



# FCC&ISED

## RF Test Report

Product Name: Smart Phone

Model Number: ELE-L29/ELE-L09

Report No.: SYBH(Z-RF)20181114019001-2003

FCC ID : QISELE-LX9

| Authorized | APPROVED<br>(Lab Manager) | PREPARED<br>(Test Engineer) |
|------------|---------------------------|-----------------------------|
| BY         | He Hao                    | zhou ling bo                |
| DATE       | 2018-12-27                | 2018-12-27                  |

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※ ※ Notice ※ ※

1. The Reliability Laboratory of Huawei Technologies Co., Ltd has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01
2. The Laboratory of Sporton International (Shenzhen) Inc has passed the accreditation by National Voluntary Laboratory Accreditation Program (NVLAP). The NVLAP LAB CODE is 600156-0.
3. The Reliability Laboratory of Huawei Technologies Co., Ltd has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.
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5. The Reliability Laboratory of Huawei Technologies Co., Ltd has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
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**MODIFICATION RECORD**

| No. | Report No                | Modification Description |
|-----|--------------------------|--------------------------|
| 1   | SYBH(Z-RF)20181114019001 | First release.           |

**DECLARATION**

| Type                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Multiple<br>Models<br>Applications | <p><input type="checkbox"/> The present report applies to single model.</p> <p><input checked="" type="checkbox"/> The present report applies to several models. The practical measurements are performed with the model <u>ELE-L29</u>.</p> <p>These models utilize the similar radio design, shielding, interface, physical layout and so on. The differences and modifications between these models are declared by the applicant and showed in General Description</p> <p>All others between these models are identical.</p> <p>The present report only presents the worst test case of all modes, see relevant test results for detailed.</p> |

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## 2 General Information

### 2.1 Test standard/s

|                 |                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Applied Rules : | 47 CFR FCC Part 2, Subpart J<br>47 CFR FCC Part 15, Subpart C                                                                     |
| Test Method :   | FCC KDB 558074 D01 DTS Meas Guidance v05<br>ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices. |

### 2.2 Test Environment

|                            |                |          |                                  |
|----------------------------|----------------|----------|----------------------------------|
| Temperature :              | TN             | 15 to 30 | °C during room temperature tests |
| Ambient Relative Humidity: | 20 to 85 %     |          |                                  |
| Atmospheric Pressure:      | Not applicable |          |                                  |
| Power supply :             | VL             | 3.6      | V                                |
|                            | VN             | 3.82     | V DC by Battery                  |
|                            | VH             | 4.35     | V                                |

NOTE 1: 1) VN= nominal voltage, VL= low extreme test voltage, VH= High extreme test voltage;

TN= normal temperature, TL= low extreme test temperature, TH= High extreme test temperature.

NOTE 2: The values used in the test report may be stringent than the declared.

### 2.3 Test Laboratories

|                                             |                                                                                                                                   |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Test Location 1 :                           | RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.                                                                           |
| Address of Test Location 1 :                | No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C                                          |
| Sub-contracted Test Location 1 :            | Sporton International (Shenzhen) Inc.                                                                                             |
| Address of Sub-contracted Test Location 1 : | No.3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.China |

## 2.4 Applicant and Manufacturer

|                |                                                                                                                             |
|----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Company Name : | HUAWEI TECHNOLOGIES CO., LTD                                                                                                |
| Address :      | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |

## 2.5 Application details

|                         |            |
|-------------------------|------------|
| Date of Receipt Sample: | 2018-11-22 |
| Start of test:          | 2018-11-22 |
| End of test:            | 2018-12-25 |

## 3 Test Summary

| Test Item                                       | FCC Rule No.               | Requirements                                                                                                            | Test Result | Verdict                                      | Testing location   |
|-------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------|--------------------|
| DTS (6 dB)<br>Bandwidth                         | 15.247(a)(2)               | $\geq 500$ kHz.                                                                                                         | Appendix A  | Refer to NO.<br>SYBH(Z-RF)2018111<br>5007001 | Test<br>Location 1 |
| Occupied<br>Bandwidth                           | ---                        | No limit.                                                                                                               | Appendix B  | Refer to NO.<br>SYBH(Z-RF)2018111<br>5007001 | Test<br>Location 1 |
| Duty Cycle                                      | KDB<br>558074 D01<br>(6.0) | No limit.                                                                                                               | Appendix C  | Refer to NO.<br>SYBH(Z-RF)2018111<br>5007001 | Test<br>Location 1 |
| Maximum<br>Conducted<br>Average Output<br>Power | 15.247(b)(3)               | FCC: For<br>directional gain:<br>Conducted $< 30$<br>dBm – (G[dBi] – 6<br>[dB]); Otherwise:<br>Conducted $< 30$<br>dBm, | Appendix D  | Refer to NO.<br>SYBH(Z-RF)2018111<br>5007001 | Test<br>Location 1 |
| Maximum Power<br>Spectral Density<br>Level      | 15.247(e)                  | Conducted $< 8$<br>dBm/3 kHz.                                                                                           | Appendix E  | Refer to NO.<br>SYBH(Z-RF)2018111<br>5007001 | Test<br>Location 1 |
| Band Edges<br>Compliance                        | 15.247(d)                  | $< -20$ dBm/100<br>kHz if total peak<br>power $\leq$ power                                                              | Appendix F  | Refer to NO.<br>SYBH(Z-RF)2018111<br>5007001 | Test<br>Location 1 |

| Test Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | FCC Rule No.                    | Requirements                          | Test Result | Verdict                                | Testing location               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------|-------------|----------------------------------------|--------------------------------|
| Unwanted Emissions into Non-Restricted Frequency Bands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 | limit.                                | Appendix G  | Refer to NO. SYBH(Z-RF)2018111 5007001 | Test Location 1                |
| Unwanted Emissions into Restricted Frequency Bands (Radiated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15.247(d)<br>15.209<br>(NOTE 1) | FCC Part 15.209 field strength limit; | Appendix H  | Refer to NO. SYBH(Z-RF)2018111 5007001 | Sub-contracted Test Location 1 |
| AC Power Line Conducted Emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15.207                          | FCC Part 15.207 conducted limit;      | Appendix I  | Refer to NO. SYBH(Z-RF)2018111 5007001 | Test Location 1                |
| <p>Note1: According to KDB 558074 D01, antenna-port conducted measurements are acceptable as an alternative to 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.</p> <p>Note2: The transmitter has an integral PCB loop antenna that is enclosed within the housing of the EUT and meets the requirements of FCC 15.203</p> |                                 |                                       |             |                                        |                                |

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

### 4.1 General Description

ELE-L29/ELE-L09 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 B6 and B8 and B19. The ELE-L29/ELE-L09 LTE frequency band is B1 and B2 and B3 and B4 and B5 and B6 and B7 and B8 and B9 and B12 and B17 and B18 and B19 and B20 and B26 and B28 and B32 and B34 and B38 and B39 and B41. The ELE-L29 LTE frequency band for intra-band carrier aggregation uplink operation band is CA\_1C and CA\_2C and CA\_3C and CA\_7C and CA\_38C and CA\_39C and CA\_41C. 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. ELE-L29 is dual SIM smart phone. ELE-L09 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.

The difference between model ELE-L04 and model ELE -L29 is show in the below table.

|                      | Model            | ELE-L04                                                                  | ELE-L29                                                             |
|----------------------|------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
| Licensed Frequency   | LTE BAND         | FCC Band:<br>B2/B4/<br>B5/B7/B12/B17/B26/B38/ B41<br>(2535~2655MHz) /B66 | FCC Band:<br>B2/B4/<br>B5/B7/B12/B17/B26/B38/ B41<br>(2535~2655MHz) |
|                      | UMTS BAND        | FCC Band:<br>B2/B4/B5                                                    | FCC Band:<br>B2/B4/B5                                               |
|                      | GSM              | FCC Band:<br>B2/B5                                                       | FCC Band:<br>B2/B5                                                  |
|                      | IC               | the same                                                                 | the same                                                            |
|                      | Antenna          | the same                                                                 | the same                                                            |
|                      | NFC              | the same                                                                 | the same                                                            |
| Unlicensed Frequency | Bluetooth        | the same                                                                 | the same                                                            |
|                      | 2.4G Wi-Fi       | the same                                                                 | the same                                                            |
|                      | IC               | the same                                                                 | the same                                                            |
|                      | Antenna          | the same                                                                 | the same                                                            |
| Hardware             | Ram / Rom        | the same                                                                 | the same                                                            |
|                      | Camera           | the same                                                                 | the same                                                            |
|                      | PCB              | the same                                                                 | the same                                                            |
|                      | USB Port         | the same                                                                 | the same                                                            |
|                      | SIM              | one                                                                      | two                                                                 |
|                      | Hardware version | HL1ELLEM                                                                 | HL1ELLEM                                                            |
| RF                   | RF circuit       | The hardware channel of LTE                                              | The hardware channel of LTE                                         |

|            |                  |                                      |                                      |
|------------|------------------|--------------------------------------|--------------------------------------|
|            |                  | B2/4/7(include CA band) is different | B2/4/7(include CA band) is different |
| Appearance | Dimension        | the same                             | the same                             |
|            | Color            | different                            | different                            |
| Accessory  | Battery          | the same                             | the same                             |
|            | External Charger | the same                             | the same                             |
|            | USB label        | the same                             | the same                             |
|            | Earphone         | the same                             | the same                             |

Note1: Only Bluetooth BLE test data included in this report.

Note2: We do not test Bluetooth BLE of ELE-L29/ELE-L09, all test data can refer to No. SYBH(Z-RF)20181115007001 of ELE-L04(FCC ID:QISELE-L04).

## 4.2 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.

### 4.2.1 Board

| Board       |                           |                  |
|-------------|---------------------------|------------------|
| Description | Software Version          | Hardware Version |
| Main Board  | 5.0.1.73 (SP2C432E73R1P6) | HL1ELLEM         |

### 4.2.2 Sub- Assembly

| Sub-Assembly      |              |                              |                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|--------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sub-Assembly Name | Model        | Manufacturer                 | Description                                                                                                                                                                                                                                                                                                                                               |
| Adapter           | HW-050450B00 | Huawei Technologies Co.,Ltd. | Input Voltage:100V-240V~50/60Hz, 0.75A<br>Output Voltage: 5V  2A OR4.5V  5A<br>OR 5V  4.5A |
| Adapter           | HW-050450E00 | Huawei Technologies Co.,Ltd. | Input Voltage:100V-240V~50/60Hz, 0.75A<br>Output Voltage: 5V  2A OR4.5V  5A<br>OR 5V  4.5A |
| Adapter           | HW-050450U00 | Huawei Technologies Co.,Ltd. | Input Voltage:100V-240V~50/60Hz, 0.75A<br>Output Voltage: 5V  2A OR4.5V  5A<br>OR 5V  4.5A |
| Adapter           | HW-050450A00 | Huawei Technologies Co.,Ltd. | Input Voltage:100V-240V~50/60Hz, 0.75A<br>Output Voltage: 5V  2A OR4.5V  5A<br>OR 5V  4.5A |
| Adapter           | HW-050450E01 | Huawei Technologies          | Input Voltage:100V-240V~50/60Hz, 0.75A<br>Output Voltage: 5V  2A OR4.5V  5A                                                                                                     |

| Sub-Assembly           |              |                              |                                                                                                                                                                                                                                                                                                                                               |
|------------------------|--------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sub-Assembly Name      | Model        | Manufacturer                 | Description                                                                                                                                                                                                                                                                                                                                   |
|                        |              | Co.,Ltd.                     | OR 5V  4.5A                                                                                                                                                                                                                                                  |
| Adapter                | HW-050450A01 | Huawei Technologies Co.,Ltd. | Input Voltage:100V-240V~50/60Hz, 0.75A<br>Output Voltage: 5V  2A OR4.5V  5A<br>OR 5V  4.5A |
| Li-ion Polymer Battery | HB436380ECW  | Huawei Technologies Co.,Ltd. | Rated capacity: 3550mAh<br>Nominal Voltage: +3.85V<br>Charging Voltage: +4.43V                                                                                                                                                                                                                                                                |

### 4.3 Technical Description

NOTE: For the detailed technical descriptions, see the applicant/manufacturer's specifications or user manual.

| Characteristics       | Description                                        |                                                                                                                                                                                                                                   |
|-----------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX/RX Operating Range | 2400-2483.5 MHz band                               | $fc = 2402 \text{ MHz} + N * 2 \text{ MHz}$ , where:<br>- $fc$ = "Operating Frequency" in MHz,<br>- $N$ = "Channel Number" with the range from 0 to 39.                                                                           |
| Modulation Type       | Digital                                            | GFSK,                                                                                                                                                                                                                             |
| Emission Designator   | GFSK for BT 4.2: 1M03FXD; GFSK for BT 5.0: 2M07FXD |                                                                                                                                                                                                                                   |
| Bluetooth Power Class | Class 1                                            |                                                                                                                                                                                                                                   |
| Antenna               | Description                                        | Isotropic Antenna                                                                                                                                                                                                                 |
|                       | Type                                               | <input checked="" type="checkbox"/> Integral<br><input type="checkbox"/> External<br><input type="checkbox"/> Dedicated                                                                                                           |
|                       | Ports                                              | <input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3                                                                                                                         |
|                       | Gain                                               | -2.56dBi (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 type="checkbox"/> External DC mains,<br><input checked="" type="checkbox"/> Battery,<br><input type="checkbox"/> AC/DC Adapter,<br><input type="checkbox"/> Powered over Ethernet (PoE).<br><input type="checkbox"/> Other |

## 5 General Test Conditions / Configurations

### 5.1 EUT Configurations

#### 5.1.1 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.                                                                                                                   |

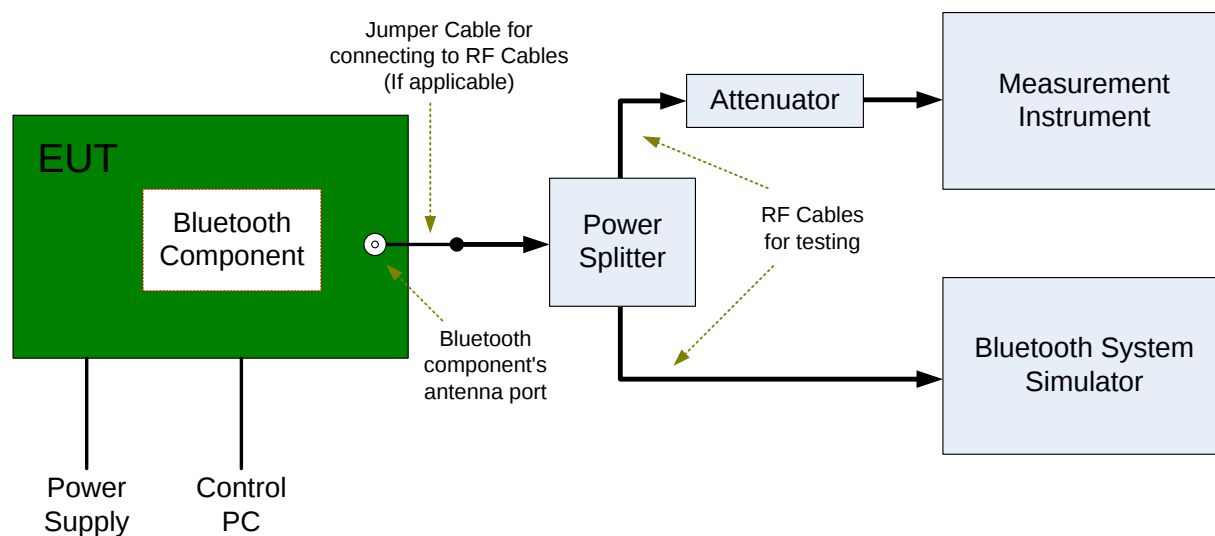
#### 5.1.2 Customized Configurations

| # EUT Conf. | Signal Description                                         | Operating Frequency  | Duty cycle |
|-------------|------------------------------------------------------------|----------------------|------------|
| TM1_Ch0     | GFSK for BT 4.2 modulation, package type DH5, hopping off. | Ch No. 0 / 2402 MHz  | 60.8%      |
| TM1_Ch19    | GFSK for BT 4.2 modulation, package type DH5, hopping off. | Ch No. 19 / 2440 MHz | 60.70%     |
| TM1_Ch39    | GFSK for BT 4.2 modulation, package type DH5, hopping off. | Ch No. 39 / 2480 MHz | 60.8%      |
| TM2_Ch0     | GFSK for BT 5.0 modulation, package type DH5, hopping off. | Ch No. 0 / 2402 MHz  | 56.90%     |
| TM2_Ch19    | GFSK for BT 5.0 modulation, package type DH5, hopping off. | Ch No. 19 / 2440 MHz | 56.90%     |
| TM2_Ch39    | GFSK for BT 5.0 modulation, package type DH5, hopping off. | Ch No. 39 / 2480 MHz | 56.93%     |

## 5.2 Test Setups

### 5.2.1 Test Setup 1

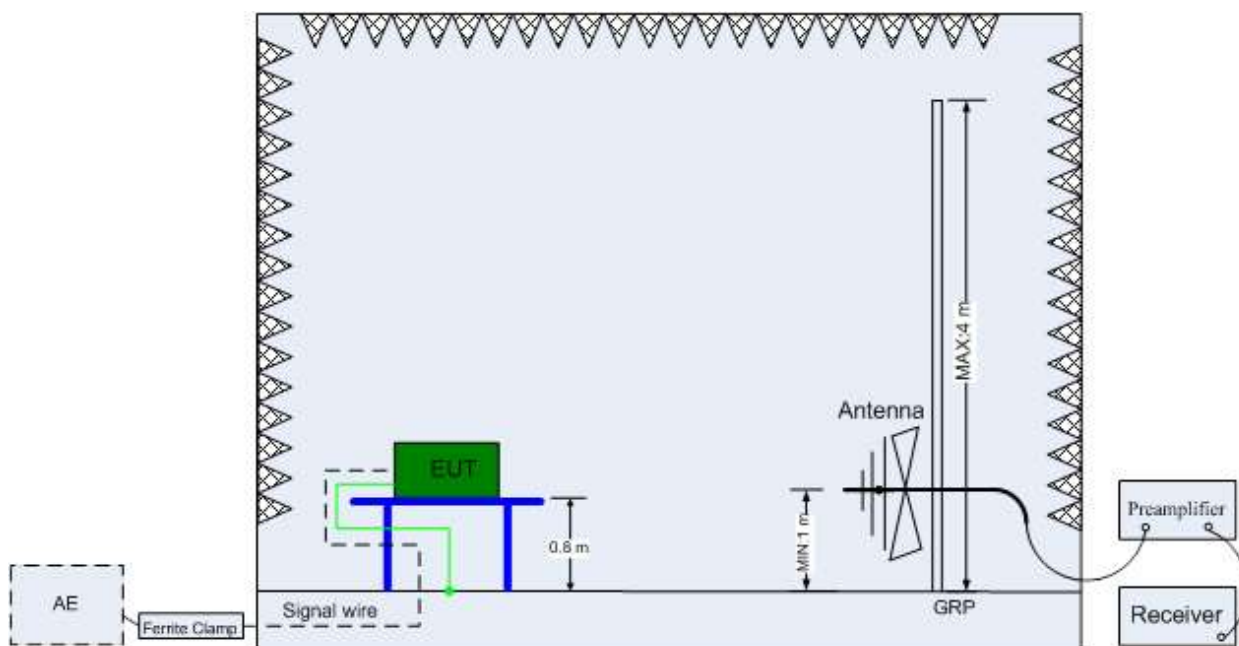
The Bluetooth component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by Bluetooth System Simulator and/or PC/software to emit the specified signals for the purpose of measurements.



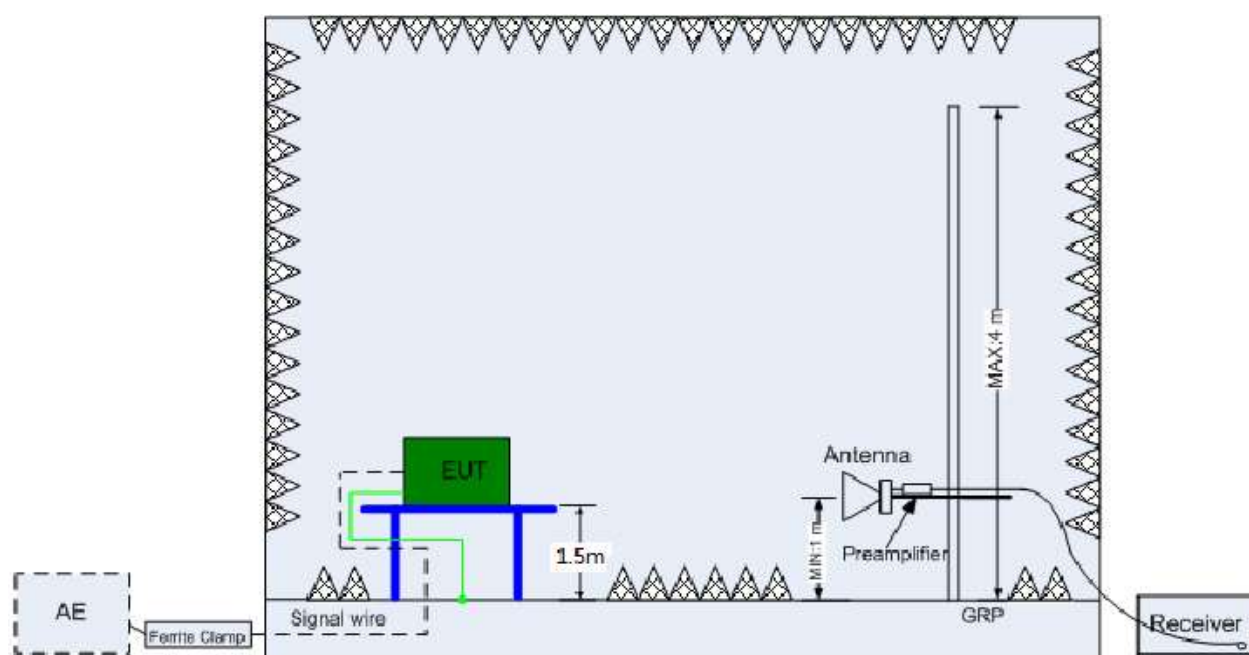
### 5.2.2 Test Setup 2

The semi-anechoic chamber and full-anechoic chamber has met the requirement of 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)

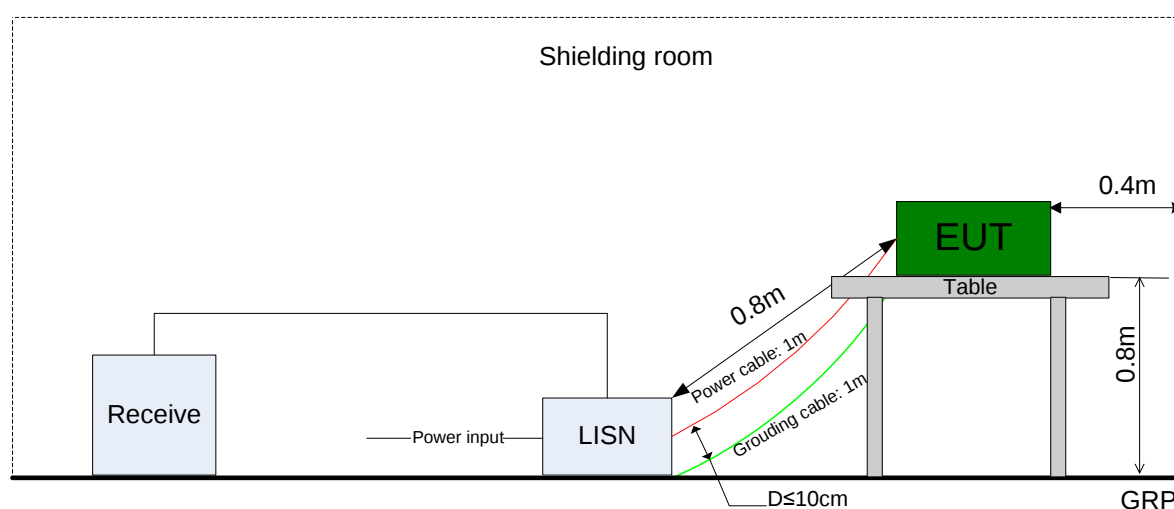


(Above 1 GHz)

### 5.2.3 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.



### 5.3 Test Conditions

| Test Case                                                     | Test Conditions |                                                              |                                                 |  |
|---------------------------------------------------------------|-----------------|--------------------------------------------------------------|-------------------------------------------------|--|
|                                                               | Configuration   | Description                                                  |                                                 |  |
| 6dB Emission Bandwidth (EBW)                                  | Meas. Method    | FCC KDB 558074 D01 §8.2 Option 2.                            |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 1                                                 |                                                 |  |
|                                                               | EUT Conf.       | TM1_Ch0, TM1_Ch19, TM1_Ch39.<br>TM2_Ch0, TM2_Ch19, TM2_Ch39. |                                                 |  |
| Occupied Bandwidth                                            | Meas. Method    | FCC KDB 558074 D01 §8.2 Option 2.                            |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 1                                                 |                                                 |  |
|                                                               | EUT Conf.       | TM1_Ch0, TM1_Ch19, TM1_Ch39.<br>TM2_Ch0, TM2_Ch19, TM2_Ch39. |                                                 |  |
| Maximum peak Conducted Output Power                           | Meas. Method    | FCC KDB 558074 D01 §8.3.1.1                                  |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 1                                                 |                                                 |  |
|                                                               | EUT Conf.       | TM1_Ch0, TM1_Ch19, TM1_Ch39.<br>TM2_Ch0, TM2_Ch19, TM2_Ch39. |                                                 |  |
| Maximum Power Spectral Density Level                          | Meas. Method    | FCC KDB 558074 D01 §8.4                                      |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 1                                                 |                                                 |  |
|                                                               | EUT Conf.       | TM1_Ch0, TM1_Ch19, TM1_Ch39.<br>TM2_Ch0, TM2_Ch19, TM2_Ch39. |                                                 |  |
| Band edge spurious emission                                   | Meas. Method    | FCC KDB 558074 D01§8.7                                       |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 1                                                 |                                                 |  |
|                                                               | EUT Conf.       | TM1_Ch0, TM1_Ch39.<br>TM2_Ch0, TM2_Ch39.                     |                                                 |  |
| Unwanted Emissions into Non-Restricted Frequency Bands        | Meas. Method    | FCC KDB 558074 D01§8.5                                       |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 1                                                 |                                                 |  |
|                                                               | EUT Conf.       | TM1_Ch0, TM1_Ch19, TM1_Ch39.<br>TM2_Ch0, TM2_Ch19, TM2_Ch39. |                                                 |  |
| Unwanted Emissions into Restricted Frequency Bands (Radiated) | Meas. Method    | ANSI C63.10; FCC KDB 558074 D01§8.6, Radiated                |                                                 |  |
|                                                               | Test Env.       | TN/VN                                                        |                                                 |  |
|                                                               | Test Setup      | Test Setup 2                                                 |                                                 |  |
|                                                               | EUT Conf.       | 30 MHz -1 GHz                                                | TM1_Ch0 (Worst Conf.). TM2_Ch0 (Worst Conf.).   |  |
|                                                               |                 | 1-3 GHz                                                      | TM1_Ch0, TM2_Ch39.<br>TM2_Ch0, TM2_Ch39.        |  |
|                                                               |                 | 3-18 GHz                                                     | TM1_Ch19 (Worst Conf.), TM2_Ch19 (Worst Conf.), |  |
|                                                               |                 | 18-26.5 GHz                                                  | TM1_Ch0 (Worst Conf.). TM2_Ch0 (Worst Conf.).   |  |

| Test Case                               | Test Conditions |                                                                                                                  |
|-----------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------|
|                                         | Configuration   | Description                                                                                                      |
| 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.       | TN/VN                                                                                                            |
|                                         | Test Setup      | Test Setup 3                                                                                                     |
|                                         | EUT Conf.       | TM1_Ch39, TM2_Ch39,                                                                                              |
|                                         |                 |                                                                                                                  |

## 6 Main Test Instruments

### 6.1.1 Test Location 1:

This table gives a complete overview of the RF measurement equipment.

Devices used during the test described are marked ☒

| <input checked="" type="checkbox"/> Main Test Equipments(BT/WIFI test system) |                                      |              |          |                |            |            |
|-------------------------------------------------------------------------------|--------------------------------------|--------------|----------|----------------|------------|------------|
| Marked                                                                        | Equipment Name                       | Manufacturer | Model    | Serial Number  | Cal Date   | Cal-Due    |
| <input checked="" type="checkbox"/>                                           | JS1120-3 BT/WIFI test system         | JS Tonscend  | JS0806-2 | 188060102      | 2018/05/30 | 2019/05/30 |
| <input type="checkbox"/>                                                      | Power Detecting & Samplig Unit       | R&S          | OSP-B157 | 101429         | 2018/07/23 | 2019/07/23 |
| <input type="checkbox"/>                                                      | Power Sensor                         | R&S          | NRP2     | 103085/106211  | 2018/05/17 | 2019/05/17 |
| <input type="checkbox"/>                                                      | DC Power Supply                      | KEITHLEY     | 2303     | 1342889        | 2018/10/24 | 2019/10/24 |
| <input type="checkbox"/>                                                      | DC Power Supply                      | KEITHLEY     | 2303     | 000500E        | 2018/05/21 | 2019/05/21 |
| <input type="checkbox"/>                                                      | DC Power Supply                      | KEITHLEY     | 2303     | 000381E        | 2018/05/21 | 2019/05/21 |
| <input type="checkbox"/>                                                      | DC Power Supply                      | KEITHLEY     | 2303     | 000510E        | 2018/05/21 | 2019/05/21 |
| <input type="checkbox"/>                                                      | Temperature Chamber                  | WEISS        | WKL64    | 56246002940010 | 2018/12/13 | 2019/12/13 |
| <input checked="" type="checkbox"/>                                           | Spectrum Analyzer                    | Agilent      | N9030A   | MY51380032     | 2018/07/23 | 2019/07/23 |
| <input type="checkbox"/>                                                      | Spectrum Analyzer                    | Agilent      | N9030A   | MY49431698     | 2018/07/23 | 2019/07/23 |
| <input type="checkbox"/>                                                      | Spectrum Analyzer                    | Keysight     | N9040B   | MY57212529     | 2018/06/28 | 2019/06/28 |
| <input type="checkbox"/>                                                      | Signal Analyzer                      | R&S          | FSQ31    | 200021         | 2018/07/23 | 2019/07/23 |
| <input type="checkbox"/>                                                      | Signal Analyzer                      | R&S          | FSU26    | 201069         | 2018/11/2  | 2019/11/2  |
| <input type="checkbox"/>                                                      | Universal Radio Communication Tester | R&S          | CMW500   | 164699         | 2018/03/15 | 2019/03/15 |
| <input type="checkbox"/>                                                      | Universal Radio Communication Tester | R&S          | CMW500   | 159302         | 2018/07/23 | 2019/07/23 |
| <input type="checkbox"/>                                                      | Wireless Communication Test set      | Agilent      | N4010A   | MY49081592     | 2018/07/23 | 2019/07/23 |
| <input checked="" type="checkbox"/>                                           | Signal generator                     | Agilent      | E8257D   | MY51500314     | 2018/04/27 | 2019/04/27 |
| <input type="checkbox"/>                                                      | Signal generator                     | Agilent      | E8257D   | MY49281095     | 2018/07/23 | 2019/07/23 |
| <input type="checkbox"/>                                                      | Vector Signal Generator              | R&S          | SMW200A  | 103447         | 2018/05/31 | 2019/05/31 |
| <input type="checkbox"/>                                                      | Vector Signal Generator              | R&S          | SMU200A  | 104162         | 2018/07/23 | 2019/07/23 |

| <input checked="" type="checkbox"/> Main Test Equipments( CE test system) |                                      |              |               |               |            |            |
|---------------------------------------------------------------------------|--------------------------------------|--------------|---------------|---------------|------------|------------|
| Marked                                                                    | Equipment Name                       | Manufacturer | Model         | Serial Number | Cal Date   | Cal-Due    |
| <input type="checkbox"/>                                                  | Test receiver                        | R&S          | ESU26         | 100387        | 2018/01/20 | 2019/01/19 |
| <input checked="" type="checkbox"/>                                       | Test receiver                        | R&S          | ESCI          | 101163        | 2018/01/20 | 2019/01/19 |
| <input type="checkbox"/>                                                  | Artificial Main Network              | R&S          | ENV4200       | 100134        | 2018/05/08 | 2019/05/07 |
| <input checked="" type="checkbox"/>                                       | Line Impedance Stabilization Network | R&S          | ENV216        | 100382        | 2018/05/08 | 2019/05/07 |
| <input checked="" type="checkbox"/>                                       | Measurement Software                 | R&S          | EMC32 V9.25.0 | /             | /          | /          |

### 6.1.2 Sub-contracted Test Location 1:

| Instrument                | Manufacturer | Model No.                    | Serial No.   | Characteristics | Calibration Date | Due Date      | Remark                |
|---------------------------|--------------|------------------------------|--------------|-----------------|------------------|---------------|-----------------------|
| EMI Test Receiver&SA      | Agilent      | N9038A                       | MY52260185   | 20Hz~26.5GHz    | Aug. 30, 2018    | Aug.29, 2019  | Radiation (03CH01-SZ) |
| Loop Antenna              | R&S          | HFH2-Z2                      | 100354       | 9kHz~30MHz      | May.29, 2018     | May.29, 2020  | Radiation (03CH01-SZ) |
| Bilog Antenna             | TeseQ        | CBL6112D                     | 35407        | 30MHz-2GHz      | Jun. 5, 2018     | Jun. 4, 2019  | Radiation (03CH01-SZ) |
| Double Ridge Horn Antenna | ETS Lindgren | 3117                         | 119436       | 1GHz~18GHz      | Jun. 28, 2018    | Jun. 27, 2019 | Radiation (03CH01-SZ) |
| SHF-EHF Horn              | com-power    | AH-840                       | 101071       | 18GHz-40GHz     | Mar.30, 2018     | Mar.29, 2019  | Radiation (03CH01-SZ) |
| LF Amplifier              | Burgeon      | BPA-530                      | 102209       | 0.01~3000Mhz    | Apr. 20, 2018    | Apr.19, 2019  | Radiation (03CH01-SZ) |
| HF Amplifier              | MITEQ        | AMF-7D-00101<br>800-30-10P-R | 1707137      | 1GHz~18GHz      | Oct.18, 2018     | Oct 17, 2019  | Radiation (03CH01-SZ) |
| HF Amplifier              | KEYSIGHT     | 83017A                       | MY53270104   | 0.5GHz~26.5Ghz  | Dec.27, 2017     | Dec 26, 2018  | Radiation (03CH01-SZ) |
| HF Amplifier              | MITEQ        | TTA1840-35-HG                | 1871923      | 18GHz~40GHz     | Jul.17.2018      | Jul.16.2019   | Radiation (03CH01-SZ) |
| AC Power Source           | Chroma       | 61601                        | 616010001985 | N/A             | NCR              | NCR           | Radiation (03CH01-SZ) |
| Turn Table                | EM           | EM1000                       | N/A          | 0~360 degree    | NCR              | NCR           | Radiation (03CH01-SZ) |

| Software Information |               |              |                      |
|----------------------|---------------|--------------|----------------------|
| Test Item            | Software Name | Manufacturer | Version              |
| RE                   | E3            | AUDIX        | 6.2009-8-24(sporton) |

## 7 Measurement Uncertainty

For a 95% confidence level ( $k = 2$ ), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

| Test Item                            |                           | Extended Uncertainty                                                                                                                |
|--------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Transmit Output Power Data           | Power [dBm]               | U = 0.39 dB                                                                                                                         |
| RF Power Density, Conducted          | Power [dBm]               | U = 0.64 dB                                                                                                                         |
| Bandwidth                            | Magnitude [%]             | U=7%                                                                                                                                |
| Band Edge Compliance                 | Disturbance Power [dBm]   | U = 0.9 dB                                                                                                                          |
| Spurious Emissions, Conducted        | Disturbance Power [dBm]   | 20MHz~3.6GHz: U=0.88dB<br>3.6GHz~8.4GHz: U=1.08dB<br>8.4GHz~13.6GHz: U=1.24dB<br>13.6GHz~22GHz: U=1.34dB<br>22GHz~26.5GHz: U=1.36dB |
| Field Strength of Spurious Radiation | ERP/EIRP [dBm]            | For 3 m Chamber:<br>U = 5.90 dB (30 MHz-1 GHz)<br>U = 4.94 dB (1 GHz-18 GHz)<br>U = 4.24 dB (18 GHz-26.5 GHz)                       |
| Frequency Stability                  | Frequency Accuracy [Hz]   | U=41.58Hz                                                                                                                           |
| AC Power Line Conducted Emissions    | Disturbance Voltage[dBμV] | U=2.3 dB                                                                                                                            |
| Duty Cycle                           | Duty Cycle [%]            | U=±2.06 %                                                                                                                           |

END