



**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-R20A-2

**Product Name:** 2-Wire Intercom

**Test Model:** R20A-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:** CR22010046-00A

**Date Of Issue:** 2022-05-07

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

**Title:** Manager

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

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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>	R20A-2
<b>Highest Operation Frequency:</b>	13.56 MHz
<b>Rated Input Voltage:</b>	DC 48V from power-in port
<b>Serial Number:</b>	CR22010046-RF-S1
<b>EUT Received Date:</b>	2022.02.08
<b>EUT Received Status:</b>	GOOD

### Accessory Information:

No accessory.

## 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

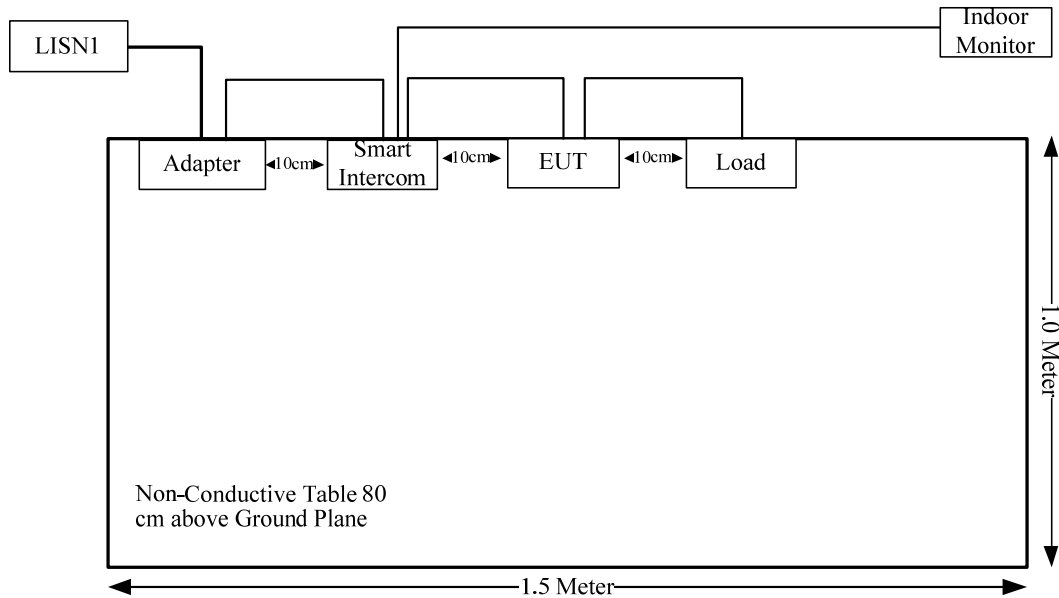
Manufacturer	Description	Model	Serial Number
AKUVOX (XIAMEN) NETWORKS CO., LTD	Smart Intercom	NS-2	NS-2
	Adapter	Unknown	CR22010046-RF-S4
	Indoor Monitor	Unknown	CR22010046-RF-S3
TaoTimeClub	Load	100W40RJ	100W40RJ

### 1.2.3 Support Cable List and Details

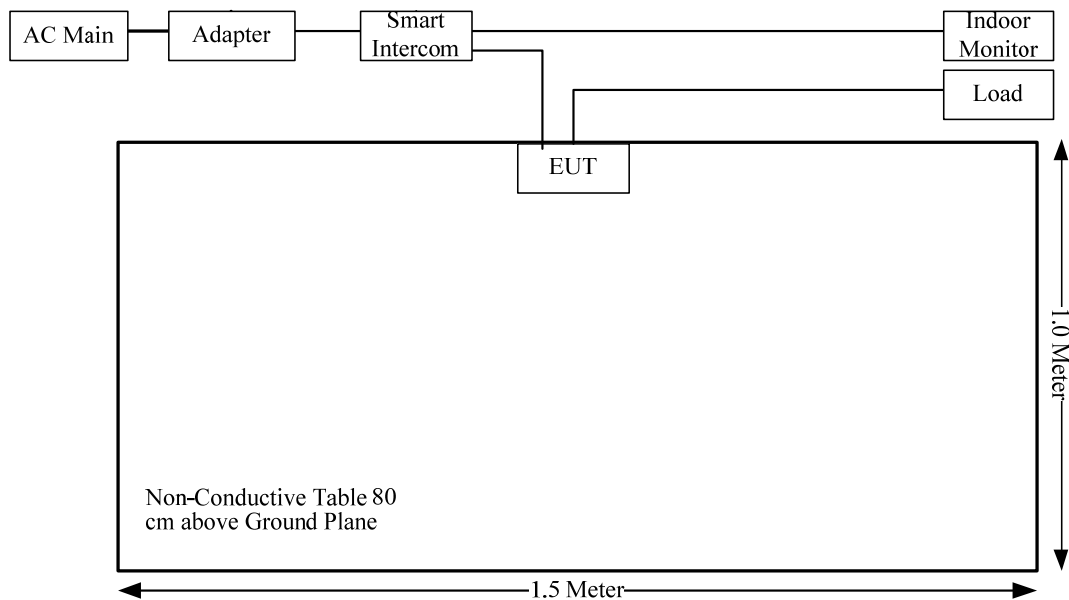
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power Line	No	No	1.5	EUT	Smart Intercom
Power Line	No	No	2.0	Indoor Monitor	Smart Intercom
Power Line	No	No	1	EUT	Load

### 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

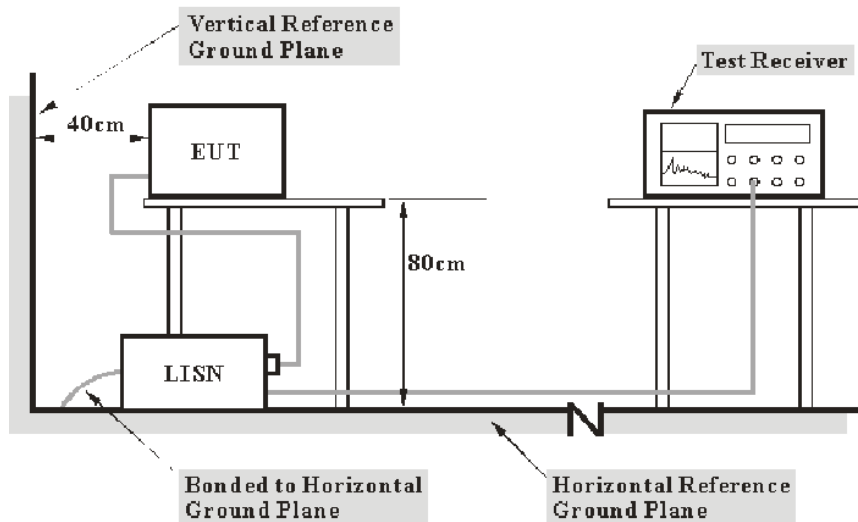
Standard(s) Section	Description of Test	Result
§15.107	Conducted emissions	Compliant
§15.109	Radiated emissions	Compliant



### 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 15MHz to 30 MHz.

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

Frequency Range	IF B/W
15MHz – 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

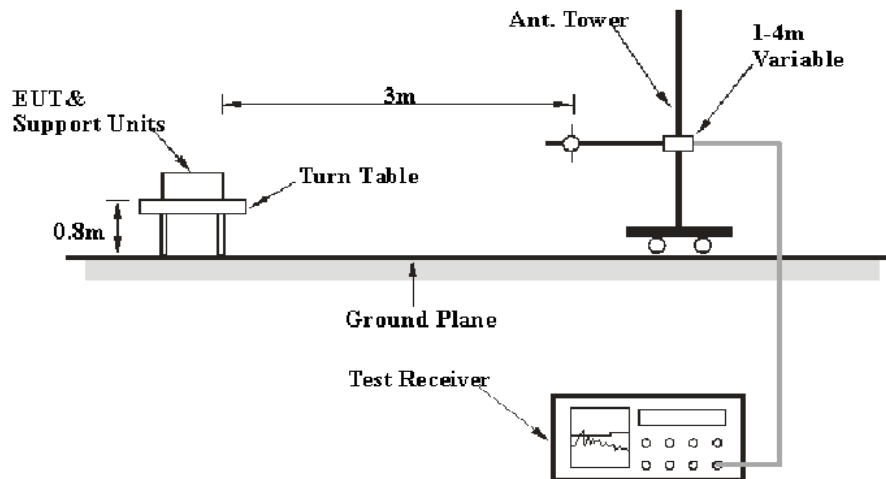
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

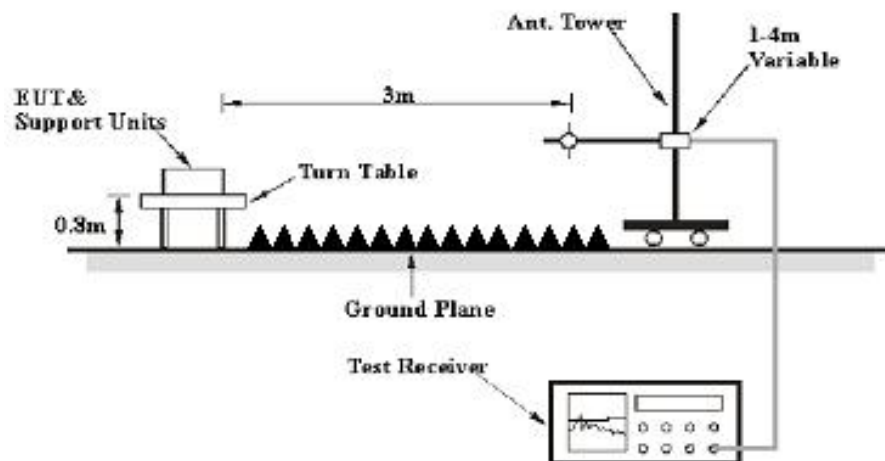
## 3.2 Radiation Spurious Emissions

### 3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission were performed in the 3 meters chamber test site, 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

The system was investigated from 30 MHz to 1 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	3 MHz	/	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:

Result = Reading + Factor

Factor = Antenna Factor + Cable Loss- 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:

Margin = Limit – Result

## 4. TEST DATA AND RESULTS

### 4.1 AC Line Conducted Emissions

Serial Number:	CR22010046-RF-S1	Test Date:	2022-04-21
Test Site:	CE	Test Mode:	Operating
Tester:	Nick Tang	Test Result:	Pass

#### Environmental Conditions:

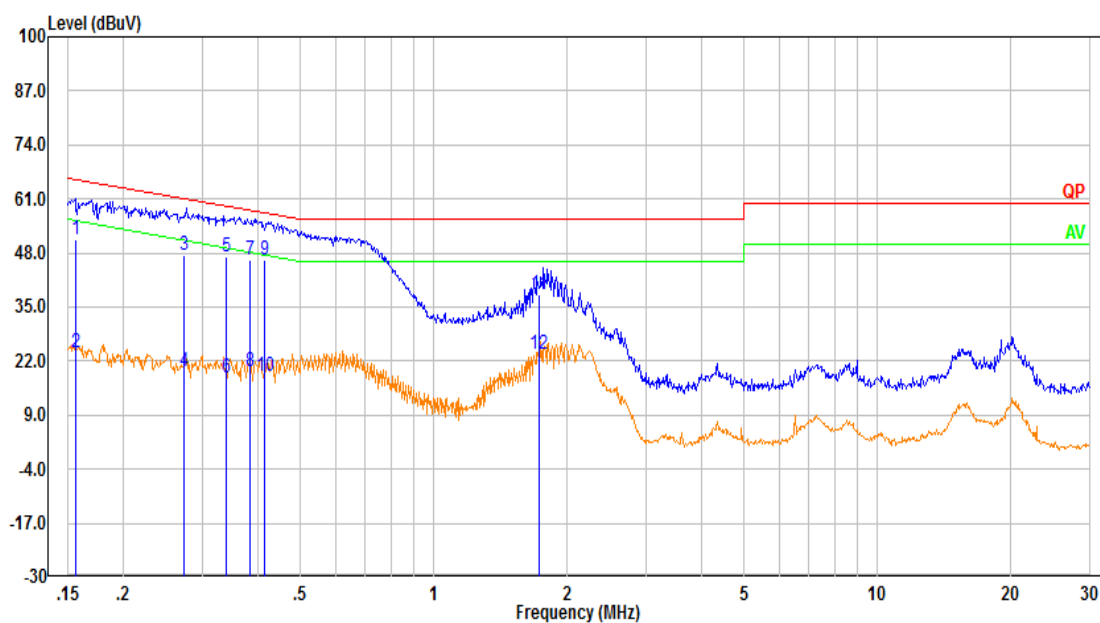
Temperature: (°C)	22.9	Relative Humidity: (%)	62	ATM Pressure: (kPa)	100.7
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#### Test Equipment List and Details:

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

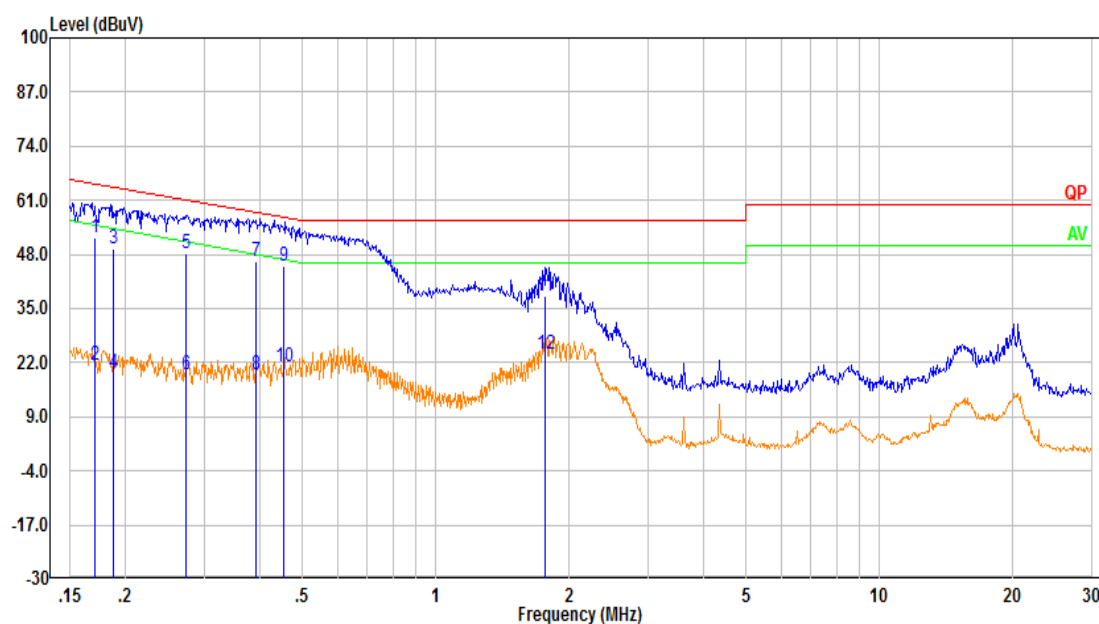
\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Line:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.156	41.59	9.61	51.20	65.67	14.47	QP
2	0.156	14.44	9.61	24.05	55.67	31.62	Average
3	0.273	37.89	9.61	47.50	61.02	13.52	QP
4	0.273	9.92	9.61	19.53	51.02	31.49	Average
5	0.341	37.35	9.61	46.96	59.19	12.23	QP
6	0.341	8.28	9.61	17.89	49.19	31.30	Average
7	0.386	36.71	9.61	46.32	58.15	11.83	QP
8	0.386	9.76	9.61	19.37	48.15	28.78	Average
9	0.415	36.68	9.61	46.29	57.54	11.25	QP
10	0.415	8.65	9.61	18.26	47.54	29.28	Average
11	1.722	28.53	9.63	38.16	56.00	17.84	QP
12	1.722	14.15	9.63	23.77	46.00	22.23	Average

Neutral:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.170	42.40	9.61	52.01	64.96	12.95	QP
2	0.170	11.70	9.61	21.31	54.96	33.65	Average
3	0.187	39.65	9.61	49.26	64.15	14.89	QP
4	0.187	10.06	9.61	19.67	54.15	34.48	Average
5	0.273	38.67	9.61	48.28	61.03	12.75	QP
6	0.273	9.40	9.61	19.01	51.03	32.02	Average
7	0.394	36.77	9.61	46.38	57.98	11.60	QP
8	0.394	9.46	9.61	19.07	47.98	28.91	Average
9	0.455	35.72	9.61	45.33	56.79	11.46	QP
10	0.455	11.42	9.61	21.03	46.79	25.76	Average
11	1.758	28.30	9.63	37.93	56.00	18.07	QP
12	1.758	14.37	9.63	24.00	46.00	22.00	Average

**4.2 Radiation Spurious Emissions**

Serial Number:	CR22010046-RF-S1	Test Date:	2022-04-28~2022-04-29
Test Site:	966-1, 966-2	Test Mode:	Operating
Tester:	Veyo Zhang, Tommy Luo	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	22.2~27.6	Relative Humidity: (%)	65~69	ATM Pressure: (kPa)	100.3~101.2
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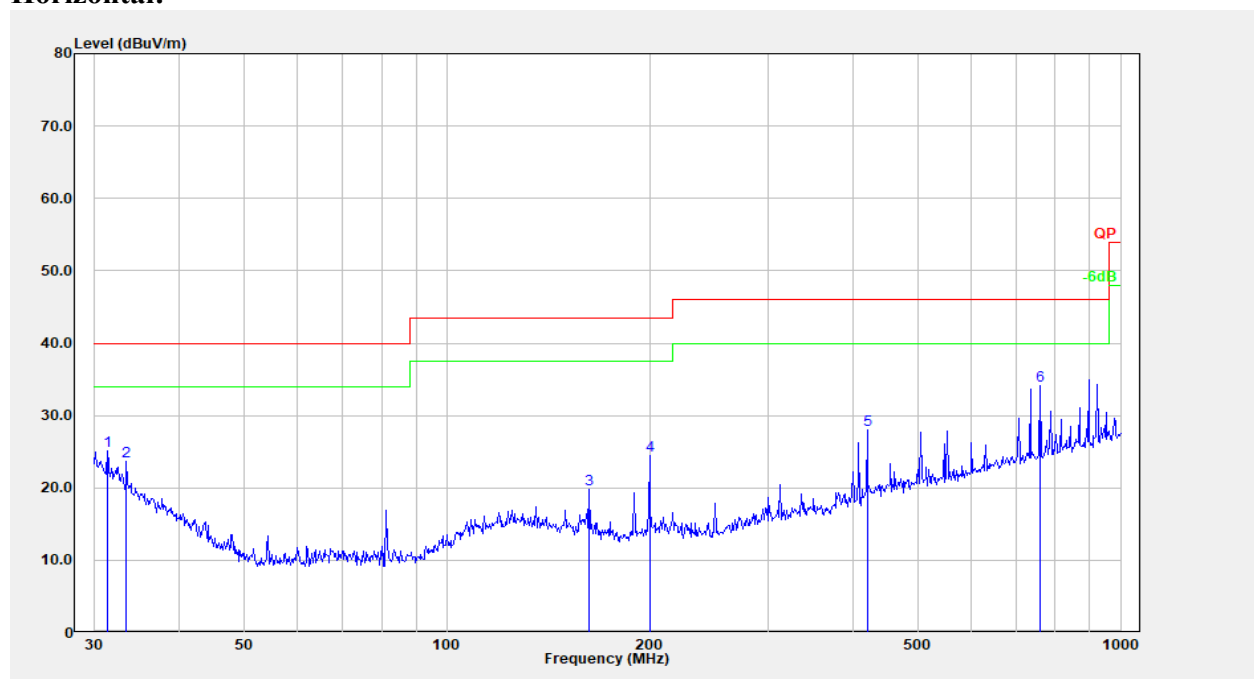
**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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

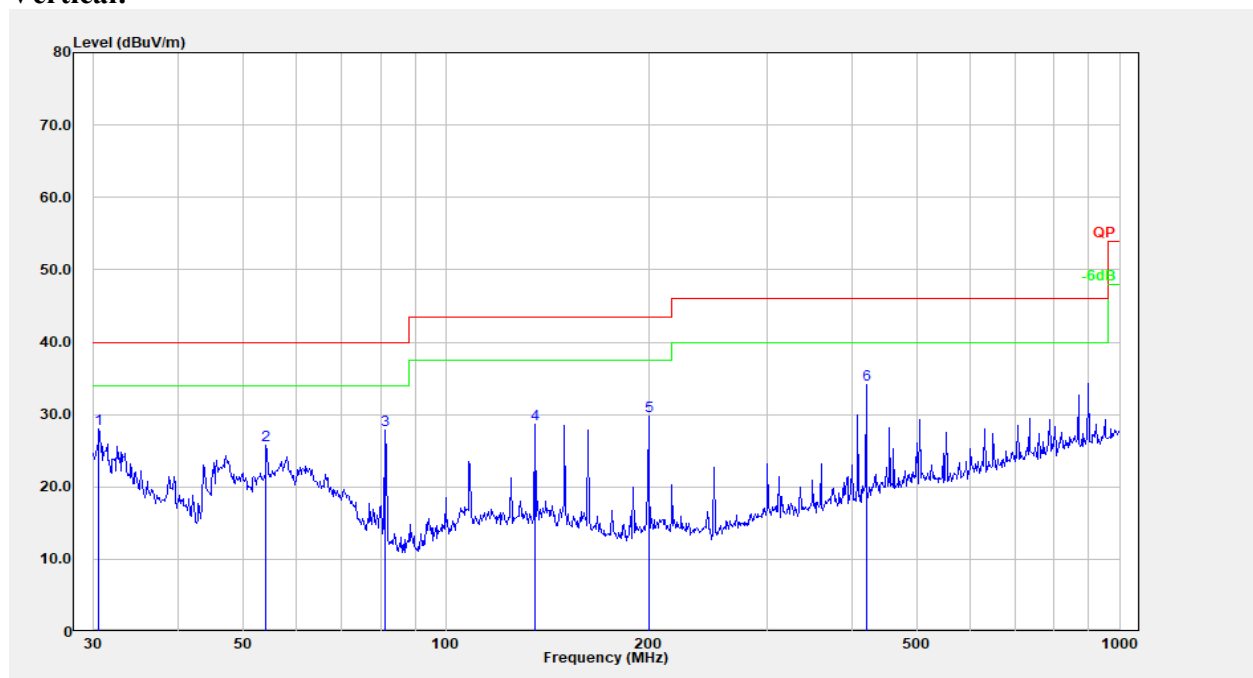
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1) 30MHz-1GHz:

**Horizontal:**

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	31.289	29.87	-4.78	25.09	40.00	14.91	Peak
2	33.445	30.17	-6.45	23.72	40.00	16.28	Peak
3	162.611	32.27	-12.54	19.73	43.50	23.77	Peak
4	199.986	36.82	-12.37	24.45	43.50	19.05	Peak
5	420.580	36.20	-8.12	28.08	46.00	17.92	Peak
6	760.704	37.12	-3.07	34.05	46.00	11.95	Peak

**Vertical:**

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