

# TEST REPORT

**Application No.:** GZCR2511001831AT

**Applicant:** Guangzhou Andea Electronics Technology Co., Ltd.

**Address of Applicant:** 11<sup>th</sup> Floor, Building C2, Lian Dong U-Valley, Yihang Intelligent Technology Park, No.29, Bishan Street, Huang Pu District, Guangzhou, Guangdong, China.

**Manufacturer:** Guangzhou Andea Electronics Technology Co., Ltd.

**Address of Manufacturer:** 11<sup>th</sup> Floor, Building C2, Lian Dong U-Valley, Yihang Intelligent Technology Park, No.29, Bishan Street, Huang Pu District, Guangzhou, Guangdong, China.

**Factory:** Guangzhou Andea Electronics Technology Co., Ltd.

**Address of Factory:** 11<sup>th</sup> Floor, Building C2, Lian Dong U-Valley, Yihang Intelligent Technology Park, No.29, Bishan Street, Huang Pu District, Guangzhou, Guangdong, China.

**Product Name:** Industrial high frequency RFID read-write device

**Model No.:** AR1401M, AR14XXY (X=0-9, Y=A-Z), AR15XXY (X=0-9, Y=A-Z) ♣

♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

**Trade Mark:** **ANDEAWELL**

**Standard(s) :** 47 CFR Part 15, Subpart C 15.225

**Date of Receipt:** 2025-11-20

**Date of Test:** 2025-12-01 to 2025-12-16

**Date of Issue:** 2026-01-26

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

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



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch, EMC Laboratory

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663  
中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

t (86-20) 82155555 www.sgsgroup.com.cn  
t (86-20) 82155555 sgs.china@sgs.com

| Revision Record |                  |            |          |
|-----------------|------------------|------------|----------|
| Version         | Report No.       | Date       | Remark   |
| 01              | GZCR251100183102 | 2026-01-26 | Original |
|                 |                  |            |          |
|                 |                  |            |          |

|                          |  |                            |  |
|--------------------------|--|----------------------------|--|
| Authorized for issue by: |  |                            |  |
|                          |  | Key Liang                  |  |
|                          |  | Key Liang/Project Engineer |  |
| Approved By              |  | Vico Cui                   |  |
|                          |  | Vico Cui/Reviewer          |  |



## 2 Test Summary

| Radio Spectrum Technical Requirement |                                  |        |                                  |        |
|--------------------------------------|----------------------------------|--------|----------------------------------|--------|
| Item                                 | Standard                         | Method | Requirement                      | Result |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.225 | N/A    | 47 CFR Part 15, Subpart C 15.203 | Pass   |

| Radio Spectrum Matter Part                            |                                  |                                |                                              |        |
|-------------------------------------------------------|----------------------------------|--------------------------------|----------------------------------------------|--------|
| Item                                                  | Standard                         | Method                         | Requirement                                  | Result |
| Conducted Emissions at Mains Terminals (150kHz-30MHz) | 47 CFR Part 15, Subpart C 15.225 | ANSI C63.10 (2020) Section 6.2 | 47 CFR Part 15, Subpart C 15.207             | Pass   |
| 20dB Bandwidth                                        |                                  | ANSI C63.10 (2020) Section 6.9 | 47 CFR Part 15, Subpart C 15.215             | Pass   |
| Emission Mask                                         |                                  | ANSI C63.10 (2020) Section 6.4 | 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C ) | Pass   |
| Frequency tolerance                                   |                                  | ANSI C63.10 (2020) Section 6.8 | 47 CFR Part 15, Subpart C 15.225(e)          | Pass   |
| Radiated Emissions (9kHz-30MHz)                       |                                  | ANSI C63.10 (2020) Section 6.4 | 47 CFR Part 15, Subpart C 15.225(d) & 15.209 | Pass   |
| Radiated Emissions (30MHz-1GHz)                       |                                  | ANSI C63.10 (2020) Section 6.5 | 47 CFR Part 15, Subpart C 15.225(d) & 15.209 | Pass   |

**Note:**

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

Model No.: AR1401M, AR14XXY (X=0-9, Y=A-Z), AR15XXY (X=0-9, Y=A-Z)

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the model name.

Only the model **AR1401M** was tested.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch (EMC Laboratory)

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663  
中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

t (86-20) 82155555 www.sgsgroup.com.cn  
t (86-20) 82155555 sgs.china@sgs.com

## 3 Contents

|                                                                 | Page      |
|-----------------------------------------------------------------|-----------|
| <b>1 Cover Page</b> .....                                       | <b>1</b>  |
| <b>2 Test Summary</b> .....                                     | <b>3</b>  |
| <b>3 Contents</b> .....                                         | <b>4</b>  |
| <b>4 General Information</b> .....                              | <b>6</b>  |
| 4.1 Details of E.U.T. ....                                      | 6         |
| 4.2 Description of Support Units .....                          | 6         |
| 4.3 Measurement Uncertainty .....                               | 6         |
| 4.4 Test Location .....                                         | 7         |
| 4.5 Test Facility .....                                         | 7         |
| 4.6 Deviation from Standards .....                              | 7         |
| 4.7 Abnormalities from Standard Conditions .....                | 7         |
| <b>5 Equipment List</b> .....                                   | <b>8</b>  |
| <b>6 Radio Spectrum Technical Requirement</b> .....             | <b>10</b> |
| 6.1 Antenna Requirement .....                                   | 10        |
| 6.1.1 Test Requirement: .....                                   | 10        |
| 6.1.2 Conclusion .....                                          | 10        |
| <b>7 Radio Spectrum Matter Test Results</b> .....               | <b>11</b> |
| 7.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) ..... | 11        |
| 7.1.1 E.U.T. Operation .....                                    | 11        |
| 7.1.2 Test Mode Description .....                               | 11        |
| 7.1.3 Test Setup Diagram .....                                  | 11        |
| 7.1.4 Measurement Procedure and Data .....                      | 12        |
| 7.2 20dB Bandwidth .....                                        | 15        |
| 7.2.1 E.U.T. Operation .....                                    | 15        |
| 7.2.2 Test Mode Description .....                               | 15        |
| 7.2.3 Test Setup Diagram .....                                  | 15        |
| 7.2.4 Measurement Procedure and Data .....                      | 16        |
| 7.3 Emission Mask .....                                         | 17        |
| 7.3.1 E.U.T. Operation .....                                    | 17        |
| 7.3.2 Test Mode Description .....                               | 17        |
| 7.3.3 Test Setup Diagram .....                                  | 18        |
| 7.3.4 Measurement Procedure and Data .....                      | 18        |
| 7.4 Frequency tolerance .....                                   | 21        |
| 7.4.1 E.U.T. Operation .....                                    | 21        |
| 7.4.2 Test Mode Description .....                               | 21        |
| 7.4.3 Test Setup Diagram .....                                  | 21        |
| 7.4.4 Measurement Procedure and Data .....                      | 21        |
| 7.5 Radiated Emissions (9kHz-30MHz) .....                       | 23        |
| 7.5.1 E.U.T. Operation .....                                    | 24        |
| 7.5.2 Test Mode Description .....                               | 24        |
| 7.5.3 Test Setup Diagram .....                                  | 24        |



|       |                                               |    |
|-------|-----------------------------------------------|----|
| 7.5.4 | Measurement Procedure and Data .....          | 24 |
| 7.6   | Radiated Emissions (30MHz-1GHz) .....         | 28 |
| 7.6.1 | E.U.T. Operation .....                        | 28 |
| 7.6.2 | Test Mode Description .....                   | 28 |
| 7.6.3 | Test Setup Diagram .....                      | 28 |
| 7.6.4 | Measurement Procedure and Data .....          | 29 |
| 8     | Test Setup Photo .....                        | 32 |
| 9     | EUT Constructional Details (EUT Photos) ..... | 33 |



## 4 General Information

### 4.1 Details of E.U.T.

Power supply: DC 24V  
Test voltage: AC 120V, 60Hz powered by AC/DC adapter provided by applicant  
Cable(s): 1.0m unscreened 4pin cable.  
0.3m unscreened USB cable.  
Operation Frequency: 13.56MHz  
Antenna Type: Loop Antenna  
Modulation Type: ASK  
Antenna Number: 1

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

### 4.2 Description of Support Units

| Description                         | Manufacturer | Model No.                                                                                     | Serial No.   |
|-------------------------------------|--------------|-----------------------------------------------------------------------------------------------|--------------|
| AC/DC adapter provided by applicant | MEAN WELL    | MODEL NO: GSM36U24<br>INPUT: 100-240VAC, 50/60Hz, 0.9-0.45A<br>OUTPUT: DC 24V, 1.5A, 36W MAX. | GSM36U24-P1J |
| Note Book Computer                  | LENOVO       | ThinkPad T490                                                                                 | PF1D1MVJ     |

### 4.3 Measurement Uncertainty

| Test Item                                             | Measurement Uncertainty                                                      |
|-------------------------------------------------------|------------------------------------------------------------------------------|
| Conducted Emissions at Mains Terminals (150kHz-30MHz) | $\pm 3.22\text{dB}$                                                          |
| 20dB Bandwidth                                        | $\pm 0.274\%$                                                                |
| Emission Mask                                         | $\pm 3.19\text{dB}$                                                          |
| Frequency tolerance                                   | $\pm 7.25 \text{ E-}8$                                                       |
| Radiated Emissions (9kHz-30MHz)                       | $\pm 3.19\text{dB}$                                                          |
| Radiated Emissions (30MHz-1GHz)                       | $\pm 5.14\text{dB}$ (30MHz-1GHz):3m;<br>$\pm 4.90\text{dB}$ (30MHz-1GHz):10m |

Remark:

The  $U_{\text{lab}}$  (lab Uncertainty) is less than  $U_{\text{CISPR}}$  (CISPR Uncertainty) or  $U_{\text{ETSI}}$  (ETSI Uncertainty).

Emission decision rule:

- Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit, marked as Pass in the report.
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit, marked as Fail in the report.



## 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,  
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,  
Guangdong, China 510663

Tel: +86 20 82155555

No tests were sub-contracted.

## 4.5 Test Facility

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

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

## 4.6 Deviation from Standards

None

## 4.7 Abnormalities from Standard Conditions

None



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch EMC Laboratory

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663  
中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

t (86-20) 82155555 www.sgsgroup.com.cn  
t (86-20) 82155555 sgs.china@sgs.com

## 5 Equipment List

| Conducted Emissions at Mains Terminals (150kHz-30MHz) |                   |                 |               |            |              |
|-------------------------------------------------------|-------------------|-----------------|---------------|------------|--------------|
| Equipment                                             | Manufacturer      | Model No.       | Inventory No. | Cal Date   | Cal Due Date |
| Coaxial Cable                                         | HangTianXing      | BL03-NMMN-6.00M | EMC0107       | 2025-08-12 | 2026-08-11   |
| Shielding Room                                        | ChangZhou ZhongYu | 8m x 3m x 3.8m  | EMC0306       | 2025-08-14 | 2028-08-13   |
| Two-Line V-Network-GZ                                 | Rohde & Schwarz   | ENV216          | EMC2135       | 2025-08-13 | 2026-08-12   |
| EMI Test Receiver (9kHz-3.6GHz)                       | Rohde & Schwarz   | ESR3            | EMC2221       | 2025-11-18 | 2026-11-17   |
| Test Software E3r                                     | Audix             | Ver.6.191211    | GZE100-77     | N/A        | N/A          |

| 20dB Bandwidth                    |                      |           |               |            |              |
|-----------------------------------|----------------------|-----------|---------------|------------|--------------|
| Equipment                         | Manufacturer         | Model No. | Inventory No. | Cal Date   | Cal Due Date |
| MXA Signal Analyzer (10Hz-8.4GHz) | Agilent Technologies | N9020A    | SEM004-10     | 2025-11-25 | 2026-11-24   |
| MI CABLE                          | SGS-EMC              | 0.8M      | EMC2136       | 2025-11-02 | 2026-11-01   |

| Emission Mask                |                       |               |               |            |              |
|------------------------------|-----------------------|---------------|---------------|------------|--------------|
| Equipment                    | Manufacturer          | Model No.     | Inventory No. | Cal Date   | Cal Due Date |
| Active Loop Antenna-RED      | ETS-Lindgren          | 6502          | EMC2190       | 2024-04-16 | 2026-04-15   |
| EMI Test Receiver (1Hz-8GHz) | Rohde & Schwarz       | ESW8          | EMC2229       | 2025-11-18 | 2026-11-17   |
| Test Software E3             | Audix                 | Ver.6.120110a | GZE100-61     | N/A        | N/A          |
| 966 Anechoic Chamber         | Shenzhen C.R.T        | CRTSGSSAC966  | EMC2230       | 2025-03-22 | 2028-03-21   |
| Coaxial Cable                | Mirco-COAX UTIFLEX ve | LA2-C125-8000 | EMC2239       | 2025-11-25 | 2026-11-24   |

| Frequency tolerance               |                      |           |               |            |              |
|-----------------------------------|----------------------|-----------|---------------|------------|--------------|
| Equipment                         | Manufacturer         | Model No. | Inventory No. | Cal Date   | Cal Due Date |
| Temperature Chamber               | GZ GongWen Co.Ltd.   | GDJW-100  | EMC0039       | 2025-11-19 | 2026-11-18   |
| MXA Signal Analyzer (10Hz-8.4GHz) | Agilent Technologies | N9020A    | SEM004-10     | 2025-11-25 | 2026-11-24   |
| MI CABLE                          | SGS-EMC              | 0.8M      | EMC2136       | 2025-11-02 | 2026-11-01   |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd. No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663 t (86-20) 82155555 www.sgsgroup.com.cn  
Guangzhou Branch Testing Center EEC Laboratory. 中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 sgs.china@sgs.com

| Radiated Emissions (9kHz-30MHz) |                       |               |               |            |              |
|---------------------------------|-----------------------|---------------|---------------|------------|--------------|
| Equipment                       | Manufacturer          | Model No.     | Inventory No. | Cal Date   | Cal Due Date |
| Active Loop Antenna-RED         | ETS-Lindgren          | 6502          | EMC2190       | 2024-04-16 | 2026-04-15   |
| EMI Test Receiver (1Hz-8GHz)    | Rohde & Schwarz       | ESW8          | EMC2229       | 2025-11-18 | 2026-11-17   |
| Test Software E3                | Audix                 | Ver.6.120110a | GZE100-61     | N/A        | N/A          |
| 966 Anechoic Chamber            | Shenzhen C.R.T        | CRTSGSSAC966  | EMC2230       | 2025-03-22 | 2028-03-21   |
| Coaxial Cable                   | Mirco-COAX UTIFLEX ve | LA2-C125-8000 | EMC2239       | 2025-11-25 | 2026-11-24   |

| Radiated Emissions (30MHz-1GHz)       |                             |               |               |            |              |
|---------------------------------------|-----------------------------|---------------|---------------|------------|--------------|
| Equipment                             | Manufacturer                | Model No.     | Inventory No. | Cal Date   | Cal Due Date |
| 966 Anechoic Chamber                  | Shenzhen C.R.T              | CRTSGSSAC966  | EMC2230       | 2025-03-22 | 2028-03-21   |
| EMI Test Receiver(1Hz-8GHz)           | Rohde & Schwarz             | ESW8          | EMC2229       | 2025-11-18 | 2026-11-17   |
| Amplifier(9k-1000MHz)                 | SONOMA                      | 310           | EMC2237       | 2025-11-25 | 2026-11-24   |
| Trilog Broadband Antenna (25MHz-2GHz) | Schwarzbeck Mess-Elektronik | VULB 9168     | EMC2238       | 2025-03-24 | 2027-03-23   |
| Coaxial Cable                         | Mirco-COAX UTIFLEX ve       | LA2-C125-8000 | EMC2239       | 2025-11-25 | 2026-11-24   |
| Test Software E3                      | Audix                       | Ver.6.191211  | GZE100-81     | N/A        | N/A          |

| General used equipment |              |          |              |            |              |
|------------------------|--------------|----------|--------------|------------|--------------|
| Equipment              | Manufacturer | Model No | Inventory No | Cal Date   | Cal Due Date |
| DMM                    | Fluke        | 73       | EMC0006      | 2025-06-03 | 2026-06-02   |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd. No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663 t (86-20) 82155555 www.sgsgroup.com.cn  
Guangzhou Branch Testing Center EEC Laboratory. 中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 sgs.china@sgs.com

## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

#### 6.1.2 Conclusion

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.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement.

Antenna location: Refer to Internal photos

## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2020) Section 6.2

Test Engineer: Sunny Yang

Limit:

| Frequency range (MHz) | Limit (dBuV) |           |
|-----------------------|--------------|-----------|
|                       | 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.

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C

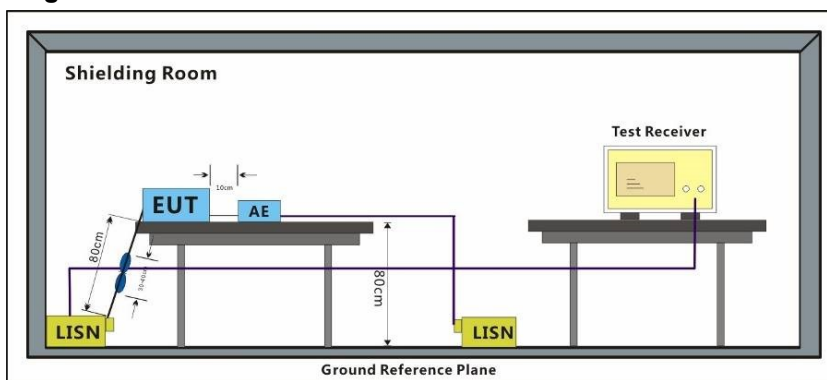
Humidity: 54.4 % RH

Atmospheric Pressure: 1020 mbar

#### 7.1.2 Test Mode Description

|            |      |                          |
|------------|------|--------------------------|
| Pre-scan / | Mode | Description              |
| Final test | Code |                          |
| Final test | 00   | TX mode with modulation. |

#### 7.1.3 Test Setup Diagram



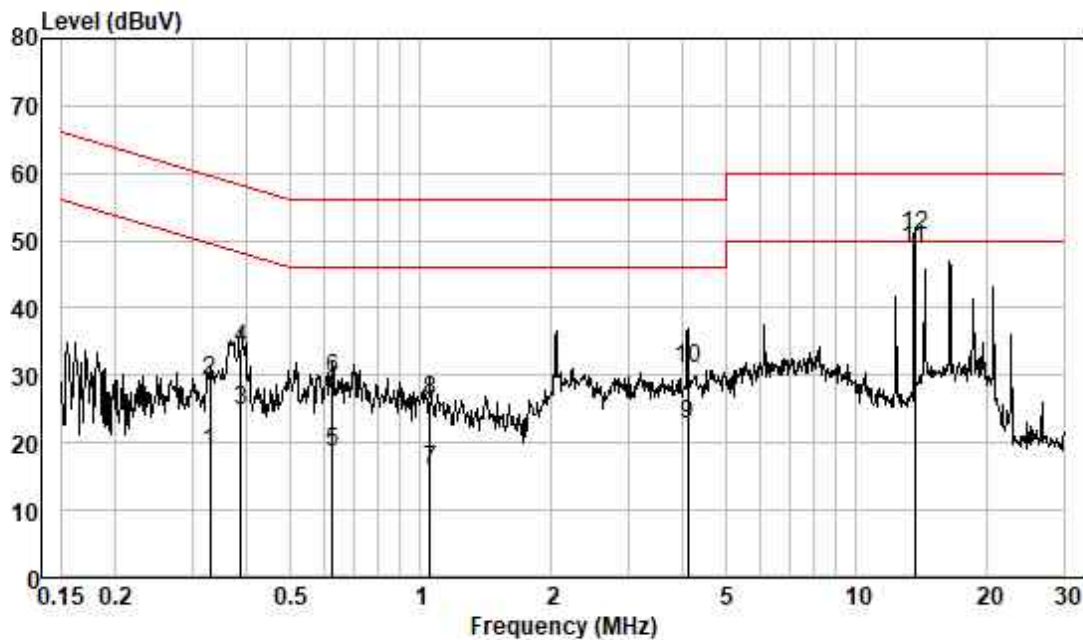
## 7.1.4 Measurement Procedure and Data

- 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/50μH + 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.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



Test Mode: 00; Line: Live line

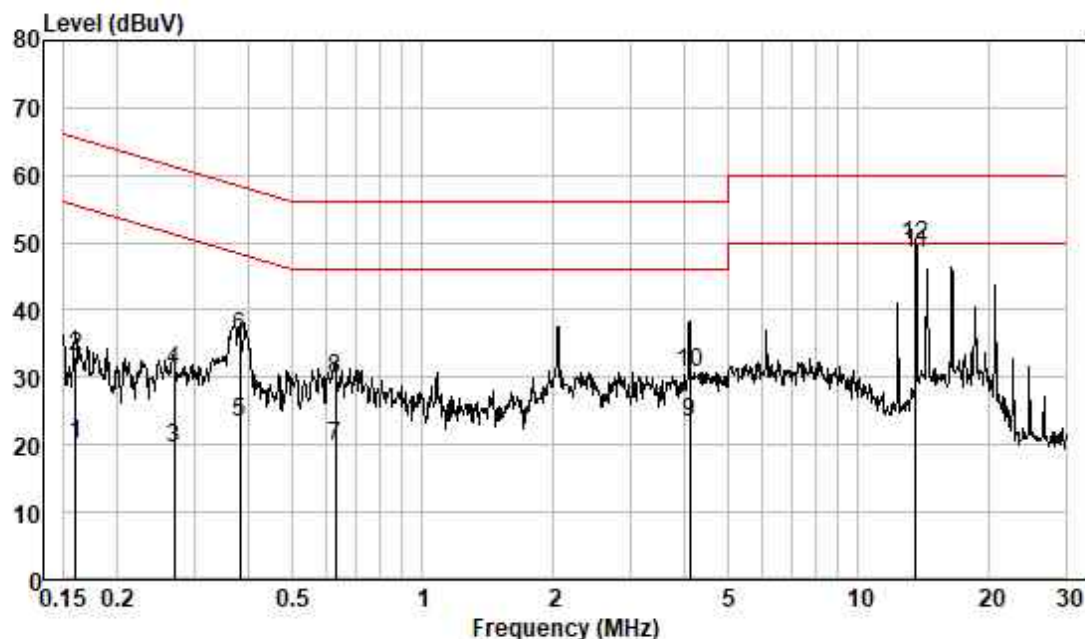


Pol : LINE  
Mode :  
Model :  
Power :

|    | Frequency<br>MHz | Read<br>Level<br>dBuV | Cable<br>Loss<br>dB | LISN<br>Factor<br>dB | Measured<br>Level<br>dBuV | Limit<br>Line<br>dBuV | Over<br>Limit<br>dB | Remark  |
|----|------------------|-----------------------|---------------------|----------------------|---------------------------|-----------------------|---------------------|---------|
| 1  | 0.329            | 8.94                  | 0.04                | 9.57                 | 18.55                     | 49.49                 | -30.94              | Average |
| 2  | 0.329            | 19.74                 | 0.04                | 9.57                 | 29.35                     | 59.49                 | -30.14              | QP      |
| 3  | 0.387            | 15.08                 | 0.05                | 9.54                 | 24.67                     | 48.12                 | -23.45              | Average |
| 4  | 0.387            | 24.34                 | 0.05                | 9.54                 | 33.93                     | 58.12                 | -24.19              | QP      |
| 5  | 0.627            | 8.84                  | 0.06                | 9.56                 | 18.46                     | 46.00                 | -27.54              | Average |
| 6  | 0.627            | 19.97                 | 0.06                | 9.56                 | 29.59                     | 56.00                 | -26.41              | QP      |
| 7  | 1.054            | 6.32                  | 0.07                | 9.54                 | 15.93                     | 46.00                 | -30.07              | Average |
| 8  | 1.054            | 16.77                 | 0.07                | 9.54                 | 26.38                     | 56.00                 | -29.62              | QP      |
| 9  | 4.114            | 13.05                 | 0.18                | 9.64                 | 22.87                     | 46.00                 | -23.13              | Average |
| 10 | 4.114            | 21.25                 | 0.18                | 9.64                 | 31.07                     | 56.00                 | -24.93              | QP      |
| 11 | 13.623           | 38.65                 | 0.31                | 9.82                 | 48.78                     | 50.00                 | -1.22               | Average |
| 12 | 13.623           | 40.78                 | 0.31                | 9.82                 | 50.91                     | 60.00                 | -9.09               | QP      |



Test Mode: 00; Line: Neutral Line



Pol : NEUTRAL  
Mode :  
Model :  
Power :

|    | Frequency<br>MHz | Read<br>Level<br>dBuV | Cable<br>Loss<br>dB | LISN<br>Factor<br>dB | Measured<br>Level<br>dBuV | Limit<br>Line<br>dBuV | Over<br>Limit<br>dB | Remark  |
|----|------------------|-----------------------|---------------------|----------------------|---------------------------|-----------------------|---------------------|---------|
| 1  | 0.160            | 10.56                 | 0.04                | 9.53                 | 20.13                     | 55.47                 | -35.34              | Average |
| 2  | 0.160            | 23.49                 | 0.04                | 9.53                 | 33.06                     | 65.47                 | -32.41              | QP      |
| 3  | 0.269            | 9.77                  | 0.04                | 9.53                 | 19.34                     | 51.16                 | -31.82              | Average |
| 4  | 0.269            | 21.40                 | 0.04                | 9.53                 | 30.97                     | 61.16                 | -30.19              | QP      |
| 5  | 0.381            | 13.61                 | 0.05                | 9.53                 | 23.19                     | 48.25                 | -25.06              | Average |
| 6  | 0.381            | 26.36                 | 0.05                | 9.53                 | 35.94                     | 58.25                 | -22.31              | QP      |
| 7  | 0.630            | 10.09                 | 0.06                | 9.56                 | 19.71                     | 46.00                 | -26.29              | Average |
| 8  | 0.630            | 20.12                 | 0.06                | 9.56                 | 29.74                     | 56.00                 | -26.26              | QP      |
| 9  | 4.114            | 13.54                 | 0.18                | 9.60                 | 23.32                     | 46.00                 | -22.68              | Average |
| 10 | 4.114            | 20.87                 | 0.18                | 9.60                 | 30.65                     | 56.00                 | -25.35              | QP      |
| 11 | 13.551           | 38.23                 | 0.31                | 9.87                 | 48.41                     | 50.00                 | -1.59               | Average |
| 12 | 13.551           | 39.53                 | 0.31                | 9.87                 | 49.71                     | 60.00                 | -10.29              | QP      |



### 7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215  
 Test Method: ANSI C63.10 (2020) Section 6.9  
 Test Engineer: Lily Kuang

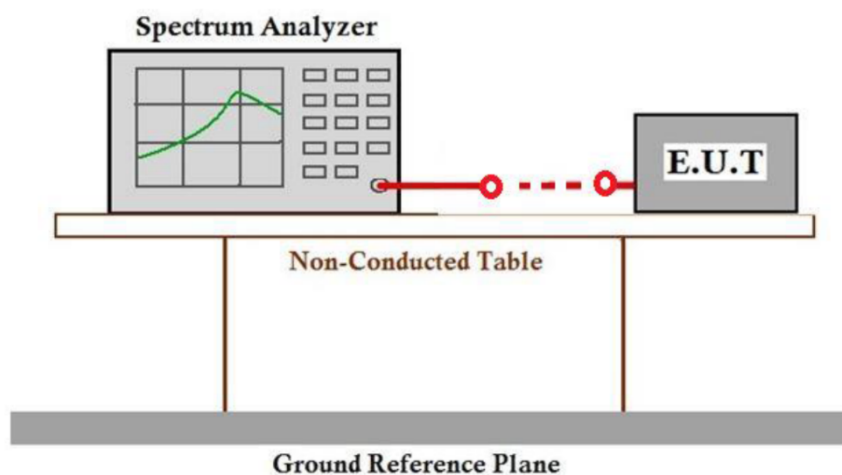
#### 7.2.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22.4 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

#### 7.2.2 Test Mode Description

| Pre-scan / | Mode | Description              |
|------------|------|--------------------------|
| Final test | Code |                          |
| Final test | 00   | TX mode with modulation. |

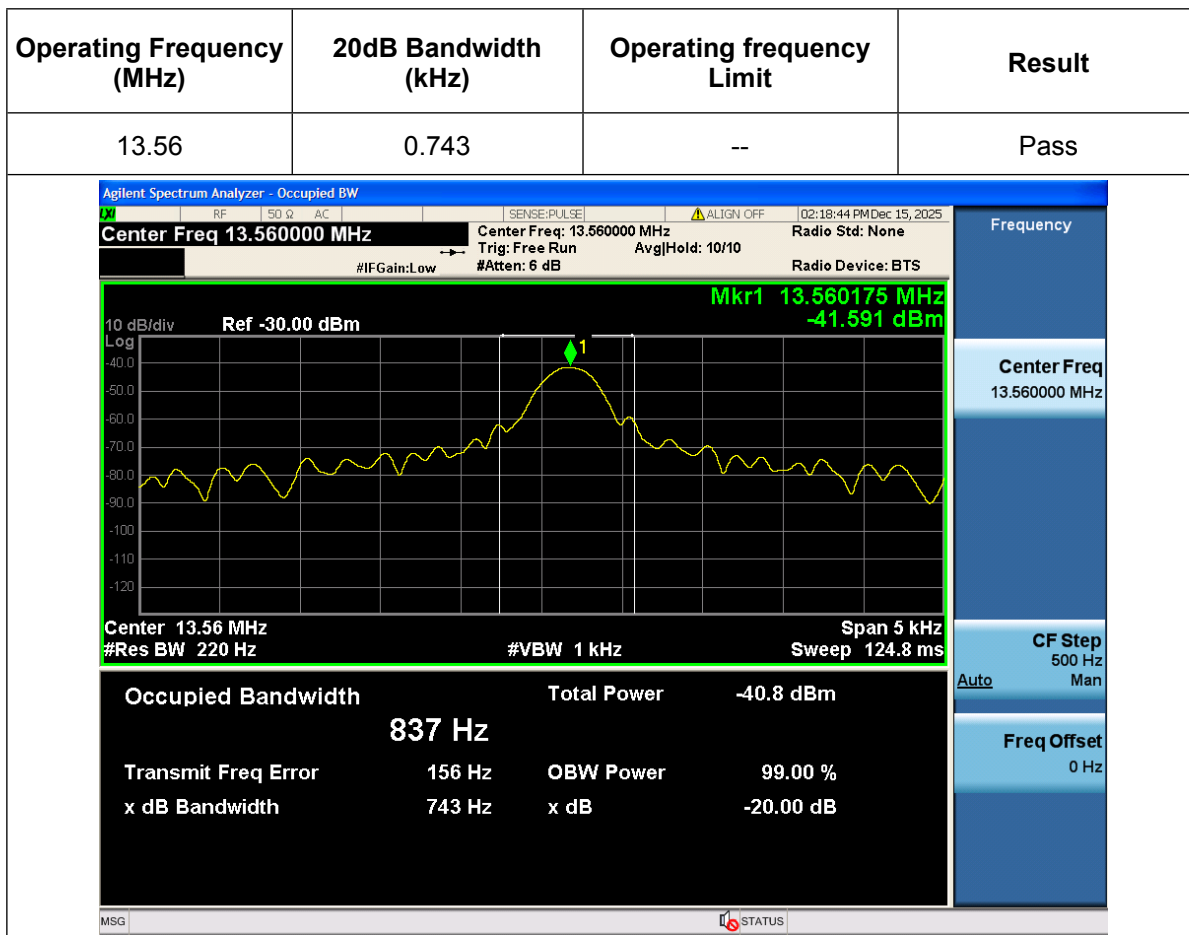
#### 7.2.3 Test Setup Diagram



### 7.2.4 Measurement Procedure and Data

The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

Test Mode: 00



Remark: The setting of RBW was the minimum for the spectrum.

### 7.3 Emission Mask

Test Requirement 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C )

Test Method: ANSI C63.10 (2020) Section 6.4

Test Engineer: Jarry Li

Limit:

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

#### Below 30MHz

The test was performed at a 3m test site.

The factor calculated by the following equation:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left( \frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

$FS_{\text{limit}}$  is the calculation of field strength at the limit distance, expressed in dBμV/m  
 $FS_{\text{max}}$  is the measured field strength, expressed in dBμV/m  
 $d_{\text{measure}}$  is the distance of the measurement point from the EUT  
 $d_{\text{limit}}$  is the reference distance or the distance of the  $\lambda/2\pi$  point

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 84dBμV/m at 30 meters.

#### 7.3.1 E.U.T. Operation

Operating Environment:

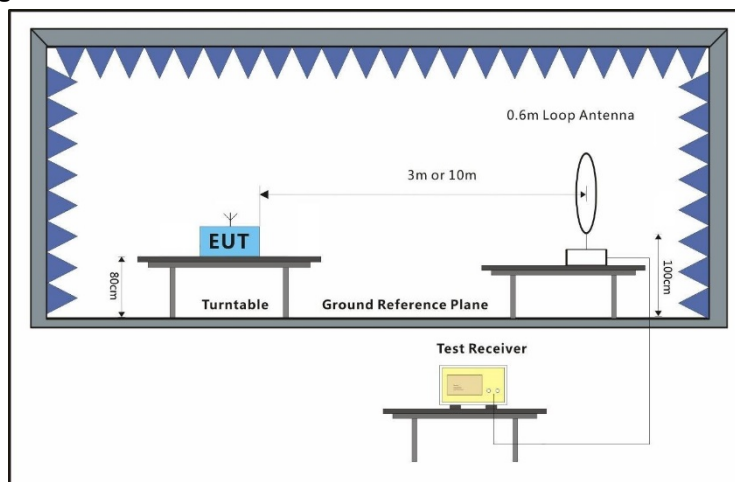
Temperature: 25.4 °C Humidity: 50.4 % RH Atmospheric Pressure: 1020 mbar

#### 7.3.2 Test Mode Description

| Pre-scan / Mode | Description              |
|-----------------|--------------------------|
| Final test Code |                          |
| Final test 00   | TX mode with modulation. |



### 7.3.3 Test Setup Diagram

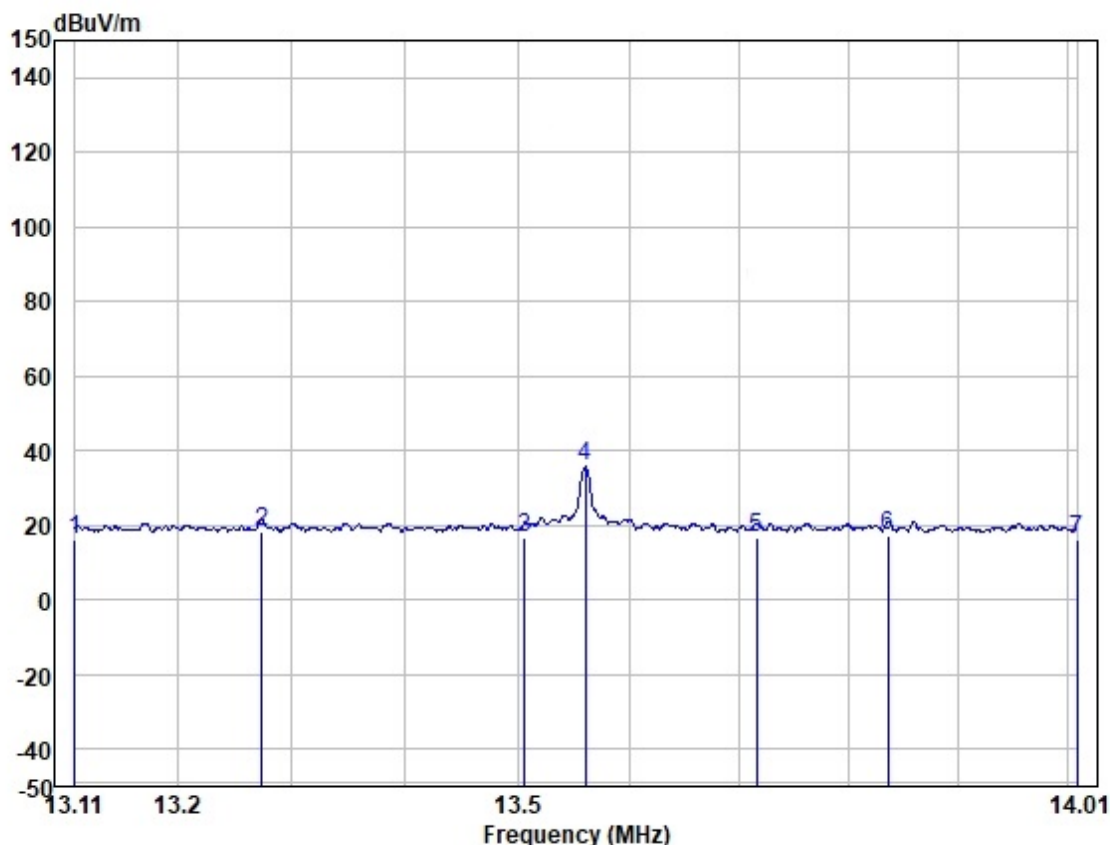


### 7.3.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



Test Mode: 00;



loop :  
Test Mode:  
Model : Y

| Frequency<br>MHz | Read<br>level<br>dBuV/m | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Measured<br>level<br>dBuV/m | Limit<br>Line<br>dBuV/m | Over<br>limit<br>dB |
|------------------|-------------------------|---------------------|---------------------------|------------------------|-----------------------------|-------------------------|---------------------|
| 13.110           | 38.17                   | 0.19                | 10.61                     | 32.71                  | 16.26                       |                         |                     |
| 13.274           | 40.30                   | 0.19                | 10.59                     | 32.71                  | 18.37                       |                         |                     |
| 13.507           | 38.51                   | 0.19                | 10.51                     | 32.71                  | 16.50                       |                         |                     |
| 13.561           | 57.61                   | 0.20                | 10.51                     | 32.72                  | 35.60                       |                         |                     |
| 13.715           | 38.68                   | 0.20                | 10.47                     | 32.72                  | 16.63                       |                         |                     |
| 13.835           | 39.25                   | 0.20                | 10.45                     | 32.72                  | 17.18                       |                         |                     |
| 14.010           | 38.15                   | 0.20                | 10.43                     | 32.72                  | 16.06                       |                         |                     |



Test Mode: 00

| Frequency (MHz) | Measured Level (dBuV/m) @3m | Extrapolation Correction (dB) @3 m to 30 m | Level (dBuV/m) @30m | Limit (dBuV/m) @30m | Over limit (dB) |
|-----------------|-----------------------------|--------------------------------------------|---------------------|---------------------|-----------------|
| 13.110          | 16.26                       | -40                                        | -23.74              | 29.54               | -53.28          |
| 13.410          | 18.37                       | -40                                        | -21.63              | 40.51               | -62.14          |
| 13.550          | 16.50                       | -40                                        | -23.50              | 50.47               | -73.97          |
| 13.560          | 35.60                       | -40                                        | -4.40               | 84                  | -88.4           |
| 13.570          | 16.63                       | -40                                        | -23.37              | 50.47               | -73.84          |
| 13.710          | 17.18                       | -40                                        | -22.82              | 40.51               | -63.33          |
| 14.010          | 16.06                       | -40                                        | -23.94              | 29.54               | -53.48          |

Remark: Extrapolation Correction (dB)@3m to 30 m =  $40 \cdot \log(3/30) = -40$  according to FCC part 15.31 (f) (1)

Level (dBuV/m) @ 30m = Measured Level (dBuV/m) @3m + Extrapolation Correction (dB)@3 m to 30 m



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch (EMC Laboratory)

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663  
中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

t (86-20) 82155555 www.sgsgroup.com.cn  
t (86-20) 82155555 sgs.china@sgs.com

### 7.4 Frequency tolerance

|                  |                                                |
|------------------|------------------------------------------------|
| Test Requirement | 47 CFR Part 15, Subpart C 15.225(e)            |
| Test Method:     | ANSI C63.10 (2020) Section 6.8                 |
| Test Engineer:   | Lily Kuang                                     |
| Limit:           | Within $\pm 0.01\%$ of the operating frequency |

#### 7.4.1 E.U.T. Operation

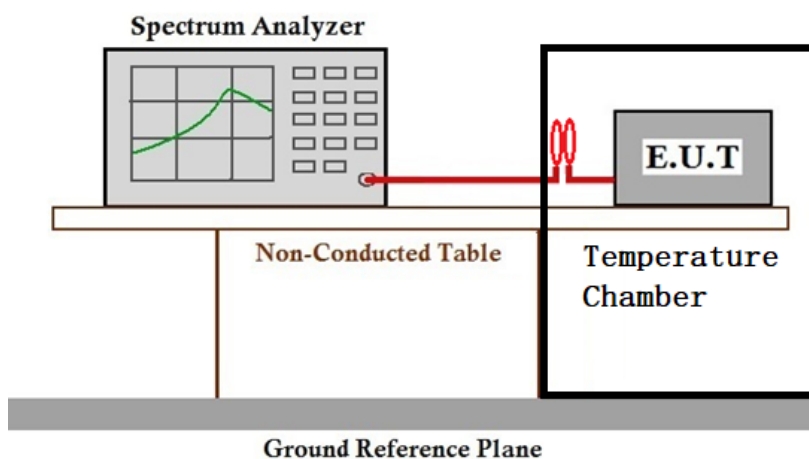
Operating Environment:

Temperature: 22.4 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

#### 7.4.2 Test Mode Description

| Pre-scan / Mode | Description              |
|-----------------|--------------------------|
| Final test Code |                          |
| Final test 00   | TX mode with modulation. |

#### 7.4.3 Test Setup Diagram



#### 7.4.4 Measurement Procedure and Data

The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.

Test Mode: 00

Limit:  $\pm 0.01\%$

### Start up

| Voltage (V AC)          | Temperature (°C)          | Frequency Measured (MHz) | Test data (%) | Verdict |
|-------------------------|---------------------------|--------------------------|---------------|---------|
| $V_{\text{norm}} : 120$ | -20                       | 13.56109                 | 0.0081%       | Pass    |
|                         | -10                       | 13.56118                 | 0.0087%       | Pass    |
|                         | 0                         | 13.56102                 | 0.0075%       | Pass    |
|                         | 10                        | 13.56105                 | 0.0077%       | Pass    |
|                         | $T_{\text{normal}} : +20$ | 13.56016                 | 0.0012%       | Pass    |
|                         | 30                        | 13.56126                 | 0.0093%       | Pass    |
|                         | 40                        | 13.56119                 | 0.0087%       | Pass    |
|                         | 50                        | 13.56114                 | 0.0084%       | Pass    |
| $V_{\text{max}} : 132$  | $T_{\text{normal}} : +20$ | 13.56132                 | 0.0097%       | Pass    |
| $V_{\text{min}} : 108$  |                           | 13.56102                 | 0.0075%       | Pass    |

### 2min

| Voltage (V AC)          | Temperature (°C)          | Frequency Measured (MHz) | Test data (%) | Verdict |
|-------------------------|---------------------------|--------------------------|---------------|---------|
| $V_{\text{norm}} : 120$ | -20                       | 13.561057                | 0.0078%       | Pass    |
|                         | -10                       | 13.561343                | 0.0099%       | Pass    |
|                         | 0                         | 13.561218                | 0.0090%       | Pass    |
|                         | 10                        | 13.561315                | 0.0097%       | Pass    |
|                         | $T_{\text{normal}} : +20$ | 13.560175                | 0.0013%       | Pass    |
|                         | 30                        | 13.56127                 | 0.0094%       | Pass    |
|                         | 40                        | 13.561216                | 0.0090%       | Pass    |
|                         | 50                        | 13.561                   | 0.0074%       | Pass    |
| $V_{\text{max}} : 132$  | $T_{\text{normal}} : +20$ | 13.561192                | 0.0088%       | Pass    |
| $V_{\text{min}} : 108$  |                           | 13.561151                | 0.0085%       | Pass    |

### 5min

| Voltage (V AC)          | Temperature (°C)          | Frequency Measured (MHz) | Test data (%) | Verdict |
|-------------------------|---------------------------|--------------------------|---------------|---------|
| $V_{\text{norm}} : 120$ | -20                       | 13.56105                 | 0.0078%       | Pass    |
|                         | -10                       | 13.56114                 | 0.0084%       | Pass    |
|                         | 0                         | 13.561                   | 0.0074%       | Pass    |
|                         | 10                        | 13.56136                 | 0.0100%       | Pass    |
|                         | $T_{\text{normal}} : +20$ | 13.56022                 | 0.0016%       | Pass    |
|                         | 30                        | 13.56136                 | 0.0100%       | Pass    |
|                         | 40                        | 13.56125                 | 0.0092%       | Pass    |
|                         | 50                        | 13.56118                 | 0.0087%       | Pass    |
| $V_{\text{max}} : 132$  | $T_{\text{normal}} : +20$ | 13.56103                 | 0.0076%       | Pass    |
| $V_{\text{min}} : 108$  |                           | 13.56107                 | 0.0079%       | Pass    |

### 10min

| Voltage (V AC)          | Temperature (°C)          | Frequency Measured (MHz) | Test data (%) | Verdict |
|-------------------------|---------------------------|--------------------------|---------------|---------|
| $V_{\text{norm}} : 120$ | -20                       | 13.561255                | 0.0093%       | Pass    |
|                         | -10                       | 13.561104                | 0.0081%       | Pass    |
|                         | 0                         | 13.561286                | 0.0095%       | Pass    |
|                         | 10                        | 13.561291                | 0.0095%       | Pass    |
|                         | $T_{\text{normal}} : +20$ | 13.5602                  | 0.0015%       | Pass    |
|                         | 30                        | 13.561138                | 0.0084%       | Pass    |
|                         | 40                        | 13.561236                | 0.0091%       | Pass    |
|                         | 50                        | 13.561006                | 0.0074%       | Pass    |
| $V_{\text{max}} : 132$  | $T_{\text{normal}} : +20$ | 13.561323                | 0.0098%       | Pass    |
| $V_{\text{min}} : 108$  |                           | 13.561206                | 0.0089%       | Pass    |



### 7.5 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2020) Section 6.4

Test Engineer: Jarry Li

Limit:

| Frequency(MHz) | Field strength<br>(microvolts/meter) | Limit<br>(dBuV/m) | Detector | Measurement Distance<br>(meters) |
|----------------|--------------------------------------|-------------------|----------|----------------------------------|
| 0.009-0.490    | 2400/F(kHz)                          | -                 | -        | 300                              |
| 0.490-1.705    | 24000/F(kHz)                         | -                 | -        | 30                               |
| 1.705-30       | 30                                   | -                 | -        | 30                               |

#### Below 30MHz

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the  $\lambda/2\pi$  distance, and at a 20 dB/decade of distance rate beyond  $\lambda/2\pi$ . This shall be accomplished using Equation (2):

$$FS_{(3m)} = FS_{(30/300m)} + 40\log\{d_{(near\ field)}/d_{(3m)}\} + 20\log\{d_{(30/300m)}/d_{(near\ field)}\} \quad (2)$$

If the single point measured is at a distance greater than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(3m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(3m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(3m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(3m)}\} \quad (4)$$

Remark:

$$d_{near\ field} = 47.77 / f_{MHz}$$

where  $f_{MHz}$  is the frequency of the emission being measured in MHz.

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

$$FS_{limit} = FS_{max} - 40\log\left(\frac{d_{limit}}{d_{measure}}\right)$$

where

$FS_{limit}$  is the calculation of field strength at the limit distance, expressed in dBuV/m  
 $FS_{max}$  is the measured field strength, expressed in dBuV/m  
 $d_{measure}$  is the distance of the measurement point from the EUT  
 $d_{limit}$  is the reference distance or the distance of the  $\lambda/2\pi$  point



### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

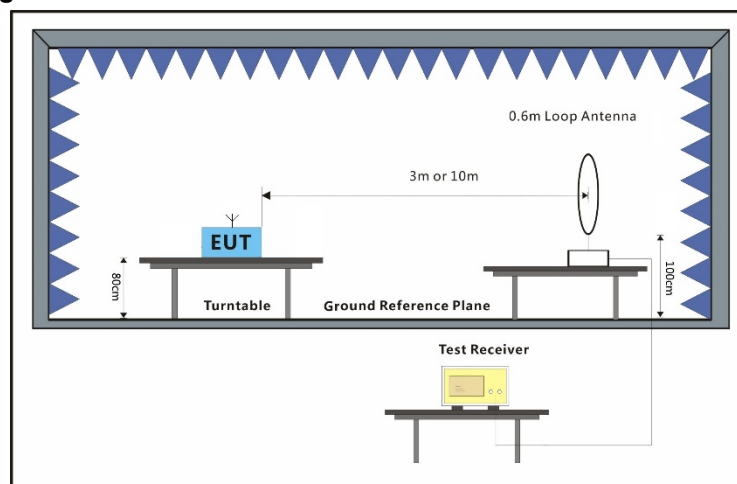
Humidity: 50.4 % RH

Atmospheric Pressure: 1020 mbar

### 7.5.2 Test Mode Description

| Pre-scan /        | Mode      | Description                     |
|-------------------|-----------|---------------------------------|
| Final test        | Code      |                                 |
| <b>Final test</b> | <b>00</b> | <b>TX mode with modulation.</b> |

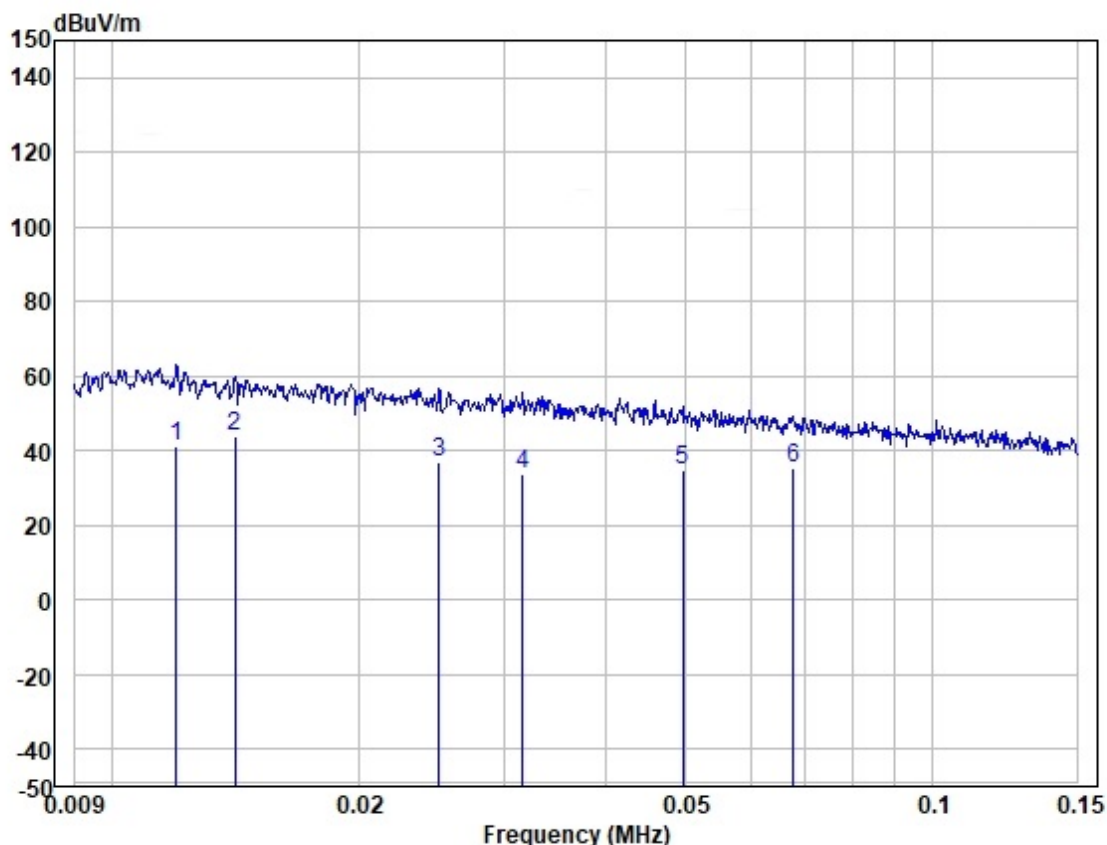
### 7.5.3 Test Setup Diagram



### 7.5.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Test Mode: 00

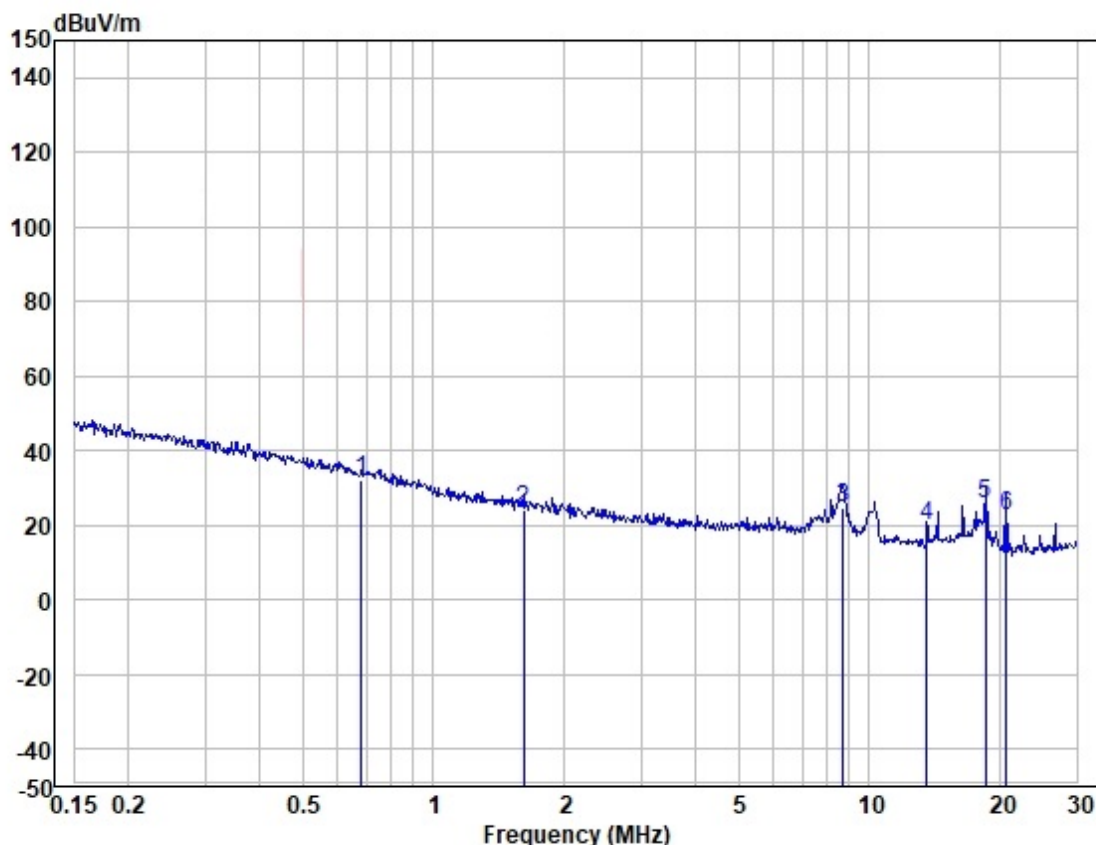


loop :  
Test Mode:  
Model : X

| Frequency<br>MHz | Read<br>level<br>dBuV/m | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Measured<br>level<br>dBuV/m | Limit<br>Line<br>dBuV/m | Over<br>limit<br>dB |
|------------------|-------------------------|---------------------|---------------------------|------------------------|-----------------------------|-------------------------|---------------------|
| 0.012            | 53.05                   | 0.01                | 20.63                     | 32.72                  | 40.97                       |                         |                     |
| 0.014            | 57.77                   | 0.01                | 18.79                     | 32.72                  | 43.85                       |                         |                     |
| 0.025            | 53.22                   | 0.01                | 16.24                     | 32.72                  | 36.75                       |                         |                     |
| 0.032            | 50.66                   | 0.01                | 15.65                     | 32.72                  | 33.60                       |                         |                     |
| 0.050            | 52.56                   | 0.01                | 14.95                     | 32.72                  | 34.80                       |                         |                     |
| 0.068            | 53.31                   | 0.01                | 14.83                     | 32.72                  | 35.43                       |                         |                     |



Test Mode: 00



loop :  
Test Mode:  
Model : X

| Frequency<br>MHz | Read<br>level<br>dBuV/m | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Preamplifier<br>Factor<br>dB | Measured<br>level<br>dBuV/m | Limit<br>Line<br>dBuV/m | Over<br>limit<br>dB |
|------------------|-------------------------|---------------------|---------------------------|------------------------------|-----------------------------|-------------------------|---------------------|
| 0.683            | 50.50                   | 0.05                | 14.12                     | 32.70                        | 31.97                       |                         |                     |
| 1.610            | 43.17                   | 0.06                | 13.85                     | 32.70                        | 24.38                       |                         |                     |
| 8.683            | 45.18                   | 0.16                | 11.99                     | 32.71                        | 24.62                       |                         |                     |
| 13.551           | 41.96                   | 0.20                | 10.51                     | 32.72                        | 19.95                       |                         |                     |
| 18.426           | 48.43                   | 0.23                | 9.60                      | 32.72                        | 25.54                       |                         |                     |
| 20.594           | 45.97                   | 0.25                | 9.17                      | 32.73                        | 22.66                       |                         |                     |



| Frequency (MHz) | Level @3m (dBuV/m) | Limit @300m (dBuV/m) | Convert Factor (dB)@3 m to 300 m | Level @ 300m (dBuV/m) | Over limit (dB) | Remark |
|-----------------|--------------------|----------------------|----------------------------------|-----------------------|-----------------|--------|
| 0.012           | 40.97              | 46.02                | -80                              | -39.03                | -85.05          | AV     |
| 0.014           | 43.85              | 44.68                | -80                              | -36.15                | -80.83          | AV     |
| 0.025           | 36.75              | 39.65                | -80                              | -43.25                | -82.90          | AV     |
| 0.032           | 33.60              | 37.50                | -80                              | -46.40                | -83.90          | AV     |
| 0.050           | 34.80              | 33.62                | -80                              | -45.20                | -78.82          | AV     |
| 0.068           | 35.43              | 30.95                | -80                              | -44.57                | -75.52          | AV     |
| Frequency (MHz) | Level @3m (dBuV/m) | Limit @30m (dBuV/m)  | Convert Factor (dB)@3 m to 30 m  | Level @ 30m (dBuV/m)  | Over limit (dB) | Remark |
| 0.683           | 31.97              | 30.92                | -40                              | -8.03                 | -38.95          | QP     |
| 1.61            | 24.38              | 23.47                | -40                              | -15.62                | -39.09          | QP     |
| 8.683           | 24.62              | 29.54                | -40                              | -15.38                | -44.92          | QP     |
| 13.551          | 19.95              | 29.54                | -40                              | -20.05                | -49.59          | QP     |
| 18.426          | 25.54              | 29.54                | -40                              | -14.46                | -44.00          | QP     |
| 20.594          | 22.66              | 29.54                | -40                              | -17.34                | -46.88          | QP     |

## Remark1:

Extrapolation Correction (dB)@3m to 300 m =  $40 \cdot \log(3/300) = -80$  according to FCC part 15.31 (f) (1)

Extrapolation Correction (dB)@3m to 30 m =  $40 \cdot \log(3/30) = -40$  according to FCC part 15.31 (f) (1)

Level (dBuV/m) @ 300m = Measured Level (dBuV/m) @3m + Extrapolation Correction (dB)@3 m to 300 m

Level (dBuV/m) @ 30m = Measured Level (dBuV/m) @3m + Extrapolation Correction (dB)@3 m to 30 m

## Remark2:

The trace from 9kHz to 8MHz was the background of the test site.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch (CMAA, CNAS, EEC Laboratory)

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663  
中国·广东·广州高新技术产业开发区科学城科珠路198号

t (86-20) 82155555 www.sgsgroup.com.cn  
t (86-20) 82155555 sgs.china@sgs.com

### 7.6 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2020) Section 6.5

Test Engineer: Jarry Li

Limit:

| Frequency(MHz) | Field strength(microvolts/meter) | Measurement distance(meters) |
|----------------|----------------------------------|------------------------------|
| 30-88          | 100                              | 3                            |
| 88-216         | 150                              | 3                            |
| 216-960        | 200                              | 3                            |
| Above 960      | 500                              | 3                            |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

Humidity: 50.3 % RH

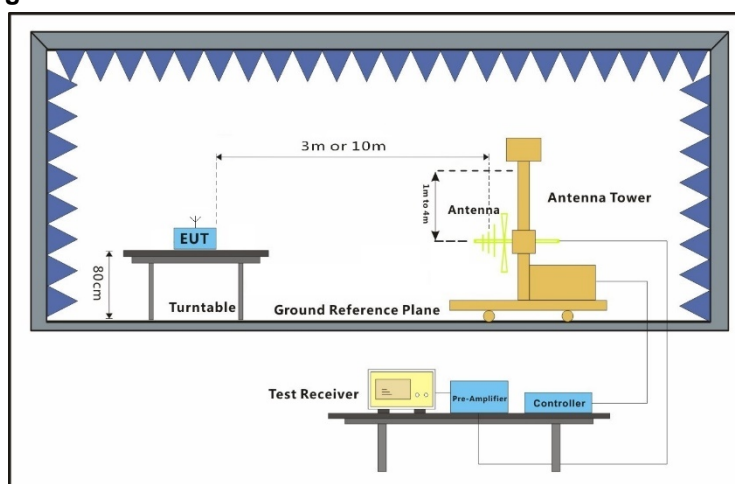
Atmospheric Pressure: 1020 mbar

#### 7.6.2 Test Mode Description

|                   |           |             |
|-------------------|-----------|-------------|
| Pre-scan /        | Mode      | Description |
| Final test        | Code      |             |
| <b>Final test</b> | <b>00</b> |             |

TX mode with modulation.

#### 7.6.3 Test Setup Diagram



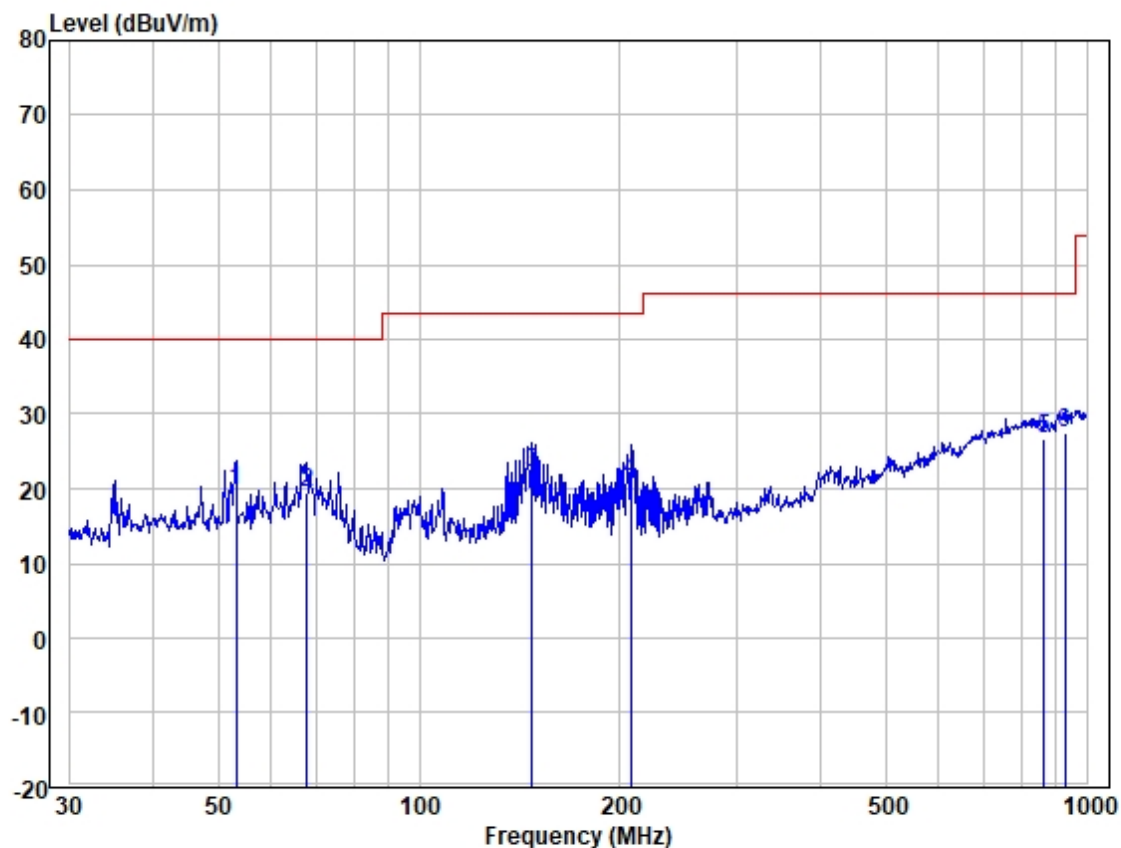
### 7.6.4 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



Test Mode: 00; Polarity: Horizontal

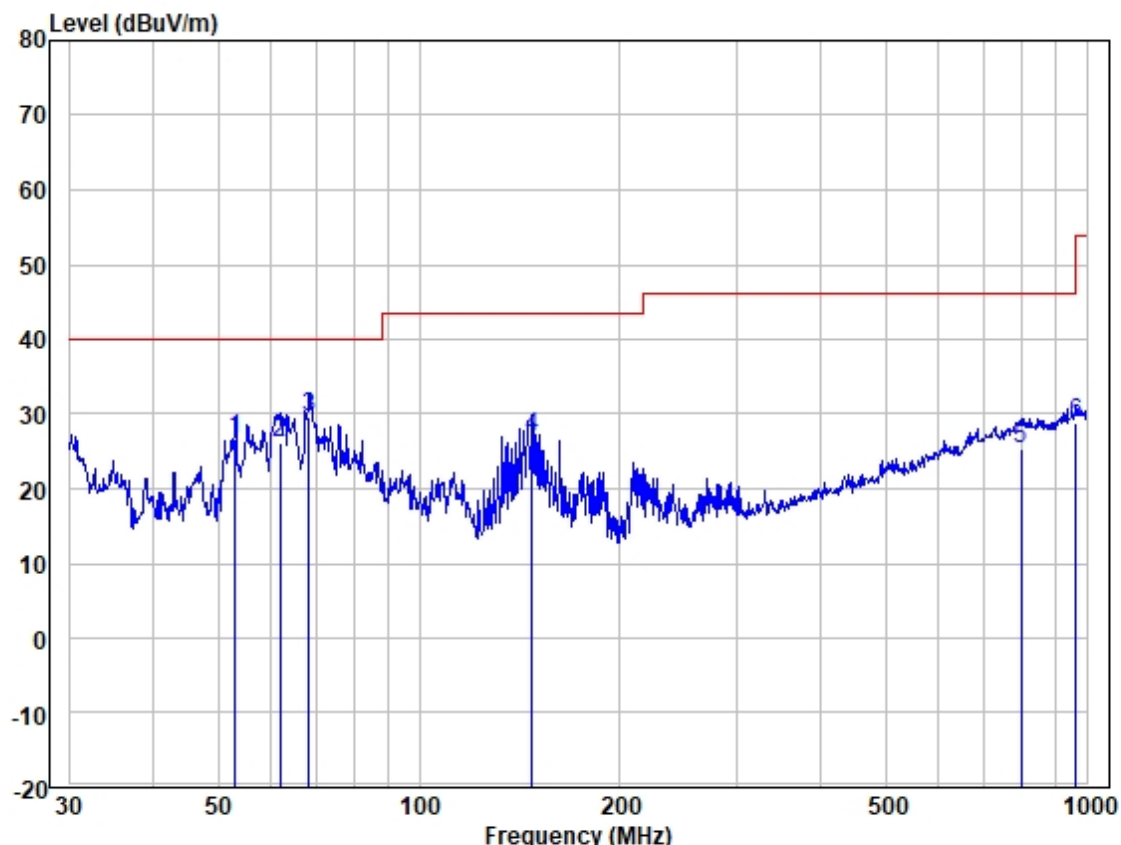


Site : 966 Chamber  
Job :  
Model :  
Power :  
Test Mode :

|   | Freq    | Read Level | Antenna Factor | Cable Loss | Preamplifier Factor | Measured Level | Limit Line | Over Limit | Pol/Phase  | Remark |
|---|---------|------------|----------------|------------|---------------------|----------------|------------|------------|------------|--------|
|   | MHz     | dBuV       | dB/m           | dB         | dB                  | dBuV/m         | dBuV/m     | dB         |            |        |
| 1 | 53.318  | 32.62      | 19.54          | 0.40       | 32.79               | 19.77          | 40.00      | -20.23     | HORIZONTAL | QP     |
| 2 | 67.913  | 34.01      | 17.63          | 0.45       | 32.76               | 19.33          | 40.00      | -20.67     | HORIZONTAL | QP     |
| 3 | 147.404 | 35.26      | 19.03          | 0.66       | 32.75               | 22.20          | 43.52      | -21.32     | HORIZONTAL | QP     |
| 4 | 207.123 | 37.43      | 15.56          | 0.80       | 32.81               | 20.98          | 43.52      | -22.54     | HORIZONTAL | QP     |
| 5 | 863.056 | 27.77      | 28.50          | 1.73       | 31.44               | 26.56          | 46.02      | -19.46     | HORIZONTAL | QP     |
| 6 | 925.756 | 27.01      | 29.69          | 1.77       | 30.87               | 27.60          | 46.02      | -18.42     | HORIZONTAL | QP     |



Test Mode: 00; Polarity: Vertical



Site : 966 Chamber  
Job :  
Model :  
Power :  
Test Mode :

|   | Freq    | Read Level | Antenna Factor | Cable Loss | Preamplifier Factor | Measured Level | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---------|------------|----------------|------------|---------------------|----------------|------------|------------|-----------|--------|
|   | MHz     | dBuV       | dB/m           | dB         | dB                  | dBuV/m         | dBuV/m     | dB         |           |        |
| 1 | 53.131  | 39.43      | 19.54          | 0.40       | 32.79               | 26.58          | 40.00      | -13.42     | VERTICAL  | QP     |
| 2 | 61.995  | 39.84      | 18.70          | 0.42       | 32.77               | 26.19          | 40.00      | -13.81     | VERTICAL  | QP     |
| 3 | 68.391  | 44.51      | 17.50          | 0.45       | 32.76               | 29.70          | 40.00      | -10.30     | VERTICAL  | QP     |
| 4 | 147.404 | 39.92      | 19.03          | 0.66       | 32.75               | 26.86          | 43.52      | -16.66     | VERTICAL  | QP     |
| 5 | 796.183 | 26.57      | 28.75          | 1.66       | 31.62               | 25.36          | 46.02      | -20.66     | VERTICAL  | QP     |
| 6 | 962.162 | 27.62      | 30.12          | 1.82       | 30.73               | 28.83          | 53.98      | -25.15     | VERTICAL  | QP     |



## 8 Test Setup Photo

Refer to Appendix - Test Setup Photo for GZCR251100183102



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

**Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)**

## 9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2511001831AT

- End of the Report -

