

**CFR 47 FCC PART 15 SUBPART C**

**TEST REPORT**

*For*

**Audio Baby Monitor**

**MODEL NUMBER: HY820**

**REPORT NUMBER: E04A24090009F00101**

**ISSUE DATE: September 30, 2024**

**FCC ID: 2AXOF-HY820**

*Prepared for*

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**This report is based on a single evaluation of the submitted sample(s) of the above mentioned product, it does not imply an assessment of the production of the products.**

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Revision History

| Rev. | Issue Date            | Revisions     | Revised By |
|------|-----------------------|---------------|------------|
| V0   | September 30,<br>2024 | Initial Issue |            |

**Summary of Test Results**

| Summary of Test Results   |  |  |              |
|---|--|--|--------------|
| Clause  | Test Items                                   | Rules  | Test Results |
| 1   | 20 dB Bandwidth<br>99 % Occupied Bandwidth   | CFR 47 FCC §15.215 (c)   | Pass         |
| 2   | Radiated Emission                            | CFR 47 FCC §15.249 (a)(d)(e)<br>CFR 47 FCC §15.205 and §15.209 | Pass         |
| 3   | Conducted Emission Test<br>for AC Power Port | CFR 47 FCC §15.207   | Pass         |
| 4   | Antenna Requirement                          | CFR 47 FCC §15.203   | Pass         |
| <p>Note 1: This test report is only published to and used by the applicant, and it is not for evidence purpose in China.</p> <p>Note 2: The measurement result for the sample received is &lt;Pass&gt; according to &lt; CFR 47 FCC PART 15 SUBPART C &gt; when &lt;Accuracy Method&gt; decision rule is applied.</p> |  |  |              |

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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Shenzhen Macross Automation Technology Co., Ltd.  
Address: Room 301-3, #5 Building, Jianghao Technical Park, Bantian St.  
Longgang District, Shenzhen, China

### Manufacturer Information

Company Name: Shenzhen Macross Automation Technology Co., Ltd.  
Address: Room 301-3, #5 Building, Jianghao Technical Park, Bantian St.  
Longgang District, Shenzhen, China

### EUT Information

Product Description: Audio Baby Monitor  
Model: HY820  
Brand: HOSMART  
Sample Received Date: September 6, 2024  
Sample Status: Normal  
Sample ID: A24090009 004  
Date of Tested: September 6, 2024 to September 30, 2024

| APPLICABLE STANDARDS         |              |
|------------------------------|--------------|
| STANDARD                     | TEST RESULTS |
| CFR 47 FCC PART 15 SUBPART C | Pass         |

Prepared By:



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Approved By:



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Checked By:



Alan He  
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## 2. TEST METHODOLOGY

All tests were performed in accordance with the standard CFR 47 FCC PART 15 SUBPART C

## 3. FACILITIES AND ACCREDITATION

|                           |  |
|---------------------------|--|
| Accreditation Certificate | <p><b>A2LA (Certificate No.: 6947.01)</b><br/>Guangdong Global Testing Technology Co., Ltd.<br/>has been assessed and proved to be in compliance with A2LA.</p> <p><b>FCC (FCC Designation No.: CN1343)</b><br/>Guangdong Global Testing Technology Co., Ltd.<br/>has been recognized to perform compliance testing on equipment<br/>subject to Supplier's Declaration of Conformity (SDoC) and<br/>Certification rules</p> <p><b>ISED (Company No.: 30714)</b><br/>Guangdong Global Testing Technology Co., Ltd.<br/>has been registered and fully described in a report filed with ISED.<br/>The Company Number is 30714 and the test lab Conformity<br/>Assessment Body Identifier (CABID) is CN0148.</p> |
|---------------------------|--|

Note: All tests measurement facilities use to collect the measurement data are located at Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Items   | k    | Uncertainty   |
|--|------|---|
| 20dB Emission Bandwidth  | 1.96 | ±9.2 PPM  |
| Conducted Output Power   | 1.96 | ±1.5 dB   |
| Power Spectral Density Level   | 1.96 | ±1.9 dB   |
| Conducted Spurious Emission  | 1.96 | 9 kHz-30 MHz: ± 0.95 dB<br>30 MHz-1 GHz: ± 1.5 dB<br>1GHz-12.75GHz: ± 1.8 dB<br>12.75 GHz-26.5 GHz: ± 2.1dB |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96. |      |   |

| Test Item   | Measurement Frequency Range | K | U(dB) |
|---|-----------------------------|---|-------|
| Conducted emissions from the AC mains power ports (AMN)   | 150 kHz ~ 30 MHz            | 2 | 3.37  |
| Radiated emissions  | 9 kHz ~ 30 MHz              | 2 | 4.16  |
| Radiated emissions  | 30 MHz ~ 1 GHz              | 2 | 3.79  |
| Radiated emissions  | 1 GHz ~ 18 GHz              | 2 | 5.62  |
| Radiated emissions  | 18 GHz ~ 40 GHz             | 2 | 5.54  |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                             |   |       |

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

|                  |         |   |
|------------------|---------|---|
| EUT Name         |         | Audio Baby Monitor  |
| Model            |         | HY820   |
| Hardware Version |         | V2.0  |
| Software Version |         | V1.3  |
| Adapter Ratings  |         | Model: JHD-AP006U-050100BB-2<br>Input: 100-240V~ 50/60Hz 0.2A<br>Output: 5V==1000mA |
| Battery Ratings  |         | 3.7V 1800mAh 6.66Wh   |
| Power Supply     | AC      | 120V/60Hz   |
|                  | DC      | 5V  |
|                  | Battery | 3.7V  |

|                      |          |
|----------------------|----------|
| Operation Frequency: | 919.2MHz |
| Type of Modulation:  | GFSK     |

### 5.2. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 1       | 919.2           | /       | /               | /       | /               | /       | /               |

### 5.3. MAXIMUM FIELD STRENGTH

| Frequency Range (MHz) | Frequency (MHz) | Channel Number | Max field strength (dBμV/m) |
|-----------------------|-----------------|----------------|-----------------------------|
| 919.2 MHz             | 919.2 MHz       | 1              | 91.21                       |

### 5.4. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel | Frequency |
|-----------|--------------|-----------|
| GFSK      | CH 1         | 919.2 MHz |

### 5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter |                         |              |
|--|-------------------------|--------------|
| Test Software                          |                         | /            |
| Modulation Type                        | Transmit Antenna Number | Test Channel |
|  |                         | CH 1         |
| GFSK                                   | 1                       | Default      |



## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Antenna | Frequency (MHz) | Antenna Type     | MAX Antenna Gain (dBi) |
|---------|-----------------|------------------|------------------------|
| 1       | 919.2           | Internal antenna | 2.09                   |

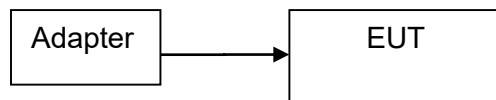
| Test Mode | Transmit and Receive Mode                    | Description  |
|-----------|--|--|
| GFSK      | <input checked="" type="checkbox"/> 1TX, 1RX | Antenna 1 can be used as transmitting/receiving antenna. |

## 5.7. SUPPORT UNITS FOR SYSTEM TEST

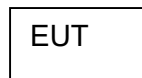
| No. | Equipment | Manufacturer                                    | Model No.             | Serial No. |
|-----|-----------|---|-----------------------|------------|
| 1   | Adapter   | Shenzhen Macross Automation technology Co.,Ltd. | JHD-AP006U-050100BB-2 | /          |

## 5.8. SETUP DIAGRAM

AC conducted emission:



Radiated Emission:



RF conducted:



## 6. MEASURING EQUIPMENT AND SOFTWARE USED

| Test Equipment of Conducted RF      |                 |                      |             |            |            |
|-------------------------------------|-----------------|----------------------|-------------|------------|------------|
| Equipment                           | Manufacturer    | Model No.            | Serial No.  | Last Cal.  | Due Date   |
| Spectrum Analyzer                   | Rohde & Schwarz | FSV40                | 102257      | 2024/09/14 | 2025/09/13 |
| Spectrum Analyzer                   | KEYSIGHT        | N9020A               | MY51285127  | 2024/09/14 | 2025/09/13 |
| EXG Analog Signal Generator         | KEYSIGHT        | N5173B               | MY61253075  | 2024/09/14 | 2025/09/13 |
| Vector Signal Generator             | Rohde & Schwarz | SMM100A              | 101899      | 2024/09/14 | 2025/09/13 |
| RF Control box                      | MWRF-test       | MW100-RFCB           | MW220926GTG | 2024/09/14 | 2025/09/13 |
| Wideband Radio Communication Tester | Rohde & Schwarz | CMW270               | 102792      | 2024/09/14 | 2025/09/13 |
| Wideband Radio Communication Tester | Rohde & Schwarz | CMW500               | 103235      | 2024/09/14 | 2025/09/13 |
| temperature humidity chamber        | Espec           | SH-241               | SH-241-2014 | 2024/09/14 | 2025/09/13 |
| RF Test Software                    | MWRF-test       | MTS8310E (Ver. V2/0) | N/A         | N/A        | N/A        |

| Test Equipment of Radiated emissions below 1GHz |                 |                         |            |            |            |
|---|-----------------|-------------------------|------------|------------|------------|
| Equipment                                       | Manufacturer    | Model No.               | Serial No. | Last Cal.  | Due Date   |
| 3m Semi-anechoic Chamber                        | ETS             | 9m*6m*6m                | Q2146      | 2022/08/30 | 2025/08/29 |
| EMI Test Receiver                               | Rohde & Schwarz | ESCI3                   | 101409     | 2024/09/14 | 2025/09/13 |
| Spectrum Analyzer                               | KEYSIGHT        | N9020A                  | MY51283932 | 2024/09/14 | 2025/09/13 |
| Pre-Amplifier                                   | HzEMC           | HPA-9K0130              | HYPA21001  | 2024/09/14 | 2025/09/13 |
| Biconilog Antenna                               | Schwarzbeck     | VULB 9168               | 01315      | 2022/10/10 | 2025/10/09 |
| Biconilog Antenna                               | ETS             | 3142E                   | 00243646   | 2022/03/23 | 2025/03/22 |
| Loop Antenna                                    | ETS             | 6502                    | 243668     | 2022/03/30 | 2025/03/29 |
| Test Software                                   | Farad           | EZ-EMC (Ver.FA-03A2 RE) | N/A        | N/A        | N/A        |

| Test Equipment of Radiated emissions above 1GHz |                 |            |            |            |            |
|---|-----------------|------------|------------|------------|------------|
| Equipment                                       | Manufacturer    | Model No.  | Serial No. | Last Cal.  | Due Date   |
| 3m Semi-anechoic Chamber                        | ETS             | 9m*6m*6m   | Q2149      | 2022/08/30 | 2025/08/29 |
| Spectrum Analyzer                               | Rohde & Schwarz | FSV40      | 101413     | 2024/09/14 | 2025/09/13 |
| Spectrum Analyzer                               | KEYSIGHT        | N9020A     | MY51283932 | 2024/09/14 | 2025/09/13 |
| Pre-Amplifier                                   | A-INFO          | HPA-1G1850 | HYPA21003  | 2024/09/14 | 2025/09/13 |
| Horn antenna                                    | A-INFO          | 3117       | 246069     | 2022/03/11 | 2025/03/10 |
| Pre-Amplifier                                   | ZKJC            | HPA-184057 | HYPA21004  | 2024/09/14 | 2025/09/13 |

|               |       |                                |        |            |            |
|---------------|-------|--------------------------------|--------|------------|------------|
| Horn antenna  | ZKJC  | 3116C                          | 246265 | 2022/03/29 | 2025/03/28 |
| Test Software | Farad | EZ-EMC<br>(Ver.FA-03A2<br>RE+) | N/A    | N/A        | N/A        |

| Test Equipment of Conducted emissions |                 |                                    |            |            |            |
|---------------------------------------|-----------------|------------------------------------|------------|------------|------------|
| Equipment                             | Manufacturer    | Model No.                          | Serial No. | Last Cal.  | Due Date   |
| Shielded Room                         | CHENG YU        | 8m*5m*4m                           | N/A        | 2022/10/29 | 2025/10/28 |
| EMI Test Receiver                     | Rohde & Schwarz | ESR3                               | 102647     | 2024/09/14 | 2025/09/13 |
| LISN/AMN                              | Rohde & Schwarz | ENV216                             | 102843     | 2024/09/14 | 2025/09/13 |
| NNLK 8129 RC                          | Schwarzbeck     | NNLK 8129 RC                       | 5046       | 2024/09/14 | 2025/09/13 |
| Test Software                         | Farad           | EZ-EMC (Ver.<br>EMC-con-3A1<br>1+) | N/A        | N/A        | N/A        |

## 7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME AND DUTY CYCLE

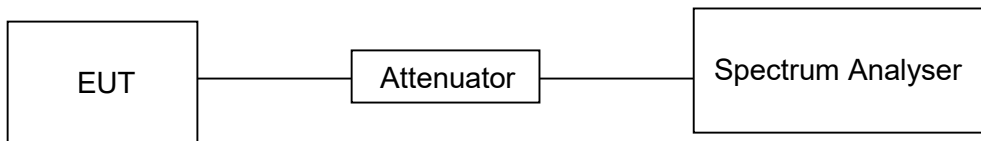
#### LIMITS

None; for reporting purposes only

#### TEST PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

|                     |        |                   |     |
|---------------------|--------|-------------------|-----|
| Temperature         | 22.8°C | Relative Humidity | 55% |
| Atmosphere Pressure | 101kPa |                   |     |

#### TEST RESULTS

919.2MHz

| On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) | 1/T Minimum VBW (kHz) | Final setting For VBW (kHz) |
|----------------|---------------|-----------------------|----------------|-----------------------------------|-----------------------|-----------------------------|
| 100            | 100           | 1                     | 100            | 0                                 | 0.01                  | 1                           |

Note:

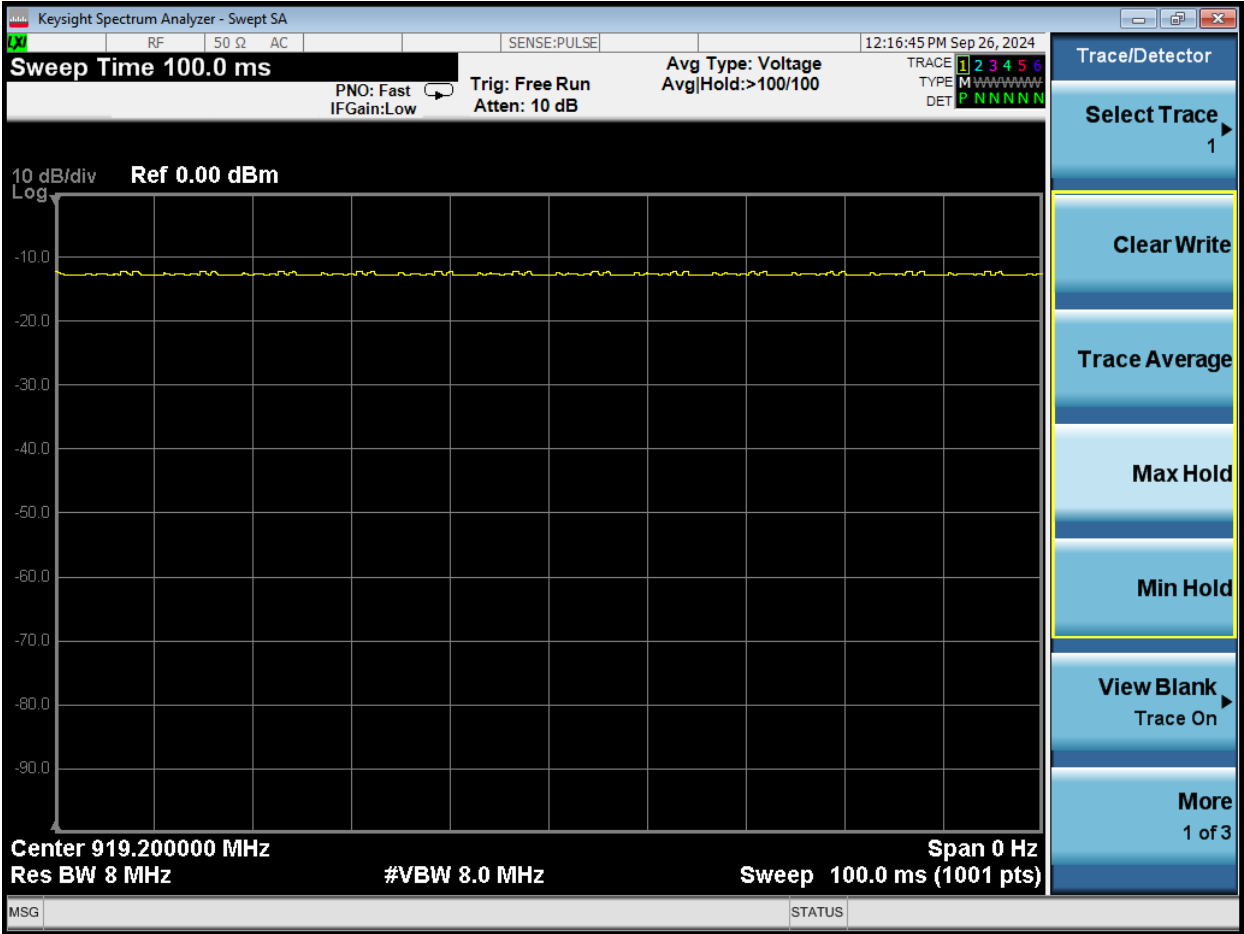
Duty Cycle Correction Factor=10log(1/x).

Where: x is Duty Cycle (Linear)

Where: T is On Time (transmitting duration)

If that calculated VBW is not available on the analyzer then the next higher value should be used.

ON TIME AND DUTY CYCLE



919.2MHz

## 7.2. 20 DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

### LIMITS

| CFR 47 FCC Part15 (15.249) Subpart C<br>RSS-Gen Issue 5 |                         |                              |                       |
|---|-------------------------|------------------------------|-----------------------|
| Section   | Test Item               | Limit                        | Frequency Range (MHz) |
| CFR 47 FCC §15.215 (c)                                  | 20 dB Bandwidth         | for reporting purposes only  | 914.2, 915            |
| ISED RSS-Gen Clause 6.7                                 | 99 % Occupied Bandwidth | For reporting purposes only. | 914.2, 915            |

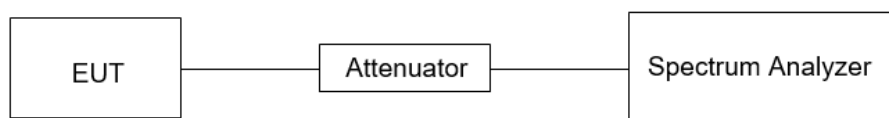
### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

|                  |  |
|------------------|--|
| Center Frequency | The center frequency of the channel under test |
| Detector         | Peak   |
| RBW              | 1 % to 5 % of the occupied bandwidth           |
| VBW              | approximately 3×RBW                            |
| Trace            | Max hold                                       |
| Sweep            | Auto couple                                    |

Allow the trace to stabilize and 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 / 99 % relative to the maximum level measured in the fundamental emission.

### TEST SETUP



### TEST ENVIRONMENT

|                     |        |                   |     |
|---------------------|--------|-------------------|-----|
| Temperature         | 22.8°C | Relative Humidity | 55% |
| Atmosphere Pressure | 101kPa |                   |     |

**TEST RESULTS**

| Channel | 20dB bandwidth (MHz) | 99 % bandwidth (MHz) | Limit (MHz) | Result |
|---------|----------------------|----------------------|-------------|--------|
| 1       | 1.052                | 1.0001               | --          | Pass   |



## 8. RADIATED TEST RESULTS

### LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.

Please refer to CFR 47 FCC §15.249 (a)(d)(e)

Please refer to ISSED RSS-210 Issue 10 Annex B B.10

Please refer to ISSED RSS-GEN Clause 8.9 and Clause 8.10.

| The field strength of emissions from intentional radiators operated within these frequency bands |                               |                             |              |
|--|-------------------------------|-----------------------------|--------------|
| Frequency (MHz)  | Field strength of Fundamental | Field strength of Harmonics | Distance (m) |
| 902 - 928  | 50 mV/m<br>(94 dBuV/m)        | 500 uV/m<br>(54 dBuV/m)     | 3            |
| 2400 – 2483.5  | 50 mV/m<br>(94 dBuV/m)        | 500 uV/m<br>(54 dBuV/m)     | 3            |
| 5725 – 5875  | 50 mV/m<br>(94 dBuV/m)        | 500 uV/m<br>(54 dBuV/m)     | 3            |

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz ~ 1 GHz)

| Emissions radiated outside of the specified frequency bands above 30 MHz |                                    |                                      |         |
|--|------------------------------------|--------------------------------------|---------|
| Frequency Range (MHz)  | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |         |
|  |                                    | Quasi-Peak                           |         |
| 30 - 88  | 100                                | 40                                   |         |
| 88 - 216   | 150                                | 43.5                                 |         |
| 216 - 960  | 200                                | 46                                   |         |
| Above 960  | 500                                | 54                                   |         |
| Above 1000   | 500                                | Peak                                 | Average |
|  |                                    | 74                                   | 54      |

| FCC Emissions radiated outside of the specified frequency bands below 30 MHz |                                   |                               |
|--|-----------------------------------|-------------------------------|
| 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                            |



## ISED General field strength limits at frequencies below 30 MHz

| Table 6 – General field strength limits at frequencies below 30 MHz |   |                          |
|---|---|--------------------------|
| Frequency   | Magnetic field strength (H-Field) ( $\mu\text{A/m}$ ) | Measurement distance (m) |
| 9 - 490 kHz <sup>Note 1</sup>                                       | 6.37/F (F in kHz)                                     | 300                      |
| 490 - 1705 kHz  | 63.7/F (F in kHz)                                     | 30                       |
| 1.705 - 30 MHz  | 0.08  | 30                       |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

| Table 7 – Restricted frequency bands <sup>Note 1</sup> |                       |               |
|--|-----------------------|---------------|
| MHz  | MHz                   | GHz           |
| 0.090 - 0.110  | 149.9 - 150.05        | 9.0 - 9.2     |
| 0.495 - 0.505  | 156.52475 - 156.52525 | 9.3 - 9.5     |
| 2.1735 - 2.1905  | 156.7 - 156.9         | 10.6 - 12.7   |
| 3.020 - 3.026  | 162.0125 - 167.17     | 13.25 - 13.4  |
| 4.125 - 4.128  | 167.72 - 173.2        | 14.47 - 14.5  |
| 4.17725 - 4.17775                                      | 240 - 285             | 15.35 - 16.2  |
| 4.20725 - 4.20775                                      | 322 - 335.4           | 17.7 - 21.4   |
| 5.677 - 5.683  | 399.9 - 410           | 22.01 - 23.12 |
| 6.215 - 6.218  | 608 - 614             | 23.6 - 24.0   |
| 6.26775 - 6.26825                                      | 960 - 1427            | 31.2 - 31.8   |
| 6.31175 - 6.31225                                      | 1435 - 1626.5         | 36.43 - 36.5  |
| 8.291 - 8.294  | 1645.5 - 1646.5       | Above 38.6    |
| 8.362 - 8.366  | 1660 - 1710           |               |
| 8.37625 - 8.38675                                      | 1718.8 - 1722.2       |               |
| 8.41425 - 8.41475                                      | 2200 - 2300           |               |
| 12.29 - 12.293   | 2310 - 2390           |               |
| 12.51975 - 12.52025                                    | 2483.5 - 2500         |               |
| 12.57675 - 12.57725                                    | 2655 - 2900           |               |
| 13.36 - 13.41  | 3260 - 3267           |               |
| 16.42 - 16.423   | 3332 - 3339           |               |
| 16.69475 - 16.69525                                    | 3345.8 - 3358         |               |
| 16.80425 - 16.80475                                    | 3500 - 4400           |               |
| 25.5 - 25.67   | 4500 - 5150           |               |
| 37.5 - 38.25   | 5350 - 5460           |               |
| 73 - 74.6  | 7250 - 7750           |               |
| 74.8 - 75.2  | 8025 - 8500           |               |
| 108 - 138  |                       |               |

**Note 1:** Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

FCC Restricted bands of operation refer to FCC §15.205 (a):

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.17725-4.17775          | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.20725-4.20775          | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

Note: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6c

## TEST PROCEDURE

Below 30 MHz

TRF No.: 04-E001-0B

Global Testing , Great Quality.

## The setting of the spectrum analyser

|       |  |
|-------|--|
| RBW   | 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz) |
| VBW   | 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz) |
| Sweep | Auto   |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
5. The radiated emission limits 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.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to  $Y-51.5 = Z$  dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

## Below 1 GHz and above 30 MHz

## The setting of the spectrum analyser

|          |          |
|----------|----------|
| RBW      | 120 kHz  |
| VBW      | 300 kHz  |
| Sweep    | Auto     |
| Detector | Peak/QP  |
| Trace    | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high

pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1G

The setting of the spectrum analyser

|          |                                |
|----------|--------------------------------|
| RBW      | 1 MHz                          |
| VBW      | PEAK: 3 MHz<br>AVG: see note 6 |
| Sweep    | Auto                           |
| Detector | Peak                           |
| Trace    | Max hold                       |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

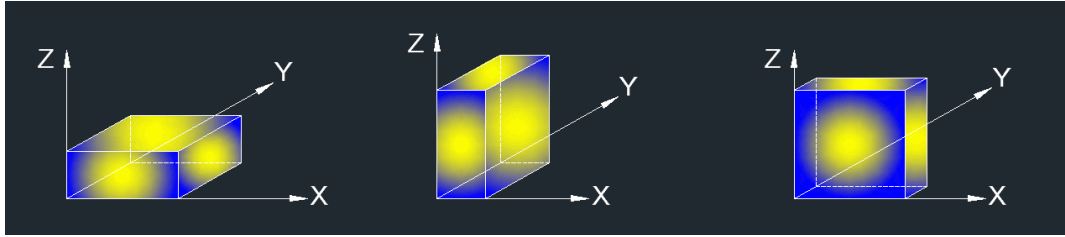
3. The EUT was placed on a turntable with 1.5 m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

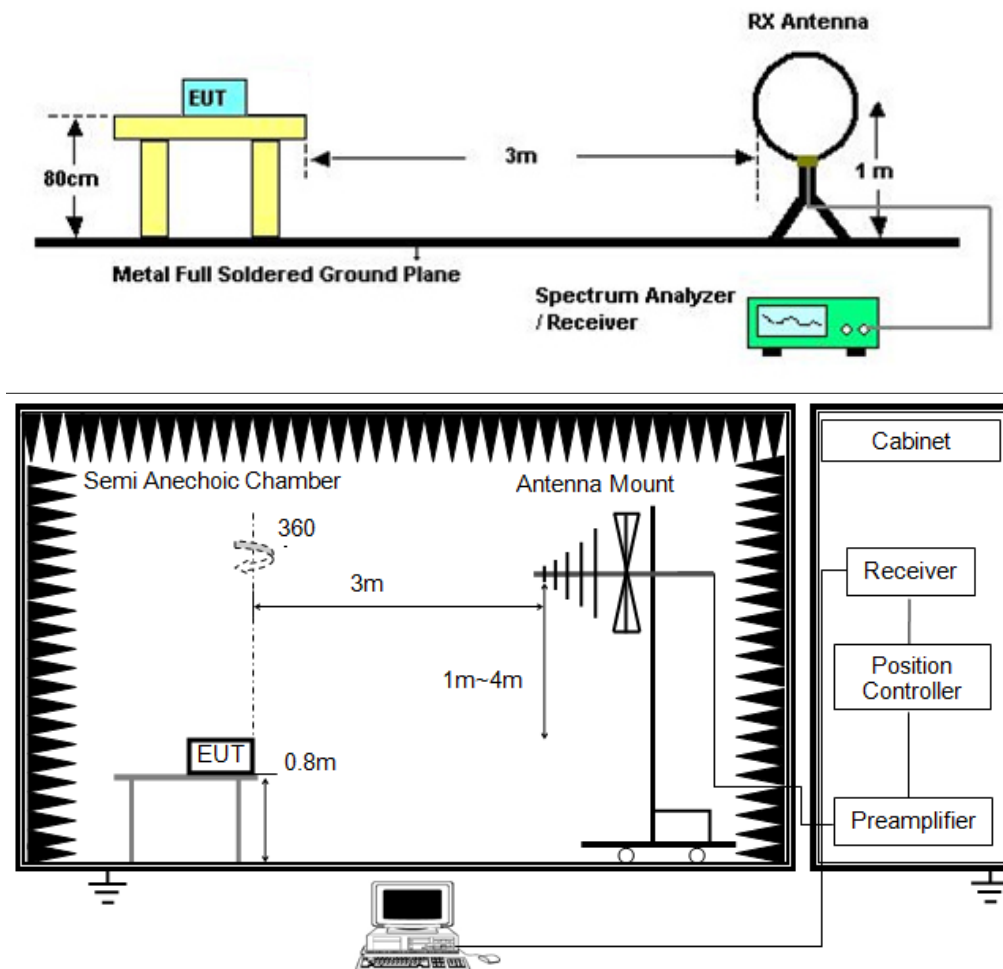
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.

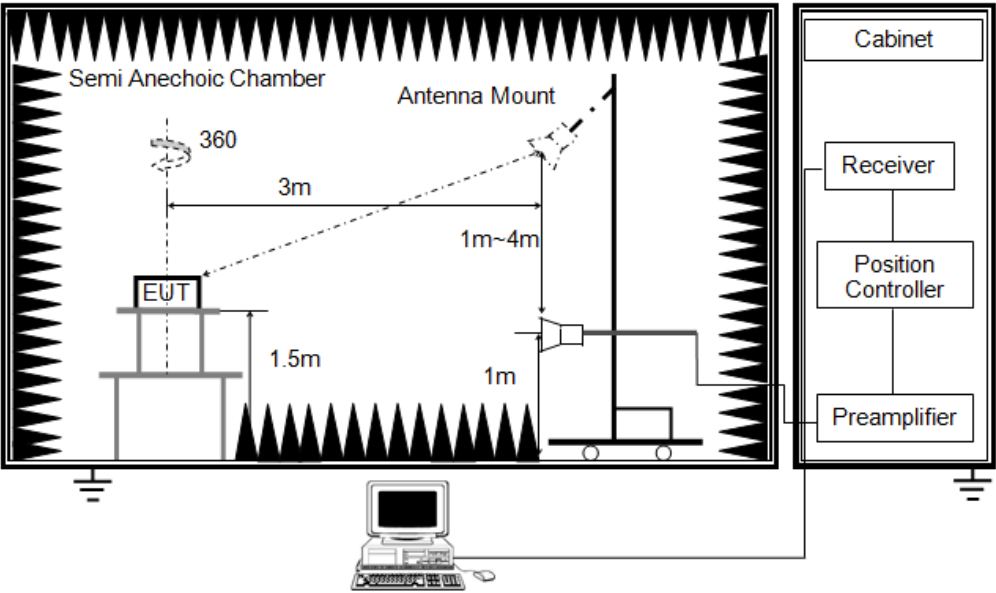
X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

### TEST SETUP





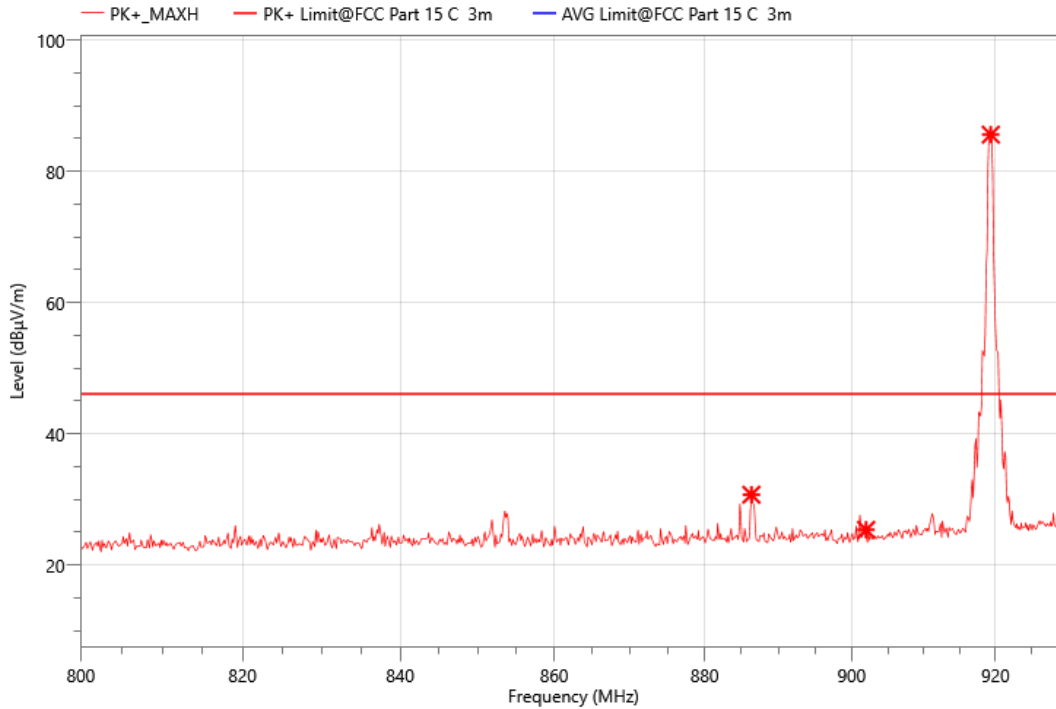
TEST ENVIRONMENT

|                     |        |                   |     |
|---------------------|--------|-------------------|-----|
| Temperature         | 22.1℃  | Relative Humidity | 51% |
| Atmosphere Pressure | 101kPa |                   |     |

TEST RESULTS

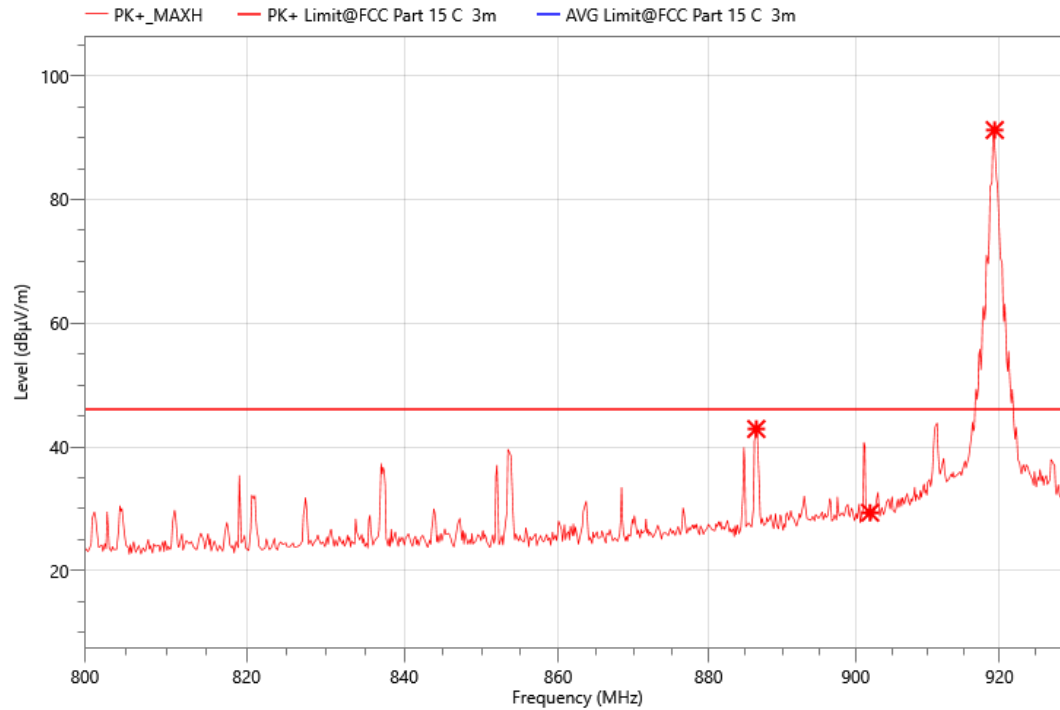
## 8.1. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS

### RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (919.2 MHz)



| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 886.320     | 35.94          | -5.23      | 30.71          | 46.00          | 15.29       | PK+  | H    |
| 2   | 902.000     | 30.38          | -5.03      | 25.35          | 46.00          | 20.65       | PK+  | H    |
| 3   | 919.340     | 89.26          | -3.67      | 85.59          | 46.00          | -39.59      | PK+  | H    |

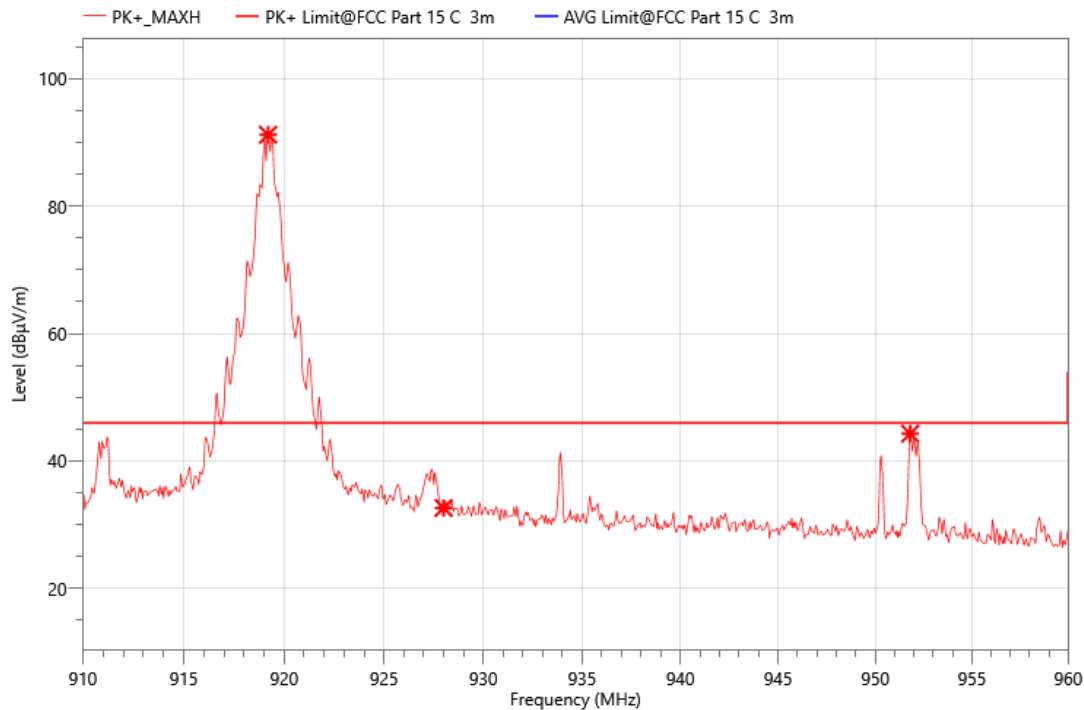
- Note: 1. Measurement = Reading Level + Correct Factor.  
 2. Peak: Peak detector.  
 3. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.  
 4. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.



| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 886.450     | 48.13          | -5.23      | 42.90          | 46.00          | 3.10        | PK+  | V    |
| 2   | 902.000     | 34.39          | -5.03      | 29.36          | 46.00          | 16.64       | PK+  | V    |
| 3   | 919.340     | 94.90          | -3.67      | 91.23          | 46.00          | -45.23      | PK+  | V    |

- Note: 1. Measurement = Reading Level + Correct Factor.  
 2. Peak: Peak detector.  
 3. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.  
 4. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.





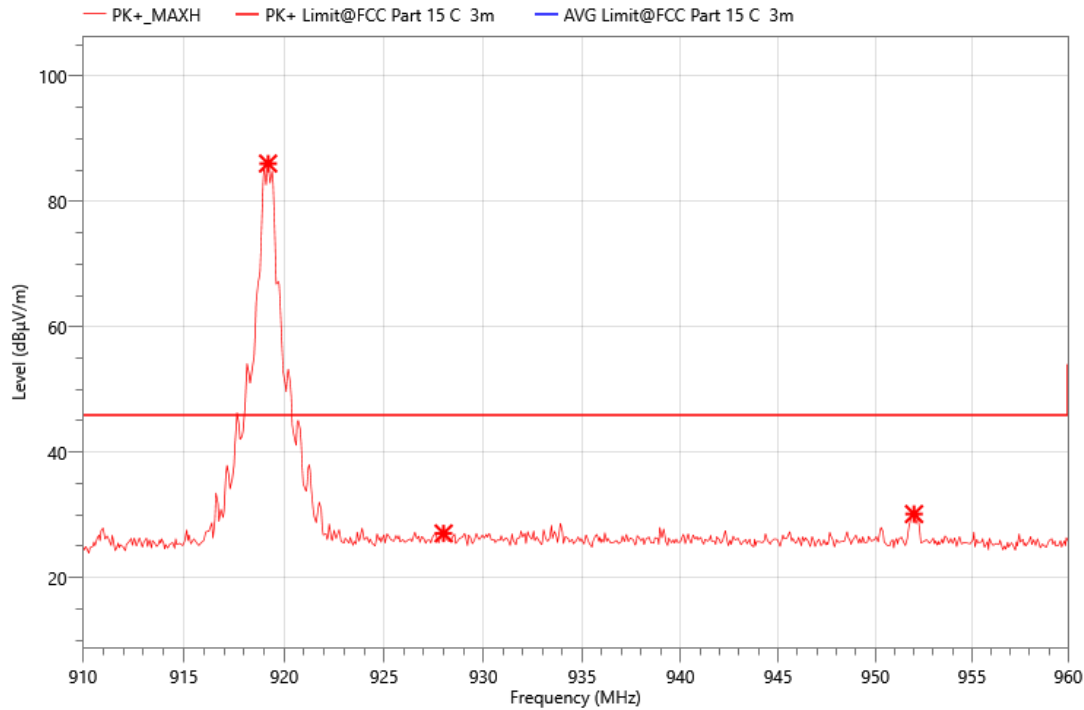
| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 919.200     | 94.89          | -3.68      | 91.21          | 46.00          | -45.21      | PK+  | V    |
| 2   | 928.000     | 35.70          | -3.1       | 32.60          | 46.00          | 13.40       | PK+  | V    |
| 3   | 951.800     | 47.75          | -3.48      | 44.27          | 46.00          | 1.73        | PK+  | V    |

Note: 1. Measurement = Reading Level + Correct Factor.

2. Peak: Peak detector.

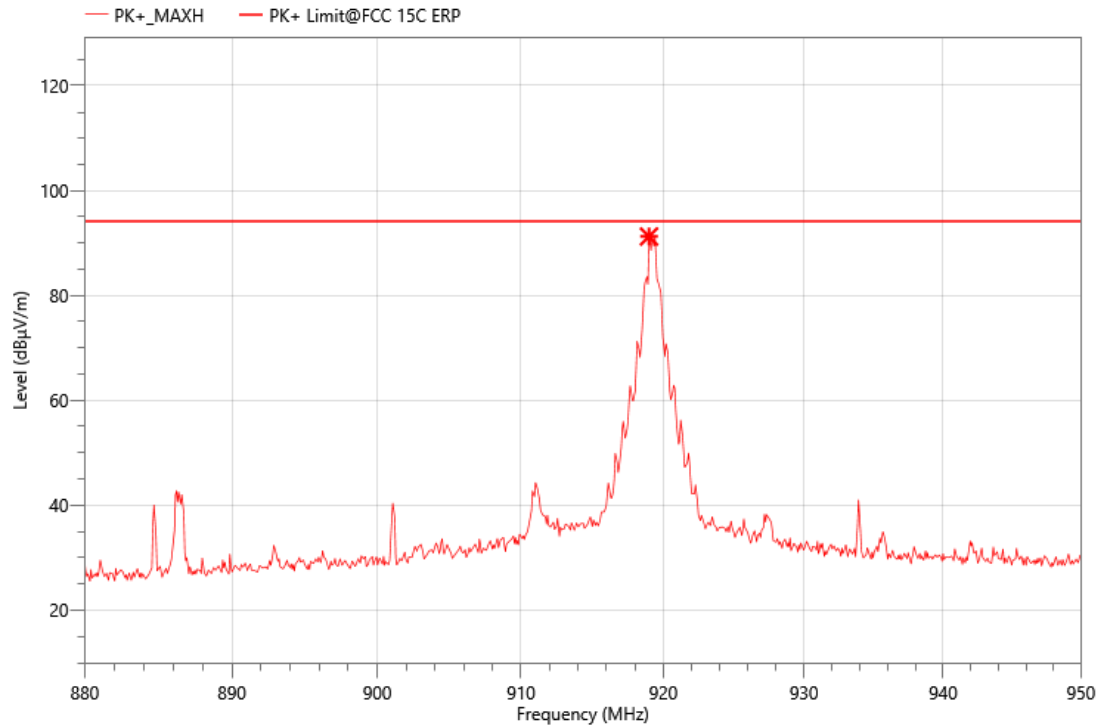
3. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

4. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.



| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 919.200     | 89.73          | -3.68      | 86.05          | 46.00          | -40.05      | PK+  | H    |
| 2   | 928.000     | 30.13          | -3.1       | 27.03          | 46.00          | 18.97       | PK+  | H    |
| 3   | 952.000     | 33.61          | -3.49      | 30.12          | 46.00          | 15.88       | PK+  | H    |

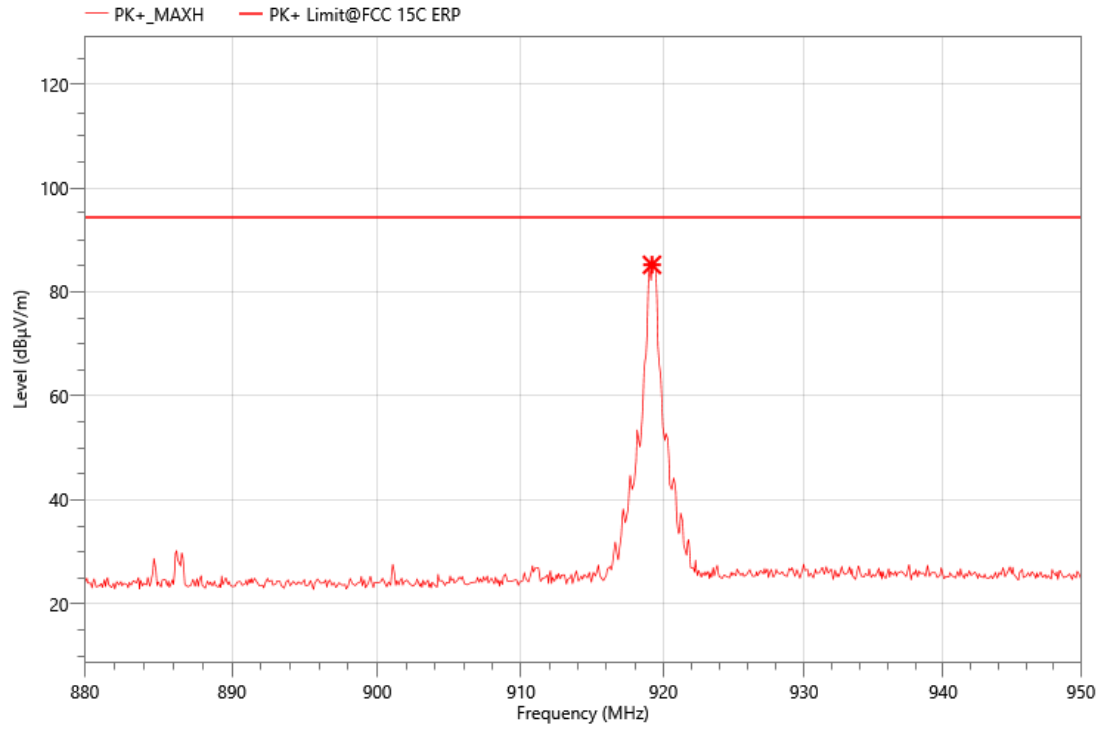
- Note: 1. Measurement = Reading Level + Correct Factor.  
 2. Peak: Peak detector.  
 3. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.  
 4. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.



| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 918.990     | 94.91          | -3.7       | 91.21          | 94.00          | 2.79        | PK+  | V    |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

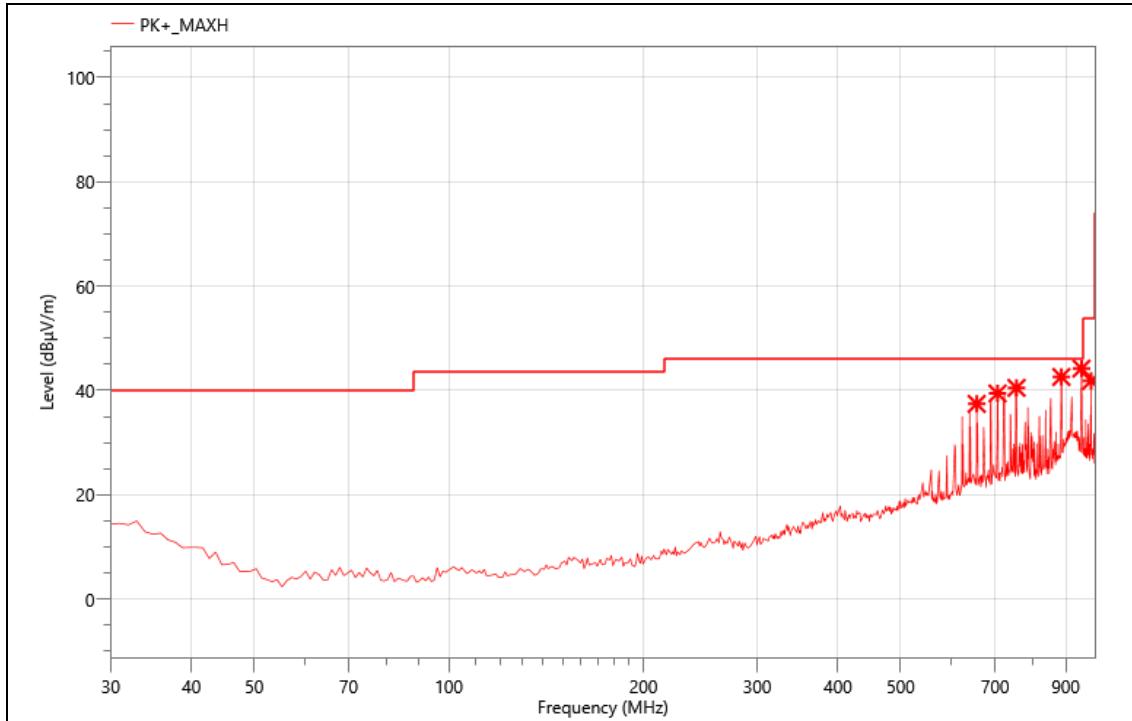


| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 919.200     | 88.90          | -3.68      | 85.22          | 94.00          | 8.78        | PK+  | H    |

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

## 8.2. RADIATED SPURIOUS EMISSION

|        |                   |
|--------|-------------------|
| Mode:  | 919.2MHz          |
| Power: | Battery 3.7V      |
| TE:    | Berny             |
| Date   | 2024/9/27         |
| T/A/P  | 22.1°C/51%/101Kpa |

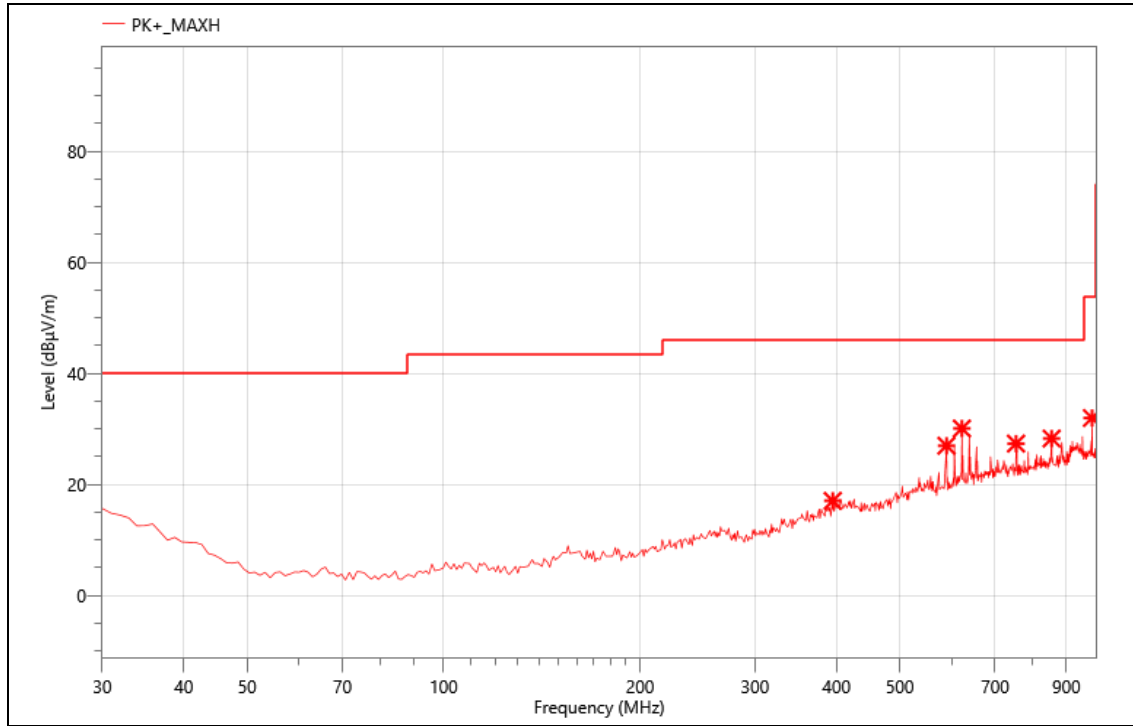


### Critical\_Freqs

| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 655.650     | 45.78          | -8.36      | 37.42          | 46.00          | 8.58        | PK+  | V    |
| 2   | 706.090     | 46.65          | -7.23      | 39.42          | 46.00          | 6.58        | PK+  | V    |
| 3   | 755.560     | 47.82          | -7.33      | 40.49          | 46.00          | 5.51        | PK+  | V    |
| 4   | 886.510     | 47.81          | -5.23      | 42.58          | 46.00          | 3.42        | PK+  | V    |
| 5   | 952.470     | 47.70          | -3.51      | 44.19          | 46.00          | 1.81        | PK+  | V    |
| 6   | 985.450     | 45.55          | -3.73      | 41.82          | 53.90          | 12.08       | PK+  | V    |

Note: [Margin=Limit-Meas.]; [Meas.=Reading+Corr. ]

|        |                   |
|--------|-------------------|
| Mode:  | 919.2MHz          |
| Power: | Battery 3.7V      |
| TE:    | Berny             |
| Date   | 2024/9/27         |
| T/A/P  | 22.1°C/51%/101Kpa |



### Critical\_Freqs

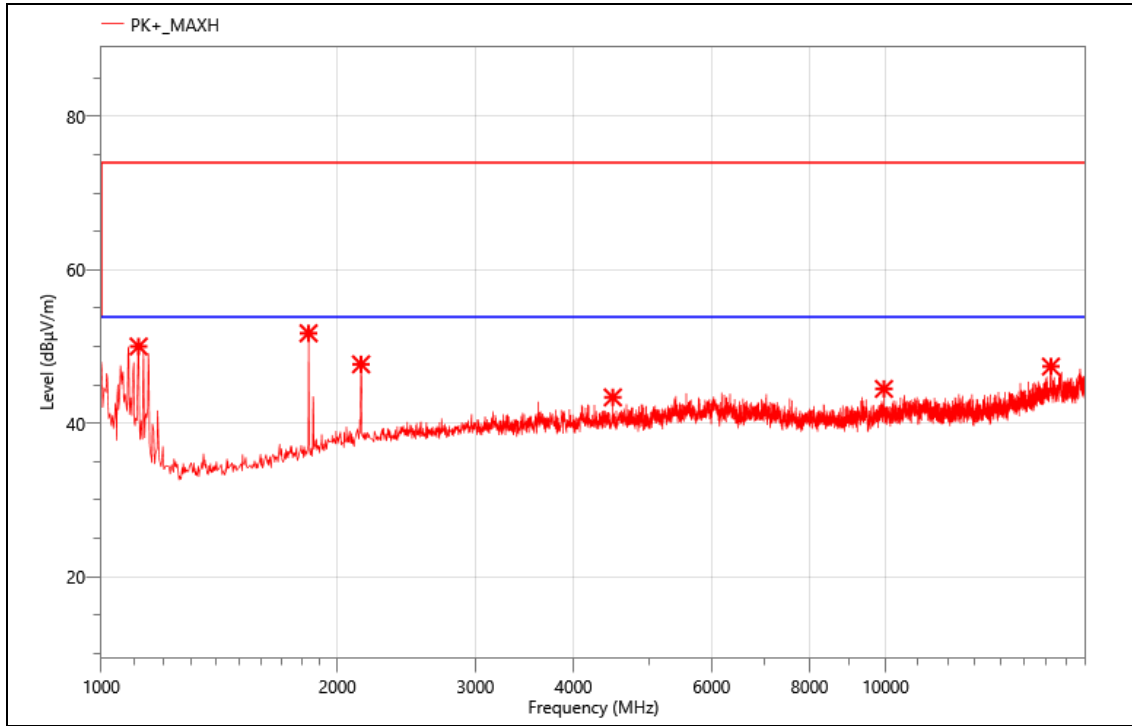
| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 394.720     | 31.22          | -14.19     | 17.03          | 46.00          | 28.97       | PK+  | H    |
| 2   | 589.690     | 37.11          | -10.15     | 26.96          | 46.00          | 19.04       | PK+  | H    |
| 3   | 622.670     | 39.27          | -9.2       | 30.07          | 46.00          | 15.93       | PK+  | H    |
| 4   | 753.620     | 34.64          | -7.29      | 27.35          | 46.00          | 18.65       | PK+  | H    |
| 5   | 854.500     | 33.92          | -5.66      | 28.26          | 46.00          | 17.74       | PK+  | H    |
| 6   | 985.450     | 35.69          | -3.73      | 31.96          | 53.90          | 21.94       | PK+  | H    |

Note: [Margin=Limit-Meas.]; [Meas.=Reading+Corr. ]

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

|        |                   |
|--------|-------------------|
| Mode:  | 919.2MHz          |
| Power: | Battery 3.7V      |
| TE:    | Berny             |
| Date   | 2024/9/27         |
| T/A/P  | 22.1°C/51%/101Kpa |

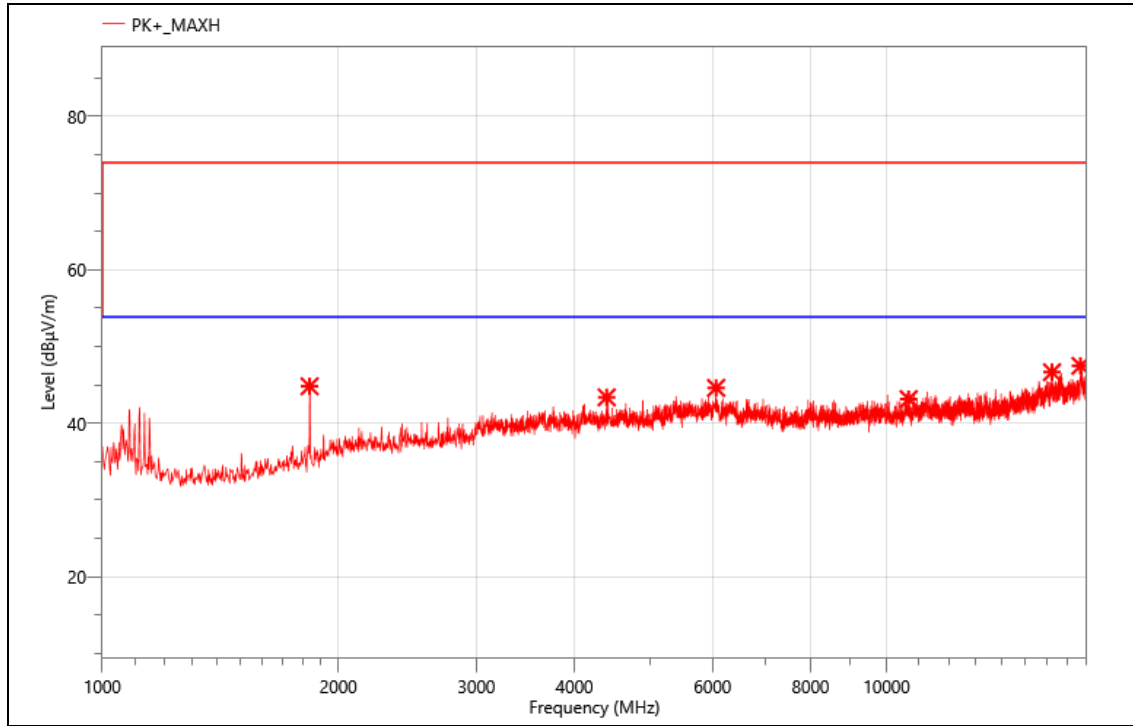


### Critical\_Freqs

| No. | Freq. (MHz) | Reading (dBμV) | Corr. (dB) | Meas. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 1116.000    | 72.94          | -22.93     | 50.01          | 74.00          | 23.99       | PK+  | V    |
| 2   | 1838.000    | 71.47          | -19.74     | 51.73          | 74.00          | 22.27       | PK+  | V    |
| 3   | 2144.000    | 65.68          | -18        | 47.68          | 74.00          | 26.32       | PK+  | V    |
| 4   | 4489.500    | 55.33          | -11.96     | 43.37          | 74.00          | 30.63       | PK+  | V    |
| 5   | 9952.500    | 50.81          | -6.33      | 44.48          | 74.00          | 29.52       | PK+  | V    |
| 6   | 16251.000   | 47.99          | -0.6       | 47.39          | 74.00          | 26.61       | PK+  | V    |

Note: [Margin=Limit-Meas.]; [Meas.=Reading+Corr. ]

|        |                   |
|--------|-------------------|
| Mode:  | 919.2MHz          |
| Power: | Battery 3.7V      |
| TE:    | Berny             |
| Date   | 2024/9/27         |
| T/A/P  | 22.1°C/51%/101Kpa |



### Critical\_Freqs

| No. | Freq. (MHz) | Reading (dBµV) | Corr. (dB) | Meas. (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Det. | Pol. |
|-----|-------------|----------------|------------|----------------|----------------|-------------|------|------|
| 1   | 1838.000    | 64.56          | -19.74     | 44.82          | 74.00          | 29.18       | PK+  | H    |
| 2   | 4396.500    | 55.30          | -11.92     | 43.38          | 74.00          | 30.62       | PK+  | H    |
| 3   | 6063.000    | 52.59          | -7.98      | 44.61          | 74.00          | 29.39       | PK+  | H    |
| 4   | 10669.500   | 48.29          | -5.14      | 43.15          | 74.00          | 30.85       | PK+  | H    |
| 5   | 16254.000   | 47.34          | -0.68      | 46.66          | 74.00          | 27.34       | PK+  | H    |
| 6   | 17671.500   | 47.20          | 0.28       | 47.48          | 74.00          | 26.52       | PK+  | H    |

Note: [Margin=Limit-Meas.]; [Meas.=Reading+Corr. ]

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



## 9. AC POWER LINE CONDUCTED EMISSION

### LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISCED RSS-Gen Clause 8.8.

| FREQUENCY (MHz) | Quasi-peak | Average   |
|-----------------|------------|-----------|
| 0.15 -0.5       | 66 - 56 *  | 56 - 46 * |
| 0.50 -5.0       | 56.00      | 46.00     |
| 5.0 -30.0       | 60.00      | 50.00     |

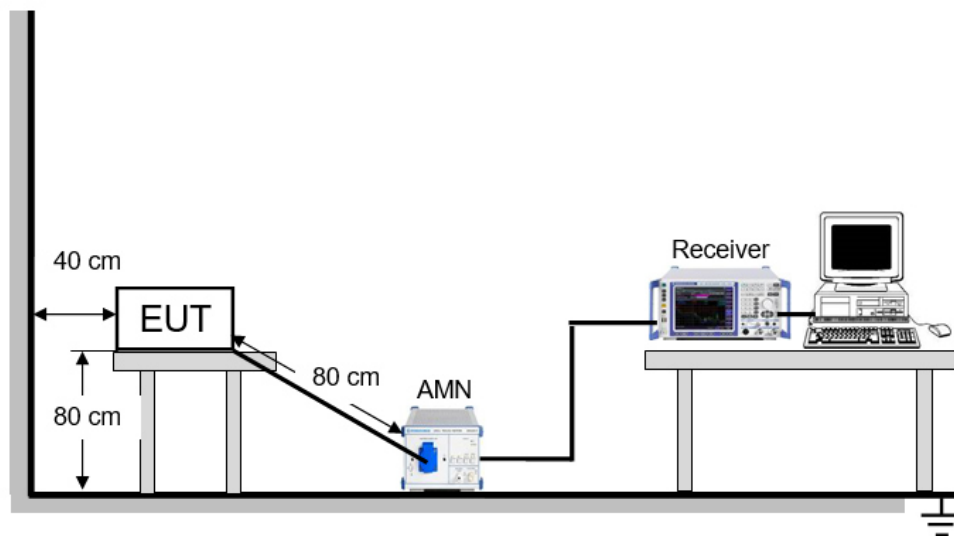
### TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver is used to test the emissions from the AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

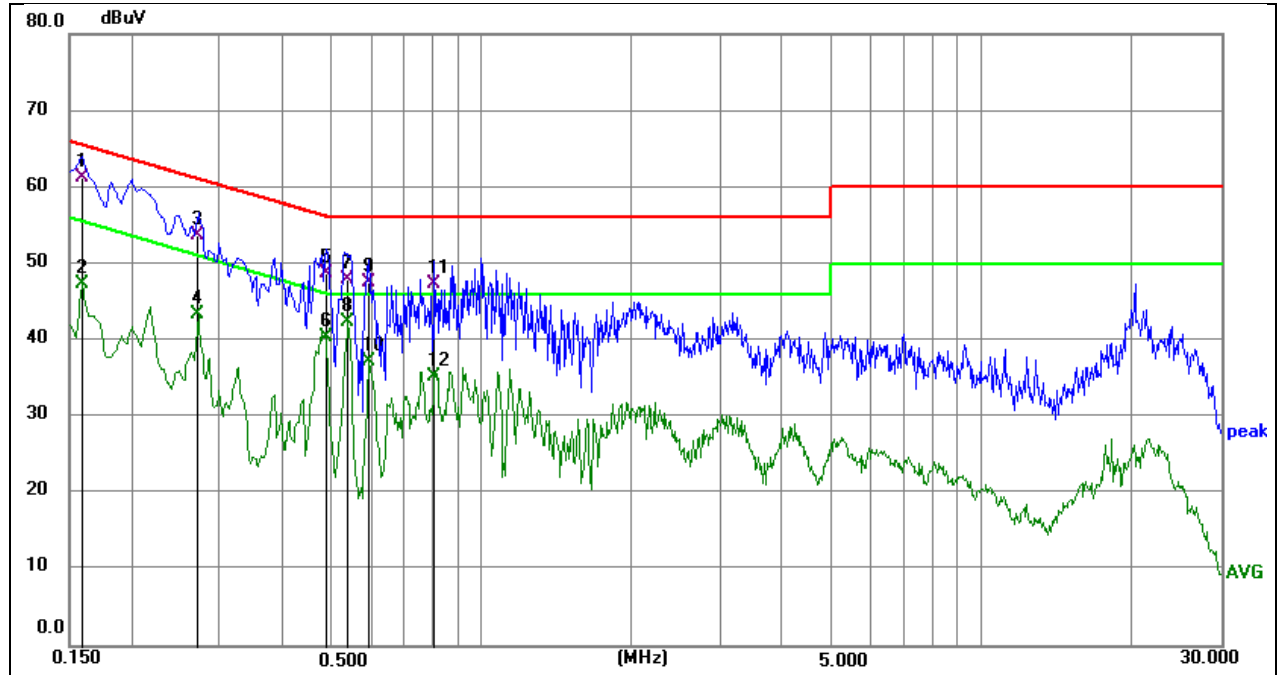
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

### TEST SETUP



### TEST ENVIRONMENT

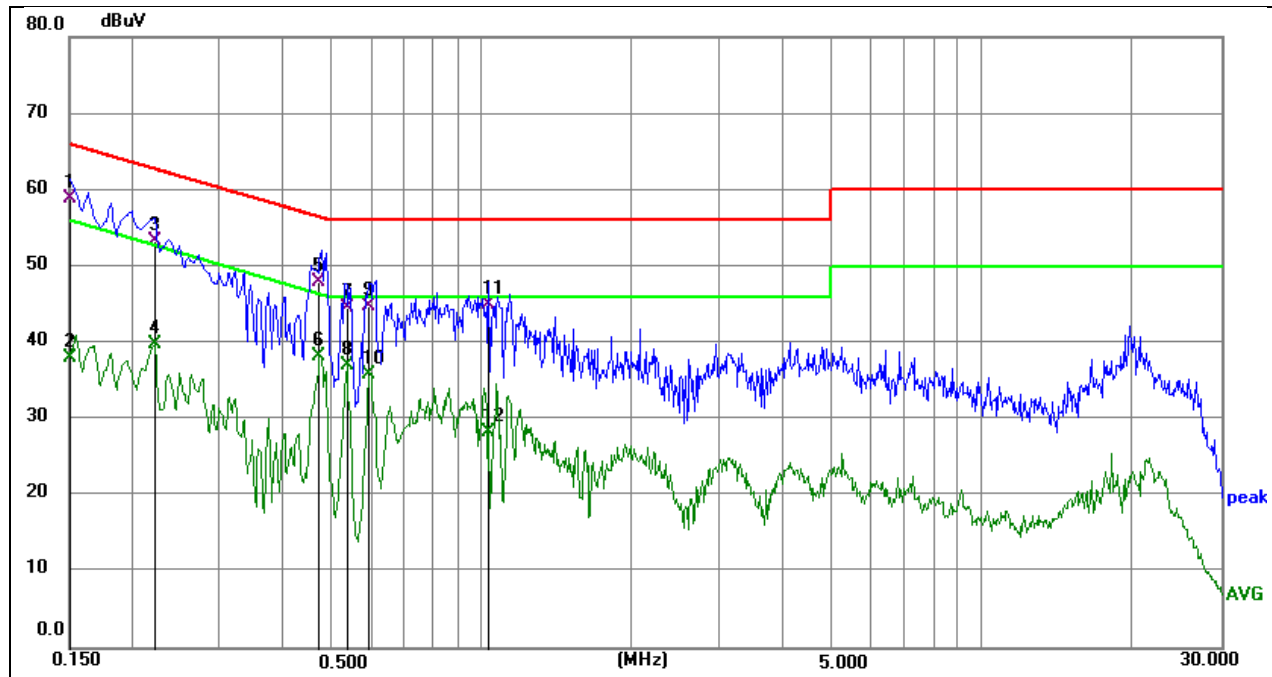
|                     |        |                   |     |
|---------------------|--------|-------------------|-----|
| Temperature         | 23.2°C | Relative Humidity | 52% |
| Atmosphere Pressure | 101kPa |                   |     |

**TEST RESULTS**

Phase: N

Mode: 919.2MHz

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1   | 0.1590             | 51.18             | 9.97            | 61.15            | 65.52           | -4.37          | QP     |
| 2   | 0.1590             | 37.33             | 9.97            | 47.30            | 55.52           | -8.22          | AVG    |
| 3   | 0.2714             | 43.81             | 9.90            | 53.71            | 61.07           | -7.36          | QP     |
| 4   | 0.2714             | 33.47             | 9.90            | 43.37            | 51.07           | -7.70          | AVG    |
| 5   | 0.4875             | 38.72             | 9.97            | 48.69            | 56.21           | -7.52          | QP     |
| 6   | 0.4875             | 30.43             | 9.97            | 40.40            | 46.21           | -5.81          | AVG    |
| 7   | 0.5415             | 37.94             | 9.99            | 47.93            | 56.00           | -8.07          | QP     |
| 8   | 0.5415             | 32.39             | 9.99            | 42.38            | 46.00           | -3.62          | AVG    |
| 9   | 0.5955             | 37.55             | 10.00           | 47.55            | 56.00           | -8.45          | QP     |
| 10  | 0.5955             | 27.29             | 10.00           | 37.29            | 46.00           | -8.71          | AVG    |
| 11  | 0.8070             | 37.31             | 10.04           | 47.35            | 56.00           | -8.65          | QP     |
| 12  | 0.8070             | 25.12             | 10.04           | 35.16            | 46.00           | -10.84         | AVG    |



Phase: L1

Mode: 919.2MHz

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1   | 0.1500             | 49.04             | 9.90            | 58.94            | 66.00           | -7.06          | QP     |
| 2   | 0.1500             | 28.14             | 9.90            | 38.04            | 56.00           | -17.96         | AVG    |
| 3   | 0.2220             | 43.33             | 9.88            | 53.21            | 62.74           | -9.53          | QP     |
| 4   | 0.2220             | 29.86             | 9.88            | 39.74            | 52.74           | -13.00         | AVG    |
| 5   | 0.4740             | 38.11             | 9.83            | 47.94            | 56.44           | -8.50          | QP     |
| 6   | 0.4740             | 28.47             | 9.83            | 38.30            | 46.44           | -8.14          | AVG    |
| 7   | 0.5370             | 34.67             | 9.90            | 44.57            | 56.00           | -11.43         | QP     |
| 8   | 0.5370             | 27.11             | 9.90            | 37.01            | 46.00           | -8.99          | AVG    |
| 9   | 0.5979             | 34.80             | 10.00           | 44.80            | 56.00           | -11.20         | QP     |
| 10  | 0.5979             | 25.76             | 10.00           | 35.76            | 46.00           | -10.24         | AVG    |
| 11  | 1.0320             | 34.85             | 10.04           | 44.89            | 56.00           | -11.11         | QP     |
| 12  | 1.0320             | 18.31             | 10.04           | 28.35            | 46.00           | -17.65         | AVG    |

Note: 1. Result = Reading + Correct Factor.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).

4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

## 10. ANTENNA REQUIREMENT

### REQUIREMENT

Please refer to FCC §15.203

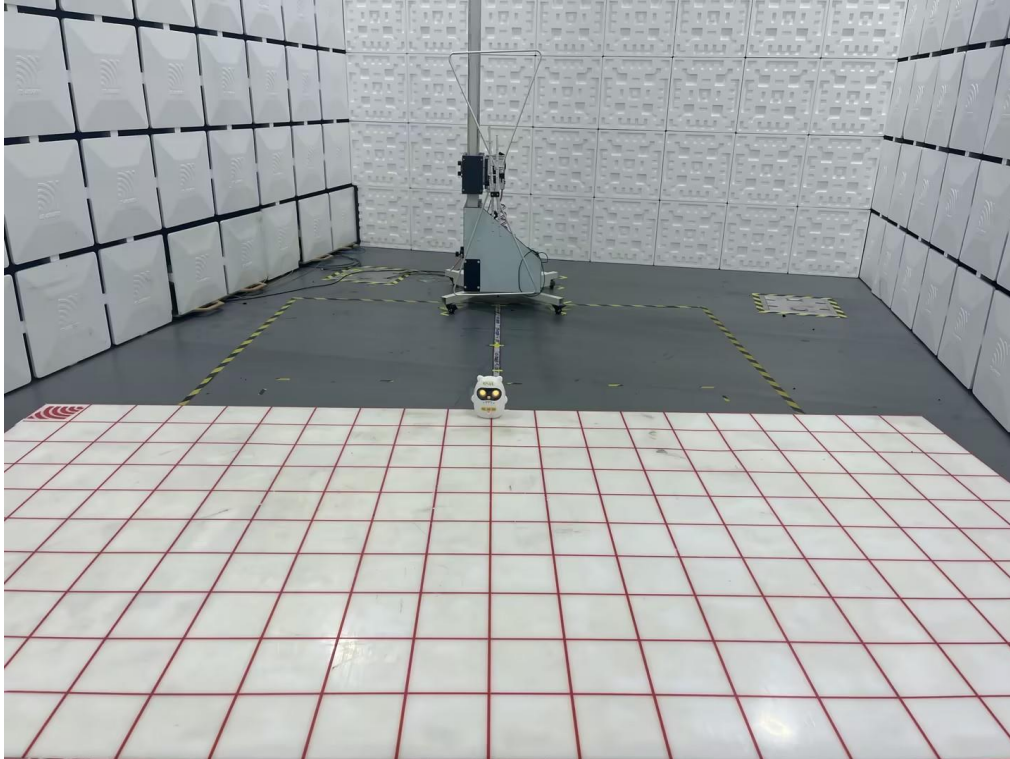
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply 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.

### DESCRIPTION

Pass

## APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION

### Radiated Spurious Emission



**AC Power Line Conducted Emission**



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**END OF REPORT**