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# TEST REPORT

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Report No.: SRTC2020-9003(R)-0049  
Product Name: Notification Pager Receiver  
Model Name: P0004930100R  
Applicant: SoftBank Robotics Corp.  
Manufacturer: SoftBank Robotics Corp.  
Specification: RSS-Gen (Issue 5, Amendment 1, March 2019)  
IC ID: 25110-P000493010R

The State Radio\_monitoring\_center Testing Center (SRTC)  
15th Building, No.30 Shixing Street, Shijingshan District,  
Beijing, China

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## CONTENTS

|                                                   |    |
|---------------------------------------------------|----|
| 1. General information .....                      | 3  |
| 1.1 Notes of the test report .....                | 3  |
| 1.2 Information about the testing laboratory..... | 3  |
| 1.3 Applicant's details .....                     | 3  |
| 1.4 Manufacturer's details.....                   | 3  |
| 1.5 Application details .....                     | 4  |
| 1.6 Reference specification.....                  | 4  |
| 1.7 Information of EUT .....                      | 4  |
| 1.7.1 General information.....                    | 4  |
| 1.7.2EUT details .....                            | 5  |
| 1.7.3 Auxiliary equipment details.....            | 5  |
| 2. Test information .....                         | 6  |
| 2.1 Summary of the test results .....             | 6  |
| 2.2 Test result.....                              | 7  |
| 2.2.1Conducted Emissions- RSS-GEN.7.2 .....       | 7  |
| 2.2.2RadiatedEmissions- RSS-GEN.7.3 .....         | 10 |
| 2.3. List of test equipments .....                | 14 |

## 1. General information

### 1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

### 1.2 Information about the testing laboratory

Company: The State Radio\_monitoring\_center Testing Center (SRTC)  
Address: 15th Building, No.30 Shixing Street, Shijingshan District  
Testing location: No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.  
City: Beijing  
Country or Region: China  
Contacted person: Liu Jia  
Tel: +86 10 57996183  
Fax: +86 10 57996388  
Email: liujiaf@srtc.org.cn

### 1.3 Applicant's details

Company: SoftBank Robotics Corp.  
Address: 1-9-2 Higashi-shimbashi, Minato-ku, Tokyo, Japan  
City: Tokyo  
Country or Region: Japan  
Contacted person: Huijun Wang  
Tel: 81-3-6889-2450  
Email: huijun.wang@g.softbank.co.jp

### 1.4 Manufacturer's details

Company: SoftBank Robotics Corp.  
Address: 1-9-2 Higashi-shimbashi, Minato-ku, Tokyo, Japan  
City: Tokyo  
Country or Region: Japan  
Contacted person: Huijun Wang  
Tel: 81-3-6889-2450  
Email: huijun.wang@g.softbank.co.jp

## 1.5 Application details

Date of reception of test sample: 3<sup>th</sup> Aug. 2020

Date of test: 3<sup>th</sup> Aug. 2020 to 12<sup>th</sup> Aug. 2020

## 1.6 Reference specification

RSS-Gen—General Requirements for Compliance of Radio Apparatus(Issue 5, Amendment 1, March 2019)

## 1.7 Information of EUT

### 1.7.1 General information

|                            |                                  |
|----------------------------|----------------------------------|
| Name of EUT                | Notification Pager Receiver      |
| Model Name                 | P0004930100R                     |
| FCC ID                     | 2ATI9-P0004930100R               |
| Frequency Range            | Lora: 902-928MHz                 |
| Equipment Class            | Class B                          |
| Power Supply               | Battery or Charger               |
| Rated Power Supply Voltage | 5.0V                             |
| Extreme Temperature        | Lowest: 0°C<br>Highest: 45°C     |
| Extreme Voltage            | Minimum: 4.75V    Maximum: 5.25V |
| HW Version                 | V1.1.0                           |
| SW Version                 | 1.1                              |

### 1.7.2 EUT details

| Product Name                | Model Name   | IMEI |
|-----------------------------|--------------|------|
| Notification Pager Receiver | P0004930100R | /    |

### 1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: USB Cable

|              |                            |
|--------------|----------------------------|
| Manufacturer | YUQIU ELECTRONICS CO.,LTD. |
| Model Number | 1301187-00000-01           |

AE (Auxiliary Equipment) 2#: Battery

|              |                            |
|--------------|----------------------------|
| Type         | Li-Lon                     |
| Manufacturer | APACK TECHNOLOGY CO., LTD. |
| Model Number | APP00332                   |

AE (Auxiliary Equipment) 3#: Charger

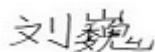
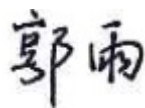
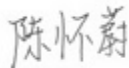
|              |                                  |
|--------------|----------------------------------|
| Manufacturer | JIANGSU CHENYANG ELECTRON CO LTD |
| Model Number | SP-11N1201250-Z                  |

Note1: The EUT is sold without power adapter. The Charger (AE3) was provided by laboratory. Just for test.

## 2. Test information

### 2.1 Summary of the test results

| No. | Test case           | FCC reference | Verdict |
|-----|---------------------|---------------|---------|
| 1   | Conducted emissions | 15.107        | Pass    |
| 2   | Radiated emissions  | 15.109        | Pass    |

|                                                                                                                                                |                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Approved By: Liu Wei<br>Director of the test department<br> | Checked By: Guo Yu<br>Vice director of the test department<br> |
| Tested By:<br>Mr Chen Huaiwei<br>                           | Issued date:<br>2020.08.12                                                                                                                          |

## 2.2 Test result

### 2.2.1 Conducted Emissions- RSS-GEN.7.2

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25.5°C      | 41.2%             | 101.2kPa |

Test Setup with charger:

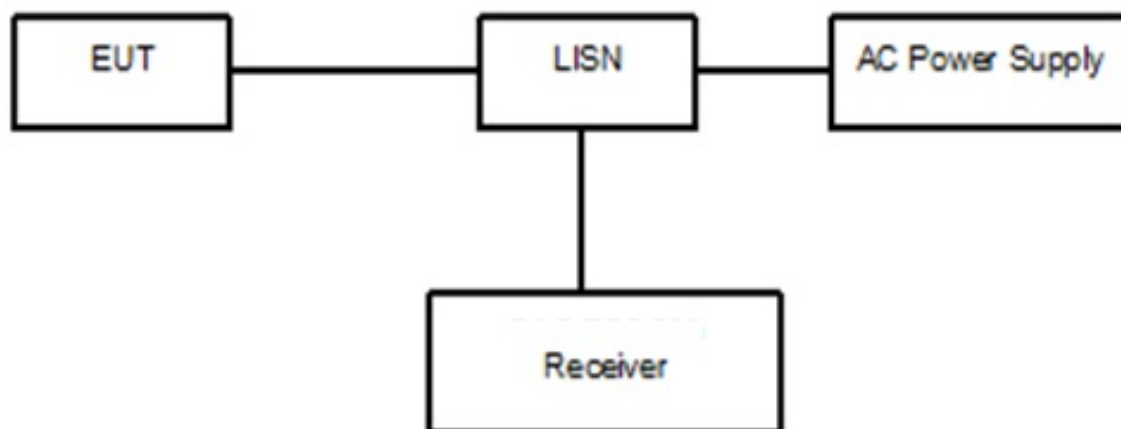


Figure 2

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. The LISN is connected to the reference ground. The EUT was working at charging mode.

The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

A "reference path loss" Corr.(dB) is established and the  $L_{\text{cable}} + \text{ATT} + \text{VDF}$  is the attenuation of "reference path loss", and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation:  $(29.85 \text{ dB}\mu\text{V}) = (0.15 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$ , the corresponding frequency is 0.593486MHz.

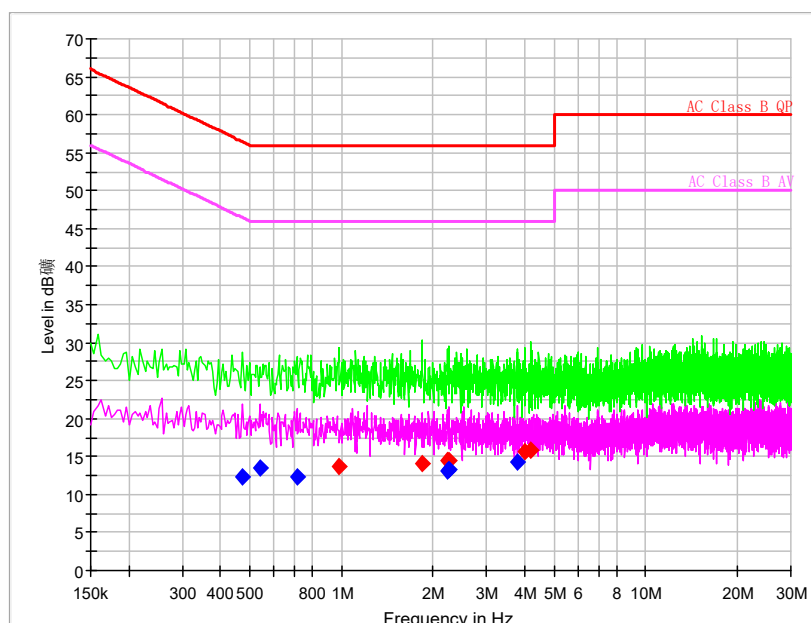
Limit:

| Frequency of Emission(MHz) | Limits(dB $\mu$ V) |           |
|----------------------------|--------------------|-----------|
|                            | Quasi-peak         | Average   |
| 0.15~0.5                   | 66 to 56*          | 56 to 46* |
| 0.5~5                      | 56                 | 46        |
| 5~30                       | 60                 | 50        |

Note: \* Decreases with the logarithm of the frequency

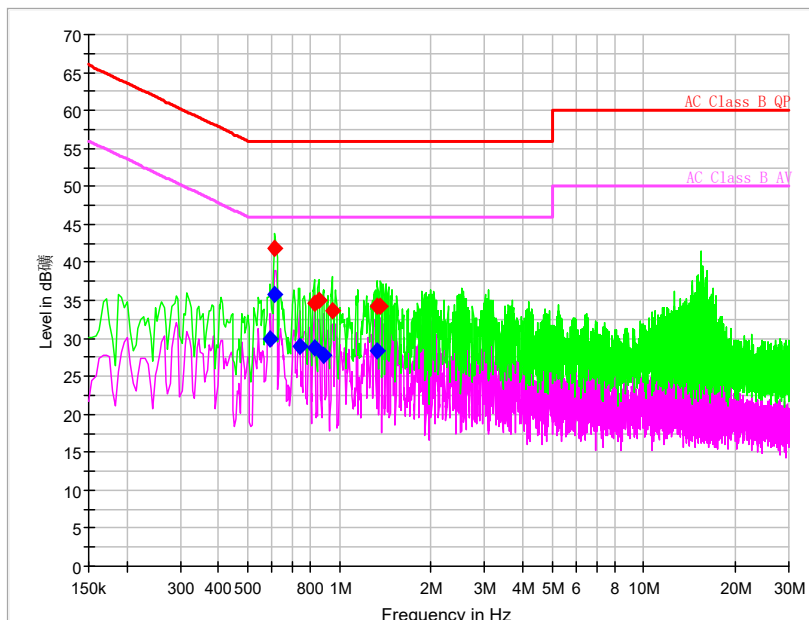
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

EUT+1#USB Cable+2#Battery +3#Charger:



Pic2. Conducted emission L&N Line

| Frequency (MHz) | QuasiPeak (dBμV) | Average (dBμV) | Limit (dBμV) | Margin (dB) | Line | Corr. (dB) | Pmea QuasiPeak (dBμV) | Pmea Average (dBμV) |
|-----------------|------------------|----------------|--------------|-------------|------|------------|-----------------------|---------------------|
| 0.593486        | ---              | 29.85          | 46.00        | 16.15       | L    | 29.7       | ---                   | 0.15                |
| 0.614807        | ---              | 35.84          | 46.00        | 10.16       | L    | 29.7       | ---                   | 6.14                |
| 0.614807        | 41.92            | ---            | 56.00        | 14.08       | L    | 29.7       | 12.22                 | ---                 |
| 0.738471        | ---              | 28.95          | 46.00        | 17.05       | L    | 29.7       | ---                   | -0.75               |
| 0.828021        | ---              | 28.65          | 46.00        | 17.35       | L    | 29.7       | ---                   | -1.05               |
| 0.828021        | 34.62            | ---            | 56.00        | 21.38       | L    | 29.7       | 4.92                  | ---                 |
| 0.853607        | 35.01            | ---            | 56.00        | 20.99       | L    | 29.7       | 5.31                  | ---                 |
| 0.887721        | ---              | 27.74          | 46.00        | 18.26       | N    | 29.7       | ---                   | -1.96               |
| 0.947421        | 33.69            | ---            | 56.00        | 22.31       | L    | 29.7       | 3.99                  | ---                 |
| 1.331207        | 34.12            | ---            | 56.00        | 21.88       | N    | 29.7       | 4.42                  | ---                 |
| 1.335471        | ---              | 28.44          | 46.00        | 17.56       | N    | 29.7       | ---                   | -1.26               |
| 1.365321        | 34.26            | ---            | 56.00        | 21.74       | L    | 29.7       | 4.56                  | ---                 |

## 2.2.2 Radiated Emissions- RSS-GEN.7.3

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25.5°C      | 41.2%             | 101.2kPa |

Test Setup:

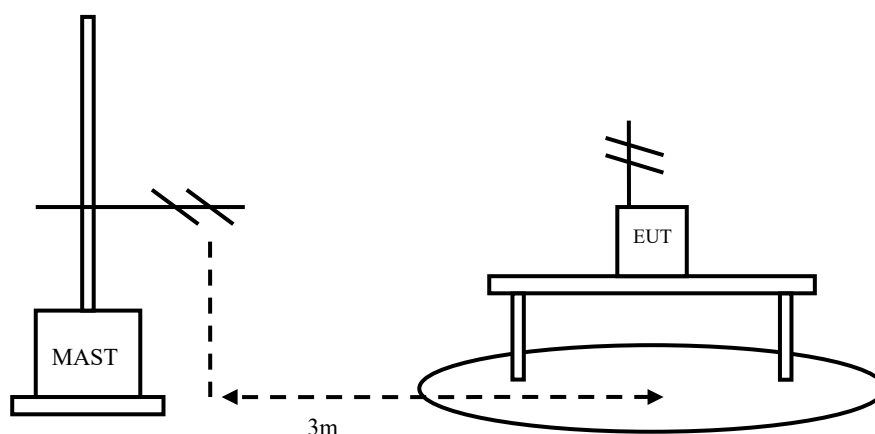


Figure 2

Test Procedure:

EUT+ charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters.

The EUT should work in charging mode and Receiver mode. The EUT is connected with the charger. The test set-up and the test methods are performed according to ANSI C63.4:2014.

Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna VULB 9163.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow:  
1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: 30MHz<f<1GHz

RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

A “reference path loss” is established and the  $A_{Rpl}$  is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

Result=  $P_{mea} + A_{Rpl}$

Limit:

| Frequency of Emission(MHz)                                              | Limits     |                     |
|-------------------------------------------------------------------------|------------|---------------------|
|                                                                         | Detector   | Unit (dB $\mu$ V/m) |
| 30~88                                                                   | Quasi-peak | 40                  |
| 88~216                                                                  | Quasi-peak | 43.5                |
| 216~960                                                                 | Quasi-peak | 46                  |
| 960~1000                                                                | Quasi-peak | 54                  |
| 1000~5th harmonic of the highest frequency or 40GHz, whichever is lower | Average    | 54                  |
|                                                                         | Peak       | 74                  |

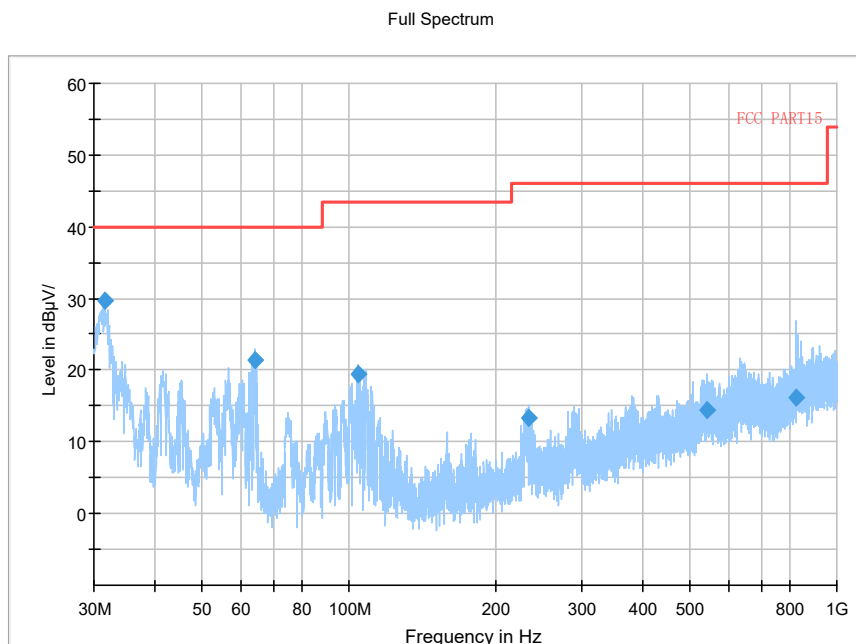
Test result:

Sample calculation: (29.69 dB  $\mu$  V/m) = (50.39 dB  $\mu$  V/m) + (-20.7 dB), the corresponding frequency is 31.503500MHz.

EUT+1#USB Cable+2#Battery +3#Charger:

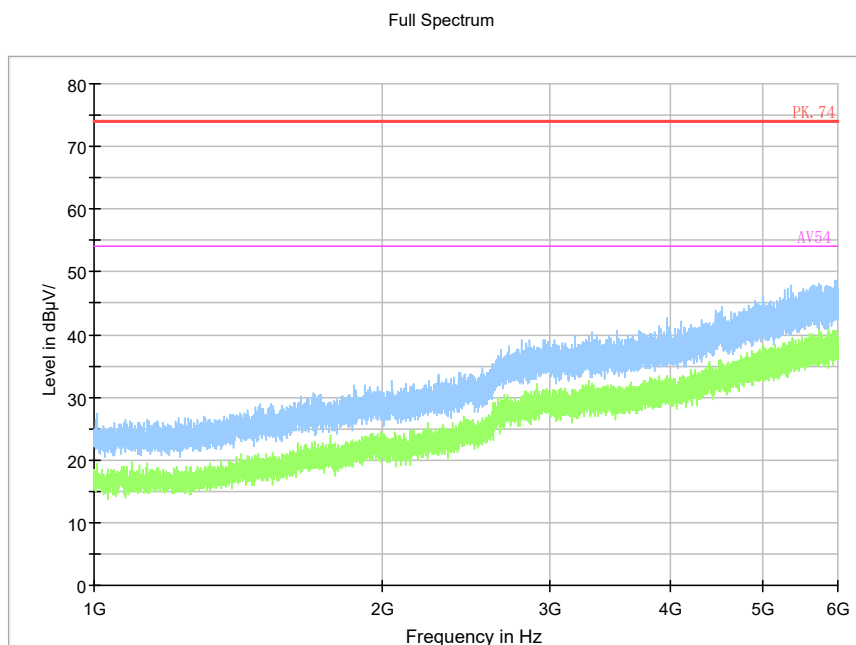
| Frequency(MHz) | Result( dB $\mu$ V/m ) | Limit (dB $\mu$ V/m) | $A_{Rpl}$ (dB) | $P_{mea}$ ( dB $\mu$ V/m ) | Polarity |
|----------------|------------------------|----------------------|----------------|----------------------------|----------|
| 31.503500      | 29.69                  | 40.00                | -20.7          | 50.39                      | V        |
| 64.144000      | 21.44                  | 40.00                | -19.8          | 41.24                      | V        |
| 104.302000     | 19.44                  | 43.50                | -19.0          | 38.44                      | V        |
| 233.409000     | 13.35                  | 46.00                | -17.0          | 30.35                      | V        |
| 542.742000     | 14.34                  | 46.00                | -8.1           | 22.44                      | V        |
| 827.825000     | 16.19                  | 46.00                | -2.8           | 18.99                      | V        |

EUT+1#USB Cable+2#Battery +3#Charger: refer to Pic3, Pic4, Pic5



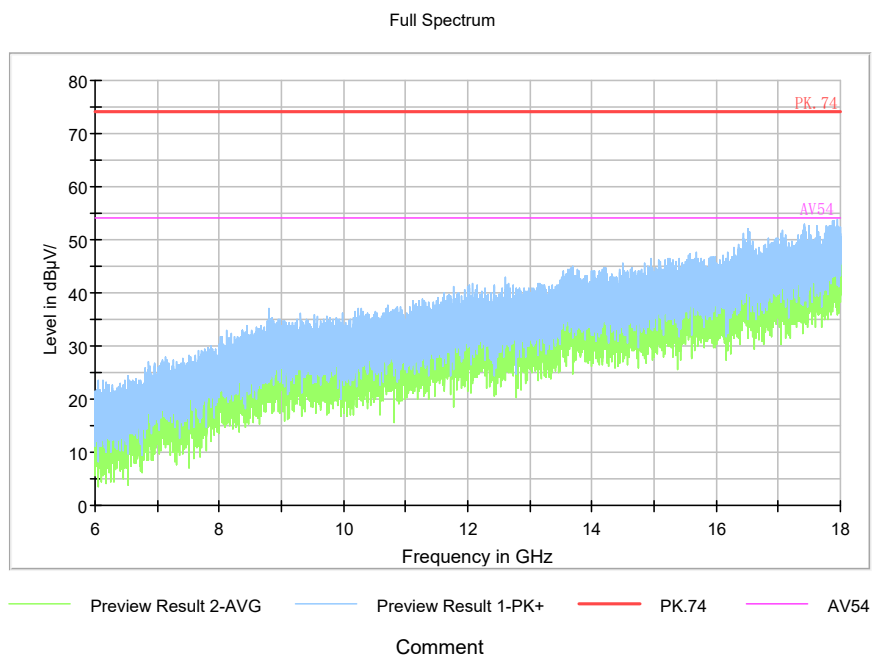
Pic3. Radiated emission(30MHz – 1GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic4. Radiated emission (1GHz –6GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical.



Pic5. Radiated emission (6GHz –18GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical.

## 2.3. List of test equipments

| No. | Name/Model                                     | Manufacturer | S/N              | Calibration Due Date | Calibration Date  |
|-----|------------------------------------------------|--------------|------------------|----------------------|-------------------|
| 1   | 23.18m×16.88m×9.60mS<br>emi-AnechoicChamber    | FRANKONIA    | -----            | 5th Sep.<br>2021     | 6th Sep.<br>2016  |
| 2   | ESW EMI test receiver                          | R&S          | 101574           | 20th Aug.<br>2020    | 20th Aug.<br>2019 |
| 3   | 9.080m×5.255m×3.525m<br>Shielding room         | FRANKONIA    | -----            | 5th Sep.<br>2021     | 6th Sep.<br>2016  |
| 4   | ESR3 EMI test receiver                         | R&S          | 102361           | 21th Apr.<br>2021    | 20th Apr.<br>2020 |
| 5   | VULB 9163 Ultra log test<br>antenna            | schwarzbeck  | 867              | 25th Mar.<br>2021    | 25th Mar.<br>2020 |
| 6   | ENV216 AMN                                     | R&S          | 3560.6550.<br>12 | 20th Aug.<br>2020    | 20th Aug.<br>2019 |
| 7   | HF 907 Double-Ridged<br>Waveguide Horn Antenna | R&S          | 100512           | 25th Mar.<br>2021    | 25th Mar.<br>2020 |
| 8   | PS2000 Turn Table                              | FRANKONIA    | -----            | -----                | -----             |
| 9   | MA260 Antenna Master                           | FRANKONIA    | -----            | -----                | -----             |
| 10  | EMC32EMI test software                         | R&S          | -----            | -----                | -----             |