

FCC PART 15C TEST REPORT FOR CERTIFICATION  
On Behalf of

AUO Display Plus Corporation

Module

Model Number: WXQ65NFC

FCC ID: 2A639-WXQ65NFC

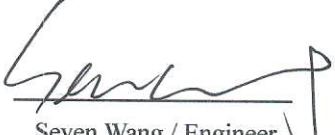
|              |                                                                     |
|--------------|---------------------------------------------------------------------|
| Applicant :  | AUO Display Plus Corporation                                        |
| Address:     | No. 1, Gongye E. 3rd Rd., East Dist., Hsinchu Science Park,         |
|              | Hsinchu City, Taiwan                                                |
|              |                                                                     |
| Prepared By: | EST Technology Co., Ltd.                                            |
|              | Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China |
|              | Tel: 86-769-83081888-808                                            |

|                 |                       |
|-----------------|-----------------------|
| Report Number:  | ESTE-R2305015         |
| Date of Test:   | Jan. 06~May. 04, 2023 |
| Date of Report: | May. 05, 2023         |

# TABLE OF CONTENTS

| Description                                    | Page |
|------------------------------------------------|------|
| TEST REPORT VERIFICATION.....                  | 3    |
| 1. GENERAL INFORMATION .....                   | 4    |
| 1.1. Description of Device (EUT) .....         | 4    |
| 1.2. Antenna Information .....                 | 4    |
| 1.3. Information of RF Cable .....             | 4    |
| 2. SUMMARY OF TEST .....                       | 5    |
| 2.1. Summary of test result.....               | 5    |
| 2.2. Test Facilities .....                     | 6    |
| 2.3. Measurement uncertainty .....             | 7    |
| 2.4. Assistant equipment used for test.....    | 7    |
| 2.5. Block Diagram .....                       | 7    |
| 2.6. Test mode .....                           | 8    |
| 2.7. Channel List .....                        | 8    |
| 2.8. Test Equipment.....                       | 9    |
| 3. AC POWER LINE CONDUCTED EMISSIONS .....     | 10   |
| 3.1. Limit .....                               | 10   |
| 3.2. Test Setup.....                           | 10   |
| 3.3. Spectrum Analyzer Setting.....            | 10   |
| 3.4. Test Procedure .....                      | 10   |
| 3.5. Test Result.....                          | 11   |
| 4. RADIATED EMISSION .....                     | 15   |
| 4.1. Limit .....                               | 15   |
| 4.2. Test Setup.....                           | 16   |
| 4.3. Spectrum Analyzer Setting.....            | 17   |
| 4.4. Test Procedure .....                      | 17   |
| 4.5. Test Result.....                          | 18   |
| 5. FREQUENCY TOLERANCE .....                   | 26   |
| 5.1. Limit .....                               | 26   |
| 5.2. Test Setup.....                           | 26   |
| 5.3. Spectrum Analyzer Setting.....            | 26   |
| 5.4. Test Procedure .....                      | 27   |
| 5.5. Test Result.....                          | 28   |
| 6. 20DB BANDWIDTH&99% OCCUPIED BANDWIDTH ..... | 30   |
| 6.1. Limit .....                               | 30   |
| 6.2. Test Setup.....                           | 30   |
| 6.3. Spectrum Analyzer Setting.....            | 30   |
| 6.4. Test Procedure .....                      | 31   |
| 6.5. Test Result.....                          | 32   |
| 7. ANTENNA REQUIREMENTS .....                  | 34   |
| 7.1. Limit .....                               | 34   |
| 7.2. Test Result.....                          | 34   |
| 8. TEST SETUP PHOTO .....                      | 35   |
| 9. EUT PHOTO.....                              | 37   |

## EST Technology Co., Ltd.

|                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                              |                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Applicant:</b>                                                                                                                                                                                        | AUO Display Plus Corporation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                              |                                                                                                              |
| <b>Address:</b>                                                                                                                                                                                          | No. 1, Gongye E. 3rd Rd., East Dist., Hsinchu Science Park,<br>Hsinchu City, Taiwan                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                              |                                                                                                              |
| <b>Manufacturer:</b>                                                                                                                                                                                     | AUO Display Plus Corporation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                              |                                                                                                              |
| <b>Address:</b>                                                                                                                                                                                          | No. 1, Gongye E. 3rd Rd., East Dist., Hsinchu Science Park,<br>Hsinchu City, Taiwan                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                              |                                                                                                              |
| <b>Factory:</b>                                                                                                                                                                                          | Heyuan lianteng industrial co., LTD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                              |                                                                                                              |
| <b>Address:</b>                                                                                                                                                                                          | 517000. GD. Heyuan.Yc-Ah13, Longling Fourth Road, Longling Industrial<br>Park, Yuancheng District China                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                              |                                                                                                              |
| <b>E.U.T:</b>                                                                                                                                                                                            | Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                              |                                                                                                              |
| <b>Model Number:</b>                                                                                                                                                                                     | WXQ65NFC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                              |                                                                                                              |
| <b>Power Supply:</b>                                                                                                                                                                                     | DC 3.3V From PC Input AC 120V/60Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                              |                                                                                                              |
| <b>Trade Name:</b>                                                                                                                                                                                       | AUO Display Plus or AUO Display+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                              |                                                                                                              |
| <b>Date of Receipt:</b>                                                                                                                                                                                  | Jan. 06, 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Date of Test:</b>                                                                                         | Jan. 06~May. 04, 2023                                                                                        |
| <b>Test Specification:</b>                                                                                                                                                                               | FCC Part 15 Subpart C (15.225)<br>ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                              |                                                                                                              |
| <b>Test Result:</b>                                                                                                                                                                                      | <p>The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements.</p> <p>This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.</p> |                                                                                                              |                                                                                                              |
| <b>Prepared by:</b>                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Reviewed by:</b>                                                                                          | <b>Date:</b> May. 05, 2023                                                                                   |
| <br>Ring Yang / Assistant                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <br>Seven Wang / Engineer | <br>Iceman Hu / Manager |
| <b>Other Aspects:</b><br>None.                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                              |                                                                                                              |
| Abbreviations: OK/P=passed    fail/F=failed    n.a/N=not applicable    E.U.T=equipment under tested                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                              |                                                                                                              |
| <i>This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                              |                                                                                                              |

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                     |   |                      |
|---------------------|---|----------------------|
| Product Name        | : | Module               |
| Model Number        | : | WXQ65NFC             |
| Software Version    | : | N/A                  |
| Hardware Version    | : | N/A                  |
| Operation frequency | : | 13.56MHz             |
| Number of channel   | : | 1                    |
| Modulation Type     | : | ASK                  |
| Sample Type         | : | Prototype production |

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

### 1.2. Antenna Information

| Ant No. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|---------|-------|------------|--------------|-----------|------------|
| 1       | -     | -          | PCB          | -         | 0          |

Note: This information is provided by the applicant.

### 1.3. Information of RF Cable

| Cable Loss(dB)                                                                                                                                                                               | Provided by                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1.0                                                                                                                                                                                          | AUO Display Plus Corporation |
| Note: 1.The customer declared the loss value of the RF Cable, and the test results of this report only apply to the sample as received.<br>2. This information is provided by the applicant. |                              |

## 2. SUMMARY OF TEST

### 2.1. Summary of test result

| No. | Description of Test Item              | FCC Standard Section | Results |
|-----|---------------------------------------|----------------------|---------|
| 1   | AC Power Line Conducted Emissions     | 15.207               | PASS    |
| 2   | Radiated Emission                     | 15.225(a)(b)(c)(d)   | PASS    |
| 3   | Frequency Tolerance                   | 15.225(e)            | PASS    |
| 4   | 20dB Bandwidth&99% Occupied Bandwidth | 15.215               | PASS    |
| 5   | Antenna Requirement                   | 15.203               | PASS    |

Note: "N/A" denotes test is not applicable in this test report.

## 2.2. Test Facilities

EMC Lab : Certificated by CNAS, CHINA  
Registration No.: L5288  
This Certificate is valid until: November 12, 2023

Certificated by FCC, USA  
Designation Number: CN1215  
This Certificate is valid until: January 31, 2024

Certificated by A2LA, USA  
Registration No.: 4366.01  
This Certificate is valid until: January 31, 2024

Certificated by Industry Canada  
CAB identifier No.: CN0035  
This Certificate is valid until: January 31, 2024

Certificated by VCCI, Japan  
Registration No.:C-14103; T-20073; R-13663;  
R-20103; G-20097  
Date of registration: Apr. 20, 2020  
This Certificate is valid until: Apr. 19, 2023

Certificated by TUV Rheinland, Germany  
Registration No.: UA 50413872 0001  
Date of registration: July 31, 2018

Certificated by Intertek  
Registration No.: 2011-RTL-L2-64  
Date of registration: November 08, 2018

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan,  
Guangdong, China

### 2.3. Measurement uncertainty

| Test Item                                                  | Uncertainty                       |
|------------------------------------------------------------|-----------------------------------|
| Uncertainty for Conduction emission test                   | $\pm 3.48\text{dB}$               |
| Uncertainty for spurious emissions test<br>(Below 30MHz)   | $\pm 1.62\text{ dB}$              |
| Uncertainty for spurious emissions test<br>(30MHz-1GHz)    | $\pm 4.60\text{ dB(Polarize: H)}$ |
|                                                            | $\pm 4.68\text{ dB(Polarize: V)}$ |
| Uncertainty for spurious emissions test<br>(1GHz to 18GHz) | $\pm 4.96\text{dB}$               |
| Uncertainty for radio frequency                            | $7 \times 10^{-8}$                |
| Uncertainty for conducted RF Power                         | 1.08dB                            |
| Uncertainty for Power density test                         | 0.26dB                            |

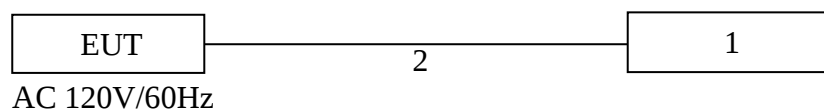
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 2.4. Assistant equipment used for test

| Code | Equipment       | Manufacturer | Model No.     | Equipment No. | Series No. |
|------|-----------------|--------------|---------------|---------------|------------|
| 1    | Laptop computer | DELL         | Inspiron 5493 | EST-E316      | 5376699759 |
| 2    | cable           | /            | /             | EST-E308      | /          |

### 2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground.



(EUT: WIFI Module)

## 2.6. Test mode

The final test as listed below.

| Test Item                             | Modulation Type | Operating Mode |
|---------------------------------------|-----------------|----------------|
| AC Power Line Conducted Emissions     | ASK             | TX Mode        |
| Radiated Emission                     | ASK             | TX Mode        |
| Frequency Tolerance                   | ASK             | TX Mode        |
| 20dB Bandwidth&99% Occupied Bandwidth | ASK             | TX Mode        |

Note: In radiated measurement, the EUT had been pre-scan on the positioned of each 3axis (X,Y, Z), the worst case was found when positioned on **X-plane**.

## 2.7. Channel List

| Channel No. | Frequency (MHz) |
|-------------|-----------------|
| 1           | 13.56           |

## 2.8. Test Equipment

| For conducted emission test |                 |              |            |                  |            |           |
|-----------------------------|-----------------|--------------|------------|------------------|------------|-----------|
| Equipment                   | Manufacturer    | Model No.    | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| EMI Test Receiver           | Rohde & Schwarz | ESHS30       | EST-E001   | LISAI            | June 13,22 | 1 Year    |
| Artificial Mains Network    | Rohde & Schwarz | ENV216       | EST-E002   | LISAI            | June 13,22 | 1 Year    |
| Pulse Limiter               | Rohde & Schwarz | ESH3-Z2      | EST-E078   | LISAI            | June 13,22 | 1 Year    |
| Test Software               | Audix           | e3-6.111221a | N/A        | N/A              | N/A        | N/A       |

| For radiated emission test(9kHz-30MHz) |                 |              |            |                  |            |           |
|----------------------------------------|-----------------|--------------|------------|------------------|------------|-----------|
| Equipment                              | Manufacturer    | Model No.    | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| EMI Test Receiver                      | Rohde & Schwarz | ESR7         | EST-E047   | LISAI            | June 13,22 | 1 Year    |
| Active Loop Antenna                    | SCHWARZB ECK    | FMZB 1519B   | EST-E054   | LISAI            | June 13,22 | 1 Year    |
| Test Software                          | Audix           | e3-6.111221a | N/A        | N/A              | N/A        | N/A       |
| 9kHz-30MHz Cable                       | N/A             | EST-001      | N/A        | N/A              | N/A        | N/A       |

| For radiated emission test(Above 1000MHz) |                |                  |            |                  |            |           |
|-------------------------------------------|----------------|------------------|------------|------------------|------------|-----------|
| Equipment                                 | Manufacturer   | Model No.        | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| Horn Antenna                              | SCHWARZB ECK   | BBHA9120D        | EST-E144   | LISAI            | June 13,22 | 1 Year    |
| Horn Antenna                              | Com-Power      | AHA-840          | EST-E133   | LISAI            | June 13,22 | 1 Year    |
| Low Noise Amplifier                       | RF             | TRLA-01018 0G45N | EST-E142   | LISAI            | June 13,22 | 1 Year    |
| Spectrum Analyzer                         | Rohde &Schwarz | FSV40            | EST-E069   | LISAI            | June 13,22 | 1 Year    |
| Test Software                             | Audix          | e3-6.111221a     | N/A        | N/A              | N/A        | N/A       |
| Above 1GHz Cable                          | N/A            | EST-003          | N/A        | N/A              | N/A        | N/A       |

| For connect EUT antenna terminal test |                |           |            |                  |            |           |
|---------------------------------------|----------------|-----------|------------|------------------|------------|-----------|
| Equipment                             | Manufacturer   | Model No. | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| TS 1120                               | Tonscend       | /         | /          | /                | /          | /         |
| Test Software                         | Tonscend       | TS1120-3  | 3.2.11     | /                | /          | /         |
| RF Control Unit                       | Tonscend       | JS0806-2  | EST-E134   | LISAI            | June 13,22 | 1 Year    |
| Signal and Spectrum Analyzer          | Rohde &Schwarz | FSV 40    | EST-E136   | LISAI            | June 13,22 | 1 Year    |

### 3. AC POWER LINE CONDUCTED EMISSIONS

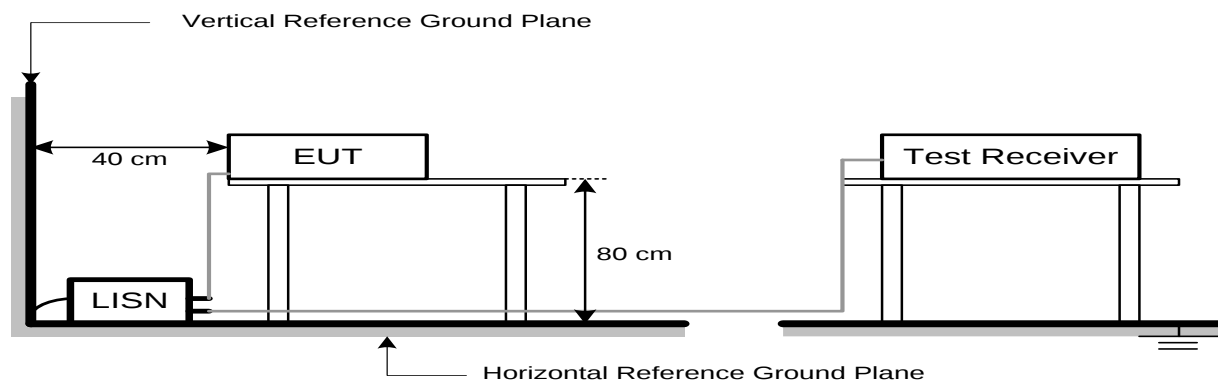
#### 3.1. Limit

| Frequency |   |        | Maximum RF Line Voltage          |                               |
|-----------|---|--------|----------------------------------|-------------------------------|
|           |   |        | Quasi-Peak Level<br>dB( $\mu$ V) | Average Level<br>dB( $\mu$ V) |
| 150kHz    | ~ | 500kHz | 66 ~ 56*                         | 56 ~ 46*                      |
| 500kHz    | ~ | 5MHz   | 56                               | 46                            |
| 5MHz      | ~ | 30MHz  | 60                               | 50                            |

Note:

1. \* Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

#### 3.2. Test Setup



#### 3.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 9KHz     |
| VBW                 | 9KHz     |
| Start frequency     | 150KHz   |
| Stop frequency      | 30MHz    |
| Sweep Time          | Auto     |
| Detector            | QP/AVG   |
| Trace Mode          | Max Hold |

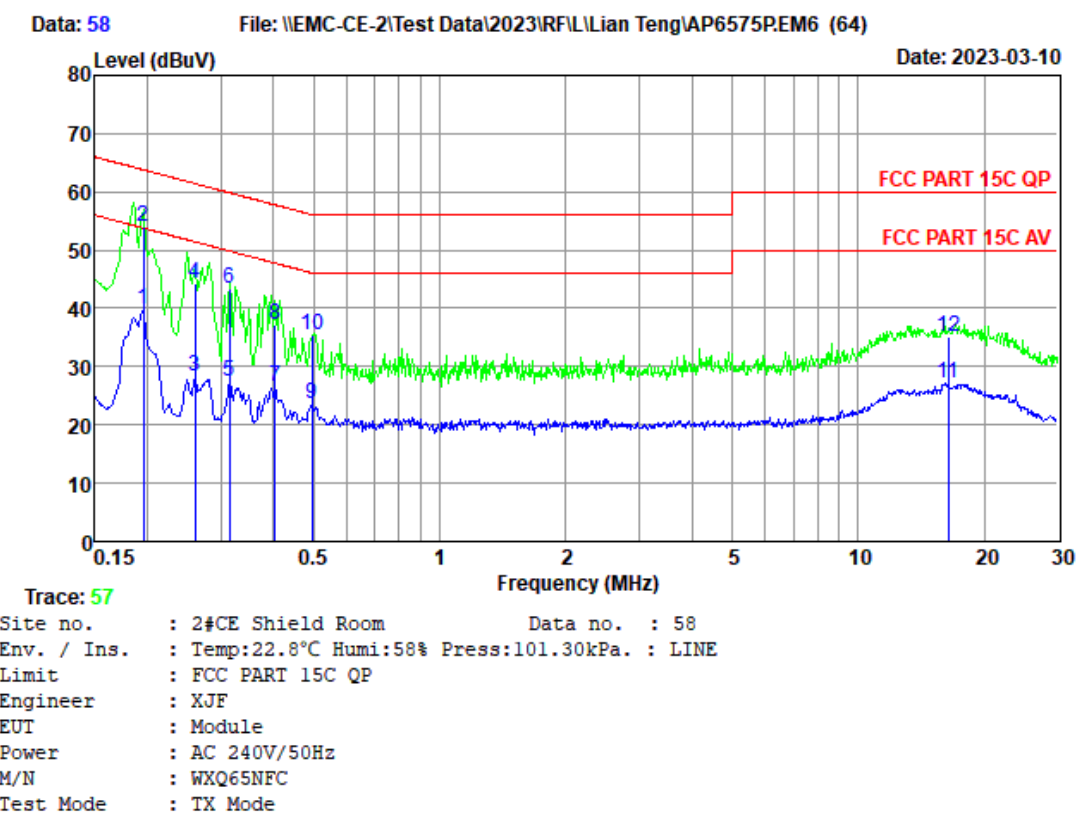
#### 3.4. Test Procedure

- a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
- b. The EUT Power connected to the power mains through a line impedance stabilization network.
- c. Provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
- d. Set the EUT transmit continuously with maximum output power.
- e. Spectrum analyzer setting parameters in accordance with section 3.3.
- f. The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.
- g. Record the results in the test report.

3.5. Test Result

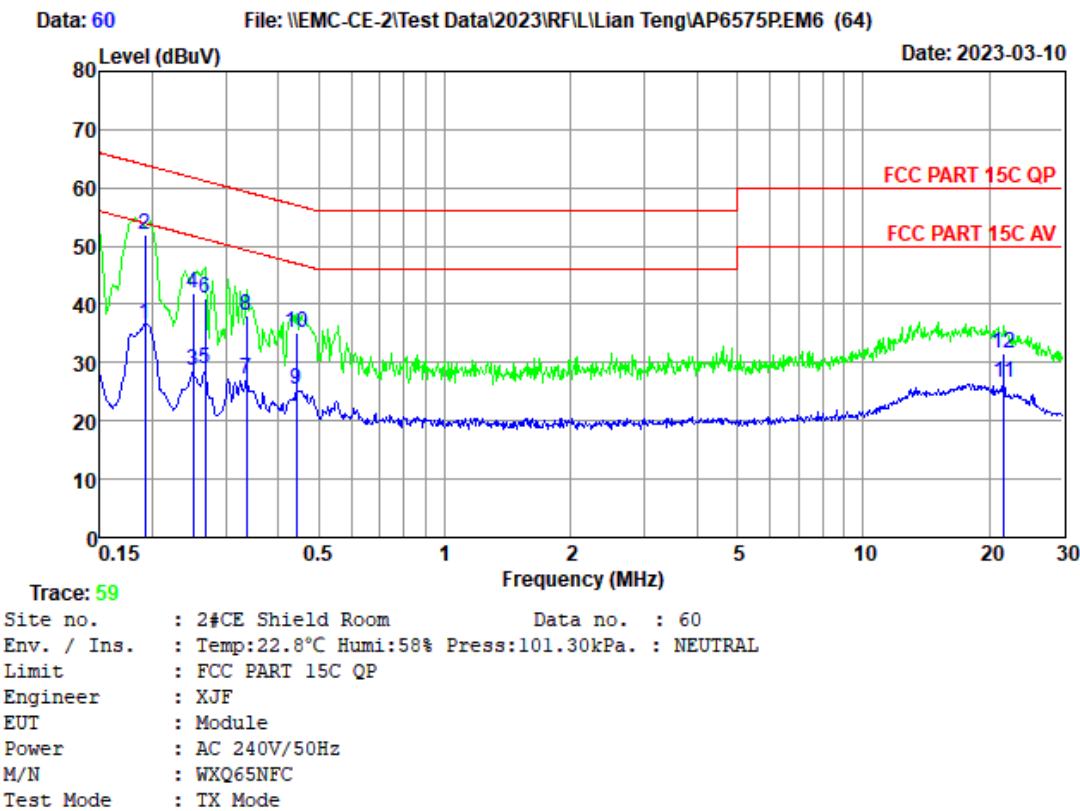
EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878



|    | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.20           | 9.84                   | 9.77                  | 20.23             | 39.84                       | 53.80            | 13.96          | Average |
| 2  | 0.20           | 9.84                   | 9.77                  | 34.54             | 54.15                       | 63.80            | 9.65           | QP      |
| 3  | 0.26           | 9.73                   | 9.92                  | 8.76              | 28.41                       | 51.42            | 23.01          | Average |
| 4  | 0.26           | 9.73                   | 9.92                  | 24.56             | 44.21                       | 61.42            | 17.21          | QP      |
| 5  | 0.31           | 9.81                   | 9.92                  | 7.69              | 27.42                       | 49.84            | 22.42          | Average |
| 6  | 0.31           | 9.81                   | 9.92                  | 23.78             | 43.51                       | 59.84            | 16.33          | QP      |
| 7  | 0.40           | 9.85                   | 9.92                  | 6.72              | 26.49                       | 47.77            | 21.28          | Average |
| 8  | 0.40           | 9.85                   | 9.92                  | 17.48             | 37.25                       | 57.77            | 20.52          | QP      |
| 9  | 0.49           | 9.84                   | 9.92                  | 4.00              | 23.76                       | 46.10            | 22.34          | Average |
| 10 | 0.49           | 9.84                   | 9.92                  | 15.74             | 35.50                       | 56.10            | 20.60          | QP      |
| 11 | 16.40          | 9.86                   | 10.13                 | 7.11              | 27.10                       | 50.00            | 22.90          | Average |
| 12 | 16.40          | 9.86                   | 10.13                 | 15.11             | 35.10                       | 60.00            | 24.90          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. If the average limit is met when using a quasi-peak detector,  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.



|    | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.19           | 9.72                   | 9.77                  | 17.25             | 36.74                       | 53.93            | 17.19          | Average |
| 2  | 0.19           | 9.72                   | 9.77                  | 32.47             | 51.96                       | 63.93            | 11.97          | QP      |
| 3  | 0.25           | 9.84                   | 9.92                  | 8.97              | 28.73                       | 51.73            | 23.00          | Average |
| 4  | 0.25           | 9.84                   | 9.92                  | 22.14             | 41.90                       | 61.73            | 19.83          | QP      |
| 5  | 0.27           | 9.84                   | 9.92                  | 9.03              | 28.79                       | 51.20            | 22.41          | Average |
| 6  | 0.27           | 9.84                   | 9.92                  | 21.24             | 41.00                       | 61.20            | 20.20          | QP      |
| 7  | 0.34           | 9.76                   | 9.92                  | 7.59              | 27.27                       | 49.31            | 22.04          | Average |
| 8  | 0.34           | 9.76                   | 9.92                  | 18.47             | 38.15                       | 59.31            | 21.16          | QP      |
| 9  | 0.44           | 9.73                   | 9.92                  | 5.62              | 25.27                       | 47.02            | 21.75          | Average |
| 10 | 0.44           | 9.73                   | 9.92                  | 15.40             | 35.05                       | 57.02            | 21.97          | QP      |
| 11 | 21.71          | 10.17                  | 10.16                 | 6.18              | 26.51                       | 50.00            | 23.49          | Average |
| 12 | 21.71          | 10.17                  | 10.16                 | 11.21             | 31.54                       | 60.00            | 28.46          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. If the average limit is met when using a quasi-peak detector,  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.

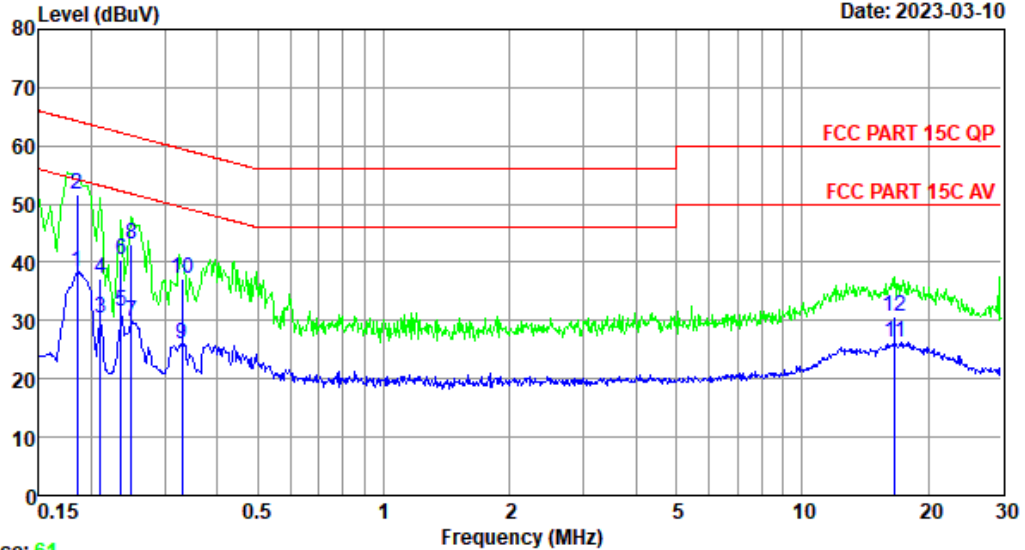
## EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878

Data: 62

File: \\EMC-CE-2\Test Data\2023\RF\L\Lian Teng\AP6575PEM6 (64)

Date: 2023-03-10



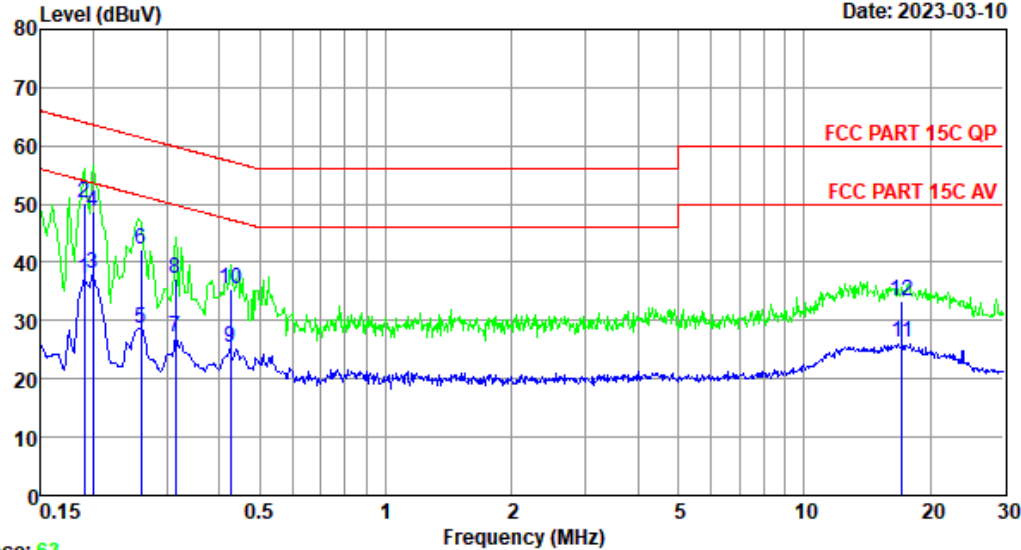
Trace: 61

Site no. : 2#CE Shield Room Data no. : 62  
 Env. / Ins. : Temp:22.8°C Humi:58% Press:101.30kPa. : NEUTRAL  
 Limit : FCC PART 15C QP  
 Engineer : XJF  
 EUT : Module  
 Power : AC 120V/60Hz  
 M/N : WXQ65NFC  
 Test Mode : TX Mode

|    | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.19           | 9.72                   | 9.77                  | 18.99             | 38.48                       | 54.24            | 15.76          | Average |
| 2  | 0.19           | 9.72                   | 9.77                  | 32.14             | 51.63                       | 64.24            | 12.61          | QP      |
| 3  | 0.21           | 9.78                   | 9.84                  | 10.88             | 30.50                       | 53.18            | 22.68          | Average |
| 4  | 0.21           | 9.78                   | 9.84                  | 17.54             | 37.16                       | 63.18            | 26.02          | QP      |
| 5  | 0.24           | 9.84                   | 9.92                  | 11.75             | 31.51                       | 52.26            | 20.75          | Average |
| 6  | 0.24           | 9.84                   | 9.92                  | 20.67             | 40.43                       | 62.26            | 21.83          | QP      |
| 7  | 0.25           | 9.84                   | 9.92                  | 10.11             | 29.87                       | 51.78            | 21.91          | Average |
| 8  | 0.25           | 9.84                   | 9.92                  | 23.47             | 43.23                       | 61.78            | 18.55          | QP      |
| 9  | 0.33           | 9.76                   | 9.92                  | 6.40              | 26.08                       | 49.44            | 23.36          | Average |
| 10 | 0.33           | 9.76                   | 9.92                  | 17.45             | 37.13                       | 59.44            | 22.31          | QP      |
| 11 | 16.66          | 10.14                  | 10.13                 | 5.97              | 26.24                       | 50.00            | 23.76          | Average |
| 12 | 16.66          | 10.14                  | 10.13                 | 10.57             | 30.84                       | 60.00            | 29.16          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
 2. Margin= Limit - Emission Level.  
 3. If the average limit is met when using a quasi-peak detector,  
 the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.

Data: 64                      File: \\EMC-CE-2\Test Data\2023\RF\L\Lian Teng\AP6575PEM6 (64)                      Date: 2023-03-10



Trace: 63  
Site no. : 2#CE Shield Room                      Data no. : 64  
Env. / Ins. : Temp:22.8°C Humi:58% Press:101.30kPa. : LINE  
Limit : FCC PART 15C QP  
Engineer : XJF  
EUT : Module  
Power : AC 120V/60Hz  
M/N : WXQ65NFC  
Test Mode : TX Mode

|    | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.19           | 9.84                   | 9.77                  | 17.48             | 37.09                       | 54.02            | 16.93          | Average |
| 2  | 0.19           | 9.84                   | 9.77                  | 30.54             | 50.15                       | 64.02            | 13.87          | QP      |
| 3  | 0.20           | 9.84                   | 9.77                  | 18.38             | 37.99                       | 53.62            | 15.63          | Average |
| 4  | 0.20           | 9.84                   | 9.77                  | 29.12             | 48.73                       | 63.62            | 14.89          | QP      |
| 5  | 0.26           | 9.73                   | 9.92                  | 9.05              | 28.70                       | 51.42            | 22.72          | Average |
| 6  | 0.26           | 9.73                   | 9.92                  | 22.46             | 42.11                       | 61.42            | 19.31          | QP      |
| 7  | 0.31           | 9.81                   | 9.92                  | 7.48              | 27.21                       | 49.84            | 22.63          | Average |
| 8  | 0.31           | 9.81                   | 9.92                  | 17.50             | 37.23                       | 59.84            | 22.61          | QP      |
| 9  | 0.43           | 9.85                   | 9.92                  | 5.63              | 25.40                       | 47.33            | 21.93          | Average |
| 10 | 0.43           | 9.85                   | 9.92                  | 15.70             | 35.47                       | 57.33            | 21.86          | QP      |
| 11 | 17.11          | 9.86                   | 10.13                 | 6.24              | 26.23                       | 50.00            | 23.77          | Average |
| 12 | 17.11          | 9.86                   | 10.13                 | 13.51             | 33.50                       | 60.00            | 26.50          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. If the average limit is met when using a quasi-peak detector,  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.

## 4. RADIATED EMISSION

### 4.1. Limit

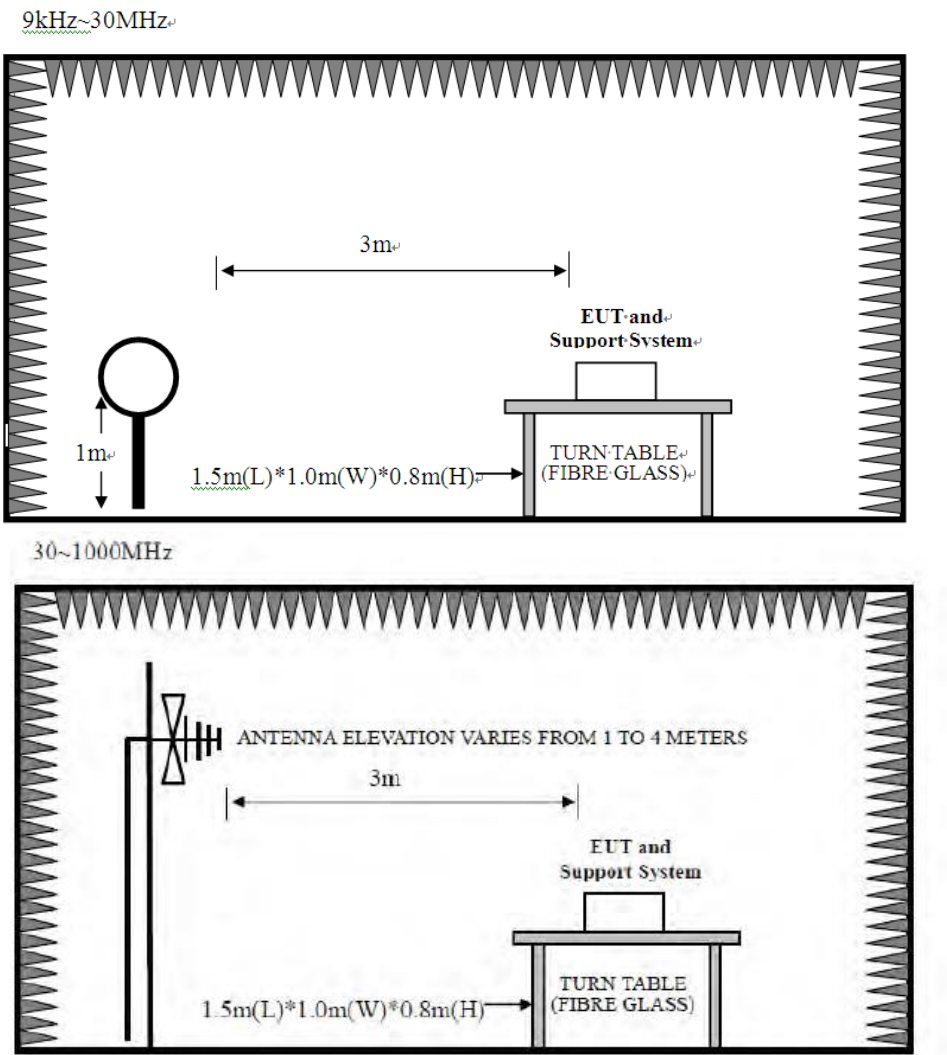
| Frequency (MHz) | Field Strength( $\mu\text{V/m}$ ) | Distance(m) |
|-----------------|-----------------------------------|-------------|
| 0.009~ 0.490    | 2400/F(KHz)                       | 300         |
| 0.490~ 1.705    | 24000/F(KHz)                      | 30          |
| 1.705~ 13.110   | 30                                | 30          |
| 13.110 ~ 13.410 | 106                               | 30          |
| 13.410 ~ 13.553 | 334                               | 30          |
| 13.553 ~13.567  | 15.848                            | 30          |
| 13.567 ~ 13.710 | 334                               | 30          |
| 13.710 ~14.010  | 106                               | 30          |
| 14.010~30       | 30                                | 30          |
| 30~ 88          | 100                               | 3           |
| 88~ 216         | 150                               | 3           |
| 216~ 960        | 200                               | 3           |
| Above 960       | 500                               | 3           |

Note:

1. Field Strength (dB  $\mu\text{V/m}$ ) =  $20 \times \log[\text{Field Strength } (\mu\text{V/m})]$ .
2. At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).  
For example: When measurement the frequencies form 13.553MHz to 13.567Mhz at 3m distance, the Limit show in below:

$$\text{Limit}(\text{dB } \mu\text{V/m})@3\text{m} = 20 \times \log(15,848)\text{dB } \mu\text{V/m} + 40 \times \log(30/3)\text{dB} = 124\text{dB } \mu\text{V/m}$$

4.2. Test Setup



### 4.3. Spectrum Analyzer Setting

For 9KHz-150KHz

| Spectrum Parameters | Setting                                 |
|---------------------|-----------------------------------------|
| RBW                 | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| VBW                 | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| Start frequency     | 9KHz                                    |
| Stop frequency      | 150KHz                                  |
| Sweep Time          | Auto                                    |
| Detector            | PEAK/QP/AVG                             |
| Trace Mode          | Max Hold                                |

For 150KHz-30MHz

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 9KHz     |
| VBW                 | 9KHz     |
| Start frequency     | 150KHz   |
| Stop frequency      | 30MHz    |
| Sweep Time          | Auto     |
| Detector            | QP       |
| Trace Mode          | Max Hold |

For 30MHz-1GHz

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 120KHz   |
| VBW                 | 300KHz   |
| Start frequency     | 30MHz    |
| Stop frequency      | 1GHz     |
| Sweep Time          | Auto     |
| Detector            | QP       |
| Trace Mode          | Max Hold |

### 4.4. Test Procedure

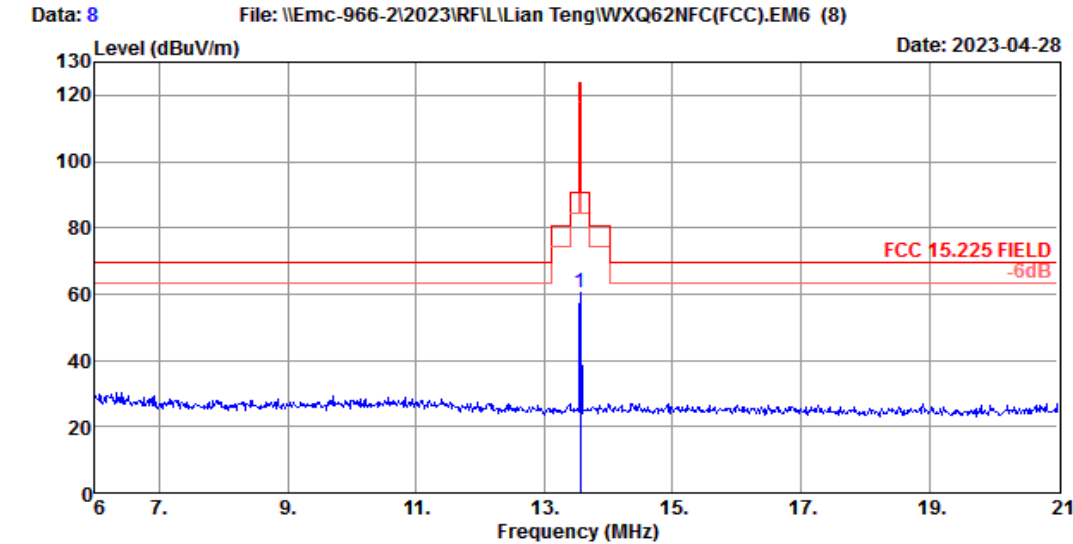
- EUT was placed on a turn table, which is 0.8 meter high above ground.
- EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
- Set the EUT transmit continuously with maximum output power.
- Spectrum analyzer setting parameters in accordance with section 4.3.
- The turn table can rotate 360 degrees to determine the position of the maximum emission level.
- For below 30MHz test, the center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates both horizontal and vertical polarization to find out the maximum emission level.
- For above 30MHz test, the antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
- Record the results in the test report.

4.5. Test Result

Field strength of fundamental

EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878



Site no. : 2# 966 chamber                      Data no. : 8  
Dis. / Ant. : 3m FMZB 1519B                      Ant. pol. : COAXIAL  
Limit : FCC 15.225 FIELD  
Env. / Ins. : Temp:20.6°C;Humi:48%;Press:101.52kPa  
Engineer : JBR  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

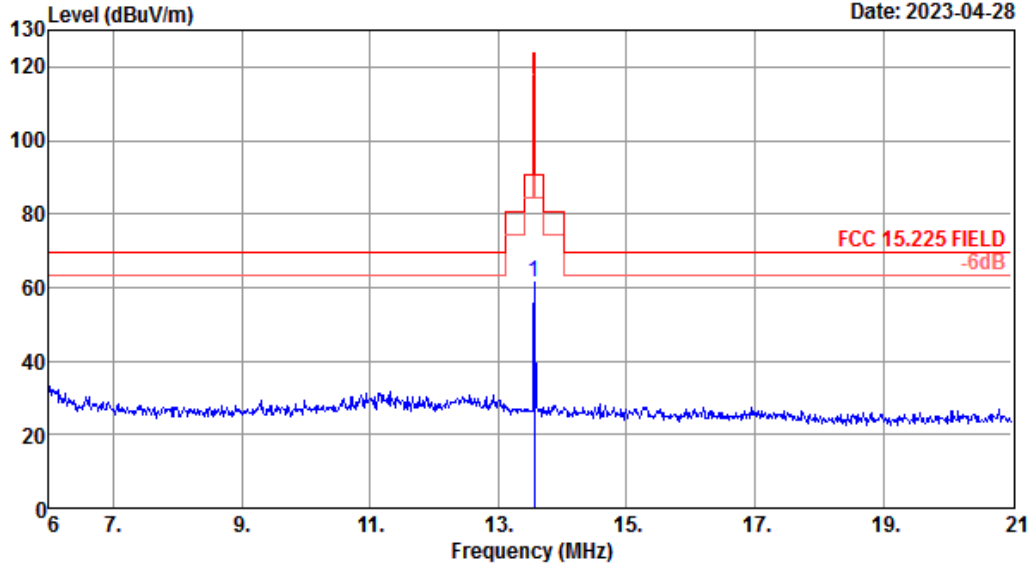
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 13.56          | 19.59                   | 0.15                  | 40.51             | 60.25                         | 124.00            | 63.75          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878

Data: 7                      File: \\Emc-966-2\\2023\\RFIL\\Lian Teng\\WXQ62NFC(FCC).EM6 (8)                      Date: 2023-04-28



Site no. : 2# 966 chamber                      Data no. : 7  
Dis. / Ant. : 3m FMZB 1519B                      Ant. pol. : COPLANAR  
Limit : FCC 15.225 FIELD  
Env. / Ins. : Temp:20.6℃;Humi:48%;Press:101.52kPa  
Engineer : JBR  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 13.56          | 19.59                   | 0.15                  | 41.67             | 61.41                         | 124.00            | 62.59          | Peak   |

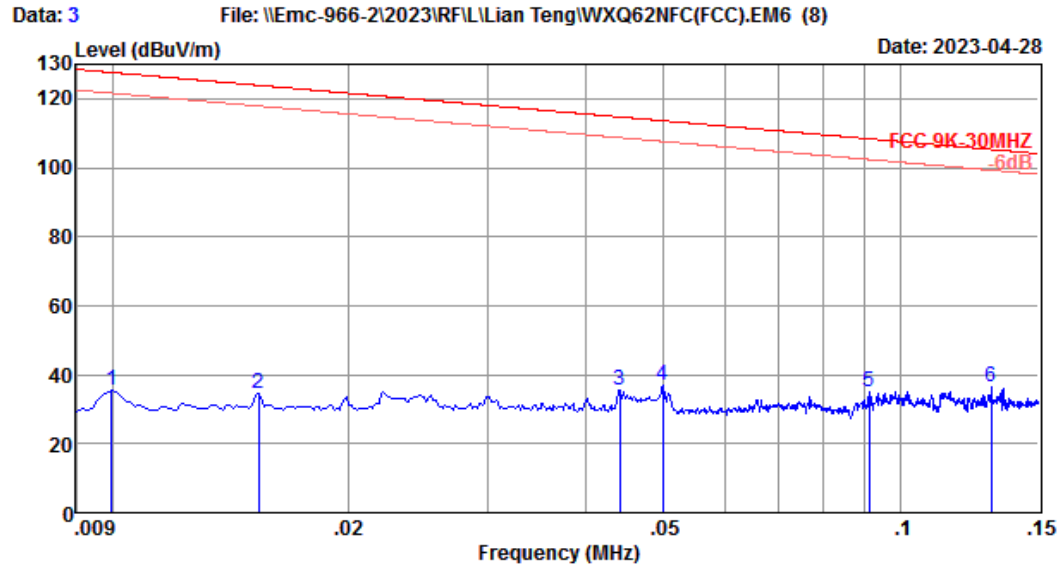
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



## Below 30MHz Spurious Emission

EST Technology

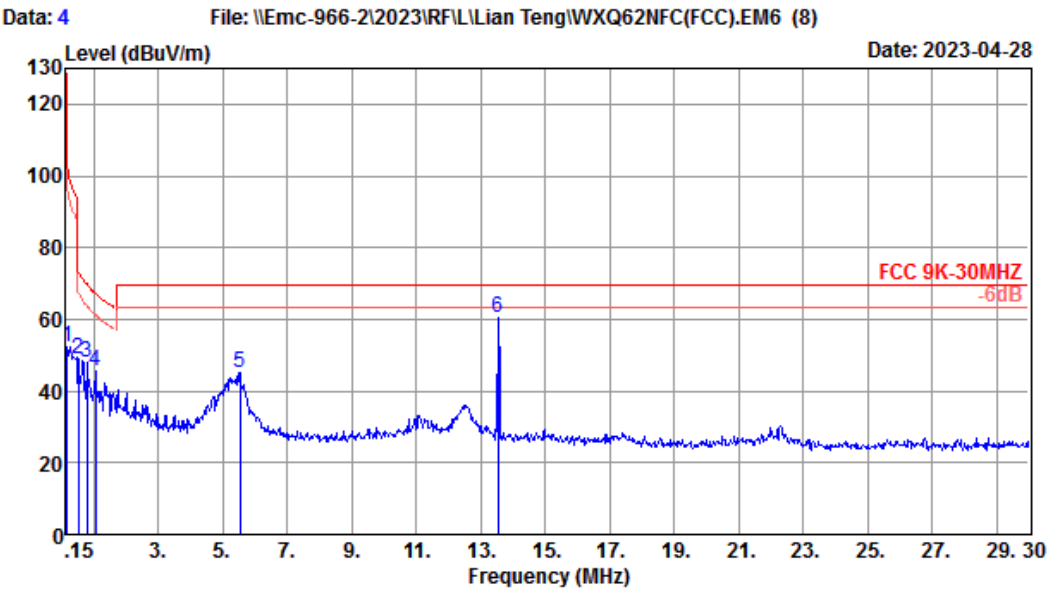
Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878



Site no. : 2# 966 chamber Data no. : 3  
Dis. / Ant. : 3m FMZB 1519B Ant. pol. : COPLANAR  
Limit : FCC 9K-30MHZ  
Env. / Ins. : Temp: 20.6°C; Humi: 48%; Press: 101.52kPa  
Engineer : JBR  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.01           | 20.60                   | 0.10                  | 14.83             | 35.53                         | 127.62            | 92.09          | Peak   |
| 2 | 0.02           | 20.60                   | 0.10                  | 13.99             | 34.69                         | 123.89            | 89.20          | Peak   |
| 3 | 0.04           | 20.60                   | 0.10                  | 14.92             | 35.62                         | 114.71            | 79.09          | Peak   |
| 4 | 0.05           | 20.60                   | 0.10                  | 16.26             | 36.96                         | 113.62            | 76.66          | Peak   |
| 5 | 0.09           | 20.70                   | 0.10                  | 14.44             | 35.24                         | 108.39            | 73.15          | Peak   |
| 6 | 0.13           | 20.40                   | 0.10                  | 15.72             | 36.22                         | 105.29            | 69.07          | Peak   |

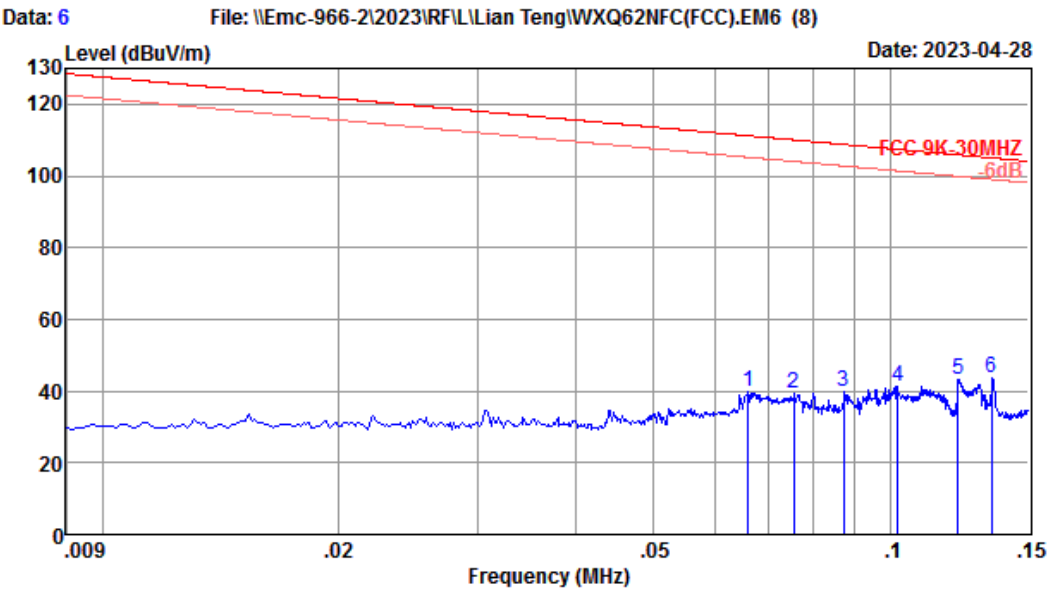
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



Site no. : 2# 966 chamber      Data no. : 4  
Dis. / Ant. : 3m FMZB 1519B      Ant. pol. : COPLANAR  
Limit : FCC 9K-30MHZ  
Env. / Ins. : Temp:20.6℃;Humi:48%;Press:101.52kPa  
Engineer : JBR  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.18           | 20.25                   | 0.10                  | 31.83             | 52.18                         | 102.51            | 50.33          | Peak   |
| 2 | 0.54           | 20.81                   | 0.10                  | 28.08             | 48.99                         | 72.99             | 24.00          | Peak   |
| 3 | 0.81           | 20.86                   | 0.10                  | 27.17             | 48.13                         | 69.47             | 21.34          | Peak   |
| 4 | 1.08           | 20.88                   | 0.10                  | 24.60             | 45.58                         | 66.97             | 21.39          | Peak   |
| 5 | 5.55           | 20.10                   | 0.12                  | 24.82             | 45.04                         | 69.54             | 24.50          | Peak   |
| 6 | 13.55          | 19.59                   | 0.15                  | 40.76             | 60.50                         | 69.54             | 9.04           | Peak   |

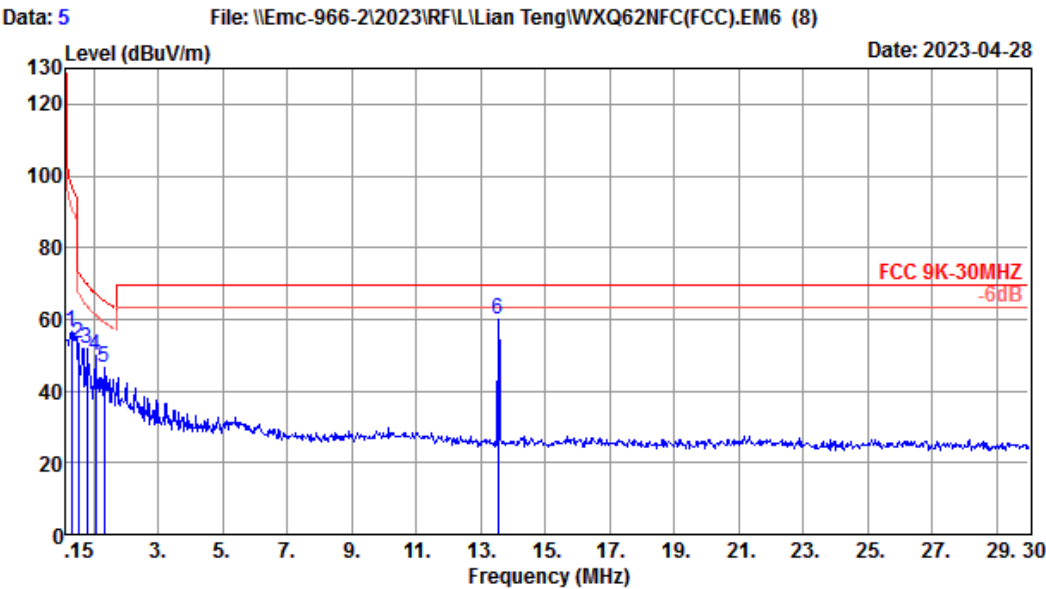
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



Site no. : 2# 966 chamber                      Data no. : 6  
Dis. / Ant. : 3m FMZB 1519B                      Ant. pol. : COAXIAL  
Limit : FCC 9K-30MHz  
Env. / Ins. : Temp:20.6℃;Humi:48%;Press:101.52kPa  
Engineer : JBR  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.07           | 20.20                   | 0.10                  | 19.39             | 39.69                         | 111.20            | 71.51          | Peak   |
| 2 | 0.08           | 20.20                   | 0.10                  | 19.07             | 39.37                         | 110.04            | 70.67          | Peak   |
| 3 | 0.09           | 20.70                   | 0.10                  | 18.99             | 39.79                         | 108.77            | 68.98          | Peak   |
| 4 | 0.10           | 20.70                   | 0.10                  | 20.39             | 41.19                         | 107.42            | 66.23          | Peak   |
| 5 | 0.12           | 20.40                   | 0.10                  | 22.79             | 43.29                         | 105.88            | 62.59          | Peak   |
| 6 | 0.13           | 20.40                   | 0.10                  | 23.18             | 43.68                         | 105.02            | 61.34          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



Site no. : 2# 966 chamber Data no. : 5  
Dis. / Ant. : 3m FMZB 1519B Ant. pol. : COAXIAL  
Limit : FCC 9K-30MHz  
Env. / Ins. : Temp:20.6°C;Humi:48%;Press:101.52kPa  
Engineer : JBR  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

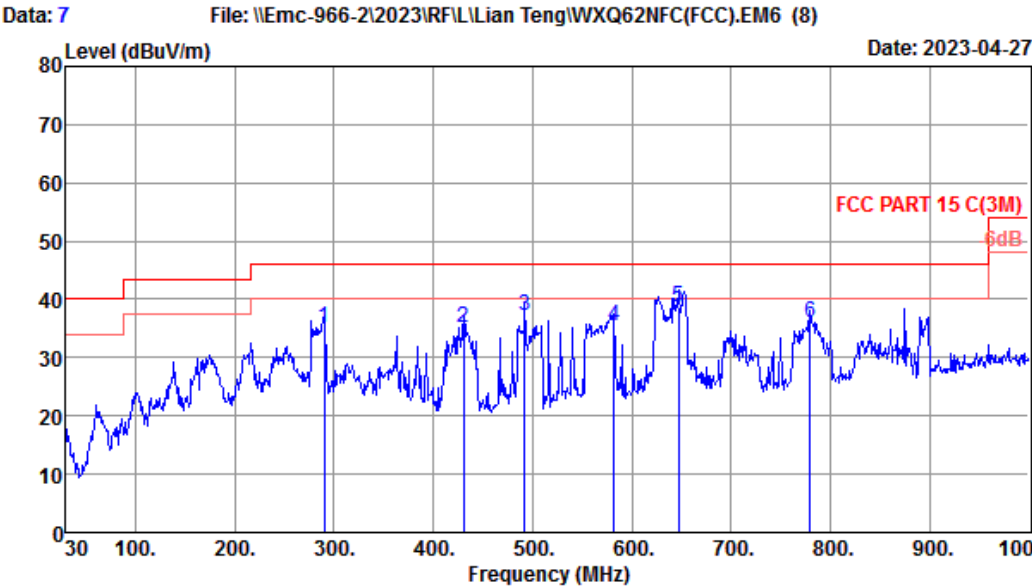
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.33           | 20.53                   | 0.10                  | 35.95             | 56.58                         | 97.26             | 40.68          | Peak   |
| 2 | 0.54           | 20.81                   | 0.10                  | 32.49             | 53.40                         | 73.37             | 19.97          | Peak   |
| 3 | 0.81           | 20.86                   | 0.10                  | 30.92             | 51.88                         | 70.98             | 19.10          | Peak   |
| 4 | 1.08           | 20.88                   | 0.10                  | 28.91             | 49.89                         | 68.58             | 18.69          | Peak   |
| 5 | 1.34           | 20.81                   | 0.10                  | 25.75             | 46.66                         | 66.19             | 19.53          | Peak   |
| 6 | 13.55          | 19.59                   | 0.15                  | 40.18             | 59.92                         | 70.00             | 10.08          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.

Above 30MHz Spurious Emission

EST Technology

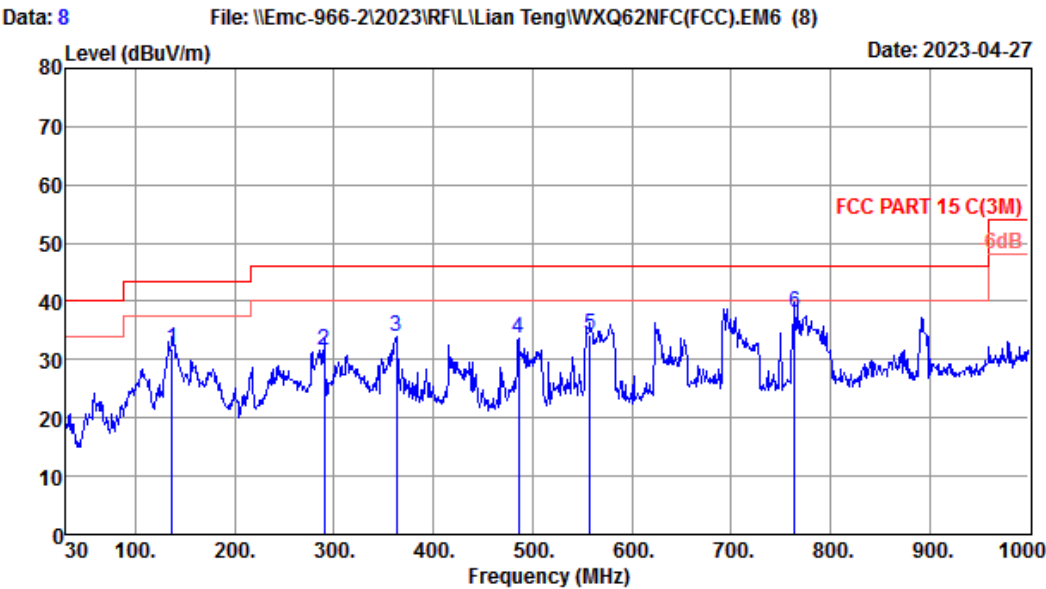
Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878



Site no. : 2# 966 chamber Data no. : 7  
Dis. / Ant. : 3m 47018 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15 C(3M)  
Env. / Ins. : Temp:24.6℃;Humi:50%;Press:101.52kPa  
Engineer : Blank  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 289.96         | 13.60                   | 1.58                  | 19.93             | 35.11                         | 46.00             | 10.89          | QP     |
| 2 | 430.61         | 16.91                   | 1.99                  | 16.19             | 35.09                         | 46.00             | 10.91          | QP     |
| 3 | 491.72         | 18.14                   | 2.27                  | 16.71             | 37.12                         | 46.00             | 8.88           | QP     |
| 4 | 581.93         | 20.02                   | 2.50                  | 12.98             | 35.50                         | 46.00             | 10.50          | QP     |
| 5 | 646.92         | 21.18                   | 2.71                  | 14.81             | 38.70                         | 46.00             | 7.30           | QP     |
| 6 | 779.81         | 22.90                   | 2.96                  | 10.22             | 36.08                         | 46.00             | 9.92           | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



Site no. : 2# 966 chamber                      Data no. : 8  
Dis. / Ant. : 3m 47018                      Ant. pol. : VERTICAL  
Limit : FCC PART 15 C(3M)  
Env. / Ins. : Temp:24.6°C;Humi:50%;Press:101.52kPa  
Engineer : Blank  
EUT : Module  
Power : DC 3.3V  
M/N : WXQ65NFC  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 136.70         | 12.20                   | 0.93                  | 18.74             | 31.87                         | 43.50             | 11.63          | QP     |
| 2 | 289.96         | 13.60                   | 1.58                  | 16.37             | 31.55                         | 46.00             | 14.45          | QP     |
| 3 | 362.71         | 15.65                   | 1.87                  | 16.38             | 33.90                         | 46.00             | 12.10          | QP     |
| 4 | 485.90         | 17.62                   | 2.26                  | 13.66             | 33.54                         | 46.00             | 12.46          | QP     |
| 5 | 557.68         | 19.68                   | 2.44                  | 12.22             | 34.34                         | 46.00             | 11.66          | QP     |
| 6 | 764.29         | 22.56                   | 2.99                  | 12.44             | 37.99                         | 46.00             | 8.01           | QP     |

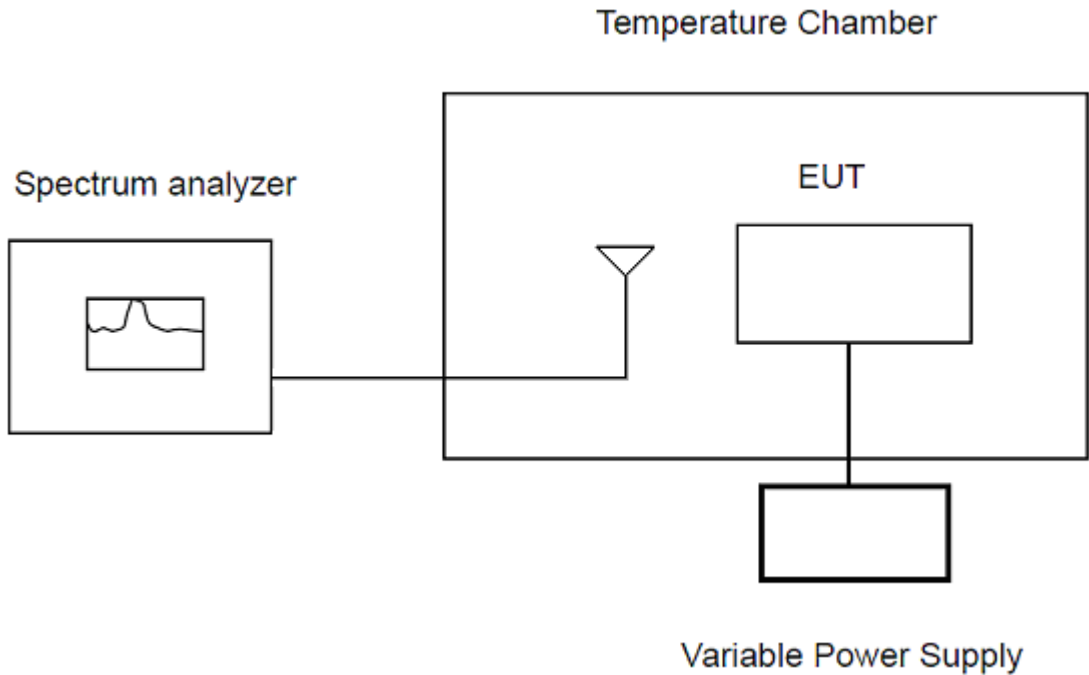
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.

5. FREQUENCY TOLERANCE

5.1. Limit

The devices operating in the 13.553-13.567 MHz shall maintain the carrier frequency within 0.01% of the operating frequency over the temperature variation of -20 °C to +50 °C using an environmental chamber. The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

5.2. Test Setup



5.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 10KHz    |
| VBW                 | 10KHz    |
| Span                | 50KHz    |
| Sweep Time          | Auto     |
| Detector            | PEAK     |
| Trace Mode          | Max Hold |

## 5.4. Test Procedure

### **For measurement frequency stability under temperature variation :**

- a. Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT.
- b. Turn the EUT OFF and place it inside the environmental temperature chamber.
- c. The spectrum analyzer connected a receive antenna and place near the EUT.
- d. Spectrum analyzer setting parameters in accordance with section 5.3.
- e. Set the temperature control on the chamber to the Specified temperature and allow the oscillator heater and the chamber temperature to stabilize.
- f. Turn the EUT ON with the rated voltage, and the EUT transmit continuously with maximum output power.
- g. Record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized.
- h. Repeat step d through step g to measured the temperature form  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  in  $10^{\circ}\text{C}$  steps.

### **For frequency stability under voltage variation:**

- a. Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT.
- b. Turn the EUT OFF and place it inside the environmental temperature chamber.
- c. The spectrum analyzer connected a receive antenna and place near the EUT.
- d. Spectrum analyzer setting parameters in accordance with section 5.3.
- e. Unless otherwise specified, set the temperature control on the chamber to the ambient room temperature ( $+15^{\circ}\text{C}$  to  $+25^{\circ}\text{C}$ ) and allow the oscillator heater and the chamber temperature to stabilize.
- f. Turn the EUT ON with the rated voltage, and the EUT transmit continuously with maximum output power.
- g. Record the operating frequency.
- h. Repeat step d through step g to measured the varied from 85% to 115% of the rated voltage.

## 5.5. Test Result

| Frequency Stability Under Temperature Variation |             |                  |                |                         |                         |           |             |
|-------------------------------------------------|-------------|------------------|----------------|-------------------------|-------------------------|-----------|-------------|
| Declared Frequency (MHz)                        | Voltage (V) | Temperature (°C) | Time (minutes) | Measurement Value (MHz) | Frequency Deviation (%) | Limit (%) | Test Result |
| 13.56                                           | 3           | 50               | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5599015              | -0.0007264              | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | 40               | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | 30               | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | 20               | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | 10               | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | 0                | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | -10              | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 10             | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             | -20              | 0              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 2              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |
|                                                 |             |                  | 5              | 13.5606015              | 0.0044358               | ±0.01     | PASS        |

|  |  |  |    |            |           |       |      |
|--|--|--|----|------------|-----------|-------|------|
|  |  |  | 10 | 13.5606015 | 0.0044358 | ±0.01 | PASS |
|--|--|--|----|------------|-----------|-------|------|

Note:Frequency Deviation(%)=[(Measurement Value- Declared Frequency)/ Declared Frequency]\*100%.

| Frequency Stability Under Voltage Variation |                  |             |                         |                     |           |             |
|---------------------------------------------|------------------|-------------|-------------------------|---------------------|-----------|-------------|
| Frequency (MHz)                             | Temperature (°C) | Voltage (V) | Measurement Value (MHz) | Frequency Error (%) | Limit (%) | Test Result |
| 13.56                                       | 25               | 3.00        | 13.5606015              | 0.0044358           | ±0.01     | PASS        |
|                                             |                  | 3.45        | 13.5606015              | 0.0044358           | ±0.01     | PASS        |
|                                             |                  | 2.55        | 13.5599015              | -0.0007264          | ±0.01     | PASS        |

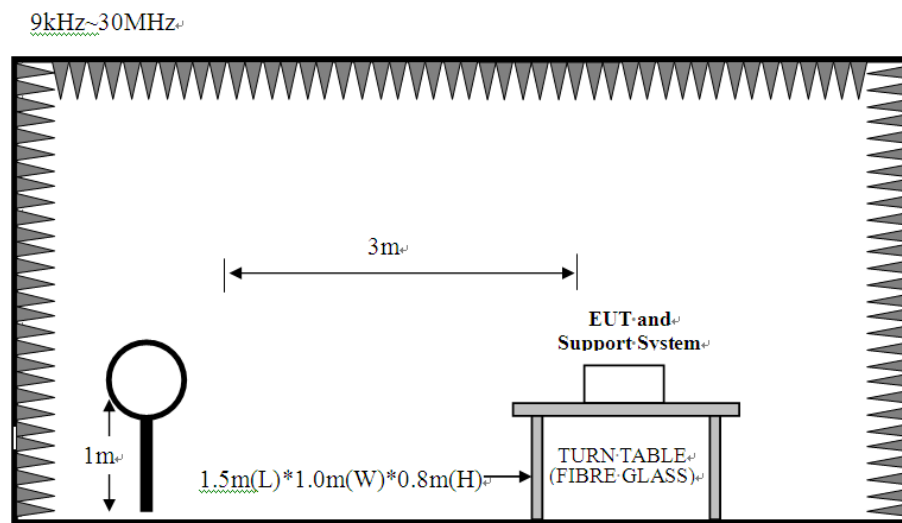
Note:Frequency Deviation(%)=[(Measurement Value- Declared Frequency)/ Declared Frequency]\*100%.

## 6. 20dB BANDWIDTH&99% OCCUPIED BANDWIDTH

### 6.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §13.553-13.567 MHz and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### 6.2. Test Setup



### 6.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting                          |
|---------------------|----------------------------------|
| RBW                 | 10KHz                            |
| VBW                 | 30KHz                            |
| Span                | two times and five times the OBW |
| Sweep Time          | Auto                             |
| Detector            | Peak                             |
| Trace Mode          | Max Hold                         |

## 6.4. Test Procedure

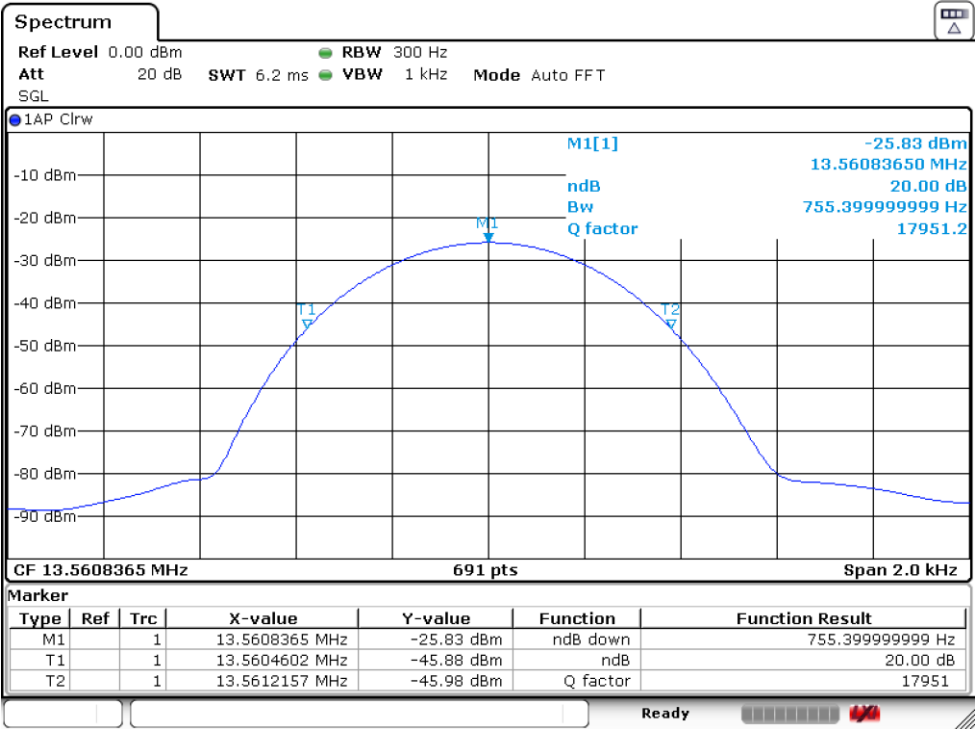
- a. EUT was placed on a turn table, which is 0.8 meter high above ground
- b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
- c. Set the EUT transmit continuously with maximum output power.
- d. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
- e. Spectrum analyzer setting parameters in accordance with section 6.3.
- f. Allow the trace to stabilize, Set the spectrum analyzer marker to the highest level of the displayed trace, use the 99% power bandwidth function to measure 99% occupied bandwidth, and use mark-delta function measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.
- g. Record the the value of 99% occupied bandwidth and 20 dB bandwidth.

## 6.5. Test Result

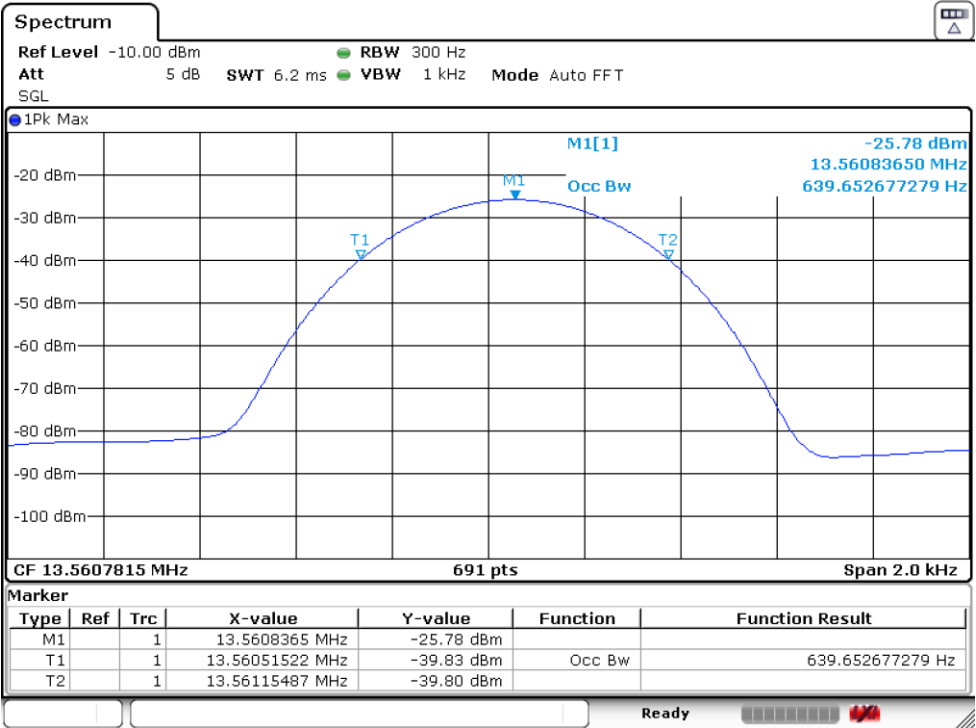
|                    |                         |                                 |                                   |             |
|--------------------|-------------------------|---------------------------------|-----------------------------------|-------------|
| Temperature        | 24.2℃                   | Relative Humidity               | 54%                               |             |
| Test Voltage       | DC 3.3V                 |                                 |                                   |             |
| Frequency<br>(MHz) | 20dB Bandwidth<br>(KHz) | 99% Occupied Bandwidth<br>(KHz) | 20 dB Bandwidth<br>Limit<br>(KHz) | Test Result |
| 13.56              | 0.75540                 | 0.63965                         | ≤11.2                             | PASS        |

Note :For NFC devices,the permitted band is 13.553MHz-13.567MHz,the bandwidth is 14KHz,so the Limit=14KHz×80%=11.2KHz.

20dB Bandwidth



99% Occupied Bandwidth



## 7. ANTENNA REQUIREMENTS

### 7.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 7.2. Test Result

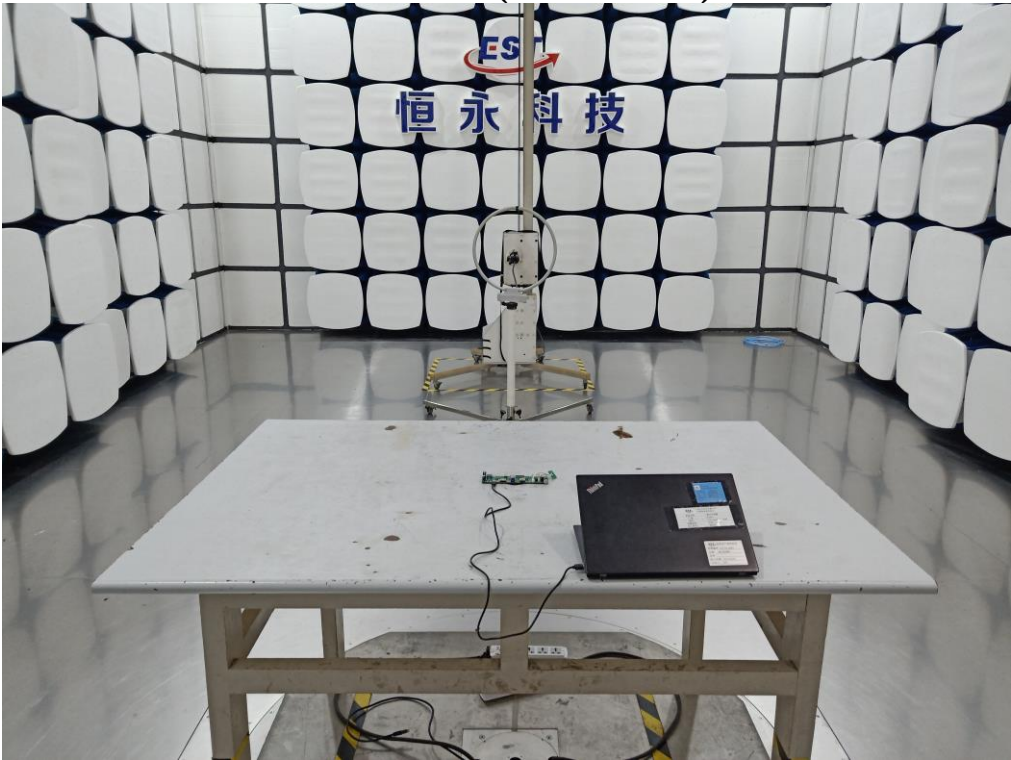
The antennas used for this product is internal antenna, so compliance with antenna requirements.  
( Please refer to the EUT photo for details)

## 8. TEST SETUP PHOTO

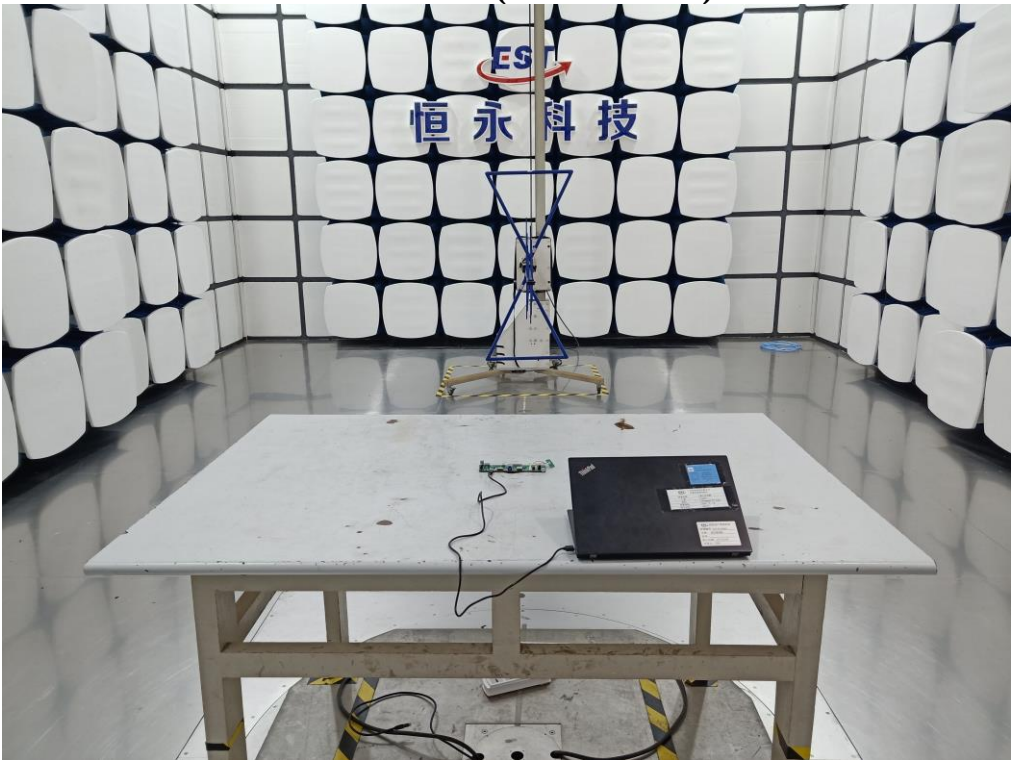
Conducted Emissions Test



Radiated Test (Below 30MHz)

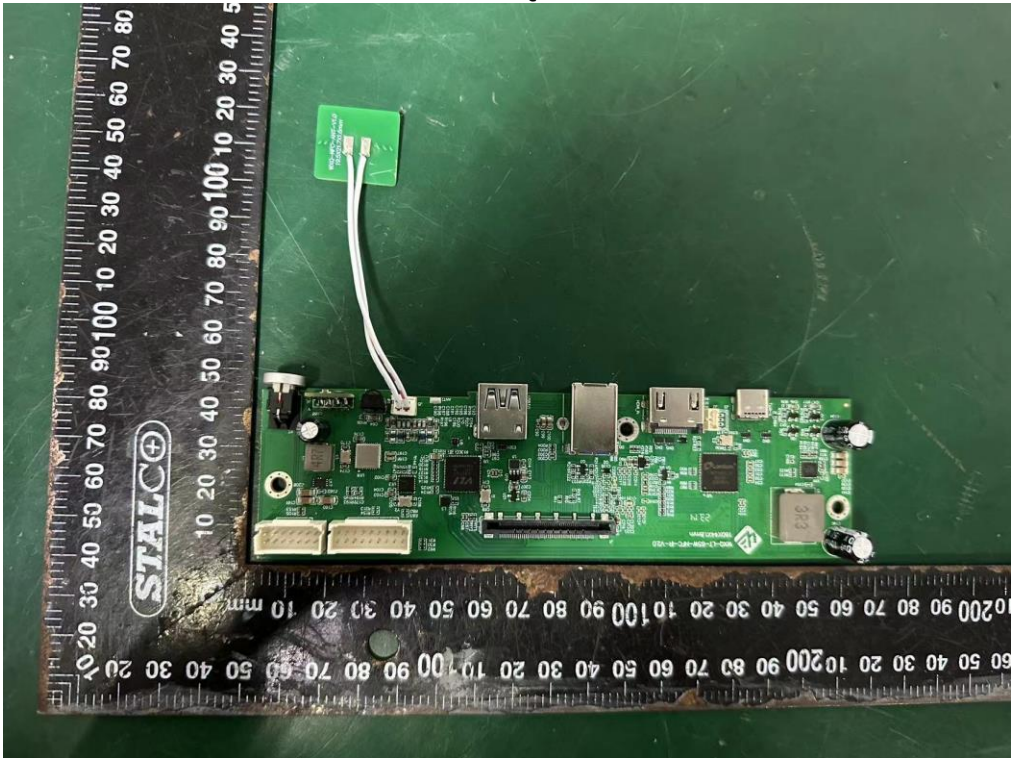


Radiated Test (Above 30MHz)

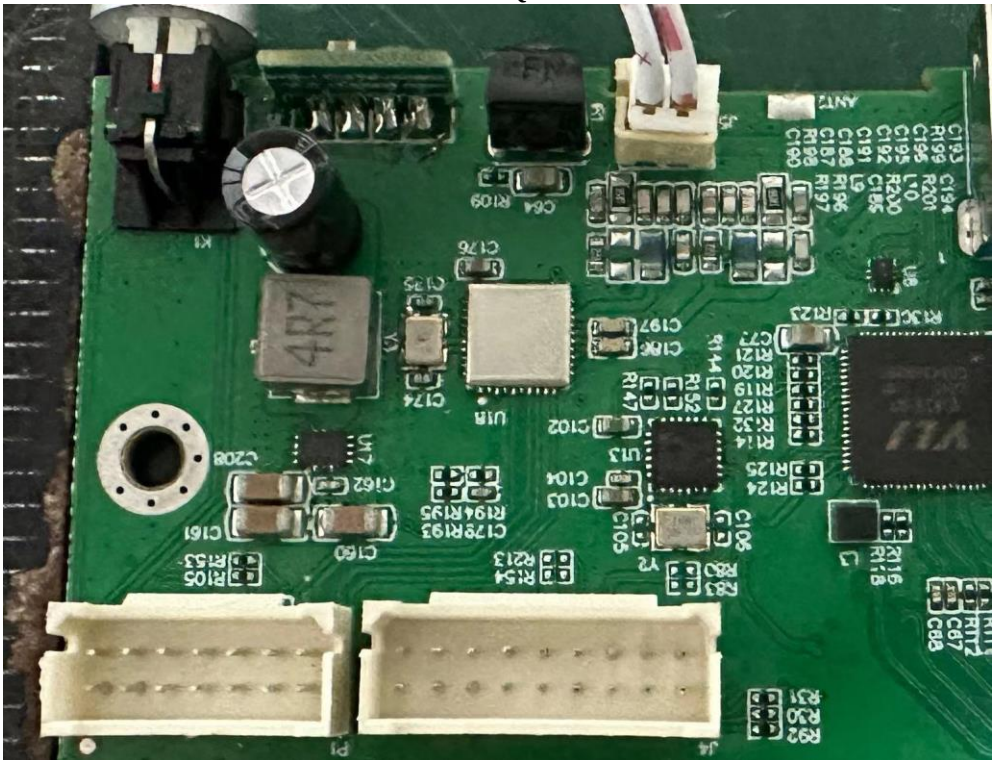


9. EUT PHOTO

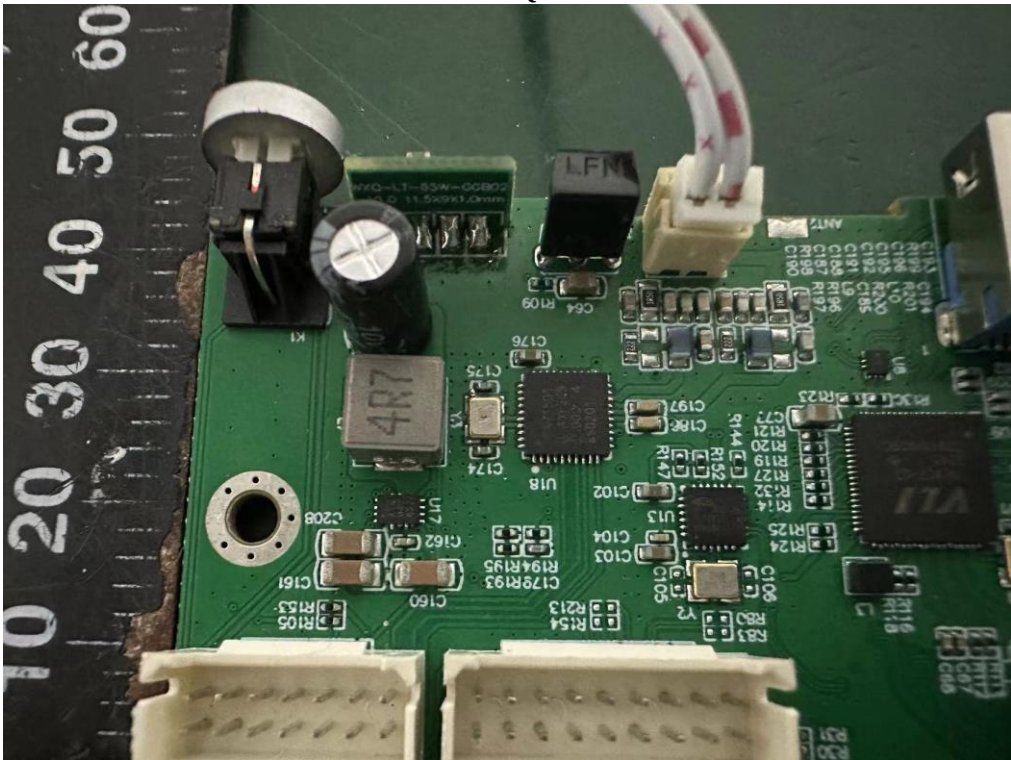
External Photos  
M/N: WXQ65NFC



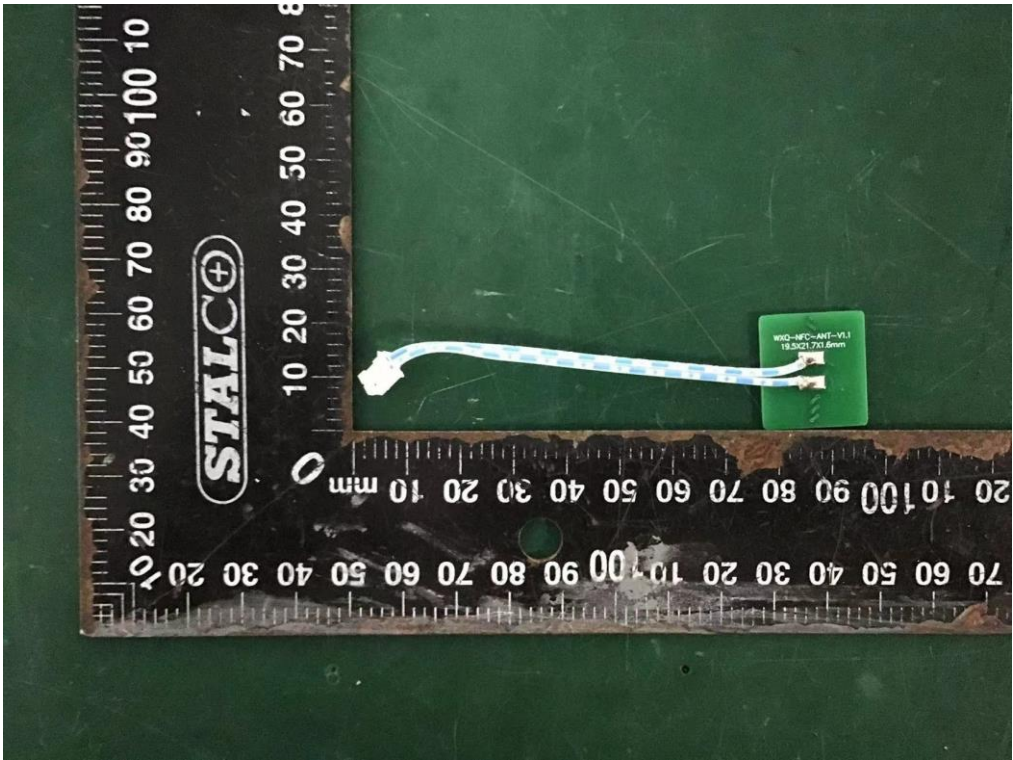
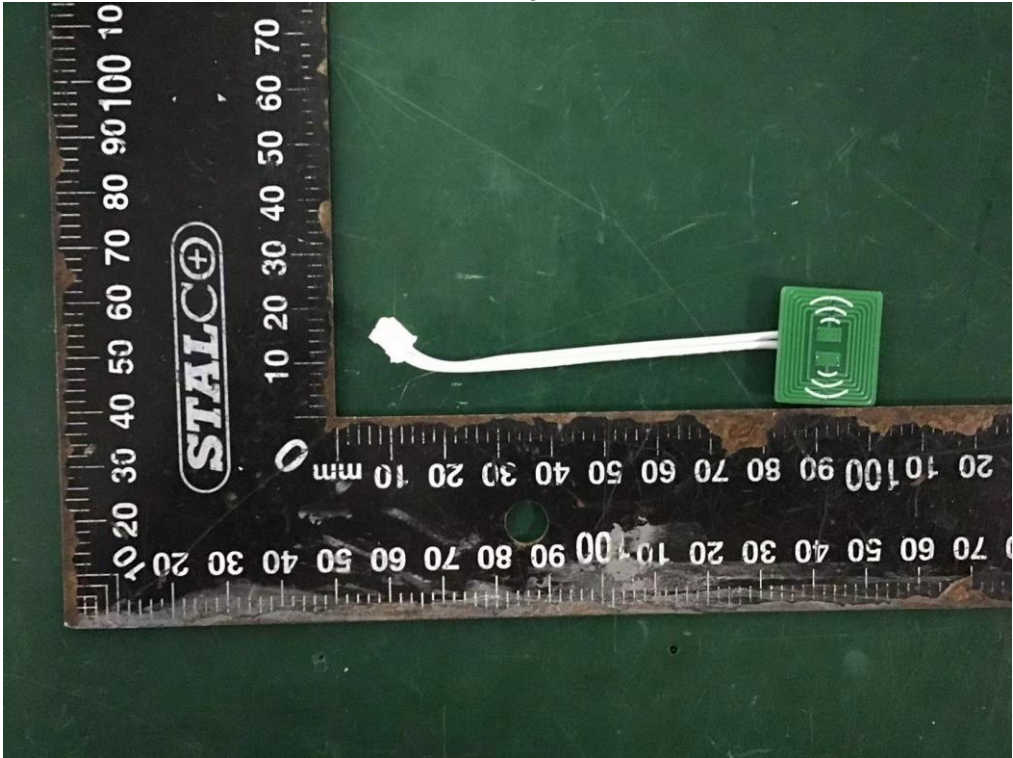
External Photos  
M/N: WXQ65NFC



Internal Photos  
M/N: WXQ65NFC



Internal Photos  
M/N: WXQ65NFC



End of Test Report