

Page 1 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

FCC TEST REPORT

FOR

Shenzhen Neewer Technology Co., Ltd 2.4G Module

Test Model: NW-01

Prepared for : Shenzhen Neewer Technology Co., Ltd

ROOM 1901-1903, Block A, LU SHAN BUILDING NO.3023

Address : CHUNFENG RD LUO HU DISTRICT, SHENZHEN, GUANGDONG,

518001, CHINA

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd

Address 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,

Shajing Street, Baoan District, Shenzhen, 518000, China

Tel : (+86)755-82591330 Fax : (+86)755-82591332 Web : www.LCS-cert.com

Mail : webmaster@LCS-cert.com

Date of receipt of test sample : March 20, 2023

Number of tested samples : 2

Sample No. : A022123027-1, A022123027-2

Sample number : Prototype

Date of Test : March 20, 2023 ~ August 18, 2023

Date of Report : August 22, 2023





Page 2 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

FCC TEST REPORT

FCC CFR 47 PART 15 C (15.249)

Report Reference No.: LCSA022123027EA

Date of Issue.....: August 22, 2023

Testing Laboratory Name.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

. 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,

Shajing Street, Baoan District, Shenzhen, 518000, China

Testing Location/ Procedure.......... Partial application of Harmonised standards

Other standard testing method

Applicant's Name.....: Shenzhen Neewer Technology Co., Ltd

Address...... : ROOM 1901-1903, Block A, LU SHAN BUILDING NO.3023

CHUNFENG RD LUO HU DISTRICT, SHENZHEN, GUANGDONG,

518001, CHINA

Test Specification

Standard...... : FCC CFR 47 PART 15 C(15.249) / ANSI C63.10: 2013

Test Report Form No.....: LCSEMC-1.0

TRF Originator.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF.....: Dated 2011-03

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test Item Description.....: 2.4G Module

Trade Mark.....: NEEWER

Test Model.....: NW-01

Ratings.....: Input: DC 3.3V

Result: Positive

Compiled by:

Kevin Huang/ Administrator

Supervised by:

Approved by:

REUN 11.

Cary Luo/ Technique principal

Gavin Liang/ Manager



Shenzhen LCS Compliance Testing Laboratory Ltd.



FCC ID: 2ANIV-NW-01

FCC -- TEST REPORT

Test Report No. : LCSA022123027EA August 22, 2023

Date of issue

Test Model.....: NW-01

EUT.....: 2.4G Module

Applicant.....: : Shenzhen Neewer Technology Co., Ltd

ROOM 1901-1903, Block A, LU SHAN BUILDING NO.3023

Report No.: LCSA022123027EA

Address.....: : CHUNFENG RD LUO HU DISTRICT, SHENZHEN, GUANGDONG,

518001, CHINA

Telephone.....: : /

Fax.....: : /

Manufacturer.....: Shenzhen Neewer Technology Co., Ltd

ROOM 1901-1903, Block A, LU SHAN BUILDING NO.3023

Address.....: : CHUNFENG RD LUO HU DISTRICT, SHENZHEN, GUANGDONG,

518001, CHINA

Telephone.....:: /

Fax.....: : /

Factory.....: Shenzhen Neewer Technology Co., Ltd

ROOM 1901-1903, Block A, LU SHAN BUILDING NO.3023

Address.....: : CHUNFENG RD LUO HU DISTRICT, SHENZHEN, GUANGDONG,

518001, CHINA

Telephone....:: /

Fax.....: : /

| Test Result | Positive |
|-------------|----------|
|-------------|----------|

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





of 33 FCC ID: 2ANIV-NW-01

Revision History

| Report Version | Issue Date | Revision Content | Revised By |
|----------------|-----------------|------------------|------------|
| 000 | August 22, 2023 | Initial Issue | |
| | | | |
| | | | |

工資格測版份 T CS Testing Lab

LCS Testing Lab

VS THAT 测版价

Report No.: LCSA022123027EA











 $\label{thm:compliance} Shenzhen\ LCS\ Compliance\ Testing\ Laboratory\ Ltd.$



FCC ID: 2ANIV-NW-01

TABLE OF CONTENTS

Report No.: LCSA022123027EA

| | TABLE OF CONTENTS | |
|-------------------|--|-------------------|
| 1. GENERAL INF | ORMATION | Visit ics Testing |
| 1.1 Description | of Device (EUT) | 6 |
| | uipment List | |
| 1.3. External I/O | | 7 |
| 1.4. Description | of Test Facility | 7 |
| | of the measurement uncertainty | |
| | nt Uncertainty | |
| • | of Test Modes | |
| | DOLOGY | |
| | uration | |
| | se | |
| | st Procedures | |
| | DIAGRAM OF TEST SYSTEM | |
| | | |
| | se Software | |
| | essoriesam/Schematics | |
| | Modifications | |
| | widding and the second and the secon | |
| | TEST RESULTS | |
| | QUIREMENT | |
| | | |
| 6. POWER LINE | CONDUCTED EMISSIONSMISSION MEASUREMENT | 13 |
| | | |
| | R BAND EDGE TESTING | |
| 9. 20 DB BANDW | /IDTH MEASUREMENT | 30 |
| 10. LIST OF MEA | ASURING EQUIPMENT | 32 |
| 11. TEST SETUP | PHOTOGRAPHS OF THE EUT | 33 |
| 12. EXTERIOR P | HOTOGRAPHS OF THE EUT | 33 |
| | | 33 |







Page 6 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT : 2.4G Module

Test Model : NW-01

Power Supply : Input: DC 3.3V

Hardware Version : /
Software Version : /

2.4G :

Frequency Range : 2405MHz

Channel Number : 1

Modulation Type : GFSK

Antenna Description : FPC Antenna, 2.5dBi(Max.)

Sher

Shenzhen LCS Compliance Testing Laboratory Ltd.



Page 7 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

1.2. Support Equipment List

| Manufacturer | Description | Model | Serial Number | Certificate |
|--------------|-------------|----------|---------------|-------------|
| Lenovo | PC | TP00094A | | FCC |

Note: The adapter is supplied by lab and only use tested.

1.3. External I/O

| I/O Port Description | Quantity | Cable | |
|----------------------|----------|-------|--|
| | | | |

1.4. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

| Test Item | n Frequency Range Uncertainty | | Note | |
|------------------------|-------------------------------|----------------|---------|-------|
| Radiation Uncertainty | | 9KHz~30MHz | ±3.10dB | ි (1) |
| | | 30MHz~200MHz | ±2.96dB | (1) |
| | | 200MHz~1000MHz | ±3.10dB | (1) |
| | | 1GHz~26.5GHz | ±3.80dB | (1) |
| | | 26.5GHz~40GHz | ±3.90dB | (1) |
| Conduction Uncertainty | : | 150kHz~30MHz | ±1.63dB | (1) |
| Power disturbance | : | 30MHz~300MHz | ±1.60dB | (1) |

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com Scan code to check authenticity



Page 8 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

1.7. Description of Test Modes

Operates in the unlicensed ISM Band at 2.4GHz. With basic data rate feature, the data rates can be up to 1 Mb/s by modulating the RF carrier using GFSK techniques. The EUT works in the X-axis, Y-axis, Z-axis. The following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

| Mode of Operations | Frequency Range (MHz) | Data Rate (Mbps) | | | |
|-----------------------|--------------------------|---------------------|--|--|--|
| GFSK | 2405 / | | | | |
| | For Conducted Emission | | | | |
| Test Mode | ode TX Mode | | | | |
| For Radiated Emission | | | | | |
| Test Mode | - | ΓX Mode | | | |

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX.

Channel List:

| Channel | Channel Frequency(MHz) | | Frequency(MHz) | |
|---------|------------------------|--|----------------|--|
| 1 | 2405 | | | |



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com Scan code to check authenticity

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.249 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz and 1.5 m above ground plane above 1GHz. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013



Shenzhen LCS Compliance Testing Laboratory Ltd.

3. CONNECTION DIAGRAM OF TEST SYSTEM

3.1. Justification

The system was configured for testing in a continuous transmit condition. Continuous transmitting was pre-programmed. It'll keep transmitting with modulated signal at the lowest channel by installing the batter. When press the "up" button, it'll move to the next channel. Repeat press "up" button, it'll transmitting at each of the channel used.

3.2. EUT Exercise Software

The product directly emits signals when it is powered on and turned on.

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.



Shenzhen LCS Compliance Testing Laboratory Ltd.





4. SUMMARY OF TEST RESULTS

| Applied Standard: FCC Part 15 Subpart C §15.249 | | | | | | |
|---|--------------------------------|-----------|--|--|--|--|
| FCC Rules | Description Of Test | Result | | | | |
| §15.203 | Antenna Requirement | Compliant | | | | |
| §15.207(a) | Power Line Conducted Emissions | Compliant | | | | |
| §15.205(a), §15.209(a), §15.249(a), §15.249(c) | Radiated Emissions Measurement | Compliant | | | | |
| §15.249 (d) | Band Edges Measurement | Compliant | | | | |
| §15.215(c) | 20 dB Bandwidth | Compliant | | | | |
| | | | | | | |
| | | | | | | |









Shenzhen LCS Compliance Testing Laboratory Ltd.

5. ANTENNA REQUIREMENT

5.1. Standard Applicable

According to § 15.203 and RSS-Gen, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

5.2. Antenna Connected Construction

The EUT use Ceramic Antenna and maximum antenna gain is 2.5dBi, FPC Antenna cannot replacement, meets FCC Part §15.203 antenna requirement. Please see EUT photo for details.

5.3. Results

Compliance



Shenzhen LCS Compliance Testing Laboratory Ltd.

6. POWER LINE CONDUCTED EMISSIONS

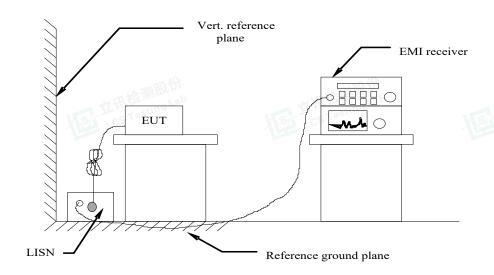
6.1. Standard Applicable

According to §15.207 (a) & RSS-Gen § 8.8: For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

| Frequency Range | Limits (dBμV) | | | |
|-----------------|---------------|----------|--|--|
| (MHz) | Quasi-peak | Average | | |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 | | |
| 0.50 to 5 | 56 | 46 | | |
| 5 to 30 | 60 | 50 | | |

^{*} Decreasing linearly with the logarithm of the frequency

6.2. Block Diagram of Test Setup



6.3. Test Results

PASS.

The test data please refer to following page.

| Temperature 23.3℃ | | Humidity | 53.1% | |
|-------------------|----------|----------|-------|--|
| Test Engineer | Joker Hu | | | |

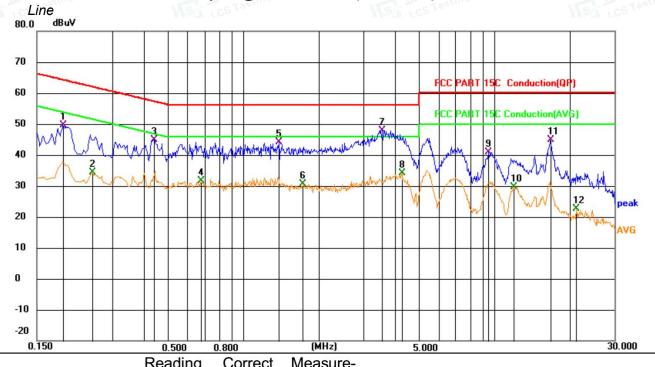


Shenzhen LCS Compliance Testing Laboratory Ltd.





AC Conducted Emission of Adapter @ AC 120V/60Hz (worst case)



FCC ID: 2ANIV-NW-01

| No. | Mk. | Freq. | Level | Factor | ment | Limit | Margin | | |
|-----|-----|---------|-------|--------|-------|-------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1906 | 29.97 | 19.63 | 49.60 | 64.01 | -14.41 | QP | |
| 2 | | 0.2491 | 14.68 | 19.63 | 34.31 | 51.79 | -17.48 | AVG | |
| 3 | | 0.4381 | 25.29 | 19.64 | 44.93 | 57.10 | -12.17 | QP | |
| 4 | | 0.6765 | 12.00 | 19.65 | 31.65 | 46.00 | -14.35 | AVG | |
| 5 | | 1.3829 | 24.53 | 19.66 | 44.19 | 56.00 | -11.81 | QP | |
| 6 | | 1.7250 | 10.90 | 19.67 | 30.57 | 46.00 | -15.43 | AVG | |
| 7 | * | 3.5701 | 28.29 | 19.70 | 47.99 | 56.00 | -8.01 | QP | |
| 8 | | 4.2721 | 14.47 | 19.70 | 34.17 | 46.00 | -11.83 | AVG | |
| 9 | | 9.4831 | 20.97 | 19.83 | 40.80 | 60.00 | -19.20 | QP | |
| 10 | | 11.9041 | 9.73 | 19.84 | 29.57 | 50.00 | -20.43 | AVG | |
| 11 | | 16.6696 | 24.92 | 19.99 | 44.91 | 60.00 | -15.09 | QP | |
| 12 | | 21.2191 | 2.47 | 20.14 | 22.61 | 50.00 | -27.39 | AVG | |



Shenzhen LCS Compliance Testing Laboratory Ltd.

 FCC ID: 2ANIV-NW-01

Report No.: LCSA022123027EA

30.000

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | | |
|-----|-----|---------|------------------|-------------------|------------------|-------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1951 | 29.34 | 19.63 | 48.97 | 63.82 | -14.85 | QP | 9 |
| 2 | | 0.2671 | 15.41 | 19.63 | 35.04 | 51.21 | -16.17 | AVG | |
| 3 | | 0.4561 | 24.40 | 19.64 | 44.04 | 56.76 | -12.72 | QP | |
| 4 | | 0.6180 | 12.28 | 19.66 | 31.94 | 46.00 | -14.06 | AVG | |
| 5 | | 1.0320 | 24.27 | 19.65 | 43.92 | 56.00 | -12.08 | QP | |
| 6 | | 1.2120 | 12.96 | 19.66 | 32.62 | 46.00 | -13.38 | AVG | |
| 7 | * | 3.6331 | 26.24 | 19.78 | 46.02 | 56.00 | -9.98 | QP | |
| 8 | | 3.9481 | 10.15 | 19.80 | 29.95 | 46.00 | -16.05 | AVG | |
| 9 | | 6.6166 | 22.45 | 19.82 | 42.27 | 60.00 | -17.73 | QP | |
| 10 | | 6.9676 | 11.55 | 19.82 | 31.37 | 50.00 | -18.63 | AVG | |
| 11 | | 16.6471 | 25.98 | 19.99 | 45.97 | 60.00 | -14.03 | QP | |
| 12 | | 19.5451 | 5.62 | 20.19 | 25.81 | 50.00 | -24.19 | AVG | |

(MHz)

5.000

***Note: Pre-scan all modes and recorded the worst case results in this report.

Measurement= Reading + Correct Factor, Margin = Measurement – Limit.

Correct Factor=Lisn Factor+Cable Factor



Shenzhen LCS Compliance Testing Laboratory Ltd.

0.500

0.800

7. RADIATED EMISSION MEASUREMENT

7.1. Standard Applicable

According to FCC § 15.249: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) and 15.249 limit in the table below has to be followed.

| Fundamental Frequency | Field Strength of fundamental (millivolts/meter) | Field Strength of harmonics (microvolts/meter) | | |
|--------------------------|--|--|--|--|
| 902-928MHz | 50 | 500 | | |
| 2400-2483.5MHz | 11 50 cs Testi | 500 | | |
| 5725-5875MHz | 50 | 500 | | |
| 24.0-24.25GHz | 250 | 2500 | | |

| Frequencies | Field Strength | Measurement Distance | | |
|-------------|--------------------|----------------------|--|--|
| (MHz) | (microvolts/meter) | (meters) | | |
| 0.009~0.490 | 2400/F(KHz) | 300 | | |
| 0.490~1.705 | 24000/F(KHz) | 30 | | |
| 1.705~30.0 | 30 | 30 | | |
| 30~88 | 100 | 3 | | |
| 88~216 | 150 | 3 | | |
| 216~960 | Militaring Law 200 | ating Lab 3 | | |
| Above 960 | 500 | 3 | | |

According to RSS-210 B.10:

The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.

The field strength limits shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) guasi-peak detector.

Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

7.2. Instruments Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10 th carrier harmonic |
| RB / VB (Emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average |
| RB / VB (Emission in non-restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average |



Shenzhen LCS Compliance Testing Laboratory Ltd.



Page 17 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

| Receiver Parameter | Setting | | | |
|------------------------|--|--|--|--|
| Attenuation | Auto | | | |
| Start ~ Stop Frequency | 9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG | | | |
| Start ~ Stop Frequency | 150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG | | | |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB/VB 120kHz/1MHz for QP | | | |

7.3. Test Procedure

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna height is 1.0 meter.
- --- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- --- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- --- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- --- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Page 18 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

2) Sequence of testing 30 MHz to 1 GHz

Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height changes from 1 to 3 meter.
- --- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- --- The final measurement will be performed with minimum the six highest peaks.
- --- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
- --- The final measurement will be done with QP detector with an EMI receiver.
- --- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.



Shenzhen LCS Compliance Testing Laboratory Ltd.



3) Sequence of testing 1 GHz to 18 GHz

Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height scan range is 1 meter to 2.5 meter.
- --- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- --- The final measurement will be performed with minimum the six highest peaks.
- --- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- --- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- --- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.









Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 1 meter.
- --- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

Final measurement:

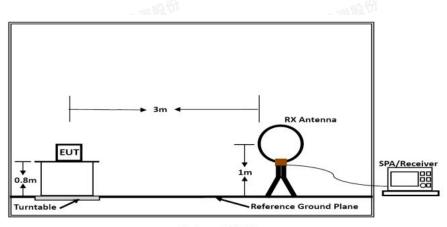
- --- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- --- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.



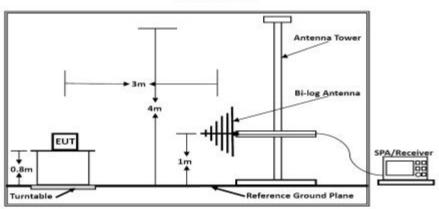


Report No.: LCSA022123027EA

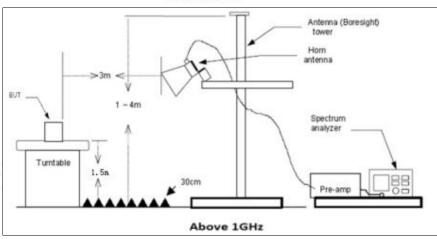




Below 30MHz



Below 1GHz



Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

7.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com Scan code to check authenticity



Page 22 of 33

FCC ID: 2ANIV-NW-01

Report No.: LCSA022123027EA

7.6. Test Results of Radiated Emissions (9 KHz~30 MHz)

| 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - | N. 1995 (sig | William State of the Control of the | Will control of the | | |
|---|---------------|---|---------------------|--|--|
| Temperature | 23.8℃ | Humidity | 52.1% | | |
| Test Engineer | Joker Hu | | | | |

| Freq. (MHz) | Level (dBuV) | | | Remark |
|----------------|-----------------|---|---|----------|
| - | - | - | - | See Note |

Note:

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

7.7. Test Results of Radiated Emissions (30 MHz – 1000 MHz)

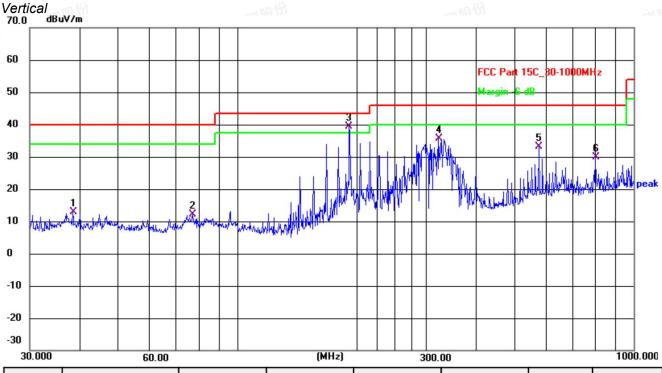
| Temperature | 23.8℃ | Humidity | 52.1% | |
|---------------|----------|----------|-------|--|
| Test Engineer | Joker Hu | | | |

PASS.

The test data please refer to following page.



Shenzhen LCS Compliance Testing Laboratory Ltd.

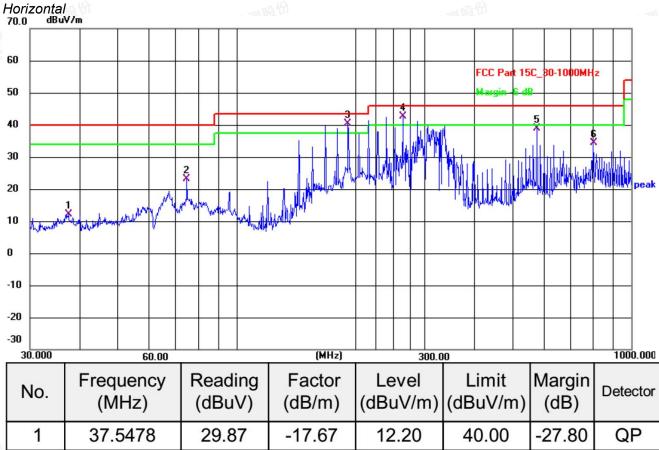


| | | | | | | | 10 | |
|---|-----|--------------------|----------------|------------------|-------------------|-------------------|----------------|----------|
| ı | No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
| 1 | 1 | 38.4809 | 30.49 | -17.62 | 12.87 | 40.00 | -27.13 | QP |
| | 2 | 77.3210 | 31.80 | -19.77 | 12.03 | 40.00 | -27.97 | QP |
| | 3 | 191.7450 | 57.60 | -18.17 | 39.43 | 43.50 | -4.07 | QP |
| | 4 | 322.1885 | 49.86 | -14.35 | 35.51 | 46.00 | -10.49 | QP |
| | 5 | 576.6443 | 44.01 | -10.83 | 33.18 | 46.00 | -12.82 | QP |
| | 6 | 801.7863 | 39.80 | -9.89 | 29.91 | 46.00 | -16.09 | QP |



Shenzhen LCS Compliance Testing Laboratory Ltd.

Page 24 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA



| | No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|------------|-----|--------------------|----------------|------------------|-------------------|-------------------|----------------|----------|
| | 1 | 37.5478 | 29.87 | -17.67 | 12.20 | 40.00 | -27.80 | QP |
| S. 10. 10. | 2 | 74.9191 | 42.68 | -19.67 | 23.01 | 40.00 | -16.99 | QP |
| | 3 | 191.7450 | 57.69 | -17.35 | 40.34 | 43.50 | -3.16 | QP |
| | 4 | 263.8190 | 58.17 | -15.48 | 42.69 | 46.00 | -3.31 | QP |
| | 5 | 576.6443 | 49.78 | -10.83 | 38.95 | 46.00 | -7.05 | QP |
| | 6 | 801.7863 | 44.37 | -9.89 | 34.48 | 46.00 | -11.52 | QP |

Note:

- 1). Pre-scan all modes and recorded the worst case results in this report.
- 2). Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3). Level = Reading + Factor, Margin = Level Limit, Factor = Antenna Factor + Cable Loss - Preamp Factor



Shenzhen LCS Compliance Testing Laboratory Ltd.



Page 25 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

7.8. Results for Radiated Emissions (1 – 26 GHz)

| Temperature | | 23.1℃ | Humidity | 52.3% | |
|-------------|---------------|----------|----------------|-------|--|
| | Test Engineer | Joker Hu | Configurations | TX | |

| Field Strength of Fundamental (TX-2405MHz) | | | | | | | |
|--|--------------------|------|--------------------------------|------------------------------|------------------------|-----------------------|--------|
| | Frequency (MHz) | Pol. | Measure Result (PK, dBuV/m) | Measure Result (AVG, dBuV/m) | Peak Limit (dBuV/m) | AVG Limit (dBuV/m) | Result |
| | 2405 | I | 88.74 | 74.34 | 114 | 94 | Pass |
| | 2405 | V | 92.91 | 81.85 | 114 | 94 | Pass |

| Freq. MHz | Reading Level dBuV | Ant. Fac. dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuV/m | Limit dBuV/m | Margin dB | Remark | Pol. |
|--------------|--------------------------|----------------------|--------------------|--------------------|--------------------|-----------------|--------------|---------|------------|
| 4810.00 | 57.85 | 33.06 | 35.04 | 3.94 | 59.81 | 74.00 | -14.19 | Peak | Horizontal |
| 4810.00 | 42.04 | 33.06 | 35.04 | 3.94 | 44.00 | 54.00 | -10.00 | Average | Horizontal |
| 4810.00 | 60.66 | 33.06 | 35.04 | 3.94 | 62.62 | 74.00 | -11.38 | Peak | Vertical |
| 4810.00 | 43.24 | 33.06 | 35.04 | 3.94 | 45.20 | 54.00 | -8.80 | Average | Vertical |

Notes:

- 1). Measuring frequencies from 9 KHz 10th harmonic (ex. 26GHz), No emission found between lowest internal used/generated frequency to 30 MHz.
- 2). Radiated emissions measured in frequency range from 9 KHz 10th harmonic (ex. 26GHz) were made with an instrument using Peak detector mode.
- 3). 18~25 GHz at least have 20dB margin. No recording in the test report.
- 4). Measured Level = Reading Level + Factor, Margin = Level Limit,

Factor = Antenna Factor + Cable Loss - Preamp Factor



Shenzhen LCS Compliance Testing Laboratory Ltd.



Report No.: LCSA022123027EA

8. RESULTS FOR BAND EDGE TESTING

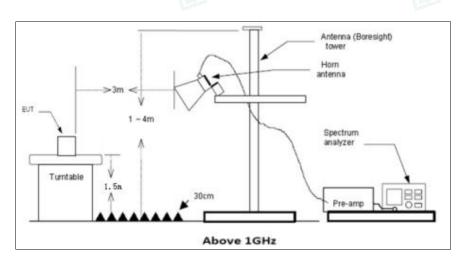
8.1. Standard Applicable

According to FCC §15.249 (d): Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

FCC ID: 2ANIV-NW-01

According to RSS-210 B.10 (b): Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

8.2. Test Setup Layout



8.3. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of Spectrum Analyzer.

8.4. Test Procedures

3) Sequence of testing 1 GHz to 18 GHz

Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen,

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com Scan code to check authenticity

Page 27 of 33 FCC ID: 2ANIV-NW-01 Report No.: LCSA022123027EA

--- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height scan range is 1 meter to 2.5 meter.
- --- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- --- The final measurement will be performed with minimum the six highest peaks.
- --- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- --- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- --- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

8.5. Measuring Instruments and Setting

| N C T T T T T T T T T T T T T T T T T T | | | |
|---|----------|----------|-------|
| Temperature | 23.5℃ | Humidity | 52.1% |
| Test Engineer | Joker Hu | | |

PASS

Remark:

- 1. The other emission levels were very low against the limit.
- 2. The average measurement was not performed when the peak measured data under the limit of average detection.
- Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=330Hz/Sweep time=Auto/Detector=Peak;
- 4. Please refer to following test plots;



Shenzhen LCS Compliance Testing Laboratory Ltd.

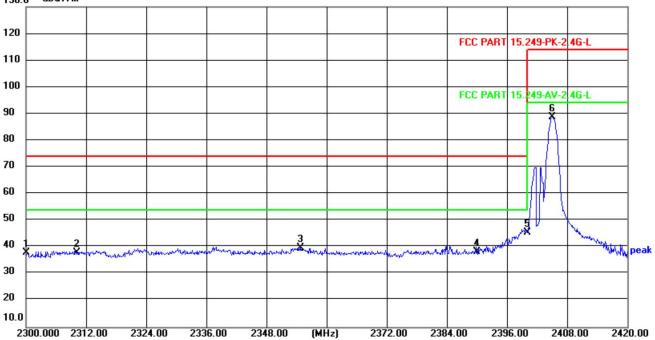




Report No.: LCSA022123027EA

Channel 1 / 2405 MHz

Horizontal



| | | | N N N N N N N N N N N N N N N N N N N | | | | |
|-----|--------------------|----------------|---------------------------------------|-------------------|-------------------|----------------|----------|
| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
| 1 | 2300.000 | 50.06 | -12.05 | 38.01 | 74.00 | -35.99 | peak |
| 2 | 2310.000 | 49.97 | -12.02 | 37.95 | 74.00 | -36.05 | peak |
| 3 | 2354.840 | 51.61 | -11.86 | 39.75 | 74.00 | -34.25 | peak |
| 4 | 2390.000 | 50.17 | -11.73 | 38.44 | 74.00 | -35.56 | peak |
| 5 | 2400.000 | 57.39 | -11.70 | 45.69 | 74.00 | -28.31 | peak |
| 6 | 2405.000 | 100.42 | -11.68 | 88.74 | 114.00 | -25.26 | peak |
| 1/2 | LCS Tosting Lab | | VE LOSTES | tiug rap | 15 | THE LCS Test | ua Fap |

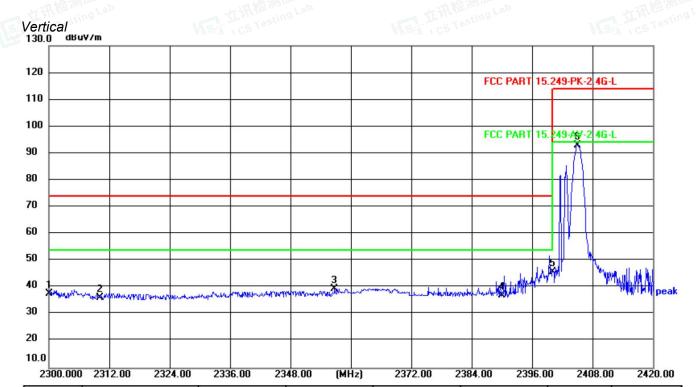


Shenzhen LCS Compliance Testing Laboratory Ltd.





Channel 1 / 2405 MHz



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|--------------------|----------------|------------------|-------------------|-------------------|----------------|----------|
| 1 | 2300.000 | 49.67 | -12.05 | 37.62 | 74.00 | -36.38 | peak |
| 2 | 2310.000 | 48.38 | -12.02 | 36.36 | 74.00 | -37.64 | peak |
| 3 | 2356.760 | 51.50 | -11.85 | 39.65 | 74.00 | -34.35 | peak |
| 4 | 2390.000 | 48.94 | -11.73 | 37.21 | 74.00 | -36.79 | peak |
| 5 | 2400.000 | 57.50 | -11.70 | 45.80 | 74.00 | -28.20 | peak |
| 6 | 2405.000 | 104.59 | -11.68 | 92.91 | 114.00 | -21.09 | peak |
| 15 | LCS Tosting Lab | | TEL TENTE | ting rap | 12 | LCS Testi | ng Lab |



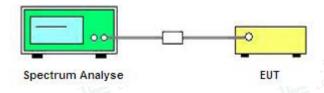
Shenzhen LCS Compliance Testing Laboratory Ltd.

9. 20 DB BANDWIDTH MEASUREMENT

9.1. Standard Applicable

§15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

9.2. Block Diagram of Test Setup



9.3. Test Procedure

Use the following spectrum analyzer settings:

Span = 5MHz

RBW = 3 kHz

VBW = 10 KHz

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).



Shenzhen LCS Compliance Testing Laboratory Ltd.



Page 31 of 33

FCC ID: 2ANIV-NW-01

Report No.: LCSA022123027EA

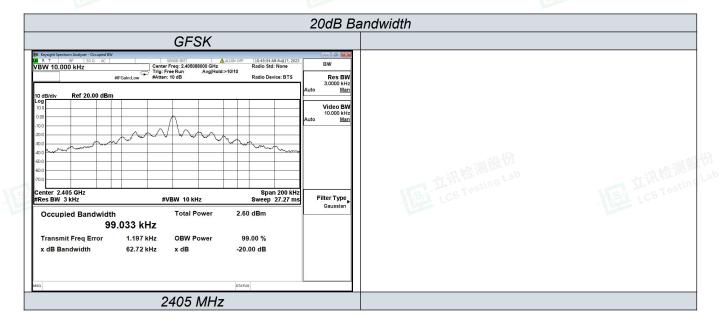
9.4. Test Results

| 9. | 4. Test Results | | | | |
|----|-----------------|----------|----------|-------|--|
| Þ | Temperature | 23.5℃ | Humidity | 52.2% | |
| | Test Engineer | Joker Hu | | | |

| Test Result of 20dB Bandwidth Measurement | | | | | | |
|---|-------|---------------|--|--|--|--|
| Test Frequency 20dB Bandwidth Limit | | | | | | |
| (MHz) | (KHz) | (MHz) | | | | |
| 2405 | 62.72 | Non-Specified | | | | |

Remark:

- 1. Test results including cable loss;
- 2. Please refer following test plots;





Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com Scan code to check authenticity



10. LIST OF MEASURING EQUIPMENT

| Item | Equipment | Manufacturer | Model No. | Serial No. | Cal Date | Due Date |
|------|-----------------------------------|----------------------|-------------|---------------------|--------------------------|--------------------------|
| 1 | MXA Signal Analyzer | Agilent | N9020A | MY49100060 | 2022-10-29 | 2023-10-28 |
| 2 | DC Power Supply | Agilent | E3642A | N/A | 2022-10-29 | 2023-10-28 |
| 3 | Temperature & Humidity Chamber | GUANGZHOU GOGNWEN | GDS-100 | 70932 | 2022-10-06 | 2023-10-05 |
| 4 | EMI Test Software | AUDIX | E3 | 1 | N/A | N/A |
| 5 | 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 2022-06-16 2023-06-09 | 2023-06-15 2024-06-08 |
| 6 | Positioning Controller | Max-Full | MF7802BS | MF780208586 | N/A | N/A |
| 7 | Active Loop Antenna | SCHWARZBECK | FMZB 1519B | 00005 | 2021-08-29 | 2024-08-28 |
| 8 | By-log Antenna | SCHWARZBECK | VULB9163 | 9163-470 | 2021-09-12 | 2024-09-11 |
| 9 | Horn Antenna | SCHWARZBECK | BBHA 9120D | 9120D-1925 | 2021-09-05 | 2024-09-04 |
| 10 | EMI Test Receiver | R&S | ESR 7 | 101181 | 2022-06-16 2023-06-09 | 2023-06-15 2024-06-08 |
| 11 | RS SPECTRUM ANALYZER | R&S | FSP40 | 100503 | 2022-10-29 | 2023-10-28 |
| 12 | Broadband Preamplifier | 1 | BP-01M18G | P190501 | 2022-06-16 2023-06-09 | 2023-06-15 2024-06-08 |
| 13 | EMI Test Receiver | R&S | ESPI | 101940 | 2022-08-18 2023-08-15 | 2023-08-17 2024-08-14 |
| 14 | Artificial Mains | R&S | ENV216 | 101288 | 2022-06-16 2023-06-09 | 2023-06-15 2024-06-08 |
| 15 | 10dB Attenuator | SCHWARZBECK | MTS-IMP-136 | 261115-001-0032 | 2022-06-16 2023-06-09 | 2023-06-15 2024-06-08 |
| 16 | EMI Test Software | Farad | EZ | T. Westerly of Land | N/A | N/A |









Shenzhen LCS Compliance Testing Laboratory Ltd.





11. TEST SETUP PHOTOGRAPHS OF THE EUT

Please refer to separated files for Test Setup Photos of the EUT.

12. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

13. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

The Los Test

-----THE END OF REPORT-----



Shenzhen LCS Compliance Testing Laboratory Ltd.