



No.:  
**FCCSZ2024-0031-EMC**

## TEST REPORT

**FCC ID** : 2ALG8BSLB

**NAME OF SAMPLE** : BEE LABEL

**APPLICANT** : Roambee Corporation

**CLASSIFICATION OF TEST** : N/A

**CVC Testing Technology (Shenzhen) Co., Ltd.**



<b>Applicant</b>	Name: Roambee Corporation  Address: 3120 De La Cruz Blvd Suite 210 Santa Clara CA 95054 United States		
<b>Manufacturer</b>	Name: AOVX WIRELESS SOLUTIONS CO.,LTD  Address: Room 501, BlockA1, ZhongAn Valley, 900 Wangjiang West Road, High-tech Zone, HeFei, China 230088		
<b>Equipment Under Test</b>	Product Name: BEE LABEL  Model/Type: BS-LB-01,BS-LB-02  Brand Name: Roambee  Serial NO.: N/A  Sample NO.:3-1		
Date of Receipt.	2024.04.17	Date of Testing	2024.04.17 ~ 2024.05.17
Test Specification	Test Result		
FCC Part 15, Subpart B, Class B	PASS		
<b>Evaluation of Test Result</b>	The equipment under test was found to comply with the requirements of the standards applied.		
	Seal of CVC  Issue Date: 2024.05.17		
Tested by:  Cai Jianyu Name Signature	Tested by:  Mo Xianbiao Name Signature	Approved by:  Dong Sanbi Name Signature	
<b>Other Aspects: NONE.</b>			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCCSZ2024-0031-EMC	Original release	2024.05.17



## 1. SUMMARY OF TEST RESULTS

EMISSION			
Standard	Test Item	Result	Remarks
FCC Part 15, Subpart B, Class B	Radiated Test (30MHz~ 1GHz)	PASS	Minimum passing margin is 13.53dB at 938.690MHz
	Radiated Test (Above 1GHz)	PASS	Minimum passing margin is 14.55dB at 17020.902MHz

### 1.1 List of Test and Measurement Instruments

Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
Radiation Spurious					
EMI Test Receiver	Rohde&Schwarz	ESR 26	101718	1 year	2024.5.25
Loop antenna (8.3k~30MHz)	Rohde&Schwarz	HFH2-Z2E	100951	1 year	2024.5.26
Antenna(30MHz~1000MHz)	SCHWARZBECK	VULB 9168	1132	1 year	2025.2.13
Horn antenna(1GHz-18GHz)	ETS	3117	227634	1 year	2025.3.24
Horn antenna(18GHz-40GHz)	SCHWARZBECK	BBHA 9170	01003	1 year	2025.3.24
3m anechoic chamber	MORI	966	CS0200019	3 year	2026.5.18
#1 control room	MORI	433	CS0300028	3 year	2026.5.16
Temperature and humidity meter	/	C193561473	CS0200071	1 year	2024.5.21



## 1.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

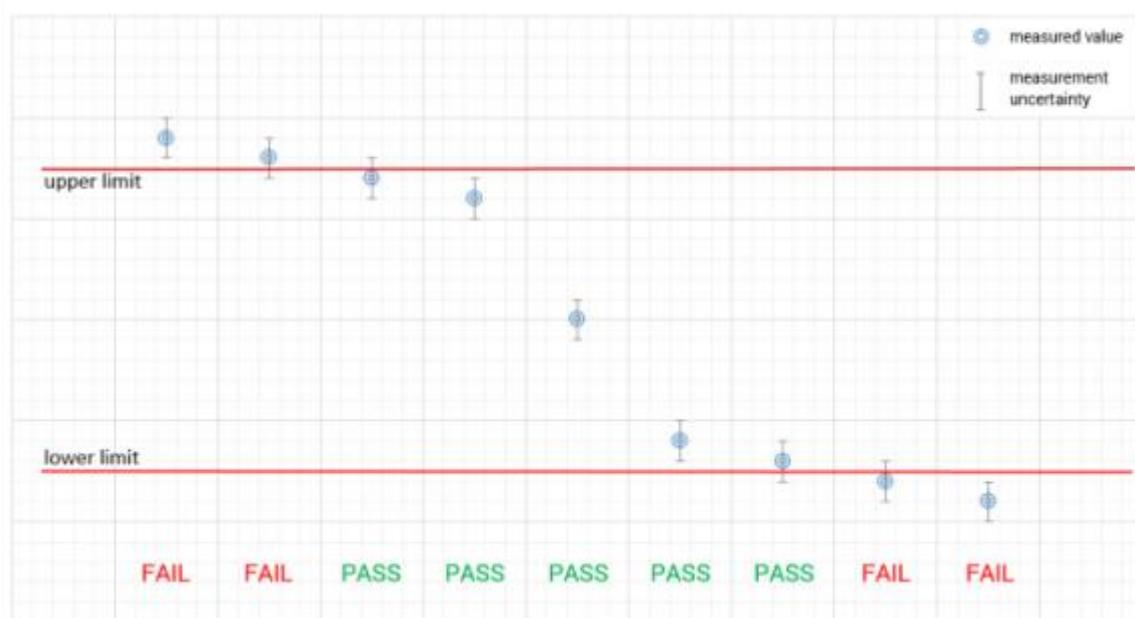
No.	Item	Measurement Uncertainty
1	Conducted emission test	+/- 2.7 dB
2	Radiated emission 30MHz-1GHz	+/- 4.6 dB
3	Radiated emission 1GHz-18GHz	+/- 4.4 dB
4	Volatage fluctuations and flicker	$\pm 1.4 \%$

**Remark: 95% Confidence Levels, k=2.**

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed.

The measurement uncertainty is mentioned in this test report, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

measured value, measurement uncertainty, verdict



## 1.3 Test Location

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

Lab Address: No. 1301, Guanguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen City, Guangdong Province 518110 P.R.China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

FCC(Test firm designation number: CN1363)

IC(Test firm CAB identifier number: CN0137)

CNAS(Test firm designation number: L16091)



## 2. GENERAL INFORMATION

### 2.1 General Product Information

PRODUCT	BEE LABEL
BRAND	Roambee
TEST MODEL	BS-LB-01
ADDITIONAL MODEL	BS-LB-02
POWER SUPPLY	DC 3V from battery
HARDWARE VERSION:	1.3
SOFTWARE VERSION:	V1.2.3:v10_RB
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

Remark:

1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. EUT photo refer to the report (Report NO.: FCCSZ2024-0031-EUT).

### 2.2 Description of Accessories

N/A

### 2.3 Additional Model/Type

Main Model No.	Serial Model No.	Difference
BS-LB-01	BS-LB-02	All the models are electrical identical including the same software parameter and hardware design (circuit design, PCB Layout, RF module/circuit, antenna type(s) and antenna location comonents on PCB and the power supply), same mechanical structure and design (including product enclosure, materials), the only difference is the model name, and the sensor used for temperature



## 2.4 Independent Operation Modes

The EUT were tested under the following modes, the final worst mode was marked in boldface and recorded in this report.

EMISSION Test Modes		
For Radiated Emission Tests		
	Test Mode	Test Voltage
1	BS-LB-01 + Normal Working + LTE Link + GNSS IDLE	DC 3V from battery
2	BS-LB-02 + Normal Working + LTE Link + GNSS IDLE	DC 3V from battery

Remark: The above test modes in boldface were the worst cases, only the test data of these modes were reported.

## 2.5 General Description of Applied Standards

According to the specifications of the manufacturers, the EUT must comply with the requirements of the following standards:

**FCC PART 15, SUBPART B, CLASS B**

**ANSI C63.4:2014**

All test items have been performed and recorded as per the above standards.

## 2.6 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support Equipment					
NO	Description	Brand	Model No.	Serial Number	Supplied by
N/A	N/A	N/A	N/A	N/A	N/A



## 3. EMISSION

### 3.1 Radiated emission

#### 3.1.1 Limits Of Radiated

TEST STANDARD:

FCC Part 15, Subpart B (Section: 15.109), for above 1GHz(section 3.2.2 Table 4)

FCC Part 15, Subpart B

Frequency (MHz)	Distance (m)	Class A (dBuV)	Class B (dBuV)
30 - 88	3	QP: 49.5	QP: 40
88 - 216	3	QP: 54	QP: 43.5
216 - 960	3	QP: 56.9	QP: 46
960-1000	3	QP: 60	QP: 54
Above 1000	3	Avg: 60 Peak: 80	Avg: 54 Peak: 74

NOTE: 1. The lower limit shall apply at the transition frequencies.

NOTE: 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

NOTE: 3. All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



## 3.1.2 Test Procedures

The basic test procedure was in accordance with ANSI C63.4:2014 (section 12).

### **1. From 30 MHz to 1GHz test procedure as below:**

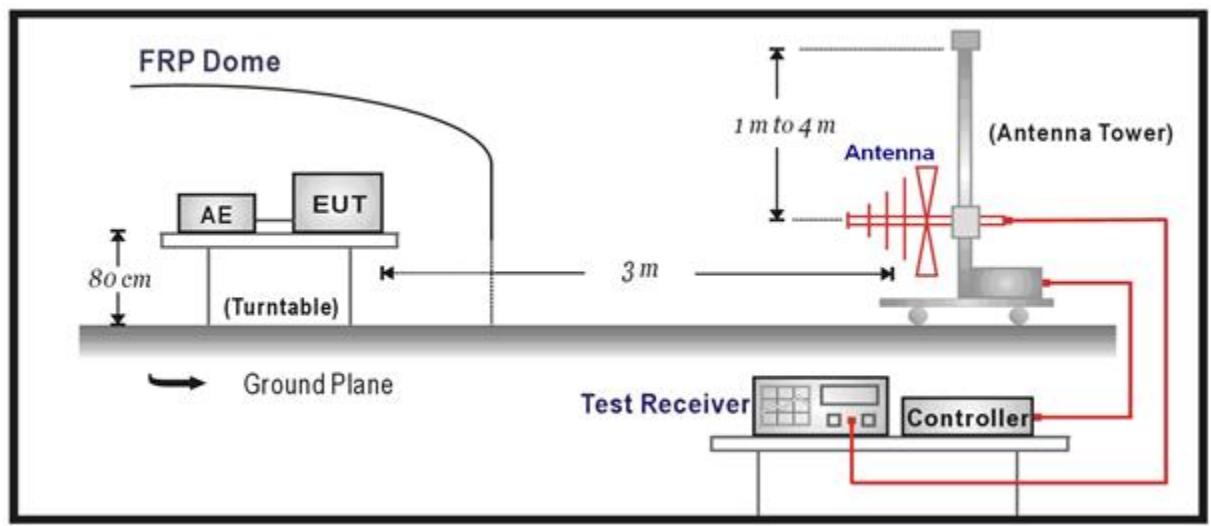
- 1) The radiated emissions were tested in a semi-anechoic chamber.
- 2) The Product was placed on the non-conductive turntable 0.1 m above the ground at a chamber.
- 3) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 4) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

### **2. Above 1GHz test procedure as below:**

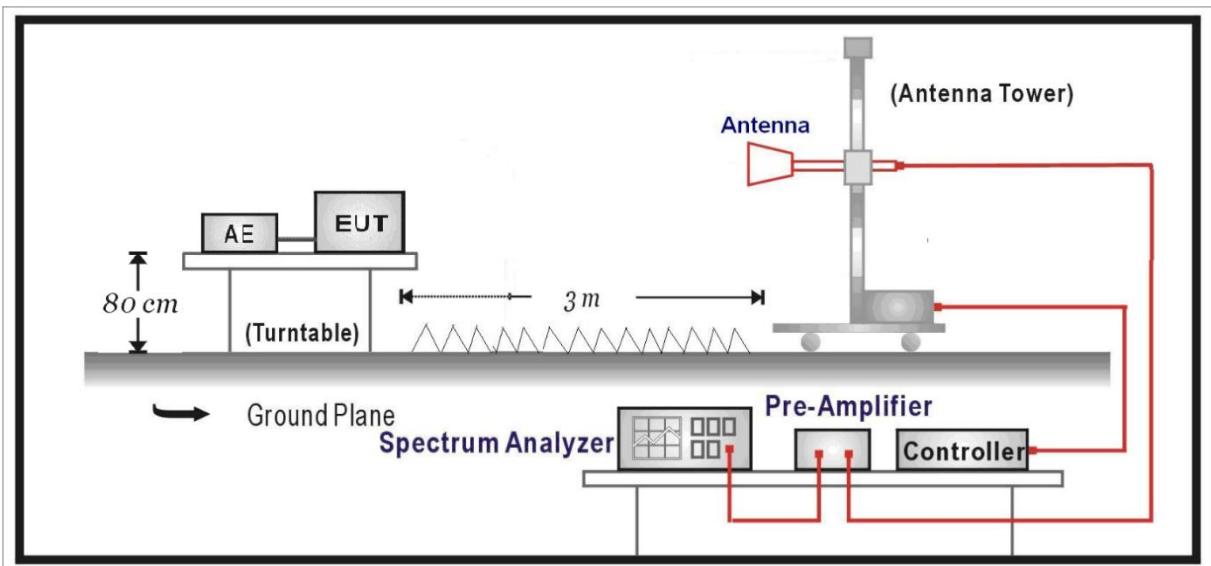
- 1) The radiated emissions were tested in a fully Anechoic Chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

### 3.1.3 Test Setup

Below 1GHz Test Setup:



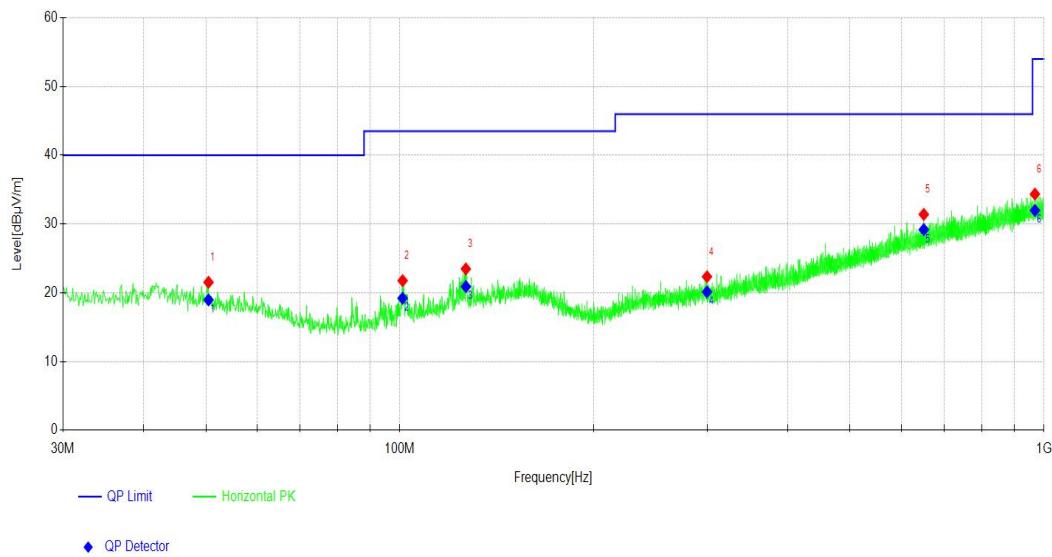
Above 1GHz Test Setup:



### 3.1.4 Test Results (Below 1GHz)

<b>Test Mode</b>	See section 2.4	<b>Frequency Range</b>	30-1000MHz
<b>Test Voltage</b>	See section 2.4	<b>Detector Function</b>	Quasi-Peak(QP)
<b>Environmental Conditions</b>	25.7deg. C,52% RH	<b>Tested By</b>	Zhou Ye

#### Horizontal



NO.	Freq. [MHz]	Reading [dB $\mu$ V]	Factor [dB/m]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]
1	50.469	-0.56	19.52	18.96	40.00	21.04	100	338
2	101.011	2.34	16.86	19.20	43.50	24.30	100	329
3	126.622	1.69	19.21	20.90	43.50	22.60	200	238
4	299.784	0.35	19.78	20.13	46.00	25.87	200	58
5	650.668	2.46	26.73	29.19	46.00	16.81	200	216
6	968.084	1.79	30.19	31.98	54.00	22.02	200	167

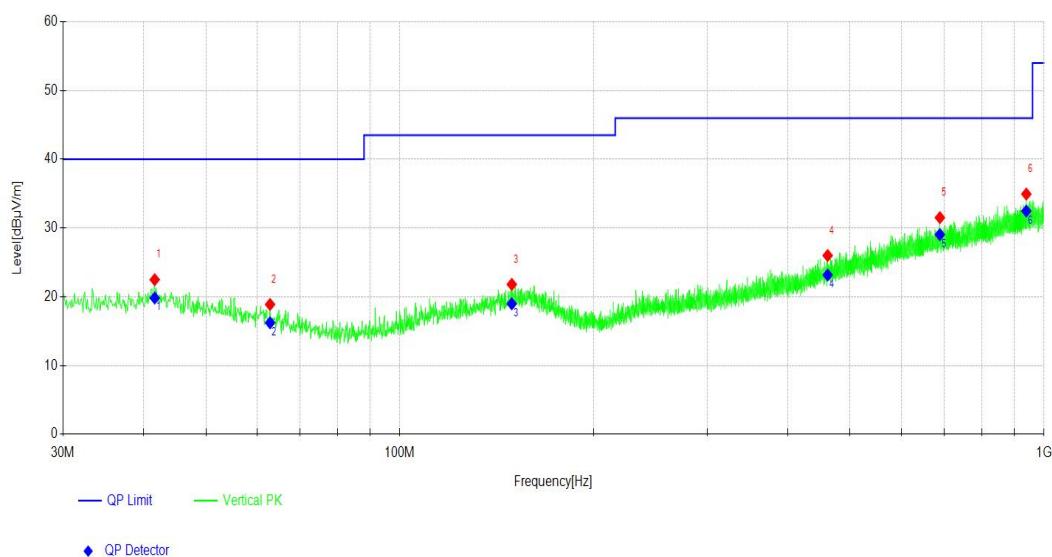
Remark: 1. The emission levels of other frequencies were greater than 20dB margin.

2. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).

3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

4. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]

<b>Test Mode</b>	See section 2.4	<b>Frequency Range</b>	30-1000MHz
<b>Test Voltage</b>	See section 2.4	<b>Detector Function</b>	Quasi-Peak(QP)
<b>Environmental Conditions</b>	25.7deg. C,52% RH	<b>Tested By</b>	Zhou Ye

**Vertical**


NO.	Freq. [MHz]	Reading [dB $\mu$ V]	Factor [dB/m]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]
1	41.641	-0.05	19.88	19.83	40.00	20.17	100	168
2	62.886	-1.87	18.09	16.22	40.00	23.78	100	34
3	149.225	-1.58	20.56	18.98	43.50	24.52	100	246
4	461.499	-0.3	23.47	23.17	46.00	22.83	100	177
5	689.181	1.8	27.24	29.04	46.00	16.96	100	73
<b>6</b>	<b>938.690</b>	<b>2.4</b>	<b>30.07</b>	<b>32.47</b>	<b>46.00</b>	<b>13.53</b>	<b>100</b>	<b>17</b>

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.

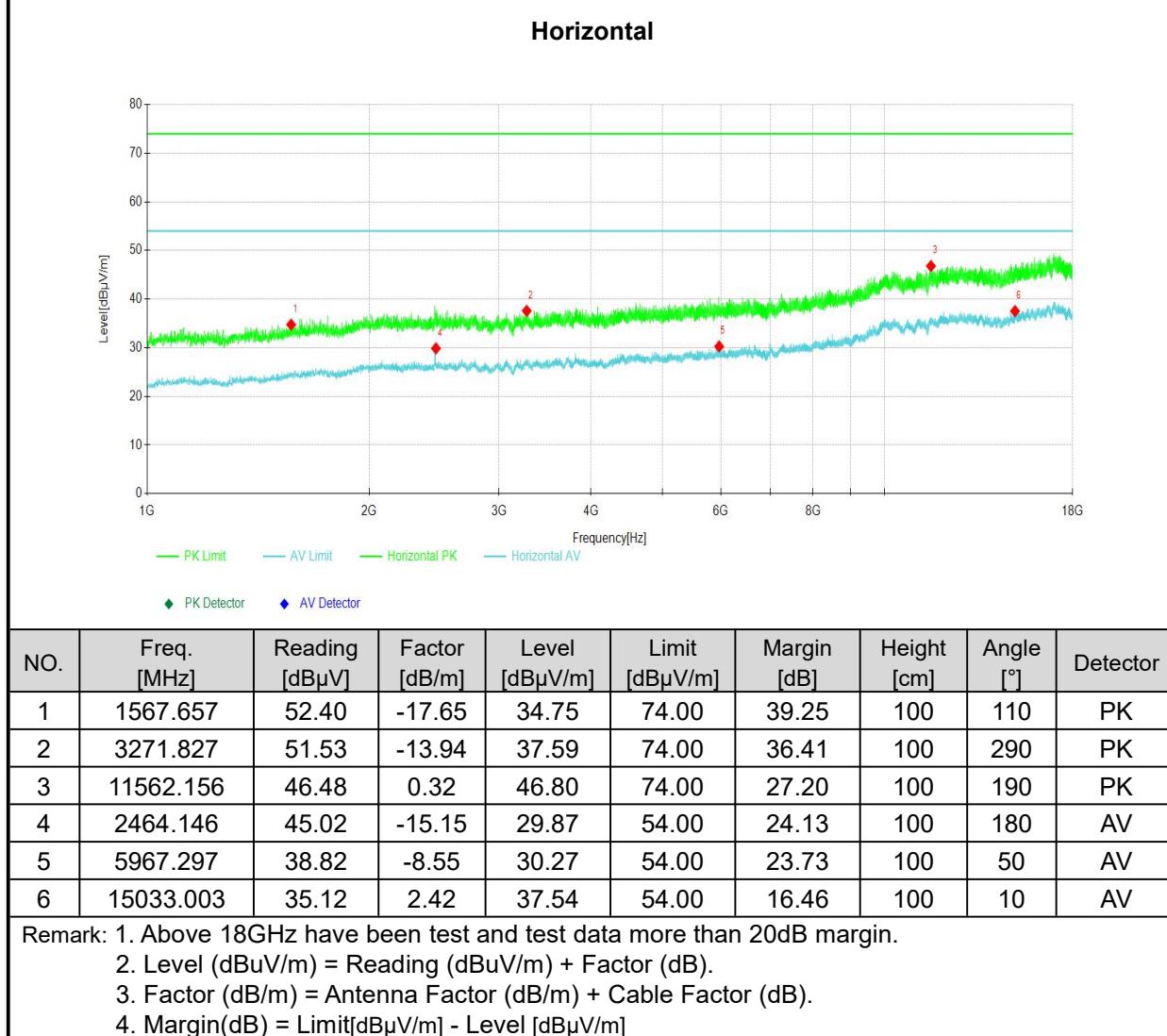
2. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).

3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

4. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]

### 3.1.5 Test Results (Above 1GHz)

<b>Test Mode</b>	See section 2.4	<b>Frequency Range</b>	Above 1GHz
<b>Test Voltage</b>	See section 2.4	<b>Detector Function</b>	PK/AV
<b>Environmental Conditions</b>	25.7deg. C, 52% RH	<b>Tested By</b>	Zhou Ye





<b>Test Mode</b>	See section 2.4	<b>Frequency Range</b>	Above 1GHz																																																																						
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<b>Vertical</b>																																																																									
<table border="1"><thead><tr><th>NO.</th><th>Freq. [MHz]</th><th>Reading [dB<math>\mu</math>V]</th><th>Factor [dB/m]</th><th>Level [dB<math>\mu</math>V/m]</th><th>Limit [dB<math>\mu</math>V/m]</th><th>Margin [dB]</th><th>Height [cm]</th><th>Angle [°]</th><th>Detector</th></tr></thead><tbody><tr><td>1</td><td>1650.465</td><td>53.25</td><td>-17.08</td><td>36.17</td><td>74.00</td><td>37.83</td><td>100</td><td>20</td><td>PK</td></tr><tr><td>2</td><td>3841.284</td><td>51.37</td><td>-12.77</td><td>38.60</td><td>74.00</td><td>35.40</td><td>100</td><td>90</td><td>PK</td></tr><tr><td>3</td><td>8712.871</td><td>47.50</td><td>-5.02</td><td>42.48</td><td>74.00</td><td>31.52</td><td>100</td><td>170</td><td>PK</td></tr><tr><td>4</td><td>2467.147</td><td>43.39</td><td>-15.15</td><td>28.24</td><td>54.00</td><td>25.76</td><td>100</td><td>140</td><td>AV</td></tr><tr><td>5</td><td>8058.306</td><td>38.31</td><td>-6.09</td><td>32.22</td><td>54.00</td><td>21.78</td><td>100</td><td>100</td><td>AV</td></tr><tr><td>6</td><td><b>17020.902</b></td><td><b>34.01</b></td><td><b>5.44</b></td><td><b>39.45</b></td><td><b>54.00</b></td><td><b>14.55</b></td><td><b>100</b></td><td><b>90</b></td><td><b>AV</b></td></tr></tbody></table>				NO.	Freq. [MHz]	Reading [dB $\mu$ V]	Factor [dB/m]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	1	1650.465	53.25	-17.08	36.17	74.00	37.83	100	20	PK	2	3841.284	51.37	-12.77	38.60	74.00	35.40	100	90	PK	3	8712.871	47.50	-5.02	42.48	74.00	31.52	100	170	PK	4	2467.147	43.39	-15.15	28.24	54.00	25.76	100	140	AV	5	8058.306	38.31	-6.09	32.22	54.00	21.78	100	100	AV	6	<b>17020.902</b>	<b>34.01</b>	<b>5.44</b>	<b>39.45</b>	<b>54.00</b>	<b>14.55</b>	<b>100</b>	<b>90</b>	<b>AV</b>
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<p>Remark: 1. Above 18GHz have been test and test data more than 20dB margin. 2. Level (dB<math>\mu</math>V/m) = Reading (dB<math>\mu</math>V/m) + Factor (dB). 3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB). 4. Margin(dB) = Limit[dB<math>\mu</math>V/m] - Level [dB<math>\mu</math>V/m]</p>																																																																									



## 4. PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Photos).



## 5. PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos and Internal Photos).

----- End of the Report -----



## Important

- (1) The test report is invalid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

*\*\*The test data and test results given in this test report should only be used for purposes of scientific research, teaching and internal quality control when the CMA symbol is not presented.\*\**

Address: No. 1301, Guanguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen, Guangdong, 518110, P. R. China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

<http://www.cvc.org.cn>