

# Test Report

**Applicant** : Kumi Technology Co., Ltd.  
Room 201, Building A, No.1 Qianwan Road,  
**Address** : Qianhai Shenzhen-Hong Kong Cooperation  
Zone, Shenzhen, China  
**Product Name** : KUMI Smart Watch  
**Brand Mark** : KUMI  
**Model** : KUMI GW5 Fit  
**Series model** : N/A  
**Report Number** : BLA-EMC-202501-A8602  
**FCC ID** : 2A2L4-KUMIGW5FIT  
**Date of Receipt** : Jan.21,2025  
**Date of Test** : Jan.22,2025 to Feb.11,2025  
**Test Standard** : 47 CFR Part 15, Subpart C 15.247  
**Test Result** : Pass

Compiled by:

charlie

Review by:

Sueels

Approved by:

13 Feb. Zheng

Issued Date:

Feb.13,2025



## BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

Address: Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District,  
Shenzhen, Guangdong Province, China



*The test report is effective only with both signature and specialized stamp and The result(s) shown in this report refer only to the sample(s) tested. Without written approval of BlueAsia, this report can't be reproduced except in full. The results described in this report do not represent the quality or characteristics of the sampled batch, nor do they represent any similar or identical products that are not explicitly stated.*

## Table of Contents

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>1 General information .....</b>                              | <b>5</b>  |
| 1.1 General information .....                                   | 5         |
| 1.2 General description of EUT .....                            | 5         |
| <b>2 Test summary .....</b>                                     | <b>6</b>  |
| <b>3 Test Configuration .....</b>                               | <b>7</b>  |
| 3.1 Test mode .....                                             | 7         |
| 3.2 Operation Frequency each of channel .....                   | 7         |
| 3.3 Test channel .....                                          | 7         |
| 3.4 Configuration diagram of EUT .....                          | 8         |
| 3.5 Auxiliary equipment .....                                   | 9         |
| 3.6 Test environment .....                                      | 9         |
| <b>4 Laboratory information .....</b>                           | <b>10</b> |
| 4.1 Laboratory and accreditations .....                         | 10        |
| 4.2 Measurement uncertainty .....                               | 10        |
| <b>5 Test equipment .....</b>                                   | <b>11</b> |
| <b>6 Test result .....</b>                                      | <b>13</b> |
| 6.1 Antenna requirement .....                                   | 13        |
| 6.2 Conducted emissions at AC power line (150 kHz-30 MHz) ..... | 14        |
| 6.3 Conducted peak output Power .....                           | 18        |
| 6.4 Minimum 6dB bandwidth .....                                 | 20        |
| 6.5 Power spectrum density .....                                | 21        |
| 6.6 Conducted Band Edges Measurement .....                      | 22        |
| 6.7 Conducted spurious emissions .....                          | 24        |
| 6.8 Radiated spurious emissions .....                           | 26        |
| 6.9 Radiated emissions which fall in the restricted bands ..... | 37        |
| <b>7 Appendix A .....</b>                                       | <b>44</b> |
| 7.1 Maximum PK Conducted Output Power .....                     | 44        |
| 7.2 -6dB Bandwidth .....                                        | 46        |
| 7.3 Occupied Channel Bandwidth .....                            | 48        |
| 7.4 Maximum Power Spectral Density Level .....                  | 50        |

|                                                    |           |
|----------------------------------------------------|-----------|
| 7.5 Band Edge .....                                | 52        |
| 7.6 Conducted RF Spurious Emission .....           | 55        |
| <b>Appendix B: photographs of test setup .....</b> | <b>59</b> |
| <b>Appendix C: photographs of EUT .....</b>        | <b>61</b> |

BlueAsia

## Revise Record

| Version No. | Date        | Description |
|-------------|-------------|-------------|
| 01          | Feb.13,2025 | Original    |
|             |             |             |
|             |             |             |
|             |             |             |

## 1 General information

### 1.1 General information

|              |                                                                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant    | Kumi Technology Co., Ltd.                                                                                                                                                                                                                           |
| Address      | Room 201, Building A, No.1 Qianwan Road, Qianhai Shenzhen-Hong Kong Cooperation Zone, Shenzhen, China                                                                                                                                               |
| Manufacturer | Shenzhen Tenxinbona Technology Co., Ltd.                                                                                                                                                                                                            |
| Address      | 405, 4th Floor, Building A, Chuanglingtong Technology Building, Shihua Road, Fubao Community, Fubao Street, Futian District, Shenzhen(405, Building A, Financial Technology Innovation Center, No. 1 Shihua Road, Hetao Sci-Tech Innovation Center) |
| Factory      | N/A                                                                                                                                                                                                                                                 |
| Address      | N/A                                                                                                                                                                                                                                                 |

### 1.2 General description of EUT

|                                                                                                                                             |                                |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Product Name                                                                                                                                | KUMI Smart Watch               |
| Model No.                                                                                                                                   | KUMI GW5 Fit                   |
| Series model                                                                                                                                | N/A                            |
| Differences of Series model                                                                                                                 | N/A                            |
| Operation Frequency                                                                                                                         | 2402MHz-2480MHz                |
| Modulation Type                                                                                                                             | GFSK                           |
| Channel Spacing:                                                                                                                            | 2MHz                           |
| Number of Channels                                                                                                                          | 40                             |
| Antenna Type                                                                                                                                | internal antenna               |
| Antenna Gain                                                                                                                                | -2.36dBi(Provided by customer) |
| Power supply or adapter information                                                                                                         | DC3.8V                         |
| Hardware Version                                                                                                                            | V1.5                           |
| Software Version                                                                                                                            | V1.5                           |
| Engineer sample no                                                                                                                          | BLA-EMC-202501-A83             |
| <i>Note: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.</i> |                                |

## 2 Test summary

| No. | Test item                                             | FCC Part Section(s)   | Test Method(Clause)                 | Result |
|-----|-------------------------------------------------------|-----------------------|-------------------------------------|--------|
| 1   | Antenna Requirement                                   | §15.203               | N/A                                 | Pass   |
| 2   | Conducted Emissions at AC Power Line (150kHz-30MHz)   | §15.207               | ANSI C63.10-2013 Clause 6.2         | Pass   |
| 3   | Conducted Peak Output Power                           | §15.247(b)(3)         | ANSI C63.10-2013 Cluase 7.8.5       | Pass   |
| 4   | Minimum 6dB Bandwidth                                 | §15.247a(2)           | ANSI C63.10-2013 Cluase 11.8.1      | Pass   |
| 5   | Power Spectrum Density                                | §15.247(d)            | ANSI C63.10-2013 Cluase 11.10.2     | Pass   |
| 6   | Conducted Band Edges Measurement                      | §15.247(d)            | ANSI C63.10-2013 Cluase 11.13       | Pass   |
| 7   | Conducted Spurious Emissions                          | §15.247(d)            | ANSI C63.10-2013 Cluase 11.11       | Pass   |
| 8   | Radiated Spurious Emissions                           | §15.209<br>§15.247(d) | ANSI C63.10-2013 Cluase 6.4,6.5,6.6 | Pass   |
| 9   | Radiated Emissions which fall in the restricted bands | §15.209<br>§15.247(d) | ANSI C63.10-2013 Cluase 11.12       | Pass   |

N/A: Not Applicable

### 3 Test Configuration

#### 3.1 Test mode

| Test Mode <sup>Note 1</sup> | Description                                                      |
|-----------------------------|------------------------------------------------------------------|
| TX                          | Keep the EUT in continuously transmitting with modulation mode.  |
| RX                          | Keep the EUT in receiving mode                                   |
| TX Low channel              | Keep the EUT in continuously transmitting mode in low channel    |
| TX middle channel           | Keep the EUT in continuously transmitting mode in middle channel |
| TX high channel             | Keep the EUT in continuously transmitting mode in high channel   |

Note 1: The EUT was configured to measure its highest possible emission and/or immunity level. The test modes were adapted according to the operation manual for use

#### 3.2 Operation Frequency each of channel

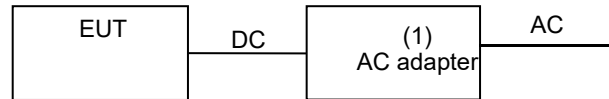
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| 0       | 2402MHz   | 10      | 2422MHz   | 20      | 2442MHz   | 30      | 2462MHz   |
| 1       | 2404MHz   | 11      | 2424MHz   | 21      | 2444MHz   | 31      | 2464MHz   |
| ...     | ...       | ...     | ...       | ...     | ...       | ...     | ...       |
| 8       | 2418MHz   | 18      | 2438MHz   | 28      | 2458MHz   | 38      | 2478MHz   |
| 9       | 2420MHz   | 19      | 2440MHz   | 29      | 2460MHz   | 39      | 2480MHz   |

#### 3.3 Test channel

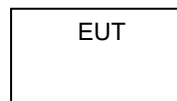
| Channel             | Frequency |
|---------------------|-----------|
| The lowest channel  | 2402MHz   |
| The middle channel  | 2442MHz   |
| The Highest channel | 2480MHz   |

### 3.4 Configuration diagram of EUT

AC conducted emission:

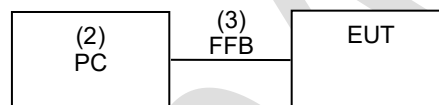


Radiated emission:



Note: see test photographs attached in APPENDIX A for the actual connections between Product and support equipment.

RF Test:



Support equipment:

| Name | Device type           | Brand  | Mode  | Series No | Remark |
|------|-----------------------|--------|-------|-----------|--------|
| (1)  | AC Adapter            | UGREEN | CD112 | N/A       | N/A    |
| (2)  | PC                    | lenovo | E460C | N/A       | N/A    |
| (3)  | Fixed frequency board | N/A    | N/A   | N/A       | N/A    |

### 3.5 Auxiliary equipment

| Device Type                                                    | Manufacturer | Model Name   | Serial No. | Remark                          |
|----------------------------------------------------------------|--------------|--------------|------------|---------------------------------|
| PC                                                             | lenovo       | E46OC        | N/A        | From lab (No.BLA-ZC-BS-2022005) |
| AC adapter                                                     | PISEN        | ZY2207-A521H | N/A        | From lab                        |
| <b>Note:</b> “--” mean no any auxiliary device during testing. |              |              |            |                                 |

### 3.6 Test environment

| Environment | Temperature | Voltage |
|-------------|-------------|---------|
| Normal      | 25℃         | DC 3.8V |

## 4 Laboratory information

### 4.1 Laboratory and accreditations

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

|                          |                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------------------------|
| Company name:            | BlueAsia of Technical Services(Shenzhen) Co., Ltd.                                                          |
| Address:                 | Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China |
| CNAS accredited No.:     | L9788                                                                                                       |
| A2LA Cert. No.:          | 5071.01                                                                                                     |
| FCC Designation No.:     | CN1252                                                                                                      |
| ISED CAB identifier No.: | CN0028                                                                                                      |
| Telephone:               | +86-755-28682673                                                                                            |
| FAX:                     | +86-755-28682673                                                                                            |

### 4.2 Measurement uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

| Parameter                                      | Expanded Uncertainty            |
|------------------------------------------------|---------------------------------|
| Radiated Emission(9kHz-30MHz)                  | $\pm 4.34\text{dB}$             |
| Radiated Emission(30Mz-1000MHz)                | $\pm 4.24\text{dB}$             |
| Radiated Emission(1GHz-18GHz)                  | $\pm 4.68\text{dB}$             |
| AC Power Line Conducted Emission(150kHz-30MHz) | $\pm 3.45\text{dB}$             |
| Occupied Channel Bandwidth                     | $\pm 5\%$                       |
| RF output power, conducted                     | $\pm 1.5\text{ dB}$             |
| Power Spectral Density, conducted              | $\pm 3.0\text{ dB}$             |
| Unwanted Emissions, conducted                  | $\pm 3.0\text{ dB}$             |
| Temperature                                    | $\pm 3\text{ }^{\circ}\text{C}$ |
| Supply voltages                                | $\pm 3\%$                       |
| Time                                           | $\pm 5\%$                       |

## 5 Test equipment

### Radiated Spurious Emissions (Below 1GHz)

| Equipment      | Name              | Model            | Manufacture | S/N    | Cal. Date  | Due. Date  |
|----------------|-------------------|------------------|-------------|--------|------------|------------|
| BLA-EMC-002-01 | Anechoic chamber  | 9*6*6 chamber    | SKET        | N/A    | 2024/3/27  | 2027/3/26  |
| BLA-EMC-002-02 | Control room      | 966 control room | SKET        | N/A    | 2024/3/27  | 2027/3/26  |
| BLA-EMC-009    | EMI receiver      | ESR7             | R&S         | 101199 | 2024/08/08 | 2025/08/07 |
| BLA-EMC-043    | Loop antenna      | FMZB1519B        | Schwarzbeck | 00102  | 2024/06/29 | 2026/06/28 |
| BLA-EMC-065    | Broadband antenna | VULB9168         | Schwarzbeck | 01065P | 2024/06/29 | 2026/06/27 |
| BLA-XC-01      | Coaxial Cable     | N/A              | BlueAsia    | V01    | N/A        | N/A        |
| BLA-XC-02      | Coaxial Cable     | N/A              | BlueAsia    | V02    | N/A        | N/A        |

### Radiated Spurious Emissions (Above 1GHz)

| Equipment      | Name              | Model                | Manufacture | S/N              | Cal. Date  | Due. Date  |
|----------------|-------------------|----------------------|-------------|------------------|------------|------------|
| BLA-EMC-001-01 | Anechoic chamber  | 9*6*6 chamber        | SKET        | N/A              | 2023/11/16 | 2026/11/15 |
| BLA-EMC-001-02 | Control Room      | 966 control room     | SKET        | N/A              | 2023/11/16 | 2025/11/15 |
| BLA-EMC-008    | Spectrum          | FSP40                | R&S         | 100817           | 2024/08/08 | 2025/08/07 |
| BLA-EMC-012    | Broadband antenna | VULB9168             | Schwarzbeck | 00836<br>P:00227 | 2022/10/12 | 2025/10/11 |
| BLA-EMC-013    | Horn Antenna      | BBHA9120D            | Schwarzbeck | 01892            | 2024/06/29 | 2026/06/28 |
| BLA-EMC-014    | Amplifier         | PA_000318G-45        | SKET        | PA201804<br>3003 | 2024/08/08 | 2025/08/07 |
| BLA-EMC-046    | Filter bank       | 2.4G/5G Filter bank  | SKET        | N/A              | 2024/06/28 | 2025/06/27 |
| BLA-EMC-061    | Receiver          | ESPI7                | R&S         | 101477           | 2024/06/28 | 2025/06/27 |
| BLA-EMC-066    | Amplifier         | LNPA_30M01<br>G-30   | SKET        | SK202106<br>0801 | 2024/06/28 | 2025/06/27 |
| BLA-EMC-086    | Amplifier         | LNPA_18G40<br>G-50dB | SKET        | SK202207<br>1301 | 2024/06/28 | 2025/06/27 |
| BLA-EMC-087    | Horn Antenna      | BBHA 9170            | Schwarzbeck | 1106             | 2024/06/29 | 2026/06/28 |
| BLA-XC-03      | Coaxial Cable     | N/A                  | BlueAsia    | V03              | N/A        | N/A        |
| BLA-XC-04      | Coaxial Cable     | N/A                  | BlueAsia    | V04              | N/A        | N/A        |

**Conducted emissions at AC power line (150 kHz-30 MHz)**

| Equipment       | Name                                            | Model       | Manufacture | S/N           | Cal. Date  | Due. Date  |
|-----------------|-------------------------------------------------|-------------|-------------|---------------|------------|------------|
| BLA-EMC-003-001 | Shield room                                     | 8*3*3       | SKET        | N/A           | 2023/11/16 | 2025/11/15 |
| BLA-EMC-009     | EMI receiver                                    | ESR7        | R&S         | 101199        | 2024/08/08 | 2025/08/07 |
| BLA-EMC-011     | LISN                                            | ENV216      | R&S         | 101372        | 2024/08/08 | 2025/08/07 |
| BLA-EMC-033     | Impedance transformer                           | DC-2GHz     | DFXP        | N/A           | 2024/06/28 | 2025/06/27 |
| BLA-EMC-041     | LISN                                            | AT166-2     | ATTEN       | AKK1806000003 | 2024/08/08 | 2025/08/07 |
| BLA-EMC-045     | Impedance stable network                        | ISNT8-cat 6 | TESEQ       | 53580         | 2024/08/08 | 2025/08/07 |
| BLA-EMC-095     | Single-channel vehicle artificial power network | NNBM 8124   | Schwarzbeck | 01045         | 2024/06/28 | 2025/06/27 |
| BLA-EMC-096     | Single-channel vehicle artificial power network | NNBM 8124   | Schwarzbeck | 01075         | 2024/06/28 | 2025/06/27 |
| BLA-XC-05       | Coaxial Cable                                   | N/A         | BlueAsia    | V05           | N/A        | N/A        |

**RF conducted**

| Equipment       | Name                       | Model    | Manufacture     | S/N           | Cal. Date  | Due. Date  |
|-----------------|----------------------------|----------|-----------------|---------------|------------|------------|
| BLA-EMC-003-003 | Shield room                | 5*3*3    | SKET            | N/A           | 2023/11/16 | 2025/11/15 |
| BLA-EMC-016     | Signal Generator           | N5182A   | Agilent         | MY52420567    | 2024/06/28 | 2025/06/27 |
| BLA-EMC-038     | Spectrum                   | N9020A   | Agilent         | MY49100060    | 2024/08/08 | 2025/08/07 |
| BLA-EMC-042     | Power sensor               | RPR3006W | DARE            | 14I00889SN042 | 2024/08/08 | 2025/08/07 |
| BLA-EMC-044     | Radio communication tester | CMW500   | R&S             | 132429        | 2024/08/08 | 2025/08/07 |
| BLA-EMC-064     | Signal Generator           | N5182B   | KEYSIGHT        | MY58108892    | 2024/06/28 | 2025/06/27 |
| BLA-EMC-079     | Spectrum                   | N9020A   | Agilent         | MY54420161    | 2024/08/08 | 2025/08/07 |
| BLA-EMC-088     | Audio Analyzer             | ATS-1    | Audio Precision | ATS141094     | 2024/06/28 | 2025/06/27 |

**Test Software Record**

| Software No. | Software Name | Manufacture | Software version | Test site |
|--------------|---------------|-------------|------------------|-----------|
| BLA-EMC-S001 | EZ-EMC        | EZ          | EEMC-3A1+        | RE        |
| BLA-EMC-S002 | EZ-EMC        | EZ          | EEMC-3A1+        | RE        |
| BLA-EMC-S003 | EZ-EMC        | EZ          | EEMC-3A1+        | CE        |
| BLA-EMC-S010 | MTS 8310      | MW          | 2.0.0.0          | RF        |

## 6 Test result

### 6.1 Antenna requirement

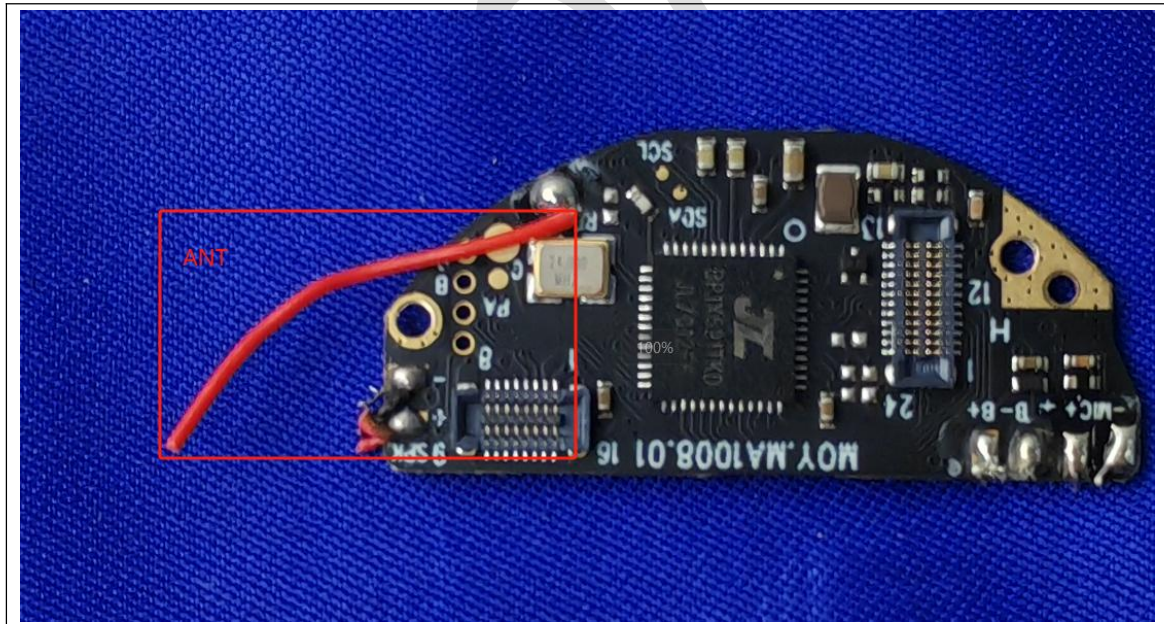
|               |                                  |
|---------------|----------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.203 |
| Test Method   | N/A                              |

#### 6.1.1 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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of a so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT antenna:

The antenna is internal internal antenna The best case gain of the antenna is -2.36dBi from 2402~2480MHz



## 6.2 Conducted emissions at AC power line (150 kHz-30 MHz)

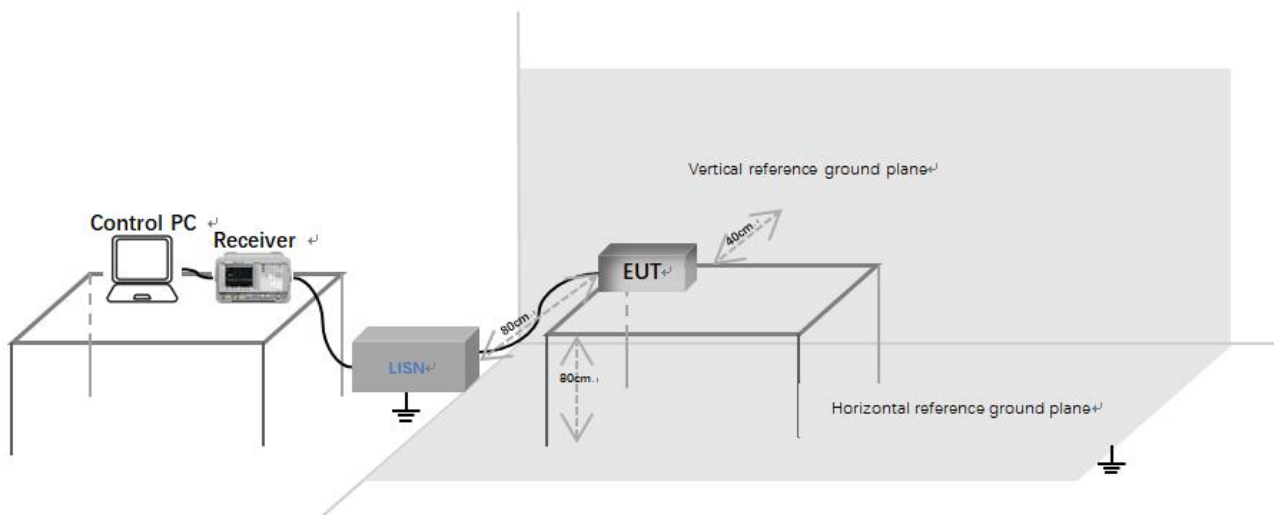
|                        |                                  |
|------------------------|----------------------------------|
| Test Standard          | 47 CFR Part 15, Subpart C 15.207 |
| Test Method            | ANSI C63.10-2013 Cluase 6.2      |
| Test Mode (Pre-Scan)   | TX                               |
| Test Mode (Final Test) | TX                               |

### 6.2.1 Limit

| Frequency of emission(MHz) | Conducted limit(dB $\mu$ V) |           |
|----------------------------|-----------------------------|-----------|
|                            | 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.

### 6.2.2 Test setup



Description of test setup connection:

- Connect the control PC to the receiver through a USB to GPIB cable;
- The receiver is connected to the LISN through a coaxial line;
- Connect the power port of LISN to the EUT.

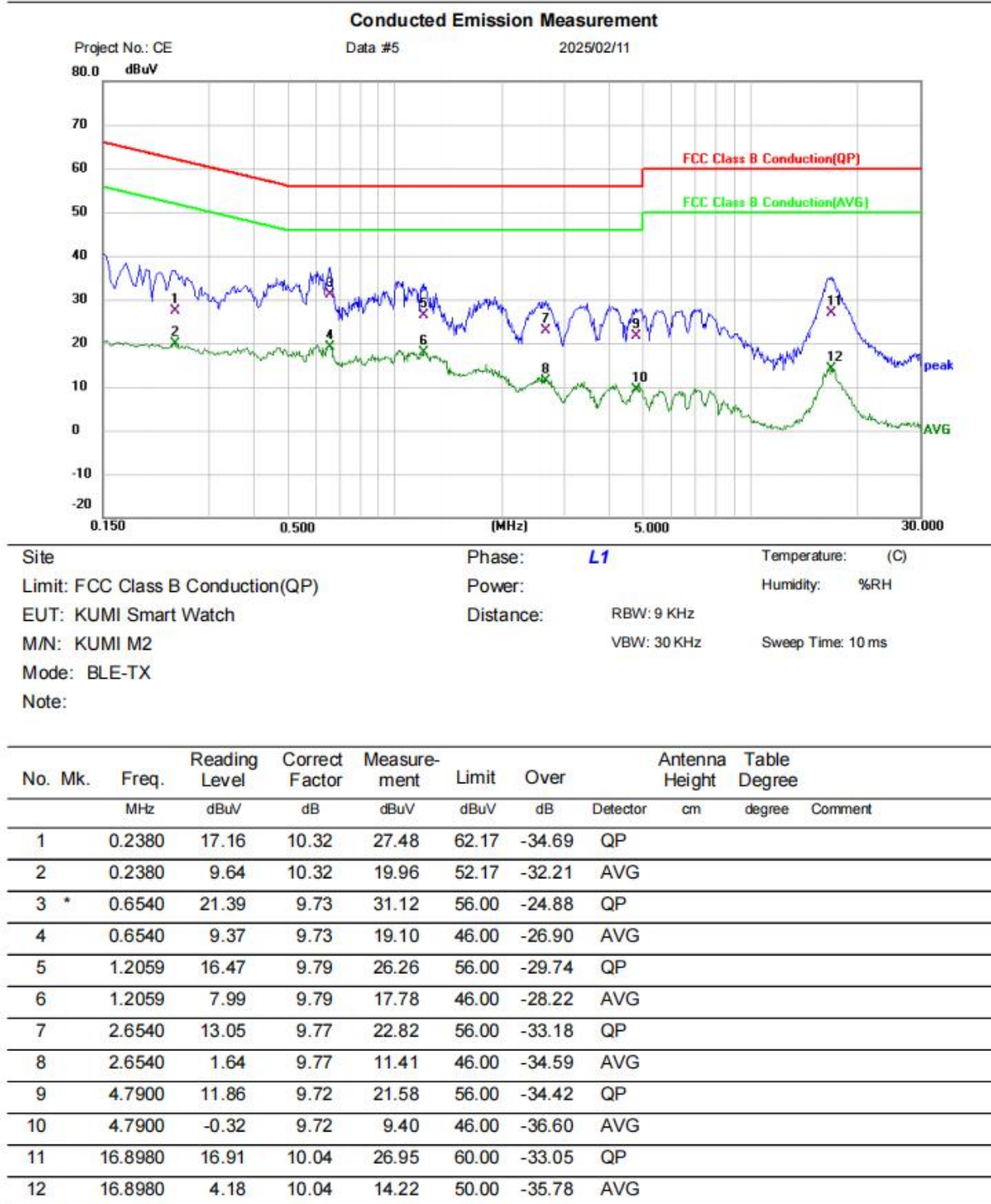
### 6.2.3 Procedure

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear 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 being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

LISN=Read Level+ Cable Loss+ LISN Factor

## 6.2.4 Test data

[Test mode: TX]; [Line: Line];[Power:AC120V/60Hz]



**Test Result: Pass**

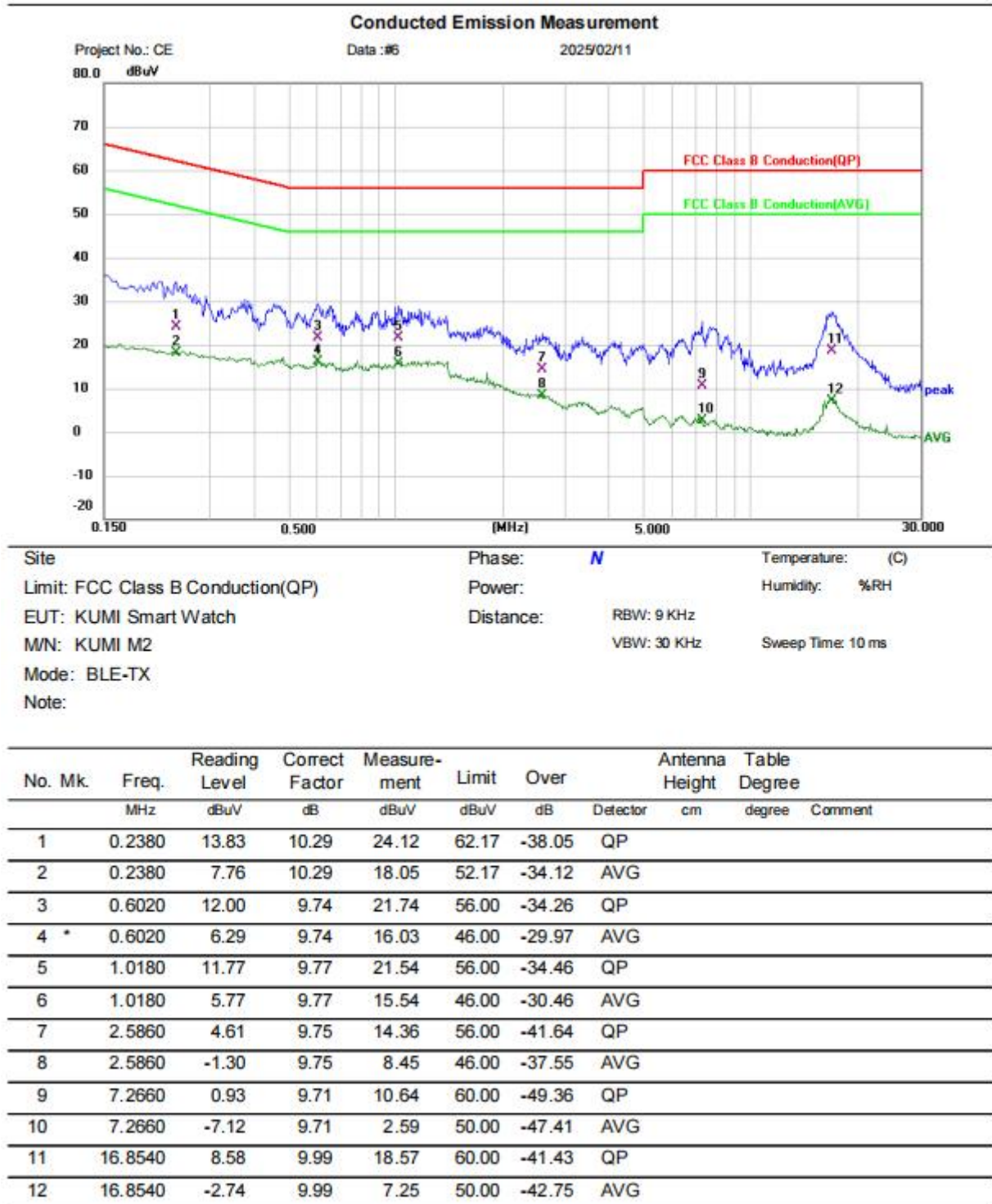
*BlueAsia of Technical Services (Shenzhen) Co., Ltd.*

Tel: +86-755-23059481

Email: [marketing@cblueasia.com](mailto:marketing@cblueasia.com)      [www.cblueasia.com](http://www.cblueasia.com)

Version:v1.3

[Test mode: TX]; [Line: Neutral];[Power:AC120V/60Hz]


**Test Result: Pass**

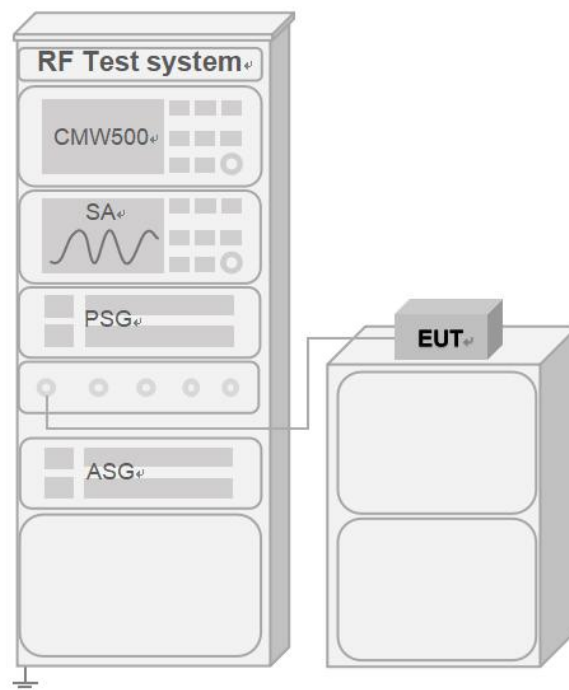
### 6.3 Conducted peak output Power

|                               |                                        |
|-------------------------------|----------------------------------------|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.247(b)(3) |
| <b>Test Method</b>            | ANSI C63.10-2013 Cluase 7.8.5          |
| <b>Test Mode (Pre-Scan)</b>   | TX                                     |
| <b>Test Mode (Final Test)</b> | TX                                     |

#### 6.3.1 Limit

| Frequency range(MHz) | Output power of the intentional radiator(watt)         |
|----------------------|--------------------------------------------------------|
| 902-928              | 1 for $\geq 50$ hopping channels                       |
|                      | 0.25 for $25 \leq$ hopping channels $< 50$             |
|                      | 1 for digital modulation                               |
| 2400-2483.5          | 1 for $\geq 75$ non-overlapping hopping channels       |
|                      | 0.125 for all other frequency hopping systems          |
|                      | 1 for digital modulation                               |
| 5725-5850            | 1 for frequency hopping systems and digital modulation |

#### 6.3.2 Test setup



### 6.3.3 Test data

Pass: Please refer to appendix A for details

BlueAsia

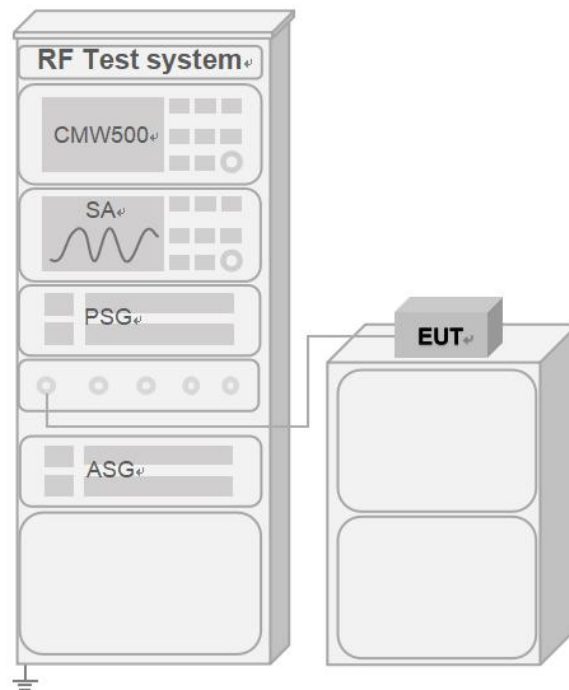
## 6.4 Minimum 6dB bandwidth

|                        |                                      |
|------------------------|--------------------------------------|
| Test Standard          | 47 CFR Part 15, Subpart C 15.247a(2) |
| Test Method            | ANSI C63.10-2013 Cluase 11.8.1       |
| Test Mode (Pre-Scan)   | TX                                   |
| Test Mode (Final Test) | TX                                   |

### 6.4.1 Limit

≥500 kHz

### 6.4.2 Test setup



### 6.4.3 Test data

Pass: Please refer to appendix A for details