

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640 Fax: +86-755-26648637

Website: <a href="https://www.cqa-cert.com">www.cqa-cert.com</a> Report Template Revision Date: 2021-11-03

Report Template Version: V05

# **Test Report**

**Report No.:** CQASZ20220200203E-01

Applicant: HONGKONG VIMAI TECHNOLOGY CO., LIMITED

Address of Applicant: FLAT/RM H29, 1/F PHASE 2 KWAI SHING IND BLDG NO.42-46, TAI LIN PAI

ROAD KWAI CHUNG, HONG KONG

**Equipment Under Test (EUT):** 

**Product:** Live streaming monitoring wireless earphone

Model No.: EP030
Test Model No.: EP030

Brand Name: N/A

FCC ID: 2AVLI-EP030A

Standards: 47 CFR Part 15, Subpart C

**Date of Receipt:** 2022-02-17

**Date of Test:** 2022-02-17 to 2022-03-28

Date of Issue: 2022-03-30 Test Result : PASS\*

\*In the configuration tested, the EUT complied with the standards specified above.

Tested By: \_\_\_\_\_lewis 2h0u

( Lewis Zhou

Reviewed By:

(Rock Huang)

Approved By: (Jack Ai)





Report No.: CQASZ20220200203E-01

# 1 Version

## **Revision History Of Report**

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20220200203E-01 | Rev.01  | Initial report | 2022-03-30 |



# 2 Test Summary

| Test Item   | Test Requirement  | Test method        | Result |
|---|---|--------------------|--------|
| Antenna Requirement   | 47 CFR Part 15, Subpart C Section<br>15.203/15.247 (c)                                | ANSI C63.10 (2013) | PASS   |
| AC Power Line Conducted Emission                                  | 47 CFR Part 15, Subpart C Section<br>15.207   | ANSI C63.10 (2013) | PASS   |
| Conducted Peak Output<br>Power                                    | 47 CFR Part 15, Subpart C Section<br>15.247 (b)(1)                                    | ANSI C63.10 (2013) | PASS   |
| 20dB Occupied Bandwidth   | 47 CFR Part 15, Subpart C Section<br>15.247 (a)(1)                                    | ANSI C63.10 (2013) | PASS   |
| Carrier Frequencies Separation                                    | 47 CFR Part 15, Subpart C Section<br>15.247 (a)(1)                                    | ANSI C63.10 (2013) | PASS   |
| Hopping Channel Number  | 47 CFR Part 15, Subpart C Section<br>15.247 (a)(1)                                    | ANSI C63.10 (2013) | PASS   |
| Dwell Time  | 47 CFR Part 15, Subpart C Section<br>15.247 (a)(1)                                    | ANSI C63.10 (2013) | PASS   |
| Pseudorandom Frequency<br>Hopping Sequence                        | 47 CFR Part 15, Subpart C Section<br>15.247(b)(4)&TCB Exclusion List<br>(7 July 2002) | ANSI C63.10 (2013) | PASS   |
| Band-edge for RF<br>Conducted Emissions                           | 47 CFR Part 15, Subpart C Section 15.247(d)   | ANSI C63.10 (2013) | PASS   |
| RF Conducted Spurious<br>Emissions                                | 47 CFR Part 15, Subpart C Section 15.247(d)   | ANSI C63.10 (2013) | PASS   |
| Radiated Spurious emissions                                       | 47 CFR Part 15, Subpart C Section<br>15.205/15.209                                    | ANSI C63.10 (2013) | PASS   |
| Restricted bands around fundamental frequency (Radiated Emission) | 47 CFR Part 15, Subpart C Section<br>15.205/15.209                                    | ANSI C63.10 (2013) | PASS   |



# 3 Contents

|  | Page |
|--|------|
| 1 VERSION  | 2    |
| 2 TEST SUMMARY   | 3    |
| 3 CONTENTS   | 4    |
| 4 GENERAL INFORMATION  | 5    |
| 4.1 CLIENT INFORMATION   | 5    |
| 4.2 GENERAL DESCRIPTION OF EUT.                                  |      |
| 4.3 ADDITIONAL INSTRUCTIONS                                      |      |
| 4.4 Test Environment.  |      |
| 4.5 DESCRIPTION OF SUPPORT UNITS.                                |      |
| 4.6 STATEMENT OF THE MEASUREMENT UNCERTAINTY                     |      |
| 4.7 TEST LOCATION  | 10   |
| 4.8 TEST FACILITY  |      |
| 4.9 ABNORMALITIES FROM STANDARD CONDITIONS                       |      |
| 4.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER                 |      |
| 4.11 EQUIPMENT LIST  | 11   |
| 5 TEST RESULTS AND MEASUREMENT DATA                              | 12   |
| 5.1 Antenna Requirement  | 12   |
| 5.2 CONDUCTED EMISSIONS  | 13   |
| 5.3 CONDUCTED PEAK OUTPUT POWER.                                 |      |
| 5.4 20dB Occupy Bandwidth  |      |
| 5.5 CARRIER FREQUENCIES SEPARATION                               |      |
| 5.6 HOPPING CHANNEL NUMBER                                       |      |
| 5.7 DWELL TIME   |      |
| 5.8 BAND-EDGE FOR RF CONDUCTED EMISSIONS                         |      |
| 5.10 Other requirements Frequency Hopping Spread Spectrum System |      |
| 5.11 RADIATED SPURIOUS EMISSION & RESTRICTED BANDS               |      |
| 5.11.1 Radiated Emission below 1GHz                              |      |
| 5.11.2 Transmitter Emission above 1GHz                           |      |
| 6 PHOTOGRAPHS - EUT TEST SETUP                                   | 81   |
| 6.1 RADIATED EMISSION  | 81   |
| 6.2 CONDUCTED EMISSION   | 82   |
| 7 PHOTOGRAPHS - FUT CONSTRUCTIONAL DETAILS                       | 83   |



Report No.: CQASZ20220200203E-01

# 4 General Information

## 4.1 Client Information

| Applicant:               | HONGKONG VIMAI TECHNOLOGY CO., LIMITED  |
|--------------------------|---|
| Address of Applicant:    | FLAT/RM H29, 1/F PHASE 2 KWAI SHING IND BLDG NO.42-46, TAI LIN PAI ROAD KWAI CHUNG, HONG KONG           |
| Manufacturer:            | SHEN ZHEN VIMAI TECHNOLOGY CO., LTD   |
| Address of Manufacturer: | Floor 3, building B, no. 5 huating road, tongsheng community, dalang street, longhua district, shenzhen |
| Factory:                 | SHEN ZHEN VIMAI TECHNOLOGY CO., LTD   |
| Address of Factory:      | Floor 3, building B, no. 5 huating road, tongsheng community, dalang street, longhua district, shenzhen |

## 4.2 General Description of EUT

| Product Name:         | Live streaming monitoring wireless earphone                     |
|-----------------------|---|
| Model No.:            | EP030   |
| Test Model No.:       | EP030   |
| Trade Mark:           | N/A   |
| Software Version:     | 20220101EP030Ver6.2   |
| Hardware Version:     | EP030_LX_L/R_V1.5   |
| Operation Frequency:  | 2402MHz~2480MHz   |
| Bluetooth Version:    | V5.0  |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS)                         |
| Modulation Type:      | GFSK, π/4DQPSK, 8DPSK   |
| Transfer Rate:        | 1Mbps/2Mbps/3Mbps   |
| Number of Channel:    | 79  |
| Hopping Channel Type: | Adaptive Frequency Hopping systems                              |
| Product Type:         | ☐ Mobile ☐ Portable ☐ Fix Location                              |
| Test Software of EUT: | BT_Tool V1.1.0  |
| Antenna Type:         | FPC antenna   |
| Antenna Gain:         | -1.5dBi   |
| Power Supply:         | Li-ion battery: DC 3.7V 70mAh, Charge by DC 3.7V for Charge Box |



Report No.: CQASZ20220200203E-01

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 0                                   | 2402MHz   | 20      | 2422MHz   | 40      | 2442MHz   | 60      | 2462MHz   |
| 1                                   | 2403MHz   | 21      | 2423MHz   | 41      | 2443MHz   | 61      | 2463MHz   |
| 2                                   | 2404MHz   | 22      | 2424MHz   | 42      | 2444MHz   | 62      | 2464MHz   |
| 3                                   | 2405MHz   | 23      | 2425MHz   | 43      | 2445MHz   | 63      | 2465MHz   |
| 4                                   | 2406MHz   | 24      | 2426MHz   | 44      | 2446MHz   | 64      | 2466MHz   |
| 5                                   | 2407MHz   | 25      | 2427MHz   | 45      | 2447MHz   | 65      | 2467MHz   |
| 6                                   | 2408MHz   | 26      | 2428MHz   | 46      | 2448MHz   | 66      | 2468MHz   |
| 7                                   | 2409MHz   | 27      | 2429MHz   | 47      | 2449MHz   | 67      | 2469MHz   |
| 8                                   | 2410MHz   | 28      | 2430MHz   | 48      | 2450MHz   | 68      | 2470MHz   |
| 9                                   | 2411MHz   | 29      | 2431MHz   | 49      | 2451MHz   | 69      | 2471MHz   |
| 10                                  | 2412MHz   | 30      | 2432MHz   | 50      | 2452MHz   | 70      | 2472MHz   |
| 11                                  | 2413MHz   | 31      | 2433MHz   | 51      | 2453MHz   | 71      | 2473MHz   |
| 12                                  | 2414MHz   | 32      | 2434MHz   | 52      | 2454MHz   | 72      | 2474MHz   |
| 13                                  | 2415MHz   | 33      | 2435MHz   | 53      | 2455MHz   | 73      | 2475MHz   |
| 14                                  | 2416MHz   | 34      | 2436MHz   | 54      | 2456MHz   | 74      | 2476MHz   |
| 15                                  | 2417MHz   | 35      | 2437MHz   | 55      | 2457MHz   | 75      | 2477MHz   |
| 16                                  | 2418MHz   | 36      | 2438MHz   | 56      | 2458MHz   | 76      | 2478MHz   |
| 17                                  | 2419MHz   | 37      | 2439MHz   | 57      | 2459MHz   | 77      | 2479MHz   |
| 18                                  | 2420MHz   | 38      | 2440MHz   | 58      | 2460MHz   | 78      | 2480MHz   |
| 19                                  | 2421MHz   | 39      | 2441MHz   | 59      | 2461MHz   |         |           |

#### Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel             | Frequency |
|---------------------|-----------|
| The Lowest channel  | 2402MHz   |
| The Middle channel  | 2441MHz   |
| The Highest channel | 2480MHz   |

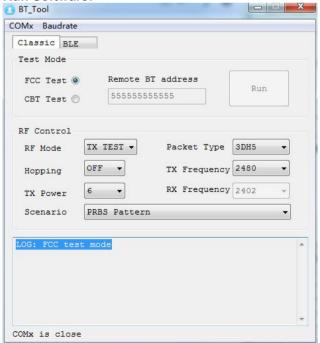




### 4.3 Additional Instructions

| <b>EUT Test Software S</b>   | ettings:   |  |  |  |  |
|------------------------------|--|--|--|--|--|
| Mode:                        | <ul> <li>         ⊠ Special software is used.          ☐ Through engineering command into the engineering mode.         engineering command: *#*#3646633#*#*     </li> </ul> |  |  |  |  |
| EUT Power level:             | Class2 (Power level is built-in set pa selected)   | Class2 (Power level is built-in set parameters and cannot be changed and selected) |  |  |  |
| Use test software to set the | lowest frequency, the middle frequency a   | nd the highest frequency keep  |  |  |  |
| transmitting of the EUT.     |  | -  |  |  |  |
| Mode                         | Channel Frequency(MHz)   |  |  |  |  |
|                              | CH0  | 2402   |  |  |  |
| DH1/DH3/DH5                  | CH39   | 2441   |  |  |  |
|                              | CH78   | 2480   |  |  |  |
|                              | CH0  | 2402   |  |  |  |
| 2DH1/2DH3/2DH5               | CH39   | 2441   |  |  |  |
|                              | CH78   | 2480   |  |  |  |
|                              | CH0  | 2402   |  |  |  |
| 3DH1/3DH3/3DH5               | CH39   | 2441   |  |  |  |
|                              | CH78   | 2480   |  |  |  |

#### Run Software:





Report No.: CQASZ20220200203E-01

### **4.4** Test Environment

| Operating Environment | Operating Environment:  |  |  |
|-----------------------|---|--|--|
| Temperature:          | 25 °C   |  |  |
| Humidity:             | 54% RH  |  |  |
| Atmospheric Pressure: | 1009mbar  |  |  |
| Test Mode:            | Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT. |  |  |

# 4.5 Description of Support Units

The EUT has been tested with associated equipment below.

| Description Manufacturer |    | Model No. | Remark |
|--------------------------|----|-----------|--------|
| Adapter                  | MI | 1         | 1      |



作 記 記 記 記 記 記 記

Report No.: CQASZ20220200203E-01

### 4.6 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 **Shenzhen Huaxia Testing Technology Co., Ltd.** guality 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.

Hereafter the best measurement capability for CQA laboratory is reported:

| No. | Item                               | Uncertainty        |
|-----|------------------------------------|--------------------|
| 1   | Radiated Emission (Below 1GHz)     | 5.12dB             |
| 2   | Radiated Emission (Above 1GHz)     | 4.60dB             |
| 3   | Conducted Disturbance (0.15~30MHz) | 3.34dB             |
| 4   | Radio Frequency                    | 3×10 <sup>-8</sup> |
| 5   | Duty cycle                         | 0.6 %              |
| 6   | Occupied Bandwidth                 | 1.1%               |
| 7   | RF conducted power                 | 0.86dB             |
| 8   | RF power density                   | 0.74               |
| 9   | Conducted Spurious emissions       | 0.86dB             |
| 10  | Temperature test                   | 0.8℃               |
| 11  | Humidity test                      | 2.0%               |
| 12  | Supply voltages                    | 0.5 %              |
| 13  | Frequency Error                    | 5.5 Hz             |



Report No.: CQASZ20220200203E-01

#### 4.7 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

### 4.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### IC Registration No.: 22984-1

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

The test facility is recognized, certified, or accredited by the following organizations:

#### • CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

#### • A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

#### • FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

#### 4.9 Abnormalities from Standard Conditions

None.

#### 4.10 Other Information Requested by the Customer

None.



Report No.: CQASZ20220200203E-01

# 4.11 Equipment List

|                   |              |                       | Instrument | Calibration | Calibration |
|-------------------|--------------|-----------------------|------------|-------------|-------------|
| Test Equipment    | Manufacturer | Model No.             | No.        | Date        | Due Date    |
| EMI Test Receiver | R&S          | ESR7                  | CQA-005    | 2021/9/10   | 2022/9/9    |
| Spectrum analyzer | R&S          | FSU26                 | CQA-038    | 2021/9/10   | 2022/9/9    |
|                   |              | AFS4-00010300-18-10P- |            |             |             |
| Preamplifier      | MITEQ        | 4                     | CQA-035    | 2021/9/10   | 2022/9/9    |
|                   |              | AMF-6D-02001800-29-   |            |             |             |
| Preamplifier      | MITEQ        | 20P                   | CQA-036    | 2021/9/10   | 2022/9/9    |
| Loop antenna      | Schwarzbeck  | FMZB1516              | CQA-087    | 2021/9/16   | 2024/9/15   |
| Bilog Antenna     | R&S          | HL562                 | CQA-011    | 2021/9/16   | 2024/9/15   |
| Horn Antenna      | R&S          | HF906                 | CQA-012    | 2021/9/16   | 2024/9/15   |
| Horn Antenna      | Schwarzbeck  | BBHA 9170             | CQA-088    | 2021/9/16   | 2024/9/15   |
| Coaxial Cable     |              |                       |            |             |             |
| (Above 1GHz)      | CQA          | N/A                   | C019       | 2021/9/10   | 2022/9/9    |
| Coaxial Cable     |              |                       |            |             |             |
| (Below 1GHz)      | CQA          | N/A                   | C020       | 2021/9/10   | 2022/9/9    |
| Antenna Connector | CQA          | RFC-01                | CQA-080    | 2021/9/10   | 2022/9/9    |
| RF                |              |                       |            |             |             |
| cable(9KHz~40GHz) | CQA          | RF-01                 | CQA-079    | 2021/9/10   | 2022/9/9    |
|                   |              |                       |            |             |             |
| Power divider     | MIDWEST      | PWD-2533-02-SMA-79    | CQA-067    | 2021/9/10   | 2022/9/9    |
| EMI Test Receiver | R&S          | ESPI3                 | CQA-013    | 2021/9/10   | 2022/9/9    |
| LISN              | R&S          | ENV216                | CQA-003    | 2021/9/10   | 2022/9/9    |
| Coaxial cable     | CQA          | N/A                   | CQA-C009   | 2021/9/10   | 2022/9/9    |

#### Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.





### 5 Test results and Measurement Data

### 5.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement:

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, 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **EUT Antenna:**



The antenna is FPC antenna. The best case gain of the antenna is -1.5 dBi.





## **5.2** Conducted Emissions

| Test Requirement:     | 47 CFR Part 15C Section 15.207  |  |               |  |  |
|-----------------------|---|--|---------------|--|--|
| Test Method:          | ANSI C63.10: 2013   |  |               |  |  |
| Test Frequency Range: | 150kHz to 30MHz   |  |               |  |  |
| Limit:                | Limit (dBuV)  |  | BuV)          |  |  |
|                       | Frequency range (MHz)   | Quasi-peak                                 | Average       |  |  |
|                       | 0.15-0.5  | 66 to 56*                                  | 56 to 46*     |  |  |
|                       | 0.5-5   | 56   | 46            |  |  |
|                       | 5-30  | 60   | 50            |  |  |
|                       | * Decreases with the logarithm of the frequency.  |  |               |  |  |
| Test Procedure:       | <ol> <li>* Decreases with the logarithm of the frequency.</li> <li>The mains terminal disturbance voltage test was conducted in room.</li> <li>The EUT was connected to AC power source through a LISN 1 Impedance Stabilization Network) which provides a 50Ω/50μH-impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit bein measured. A multiple socket outlet strip was used to connect m power cables to a single LISN provided the rating of the LISN wexceeded.</li> <li>The tabletop EUT was placed upon a non-metallic table 0.8m all ground reference plane. And for floor-standing arrangement, the placed on the horizontal ground reference plane,</li> <li>The test was performed with a vertical ground reference plane of the EUT shall be 0.4 m from the vertical ground reference plane vertical ground reference plane was bonded to the horizontal ground unit under test and bonded to a ground reference plane. The LISN 1 was placed 0.8 m from the boundary unit under test and bonded to a ground reference plane. This distance we between the closest points of the LISN 1 and the EUT. All other the EUT and associated equipment was at least 0.8 m from the ln order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according.</li> </ol> |  |               |  |  |
| Test Setup:           | Shielding Room  EUT  AC Mains  LISN1  | AE  LISN2  AC Main  Ground Reference Plane | Test Receiver |  |  |

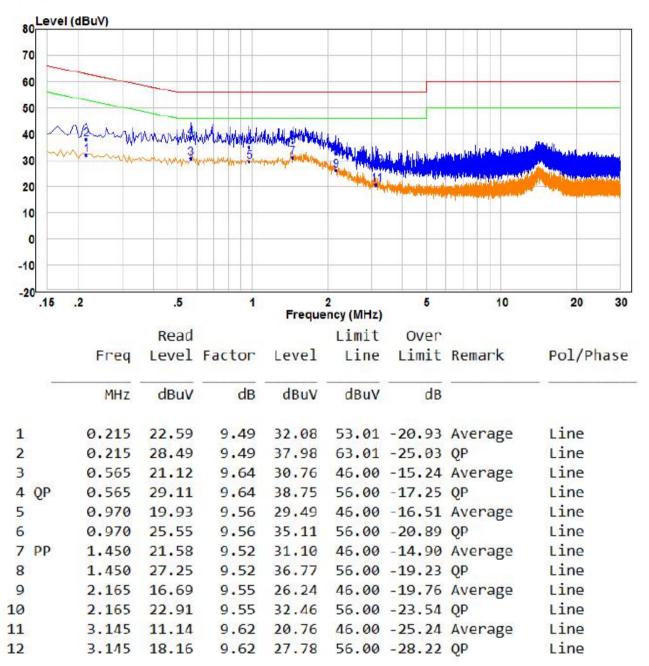


| Exploratory Test Mode: | Charging mode |
|------------------------|---------------|
| Test Voltage:          | AC 120V/60Hz  |
| Test Results:          | Pass          |



#### **Measurement Data**

Live line:

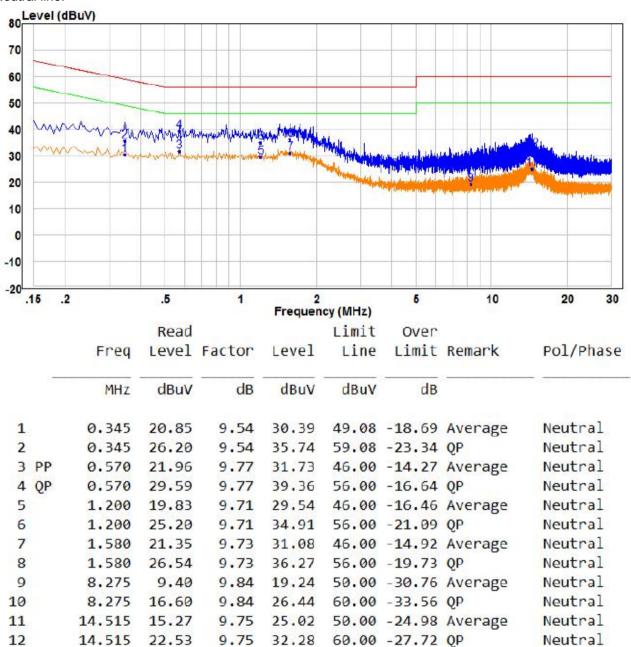


#### Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



#### Neutral line:



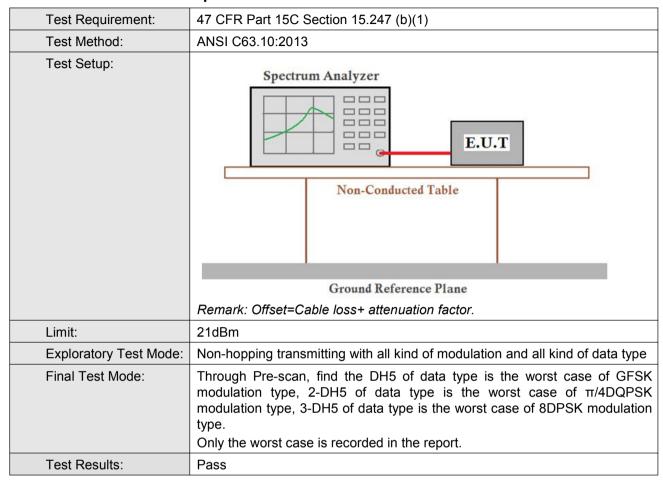
#### Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



Report No.: CQASZ20220200203E-01

### 5.3 Conducted Peak Output Power



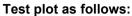


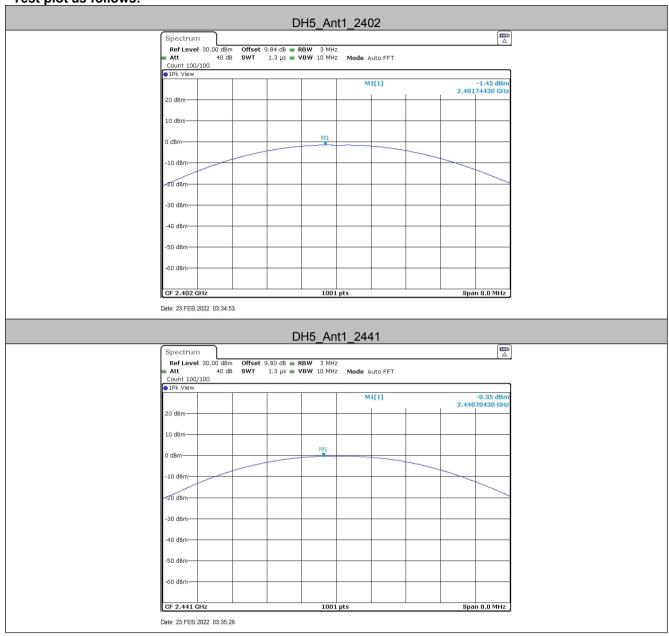
Report No.: CQASZ20220200203E-01

#### **Measurement Data**

| GFSK mode    |                         |             |        |  |  |  |
|--------------|-------------------------|-------------|--------|--|--|--|
| Test channel | Peak Output Power (dBm) | Limit (dBm) | Result |  |  |  |
| Lowest       | -1.45                   | 21.00       | Pass   |  |  |  |
| Middle       | -0.35                   | 21.00       | Pass   |  |  |  |
| Highest      | -0.38                   | 21.00       | Pass   |  |  |  |
|              | π/4DQPSK m              | ode         |        |  |  |  |
| Test channel | Peak Output Power (dBm) | Limit (dBm) | Result |  |  |  |
| Lowest       | 1.3                     | 21.00       | Pass   |  |  |  |
| Middle       | 2.22                    | 21.00       | Pass   |  |  |  |
| Highest      | 2.39 21.00              |             | Pass   |  |  |  |
| 8DPSK mode   |                         |             |        |  |  |  |
| Test channel | Peak Output Power (dBm) | Limit (dBm) | Result |  |  |  |
| Lowest       | 1.99                    | 21.00       | Pass   |  |  |  |
| Middle       | 3.06                    | 21.00       | Pass   |  |  |  |
| Highest 3.54 |                         | 21.00       | Pass   |  |  |  |



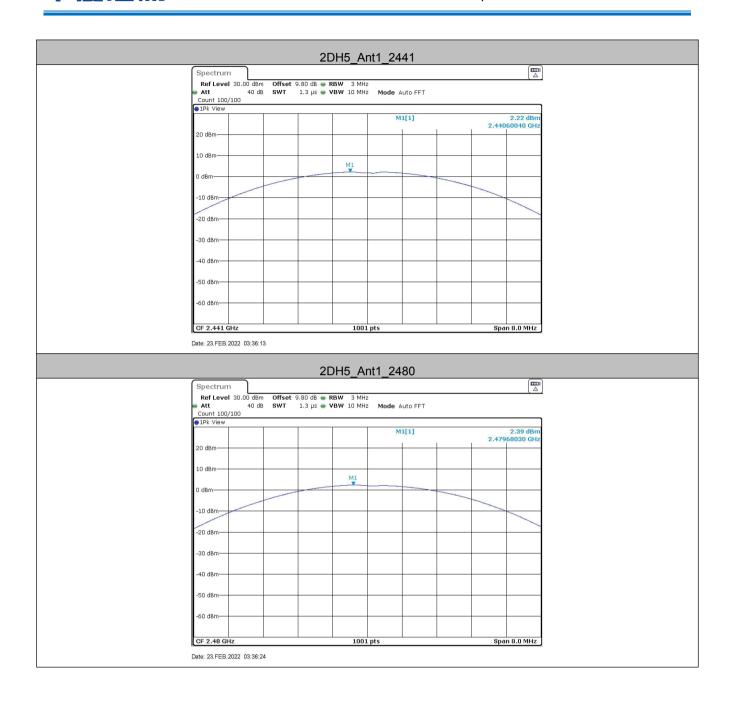








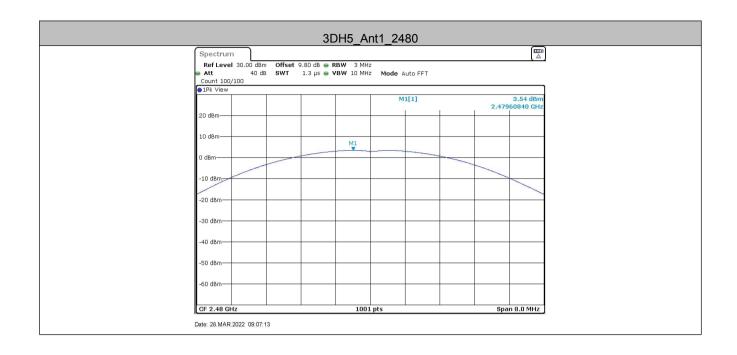








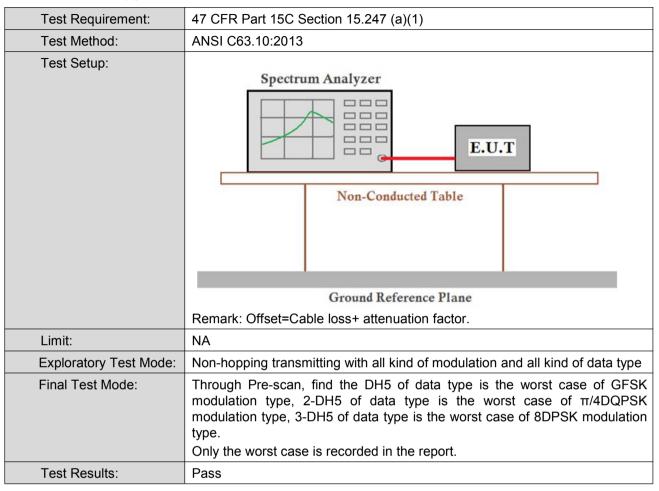






Report No.: CQASZ20220200203E-01

### 5.4 20dB Occupy Bandwidth



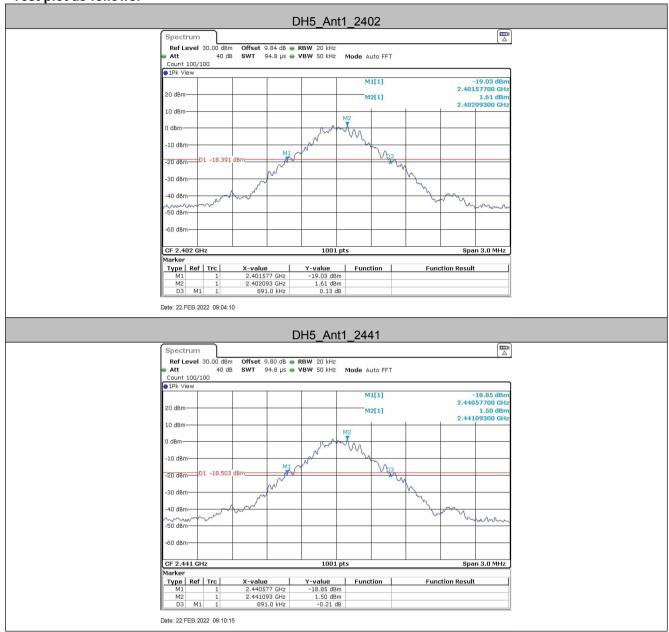
#### **Measurement Data**

| Toot channel | 20dB Occupy Bandwidth (MHz) |          |       |  |
|--------------|-----------------------------|----------|-------|--|
| Test channel | GFSK                        | π/4DQPSK | 8DPSK |  |
| Lowest       | 0.891                       | 1.089    | 1.290 |  |
| Middle       | 0.891                       | 1.323    | 1.305 |  |
| Highest      | 0.888                       | 1.323    | 1.299 |  |

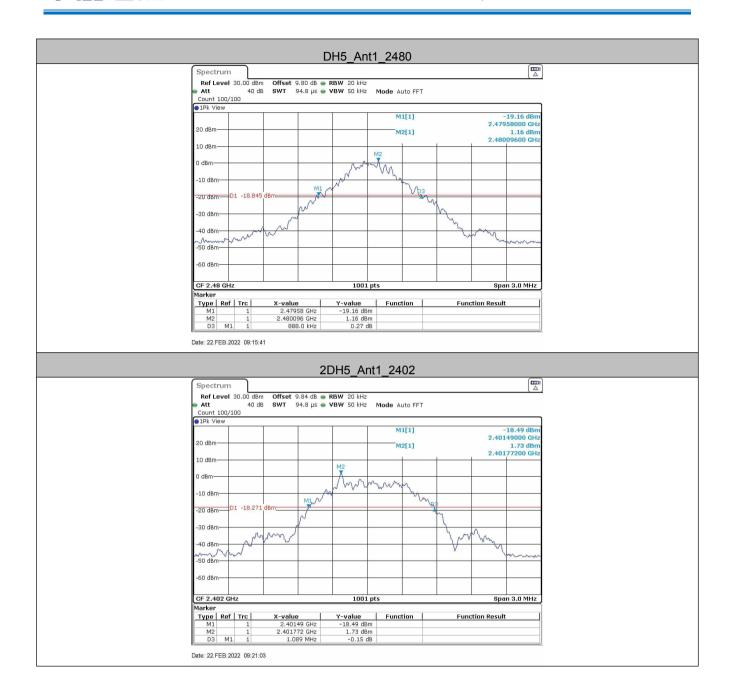


Report No.: CQASZ20220200203E-01

#### Test plot as follows:



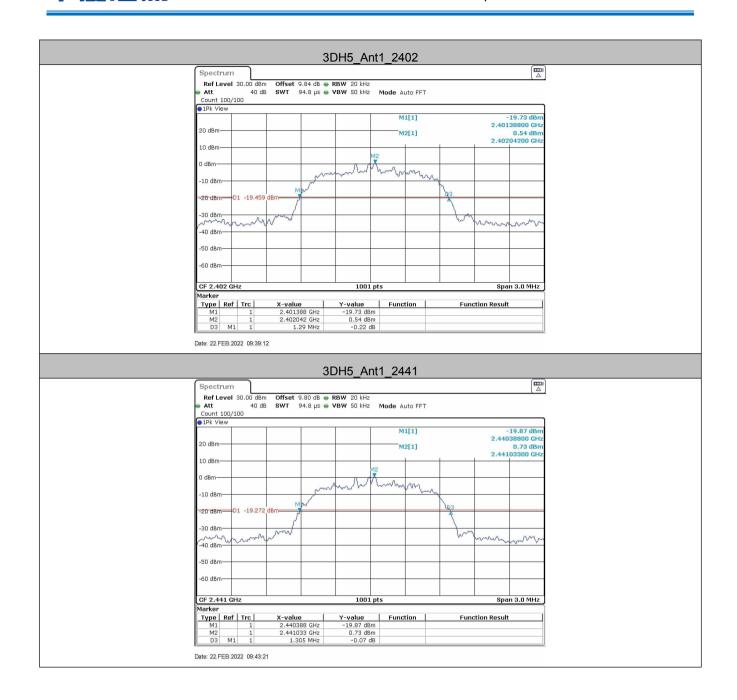




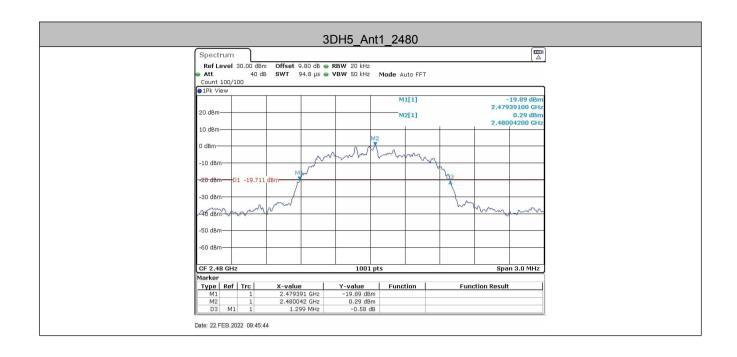














Report No.: CQASZ20220200203E-01

# 5.5 Carrier Frequencies Separation

| Test Requirement:      | 47 CFR Part 15C Section 15.247 (a)(1)   |  |  |
|------------------------|---|--|--|
| Test Method:           | ANSI C63.10:2013  |  |  |
| Test Setup:            | Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane   |  |  |
|                        | Remark: Offset=Cable loss+ attenuation factor.  |  |  |
| Limit:                 | 2/3 of the 20dB bandwidth   |  |  |
|                        | Remark: the transmission power is less than 0.125W.   |  |  |
| Exploratory Test Mode: | Hopping transmitting with all kind of modulation and all kind of data type  |  |  |
| Final Test Mode:       | Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi$ /4DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report. |  |  |
| Test Results:          | Pass  |  |  |



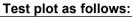
Report No.: CQASZ20220200203E-01

#### **Measurement Data**

| TestMode | Antenna | Channel | Result[MHz] | Limit[MHz] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| DH5      | Ant1    | Нор     | 1.003       | ≥0.594     | PASS    |
| 2DH5     | Ant1    | Нор     | 1.035       | ≥0.882     | PASS    |
| 3DH5     | Ant1    | Hop     | 1.159       | ≥0.870     | PASS    |

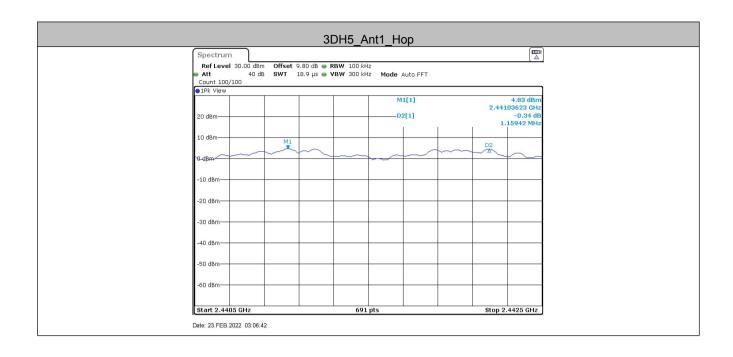
| Mode     | 20dB bandwidth (MHz) (worse case) | Limit (MHz) (Carrier Frequencies Separation) |  |  |
|----------|-----------------------------------|--|--|--|
| GFSK     | 0.891                             | ≥0.594                                       |  |  |
| π/4DQPSK | 1.323                             | ≥0.882                                       |  |  |
| 8DPSK    | 1.305                             | ≥0.870                                       |  |  |







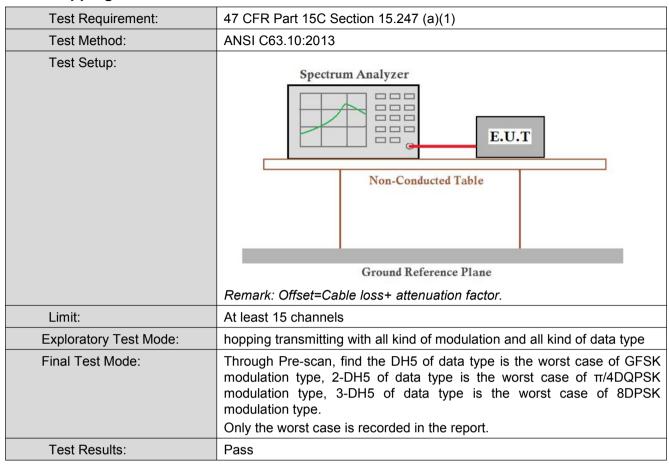






Report No.: CQASZ20220200203E-01

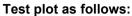
### 5.6 Hopping Channel Number

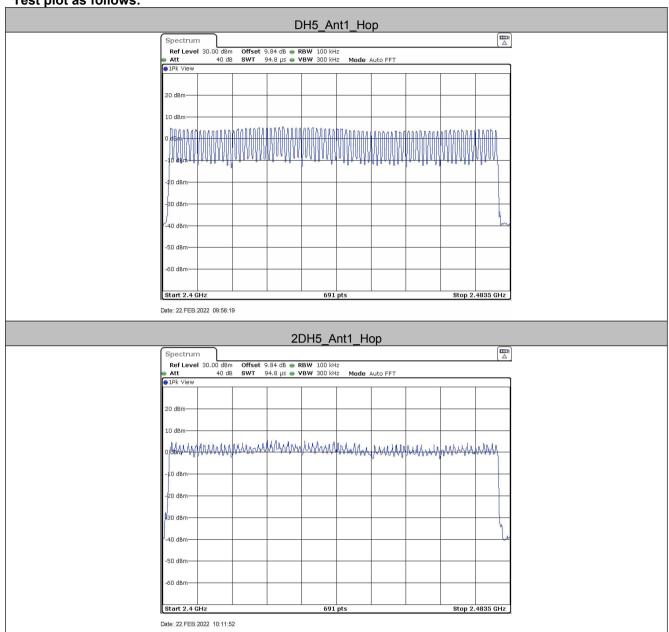


#### **Measurement Data**

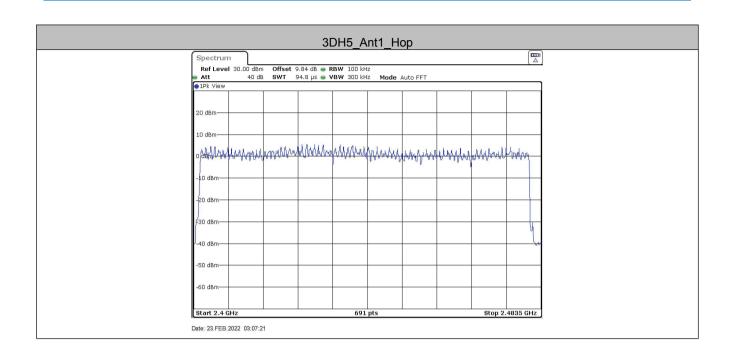
|  | Mode     | Hopping channel numbers | Limit |  |  |
|--|----------|-------------------------|-------|--|--|
|  | GFSK     | 79                      | ≥15   |  |  |
|  | π/4DQPSK | 79                      | ≥15   |  |  |
|  | 8DPSK    | 79                      | ≥15   |  |  |







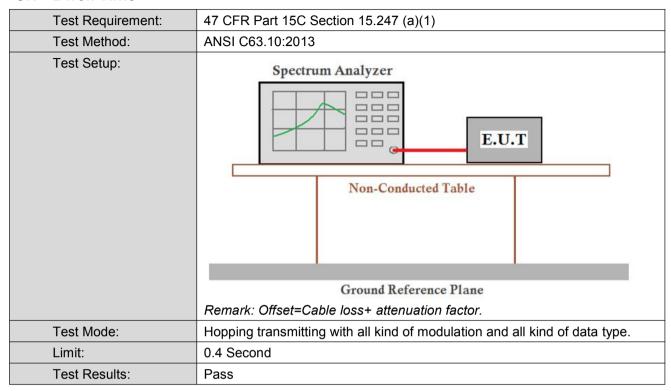








#### 5.7 Dwell Time





Report No.: CQASZ20220200203E-01

#### **Measurement Data**

| TestMode | Antenna | Channel | BurstWidth<br>[ms] | TotalHops<br>[Num] | Result[s] | Limit[s] | Verdict |
|----------|---------|---------|--------------------|--------------------|-----------|----------|---------|
| DH1      | Ant1    | Нор     | 0.39               | 320                | 0.126     | ≤0.4     | PASS    |
| DH3      | Ant1    | Нор     | 1.64               | 170                | 0.279     | ≤0.4     | PASS    |
| DH5      | Ant1    | Нор     | 2.88               | 110                | 0.317     | ≤0.4     | PASS    |
| 2DH1     | Ant1    | Нор     | 0.40               | 320                | 0.129     | ≤0.4     | PASS    |
| 2DH3     | Ant1    | Нор     | 1.65               | 160                | 0.264     | ≤0.4     | PASS    |
| 2DH5     | Ant1    | Нор     | 2.89               | 110                | 0.318     | ≤0.4     | PASS    |
| 3DH1     | Ant1    | Нор     | 0.41               | 320                | 0.13      | ≤0.4     | PASS    |
| 3DH3     | Ant1    | Нор     | 1.65               | 140                | 0.231     | ≤0.4     | PASS    |
| 3DH5     | Ant1    | Нор     | 2.89               | 100                | 0.289     | ≤0.4     | PASS    |

#### Remark:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

DH1/2DH1/3DH1 Dwell time = Burst Width(ms)\*[1600/ (2\*79)]\*31.6

DH3/2DH3/3DH3 Dwell time = Burst Width (ms)\*[1600/ (4\*79)]\*31.6

DH5/2DH5/3DH5 Dwell time = Burst Width (ms)\*[1600/ (6\*79)]\*31.6



