ACCREDITED
CERTIFICATE #5473.01

Test Report No.:
GJW2023-6450-RF

# TEST REPORT

| | | |
|---|---|---|
| **FCC ID** | : | 2BCXO-C6AM |
| **Applicant** | : | XCharge Energy USA Inc |
| **Product Name** | : | DC Electric Vehicle Charging Station |
| **Model No.** | : | C6AM150JC; C6AM150CC; C6AM150CO; C6AM120JC; C6AM120CC; C6AM120CO; C6AM90JC; C6AM90CC; C6AM90CO; C6AM60JC; C6AM60CC; C6AM60CO. |

## CVC Testing Technology Co., Ltd.

| | |
|---|---|
| **Applicant** | **Name:** XCharge Energy USA Inc<br>**Address:** 326 N LBJ Dr, Suite 173, San Marcos, TX 78666 United States |
| **Manufacturer** | **Name:** XCharge Energy USA Inc<br>**Address:** 326 N LBJ Dr, Suite 173, San Marcos, TX 78666 United States |
| **Equipment Under Test** | **Product Name :** DC Electric Vehicle Charging Station<br>**Model No. :** C6AM150JC, C6AM90JC<br>**Trade mark : /**<br>**Serial no. :/**<br>**Sampling :2-1, 2-2** |

| | | | |
|---|---|---|---|
| **Date of Receipt.** | 2022.09.20 | **Date of Testing** | 2022.10.10 |

| **Test Specification** | **Test Result** |
|---|---|
| FCC Part 15 Subpart C<br>10-1-2021 Edition | PASS |
| Evaluation of Test Result | The equipment under test was found to comply with the requirements of the standards applied.<br>**Seal of CVC**<br>**Issue Date: 2023.11.17** |

| Approved by: | Reviewed by: | Tested by: |
|---|---|---|
| **Chen HuaWen** | **Xu Zhenfei** | **Lu Weiji** |

**Other Aspects: NONE.**

Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested

# TABLE OF CONTENTS

# 1. General Product Information

## 1.1 General information

| | |
|---|---|
| Product: | DC Electric Vehicle Charging Station |
| Model no.: | C6AM150JC; C6AM150CC; C6AM150CO; C6AM120JC; C6AM120CC; C6AM120CO; C6AM90JC; C6AM90CC; C6AM90CO; C6AM60JC; C6AM60CC; C6AM60CO. |
| FCC ID: | 2BCXO-C6AM |
| Options and accessories: | N/A |
| Rating: | DC 5V (for RF module) |
| Rated input Current: | Max.200A for “C6AM150“ series and “C6AM120“ series<br>Max.300A for “C6AM90“ series and “C6AM60“ series |
| Rated output voltage: | CCS1 connector: 200VDC-1000VDC<br>CHAdeMO connector: 200VDC-500VDC |
| Rated output Current: | CCS1 connector: Max. 250A<br>CHAdeMO connector: Max. 125A |
| Rated input Current: | Max.200A for “C6AM150“ series and “C6AM120“ series<br>Max.300A for “C6AM90“ series and “C6AM60“ series |
| RF Transmission Frequency: | 13.56MHz |
| Modulation: | ASK |
| Antenna Type: | Integrate antenna |
| Description of the EUT: | EUT is a DC Electric Vehicle Charging Station with IC card reader, it can be grouped with other modules to act as a DC Charging station<br>The products contains an approved LTE module, FCC ID: 2APNR-GM500U1A.<br>The LTE module supports LTE: Band 2, Band 4, Band 5 and Band 12. |

# 2. Test Sites

## 2.1 Test Facilities

The tests and measurements refer to this report were performed by RF testing Lab. of CVC Testing Technology Co., Ltd.

Add.: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou,Guangdong,510663, People's Republic of China

Telephone : +86-20-32293888

Fax : +86-20-32293889

FCC Registration Number: 0029680543

FCC firm designation number: CN1282

## 2.2 Description of Non-standard Method and Deviations

The testing and measurement methods used in this report are applied by all standard methods. Not any non-standard method or deviation from the used standards was used.

## 2.3 List of Test and Measurement Instruments

Refer to **10.Test Equipment List**.

# 3. Summary of Test Standards

| Test Standards | |
|---|---|
| FCC Part 15 Subpart C<br>10-1-2021 Edition | PART 15 - RADIO FREQUENCY DEVICES<br>Subpart C - Intentional Radiators |

All the test methods were according to ANSI C63.10 (2013).

# 4. Summary of measurement results

| **Technical Requirements** | | | | |
|---|---|---|---|---|
| Test Condition | | Pages | Test Site | Test Result |
| FCC Rules | Test Item | 13 | 1 | P |
| §15.207 | Conducted emission AC power port | | | |
| §15.225(a), (b), (c), (d), 15.209, 15.205 | Filed Strength Measurement | 22 | 1 | P |
| §15.225 (e) | Frequency Stability | 36 | 1 | P |
| §15.215(c) | Occupied Bandwidth | 37 | 1 | P |
| Note : The EUT uses a PCB integrated. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section. | | | | |

Note 1: N/A=Not Applicable.

# 5. General Remarks

This submittal(s) (test report) is intended for FCC ID: 2BCXO-C6AM, complies with Section 15.207, 15.209, 15.215, 15.225 of the FCC Part 15 Subpart C 10-1-2021 Edition.

C6AM series DC charger has multiple models, power modules work simultaneously and evenly distribute the output power. Due to the variance in technical and customer requirements, there are differences which may reflect in the maximum output power, the installed connectors. Below shows the detail difference between each of them. The rest components that do not mentioned remain the same.

Rated output power for each C6 series charger:

| Model | Input Voltage | Power Module (QTY) | Connector1 (kW) | Connector2 (kW) |
|---|---|---|---|---|
| C6AM150JC | 480V | 5 | 65 (CHAdeMO) | 150 (CCS1) |
| C6AM150CC | 480V | 5 | 150 (CCS1) | 150 (CCS1) |
| C6AM150CO | 480V | 5 | 150 (CCS1) | N/A |
| C6AM120JC | 480V | 4 | 65(CHAdeMO) | 120 (CCS1) |
| C6AM120CC | 480V | 4 | 120 (CCS1) | 120 (CCS1) |
| C6AM120CO | 480V | 4 | 120 (CCS1) | N/A |
| C6AM90JC | 208V | 5 | 65(CHAdeMO) | 95 (CCS1) |
| C6AM90CC | 208V | 5 | 95 (CCS1) | 95 (CCS1) |
| C6AM90CO | 208V | 5 | 95 (CCS1) | N/A |
| C6AM60JC | 208V | 4 | 60(CHAdeMO) | 60 (CCS1) |
| C6AM60CC | 208V | 4 | 60 (CCS1) | 60 (CCS1) |
| C6AM60CO | 208V | 4 | 60 (CCS1) | N/A |

For C6AM150JC model (dual connectors), require 480V input voltage. It has 5 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 160A (RS306-1-S5P-160A1250V-D). Two WDR-120-12 power switch(480V) and one WDR 480-48 power switch(480V). One Ex9C400 set coil that used for 277V.

Connector 1 (CHAdeMO connector) has a maximum output power of 60kw, connector 2 (standard CCS1 connector) has a maximum output power of 150kw.

For C6AM150CC model (dual connectors), require 480V input voltage. It has 5 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 250A (RS306-01-S5P-250A). Two WDR-120-12 power switch(480V) and one WDR 480-48 power switch(480V). One Ex9C400 set coil that used for 277V.

Connector 1 (standard CCS1 connector) has a maximum output power of 150kw, connector 2 (standard CCS1 connector) has a maximum output power of 150kw.

For C6AM150CO model (single connector), require 480V input voltage. It has 5 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A). Two WDR-120-12 power switch(480V) and one WDR 480-48 power switch(480V). One Ex9C400 set coil that used for 277V.

Connector (standard CCS1 connector) has a maximum output power of 150kw.

For C6AM120JC model (dual connectors), require 480V input voltage. It has 4 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 160A (RS306-1-S5P-160A1250V-D). Two WDR-120-12 power switch(480V) and one WDR 480-48 power switch(480V). One Ex9C400 set coil that used for 277V.

Connector 1 (CHAdeMO connector) has a maximum output power of 60kw, connector 2 (standard CCS1 connector) has a maximum output power of 120kw.

For C6AM120CC model (dual connectors), require 480V input voltage. It has 4 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 250A (RS306-01-S5P-250A). Two WDR-120-12 power switch(480V) and one WDR 480-48 power switch(480V). One Ex9C400 set coil that used for 277V.

Connector 1 (standard CCS1 connector) has a maximum output power of 120kw, connector 2 (standard CCS1 connector) has a maximum output power of 120kw.

For C6AM120CO model (single connector), require 480V input voltage. It has 4 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A). Two WDR-120-12 power switch(480V) and one WDR 480-48 power switch(480V). One Ex9C400 set coil that used for 277V.

Connector (standard CCS1 connector) has a maximum output power of 120kw.

For C6AM90JC model (dual connectors), require 208V input voltage. It has 5 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 160A (RS306-1-S5P-160A1250V-D). Two NDR-120-12 power switch(208V) and one NDR 480-48 power switch(208V). One Ex9C400 set coil that used for 208V.

Connector 1 (CHAdeMO connector) has a maximum output power of 60kw, connector 2 (the standard CCS1 connector) has a maximum output power of 95kw.

For C6AM90CC model (dual connectors), require 208V input voltage. It has 5 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 250A (RS306-01-S5P-250A). Two NDR-120-12 power switch(208V) and one NDR 480-48 power switch(208V). One Ex9C400 set coil that used for 208V.

Connector 1 (standard CCS1 connector) has a maximum output power of 95kw, connector 2 (standard CCS1 connector) has a maximum output power of 95kw.

For C6AM90CO model (single connector), require 208V input voltage. It has 5 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A). Two NDR-120-12 power switch(208V) and one NDR 480-48 power switch(208V). One Ex9C400 set coil that used for 208V.

Connector (standard CCS1 connector) has a maximum output power of 95kw.

For C6AM60JC model, require 208V input voltage. It has 4 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 160A (RS306-1-S5P-160A1250V-D). Two NDR-120-12 power switch(208V) and one NDR 480-48 power switch(208V). One Ex9C400 set coil that used for 208V.

Connector 1 (CHAdeMO connector) has a maximum output power of 60kw, connector 2 (standard CCS1 connector) has a maximum output power of 60kw.

For C6AM60CC model, require 208V input voltage. It has 4 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A), DC fuse 2 breaks at 250A (RS306-01-S5P-250A). Two NDR-120-12 power switch(208V) and one NDR 480-48 power switch(208V). One Ex9C400 set coil that used for 208V.

Connector 1 (standard CCS1 connector) has a maximum output power of 60kw, connector 2 (standard CCS1 connector) has a maximum output power of 60kw.

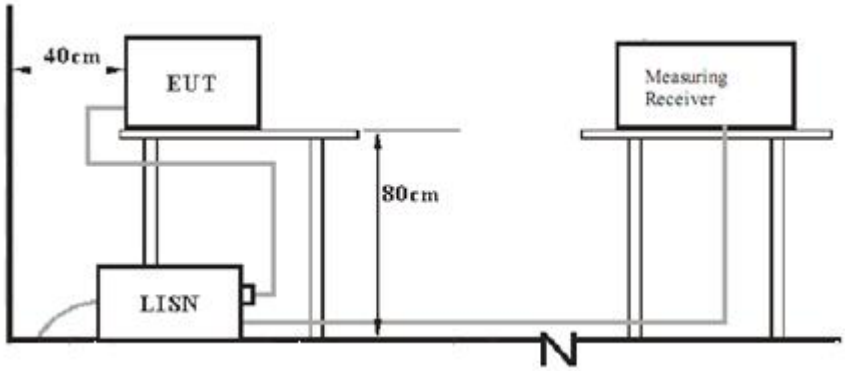
For C6AM60CO model (single connector), require 208V input voltage. It has 4 power modules (UR100030-SW), DC fuse 1 breaks at 250A (RS306-01-S5P-250A). Two NDR-120-12 power switch(208V) and one NDR 480-48 power switch(208V). One Ex9C400 set coil that used for 208V.

Connector (standard CCS1 connector) has a maximum output power of 60kw.

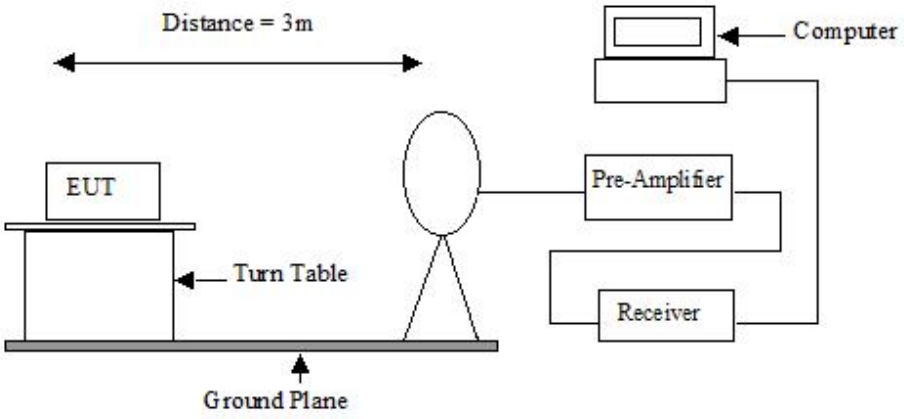
EMC parts, tests have been applied on C6AM150JC and C6AM90JC.

# 6. Test Setups

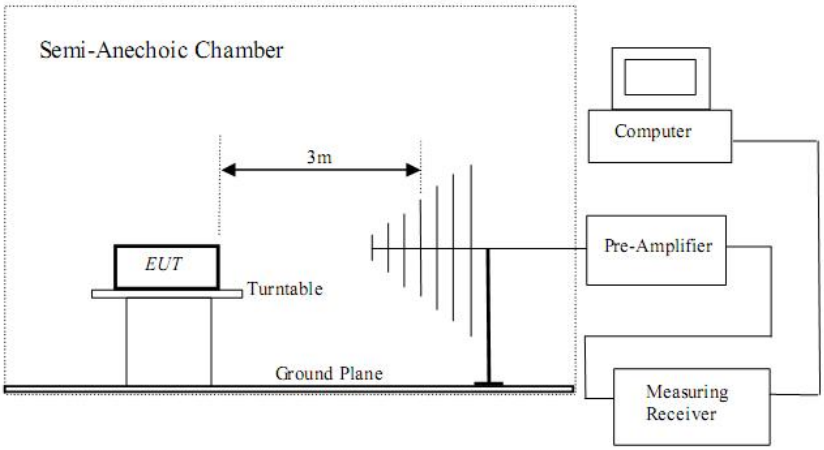
## 6.1 AC Power Line Conducted Emission test setups




## 6.2 Radiated test setups

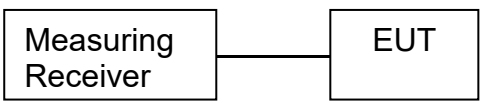



(For 9KHz-30MHz)




(For 30MHz-1GHz)

## 6.3 Conducted RF test setups



# 7. Test Methodology

## 7.1 Conducted Emission

The EUT was placed on a table, which is 0.8m above ground plane, the power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
Maximum procedure was performed to ensure EUT compliance, A EMI test receiver is used to test the emissions from both sides of AC line.

## 7.2 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, considered typical configuration, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules.

## 7.3 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

FS = R + System Factor
System Factor = AF + CF + FA – PA

Where FS = Net Field Strength in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer / Test Receiver in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

# 8. Systems test configuration

Auxiliary Equipment Used during Test:

| DESCRIPTION | MODEL NO. | MANUFACTURER |
|---|---|---|
| Resistance load | 200KW | KAPTOP |

Remark: All the auxiliary equipment are used to make this “DC Electric Vehicle Charging Station” works as its representative configuration for conducted emission test.

# 9. Technical Requirement

## 9.1 Conducted Emission Measurement

Test Requirement: FCC part 15 section 15.207

Limits of 15.207:

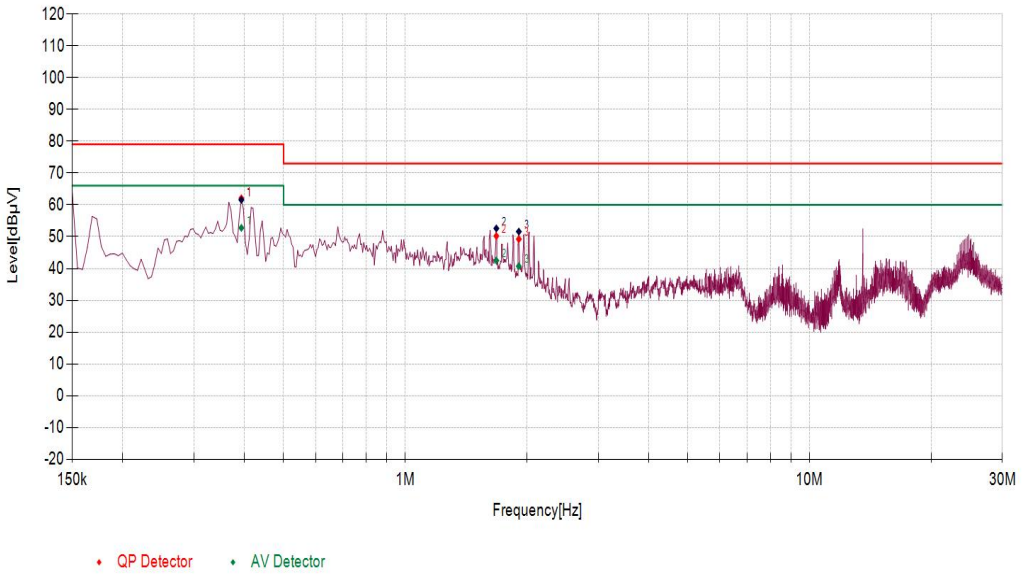
| Frequency (MHz) | Conducted limit(dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 79 | 66 |
| 0.5-5 | 73 | 60 |
| 5-30 | 73 | 60 |

* Decreases with the logarithm of the frequency.

Test Method: ANSI C63.10:2013
Test Date: 2022-10-10
Mode of Operation: Test EUT in a representative configuration that can read card.
Detector Function Quasi-peak and Average

Test data:

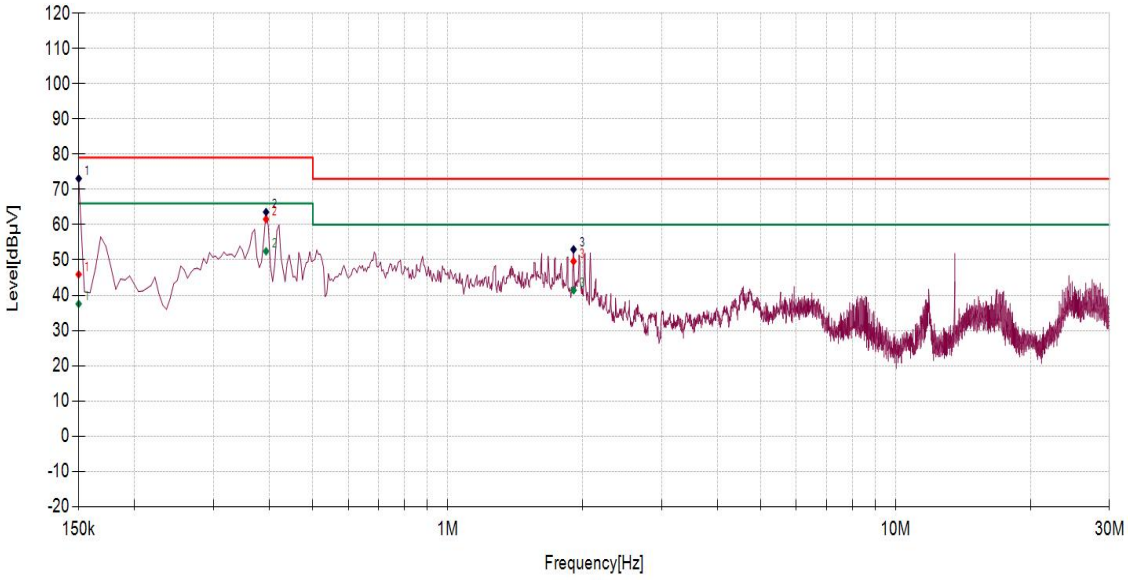
Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.3930 | 10.02 | 62.07 | 79.00 | 16.93 | 52.78 | 66.00 | 13.22 | PASS |
| 1.6800 | 10.12 | 50.21 | 73.00 | 22.79 | 42.49 | 60.00 | 17.51 | PASS |
| 1.9095 | 10.13 | 49.23 | 73.00 | 23.77 | 40.73 | 60.00 | 19.27 | PASS |

| | | |
|---|---|---|
| Test mode | : | C6AM90JC |
| Operating Mode | : | Test EUT in a representative configuration with reading card. (Supply voltage: AC 208V) |
| Conduct Line/Port | : | L1 |
| Test By | : | Carlos chen |
| Test Date | : | 2022-09-30 |

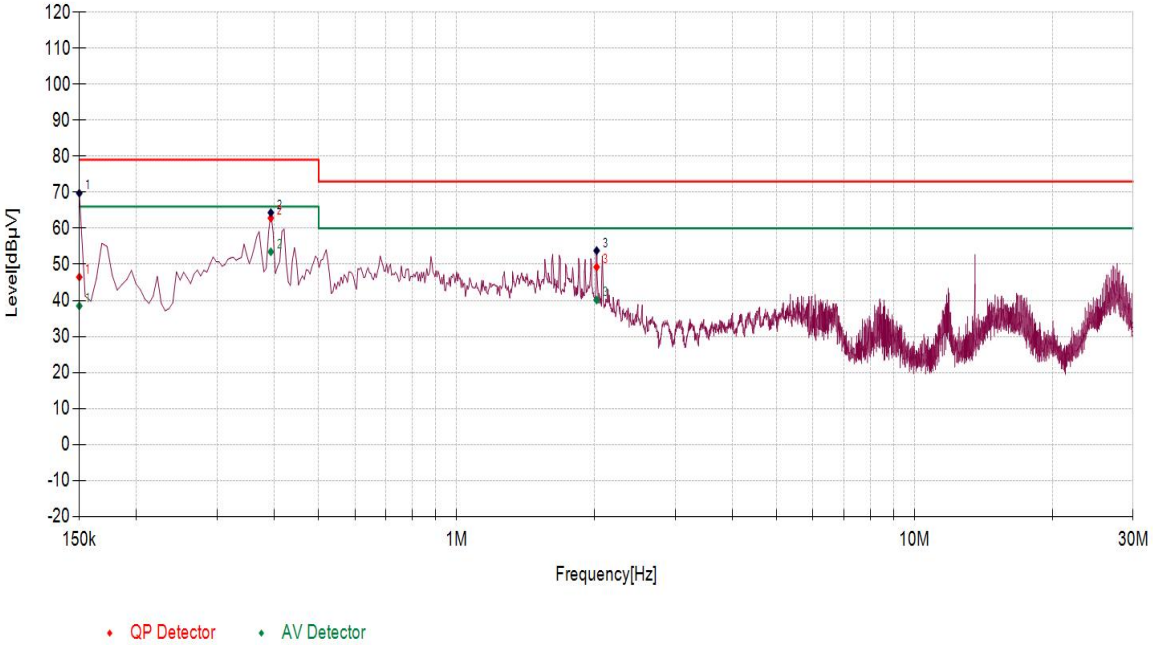
## Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.1500 | 10.07 | 45.90 | 79.00 | 33.10 | 37.53 | 66.00 | 28.47 | PASS |
| 0.3930 | 10.08 | 61.57 | 79.00 | 17.43 | 52.46 | 66.00 | 13.54 | PASS |
| 1.9095 | 10.20 | 49.60 | 73.00 | 23.40 | 41.41 | 60.00 | 18.59 | PASS |

Test mode : C6AM90JC
Operating Mode : Test EUT in a representative configuration with reading card. (Supply voltage: AC 208V)
Conduct Line/Port : L2 (Supply voltage: AC 208V)
Test By : Carlos chen
Test Date : 2022-09-30

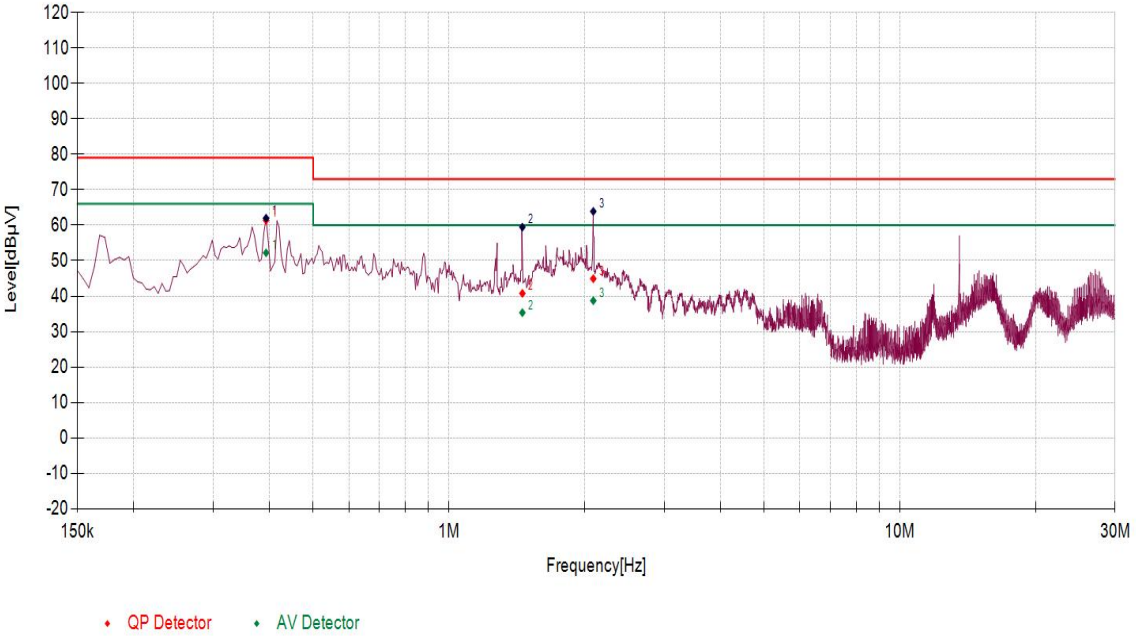
## Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.1500 | 10.09 | 46.48 | 79.00 | 32.52 | 38.47 | 66.00 | 27.53 | PASS |
| 0.3930 | 10.11 | 62.87 | 79.00 | 16.13 | 53.48 | 66.00 | 12.52 | PASS |
| 2.0220 | 10.21 | 49.25 | 73.00 | 23.75 | 40.10 | 60.00 | 19.90 | PASS |

| | | |
|---|---|---|
| Test mode | : | C6AM90JC |
| Operating Mode | : | Test EUT in a representative configuration with reading card. (Supply voltage: AC 208V) |
| Conduct Line/Port | : | L3 |
| Test By | : | Carlos chen |
| Test Date | : | 2022-09-30 |

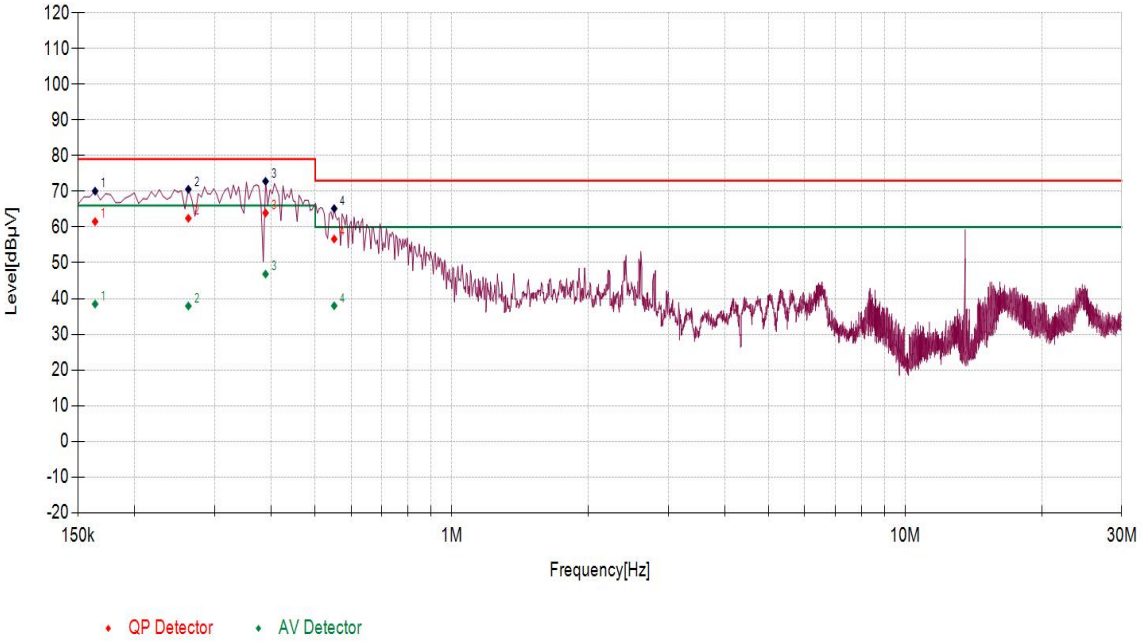
## Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.3930 | 9.99 | 61.39 | 79.00 | 17.61 | 52.20 | 66.00 | 13.80 | PASS |
| 1.4550 | 10.08 | 40.77 | 73.00 | 32.23 | 35.33 | 60.00 | 24.67 | PASS |
| 2.0895 | 10.12 | 44.91 | 73.00 | 28.09 | 38.71 | 60.00 | 21.29 | PASS |

Test mode : C6AM90JC
Operating Mode : Test EUT in a representative configuration with reading card. (Supply voltage: AC 208V)
Conduct Line/Port : N
Test By : Carlos chen
Test Date : 2022-09-30

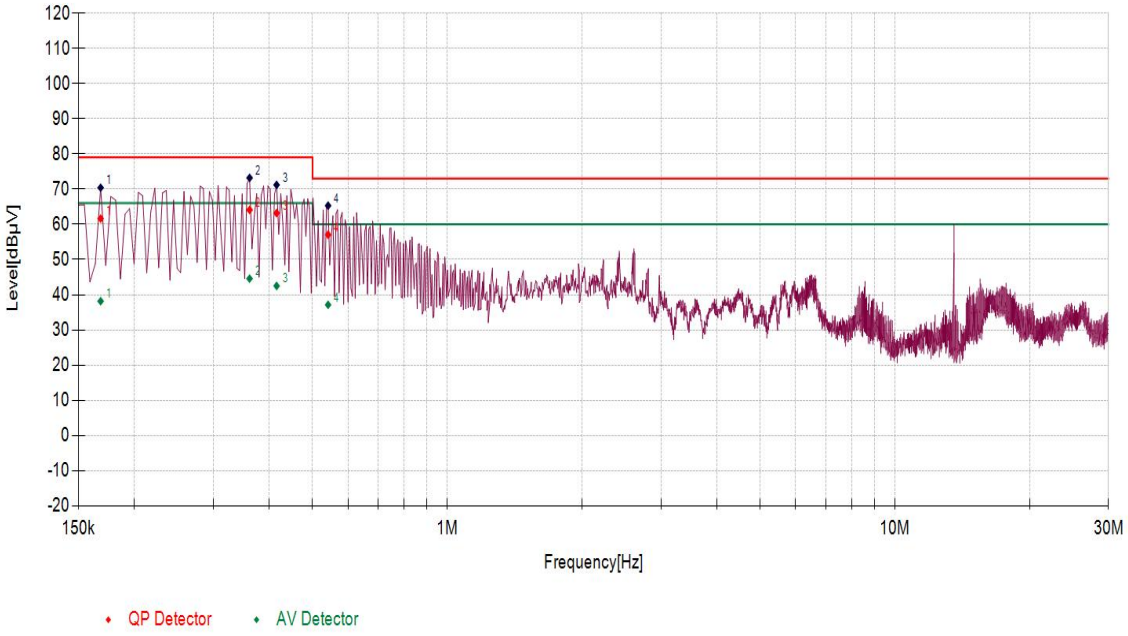
## Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.1635 | 10.02 | 61.53 | 79.00 | 17.47 | 38.44 | 66.00 | 27.56 | PASS |
| 0.2625 | 10.02 | 62.46 | 79.00 | 16.54 | 37.91 | 66.00 | 28.09 | PASS |
| 0.3885 | 10.02 | 63.95 | 79.00 | 15.05 | 46.83 | 66.00 | 19.17 | PASS |
| 0.5505 | 10.04 | 56.66 | 73.00 | 16.34 | 37.96 | 60.00 | 22.04 | PASS |

Test mode : C6AM150JC
Operating Mode : Test EUT in a representative configuration with reading card. (Supply voltage: AC 480V)
Conduct Line/Port : L1
Test By : Carlos chen
Test Date : 2022-10-10

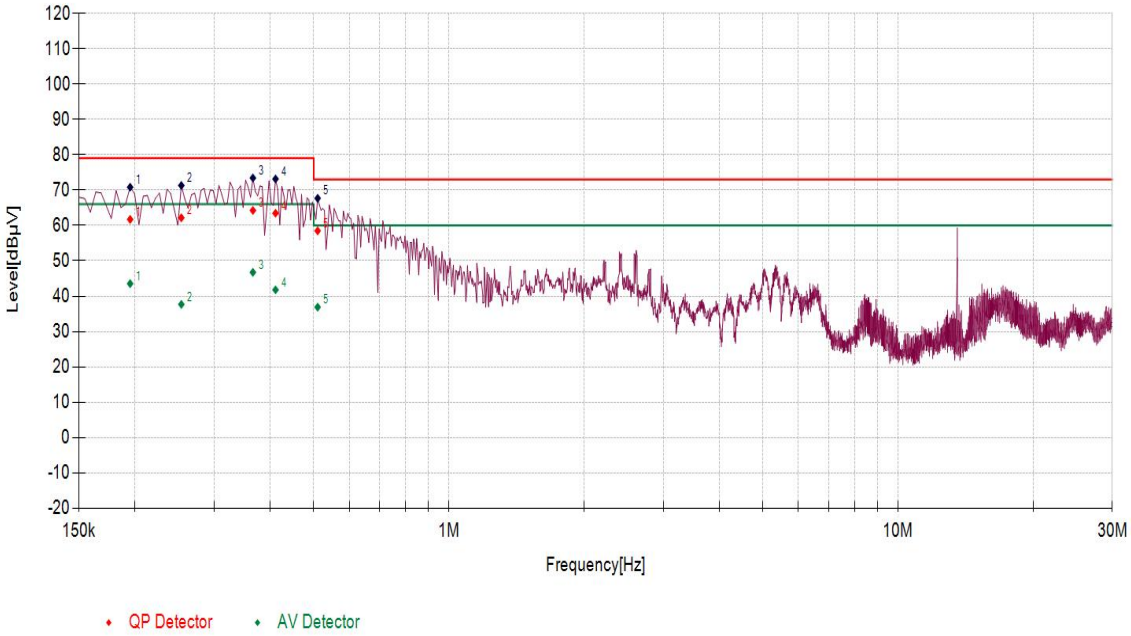
## Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.1680 | 10.07 | 61.63 | 79.00 | 17.37 | 38.16 | 66.00 | 27.84 | PASS |
| 0.3615 | 10.08 | 64.10 | 79.00 | 14.90 | 44.58 | 66.00 | 21.42 | PASS |
| 0.4155 | 10.08 | 63.20 | 79.00 | 15.80 | 42.50 | 66.00 | 23.50 | PASS |
| 0.5415 | 10.10 | 57.04 | 73.00 | 15.96 | 37.13 | 60.00 | 22.87 | PASS |

Test mode : C6AM150JC
Operating Mode : Test EUT in a representative configuration with reading card. (Supply voltage: AC 480V)
Conduct Line/Port : L2
Test By : Carlos chen
Test Date : 2022-10-10

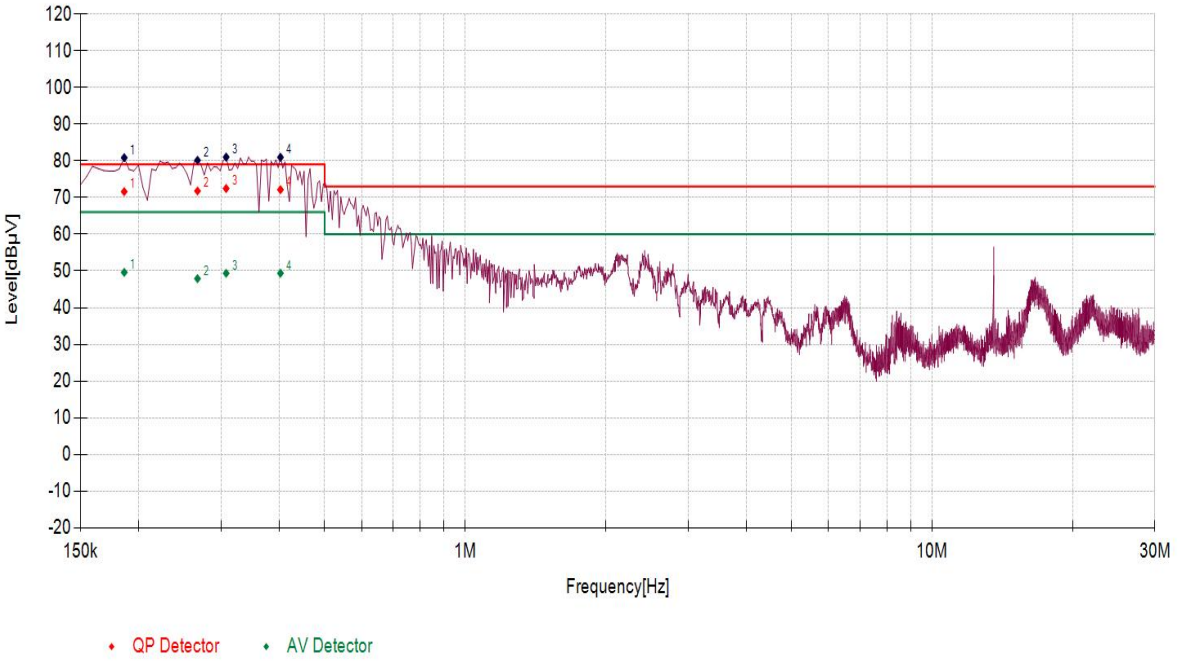
## Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.1950 | 10.10 | 61.71 | 79.00 | 17.29 | 43.54 | 66.00 | 22.46 | PASS |
| 0.2535 | 10.10 | 62.17 | 79.00 | 16.83 | 37.68 | 66.00 | 28.32 | PASS |
| 0.3660 | 10.11 | 64.25 | 79.00 | 14.75 | 46.73 | 66.00 | 19.27 | PASS |
| 0.4110 | 10.11 | 63.47 | 79.00 | 15.53 | 41.78 | 66.00 | 24.22 | PASS |
| 0.5100 | 10.11 | 58.48 | 73.00 | 14.52 | 36.89 | 60.00 | 23.11 | PASS |

| | | |
|---|---|---|
| Test mode | : | C6AM150JC |
| Operating Mode | : | Test EUT in a representative configuration with reading card. (Supply voltage: AC 480V) |
| Conduct Line/Port | : | L3 |
| Test By | : | Carlos chen |
| Test Date | : | 2022-10-10 |

Conducted emission




| Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 0.1860 | 9.99 | 71.62 | 79.00 | 7.38 | 49.61 | 66.00 | 16.39 | PASS |
| 0.2670 | 9.98 | 71.79 | 79.00 | 7.21 | 47.90 | 66.00 | 18.10 | PASS |
| 0.3075 | 9.99 | 72.46 | 79.00 | 6.54 | 49.36 | 66.00 | 16.64 | PASS |
| 0.4020 | 9.99 | 72.14 | 79.00 | 6.86 | 49.37 | 66.00 | 16.63 | PASS |

| | | |
|---|---|---|
| Test mode | : | C6AM150JC |
| Operating Mode | : | Test EUT in a representative configuration with reading card. (Supply voltage: AC 480V) |
| Conduct Line/Port | : | N |
| Test By | : | Carlos chen |
| Test Date | : | 2022-10-10 |

**Test result: PASS**

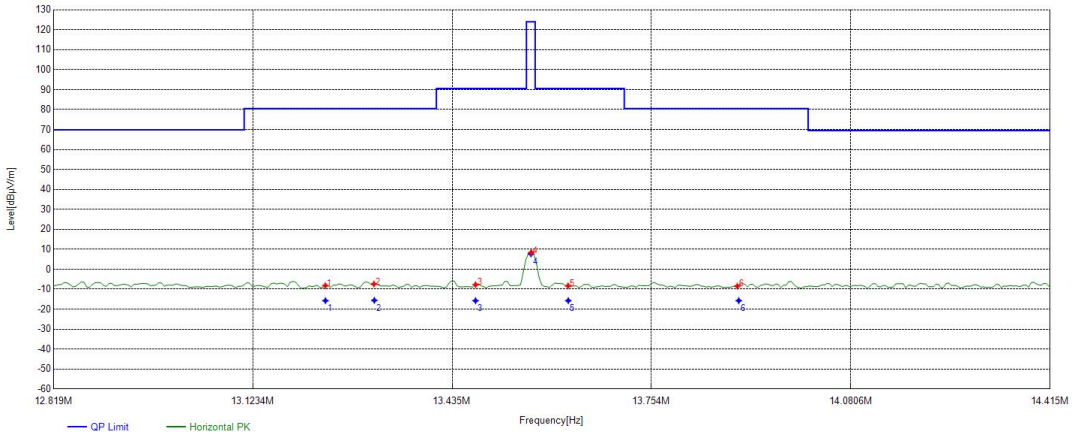
# 9.2 Field strength of Fundamental Emission Measurement

Test Requirement: FCC part 15 section 15.225 (a),(b),(c),(d), 15.205
(A) ANSI C63.10-2013 - Section 11.12.2.3 (quasi-peak measurements)The specifications for measurements using the CISPR quasi-peak detector can be found in CISPR 16-1-1. As an alternative to CISPR quasi-peak measurement, compliance can be determined for the applicable emission requirements using a peak detector

Limits of 15.209:

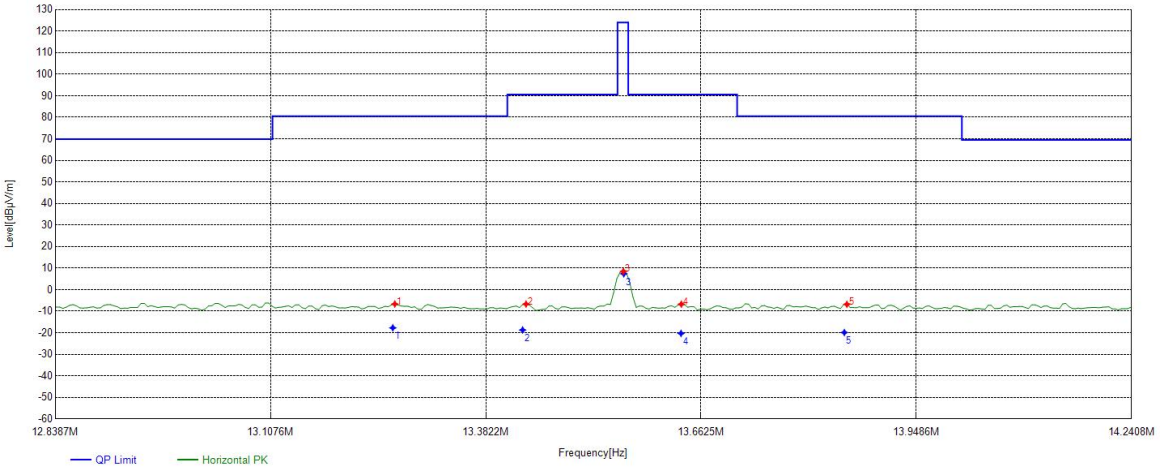
| Frequency (MHz) | Field strength dB(uv/m) at 3m | Field strength dB(uv/m) at 10m |
|---|---|---|
| 1.705 - 13.110 | 69.5 | 48.58 |
| 13.110 - 13.410 | 80.5 | 59.98 |
| 13.410 - 13.553 | 90.5 | 69.58 |
| 13.553 - 13.567 | 124 | 103.08 |
| 13.567 - 13.710 | 90.5 | 69.58 |
| 13.710 - 14.010 | 80.5 | 59.98 |
| 14.010 -30.000 | 69.5 | 48.58 |

Test Method: ANSI C63.10:2013
Test Date: 2022-09-10~2022-10-10
Mode of Operation: Continuously transmitting mode.
Detector Function ANSI C63.10-2013 - Section 11.12.2.4 (peak power measurements)
Measurement BW 1.Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3.VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7.Allow the trace was allowed to stabilize




| Frequency [MHz] | Polarity | Factor [dB] | Reading [dBµV/m] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Detector | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 13.2359 | Horizontal | -19.98 | 11.78 | -8.20 | 80.50 | 88.70 | PK | PASS |
| 13.3118 | Horizontal | -19.97 | 12.56 | -7.41 | 80.50 | 87.91 | PK | PASS |
| 13.472 | Horizontal | -19.97 | 12.23 | -7.74 | 90.50 | 98.24 | PK | PASS |
| 13.5606 | Horizontal | -19.96 | 28.37 | 8.41 | 124.00 | 115.59 | PK | PASS |
| 13.6196 | Horizontal | -19.96 | 11.64 | -8.32 | 90.50 | 98.82 | PK | PASS |
| 13.8937 | Horizontal | -19.94 | 11.46 | -8.48 | 80.50 | 88.98 | PK | PASS |

Test mode : C6AM150JC
Antenna polarization : Horizontal (Power supply DC:5V)




| Frequency [MHz] | Polarity | Factor [dB] | Reading [dBµV/m] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Detector | Pass/Fail |
|---|---|---|---|---|---|---|---|---|
| 13.2654 | Vertical | -19.98 | 13.33 | -6.65 | 80.50 | 87.15 | PK | PASS |
| 13.4341 | Vertical | -19.97 | 13.28 | -6.69 | 90.50 | 97.19 | PK | PASS |
| 13.56 | Vertical | -19.96 | 28.42 | 8.46 | 124.00 | 115.54 | PK | PASS |
| 13.6365 | Vertical | -19.96 | 13.23 | -6.73 | 90.50 | 97.23 | PK | PASS |
| 13.8557 | Vertical | -19.94 | 13.14 | -6.80 | 80.50 | 87.30 | PK | PASS |

Test mode : C6AM150JC
Antenna polarization : Vertical (Power supply DC:5V)

## 9.3 Filed Strength Measurement

Test Requirement: FCC part 15 section 15.225 (a),(b),(c),(d), 15.205

(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. (124 dBμV/m@3m)

(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. (90.5 dBμV/m@3m)

(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. (80.5 dBμV/m@3m)

(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.

Limits of 15.209:

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009–0.490 | 2400/F(kHz) | 300 |
| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30-88 | 100 | 10 |
| 88-216 | 150 | 10 |
| 216-960 | 210 | 10 |
| Above 960 | 500 | 10 |

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method: ANSI C63.10:2013

Test Date: 2022-09-10~2022-10-10

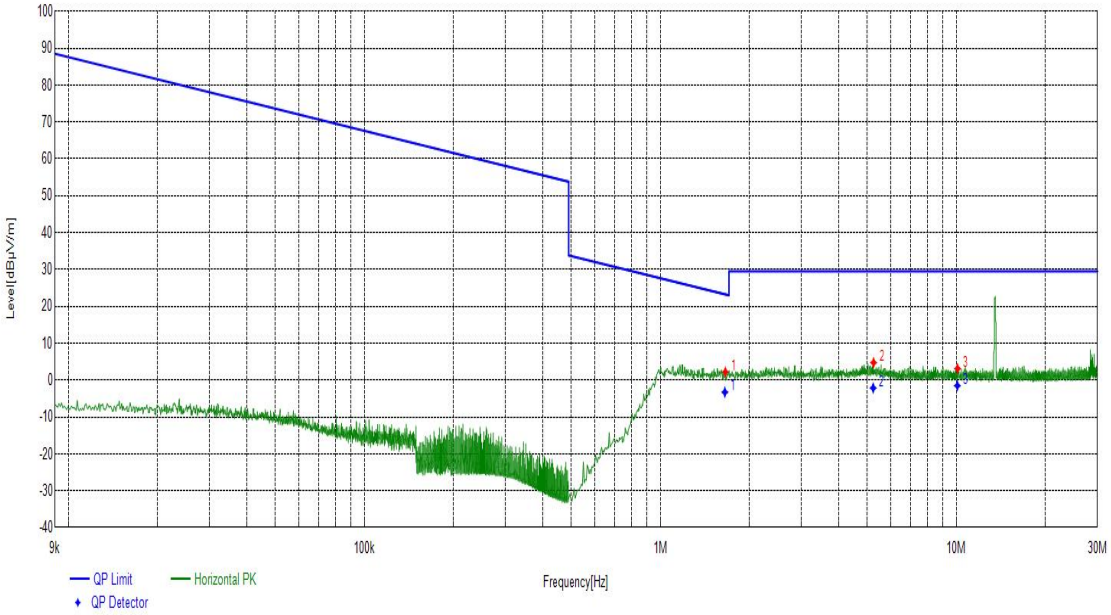
Mode of Operation: Continuously transmitting mode.

Detector Function: Quasi-peak (Below 1000 MHz)
Average and Peak (Above 1000 MHz)

Measurement BW: 200Hz(9KHz-150KHz)
9KHz(150KHz-30MHz)
120 kHz (30MHz-1000 MHz)
1 MHz (Above 1000 MHz)

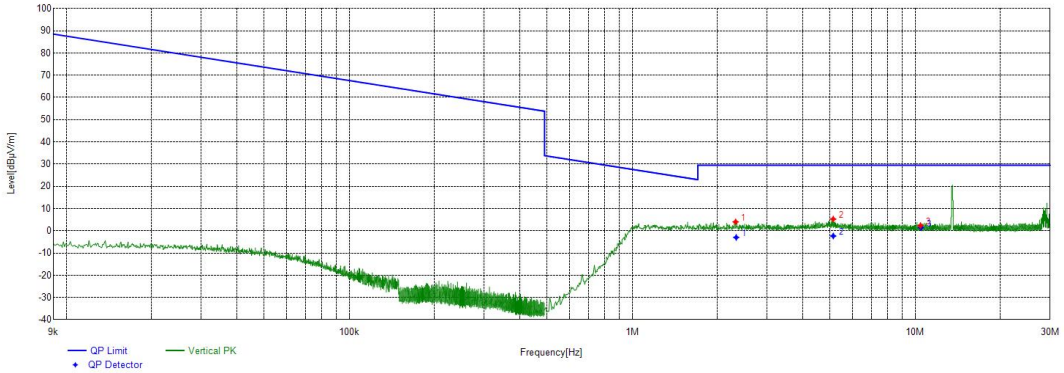
Test data:

Emission 9KHz-30MHz




No significant emission was detected within 10 dB to limit

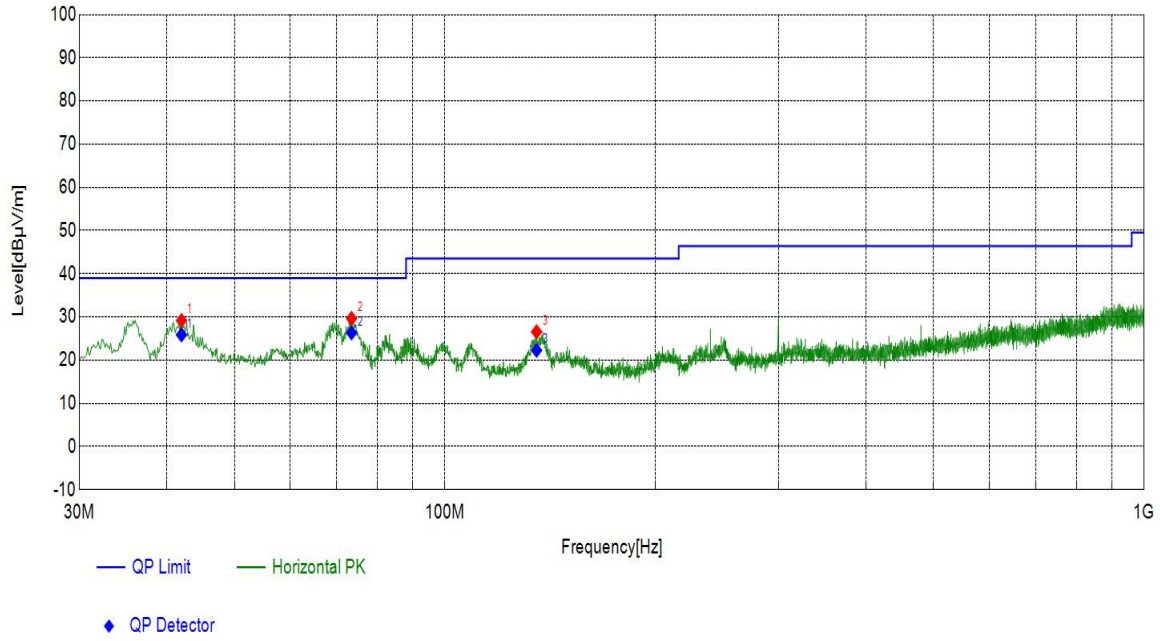
| | | |
|---|---|---|
| Test mode | : | C6AM90JC |
| Antenna polarization | : | Horizontal (Power supply AC:208V) |




No significant emission was detected within 10 dB to limit

| | | |
|---|---|---|
| Test mode | : | C6AM90JC |
| Antenna polarization | : | Vertical(Power supply AC:208V) |

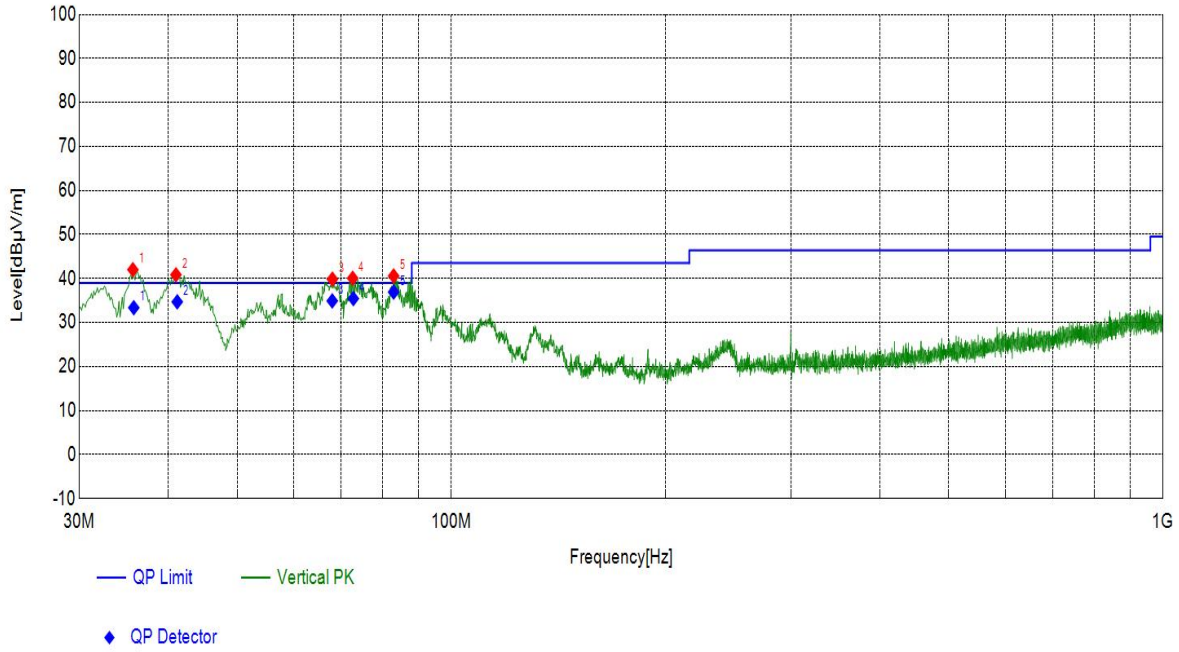
Emission 30MHz -1GHz




| Frequency [MHz] | QP Value [dBµV/m] | QP Limit [dBµV/m] | QP Margin [dB] | Height [cm] | Angle [°] |
|---|---|---|---|---|---|
| 42.0037 | 25.86 | 39.00 | 13.14 | 210 | 280 |
| 73.5288 | 26.34 | 39.00 | 12.66 | 150 | 320 |
| 135.245 | 22.27 | 43.50 | 21.23 | 189 | 180 |

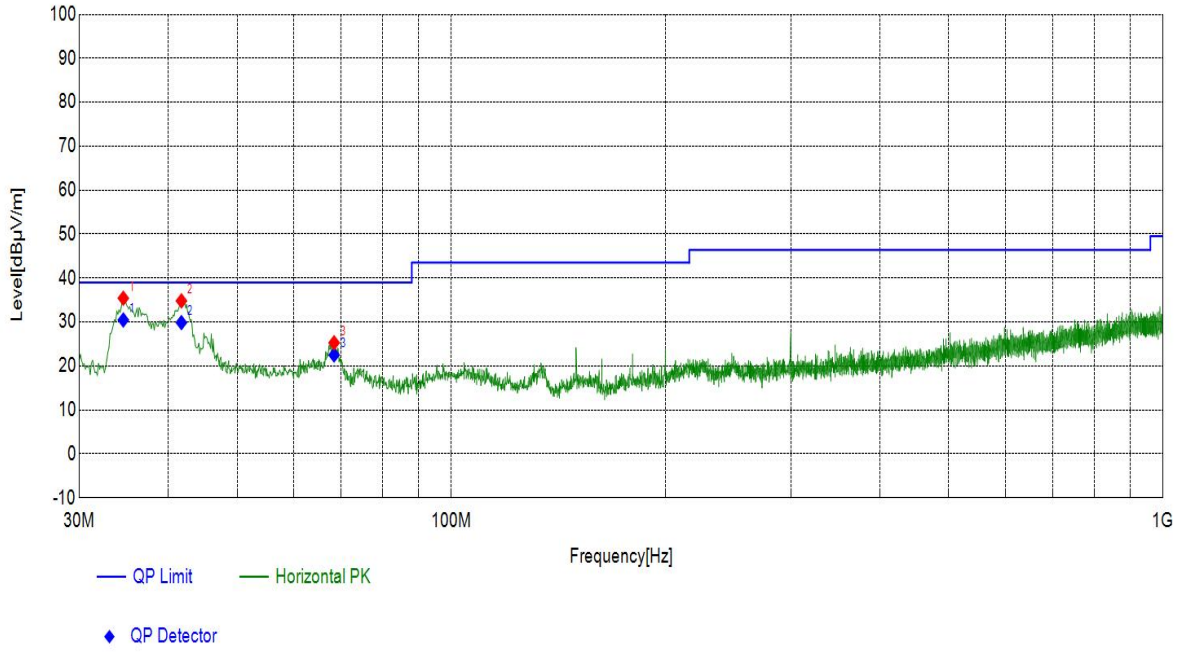
Test mode : C6AM90JC
Antenna polarization : Horizontal (Power supply AC:208V)

Antenna polarization
Vertical



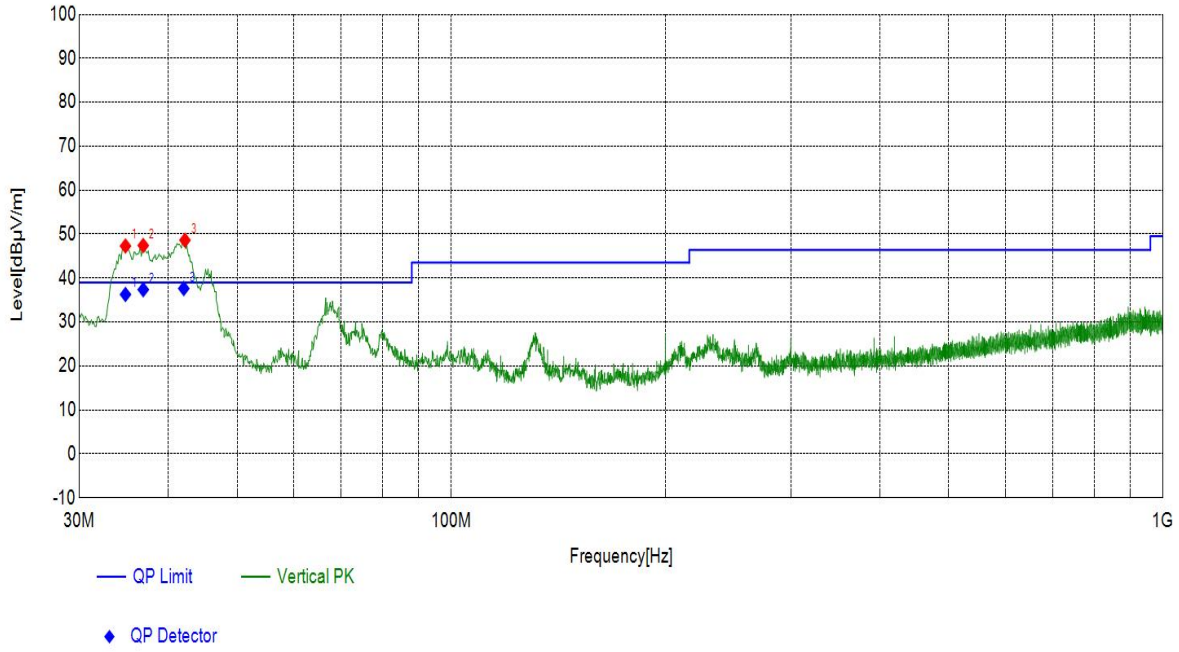

| Frequency [MHz] | QP Value [dBµV/m] | QP Limit [dBµV/m] | QP Margin [dB] | Height [cm] | Angle [°] |
|---|---|---|---|---|---|
| 35.8008 | 33.37 | 39.00 | 5.63 | 280 | 290 |
| 41.2037 | 34.70 | 39.00 | 4.30 | 240 | 120 |
| 68.0371 | 34.91 | 39.00 | 4.09 | 320 | 150 |
| 72.8370 | 35.44 | 39.00 | 3.56 | 150 | 250 |
| 82.9829 | 36.92 | 39.00 | 2.08 | 160 | 340 |

Test mode : C6AM90JC
Antenna polarization : Vertical (Power supply AC:208V)




| Frequency [MHz] | QP Value [dBµV/m] | QP Limit [dBµV/m] | QP Margin [dB] | Height [cm] | Angle [°] |
|---|---|---|---|---|---|
| 34.6075 | 30.47 | 39.00 | 8.53 | 155 | 40 |
| 41.7612 | 29.87 | 39.00 | 9.13 | 192 | 70 |
| 68.4362 | 22.50 | 39.00 | 16.50 | 224 | 110 |

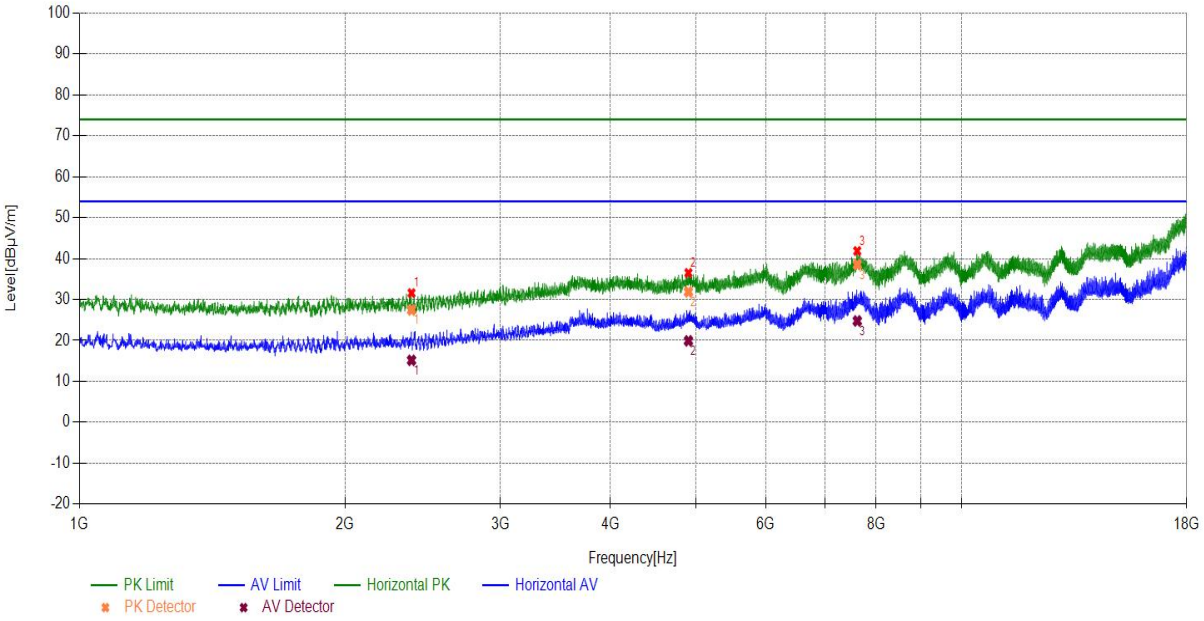
Test mode : C6AM150JC
Antenna polarization : Horizontal (Power supply AC:480V)




| Frequency [MHz] | QP Value [dBµV/m] | QP Limit [dBµV/m] | QP Margin [dB] | Height [cm] | Angle [°] |
|---|---|---|---|---|---|
| 34.85 | 36.26 | 39.00 | 2.74 | 172 | 250 |
| 36.9112 | 37.37 | 39.00 | 1.63 | 150 | 250 |
| 42.0832 | 37.63 | 39.00 | 1.37 | 262 | 30 |

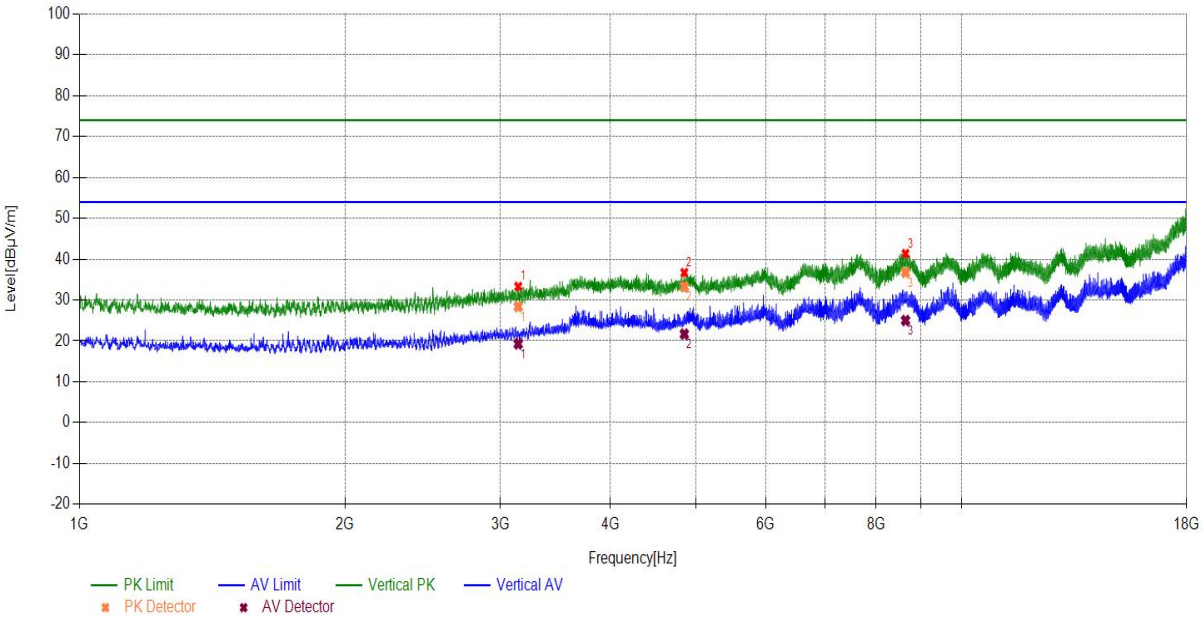
Test mode : C6AM150JC
Antenna polarization : Horizontal (Power supply AC:480V)

Emission 1GHz -18GHz



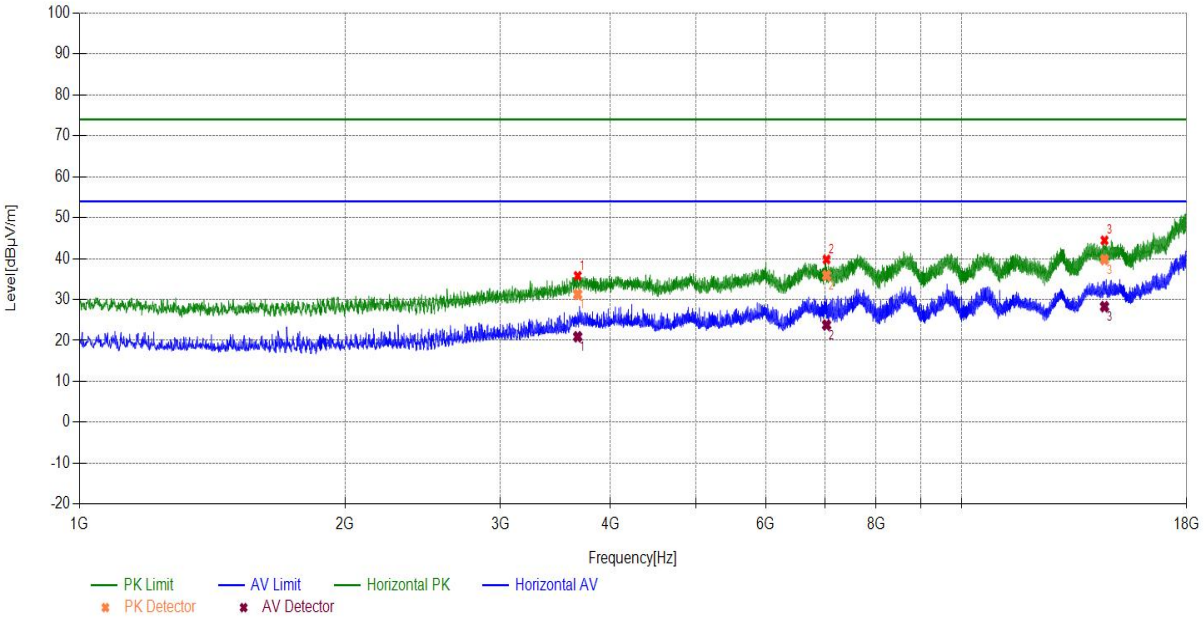

| | | |
|---|---|---|
| Test mode | : | C6AM90JC |
| Antenna polarization | : | Horizontal (Power supply AC:208V) |

Emission 1GHz -18GHz



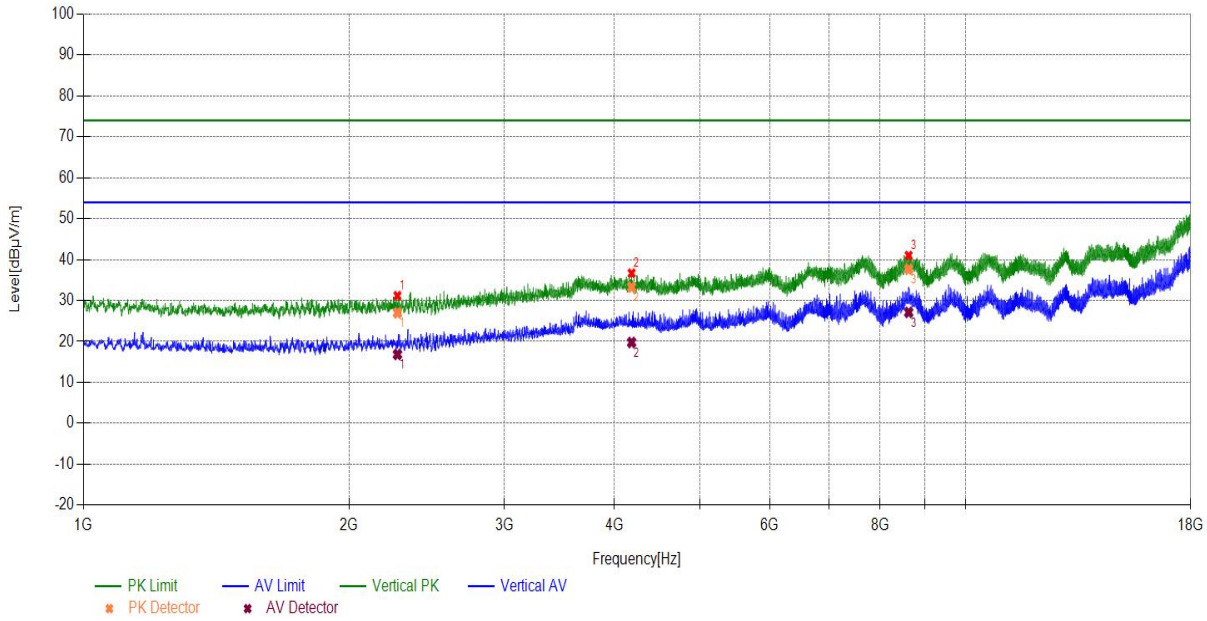

| | | |
|---|---|---|
| Test mode | : | C6AM90JC |
| Antenna polarization | : | Vertical (Power supply AC:208V) |

Emission 1GHz -18GHz




| | | |
|---|---|---|
| Test mode | : | C6AM150JC |
| Antenna polarization | : | Horizontal (Power supply AC:480V) |

Emission 1GHz -18GHz




Test mode : C6AM150JC
Antenna polarization : Vertical (Power supply AC:480V)

## Test result: PASS

## 9.4 Frequency Stability

| | |
|---|---|
| Test Requirement: | FCC Part 15 C Section 15.225(e)<br>The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery. |
| Test Method: | ANSI C63.10:2013 |
| Test Date: | 2022-10-10 |
| Mode of Operation: | Continuously transmitting mode. |
| Detector Function | Maxpeak |
| Measurement BW | RBW:1KHz<br>VBW:3KHz |

Test data:

Nominal Operating Frequency: 13.56MHz,
Limit: within +/- 1.356KHz of the operating frequency.
Power supply:3.0V for RF module.

| Frequency stability vs. temperature | | |
|---|---|---|
| Temperature (°C) | Measured Frequency (MHz) | Frequency error (KHz) |
| 50 | 13.560650 | 0.04 |
| 40 | 13.560642 | 0.04 |
| 30 | 13.560642 | 0.04 |
| 20 | 13.560645 | 0.04 |
| 10 | 13.560645 | 0.04 |
| 0 | 13.560642 | 0.04 |
| -10 | 13.560642 | 0.04 |
| -20 | 13.560641 | 0.04 |

| Frequency stability vs. voltage | | |
|---|---|---|
| Voltage (VDC) | Measured Frequency (MHz) | Frequency error (KHz) |
| 4.25 | 13.560637 | 0.06 |
| 4.5 | 13.560642 | 0.06 |
| 4.75 | 13.560642 | 0.06 |
| 5.0 | 13.560642 | 0.06 |
| 5.25 | 13.560642 | 0.06 |
| 5.5 | 13.560642 | 0.06 |
| 5.75 | 13.560642 | 0.06 |

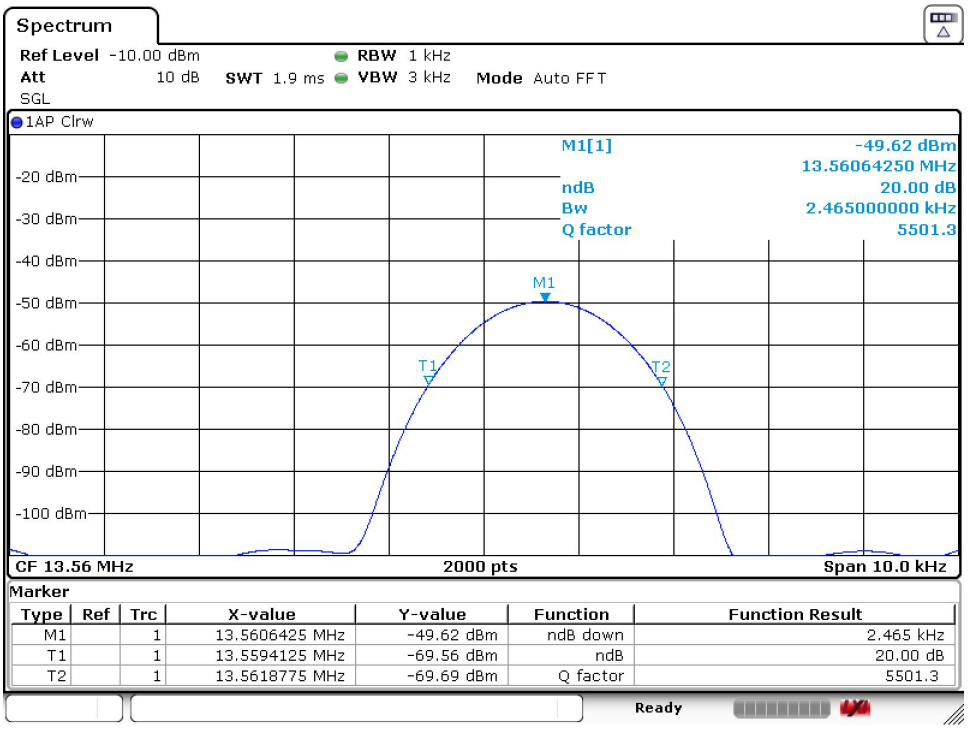
**Result: PASS**

## 9.5 Occupied Bandwidth

| | |
|---|---|
| Test Requirement: | FCC Part 15 C Section 15.215 (c)<br>Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB 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. |
| Test Method: | ANSI C63.10:2013 |
| Test Date: | 2022-10-10 |
| Mode of Operation: | Continuously transmitting mode. |
| Detector Function | Maxpeak |
| Measurement BW | RBW:1KHz<br>VBW:3KHz |

Test data:

20dB bandwidth:




**Result: PASS**

# 10. Test Equipment List

List of Test Instruments

| | Description | Manufacturer | Model no. | Serial no. | CAL. DUe DATE |
|---|---|---|---|---|---|
| C | Signal Analyzer | Rohde & Schwarz | FSV40 | 101030 | 2024-7-6 |
| | Programmable temperature and humidity chamber | MHG-408CASI | TaiLi | A81002 | 2024-7-6 |
| | DC power supply | INSTEK | GPR-30600 | EH873394 | N/A |
| CE | EMI Test Receiver | Rohde & Schwarz | ESR 3 | 101782 | 2024-7-6 |
| | LISN | Rohde & Schwarz | ENV432 | 101318 | 2024-7-6 |
| RE | EMI Test Receiver | Rohde & Schwarz | ESR 26 | 101269 | 2024-7-6 |
| | Trilog Super Broadband Test Antenna | Schwarzbeck | VULB 9163 | 707 | 2024-6-28 |
| | Horn Antenna | Rohde & Schwarz | HF907 | 102294 | 2024-6-28 |
| | Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100398 | 2024-7-6 |
| | Pre-amplifier | Rohde & Schwarz | SCU 18 | 102230 | 2024-7-6 |
| | Signal Generator | Rohde & Schwarz | SMY01 | 839369/005 | 2024-7-6 |
| | Attenuator | Agilent | 8491A | MY39264334 | 2024-7-6 |
| | 3m Semi-anechoic chamber | TDK | 9X6X6 | ---- | 2024-7-7 |
| | Test software | Rohde & Schwarz | EMC32 | Version 9.15.00 | N/A |

C - Conducted RF tests
- Occupied bandwidth
- Frequency Stability

# 11. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

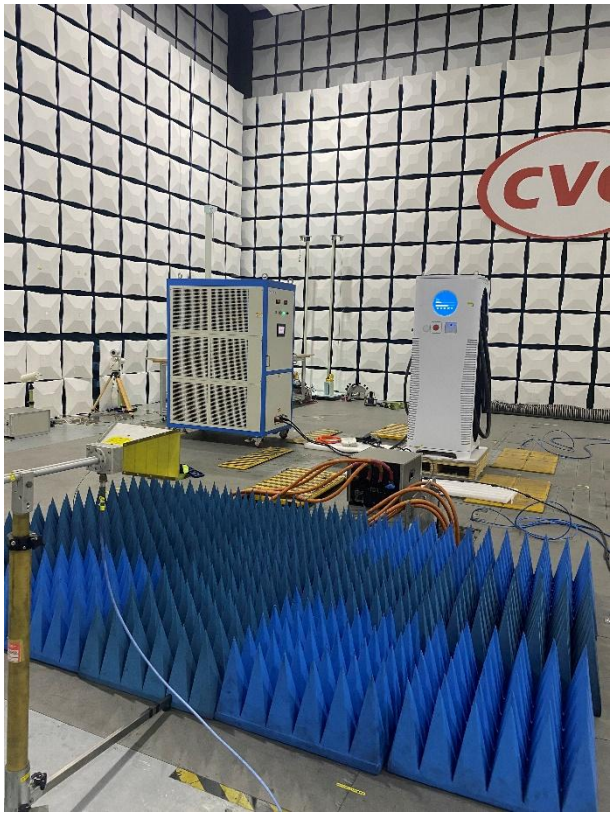
| ITEMS | EXTENDED UNCERTAINTY |
|---|---|
| Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200) | 3.21dB |
| Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz | 4.46dB |
| Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz | Horizontal: 4.91dB;<br>Vertical: 4.89dB; |
| Uncertainty for Conducted RF test with TS 8997 | RF Power Conducted: 1.16dB<br>Frequency test involved:<br>0.6×10-7 or 1% |

# 12. Appendix A – Setup Photos

Setup photo of radiated emission (9KHz-30MHz)


Setup photo of radiated emission (30MHz-1GHz)

Setup photo of radiated emission ( 1GHz-18GHz)



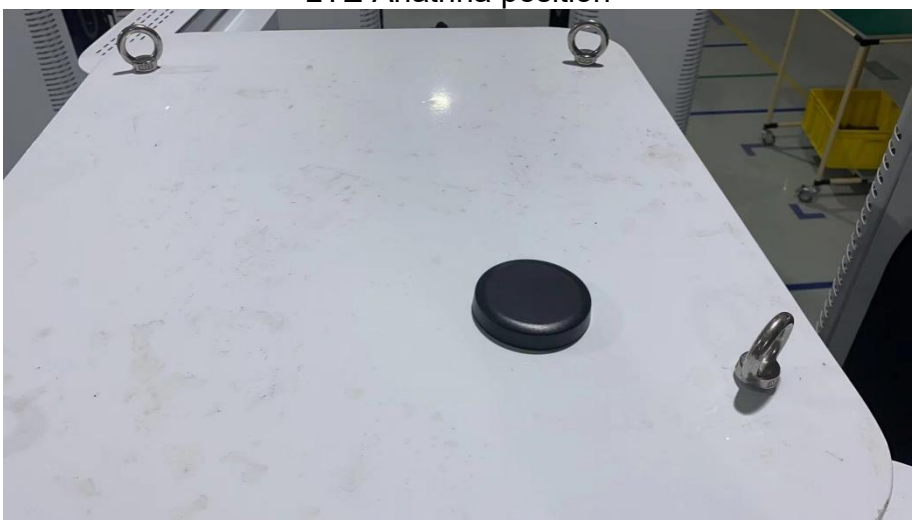
Setup photo of conducted emission (150KHz-30MHz)

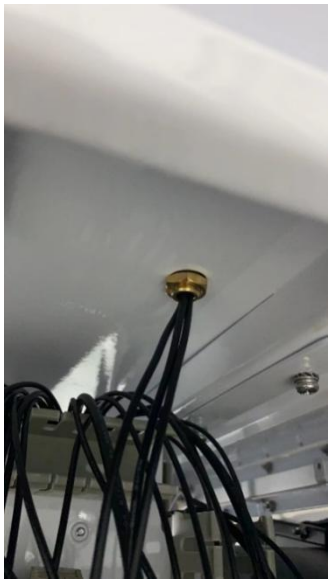
# 13. Appendix B – EUT Photos

C6AM150JC

LTE module

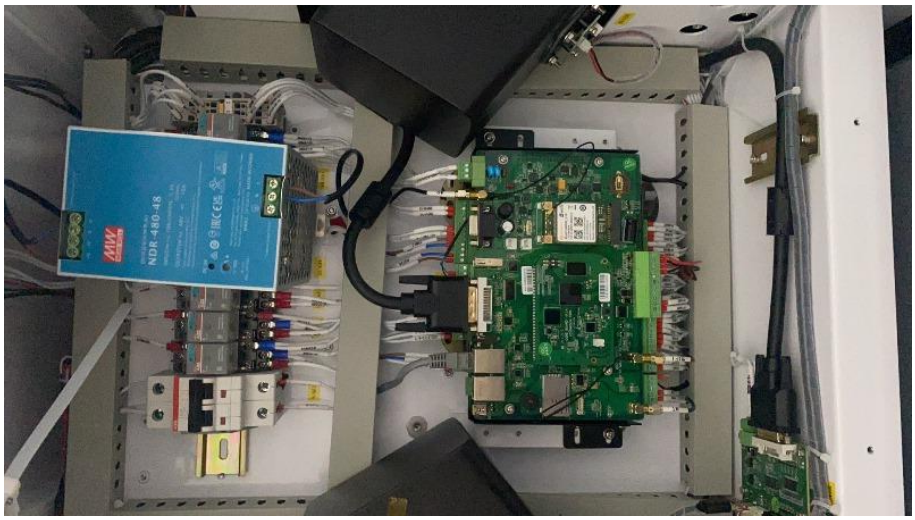

LTE Anatnna position



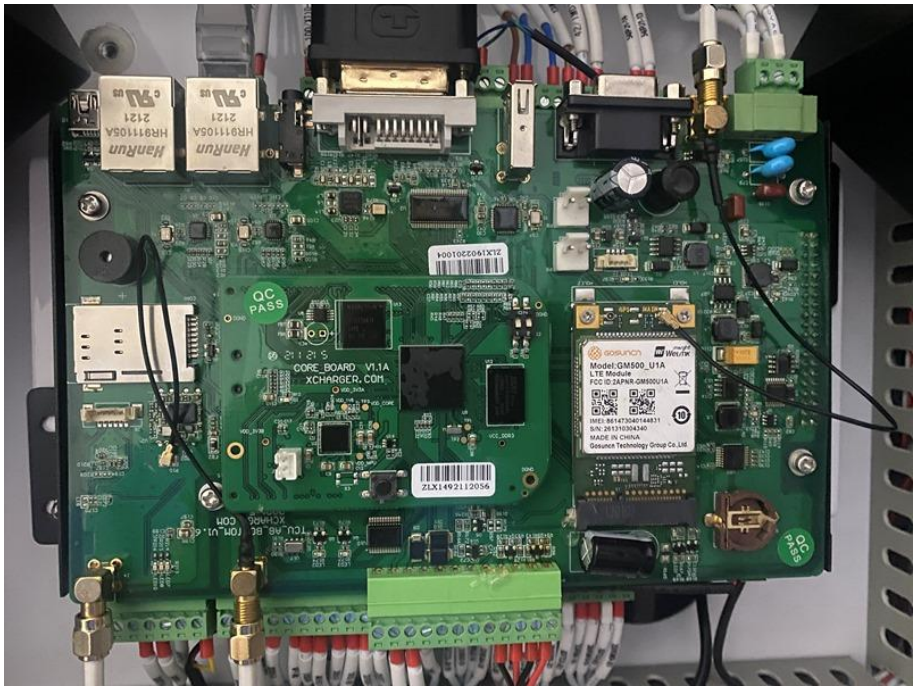


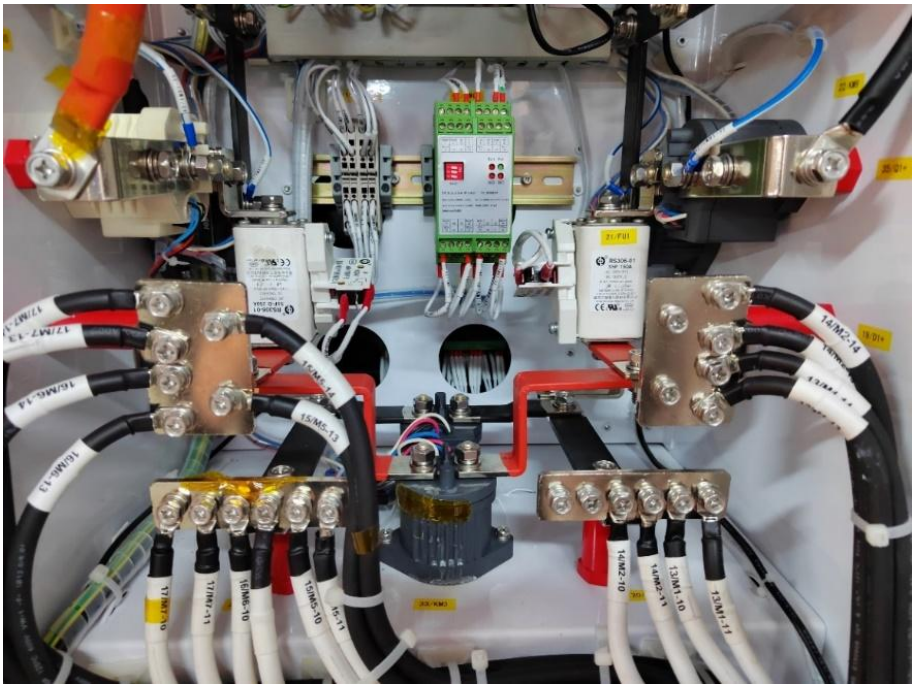

200-500V AC Power module

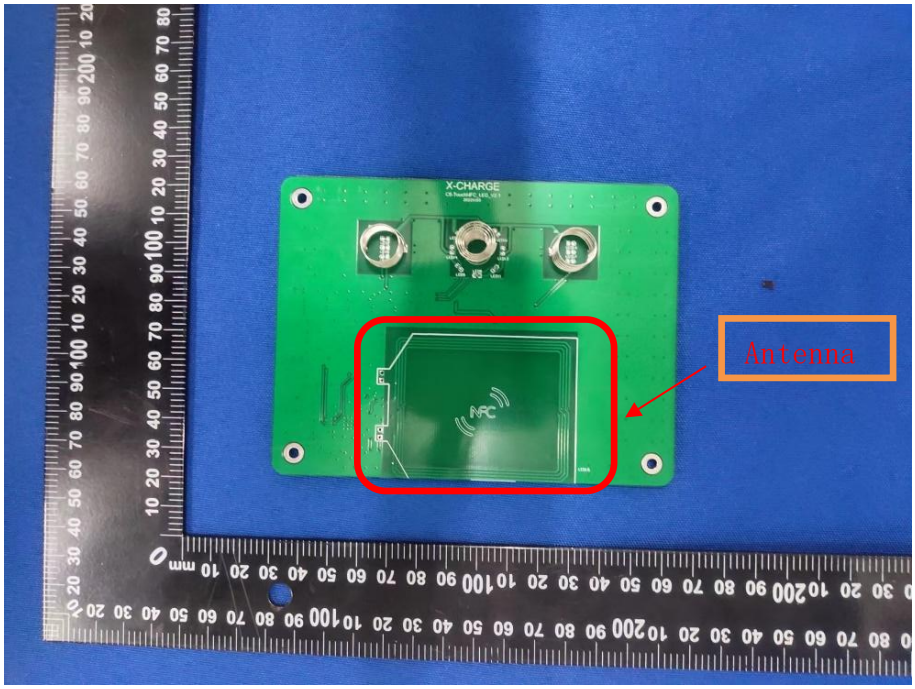
C6AM90JC. 100-240V power module

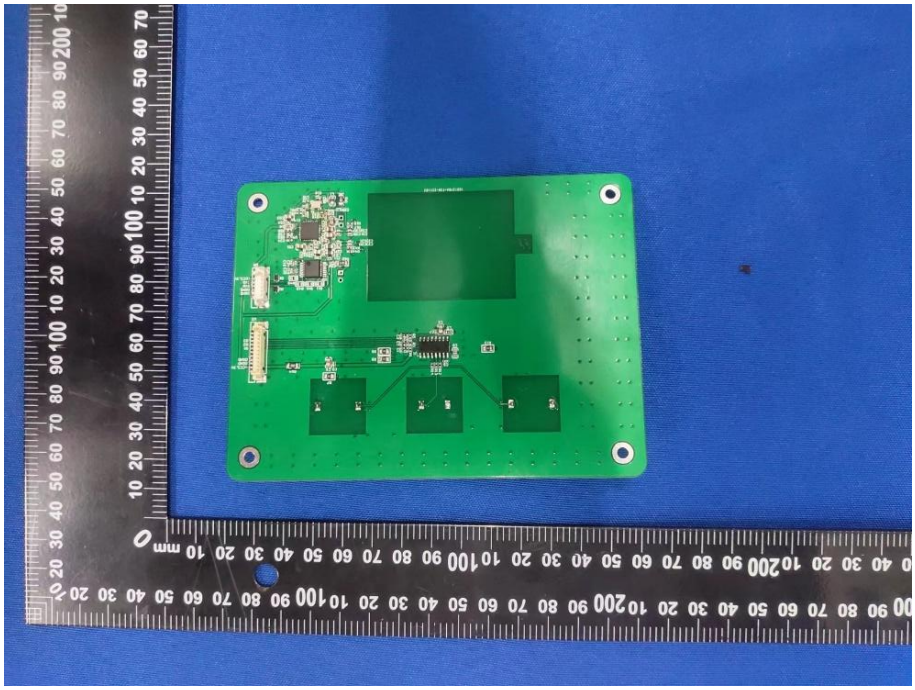



.


CORE_BOARD V1.1A
XCHARGER.COM
Model:GM500_U1A
LTE Module





End of This Report