



# Shenzhen General Testing & Inspection Technology Co.,Ltd.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel: +86-755- 27521059 Fax: +86-755- 27521011 Http://www.sz-ctc.com.cn

## TEST REPORT

**Report No.** .....: **GTI20181839F**

**FCC ID**.....: **2AHVH586586A1**

**Applicant**.....: **Shen Zhen MTC Co.,LTD**

**Address**.....: MTC Industry Park, 1st Lilang Road, Xialilang community, Nanwan street, Longgang district, Shenzhen, China

**Manufacturer**.....: Shen Zhen MTC Co.,LTD

**Address**.....: MTC Industry Park, 1st Lilang Road, Xialilang community, Nanwan street, Longgang district, Shenzhen, China

**Product Name**.....: **LED TV**

**Trade Mark**.....: AMTC,WESTINGHOUSE

**Model/Type reference**.....: MUAUV5801-6586A

**Listed Model(s)** .....: MUAUV58\*\*-6586A(\* can from 0 to 9, A to Z), WE58UL4218, WE58UB4108

**Standard**.....: **FCC CFR Title 47 Part 15 Subpart C Section 15.247**

**Date of receipt of test sample**...: 2018-09-15

**Date of testing**.....: 2018-09-16 to 2018-09-21

**Date of issue**.....: 2018-09-22

**Result**.....: **PASS**

Compiled by:

(Printed name+signature) Torny Fang

Supervised by:

( Printed name+signature) Cary Luo

Approved by:

( Printed name+signature) Walter Chen

**Testing Laboratory Name**..... **Shenzhen General Testing & Inspection Technology Co.,Ltd.**

**Address**..... 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park,  
Shenzhen, Guangdong, China

This test report may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by GTI. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver.

Any objections must be raised to GTI within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.

## Table of Contents

Page

|   |           |
|---|-----------|
| <b>1. TEST SUMMARY .....</b>                      | <b>3</b>  |
| 1.1. TEST STANDARDS.....                          | 3         |
| 1.2. REPORT VERSION.....                          | 3         |
| 1.3. TEST DESCRIPTION.....                        | 4         |
| 1.4. TEST FACILITY .....                          | 5         |
| 1.5. MEASUREMENT UNCERTAINTY .....                | 5         |
| 1.6. ENVIRONMENTAL CONDITIONS .....               | 6         |
| <b>2. GENERAL INFORMATION .....</b>               | <b>7</b>  |
| 2.1. CLIENT INFORMATION .....                     | 7         |
| 2.2. GENERAL DESCRIPTION OF EUT .....             | 8         |
| 2.3. OPERATION STATE.....                         | 9         |
| 2.4. MEASUREMENT INSTRUMENTS LIST .....           | 10        |
| <b>3. TEST ITEM AND RESULTS .....</b>             | <b>12</b> |
| 3.1. CONDUCTED EMISSION.....                      | 12        |
| 3.2. RADIATED EMISSION .....                      | 15        |
| 3.3. BAND EDGE EMISSIONS .....                    | 21        |
| 3.4. BANDWIDTH.....                               | 27        |
| 3.5. MAXIMUM PEAK CONDUCTED OUTPUT POWER.....     | 28        |
| 3.6. POWER SPECTRAL DENSITY .....                 | 29        |
| 3.7. ANTENNA REQUIREMENT .....                    | 30        |
| <b>4. EUT TEST PHOTOS .....</b>                   | <b>31</b> |
| <b>5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL .....</b> | <b>32</b> |

# 1. TEST SUMMARY

## 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

## 1.2. Report version

| Revised No. | Date of issue | Description |
|-------------|---------------|-------------|
| 01          | 2018-09-22    | Original    |
|             |               |             |
|             |               |             |
|             |               |             |

### 1.3. Test Description

| FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 2 |                  |        |               |
|--|------------------|--------|---------------|
| Test Item                                      | Standard Section | Result | Test Engineer |
|  | FCC              |        |               |
| Antenna Requirement                            | 15.203           | Pass   | Yung HE       |
| Conducted Emission                             | 15.207           | Pass   | Yung HE       |
| Restricted Bands                               | 15.205           | Pass   | Yung HE       |
| 6dB Bandwidth                                  | 15.247(a)(2)     | Pass   | Yung HE       |
| Peak Output Power                              | 15.247(b)        | Pass   | Yung HE       |
| Power Spectral Density                         | 15.247(e)        | Pass   | Yung HE       |
| Band Edge                                      | 15.247(d)        | Pass   | Yung HE       |
| Transmitter Radiated Spurious Emission         | 15.247(d)&15.209 | Pass   | Yung HE       |

Note: The measurement uncertainty is not included in the test result.

## 1.4. Test Facility

### Address of the report laboratory

#### Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

### Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

#### CNAS-Lab Code: L5365

Shenzhen General Testing & Inspection Technology Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No.: 4340.01

Shenzhen General Testing & Inspection Technology Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### IC Registration No.: 9783A

The 3m alternate test site of Shenzhen General Testing & Inspection Technology Co.,Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

#### FCC-Registration No.: 951311

Shenzhen General Testing & Inspection Technology Co.,Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug 26, 2017

## 1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen General Testing & Inspection Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for Shenzhen General Testing & Inspection Technology Co., Ltd.

| Test Items                              | Measurement Uncertainty | Notes |
|---|-------------------------|-------|
| Transmitter power conducted             | 0.42 dB                 | (1)   |
| Transmitter power Radiated              | 2.14 dB                 | (1)   |
| Conducted spurious emissions 9kHz~40GHz | 1.60 dB                 | (1)   |
| Radiated spurious emissions 9kHz~40GHz  | 2.20 dB                 | (1)   |
| Conducted Emissions 9kHz~30MHz          | 3.20 dB                 | (1)   |
| Radiated Emissions 30~1000MHz           | 4.70 dB                 | (1)   |
| Radiated Emissions 1~18GHz              | 5.00 dB                 | (1)   |
| Radiated Emissions 18~40GHz             | 5.54 dB                 | (1)   |
| Occupied Bandwidth                      | -----                   | (1)   |

**Note (1):** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

### 1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

|                    |             |
|--------------------|-------------|
| Temperature:       | 15~35°C     |
| Relative Humidity: | 30~60 %     |
| Air Pressure:      | 950~1050mba |

## 2. GENERAL INFORMATION

### 2.1. Client Information

|               |  |
|---------------|--|
| Applicant:    | Shen Zhen MTC Co.,LTD  |
| Address:      | MTC Industry Park, 1st Lilang Road, Xialilang community, Nanwan street, Longgang district, Shenzhen, China |
| Manufacturer: | Shen Zhen MTC Co.,LTD  |
| Address:      | MTC Industry Park, 1st Lilang Road, Xialilang community, Nanwan street, Longgang district, Shenzhen, China |

## 2.2. General Description of EUT

|                       |  |
|-----------------------|--|
| Product Name:         | LED TV   |
| Model/Type reference: | MUAV5801-6586A   |
| Marketing Name:       | AMTC,ELEMENT, WESTINGHOUSE   |
| Listed Model(s):      | MUAV58**-6586A(* can from 0 to 9, A to Z), WE58UL4218,WE58UB4108   |
| Model Difference:     | All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name, appearance and trade mark. |
| Power supply:         | AC120V 150W 60Hz   |
| Hardware version:     | W2HM2001_V1.0  |
| Software version:     | JEDI.L0.MP1.mt7603u.v1.13.m.0.3  |
| <b>WIFI</b>           |  |
| Modulation:           | 802.11b: DSSS(CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM(BPSK,QPSK,16QAM,64QAM)   |
| Operation frequency:  | 802.11b/g/n(HT20): 2412MHz~2462MHz<br>802.11n(HT40): 2422MHz~2452MHz   |
| Channel number:       | 802.11b/g/n(HT20):11 channels<br>802.11n(HT40):7 channels  |
| Channel separation:   | 5MHz   |
| Antenna type:         | Internal Metal Antenna   |
| Antenna gain 1:       | 1.21dBi  |
| Antenna gain 2:       | 1.21dBi  |



### 2.3. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

| Channel | Frequency (MHz) |
|---------|-----------------|
| 00      | 2412            |
| 01      | 2417            |
| 02      | 2422            |
| 03      | 2427            |
| 04      | 2432            |
| 05      | 2437            |
| 06      | 2442            |
| 07      | 2447            |
| 08      | 2452            |
| 09      | 2457            |
| 10      | 2462            |

Note: CH 00~CH 10 for 802.11b/g/n(HT20).

CH 02~CH 8 for 802.11b/g/n(HT40).

Test mode

|   |
|---|
| For RF test items   |
| The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).   |
| For AC power line conducted emissions:  |
| The EUT was set to connect with the WLAN AP under large package sizes transmission.   |
| For Radiated spurious emissions test item:  |
| The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report. |

## 2.4. Measurement Instruments List

| Tonscend JS0806-2 Test system |                                     |                 |           |            |                 |                  |
|-------------------------------|-------------------------------------|-----------------|-----------|------------|-----------------|------------------|
| Item                          | Test Equipment                      | Manufacturer    | Model No. | Serial No. | Calibrated Date | Calibrated until |
| 1                             | Spectrum Analyzer                   | Rohde & Schwarz | FSU26     | 100105     | Jan. 07, 2017   | Jan. 04 2019     |
| 2                             | Spectrum Analyzer                   | Rohde & Schwarz | FUV40-N   | 101331     | Jan. 07, 2017   | Jan. 04 2019     |
| 3                             | MXG Vector Signal Generator         | Agilent         | N5182A    | MY47420864 | Jan. 07, 2017   | Jan. 04 2019     |
| 4                             | Signal Generator                    | Agilent         | E8257D    | MY46521908 | Jan. 07, 2017   | Jan. 04 2019     |
| 5                             | Power Sensor                        | Agilent         | U2021XA   | MY5365004  | Jan. 07, 2017   | Jan. 04 2019     |
| 6                             | Power Sensor                        | Agilent         | U2021XA   | MY5365006  | Jan. 07, 2017   | Jan. 04 2019     |
| 7                             | Simultaneous Sampling DAQ           | Agilent         | U2531A    | TW54493510 | Jan. 07, 2017   | Jan. 04 2019     |
| 8                             | Climate Chamber                     | TABAI           | PR-4G     | A8708055   | Jan. 07, 2017   | Jan. 04 2019     |
| 9                             | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500    | 116410     | Jan. 06, 2018   | Jan. 04,2019     |
| 10                            | Climate Chamber                     | ESPEC           | MT3065    | /          | Jan. 04,2018    | Jan. 04,2019     |
| 11                            | 300328 v2.1.1 test system           | TONSCEND        | v2.6      | /          | /               | /                |

| Item | Test Equipment          | Manufacturer     | Model No.       | Serial No. | Calibrated until |
|------|-------------------------|------------------|-----------------|------------|------------------|
| 1    | EMI Test Receiver       | Rohde & Schwarz  | ESCI            | 100658     | Jan. 04 2019     |
| 2    | High pass filter        | micro-tranics    | HPM50111        | 142        | Jan. 04 2019     |
| 3    | Log-Bicon Antenna       | Schwarzbeck      | CBL6141A        | 4180       | Jan. 04 2019     |
| 4    | Ultra-Broadband Antenna | ShwarzBeck       | BBHA9170        | 25841      | Jan. 04 2019     |
| 5    | Loop Antenna            | LAPLAC           | RF300           | 9138       | Jan. 04 2019     |
| 6    | Spectrum Analyzer       | Rohde & Schwarz  | FSU26           | 100105     | Jan. 04 2019     |
| 7    | Horn Antenna            | Schwarzbeck      | BBHA 9120D      | 647        | Jan. 04 2019     |
| 8    | Pre-Amplifier           | HP               | 8447D           | 1937A03050 | Jan. 04 2019     |
| 9    | Pre-Amplifier           | EMCI             | EMC051835       | 980075     | Jan. 04 2019     |
| 10   | Antenna Mast            | UC               | UC3000          | N/A        | N/A              |
| 11   | Turn Table              | UC               | UC3000          | N/A        | N/A              |
| 12   | Cable Below 1GHz        | Schwarzbeck      | AK9515E         | 33155      | Jan. 04 2019     |
| 13   | Cable Above 1GHz        | Hubersuhner      | SUCOFLEX10<br>2 | DA1580     | Jan. 04 2019     |
| 14   | Splitter                | Mini-Circuit     | ZAPD-4          | 400059     | Jan. 04 2019     |
| 15   | RF Connection Cable     | HUBER+SUHNE<br>R | RE-7-FL         | N/A        | Jan. 04 2019     |

Shenzhen General Testing & Inspection Technology Co., Ltd.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

Fax: (86)755-27521011

Http://www.sz-ctc.org.cn



For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : [yz.cncaic.cn](http://yz.cncaic.cn)

|    |                              |                              |                 |          |              |
|----|------------------------------|------------------------------|-----------------|----------|--------------|
| 16 | RF Connection Cable          | Chengdu E-Microwave          | ---             | ---      | Jan. 04 2019 |
| 17 | High pass filter             | Compliance Direction systems | BSU-6           | 34202    | Jan. 04 2019 |
| 18 | Attenuator                   | Chengdu E-Microwave          | EMCAXX-10R NZ-3 | ---      | Jan. 04 2019 |
| 19 | High and low temperature box | ESPEC                        | MT3065          | 12114019 | Jan. 04 2019 |

Note:1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.

### 3. TEST ITEM AND RESULTS

#### 3.1. Conducted Emission

**Limit**

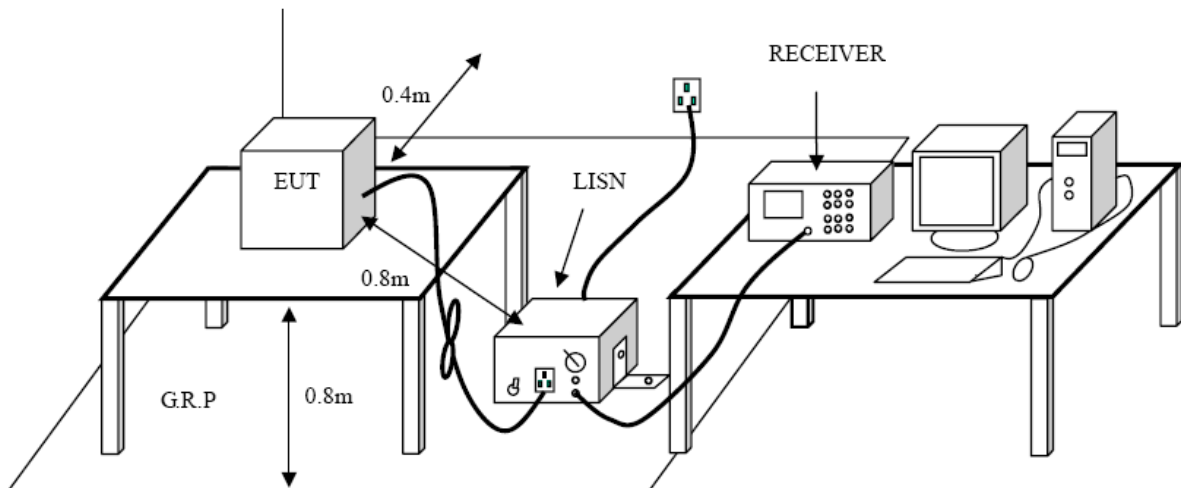
Conducted Emission Test Limit

| Frequency     | Maximum RF Line Voltage (dB $\mu$ V) |               |
|---------------|--------------------------------------|---------------|
|               | Quasi-peak Level                     | Average Level |
| 150kHz~500kHz | 66 ~ 56 *                            | 56 ~ 46 *     |
| 500kHz~5MHz   | 56                                   | 46            |
| 5MHz~30MHz    | 60                                   | 50            |

Notes:

- (1) \*Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

**Test Configuration**



**Test Procedure**

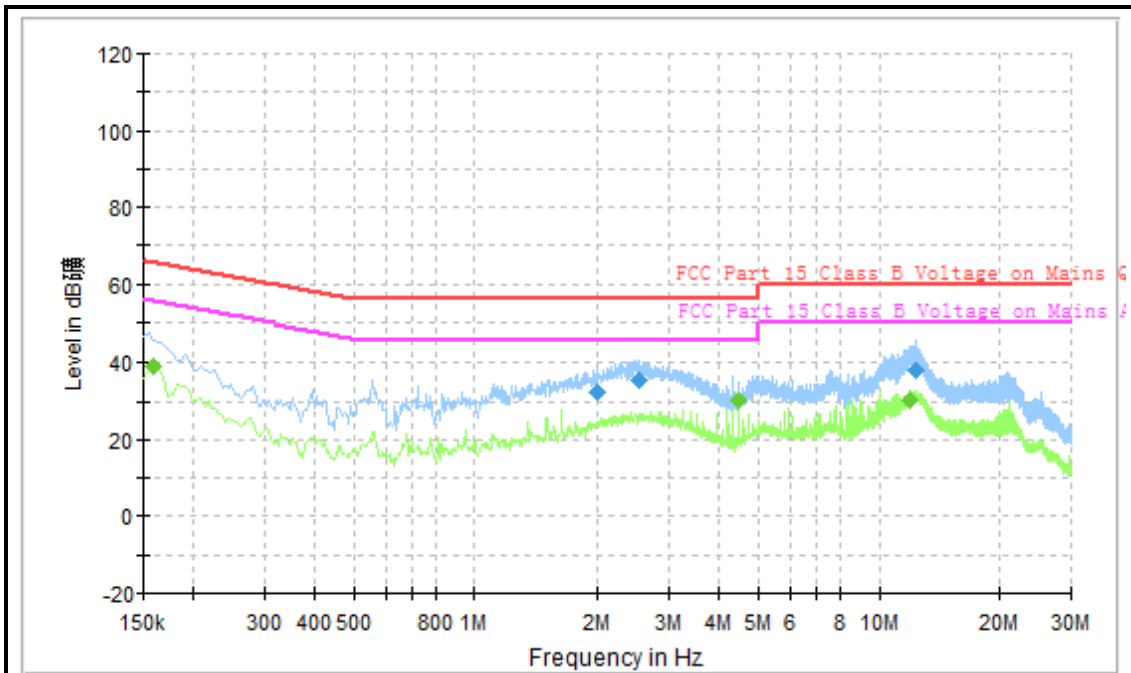
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

**Test Mode:**

Please refer to the clause 2.3.

**Test Results**

|                |              |                     |            |
|----------------|--------------|---------------------|------------|
| Temperature :  | 23.5 °C      | Relative Humidity : | 60%        |
| Pressure :     | 101 Kpa      | Test Date :         | 2018-09-17 |
| Test Mode :    | WIFI MODE    | Phase :             | L          |
| Test Voltage : | AC 120V/60Hz |                     |            |

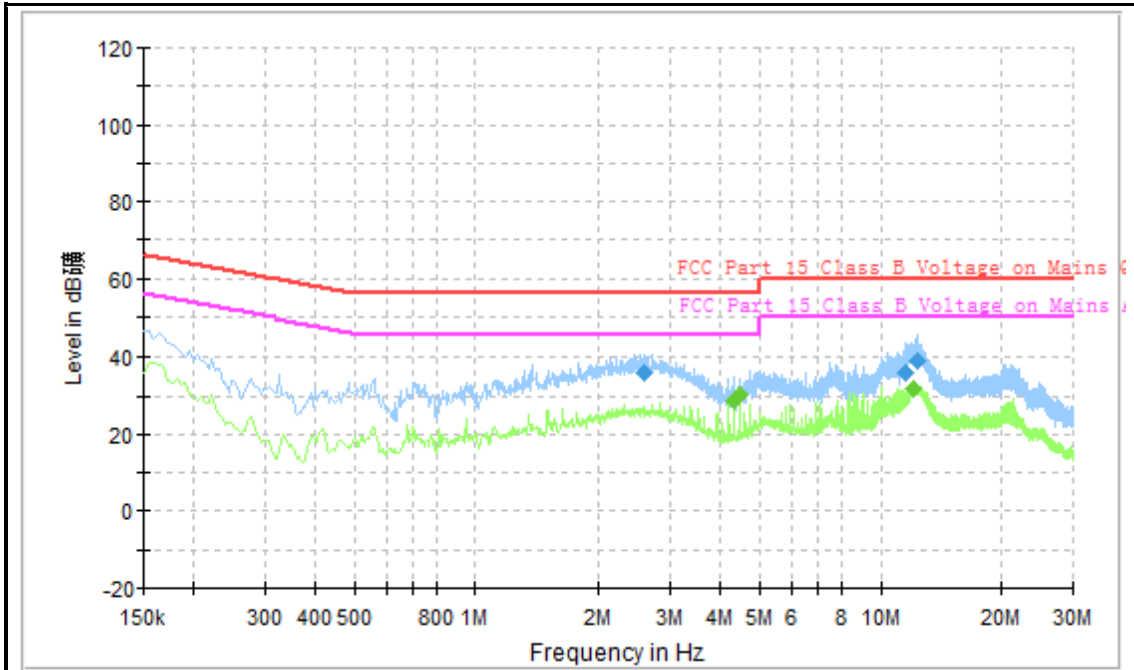


| Frequency (MHz) | QuasiPeak (dBm) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBm) |
|-----------------|-----------------|-----------------|-----------------|--------|------|------------|-------------|-------------|
| 1.981500        | 32.6            | 1000.000        | 9.000           | Off    | L1   | 10.1       | 23.4        | 56.0        |
| 2.526000        | 35.5            | 1000.000        | 9.000           | Off    | L1   | 10.0       | 20.5        | 56.0        |
| 12.349500       | 38.0            | 1000.000        | 9.000           | Off    | L1   | 9.7        | 22.0        | 60.0        |

| Frequency (MHz) | Average (dBm) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBm) |
|-----------------|---------------|-----------------|-----------------|--------|------|------------|-------------|-------------|
| 0.159000        | 39.1          | 1000.000        | 9.000           | Off    | L1   | 10.0       | 16.4        | 55.5        |
| 4.465500        | 30.2          | 1000.000        | 9.000           | Off    | L1   | 9.8        | 15.8        | 46.0        |
| 11.899500       | 30.2          | 1000.000        | 9.000           | Off    | L1   | 9.7        | 19.8        | 50.0        |

|                |              |                     |            |
|----------------|--------------|---------------------|------------|
| Temperature :  | 23.5 °C      | Relative Humidity : | 60%        |
| Pressure :     | 101 Kpa      | Test Date :         | 2018-09-17 |
| Test Mode :    | WIFI MODE    | Phase :             | N          |
| Test Voltage : | AC 120V/60Hz |                     |            |



| Frequency (MHz) | QuasiPeak (dBm) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBm) |
|-----------------|-----------------|-----------------|-----------------|--------|------|------------|-------------|-------------|
| 2.589000        | 35.8            | 1000.000        | 9.000           | Off    | N    | 10.1       | 20.2        | 56.0        |
| 11.521500       | 36.0            | 1000.000        | 9.000           | Off    | N    | 9.7        | 24.0        | 60.0        |
| 12.295500       | 38.9            | 1000.000        | 9.000           | Off    | N    | 9.7        | 21.1        | 60.0        |

| Frequency (MHz) | Average (dBm) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBm) |
|-----------------|---------------|-----------------|-----------------|--------|------|------------|-------------|-------------|
| 4.330500        | 28.8          | 1000.000        | 9.000           | Off    | N    | 9.9        | 17.2        | 46.0        |
| 4.465500        | 30.1          | 1000.000        | 9.000           | Off    | N    | 9.8        | 15.9        | 46.0        |
| 12.057000       | 31.9          | 1000.000        | 9.000           | Off    | N    | 9.7        | 18.1        | 50.0        |

### 3.2. Radiated Emission

**Limit**

**Radiated Emission Limits (9 kHz~1000 MHz)**

| Frequency (MHz) | Field Strength (microvolt/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                             |
| Above 960       | 500                              | 3                             |

**Radiated Emission Limit (Above 1000MHz)**

| Frequency (MHz) | Distance Meters(at 3m) |         |
|-----------------|------------------------|---------|
|                 | Peak                   | Average |
| Above 1000      | 74                     | 54      |

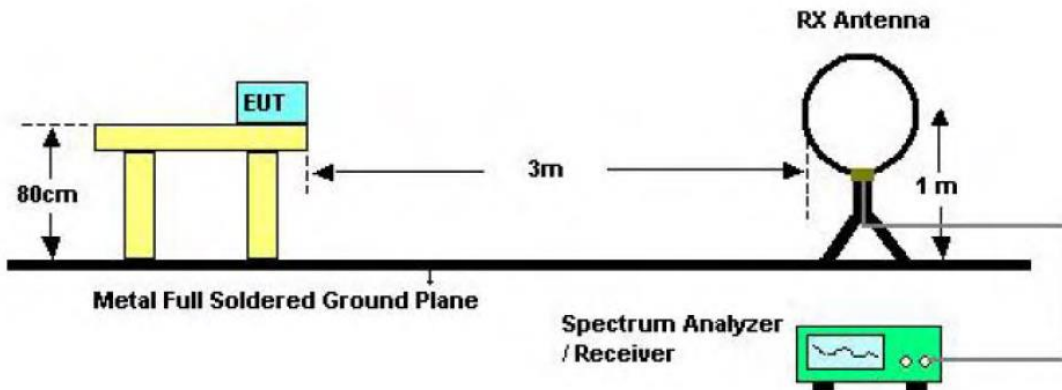
**Note:**

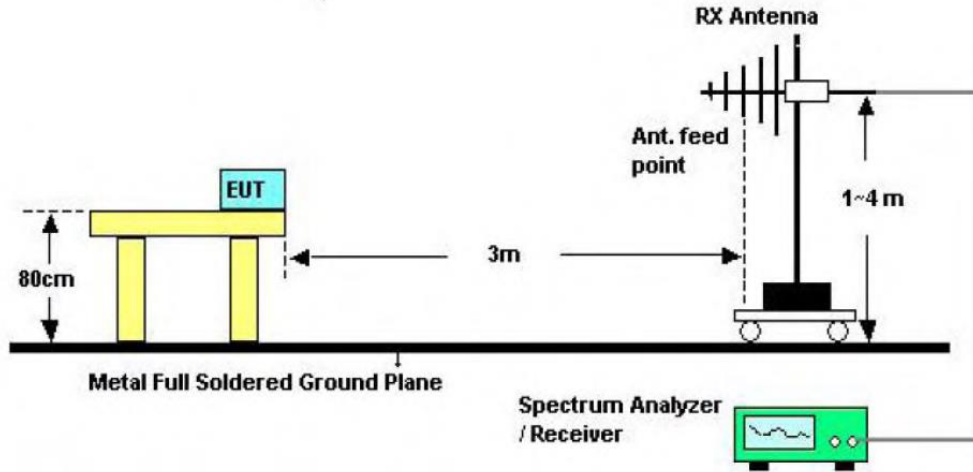
- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

**Test Configuration**

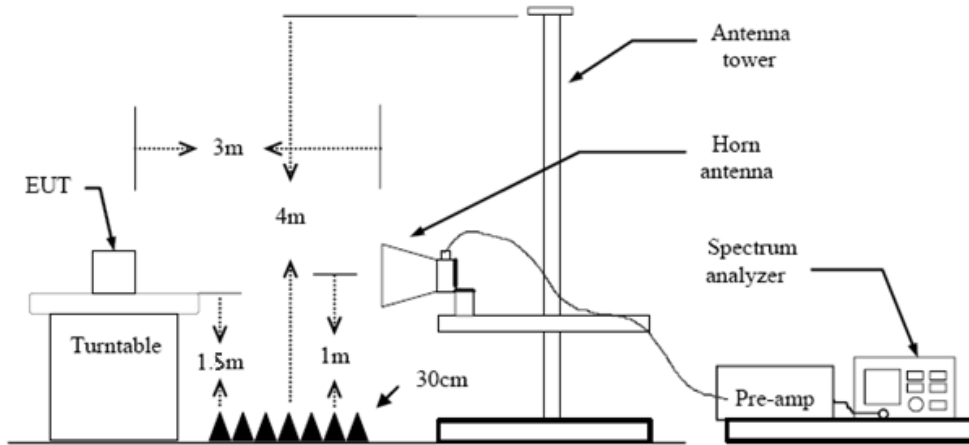
For the actual test configuration, please refer to the related Item –Test Photographs 2

Below 30MHz Test Setup





Below 1000MHz Test Setup



Above 1GHz Test Setup

**Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, 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 to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1 GHz:  
 RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
 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.
  - (3) From 1 GHz to 10<sup>th</sup> harmonic:



RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
 RBW=1MHz, VBW=3MHz RMS detector for Average value.

**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|       |                        |  |
|-------|------------------------|--|
| Where | FS = Field Strength    | CL = Cable Attenuation Factor (Cable Loss) |
|       | RA = Reading Amplitude | AG = Amplifier Gain                        |
|       | AF = Antenna Factor    |  |

For example

| Frequency (MHz) | FS (dBμV/m) | RA (dBμV/m) | AF (dB) | CL (dB) | AG (dB) | Transd (dB) |
|-----------------|-------------|-------------|---------|---------|---------|-------------|
| 150.00          | 40          | 58.1        | 12.2    | 1.6     | 31.90   | -18.1       |

$$Transd=AF +CL-AG$$

**Test Mode**

Please refer to the clause 2.3.

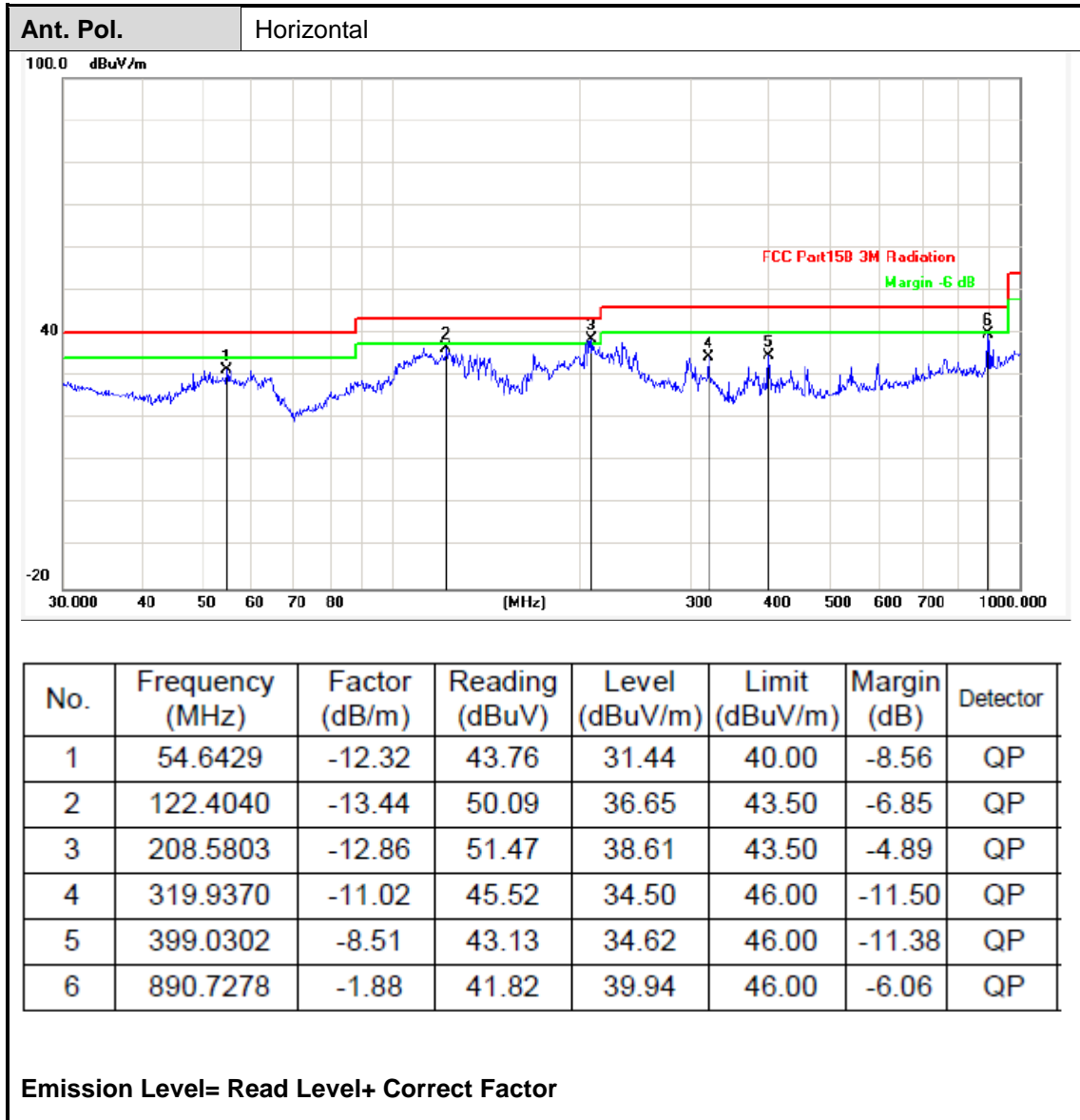
**Test Result**

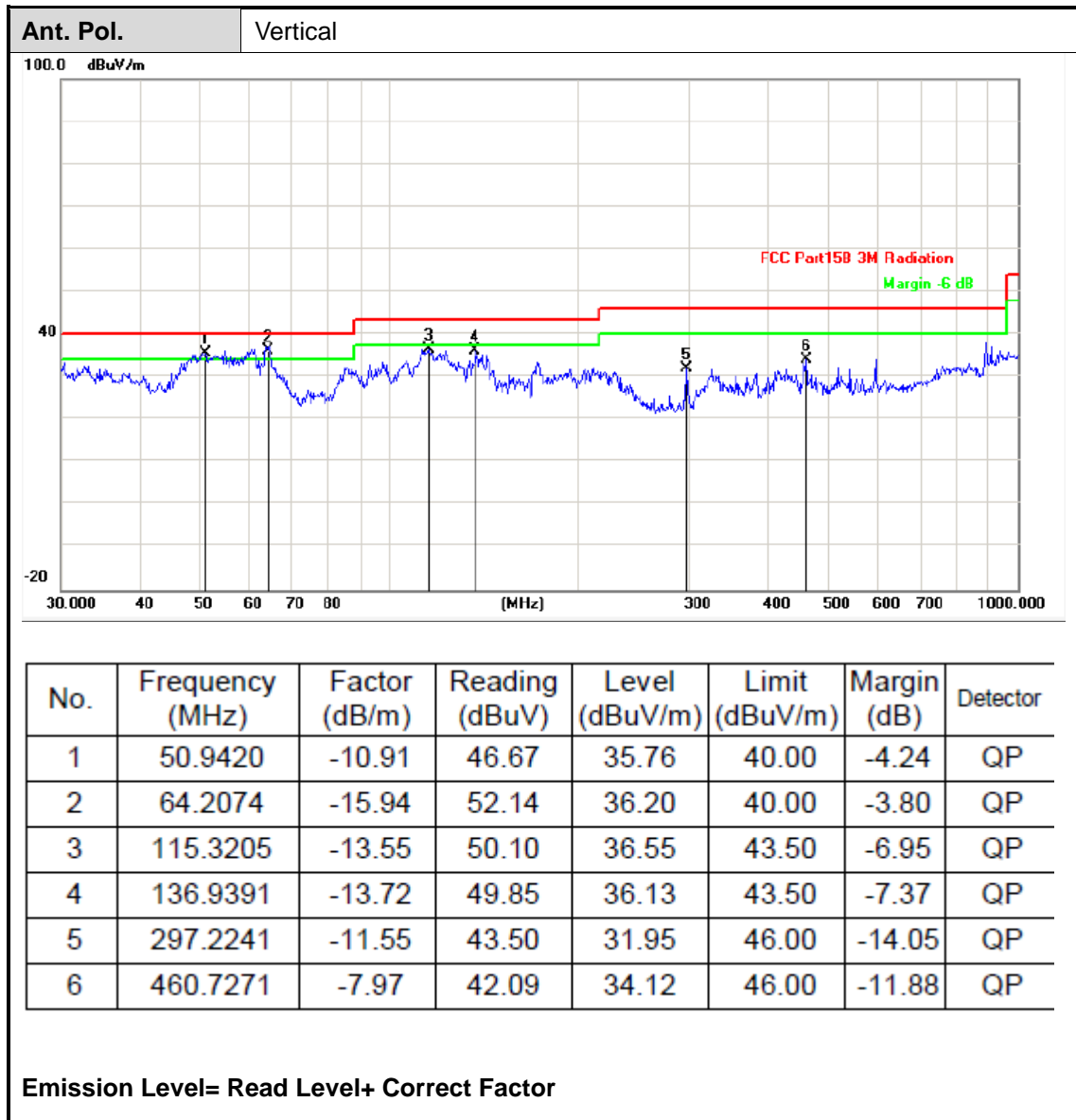
**9 KHz~30 MHz**

From 9 KHz to 30 MHz: Conclusion: PASS

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

30MHz-1GHz





**REMARKS:**

1. Emission level (dBUV/m) =Raw Value (dBUV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

**Above 1GHz emission please refer to C180918Z01-RP1**

**(1) Conducted Test**

Please see the Appendix 4

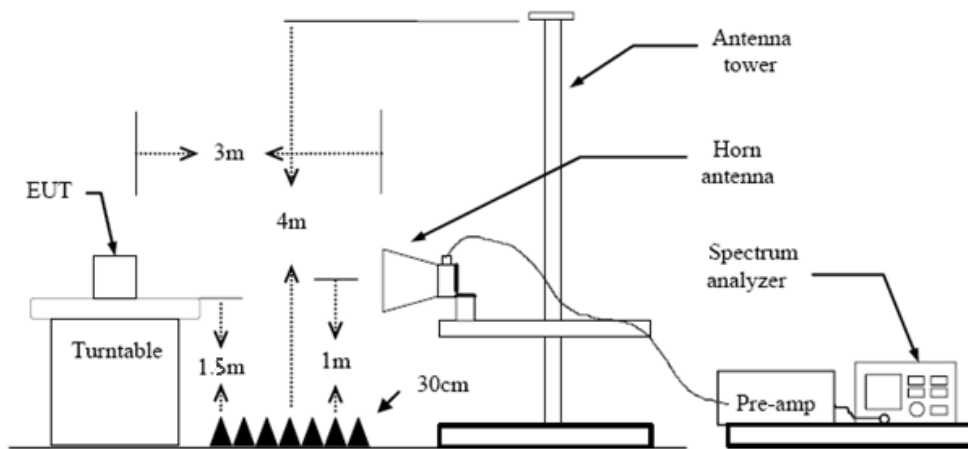
### 3.3. Band Edge Emissions

**Limit**

| Restricted Frequency Band (MHz) | (dBuV/m)(at 3m) |         |
|---------------------------------|-----------------|---------|
|                                 | Peak            | Average |
| 2310 ~2390                      | 74              | 54      |
| 2483.5 ~2500                    | 74              | 54      |

**Note: All restriction bands have been tested, only the worst case is reported.**

**Test Configuration**



**Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:  
 RBW=1MHz, VBW=3MHz PEAK detector for Peak value.  
 RBW=1MHz, VBW=10Hz with PEAK Detector for Average Value.

**Test Mode**

Please refer to the clause 2.3.

**Test Results**

**(1) Radiation Test**

**Note: Antenna 1 B mode is the worst case:**

| 802.11b         |                   |               |                | CH01                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2310            | 42.97             | 3.28          | 46.25          | 74                  | -27.75      | Vertical     | Peak       |
| 2390            | 35.36             | 3.85          | 39.21          | 74                  | -34.79      | Vertical     | Peak       |
| 2310            | 43.47             | 3.02          | 46.49          | 74                  | -27.51      | Horizontal   | Peak       |
| 2390            | 43.46             | 3.67          | 47.13          | 74                  | -26.87      | Horizontal   | Peak       |
| 2310            | 36.20             | 3.28          | 39.48          | 54                  | -14.52      | Vertical     | Average    |
| 2390            | 35.96             | 3.85          | 39.81          | 54                  | -14.19      | Vertical     | Average    |
| 2310            | 36.67             | 3.02          | 39.69          | 54                  | -14.31      | Horizontal   | Average    |
| 2390            | 41.67             | 3.67          | 45.34          | 54                  | -8.66       | Horizontal   | Average    |

| 802.11b         |                   |               |                | CH11                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2483.5          | 37.24             | 3.79          | 41.03          | 74                  | -32.97      | Vertical     | Peak       |
| 2500            | 36.02             | 4.09          | 40.11          | 74                  | -33.89      | Vertical     | Peak       |
| 2483.5          | 43.46             | 3.65          | 47.11          | 74                  | -26.89      | Horizontal   | Peak       |
| 2500            | 36.87             | 3.95          | 40.82          | 74                  | -33.18      | Horizontal   | Peak       |
| 2483.5          | 43.08             | 3.79          | 46.87          | 54                  | -7.13       | Vertical     | Average    |
| 2500            | 41.41             | 4.09          | 45.50          | 54                  | -8.50       | Vertical     | Average    |
| 2483.5          | 35.21             | 3.65          | 38.86          | 54                  | -15.14      | Horizontal   | Average    |
| 2500            | 39.43             | 3.95          | 43.38          | 54                  | -10.62      | Horizontal   | Average    |

Note: Antenna 1 G mode is the worst case:

| 802.11g         |                   |               |                | CH01                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2310            | 37.94             | 3.28          | 41.22          | 74                  | -32.78      | Vertical     | Peak       |
| 2390            | 38.18             | 3.85          | 42.03          | 74                  | -31.97      | Vertical     | Peak       |
| 2310            | 40.84             | 3.02          | 43.86          | 74                  | -30.14      | Horizontal   | Peak       |
| 2390            | 44.11             | 3.67          | 47.78          | 74                  | -26.22      | Horizontal   | Peak       |
| 2310            | 44.43             | 3.28          | 47.71          | 54                  | -6.29       | Vertical     | Average    |
| 2390            | 42.44             | 3.85          | 46.29          | 54                  | -7.71       | Vertical     | Average    |
| 2310            | 43.86             | 3.02          | 46.88          | 54                  | -7.12       | Horizontal   | Average    |
| 2390            | 43.36             | 3.67          | 47.03          | 54                  | -6.97       | Horizontal   | Average    |

| 802.11g         |                   |               |                | CH11                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2483.5          | 36.67             | 3.79          | 40.46          | 74                  | -33.54      | Vertical     | Peak       |
| 2500            | 43.90             | 4.09          | 47.99          | 74                  | -26.01      | Vertical     | Peak       |
| 2483.5          | 44.37             | 3.65          | 48.02          | 74                  | -25.98      | Horizontal   | Peak       |
| 2500            | 41.66             | 3.95          | 45.61          | 74                  | -28.39      | Horizontal   | Peak       |
| 2483.5          | 41.77             | 3.79          | 45.56          | 54                  | -8.44       | Vertical     | Average    |
| 2500            | 41.66             | 4.09          | 45.75          | 54                  | -8.25       | Vertical     | Average    |
| 2483.5          | 39.10             | 3.65          | 42.75          | 54                  | -11.25      | Horizontal   | Average    |
| 2500            | 38.30             | 3.95          | 42.25          | 54                  | -11.75      | Horizontal   | Average    |

80211N20 MIMO mode:

| 802.11n(HT20)   |                   |               |                | CH01                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2310            | 42.21             | 3.28          | 45.49          | 74                  | -28.51      | Vertical     | Peak       |
| 2390            | 40.89             | 3.85          | 44.74          | 74                  | -29.26      | Vertical     | Peak       |
| 2310            | 39.84             | 3.02          | 42.86          | 74                  | -31.14      | Horizontal   | Peak       |
| 2390            | 35.36             | 3.67          | 39.03          | 74                  | -34.97      | Horizontal   | Peak       |
| 2310            | 38.48             | 3.28          | 41.76          | 54                  | -12.24      | Vertical     | Average    |
| 2390            | 38.69             | 3.85          | 42.54          | 54                  | -11.46      | Vertical     | Average    |
| 2310            | 37.30             | 3.02          | 40.32          | 54                  | -13.68      | Horizontal   | Average    |
| 2390            | 35.32             | 3.67          | 38.99          | 54                  | -15.01      | Horizontal   | Average    |

| 802.11n(HT20)   |                   |               |                | CH11                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2483.5          | 43.99             | 3.79          | 47.78          | 74                  | -26.22      | Vertical     | Peak       |
| 2500            | 35.44             | 4.09          | 39.53          | 74                  | -34.47      | Vertical     | Peak       |
| 2483.5          | 41.58             | 3.65          | 45.23          | 74                  | -28.77      | Horizontal   | Peak       |
| 2500            | 36.86             | 3.95          | 40.81          | 74                  | -33.19      | Horizontal   | Peak       |
| 2483.5          | 41.51             | 3.79          | 45.30          | 54                  | -8.70       | Vertical     | Average    |
| 2500            | 36.85             | 4.09          | 40.94          | 54                  | -13.06      | Vertical     | Average    |
| 2483.5          | 41.51             | 3.65          | 45.16          | 54                  | -8.84       | Horizontal   | Average    |
| 2500            | 38.58             | 3.95          | 42.53          | 54                  | -11.47      | Horizontal   | Average    |



**80211N40 MIMO mode:**

| 802.11n(HT40)   |                   |               |                | CH01                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2310            | 39.62             | 3.28          | 42.90          | 74                  | -31.10      | Vertical     | Peak       |
| 2390            | 41.03             | 3.85          | 44.88          | 74                  | -29.12      | Vertical     | Peak       |
| 2310            | 44.82             | 3.02          | 47.84          | 74                  | -26.16      | Horizontal   | Peak       |
| 2390            | 36.14             | 3.67          | 39.81          | 74                  | -34.19      | Horizontal   | Peak       |
| 2310            | 44.55             | 3.28          | 47.83          | 54                  | -6.17       | Vertical     | Average    |
| 2390            | 44.84             | 3.85          | 48.69          | 54                  | -5.31       | Vertical     | Average    |
| 2310            | 37.52             | 3.02          | 40.54          | 54                  | -13.46      | Horizontal   | Average    |
| 2390            | 44.61             | 3.67          | 48.28          | 54                  | -5.72       | Horizontal   | Average    |

| 802.11n(HT40)   |                   |               |                | CH11                |             |              |            |
|-----------------|-------------------|---------------|----------------|---------------------|-------------|--------------|------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Margin (dB) | Polarization | Test value |
| 2483.5          | 40.00             | 3.79          | 43.79          | 74                  | -30.21      | Vertical     | Peak       |
| 2500            | 38.34             | 4.09          | 42.43          | 74                  | -31.57      | Vertical     | Peak       |
| 2483.5          | 39.37             | 3.65          | 43.02          | 74                  | -30.98      | Horizontal   | Peak       |
| 2500            | 35.99             | 3.95          | 39.94          | 74                  | -34.06      | Horizontal   | Peak       |
| 2483.5          | 36.47             | 3.79          | 40.26          | 54                  | -13.74      | Vertical     | Average    |
| 2500            | 37.00             | 4.09          | 41.09          | 54                  | -12.91      | Vertical     | Average    |
| 2483.5          | 42.59             | 3.65          | 46.24          | 54                  | -7.76       | Horizontal   | Average    |
| 2500            | 38.95             | 3.95          | 42.90          | 54                  | -11.10      | Horizontal   | Average    |

**REMARKS:**

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.



## (2) Conducted Test

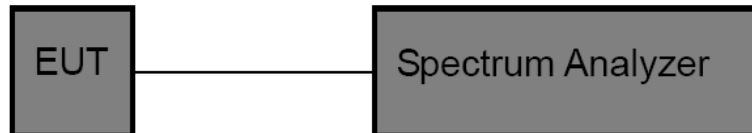
Please see the Appendix 4

### 3.4. Bandwidth

#### Limit

| Test Item | Limit                             | Frequency Range(MHz) |
|-----------|-----------------------------------|----------------------|
| Bandwidth | $\geq 500$ KHz<br>(6dB bandwidth) | 2400~2483.5          |

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
  - (1) Set RBW = 100 kHz.
  - (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

#### Test Mode

Please refer to the clause 2.3.

#### Test Results

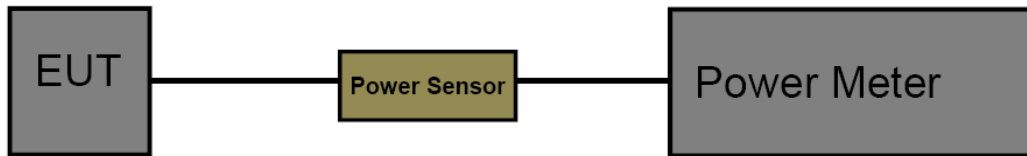
Please see the Appendix 1 and Appendix 2

### 3.5. Maximum Peak Conducted Output Power

#### Limit

| Test Item                           | Limit           | Frequency Range(MHz) |
|-------------------------------------|-----------------|----------------------|
| Maximum Peak Conducted Output Power | 1 Watt or 30dBm | 2400~2483.5          |

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The measurement is according to section 9.1.2 of KDB 558074 D01 DTS Meas Guidance v04.
3. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

#### Test Mode

Please refer to the clause 2.3

#### Test Result

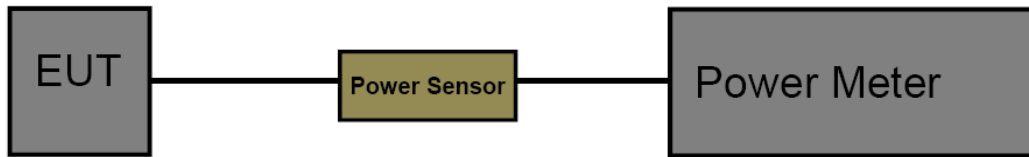
Please see the Appendix 3

### 3.6. Power Spectral Density

**Limit**

| FCC Part 15 Subpart C(15.247) |                    |                      |
|-------------------------------|--------------------|----------------------|
| Test Item                     | Limit              | Frequency Range(MHz) |
| Power Spectral Density        | 8dBm(in any 3 kHz) | 2400~2483.5          |

**Test Configuration**



**Test Procedure**

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v04.
- Spectrum Setting:
  - Set analyser center frequency to DTS channel center frequency.
  - Set the span to 1.5 times the DTS bandwidth.
  - Set the RBW to:  $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$ .
  - Set the VBW to:  $\geq 3\text{ RBW}$ .
  - Detector: peak
  - Sweep time: auto
  - Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

**Test Mode**

Please refer to the clause 2.3

**Test Result**

Please see the Appendix 3

### 3.7. Antenna requirement

#### Requirement

##### **FCC CFR Title 47 Part 15 Subpart C Section 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, 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.

#### **Result**

The EUT's antenna used a Antenna, soldered on the PCB., The antenna's gain is 1.21 dBi. Complying with the standard requirement.

#### Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.



## 4.EUT TEST PHOTOS

Reference to the document No.: Test Photographs 2.

## 5.PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Reference to the document No.: External Photographs and Internal Photographs.

\*\*\*\*\*THE END\*\*\*\*\*