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CNAS L0310



# FCC

# RF Test Report

**Product Name: Smart Phone**

**Model Number: MHA-L29**

**Report No: SYBH(Z-RF)028072016-2003**

**FCC ID: QISMHA-L29**

**Reliability Laboratory of Huawei Technologies Co.**

**(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)**

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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.
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 test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
9. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named as “Global Compliance and Testing Center of Huawei Technologies Co., Ltd”, the both names have coexisted since 2009.



**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:** 2016-08-04  
**Start Date of Test:** 2016-08-04  
**End Date of Test:** 2016-08-20

**Test Result:** Pass

|                                     |            |             |                    |
|-------------------------------------|------------|-------------|--------------------|
| <b>Approved by Senior Engineer:</b> | 2016-08-31 | Roger Zhang | <i>Roger Zhang</i> |
|                                     | Date       | Name        | Signature          |

|                     |            |           |                  |
|---------------------|------------|-----------|------------------|
| <b>Prepared by:</b> | 2016-08-31 | Wu Tingsi | <i>Wu Tingsi</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 PUBLIC NOTICE DA 00-705 Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems (Released March 30, 2000)

ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

### 1.2 Test Location

Test Location : 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: 19.5 to 25 °C

Ambient Relative Humidity: 45 to 55 %

Atmospheric Pressure: Not applicable

## 2 Test Summary

| Test Item                                                                                   | FCC Part No.        | Requirements                                                                                                                           | Test Result | Verdict (NOTE) |
|---------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|
| 20dB Emission Bandwidth (EBW)                                                               | 15.247(a)(1)        | No limit.                                                                                                                              | Appendix A  | Pass           |
| Carrier Frequency Separation                                                                | 15.247(a)(1)        | $\geq \text{MAX} \{25\text{kHz}, \text{IFF}\{\text{output power} \leq 125\text{mW}, 2/3 \times 20\text{dB EBW}, 20\text{dB EBW}\}\}$ . | Appendix B  | Pass           |
| Number of Hopping Channel                                                                   | 15.247(a)(1)(iii)   | $\geq 15$ channels.                                                                                                                    | Appendix C  | Pass           |
| Time of Occupancy (Dwell Time)                                                              | 15.247(a)(1)(iii)   | $< 0.4\text{s}$ within a period of $(0.4\text{s} \times \text{hopping number})$ .                                                      | Appendix D  | Pass           |
| Maximum Peak Conducted Output Power                                                         | 15.247(b)(1)        | $< 1\text{ W}$ if using $\geq 75$ non-overlapping channels.                                                                            | Appendix E  | Pass           |
| Band edge spurious emission                                                                 | 15.247(d)           | $< -20\text{ dBm}/100\text{ kHz}$ if total peak power $\leq$ power limit.                                                              | Appendix F  | Pass           |
| Conducted RF Spurious Emission                                                              |                     |                                                                                                                                        | Appendix G  | Pass           |
| Radiated Emissions in the Restricted Bands                                                  | 15.247(d)<br>15.209 | FCC Part 15.209 field strength limit;                                                                                                  | Appendix H  | Pass           |
| AC Power Line Conducted Emissions                                                           | 15.207              | FCC Part 15.207 conducted limit;                                                                                                       | Appendix I  | Pass           |
| NOTE1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested". |                     |                                                                                                                                        |             |                |
| NOTE 2: The Appendixes please see No.: SYBH(Z-RF)028072016-2003-A of Appendix for Bluetooth |                     |                                                                                                                                        |             |                |

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

#### 3.1 General Description

MHA-L29 is subscriber equipment in the LTE/ WCDMA/GSM system. The LTE frequency band is Band I,Band II,Band III,Band IV,Band V, Band VII,Band VIII, Band VIII,Band XII,BandXVII, Band XVIII ,Band XIX, Band XX, Band XXVI, Band XXVIII, Band XXIX,Band XXXVIII,BandXXXIX, Band XL and Band XLI. The HSUPA/HSDPA/UMTS frequency band is Band I, Band II, Band IV, Band V, Band VI, Band VIII and Band XIX, The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/ WCDMA /GSM protocol processing, voice, video, MMS service, GPS, AGPS,NFC and WIFI etc. Externally it provides earphone port (to provide voice service) and dual USIM card interfaces. 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: Only Bluetooth test data included in this report.

#### 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  | HLIAMHAM         | M300-L29C900B094 |

### 3.2.2 Sub-Assembly

| Sub-Assembly        |              |                               |                                                                                                                                                                                                                                                        |
|---------------------|--------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sub-Assembly Name   | Model        | Manufacturer                  | Description                                                                                                                                                                                                                                            |
| Adapter             | HW-050450B00 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.75A<br>Output Voltage: 5V  2A/4.5A<br>Rated Power: 10W/22.5W                                                                     |
| Adapter             | HW-050450E00 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.75A<br>Output Voltage: 5V  2A/4.5A<br>Rated Power: 10W/22.5W                                                                     |
| Adapter             | HW-050450U00 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.75A<br>Output Voltage: 5V  2A/4.5A<br>Rated Power: 10W/22.5W                                                                     |
| Adapter             | HW-050450A00 | Huawei Technologies Co., Ltd. | Input Voltage: ~100-240V 50/60Hz 0.75A<br>Output Voltage: 5V  2A/4.5A<br>Rated Power: 10W/22.5W                                                                     |
| Rechargeable Li-ion | HB396689ECW  | Huawei Technologies Co., Ltd. | Rated capacity: 3900mAh<br>Nominal Voltage:  +3.82V<br>Charging Voltage:  +4.4V |

### 3.3 Technical Description

| Characteristics       | Description                                                |                                                                                                                                                           |
|-----------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX/RX Operating Range | 2400-2483.5 MHz band                                       | $f_c = 2402 \text{ MHz} + N * 1 \text{ MHz}$ , where:<br>- $f_c$ = "Operating Frequency" in MHz,<br>- $N$ = "Channel Number" with the range from 0 to 78. |
| Modulation Type       | Carrier                                                    | Frequency Hopping Spread Spectrum (FHSS)                                                                                                                  |
|                       | Digital                                                    | GFSK, $\pi/4$ -DQPSK, 8DPSK                                                                                                                               |
| Emission Designator   | GFSK: 1M02FXD<br>$\pi/4$ -DQPSK: 1M35GXD<br>8DPSK: 1M35GXD |                                                                                                                                                           |
| Bluetooth Power Class | Class 1                                                    |                                                                                                                                                           |

## 4 General Test Conditions / Configurations

### 4.1 EUT Configurations

#### 4.1.1 General Configurations

| Configuration       | Description                                                                                                                                                                                                              |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Antenna Ports  | Until otherwise specified, <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.                                                                                                             |

#### 4.1.2 Customized Configurations

| # EUT Conf.   | Signal Description                                         | Operating Frequency  |
|---------------|------------------------------------------------------------|----------------------|
| TM1_DH5_Hop   | GFSK modulation, package type DH5, hopping on.             | ---                  |
| TM1_DH5_Ch0   | GFSK modulation, package type DH5, hopping off.            | Ch No. 0 / 2402 MHz  |
| TM1_DH5_Ch39  | GFSK modulation, package type DH5, hopping off.            | Ch No. 39 / 2441 MHz |
| TM1_DH5_Ch78  | GFSK modulation, package type DH5, hopping off.            | Ch No. 78 / 2480 MHz |
| TM2_2DH5_Hop  | $\pi/4$ -DQPSK modulation, package type 2DH5, hopping on.  | ---                  |
| TM2_2DH5_Ch0  | $\pi/4$ -DQPSK modulation, package type 2DH5, hopping off. | Ch No. 0 / 2402 MHz  |
| TM2_2DH5_Ch39 | $\pi/4$ -DQPSK modulation, package type 2DH5, hopping off. | Ch No. 39 / 2441 MHz |
| TM2_2DH5_Ch78 | $\pi/4$ -DQPSK modulation, package type 2DH5, hopping off. | Ch No. 78 / 2480 MHz |
| TM3_3DH5_Hop  | 8DPSK modulation, package type 3DH5, hopping on.           | ---                  |
| TM3_3DH5_Ch0  | 8DPSK modulation, package type 3DH5, hopping off.          | Ch No. 0 / 2402 MHz  |
| TM3_3DH5_Ch39 | 8DPSK modulation, package type 3DH5, hopping off.          | Ch No. 39 / 2441 MHz |
| TM3_3DH5_Ch78 | 8DPSK modulation, package type 3DH5, hopping off.          | Ch No. 78 / 2480 MHz |

## 4.2 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           |

## 4.3 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 **MHA-L29** are **permanently attached**.  
There are no provisions for connection to an external antenna.

### Conclusion:

The **Smart Phone FCC ID: QISMHA-L29** unit complies with the requirement of §15.203.

### Ch. Frequency (MHz)

| Ch. | Frequency (MHz) |
|-----|-----------------|
| 00  | 2402            |
| .   | .               |
| .   | .               |
| 39  | 2441            |
| .   | .               |
| .   | .               |
| 78  | 2480            |

### Frequency/ Channel Operations

## 4.4 Description of tests

### 4.4.1 Bandwidth measurement

- (a) Connect EUT test port to universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measuring frequency number, finally test the bandwidth with universal communication tester.

### 4.4.2 Carrier frequency separation measurement

- (a) Connect EUT test port to spectrum analyzer and universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

### 4.4.3 Number of hopping channel

- (a) Connect EUT test port to spectrum analyzer and universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
- (c) Count the quantity of peaks to get the number of hopping channels.

### 4.4.4 Time of occupancy

- (a) Connect test port of EUT to spectrum analyzer and universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function.
- (c) Set the span of spectrum analyzer to 0 Hz, and set the resolution bandwidth to 1 MHz and the video bandwidth to 1 MHz, then get the time domain measured diagram. and set sweep time to 2 times of one burst occupancy time, and measure the time of occupancy of one burst.
- (d) Set the resolution bandwidth to 1 MHz and the video bandwidth to 3 MHz, and set the sweep time to a period (0.4 seconds multiplied by the number of hopping channels employed), and count the number of the bursts.
- (e) Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts

### 4.4.5 Peak output power

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

#### 4.4.6 Band edge spurious emission

- (a) Connect EUT test port to spectrum analyzer and universal communication tester
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.
- (d) Switch on the frequency hopping function, and repeat above measurement.

#### 4.4.7 Conducted RF Spurious

- (a) Connect EUT test port to spectrum analyzer and universal communication tester
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted spurious separately.
- (d) Switch on the frequency hopping function, and repeat the above measurement.

#### 4.4.8 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 transmits maximum output power at 2.4GHz and switch off frequency hopping function.

Measurement bandwidth: 30 MHz - 1000 MHz: 120 kHz

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

#### 4.4.9 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.

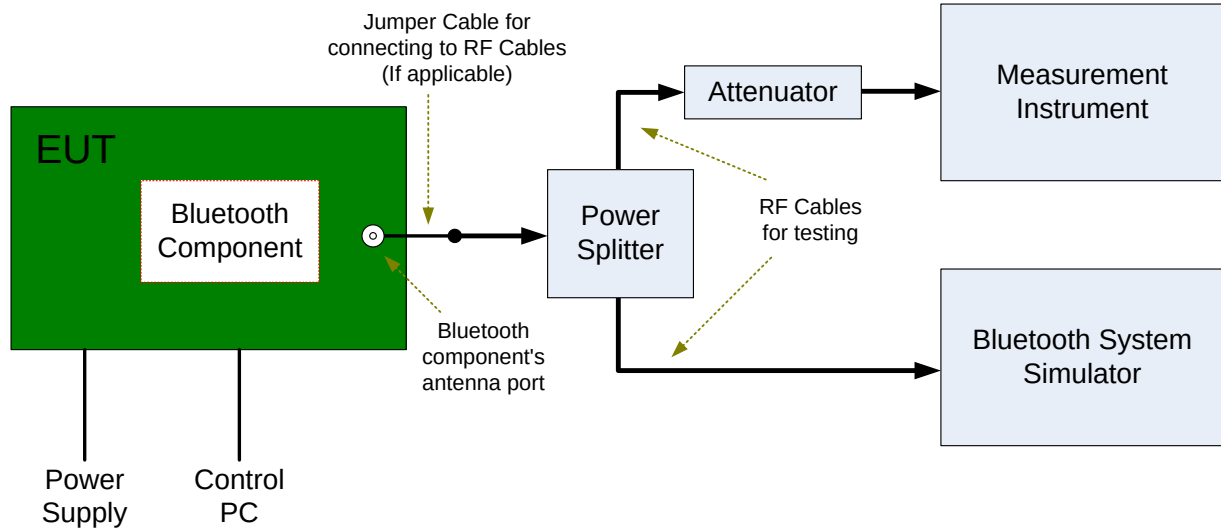
The EUT communicates with the BTS simulator through Air interface, the BTS simulator controls the EUT to transmit the maximum power which defined in specification of product. The EUT operated on the typical channel.

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

## 4.5 Test Setups

### 4.5.1 Test Setup 1

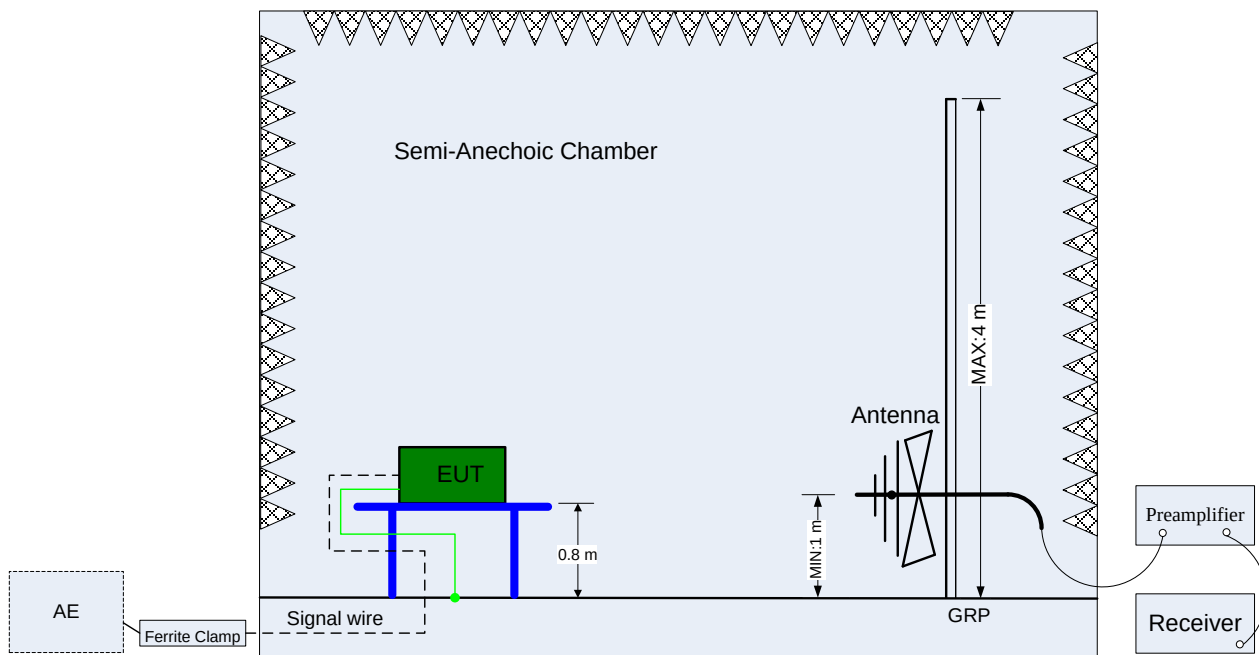
The Bluetooth component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by Bluetooth System Simulator and/or PC/software to emit the specified signals for the purpose of measurements.



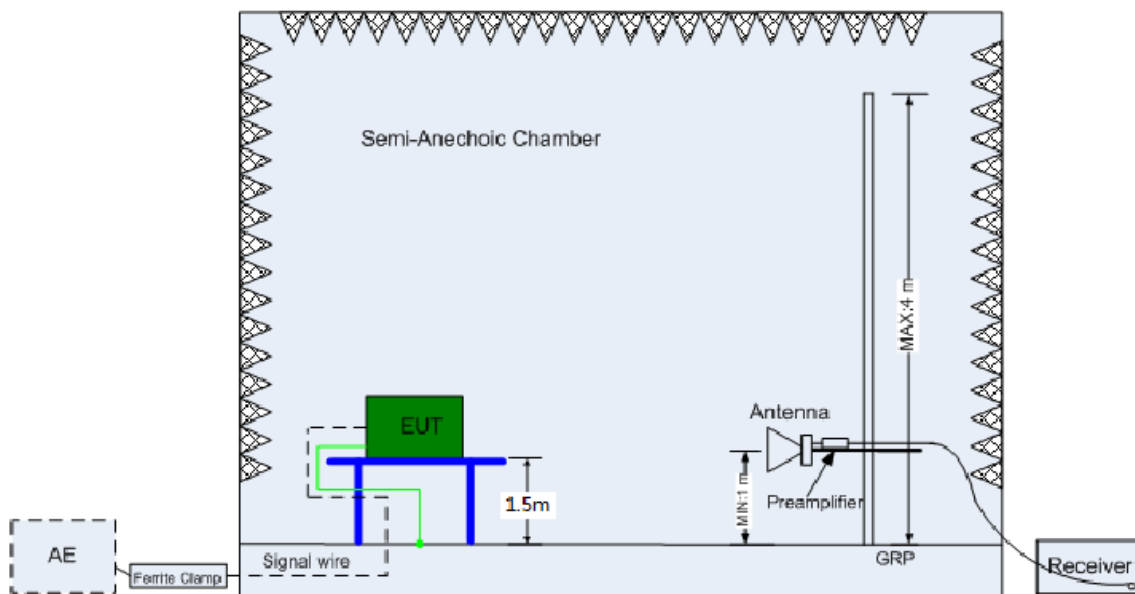
### 4.5.2 Test Setup 2

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)

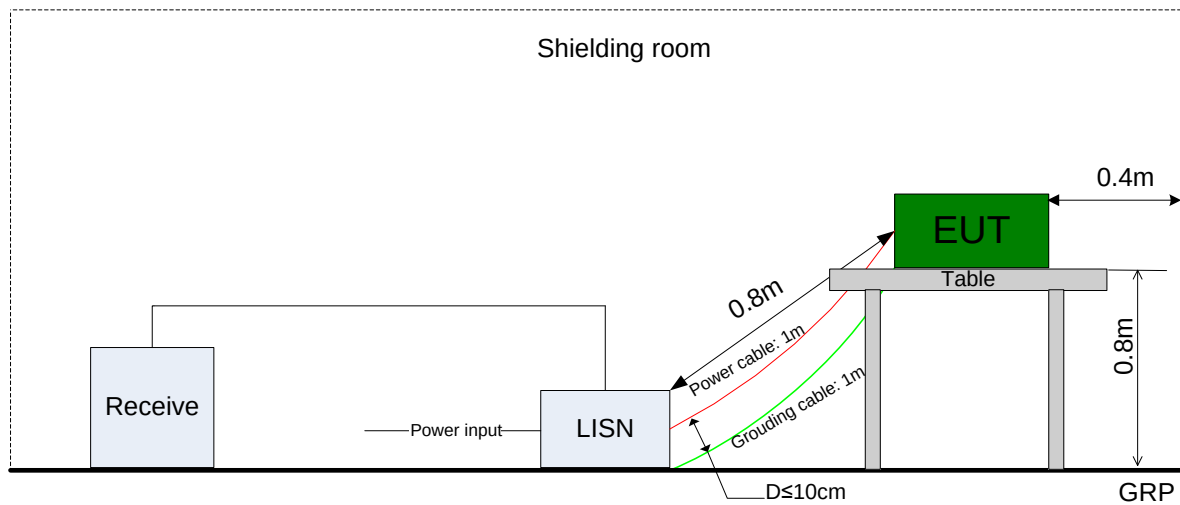


(Above 1 GHz)

### 4.5.3 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 0.8m 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.



#### 4.6 Test Conditions

| Test Case                           | Test Conditions |                                                                                                                                  |
|-------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------|
|                                     | Configuration   | Description                                                                                                                      |
| 20dB Emission Bandwidth (EBW)       | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |
|                                     | Test Setup      | Test Setup 1                                                                                                                     |
|                                     | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78. |
| Carrier Frequency Separation        | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |
|                                     | Test Setup      | Test Setup 1                                                                                                                     |
|                                     | EUT Conf.       | TM1_DH5_Hop, TM2_2DH5_Hop, TM3_3DH5_Hop.                                                                                         |
| Number of Hopping Channel           | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |
|                                     | Test Setup      | Test Setup 1                                                                                                                     |
|                                     | EUT Conf.       | TM1_DH5_Hop, TM2_2DH5_Hop, TM3_3DH5_Hop.                                                                                         |
| Time of Occupancy (Dwell Time)      | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |
|                                     | Test Setup      | Test Setup 1                                                                                                                     |
|                                     | EUT Conf.       | TM1_DH5_Ch39, TM2_2DH5_Ch39, TM3_3DH5_Ch39.                                                                                      |
| Maximum Peak Conducted Output Power | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |
|                                     | Test Setup      | Test Setup 1                                                                                                                     |
|                                     | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78. |
| Band edge spurious emission         | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |
|                                     | Test Setup      | Test Setup 1                                                                                                                     |
|                                     | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch78.                                             |
| Conducted RF Spurious Emission      | Meas. Method    | DA 00-705                                                                                                                        |
|                                     | Test Env.       | NTNV                                                                                                                             |

| Test Case                                        | Test Conditions                         |                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                              |
|--------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | Configuration                           | Description                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                              |
|                                                  | Test Setup                              | Test Setup 1                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                              |
|                                                  | EUT Conf.                               | TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78,<br>TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78,<br>TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.                                                                                                                                                                                                                                                        |                                                                                                                                              |
|                                                  | Meas. Method                            | DA 00-705, C63.4, C63.10.<br>(1) 30 MHz to 1 GHz:<br>Pre:        RBW = 100 kHz; VBW = 300 kHz; Det. = Peak.<br>Final:      RBW = 120 kHz; Det. = CISPR Quasi-Peak.<br>(2) 1 GHz to 26.5 GHz:<br>Average:    RBW = 1 MHz; VBW = 10 Hz; Det. = Peak; Sweep-time = Auto;<br>Trace = Single.<br>Peak:        RBW = 1 MHz; VBW = 3 MHz; Det. = Peak; Sweep-time = Auto;<br>Trace ≥ Max Hold * 100. |                                                                                                                                              |
| Radiated Emissions<br>in the Restricted<br>Bands | Test Env.                               | NTNV                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                              |
|                                                  | Test Setup                              | Test Setup 2                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                              |
|                                                  | EUT Conf.                               | 30 MHz -1 GHz                                                                                                                                                                                                                                                                                                                                                                                 | TM1_DH5_Ch0 (Worst Conf.).                                                                                                                   |
|                                                  |                                         | 1-3 GHz                                                                                                                                                                                                                                                                                                                                                                                       | TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78,<br>TM2_2DH5_Ch0, TM2_2DH5_Ch39,<br>TM2_2DH5_Ch78,<br>TM3_3DH5_Ch0, TM3_3DH5_Ch39,<br>TM3_3DH5_Ch78. |
|                                                  |                                         | 3-18 GHz                                                                                                                                                                                                                                                                                                                                                                                      | TM1_DH5_Ch0 (Worse Conf.),<br>TM1_DH5_Ch39 (Worse Conf.),<br>TM1_DH5_Ch78 (Worse Conf.).                                                     |
|                                                  |                                         | 18-26.5 GHz                                                                                                                                                                                                                                                                                                                                                                                   | TM1_DH5_Ch0 (Worst Conf.).                                                                                                                   |
|                                                  | AC Power Line<br>Conducted<br>Emissions | Meas. Method                                                                                                                                                                                                                                                                                                                                                                                  | AC mains conducted.<br>Pre:        RBW = 10 kHz; Det. = Peak.<br>Final:      RBW = 9 kHz; Det. = CISPR Quasi-Peak & Average.                 |
| Test Env.                                        | NTNV                                    |                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                              |
| Test Setup                                       | Test Setup 3                            |                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                              |
| EUT Conf.                                        | TM1_DH5_Ch39.                           |                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                              |

## 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  |
| <b>Software Information</b>           |               |         |              |           |           |
| Test Item                             | Software Name |         | Manufacturer |           | Version   |
| RE                                    | EMC32         |         | R&S          |           | V9.25.0   |
| CE                                    | EMC32         |         | R&S          |           | V9.25.0   |

## 6 Appendixes

| Appendix No.               | Description            |
|----------------------------|------------------------|
| SYBH(Z-RF)028072016-2003-A | Appendix for Bluetooth |

END