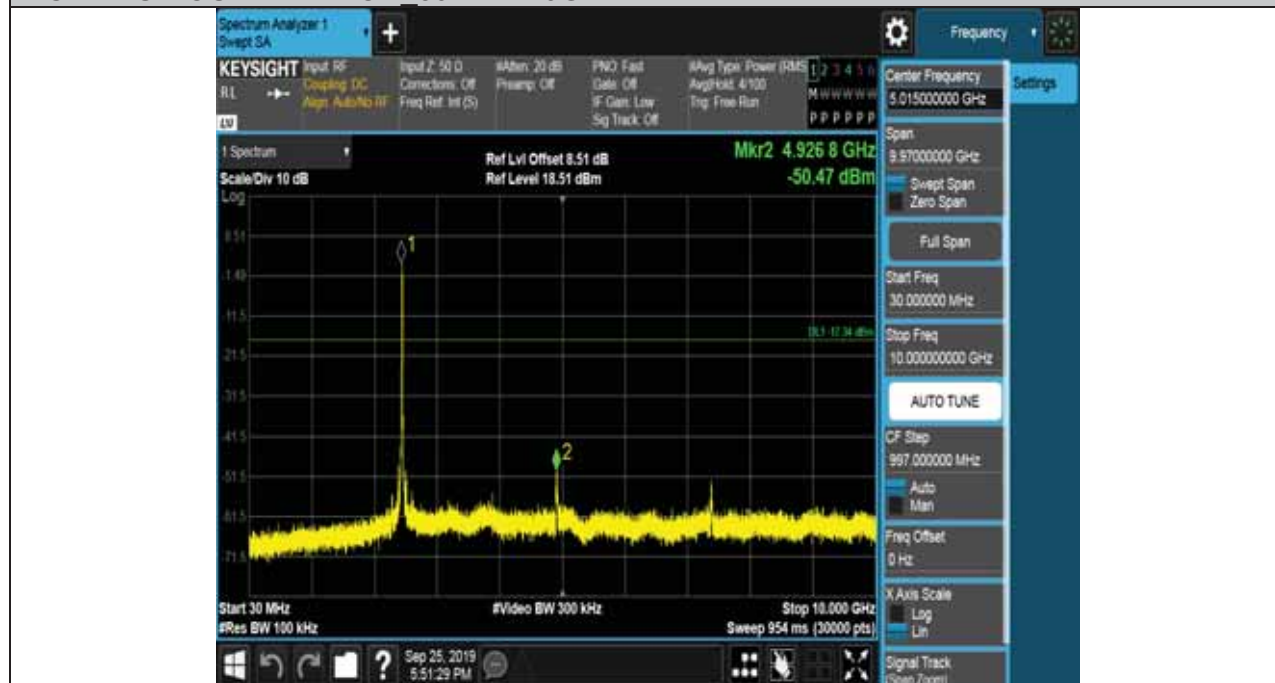
### Pref test Plot

#### HCH SPURIOUS EMISSION



# Puw test Plot

## HCH SPURIOUS EMISSION 30MHz~10GHz



## HCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N20     | LCH     | PASS    |

#### Pref test Plot

#### LCH SPURIOUS EMISSION



Puw test Plot

LCH SPURIOUS EMISSION 30MHz~10GHz



LCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N20     | MCH     | PASS    |

#### Pref test Plot

#### MCH SPURIOUS EMISSION



Puw test Plot

MCH SPURIOUS EMISSION 30MHz~10GHz



MCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N20     | HCH     | PASS    |

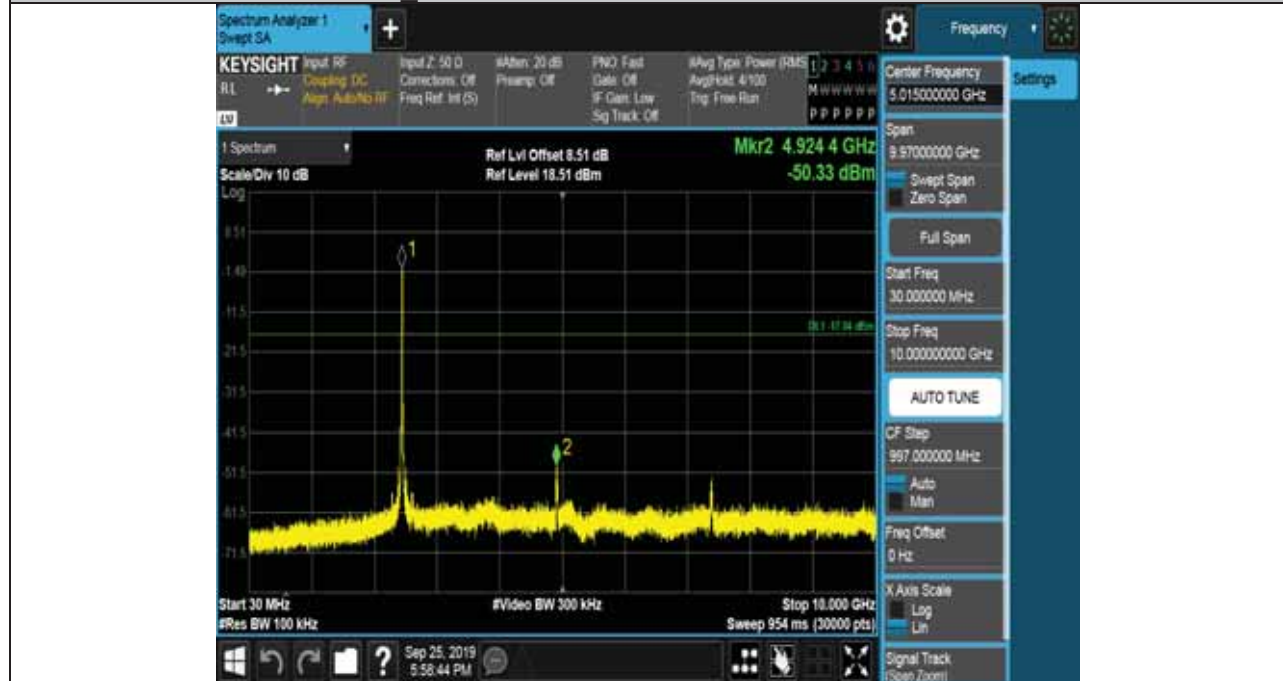
#### Pref test Plot

#### HCH SPURIOUS EMISSION



Puw test Plot

HCH SPURIOUS EMISSION 30MHz~10GHz



HCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N40     | LCH     | PASS    |

#### Pref test Plot

#### LCH SPURIOUS EMISSION



# Puw test Plot

## LCH SPURIOUS EMISSION 30MHz~10GHz



## LCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N40     | MCH     | PASS    |

### Pref test Plot

#### MCH SPURIOUS EMISSION



Puw test Plot

MCH SPURIOUS EMISSION 30MHz~10GHz



MCH SPURIOUS EMISSION 10GHz~26GHz





| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N40     | HCH     | PASS    |

#### Pref test Plot

#### HCH SPURIOUS EMISSION



# Puw test Plot

## HCH SPURIOUS EMISSION 30MHz~10GHz



## HCH SPURIOUS EMISSION 10GHz~26GHz





## 9. RADIATED TEST RESULTS

### LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209

Please refer to ISED RSS-GEN Clause 8.9 (Transmitter)

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

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

IC Restricted bands please refer to ISSED RSS-GEN Clause 8.10

FCC Restricted bands of operation:

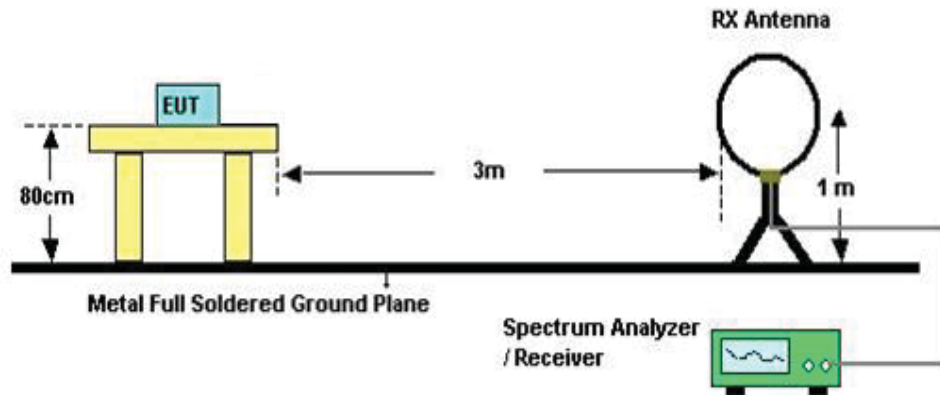
| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 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

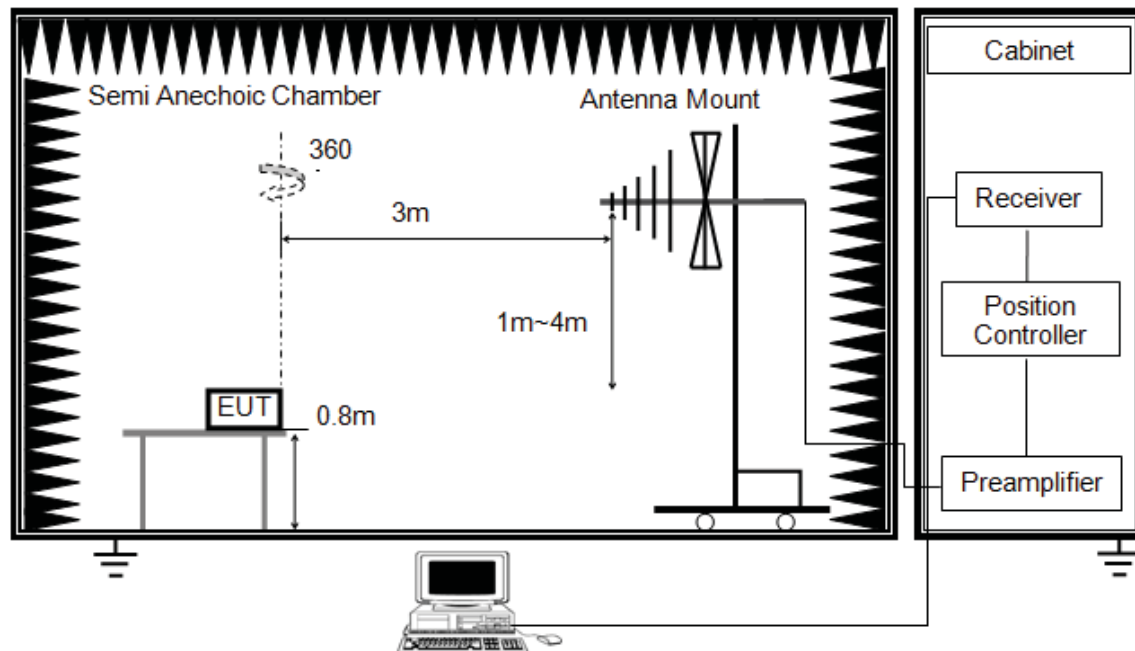


The setting of the spectrum analyzer

|          |                                                            |
|----------|------------------------------------------------------------|
| 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, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector
6. 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.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G

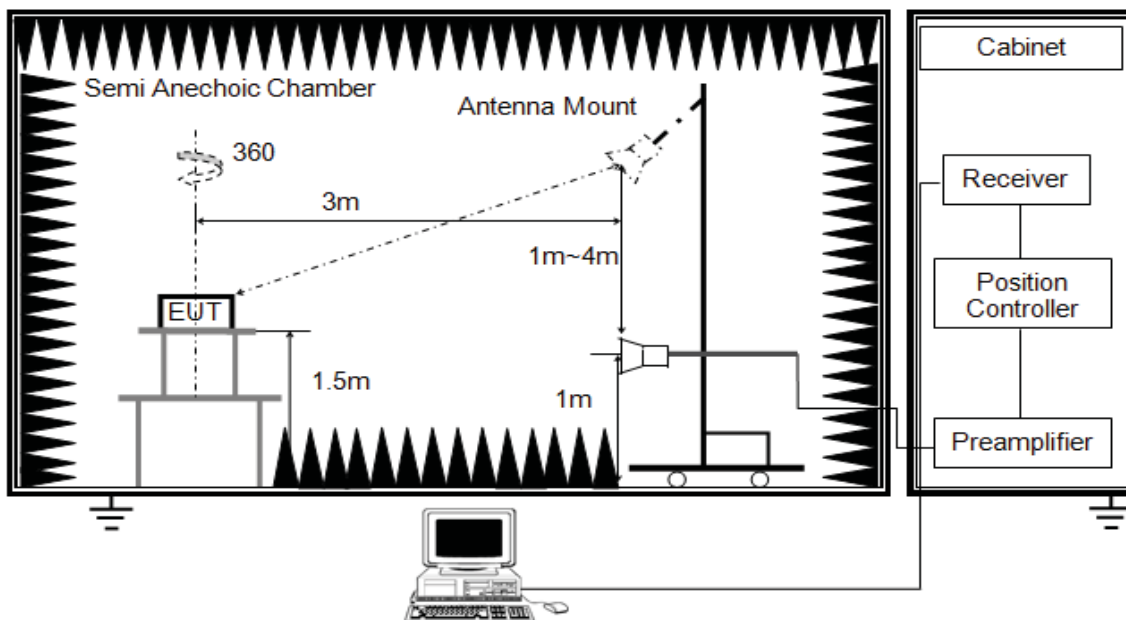


The setting of the spectrum analyser

|          |          |
|----------|----------|
| 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 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m 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

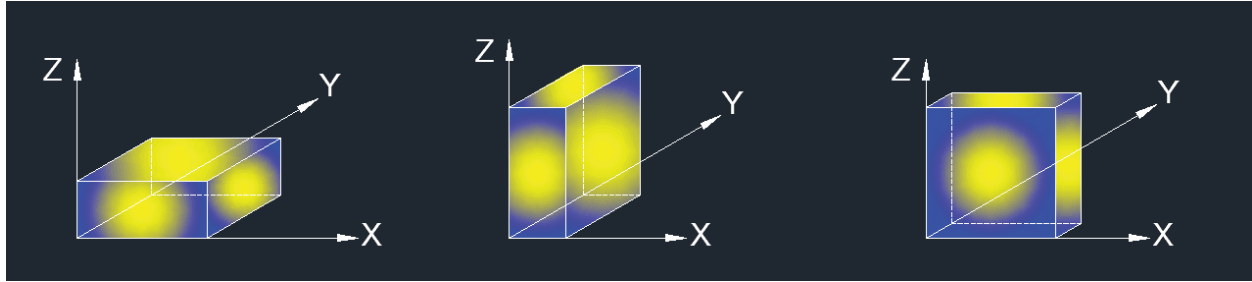


The setting of the spectrum analyser

|          |                             |
|----------|-----------------------------|
| 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 1.5m 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. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.
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:



Note : For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

#### **TEST ENVIRONMENT**

|                     |        |                   |             |
|---------------------|--------|-------------------|-------------|
| Temperature         | 20°C   | Relative Humidity | 56%         |
| Atmosphere Pressure | 101kPa | Test Voltage      | DC 3.7V * 4 |



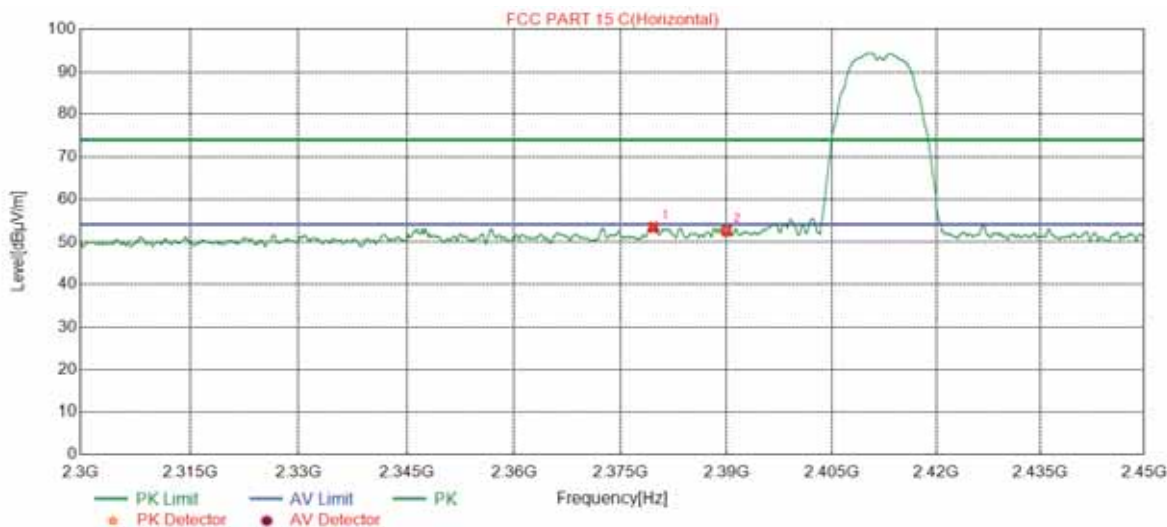
## 9.1. RESTRICTED BANDEDGE

Test Result Table

| Test Mode | Channel | Puw(dBm) | Verdict |
|-----------|---------|----------|---------|
| 11B       | LCH     | <Limit   | PASS    |
|           | MCH     | <Limit   | PASS    |
|           | HCH     | <Limit   | PASS    |
| 11G       | LCH     | <Limit   | PASS    |
|           | MCH     | <Limit   | PASS    |
|           | HCH     | <Limit   | PASS    |
| 11N20     | LCH     | <Limit   | PASS    |
|           | MCH     | <Limit   | PASS    |
|           | HCH     | <Limit   | PASS    |
| 11N40     | LCH     | <Limit   | PASS    |
|           | MCH     | <Limit   | PASS    |
|           | HCH     | <Limit   | PASS    |

### 9.1.1. 802.11b MODE

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

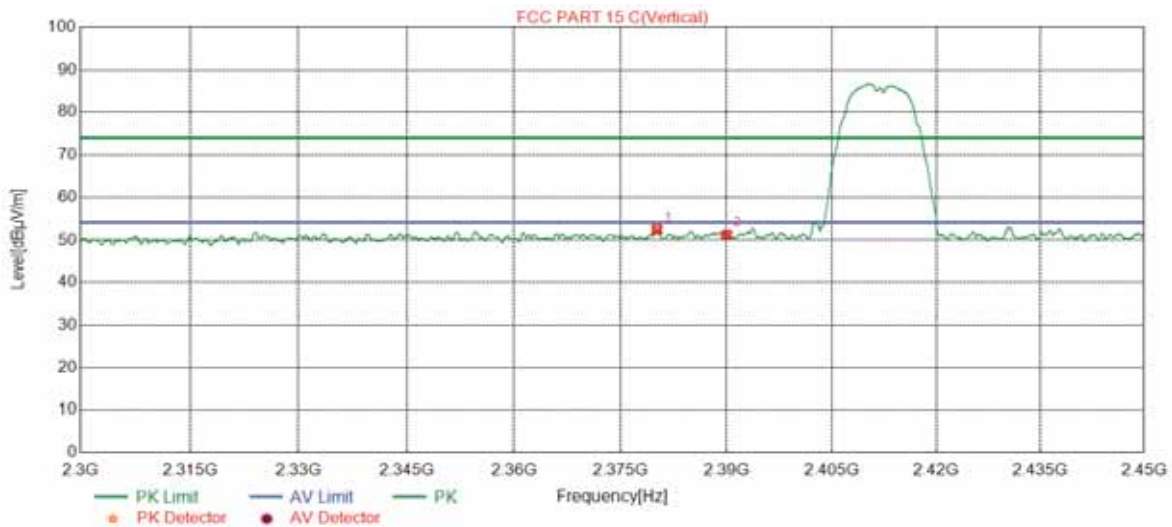


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark |
|-----|-----------|---------------|----------------|----------|----------|--------|--------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |        |
| 1   | 2379.6412 | 39.41         | 14.01          | 53.42    | 74.00    | -20.58 | peak   |
| 2   | 2390.0000 | 38.51         | 14.09          | 52.60    | 74.00    | -21.40 | peak   |

- Note:
1. Measurement = Reading Level + Correct Factor.
  2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
  3. Peak: Peak detector.
  4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

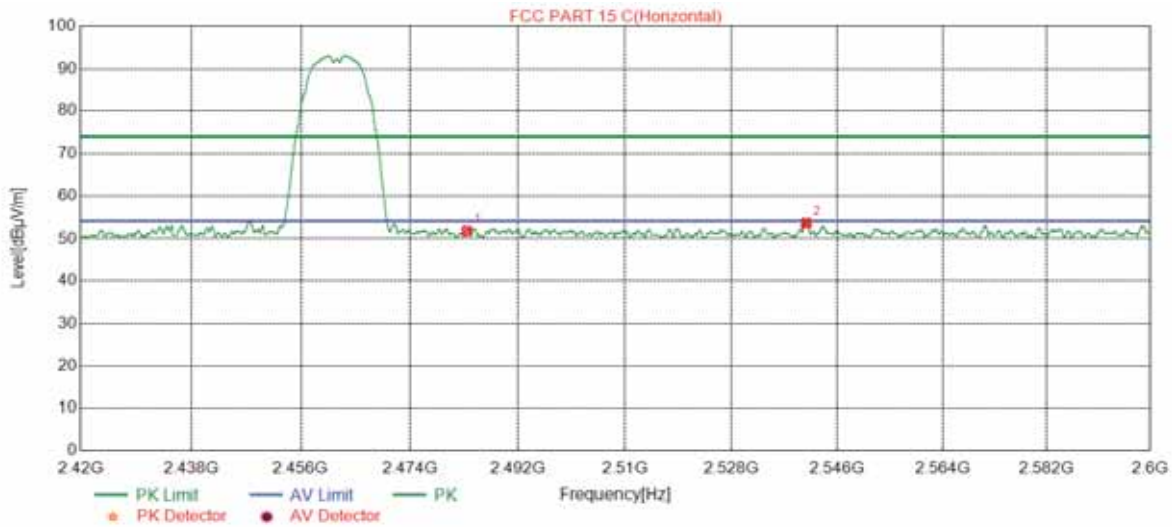


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark |
|-----|-----------|---------------|----------------|----------|----------|--------|--------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |        |
| 1   | 2380.1288 | 38.40         | 14.02          | 52.42    | 74.00    | -21.58 | peak   |
| 2   | 2390.0000 | 37.18         | 14.09          | 51.27    | 74.00    | -22.73 | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

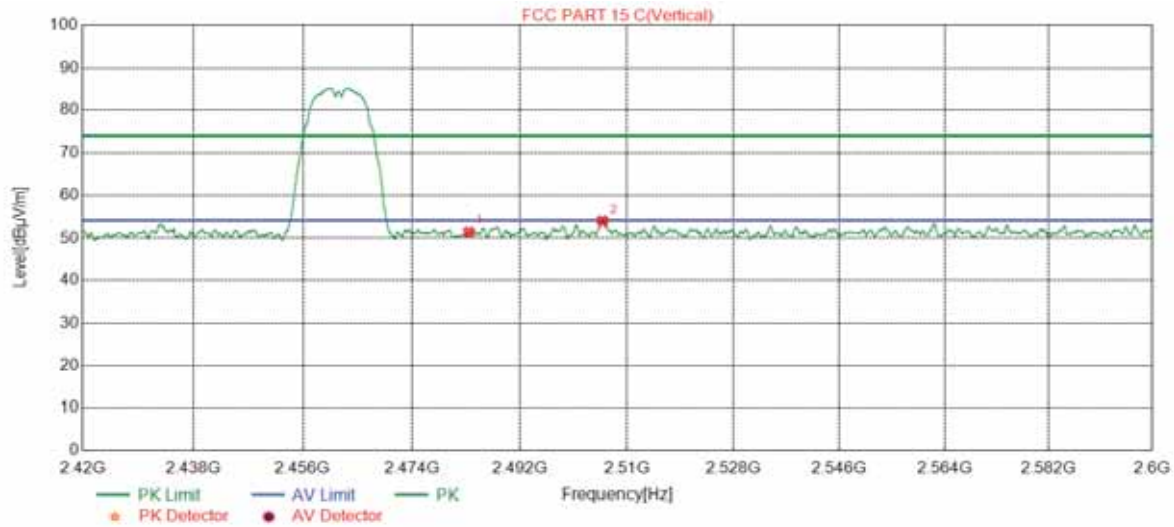


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark |
|-----|-----------|---------------|----------------|----------|----------|--------|--------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |        |
| 1   | 2483.5000 | 37.86         | 13.88          | 51.74    | 74.00    | -22.26 | peak   |
| 2   | 2540.6661 | 39.30         | 14.30          | 53.60    | 74.00    | -20.40 | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

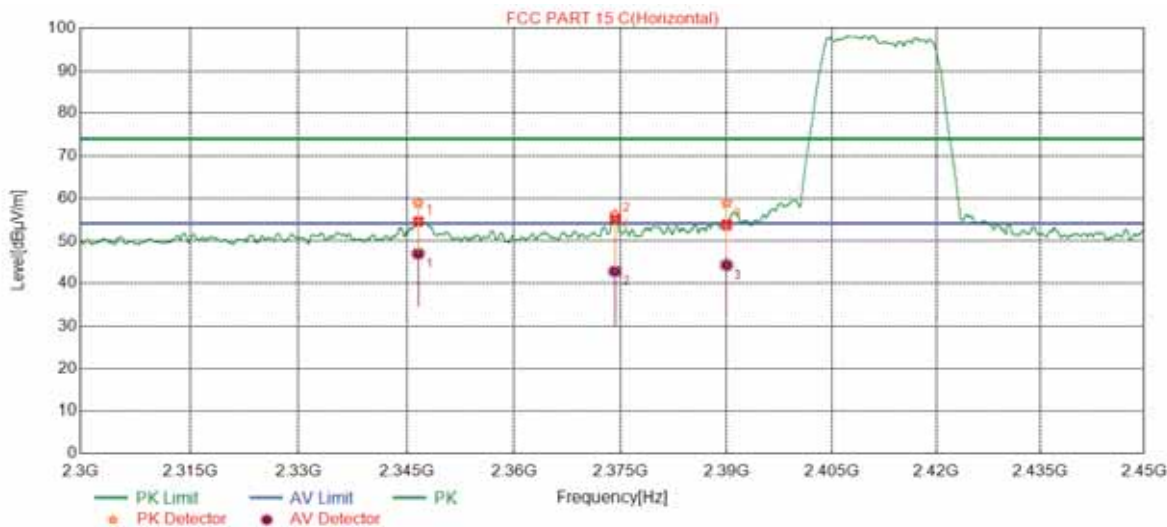


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark |
|-----|-----------|---------------|----------------|----------|----------|--------|--------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |        |
| 1   | 2483.5000 | 37.55         | 13.88          | 51.43    | 74.00    | -22.57 | peak   |
| 2   | 2505.8686 | 39.76         | 14.15          | 53.91    | 74.00    | -20.09 | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### 9.1.2. 802.11g MODE

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

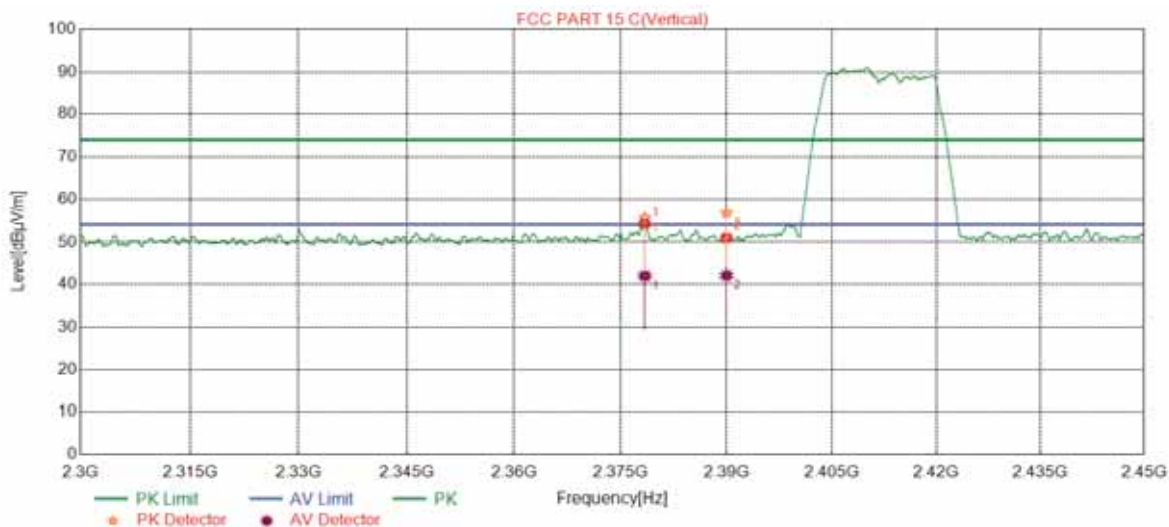


| No. | Frequency<br>(MHz) | Reading<br>Level<br>(dBuV/m) | Correct<br>Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|-----|--------------------|------------------------------|---------------------------|--------------------|-------------------|----------------|---------|
| 1   | 2346.5935          | 45.19                        | 13.65                     | 58.84              | 74.00             | -15.16         | peak    |
|     |                    | 33.36                        | 13.65                     | 47.01              | 54.00             | -6.99          | average |
| 2   | 2374.1782          | 42.20                        | 13.93                     | 56.13              | 74.00             | -17.87         | peak    |
|     |                    | 28.92                        | 13.93                     | 42.85              | 54.00             | -11.15         | average |
| 3   | 2390.0000          | 44.75                        | 14.09                     | 58.84              | 74.00             | -15.16         | peak    |
|     |                    | 30.21                        | 14.09                     | 44.30              | 54.00             | -9.70          | average |

- Note: 1. Measurement = Reading Level + Correct Factor.  
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Peak: Peak detector.  
 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

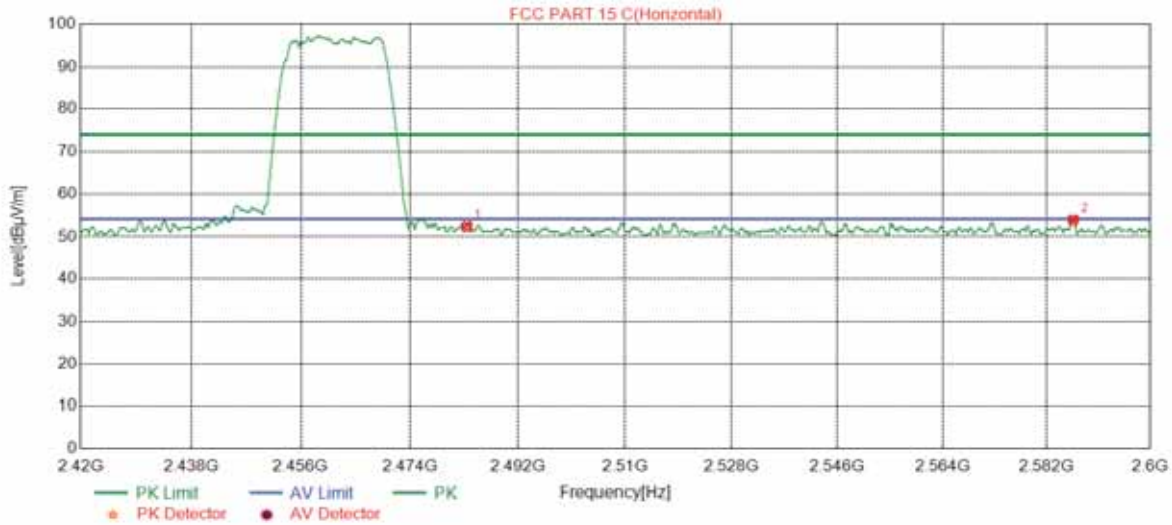


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark  |
|-----|-----------|---------------|----------------|----------|----------|--------|---------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |         |
| 1   | 2378.4232 | 41.63         | 13.97          | 55.60    | 74.00    | -18.40 | peak    |
|     |           | 28.01         | 13.97          | 41.98    | 54.00    | -12.02 | average |
| 2   | 2390.0000 | 42.68         | 14.09          | 56.77    | 74.00    | -17.23 | peak    |
|     |           | 27.97         | 14.09          | 42.06    | 54.00    | -11.94 | average |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

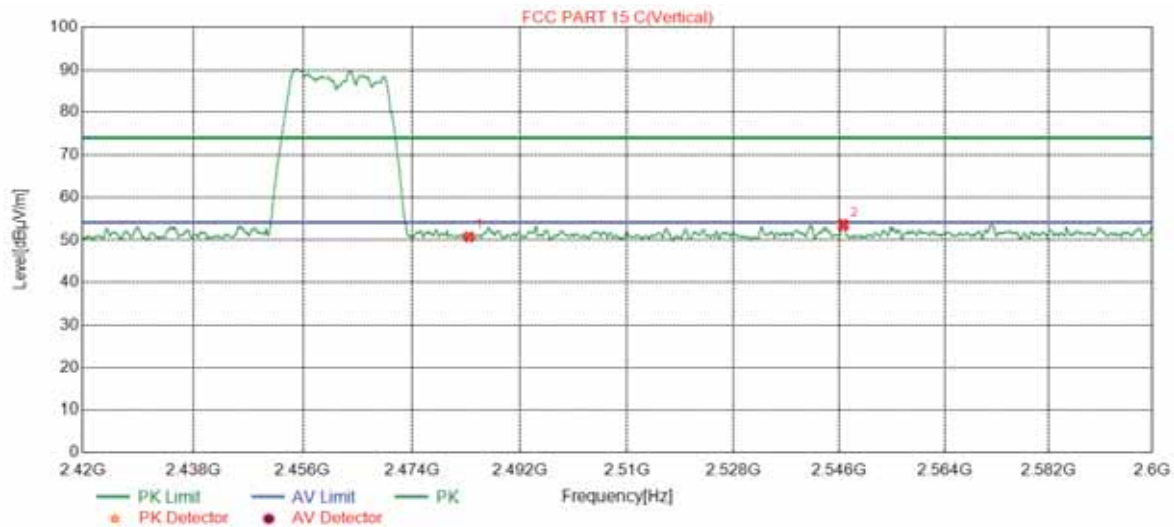


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark |
|-----|-----------|---------------|----------------|----------|----------|--------|--------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |        |
| 1   | 2483.5000 | 38.42         | 13.88          | 52.30    | 74.00    | -21.70 | peak   |
| 2   | 2586.5707 | 39.37         | 14.47          | 53.84    | 74.00    | -20.16 | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

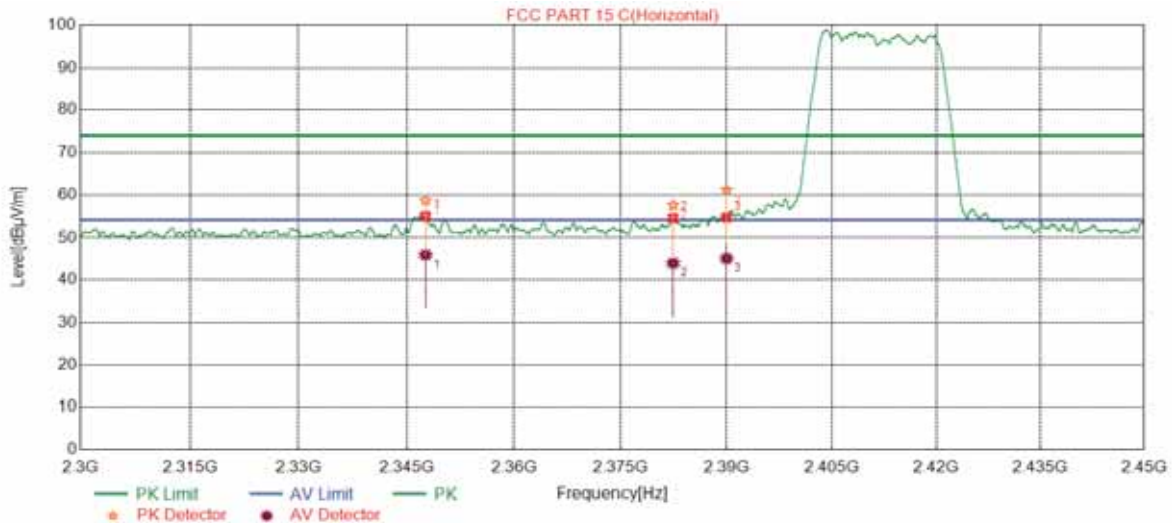


| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark |
|-----|-----------|---------------|----------------|----------|----------|--------|--------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |        |
| 1   | 2483.5000 | 36.90         | 13.88          | 50.78    | 74.00    | -23.22 | peak   |
| 2   | 2546.6607 | 39.17         | 14.37          | 53.54    | 74.00    | -20.46 | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### 9.1.3. 802.11n HT20 MODE

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



| No. | Frequency | Reading Level | Correct Factor | Result   | Limit    | Margin | Remark  |
|-----|-----------|---------------|----------------|----------|----------|--------|---------|
|     | (MHz)     | (dBuV/m)      | (dB)           | (dBuV/m) | (dBuV/m) | (dB)   |         |
| 1   | 2347.6348 | 45.03         | 13.67          | 58.70    | 74.00    | -15.30 | peak    |
|     |           | 32.25         | 13.67          | 45.92    | 54.00    | -8.08  | average |
| 2   | 2382.4204 | 43.47         | 14.07          | 57.54    | 74.00    | -16.46 | peak    |
|     |           | 29.86         | 14.07          | 43.93    | 54.00    | -10.07 | average |
| 3   | 2390.0000 | 47.09         | 14.09          | 61.18    | 74.00    | -12.82 | peak    |
|     |           | 30.97         | 14.09          | 45.06    | 54.00    | -8.94  | average |

- Note:
1. Measurement = Reading Level + Correct Factor.
  2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
  3. Peak: Peak detector.
  4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.