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TESTING  
CNAS L0310



# FCC RF Test Report

**Product Name: Smart Phone**

**Model Number: HUAWEI MLA-L13, MLA-L13, HUAWEI  
MLA-L03, MLA-L03**

**Report No: SYBH(Z-RF)022062016-2002  
FCC ID: QISMLA-LX3**

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## Notice

1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01 & 2174.02 & 2174.03.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
5. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.
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**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
 Bantian, Longgang District, Shenzhen, 518129, P.R.C

**Date of Receipt Sample:** 2016-07-03  
**Start Date of Test:** 2016-07-03  
**End Date of Test:** 2016-07-11

**Test Result:** Pass

|                                     |            |             |                    |
|-------------------------------------|------------|-------------|--------------------|
| <b>Approved by Senior Engineer:</b> | 2016-07-25 | Roger Zhang | <i>Roger Zhang</i> |
|                                     | Date       | Name        | Signature          |

|                     |            |               |                      |
|---------------------|------------|---------------|----------------------|
| <b>Prepared by:</b> | 2016-07-25 | Yang Yuanyuan | <i>Yang Yuanyuan</i> |
|                     | Date       | Name          | Signature            |



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## 1 General Information

### 1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2, Subpart J 2014  
47 CFR FCC Part 15, Subpart C 2014

Test Method: FCC KDB 558074 D01 DTS Meas Guidance v03r04  
ANSI C63.10-2013, American National Standard for Testing Unlicensed  
Wireless Devices.

### 1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, P.R.C

### 1.3 Test Environment Condition

Ambient Temperature: 19.5to 25 °C  
Ambient Relative Humidity: 40 to 55 %  
Atmospheric Pressure: Not applicable



## 2 Test Summary

| Test Item   | FCC Part No.                    | Requirements   | Test Result | Verdict   |
|---|---------------------------------|--|-------------|---|
| DTS (6 dB) Bandwidth  | 15.247(a)(2)                    | ≥ 500 kHz.   | Appendix A  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Occupied Bandwidth  | ---                             | No limit   | Appendix B  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Duty Cycle  | KDB 558074<br>(6.0)             | No limit   | Appendix C  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Maximum Conducted<br>Average Output Power                           | 15.247(b)(3)                    | For directional gain: < 30 dBm –<br>(G[dBi] – 6 [dB]), Average; Otherwise:<br>< 30 dBm, Average.           | Appendix D  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Maximum Power Spectral<br>Density Level                             | 15.247(e)                       | For directional gain: < 8 dBm/3 kHz –<br>(G[dBi] – 6 [dB]), Average. Otherwise:<br>< 8 dBm/3 kHz, Average. | Appendix E  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Band Edges Compliance   | 15.247(d)                       | < -30 dBm/100 kHz if total average<br>power ≤ power limit.   | Appendix F  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Unwanted Emissions into<br>Non-Restricted Frequency<br>Bands        |                                 |  | Appendix G  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| Unwanted Emissions into<br>Restricted Frequency<br>Bands (Radiated) | 15.247(d)<br>15.209<br>(NOTE 1) | FCC Part 15.209 field strength limit;  | Appendix H  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |
| AC Power Line Conducted<br>Emissions                                | 15.207                          | FCC Part 15.207 conducted limit;   | Appendix I  | Report No:<br>SYBH(Z-RF)<br>)027052016<br>-2002 |

NOTE 1: According to KDB 558074, antenna-port conducted measurements are acceptable as an alternative to



| Test Item   | FCC Part No. | Requirements | Test Result | Verdict |
|---|--------------|--------------|-------------|---------|
| radiated measurements for demonstrating compliance to the limits in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case emissions will also be required. |              |              |             |         |



### 3 Description of the Equipment under Test (EUT)

#### 3.1 General Description

HUAWEI MLA-L13, MLA-L13, HUAWEI MLA-L03, MLA-L03 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The UMTS frequency band is B1 and B2 and B4 and B5 and B8. The LTE frequency band is B2 and B4 and B5 and B7 and B12 and B17 and B28.

The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS and WIFI etc. Externally it provides one micro SD card interface (it can also used as SIM card interface), earphone port (to provide voice service) and one SIM card interface. HUAWEI MLA-L13, MLA-L13 is dual SIM smart phone. HUAWEI MLA-L03, MLA-L03 is single SIM smart phone. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

NOTE:

Model HUAWEI MLA-L13, MLA-L13 is a smart phone with dual SIM. Model HUAWEI MLA-L03, MLA-L03 is a smart phone with single SIM. The difference of them is only for SIM CARD. HUAWEI MLA-L03, MLA-L03 delete one SIM by software.

The mobile phone HUAWEI MLA-L13 and HUAWEI MLA-L11 are LTE/UMTS mobile phone with Bluetooth. The differences between HUAWEI MLA-L13 and HUAWEI MLA-L11 are showed in the following table. Other parts of the mobile phone are the same, including the appearance, the antenna, Chipset, Bluetooth mode, Wifi mode, Adapter, Battery, Mainboard and so on.

|                 | MLA-L13  | MLA-L11                   |
|-----------------|--|---------------------------|
| GSM four bands  | B2/B3/B5/B8  | B2/B3/B5/B8               |
| WCDMA bands     | B1/B2/B4/B5/B8   | B1/ B8                    |
| LTE bands       | B2/B4/B5/B7/B12/B17/B28                                    | B1/B3/B7/B8/B20/B38       |
| FCC bands       | GSM850/1900<br>W850/W1700/W1900<br>LTE B2/B4/B5/B7/B12/B17 | GSM850/1900<br>LTE B7/B38 |
| SIM card        | Two  | Two                       |
| External camera | the same   | the same                  |
| internal camera | the same   | the same                  |
| FLASH           | the same   | the same                  |
| Mainboard       | the same   | the same                  |
| PCB layout      | the same   | the same                  |
| Appearance      | the same   | the same                  |



|                         |  |  |
|-------------------------|--|--|
| Bluetooth mode          | the same   | the same   |
| WLAN mode               | the same   | the same   |
| BT/ WLAN antenna        | the same   | the same   |
| GSM/ WCDMA /LTE antenna | the matching of the antenna in 2G 3G 4G is different | the matching of the antenna in 2G 3G 4G is different |
| Adapter                 | the same   | the same   |
| Battery                 | the same   | the same   |
| Chipset                 | the same   | the same   |
| Memory                  | the same   | the same   |
| RF Parameter            | The same RF Parameter in the same band               | The same RF Parameter in the same band               |
| Dimension               | the same   | the same   |
| Main Frequency NV       | The same NV in the same band                         | The same NV in the same band                         |

NOTE: But only 2.4G WLAN test data included in this report.

NOTE2: We do not test WLAN of MLA-L13, all the test data refer to Report No: **SYBH(Z-RF)027052016-2002** of MLA-L11



### 3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

#### 3.2.1 Board

| Board       |                  |                                    |
|-------------|------------------|------------------------------------|
| Description | Hardware Version | Software Version                   |
| Main Board  | HL1MLAL01M       | MLA-L13C900B063<br>MLA-L03C900B063 |

#### 3.2.2 Sub-Assembly

| Sub-Assembly      |              |                               |   |
|-------------------|--------------|-------------------------------|---|
| Sub-Assembly Name | Model        | Manufacturer                  | Description   |
| Adapter           | HW-050200U01 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.5A<br>Output Voltage: 5V  2A<br>Rated Power: 5W   |
| Adapter           | HW-050200E01 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.5A<br>Output Voltage: 5V  2A<br>Rated Power: 5W   |
| Adapter           | HW-050200B01 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.5A<br>Output Voltage: 5V  2A<br>Rated Power: 5W   |
| Adapter           | HW-050200A01 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.5A<br>Output Voltage: 5V  2A<br>Rated Power: 5W   |
| Battery           | HB386483ECW+ | Huawei Technologies Co., Ltd. | Rated capacity: 3270 mAh<br>Nominal Voltage:  +3.82V<br>Charging Voltage:  +4.40V |



### 3.3 Technical Description

| Characteristics                 | Description   |  |   |
|---------------------------------|---|--|---|
| IEEE 802.11 WLAN Mode Supported | <input checked="" type="checkbox"/> 802.11b (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11g (20 MHz channel bandwidth)<br><input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth), |  |   |
| TX/RX Operating Range           | 2412-2462 MHz band  | $f_c = 2407 \text{ MHz} + N * 5 \text{ MHz}$ , where:<br>- $f_c$ = "Operating Frequency" in MHz,<br>- $N$ = "Channel Number" with the range from 1 to 11 for the 20 MHz channel bandwidth,           |   |
| Data Rate                       | 802.11b   | 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps  |   |
|                                 | 802.11g   | 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps   |   |
|                                 | 802.11n (SISO)  | MCS 0 to MCS 7   |   |
| Modulation Type                 | DBPSK/DQPSK/CCK (DSSS), BPSK/QPSK/16QAM/64QAM (OFDM).   |  |   |
| Emission Designator             | 8M61G7D (for 802.11b mode), 16M4G7D (for 802.11g mod), 17M6G7D (for 802.11n20 mode)   |  |   |
| TX Power Control                | <input type="checkbox"/> Supported, <input checked="" type="checkbox"/> Not Supported   |  |   |
| Standby Mode                    | <input type="checkbox"/> Supported, <input checked="" type="checkbox"/> Not Supported   |  |   |
| Equipment Type                  | <input type="checkbox"/> Stand-alone equipment, <input type="checkbox"/> Plug-in radio device, <input checked="" type="checkbox"/> Combined equipment   |  |   |
| Antenna                         | Description   | Isotropic Antenna  |   |
|                                 | Type  | <input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated  |   |
|                                 | Ports   | <input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3  |   |
|                                 | Smart System  | <input checked="" type="checkbox"/> SISO (for 802.11b/g/n),<br><input type="checkbox"/> MIMO (for 802.11n): 2 Tx & 2 Rx,<br><input type="checkbox"/> Diversity (for 802.11b/g) :       Tx &       Rx |   |
|                                 | Gain  | -1 dBi (per antenna port, max.)  |   |
|                                 | Remark  | When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above.   |   |
| Power Supply                    | Type  | <input checked="" type="checkbox"/> AC/DC Adapter  | <input type="checkbox"/> PoE: <input type="checkbox"/> Other: |



## 4 General Test Conditions / Configurations

### 4.1 Test Modes

NOTE: Worst cases for each IEEE 802.11 mode are selected to perform tests.

| Test Mode | Test Modes Description   |
|-----------|--|
| 11B       | IEEE 802.11b with data rate of 1 Mbps using SISO mode.                       |
| 11G       | IEEE 802.11g with data rate of 6 Mbps using SISO mode.                       |
| 11N20     | IEEE 802.11n with data rate of MCS0 and bandwidth of 20 MHz using SISO mode. |

### 4.2 EUT Configurations

#### 4.2.1 General Configurations

| Configuration       | Description  |
|---------------------|--|
| Test Antenna Ports  | Until otherwise specified,<br><ul style="list-style-type: none"> <li>- All TX tests are performed at all TX antenna ports of the EUT, and</li> <li>- All RX tests are performed at all RX antenna ports of the EUT.</li> </ul> |
| Multiple RF Sources | Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.   |

#### 4.2.2 Customized Configurations

| Test Mode | RF Ch. | TX Freq. [MHz]       | Antenna Port | RX Freq. [MHz] | Ch. BW [MHz] | Power Conf., per Port | Duty cycle [%] |
|-----------|--------|----------------------|--------------|----------------|--------------|-----------------------|----------------|
| 11B       | L      | Ch No. 1 / 2412 MHz  | Ant1         | ---            | 20           | 18                    | 97.6           |
|           | M      | Ch No. 6 / 2437 MHz  | Ant1         | ---            | 20           | 18                    | 97.6           |
|           | H      | Ch No. 11 / 2462 MHz | Ant1         | ---            | 20           | 18                    | 97.6           |
| 11G       | L      | Ch No. 1 / 2412 MHz  | Ant1         | ---            | 20           | 16                    | 87.2           |
|           | M      | Ch No. 6 / 2437 MHz  | Ant1         | ---            | 20           | 16                    | 87.2           |
|           | H      | Ch No. 11 / 2462 MHz | Ant1         | ---            | 20           | 16                    | 87.2           |
| 11N20     | L      | Ch No. 1 / 2412 MHz  | Ant1         | ---            | 20           | 14                    | 86.5           |
|           | M      | Ch No. 6 / 2437 MHz  | Ant1         | ---            | 20           | 14                    | 86.5           |
|           | H      | Ch No. 11 / 2462 MHz | Ant1         | ---            | 20           | 14                    | 86.5           |



### 4.3 Test Environments

NOTE: The values used in the test report may be stringent than the declared.

| Environment Parameter | Selected Values During Tests |         |                   |
|-----------------------|------------------------------|---------|-------------------|
|                       | Temperature                  | Voltage | Relative Humidity |
| NTNV                  | Ambient                      | 3.8 VDC | Ambient           |

### 4.4 Antenna requirements

#### Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

The antennas of the **HUAWEI MLA-L13, MLA-L13, HUAWEI MLA-L03, MLA-L03** are permanently attached. There are no provisions for connection to an external antenna.

#### Conclusion:

The **EUT FCC ID: QISMLA-LX3** unit complies with the requirement of §15.203.

#### Ch. Frequency (MHz)

| Ch.       | Frequency (MHz) |
|-----------|-----------------|
| <b>01</b> | <b>2412</b>     |
| .         | .               |
| .         | .               |
| <b>06</b> | <b>2437</b>     |
| .         | .               |
| .         | .               |
| <b>11</b> | <b>2462</b>     |

#### Frequency/ Channel Operations



## 4.5 Description of tests

### 4.5.1 Bandwidth measurement

- (a) Connect EUT test port to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power at 2.4GHz, then set the measured frequency number and test the bandwidth with spectrum analyzer.

### 4.5.2 Average output power

- (a) Connect EUT test port to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

### 4.5.3 Band edge spurious emission

- (a) Connect EUT test port to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.

### 4.5.4 Conducted RF spurious

- (a) Connect EUT test port to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted spurious separately.

### 4.5.5 Power spectral density

- (a) Connect EUT test port to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted power spectral density.

### 4.5.6 Radiated spurious emission & spurious in restricted band

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2013). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10:2013. The Radiated Disturbance measurements were made using a Rohde and Schwarz Test Receiver and control software.

A preliminary scan and a final scan of the emissions were made by using test script of software; the emissions were measured using a Quasi-Peak Detector below 1GHz, Peak Detector and AV Detector above 1GHz. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, and the azimuth range of turntable was 0° to 360°. The receive antenna has two polarizations V and H.



A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other nonmetallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized.

The EUT communicates with the BTS simulator through Air interface. The EUT operated on the typical channel.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz

Measurement bandwidth: 1000 MHz – 10<sup>th</sup> Carrier Frequency: 1 MHz

#### **4.5.7 Conducted Emission at Power Port**

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

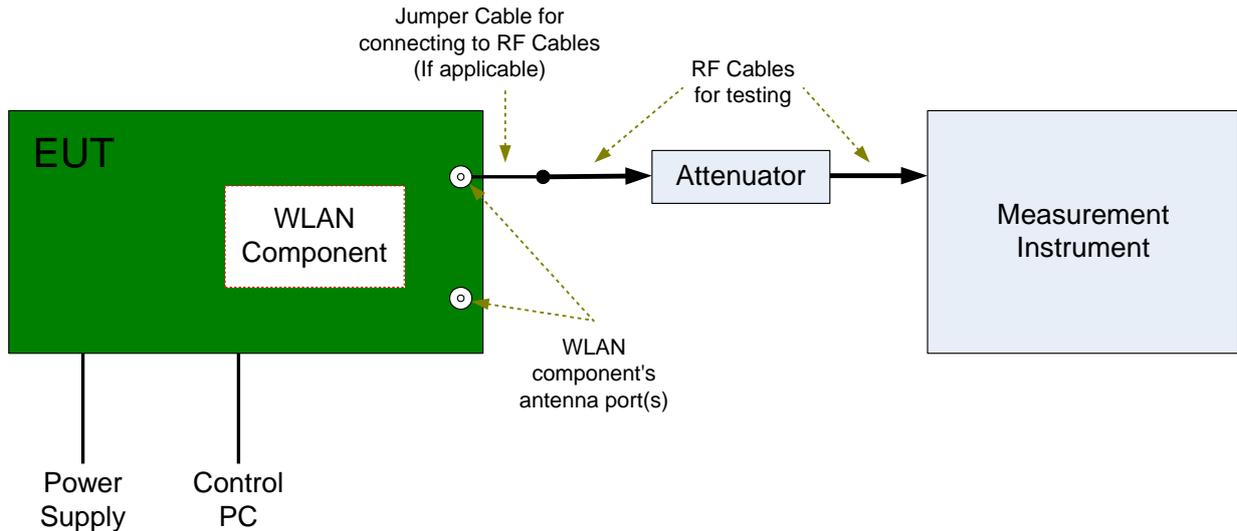
The EUT communicates with the BTS simulator through Air interface, the BTS simulator controls the Wireless Modem to transmitter the maximum power which defined in specification of product. The Wireless Modem operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

## 4.6 Test Setups

### 4.6.1 Test Setup 1

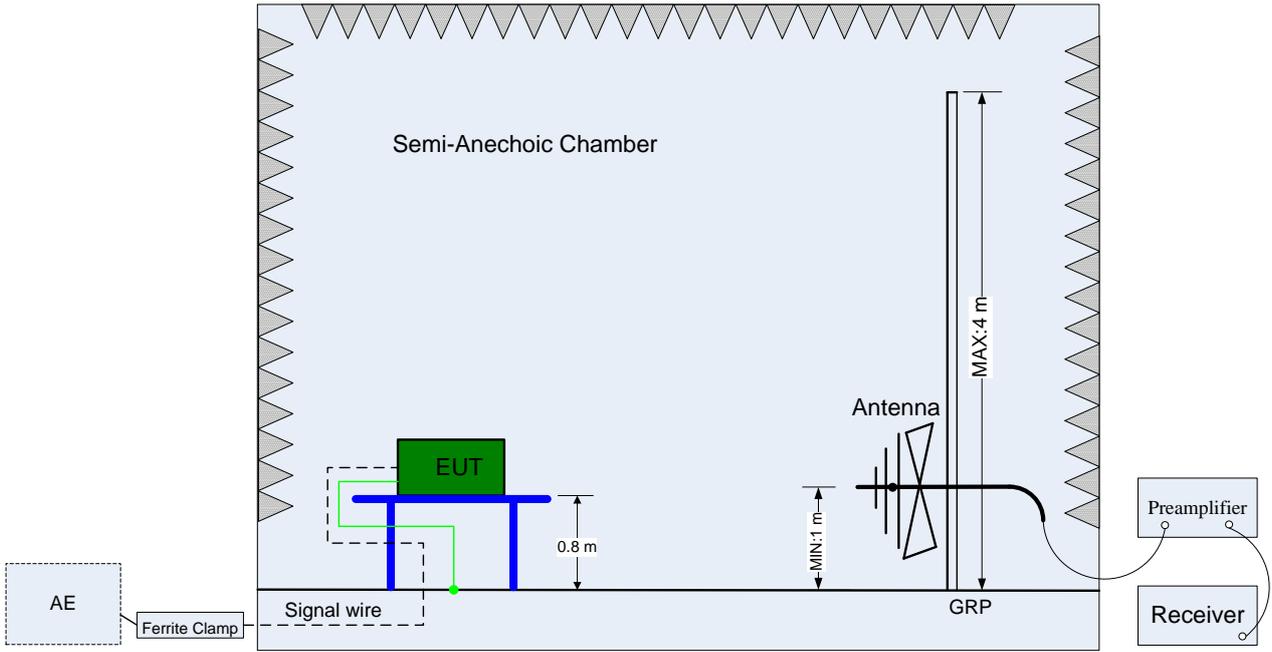
The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



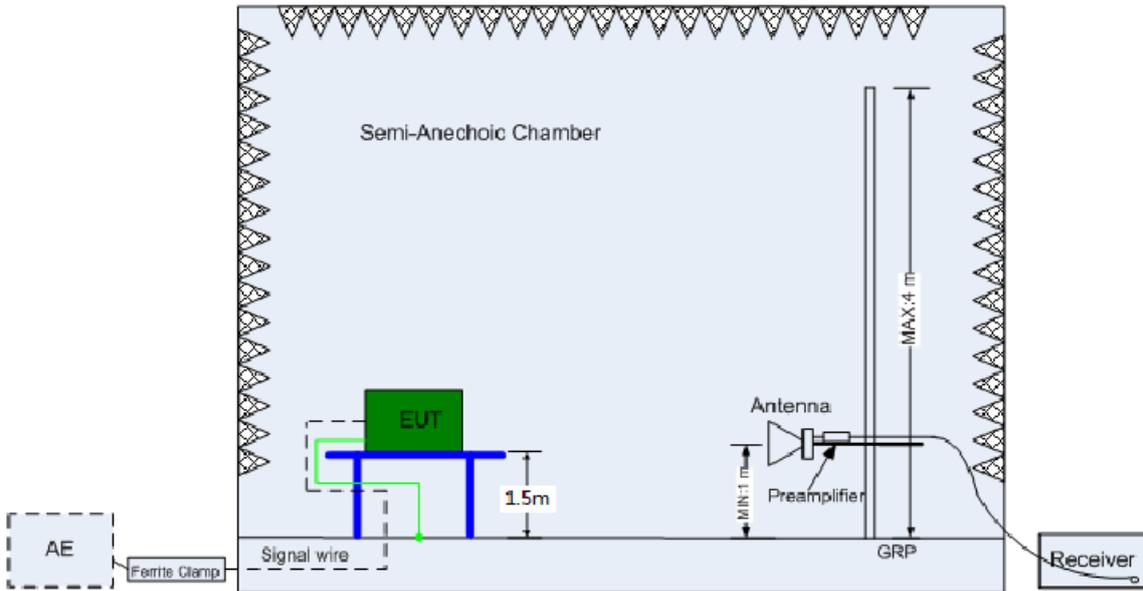
### 4.6.2 Test Setup 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4. The test distance is 3m. The setup is according to ANSI C63.4 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).



(Below 1 GHz)

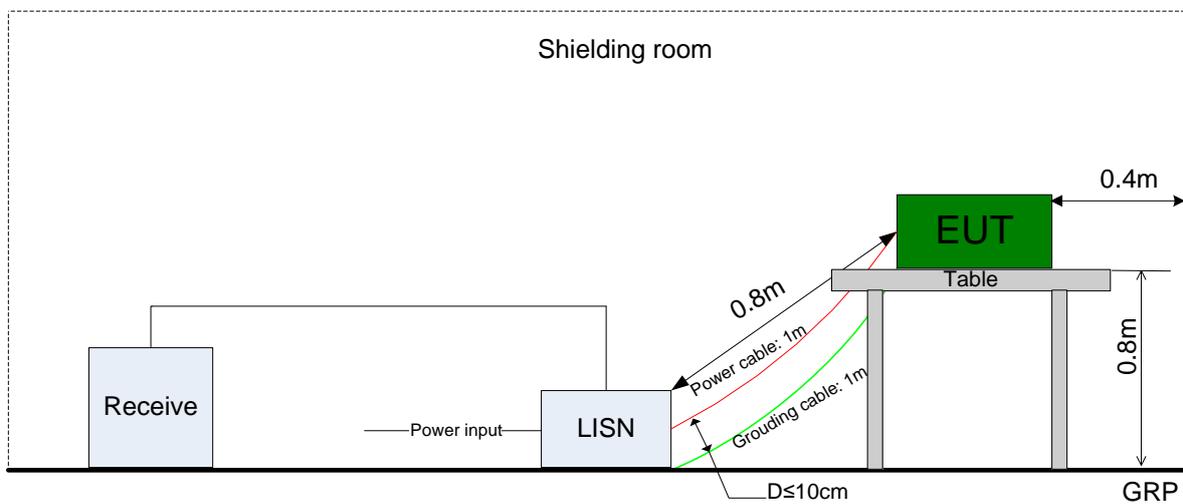


(Above 1 GHz)

### 4.6.3 Test Setup 3

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8 m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.





#### 4.7 Test Conditions

| Test Case   | Test Conditions    |   |
|---|--------------------|---|
|   | Configuration      | Description   |
| DTS (6 dB)<br>Bandwidth   | Measurement Method | FCC KDB 558074 §8.1 Option 2.   |
|   | Test Environment   | NTNV  |
|   | Test Setup         | Test Setup 1  |
|   | EUT Configuration  | 11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_M@Ant1, 11N20_H@Ant1, |
| Occupied<br>Bandwidth   | Measurement Method | FCC KDB 558074 §8.2 Option 2.   |
|   | Test Environment   | NTNV  |
|   | Test Setup         | Test Setup 1  |
|   | EUT Configuration  | 11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_M@Ant1, 11N20_H@Ant1, |
| Maximum<br>Conducted<br>Average Output<br>Power                 | Measurement Method | FCC KDB 558074 §9.2 .2. 4   |
|   | Test Environment   | NTNV  |
|   | Test Setup         | Test Setup 1  |
|   | EUT Configuration  | 11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_M@Ant1, 11N20_H@Ant1, |
| Maximum Power<br>Spectral Density<br>Level                      | Measurement Method | FCC KDB 558074 §10.1 (peak PSD).  |
|   | Test Environment   | NTNV  |
|   | Test Setup         | Test Setup 1  |
|   | EUT Configuration  | 11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_M@Ant1, 11N20_H@Ant1, |
| Band Edges<br>Compliance  | Measurement Method | FCC KDB 558074 §13.0.   |
|   | Test Environment   | NTNV  |
|   | Test Setup         | Test Setup 1  |
|   | EUT Configuration  | 11B_L@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_H@Ant1,                                       |
| Unwanted<br>Emissions into<br>Non-Restricted<br>Frequency Bands | Measurement Method | FCC KDB 558074 §11.0  |
|   | Test Environment   | NTNV  |
|   | Test Setup         | Test Setup 1  |
|   | EUT Configuration  | 11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_M@Ant1, 11N20_H@Ant1, |
| Unwanted<br>Emissions into                                      | Measurement Method | ANSI C63.10; FCC KDB 558074 §12.1, Radiated   |
|   | Test Environment   | NTNV  |



| Test Case                                   | Test Conditions    |  |
|---|--------------------|--|
|   | Configuration      | Description  |
| Restricted<br>Frequency Bands<br>(Radiated) | Test Setup         | Test Setup 2   |
|   | EUT Placement      | <input type="checkbox"/> Flatwise, <input type="checkbox"/> Upright, <input type="checkbox"/> Hung   |
|   | EUT Configuration  | (1) 30 MHz to 1 GHz:<br>11B_L@Ant1 (Worst Conf.).<br>(2) 1 GHz to 3 GHz:<br>11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1,<br>11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1,<br>11N20_L@Ant1, 11N20_M@Ant1, 11N20_H@Ant1,<br>(3) 3 GHz to 18 GHz:<br>11B_L@Ant1 (Worse Conf.), 11B_H@Ant1 (Worse Conf.).<br>(4) 18 GHz to 26.5 GHz:<br>11B_L@Ant1 (Worse Conf.), 11B_H@Ant1 (Worse Conf.). |
| AC Power Line<br>Conducted<br>Emissions     | Measurement Method | AC mains conducted.  |
|   | Test Environment   | NTNV   |
|   | Test Setup         | Test Setup 3   |
|   | EUT Configuration  | 11B_L@Ant1 (Worst Conf.).  |

**5 Main Test Instruments**

| Main Test Equipments                            |              |           |               |            |            |
|---|--------------|-----------|---------------|------------|------------|
| Equipment Name                                  | Manufacturer | Model     | Serial Number | Cal Date   | Cal- Due   |
| Power supply                                    | KEITHLEY     | 2303      | 1342889       | 2015/9/16  | 2017/9/15  |
| Wireless Communication Test set                 | Agilent      | N4010A    | MY49081592    | 2015/10/30 | 2016/10/29 |
| Universal Radio Communication Tester            | R&S          | CMU200    | 123299        | 2015/10/30 | 2016/10/29 |
| Spectrum Analyzer                               | Agilent      | N9020A    | MY52090652    | 2016/6/29  | 2017/6/29  |
| Universal Radio Communication Tester            | R & S        | CMW500    | 126854        | 2016/1/8   | 2017/1/7   |
| Signal Analyzer                                 | R&S          | FSQ31     | 200021        | 2015/10/30 | 2016/10/29 |
| Spectrum Analyzer                               | Agilent      | N9030A    | MY49431698    | 2015/10/30 | 2016/10/29 |
| Temperature Chamber                             | WEISS        | WKL64     | 5.6246E+13    | 2016/1/21  | 2017/1/20  |
| Signal generator                                | Agilent      | E8257D    | MY49281095    | 2015/10/30 | 2016/10/29 |
| Vector Signal Generator                         | R&S          | SMU200A   | 104162        | 2015/10/30 | 2016/10/29 |
| Test receiver                                   | R&S          | ESU26     | 100387        | 2016/6/21  | 2017/6/20  |
| Test receiver                                   | R&S          | ESCI      | 101163        | 2015/11/11 | 2016/11/10 |
| Spectrum analyzer                               | R&S          | FSU3      | 200474        | 2016/5/24  | 2017/5/23  |
| Spectrum analyzer                               | R&S          | FSU43     | 100144        | 2015/6/2   | 2017/6/2   |
| LOOP Antennas(9kHz-30MHz)                       | R&S          | HFH2-Z2   | 100262        | 2015/4/30  | 2017/4/29  |
| LOOP Antennas(9kHz-30MHz)                       | R&S          | HFH2-Z2   | 100263        | 2015/4/30  | 2017/4/29  |
| Trilog Broadband Antenna (30M~3GHz)             | SCHWARZBECK  | VULB 9163 | 9163-490      | 2015/4/30  | 2017/4/29  |
| Trilog Broadband Antenna (30M~3GHz)             | SCHWARZBECK  | VULB 9163 | 9163-520      | 2015/4/30  | 2017/4/29  |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S          | HF907     | 100304        | 2015/4/30  | 2017/4/29  |
| double ridged horn antenna (0.8G-18GHz)         | R&S          | HF907     | 100305        | 2015/4/30  | 2017/4/29  |



| Pyramidal Horn Antenna(18GHz-26.5GHz) | ETS-Lindgren  | Sep-60  | 5140299      | 2015/7/15 | 2017/7/14 |
|---------------------------------------|---------------|---------|--------------|-----------|-----------|
| Artificial Main Network               | R&S           | ENV4200 | 100134       | 2016/6/2  | 2017/6/1  |
| Line Impedance Stabilization Network  | R&S           | ENV216  | 100382       | 2016/6/2  | 2017/6/1  |
| Signal Generator                      | Agilent       | E4438C  | MY49071538   | 2016/3/1  | 2017/3/1  |
| Software Information                  |               |         |              |           |           |
| Test Item                             | Software Name |         | Manufacturer | Version   |           |
| RE                                    | EMC32         |         | R&S          | V9.25.0   |           |
| CE                                    | EMC32         |         | R&S          | V9.25.0   |           |
| RSE                                   | EMC32         |         | R&S          | V8.40.0   |           |

END