



中国认可
国际互认
检测
TESTING
CNAS L0310



FCC RF Test Report

Product Name: Smart Phone

Model Number: CLT-L09

Report No.: SYBH(Z-RF)20171228021001-2003

FCC ID: QISCLT-L09

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,
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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 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.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
5. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
7. The test report is invalid if there is any evidence of erasure and/or falsification.
8. The test report is only valid for the test samples.
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Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt Sample: 2018-01-08
Start Date of Test: 2018-01-08
End Date of Test: 2018-02-07

Test Result: Pass

| | | | |
|-------------------------------------|------------|-------------|--------------------|
| Approved by Senior Engineer: | 2018-02-07 | Roger zhang | <i>Roger Zhang</i> |
| | Date | Name | Signature |

| | | | |
|---------------------|------------|---------|---------------|
| Prepared by: | 2018-02-07 | Pan Man | <i>Panman</i> |
| | Date | Name | Signature |



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1 General Information

1.1 Applied Standard

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

Test Method: KDB 789033 D02 General UNII Test Procedures New Rules v02
FCC KDB 558074 D01 DTS Meas Guidance v04
FCC KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices

1.2 Test Location

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

1.3 Test Environment Condition

Temperature: 15 to 30 °C (Ambient)
Relative Humidity: 20 to 85 % (Ambient)
Atmospheric Pressure: Not applicable



2 Test Summary

2.1 Measurement Technical Requirements

2.1.1 U-NII (5150-5250, 5250-5350, 5470-5725 MHz,5725-5850)

| Test Item | Band | FCC Rule | Requirements | Test Result | Verdict |
|----------------------|-----------|------------------------------|--|-------------|---|
| Emission Bandwidth | 5150-5250 | 15.403(i) 15.407(a)(1) | No limit. | Appendix A | refer to report No.: SYBH(Z-RF)20171128003001-2003 |
| | 5250-5350 | 15.403(i) 15.407(a)(2) | | | |
| | 5470-5725 | 15.403(i) 15.407(a)(2) | | | |
| | 5725-5850 | 15.403(i) 15.407(e) | ≥ 500 kHz. | | |
| Occupied Bandwidth | 5150-5250 | KDB 789033 D02 § D | No limit. | Appendix B | refer to report No.: SYBH(Z-RF)20171128003001-2003 |
| | 5250-5350 | | | | |
| | 5470-5725 | | | | |
| | 5725-5850 | | | | |
| Duty Cycle | 5150-5850 | -- | No limit. | Appendix C | refer to report No.: SYBH(Z-RF)20171128003001-2003 |
| Maximum Output Power | 5150-5250 | 15.407(a)(1) 15.407(a)(4) | FCC: conducted < 250mW (avg during transmission) | Appendix D | refer to report No.: SYBH(Z-RF)20171128003001-2003 |
| | 5250-5350 | 15.407(a)(2) 15.407(a)(4) | conducted <MIN{250mW,11dBm+10*lg(EBW)} (avg during transmission) | | |
| | 5470-5725 | 15.407(a)(2) 15.407(a)(4) | FCC: conducted <MIN{250mW,11dBm+10*lg(EBW)} (avg during transmission) | | |
| | 5725-5850 | 15.407(a)(3) | conducted < 1W (avg during transmission) | | |
| maximum | 5150-5250 | 15.407(a)(1) | FCC | Appendix | refer to report No.: |



| Test Item | Band | FCC Rule | Requirements | Test Result | Verdict |
|------------------------|--|------------------------------|---|---------------|---|
| Power Spectral Density | | 15.407(a)(4) | conducted <11dBm/MHz (avg during transmission) | E | SYBH(Z-RF)20171128003001-2003 |
| | 5250-5350 | 15.407(a)(2) 15.407(a)(4) | conducted <11dBm/MHz (avg during transmission) | | |
| | 5470-5725 | 15.407(a)(2) 15.407(a)(4) | conducted <11dBm/MHz (avg during transmission) | | |
| | 5725-5850 | 15.407(a)(3) 15.407(a)(4) | conducted <30dBm/500KHz (avg during transmission) | | |
| Frequence Stability | 5150-5250 5250-5350 5470-5725 5725-5850 | 15.407(g) | FCC Part 15.407(g) | Appendix F | refer to report No.: SYBH(Z-RF)20171128003001-2003 |



3 Description of the Equipment under Test (EUT)

3.1 General Description

CLT-L09 is subscriber equipment in the LTE/ WCDMA/GSM system. The LTE frequency band is Band 1,Band 2,Band 3,Band 4,Band 5, Band 6, Band 7,Band 8, Band 9,Band 12,Band17, Band 18 ,Band 19, Band 20, Band 26, Band 28, Band 32, Band 34,Band 38,Band39, Band 40 and Band 41.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, 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.

The difference between model CLT-L09 and model CLT -L29 is show in the below table:

| Model | CLT -L29 | CLT -L09 |
|------------------|-----------|------------|
| Brand | the same | the same |
| Frequency | the same | the same |
| SIM Card | Dual SIM | Single SIM |
| Hardware Version | the same | the same |
| Software Version | Different | Different |
| Dimensions | the same | the same |
| Appearance | the same | the same |
| main antenna | the same | the same |
| BT/Wi-Fi antenna | the same | the same |
| div antenna | the same | the same |

NOTE1: Only 5G WIFI test data included in this report.

NOTE2: We do not test 5G WIFI of CLT-L09, all the test data can be refer to report No.:SYBH(Z-RF) 20171128003001-2003 of CLT-L29 (FCC ID:QISCLT-L29).















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 | HL1CLTM | CLT-L09 8.1.0.72(SP9C900) |

3.2.2 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 Output voltage: 5V  2A OR 4.5V  5A OR 5V  4.5A Rated Power: 10W/22.5W |
| Adapter | HW-050450E00 | Huawei Technologies Co.,Ltd. | Input Voltage: 100V-240V~50/60Hz, 0.75A Output Voltage: 5V  2A OR 4.5V  5A OR 5V  4.5A Rated Power: 10W/22.5W |
| Adapter | HW-050450U00 | Huawei Technologies Co.,Ltd. | Input Voltage: 100V-240V~50/60Hz, 0.75A Output Voltage: 5V  2A OR 4.5V  5A OR 5V  4.5A Rated Power: 10W/22.5W |
| Adapter | HW-050450A00 | Huawei Technologies Co.,Ltd. | Input Voltage: ~100-240V 50/60Hz 0.75A Output Voltage: 5V  2A OR 4.5V  5A OR 5V  4.5A Rated Power: 10W/22.5W |
| Rechargeable Li-ion | HB436486ECW | Huawei Technologies Co.,Ltd. | Rated capacity: 3900mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.4V |

3.3 Technical Description

| Characteristics | Description | |
|---------------------------------|--|--|
| IEEE 802.11 WLAN Mode Supported | <input checked="" type="checkbox"/> 802.11a (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11n (40 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11ac (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11ac (40 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11ac (80 MHz channel bandwidth), | |
| TX/RX Operating Range | All | $f_c = 5000 \text{ MHz} + N * 5 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number". |
| | 5150-5250 MHz (U-NII) | $N = 36$ to 48 with step of 4 for the 20 MHz channel bandwidth. $N = 38$ to 46 with step of 8 for the 40 MHz channel bandwidth. $N = 42$ for the 80 MHz channel bandwidth. |
| | 5250-5350 MHz (U-NII) | $N = 52$ to 64 with step of 4 for the 20 MHz channel bandwidth. $N = 54$ to 62 with step of 8 for the 40 MHz channel bandwidth. $N = 58$ for the 80 MHz channel bandwidth. |
| | 5470-5650 MHz (U-NII) (for FCC) | $N = 100$ to 128 with step of 4 for the 20 MHz channel bandwidth. $N = 102$ to 126 with step of 8 for the 40 MHz channel bandwidth. $N = 106$ to 122 with step of 16 for the 80 MHz channel bandwidth. |
| | 5650-5725 MHz (U-NII) | $N = 132$ to 144 with step of 4 for the 20 MHz channel bandwidth. $N = 134$ to 142 with step of 8 for the 40 MHz channel bandwidth. $N = 138$ for the 80 MHz channel bandwidth. |
| | 5725-5850MHz (U-NII) | $N = 149$ to 165 with step of 4 for the 20 MHz channel bandwidth. $N = 151$ to 159 with step of 8 for the 40 MHz channel bandwidth. $N = 155$ for the 80 MHz channel bandwidth. |
| Modulation Type | BPSK/QPSK/16QAM/64QAM (OFDM). | |
| Emission Designator | U-NII(5150-5250, 5250-5350, 5470-5725, 5725-5850) | 17M7G7D (for 802.11a mod), 18M6G7D (for 802.11n 20 MHz mode), 36M7G7D (for 802.11n 40 MHz mode), 18M5G7D (for 802.11ac 20 MHz mode) 36M6G7D (for 802.11ac 40 MHz mode) 76M3G7D (for 802.11ac 80 MHz mode) |
| TPC | <input type="checkbox"/> Supported, <input checked="" type="checkbox"/> Not Supported | |
| Antenna | Type | <input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated |
| | Ports | <input checked="" type="checkbox"/> Ant 1, <input checked="" type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3, <input type="checkbox"/> Ant 4 |
| | Smart System | <input checked="" type="checkbox"/> SISO (for 802.11a/n/ac), <input checked="" type="checkbox"/> CDD (for 802.11a), <input checked="" type="checkbox"/> MIMO (for 802.11n/ac), <input type="checkbox"/> Diversity (for 802.11a) : Tx & Rx |
| | Gain | Ant1:-2.11 dBi (per antenna port, max.) Ant2 :-1.17dBi (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. |



| Characteristics | Description | | |
|-----------------|-------------|---|---|
| Power Supply | Type | <input checked="" type="checkbox"/> AC/DC Adapter | <input type="checkbox"/> PoE: <input type="checkbox"/> Other: |

4 General Test Conditions / Configurations

4.1 Test Modes

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

| Test Mode | Test Modes Description |
|-----------|---|
| 11A | IEEE 802.11a with data rate of 6 Mbps using SISO mode. |
| 11A_CDD | IEEE 802.11a with data rate of 6 Mbps using CDD mode. |
| 11N20 | IEEE 802.11n with data rate of MCS0 and bandwidth of 20 MHz using SISO mode. |
| 11N20m | IEEE 802.11n with data rate of MCS8 and bandwidth of 20 MHz using MIMO mode. |
| 11N40 | IEEE 802.11n with data rate of MCS0 and bandwidth of 40 MHz using SISO mode. |
| 11N40m | IEEE 802.11n with data rate of MCS8 and bandwidth of 40 MHz using MIMO mode. |
| 11AC20 | IEEE 802.11ac with data rate of MCS0 and bandwidth of 20 MHz using SISO mode. |
| 11AC20m | IEEE 802.11ac with data rate of MCS8 and bandwidth of 20 MHz using SISO mode. |
| 11AC40 | IEEE 802.11ac with data rate of MCS0 and bandwidth of 40 MHz using SISO mode. |
| 11AC40m | IEEE 802.11ac with data rate of MCS8 and bandwidth of 40 MHz using MIMO mode. |
| 11AC80 | IEEE 802.11ac with data rate of MCS0 and bandwidth of 80 MHz using SISO mode. |
| 11AC80m | IEEE 802.11ac with data rate of MCS8 and bandwidth of 80 MHz using MIMO mode. |

4.2 EUT Configurations

4.2.1 General Configurations

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



4.2.2 Customized Configurations

4.2.2.1 U-NII

| Test Mode | Antenna Port | Power Conf., | Duty cycle [%] |
|-----------|--------------|---|----------------|
| 11A20 | ANT 1 | CH36:12.5 CH64 :12.5 CH100: 12.5 CH140:12.5 CH144: 12.5 Others: 15.5 | 94 |
| 11A20 | ANT 2 | CH36:9.5 CH 64: 9.5 CH100: 9.5 CH140:9.5 CH144: 9.5 Others: 12.5 | 93 |
| 11A20_CDD | ANT 1 | CH36:12.5 CH64 :12.5 CH100: 12.5 CH104:12.5 CH140: 12.5 Others: 15.5 | 93 |
| 11A20_CDD | ANT 2 | CH36:9.5 CH 64: 9.5 CH100: 9.5 CH140:9.5 CH144: 9.5 Others: 12.5 | 93 |
| 11N20 | ANT 1 | CH36:12.5 CH64: 12.5 CH100: 12.5 CH140:12.5 CH144:12.5 Others: 15.5 | 92 |
| 11N20 | ANT 2 | CH36: 9.5 CH 64: 9.5 CH100: 9.5 CH140:9.5 CH144: 9.5 Others: 12.5 | 93 |
| 11N20MIMO | ANT 1 | CH36:12.5 CH64: 12.5 | 88 |



| | | | |
|------------|-------|--|----|
| | | CH100: 12.5 CH140:12.5 CH144:12.5 Others: 15.5 | |
| 11N20MIMO | ANT 2 | CH36:9.5 CH 64: 9.5 CH100: 9.5 CH140:9.5 CH144: 9.5 Others: 12.5 | 88 |
| 11N40 | ANT 1 | CH38:10 CH62: 10 CH102:10 CH142:10 Others: 13 | 91 |
| 11N40 | ANT 2 | CH38:8.5 CH62: 8.5 CH102:8.5 CH142:8.5 Others: 10 | 92 |
| 11N40MIMO | ANT 1 | CH38:10 CH62: 10 CH102:10 CH142:10 Others: 13 | 87 |
| 11N40MIMO | ANT 2 | CH38:8.5 CH62: 8.5 CH102:8.5 CH142:8.5 Others: 10 | 87 |
| 11AC20 | ANT 1 | CH36:12.5 CH64: 12.5 CH100: 12.5 CH140:12.5 CH144:12.5 Others: 15.5 | 93 |
| 11AC20 | ANT 2 | CH36:9.5 CH64: 9.5 CH100: 9.5 CH140:9.5 CH144:9.5 Others: 12.5 | 93 |
| 11AC20MIMO | ANT 1 | CH36:12.5 CH64: 12.5 | 88 |



| | | | |
|------------|-------|---|----|
| | | CH100: 12.5 CH140:12.5 CH144:12.5 Others: 15.5 | |
| 11AC20MIMO | ANT 2 | CH36:9.5 CH64: 9.5 CH100: 9.5 CH140:9.5 CH144:9.5 Others: 12.5 | 87 |
| 11AC40 | ANT 1 | CH38:10 CH62: 10 CH102:10 CH142:10 Others: 13 | 92 |
| 11AC40 | ANT 2 | CH38:8.5 CH62: 8.5 CH102:8.5 CH142:8.5 Others: 10 | 92 |
| 11AC40MIMO | ANT 1 | CH38:10 CH62: 10 CH102:10 CH142:10 Others: 13 | 87 |
| 11AC40MIMO | ANT 2 | CH38:8.5 CH62: 8.5 CH102:8.5 CH142:8.5 Others: 10 | 87 |
| 11AC80 | ANT 1 | CH42:10 CH58:10 CH106: 10 CH138: 10 Others: 11.5 | 91 |
| 11AC80 | ANT 2 | All:8.5 | 91 |
| 11AC80MIMO | ANT 1 | CH42:10 CH58:10 CH106: 10 CH138: 10 Others: 11.5 | 86 |
| 11AC80MIMO | ANT 2 | All:8.5 | 86 |



4.3 Test Environments

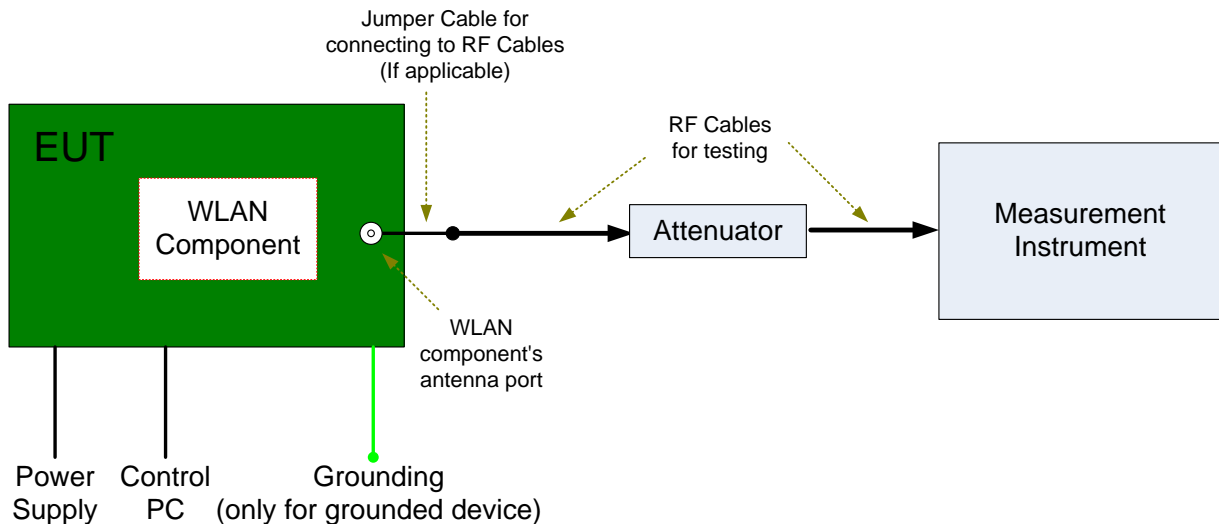
| Environment Parameter | Selected Values During Tests | |
|-----------------------|------------------------------|---------|
| Relative Humidity | Ambient | |
| Temperature | TN | Ambient |
| Voltage | VL | 3.6V |
| | VN | 3.82V |
| | VH | 4.35V |

NOTE: VL= lower extreme test voltage
VN= nominal voltage
VH= upper extreme test voltage
TN= normal temperature

4.4 Test Setups

4.4.1 Test Setup 1

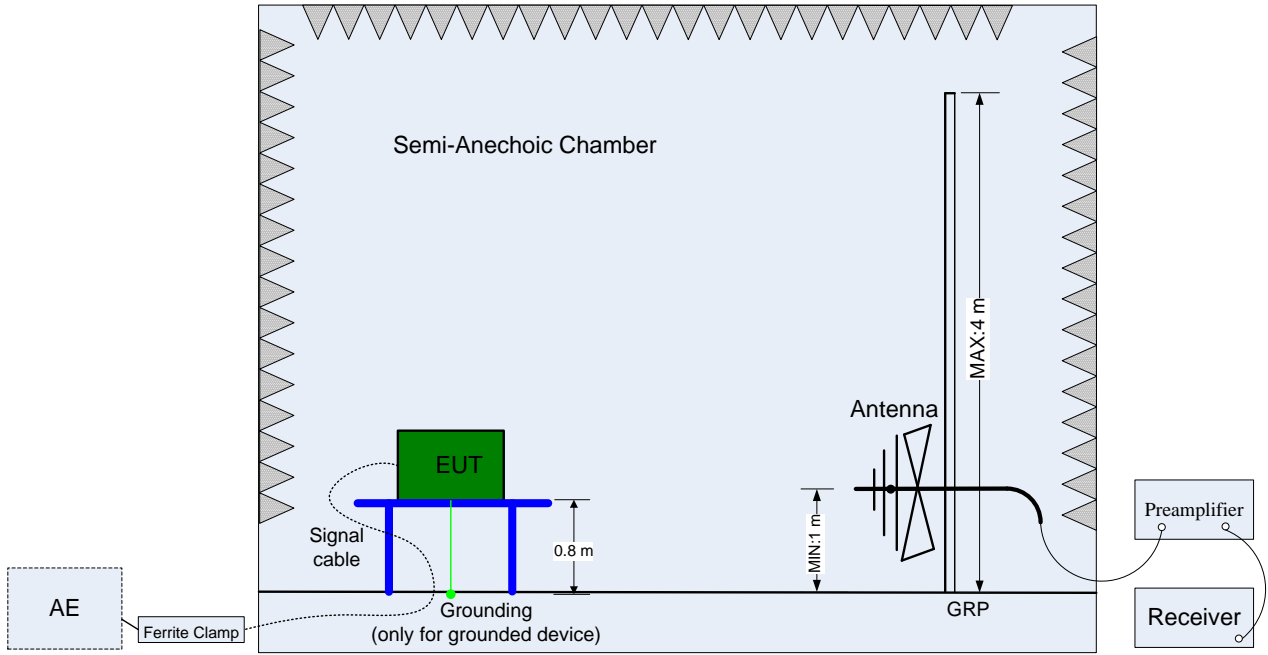
The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



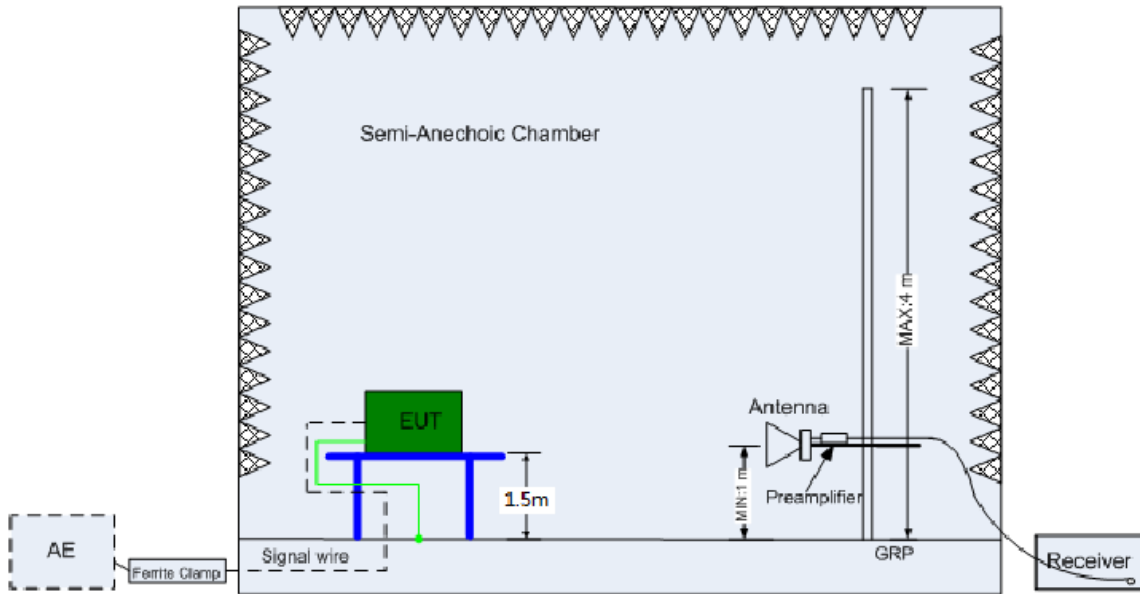
4.4.2 Test Setup 2

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 3 m (for 30 MHz to 26.5 GHz) or 1 m (for 26.5 GHz to 40 GHz). The setup is according to ANSI C63.10, 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)

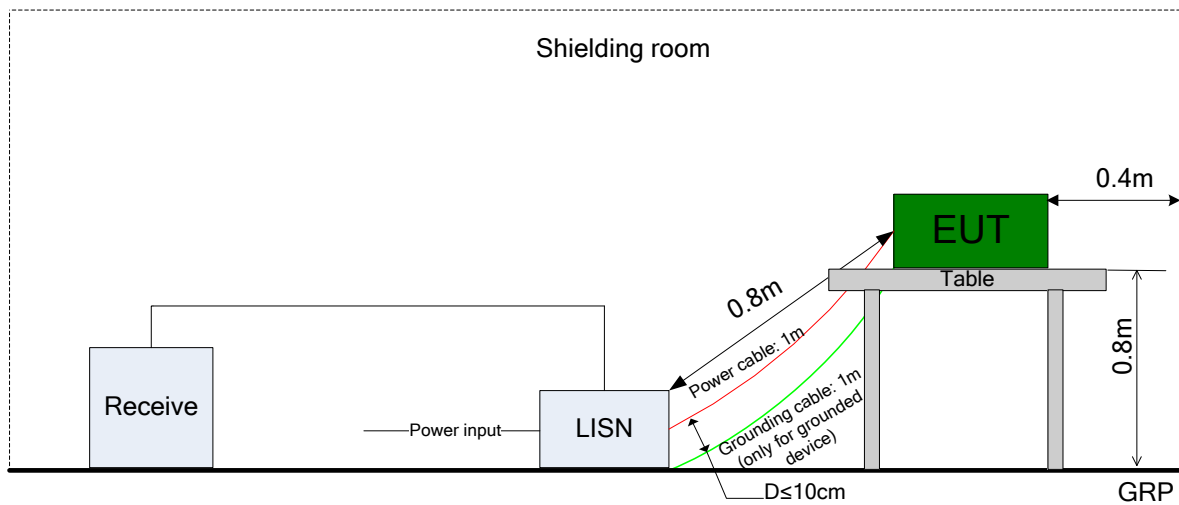


(Above 1 GHz)

4.4.3 Test Setup 3

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

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



4.5 Test Conditions

4.5.1 U-NII

| Test Case | Test Conditions | |
|--------------------------------|-----------------|---|
| | Configuration | Description |
| Emission Bandwidth (EBW) | Meas. Method | FCC KDB 789033 D02 §C). |
| | Test Env. | NTNV |
| | Test Setup | Test Setup 1 |
| | EUT Conf. | All EUT conf. with Tx modes. |
| Occupied Bandwidth (OBW) | Meas. Method | FCC KDB 789033 D02 §D). |
| | Test Env. | NTNV |
| | Test Setup | Test Setup 1 |
| | EUT Conf. | All EUT conf. with Tx modes. |
| Maximum Conducted Output Power | Meas. Method | FCC KDB 789033 D02 §E)2)b) Method SA-1 and d) Method SA-2. |
| | Test Env. | NTNV |
| | Test Setup | Test Setup 1 |
| | EUT Conf. | All EUT conf. with Tx modes. |
| Maximum Power Spectral Density | Meas. Method | FCC KDB 789033 D02 §F). |
| | Test Env. | NTNV |
| | Test Setup | Test Setup 1 |
| | EUT Conf. | All EUT conf. with Tx modes. |
| Frequency Stability | Meas. Method | 15.407(g) Frequency Stability |
| | Test Env. | (1)VL, VN and VH of Rated Voltage at Ambient Climate. (2) -5 °C,5°C,15°C,25°C,35°C,45°C,50°C |
| | Test Setup | Test Setup 1 |
| | EUT Conf. | Ch.36,Ch.165 |



5 Main Test Instruments

NOTE: Unless otherwise specified, the calibration intervals for test instruments were Annual (per year). The other intervals, if applicable, are marked with (##y), which denotes ## years calibration interval.

| Main Test Equipments | | | | | |
|--------------------------------------|--------------|----------|----------------|------------|------------|
| Equipment Name | Manufacturer | Model | Serial Number | Cal Date | Cal- Due |
| Power supply | KEITHLEY | 2303 | 000500E | 2017/5/31 | 2018/5/30 |
| Wireless Communication Test set | Agilent | N4010A | MY49081592 | 2017/7/31 | 2018/7/30 |
| Universal Radio Communication Tester | R&S | CMU200 | 110932 | 2017/5/2 | 2018/5/1 |
| Spectrum Analyzer | Agilent | N9020A | MY52090652 | 2017/7/10 | 2018/7/9 |
| Universal Radio Communication Tester | R & S | CMW500 | 126854 | 2017/10/19 | 2018/10/18 |
| Signal Analyzer | R&S | FSQ31 | 200021 | 2017/7/31 | 2018/7/30 |
| Spectrum Analyzer | Agilent | N9030A | MY49431698 | 2017/7/31 | 2018/7/30 |
| Temperature Chamber | WEISS | WKL64 | 56246002940010 | 2017/12/13 | 2018/12/12 |
| Signal generator | Agilent | E8257D | MY49281095 | 2017/7/31 | 2018/7/30 |
| Vector Signal Generator | R&S | SMU200A | 104162 | 2017/7/31 | 2018/7/30 |
| Power Detecting & Sampling Unit | R&S | OSP-B157 | 100914 | 2017/7/31 | 2018/7/30 |

END