



**中认信通**

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



## TEST REPORT

**Applicant: AKUVOX (XIAMEN) NETWORKS CO., LTD.**

Address: 10/F, No.56, Software Park II , Xiamen, China

**FCC ID: 2AHCR-C313W2V3**

**Product Name: 2-Wire Intercom**

**Model Number: C313W-2**

**Standard(s): 47 CFR Part 15 Subpart B  
ANSI C63.4-2014**

The above equipment has been tested and found compliance with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

**Report Number: CR22020009-00B**

**Date Of Issue: 2022-05-01**

**Reviewed By: Sun Zhong** *Sun Zhong*

Title: Manager

**Test Laboratory: China Certification ICT Co., Ltd (Dongguan)**

No. 113, Pingkang Road, Dalang Town, Dongguan,

Guangdong, China

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## Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

## Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

<b>EUT Name:</b>	2-Wire Intercom
<b>EUT Model:</b>	C313W-2
<b>Highest Operation Frequency:</b>	2462 MHz
<b>Rated Input Voltage:</b>	DC 48V
<b>Serial Number:</b>	CR22020009-RF-S1
<b>EUT Received Date:</b>	2022.2.16
<b>EUT Received Status:</b>	Good

#### Accessory Information:

NO.

## 1.2 Description of Test Configuration

### 1.2.1 EUT Operation Condition:

<b>EUT Operation Mode:</b>	The system was configured for testing in Typical Use Mode, which was provided by the manufacturer. Test Mode: Operating
<b>Equipment Modifications:</b>	No
<b>EUT Exercise Software:</b>	No

### 1.2.2 Support Equipment List and Details

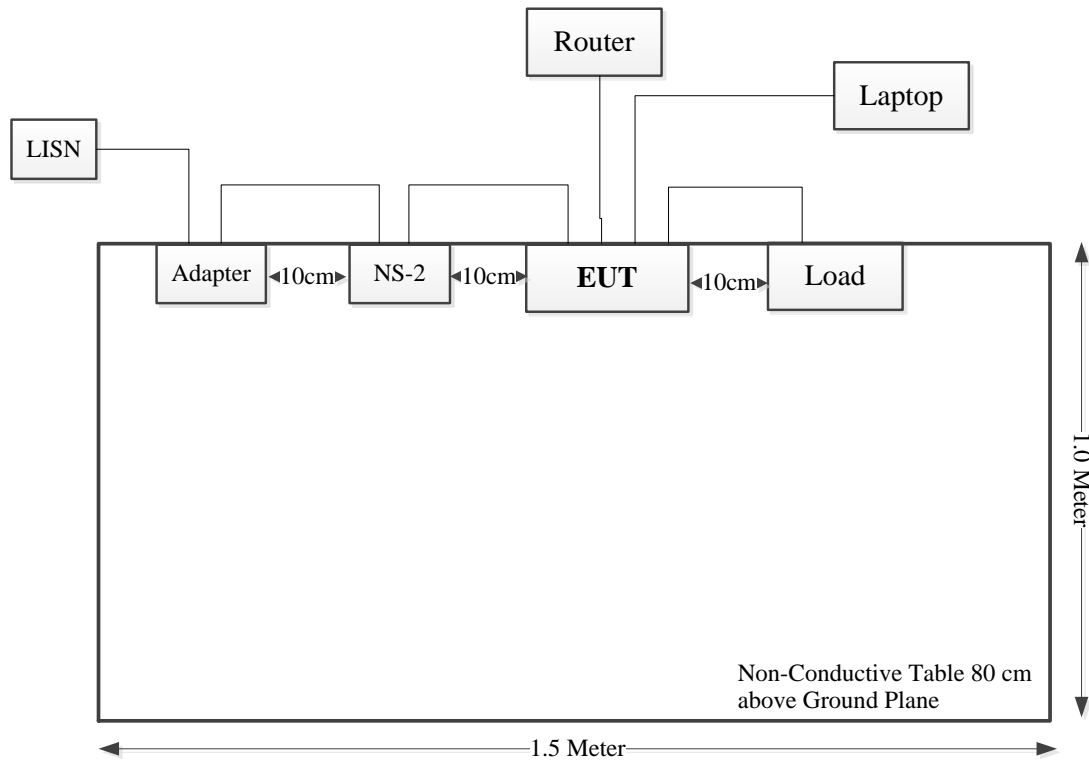
Manufacturer	Description	Model	Serial Number
TOTO LINK	Router	X5000R	X5000RK9T0560
Lenovo	Laptop	T460S	60PDTEK8
AKUVOX (XIAMEN) NETWORKS CO., LTD	Smart Intercom	NS-2	CR22020009-RF-S2
MW	Adapter	HDR-60-48	CR22020009-RF-S3
TaoTimeClub	Load	100W40RJ	L03

### 1.2.3 Support Cable List and Details

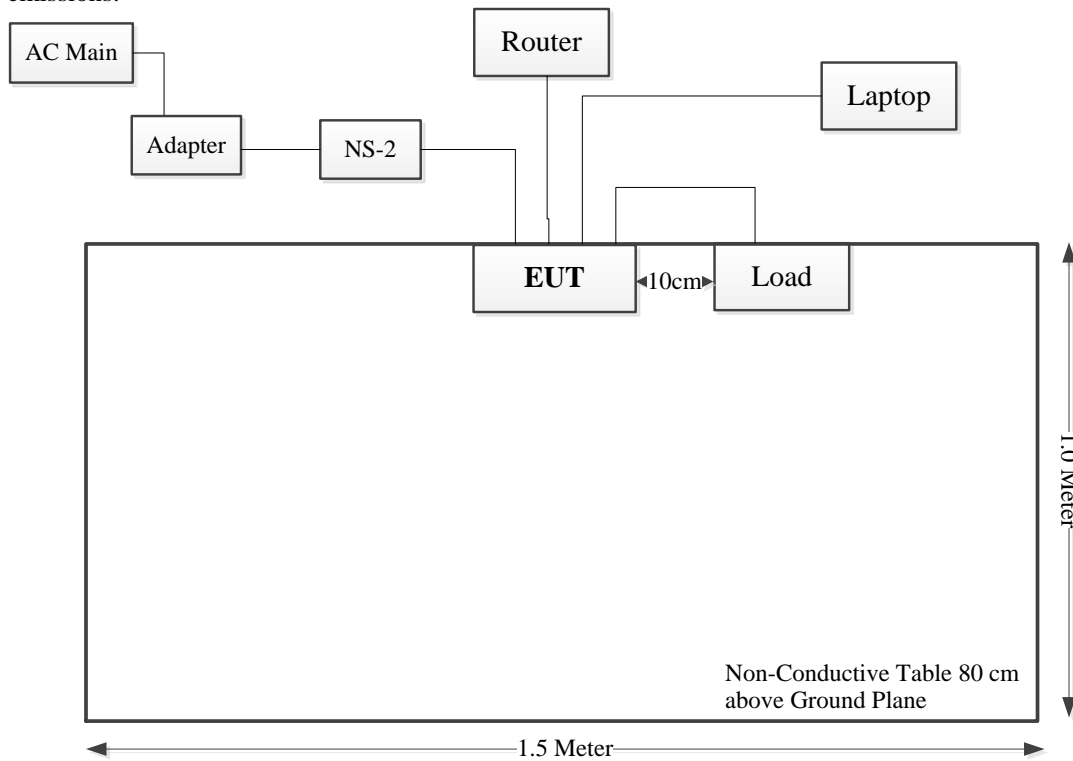
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	3	EUT	Laptop
RJ45 Cable	No	Yes	3	EUT	Router
Power Cable	No	No	1.3	Adapter	LISN
Power Cable	No	No	0.5	Adapter	NS-2
Power Cable	No	No	1	NS-2	EUT
Cable	No	No	0.2	Load	EUT

### 1.2.4 Block Diagram of Test Setup

Conducted emissions:



Radiated emissions:



### 1.3 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.15 dB, 200M~1GHz: 5.61 dB, 1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

## 2. SUMMARY OF TEST RESULTS

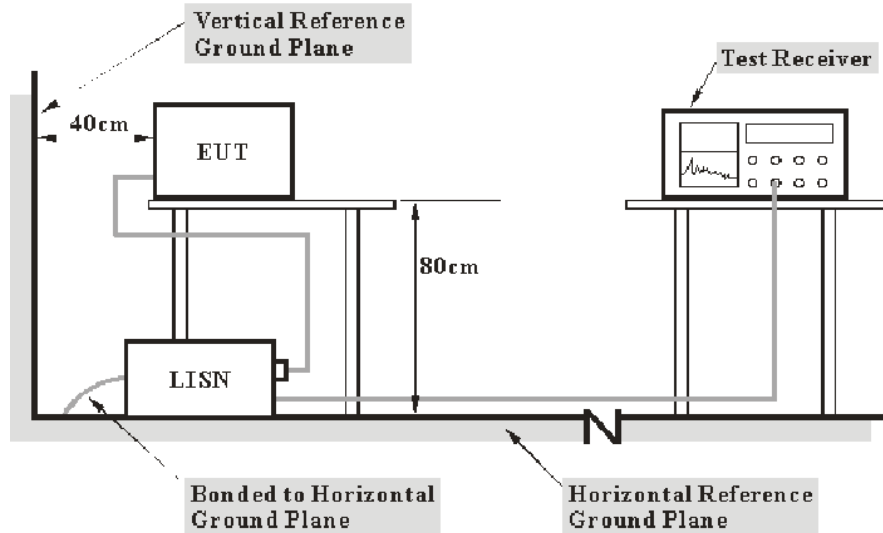
Standard(s) Section	Description of Test	Result
§15.107	Conducted emissions	Compliant
§15.109	Radiated emissions	Compliant



### 3. REQUIREMENTS AND TEST PROCEDURES

#### 3.1 AC Line Conducted Emissions

##### 3.1.1 EUT Setup



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to the main LISN with a 120 V/60 Hz AC power source.

##### 3.1.2 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### 3.1.3 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT, the report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

All data was recorded in the Quasi-peak and average detection mode.

The report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

### 3.1.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = attenuation caused by cable loss + voltage division factor of AMN

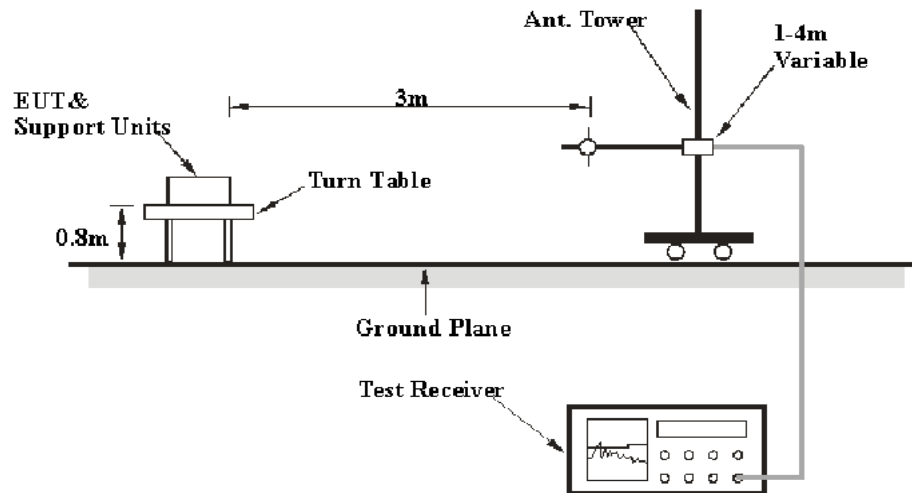
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

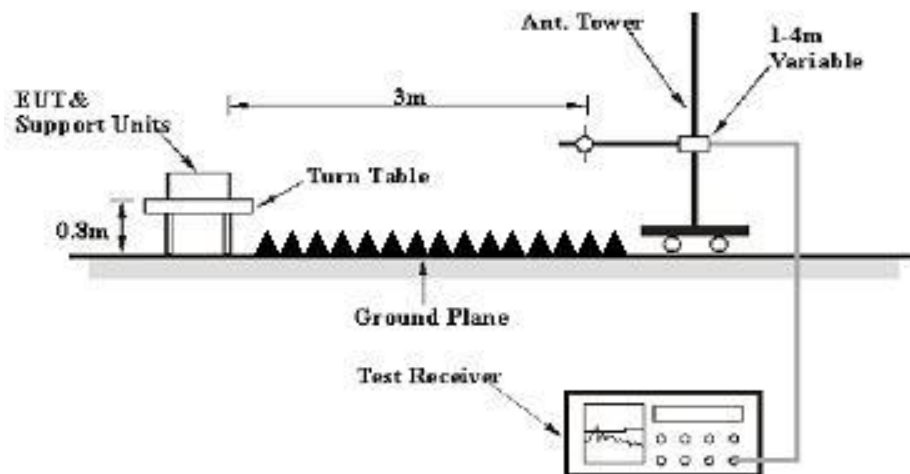
## 3.2 Radiation Spurious Emissions

### 3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber, using the setup accordance with the ANSI C63.4-2014. The specification used was with the FCC Part 15 B Class B limits.

### 3.2.2 EMI Test Receiver Setup

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced video bandwidth	/	AVG

If the maximized peak measured value complies with under the limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

### 3.2.3 Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

All emissions under the average limit and under the noise floor have not recorded in the report.

### 3.2.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$\text{Result} = \text{Reading} + \text{Factor}$$

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Result}$$

## 4. TEST DATA AND RESULTS

### 4.1 AC Line Conducted Emissions

Serial Number:	CR22020009-RF-S1	Test Date:	2022-04-24
Test Site:	CE	Test Mode:	Operating
Tester:	Nick Tang	Test Result:	Pass

#### Environmental Conditions:

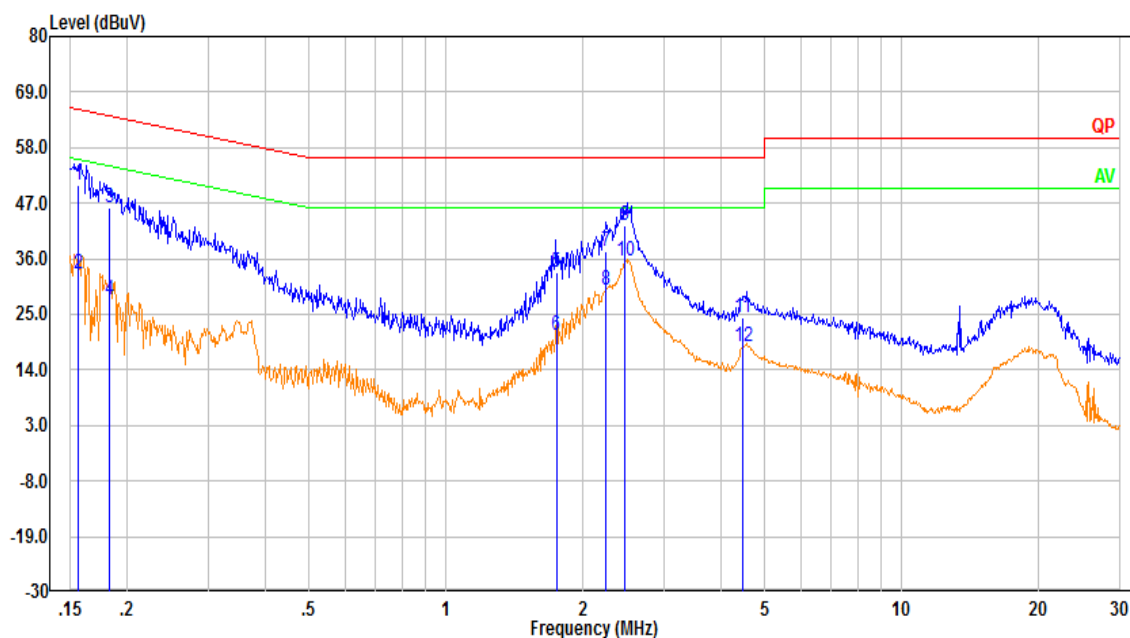
Temperature: (°C)	26.5	Relative Humidity: (%)	69	ATM Pressure: (kPa)	100.9
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#### Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2022-04-01	2023-03-31
R&S	EMI Test Receiver	ESR3	102726	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2021-08-08	2022-08-07
Audix	Test Software	E3	190306 (V9)	N/A	N/A

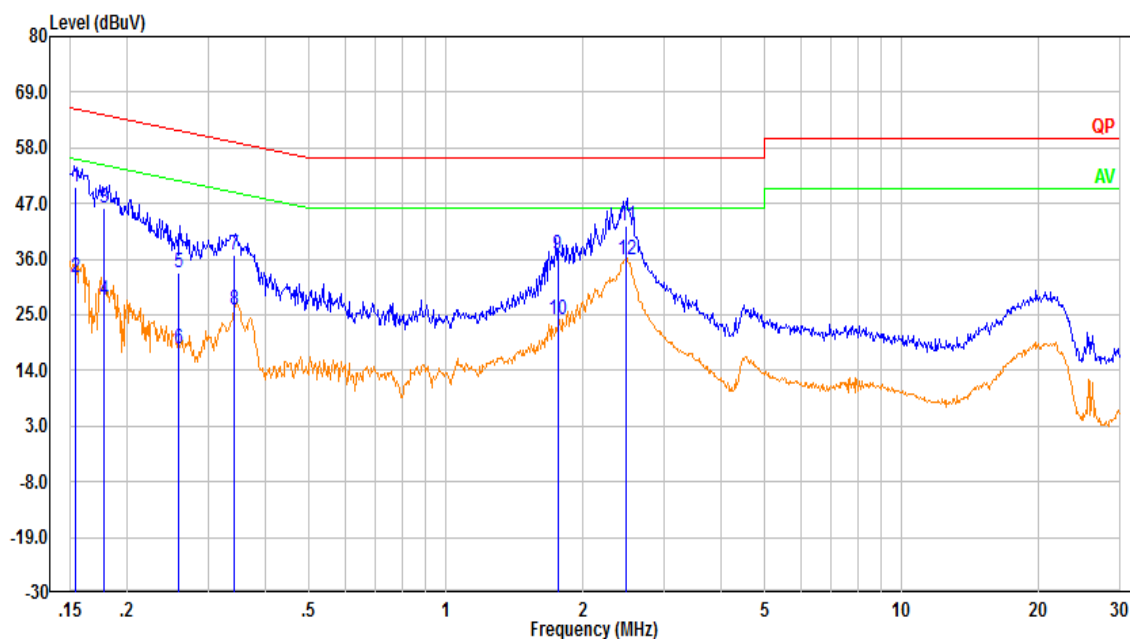
*\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Line:



No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB)	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Detector
1	0.156	41.04	9.61	50.65	65.68	15.03	QP
2	0.156	23.34	9.61	32.95	55.68	22.73	Average
3	0.183	36.40	9.61	46.01	64.36	18.35	QP
4	0.183	18.39	9.61	28.00	54.36	26.36	Average
5	1.745	23.77	9.63	33.40	56.00	22.60	QP
6	1.745	11.07	9.63	20.70	46.00	25.30	Average
7	2.239	27.73	9.63	37.37	56.00	18.63	QP
8	2.239	20.19	9.63	29.82	46.00	16.18	Average
9	2.468	32.87	9.64	42.51	56.00	13.49	QP
10	2.468	25.93	9.64	35.57	46.00	10.43	Average
11	4.481	14.70	9.65	24.36	56.00	31.64	QP
12	4.481	8.87	9.65	18.52	46.00	27.48	Average

Neutral:



No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB)	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Detector
1	0.153	40.73	9.61	50.34	65.82	15.48	QP
2	0.153	22.76	9.61	32.37	55.82	23.45	Average
3	0.178	36.38	9.61	45.99	64.59	18.60	QP
4	0.178	18.20	9.61	27.81	54.59	26.78	Average
5	0.259	23.85	9.61	33.46	61.48	28.02	QP
6	0.259	8.55	9.61	18.16	51.48	33.32	Average
7	0.344	27.34	9.61	36.95	59.11	22.16	QP
8	0.344	16.27	9.61	25.88	49.11	23.23	Average
9	1.757	27.08	9.63	36.71	56.00	19.29	QP
10	1.757	14.28	9.63	23.91	46.00	22.09	Average
11	2.487	32.98	9.64	42.62	56.00	13.38	QP
12	2.487	26.09	9.64	35.73	46.00	10.27	Average

## 4.2 Radiation Spurious Emissions

Serial Number:	CR22020009-RF-S1	Test Date:	2022-04-24~2022-04-25
Test Site:	966-1, 966-2	Test Mode:	Operating
Tester:	Veyo Zhang, Tommy Luo	Test Result:	Pass

### Environmental Conditions:

Temperature: (°C)	20.1~27.4	Relative Humidity: (%)	64~68	ATM Pressure: (kPa)	100.2~101.0
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### Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
R&S	Spectrum Analyzer	FSV40	101591	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2021-08-08	2022-08-07
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2021-08-08	2022-08-07
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2021-08-08	2022-08-07
E-Microwave	Band Rejection Filter	2400-2483.5MHz	OE01902424	2021-08-08	2022-08-07
Mini Circuits	High Pass Filter	VHF-6010+	31119	2021-08-08	2022-08-07
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17
Audix	Test Software	E3	201021 (V9)	N/A	N/A

\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

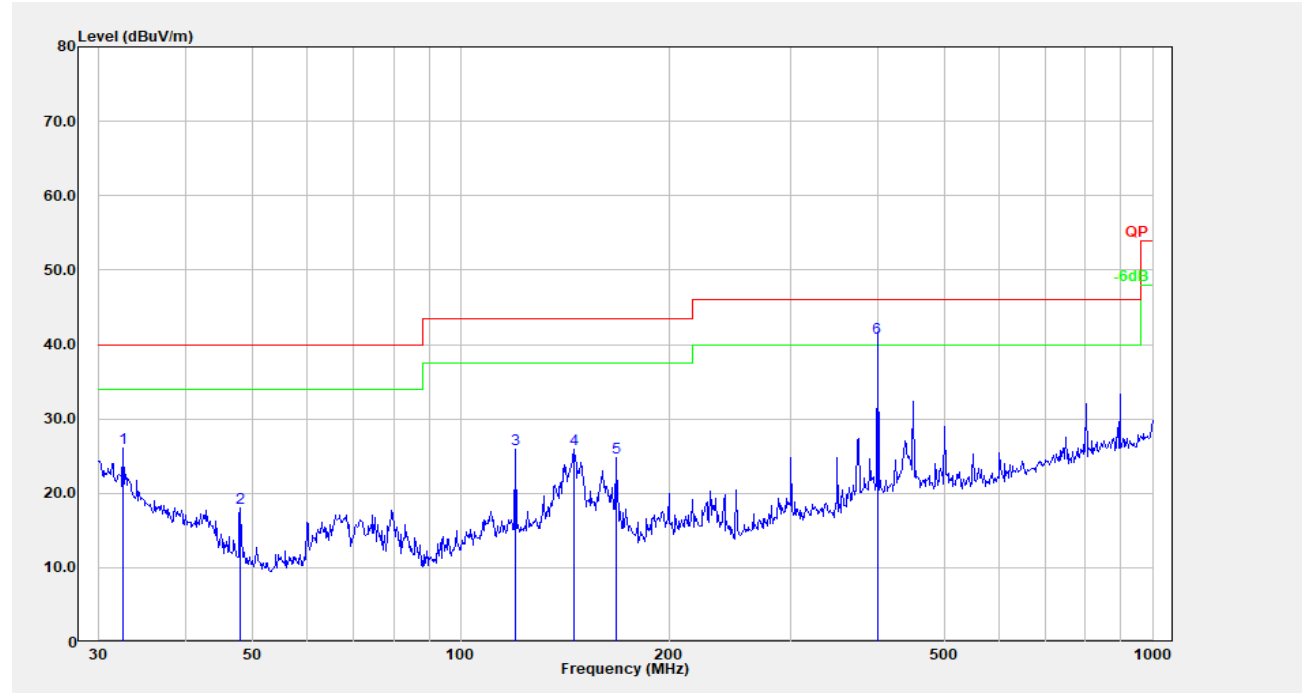
### Test Data:

Please refer to the below table and plots.

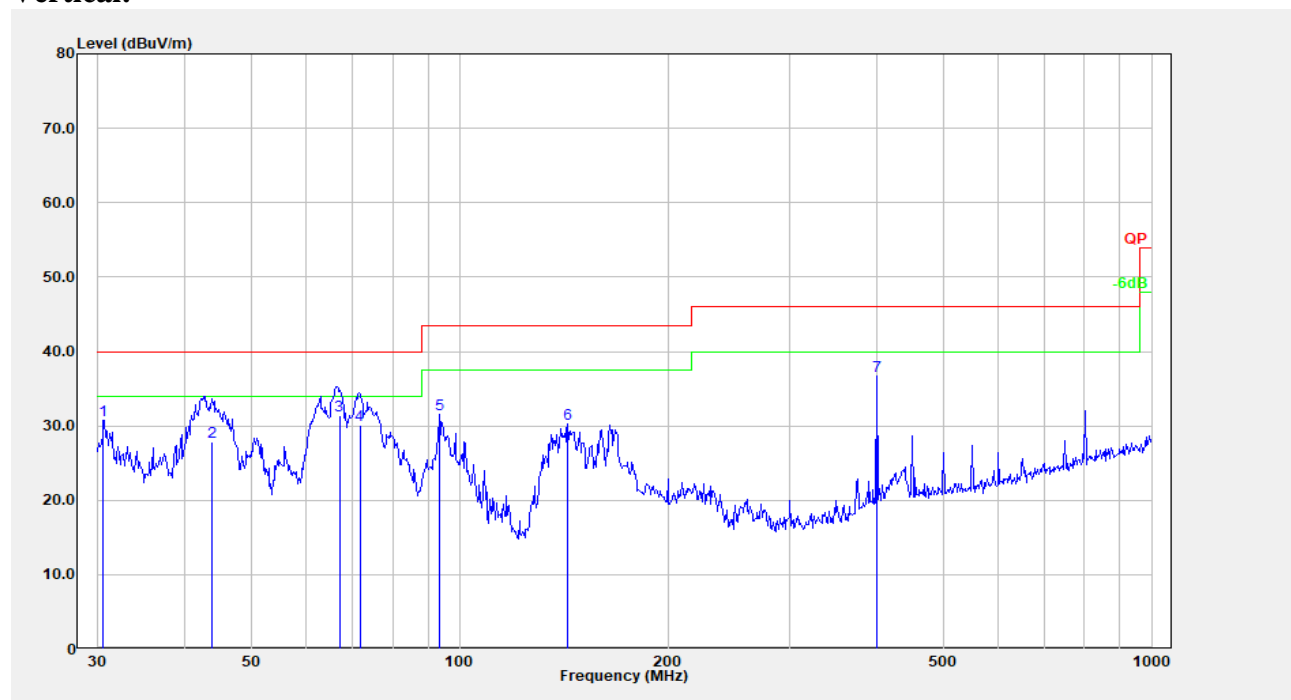
Note: The device can be mounted in multiple orientations, test was performed for all positions that are consistent with that of the normal operation of the EUT., the worst orientation was photographed and it's data was recorded.



1) 30MHz-1GHz:

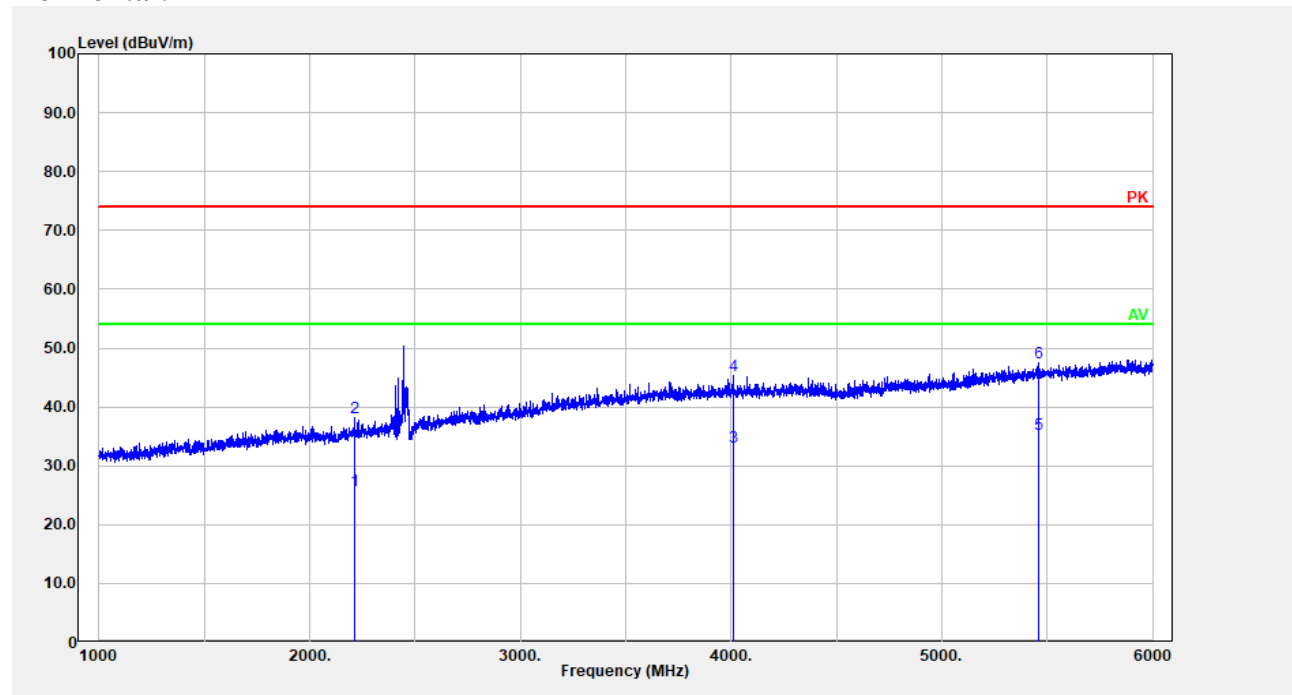
**Horizontal:**

No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	32.520	31.81	-5.74	26.07	40.00	13.93	Peak
2	47.994	34.34	-16.24	18.11	40.00	21.89	Peak
3	119.856	37.73	-11.75	25.98	43.50	17.52	Peak
4	145.861	38.21	-12.22	25.99	43.50	17.51	Peak
5	167.824	37.74	-12.96	24.78	43.50	18.72	Peak
6	400.016	49.93	-9.01	40.92	46.00	5.08	QP

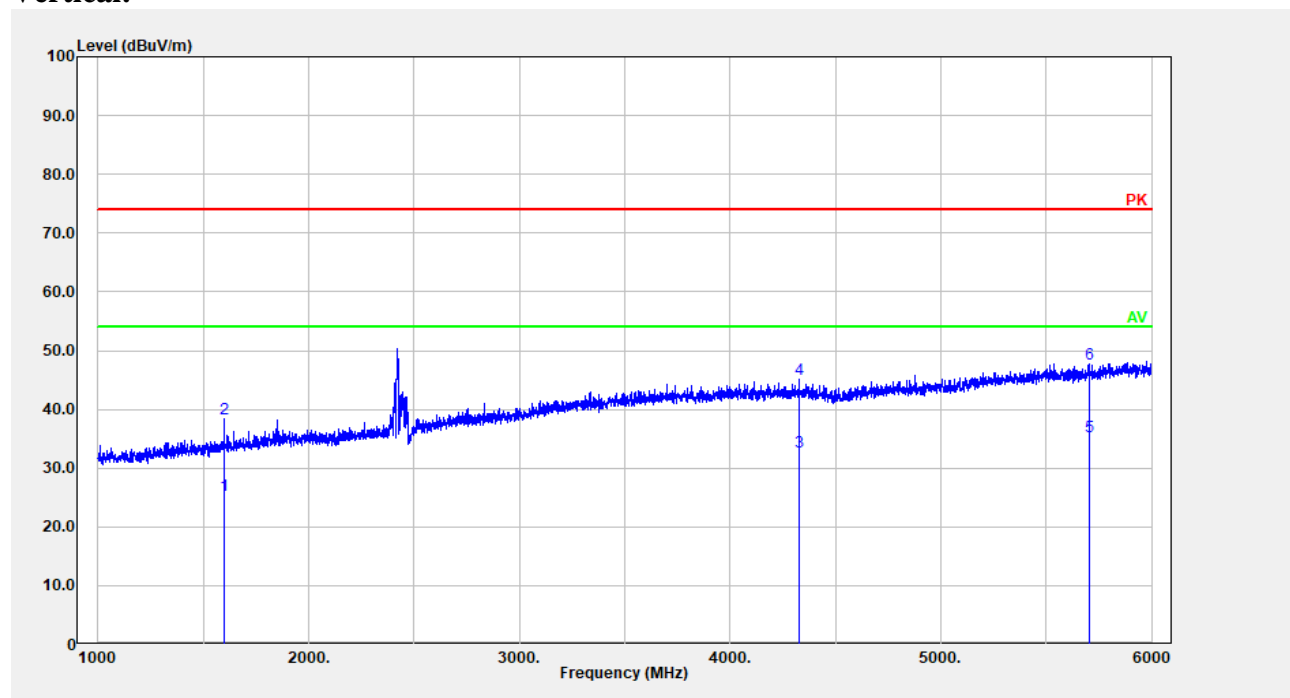
**Vertical:**

No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	30.531	34.99	-4.20	30.79	40.00	9.21	Peak
2	43.738	41.56	-13.75	27.81	40.00	12.19	QP
3	66.973	48.34	-16.99	31.34	40.00	8.66	QP
4	71.684	47.01	-16.90	30.11	40.00	9.89	QP
5	93.440	47.84	-16.30	31.54	43.50	11.96	Peak
6	143.326	42.45	-12.18	30.27	43.50	13.23	Peak
7	400.432	45.75	-9.00	36.75	46.00	9.25	Peak

## 2) Above 1GHz

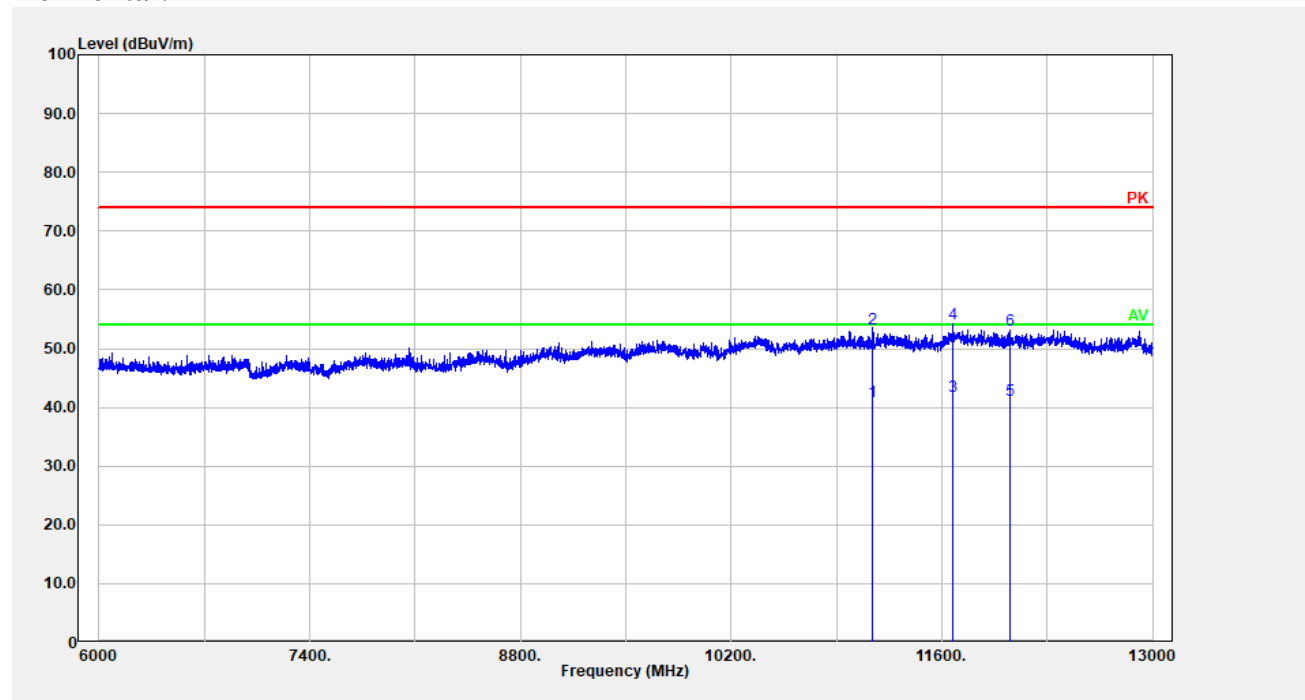
**Horizontal:**

No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	2214.243	22.80	3.04	25.84	54.00	28.16	Average
2	2214.243	35.04	3.04	38.08	74.00	35.92	Peak
3	4011.602	23.24	9.98	33.22	54.00	20.78	Average
4	4011.602	35.39	9.98	45.37	74.00	28.63	Peak
5	5458.892	22.86	12.52	35.38	54.00	18.62	Average
6	5458.892	35.08	12.52	47.60	74.00	26.40	Peak

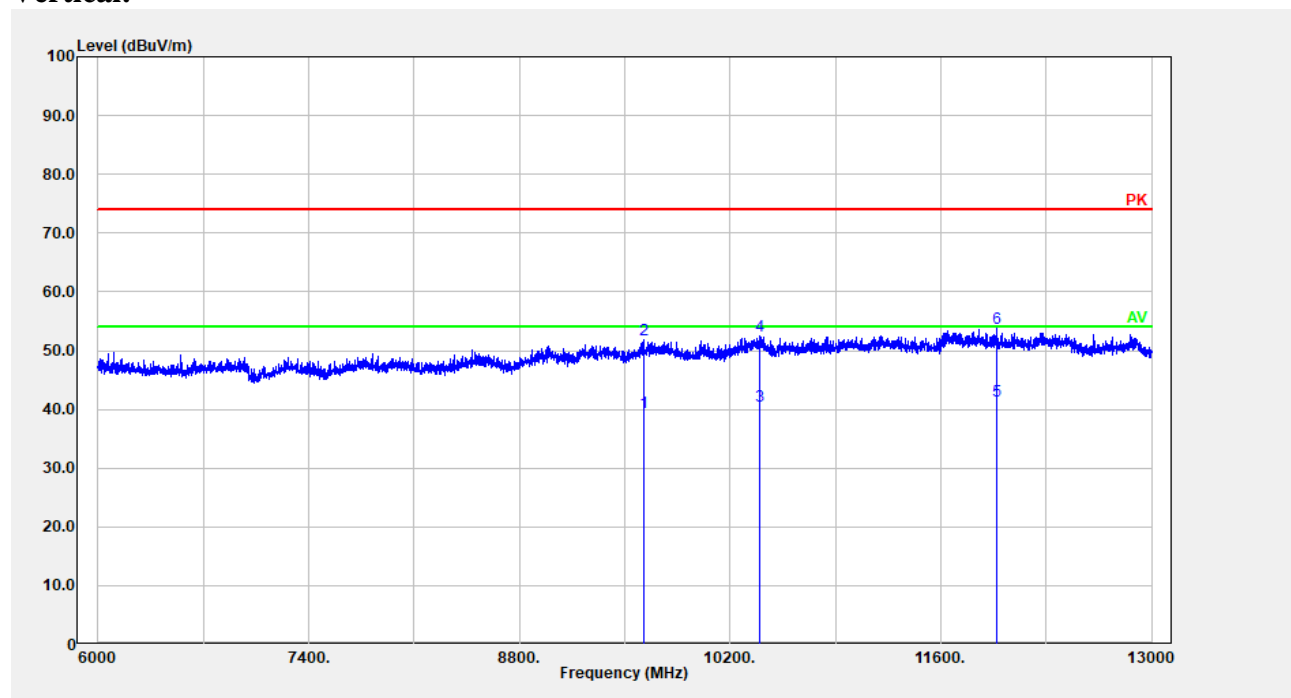
**Vertical:**

No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	1600.120	25.01	0.33	25.34	54.00	28.66	Average
2	1600.120	37.96	0.33	38.29	74.00	35.71	Peak
3	4326.666	23.17	9.69	32.86	54.00	21.14	Average
4	4326.666	35.38	9.69	45.07	74.00	28.93	Peak
5	5704.941	22.34	13.03	35.37	54.00	18.63	Average
6	5704.941	34.68	13.03	47.71	74.00	26.29	Peak

**Horizontal:**



No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	11143.230	21.69	19.28	40.97	54.00	13.03	Average
2	11143.230	34.19	19.28	53.47	74.00	20.53	Peak
3	11672.530	21.52	20.29	41.81	54.00	12.19	Average
4	11672.530	33.95	20.29	54.24	74.00	19.76	Peak
5	12057.610	20.85	20.42	41.27	54.00	12.73	Average
6	12057.610	32.76	20.42	53.18	74.00	20.82	Peak

**Vertical:**

No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	9629.526	21.66	17.79	39.45	54.00	14.55	Average
2	9629.526	33.96	17.79	51.75	74.00	22.25	Peak
3	10396.880	22.16	18.47	40.63	54.00	13.37	Average
4	10396.880	34.00	18.47	52.47	74.00	21.53	Peak
5	11967.990	21.28	20.23	41.51	54.00	12.49	Average
6	11967.990	33.52	20.23	53.75	74.00	20.25	Peak

===== END OF REPORT =====