



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-A02X

Product Name: Access Control Terminal

Model Number: A02S,A01S

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: CR21100121-00A

Date Of Issue: 2021-12-29

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
Tel: +86-769-82016888

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)

EUT Name:	Access Control Terminal
EUT Model:	A02S
Multiple Model:	A01S
Highest Operation Frequency:	Below 108MHz
Rated Input Voltage:	DC 12V from adapter or 48V from POE
Serial Number:	CR21100121-RF-S1
EUT Received Date:	2021.10.28
EUT Received Status:	GOOD

Note: The Multiple models are electrically identical with Test model, please refer to the declaration letter for more detail, which was provided by manufacturer. Test only performed with model: A02S.

Accessory Information:

N/A.

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

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

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
GOSPELL DIGITAL TECHNOLOGY CO.,LTD	POE	G0720-480-050	2014-0002925
ORIENTAL HERO ELE.FTY	Adapter	OH-1015A1201000U3-UL	96DG E230964
Unknown	Load	Unknown	Load3
TOTOLINK	Wireless Router	LR1200	LR1200155P00167

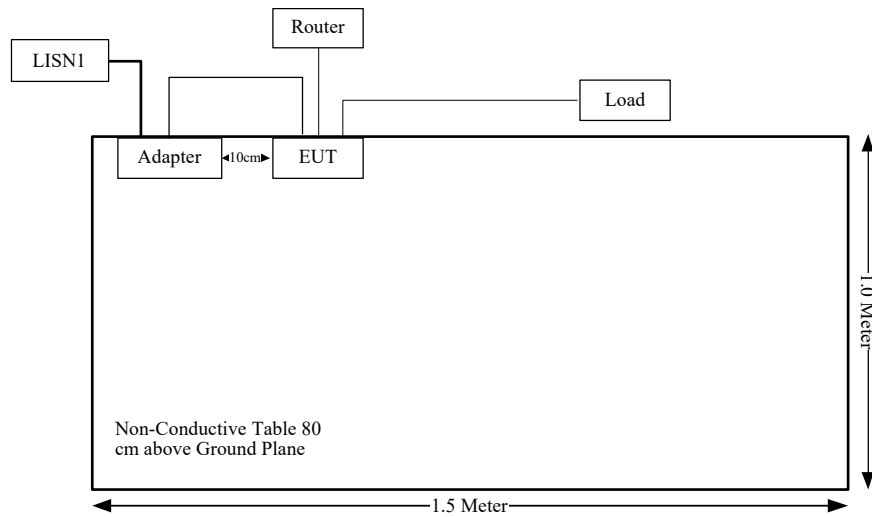
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	3	POE	Router
RJ45 Cable	No	No	0.3	POE	EUT
RJ45 Cable	No	Yes	3	EUT	Router
Adapter Cable	No	Yes	2	Adapter	EUT
Cable	No	Yes	3	EUT	Load

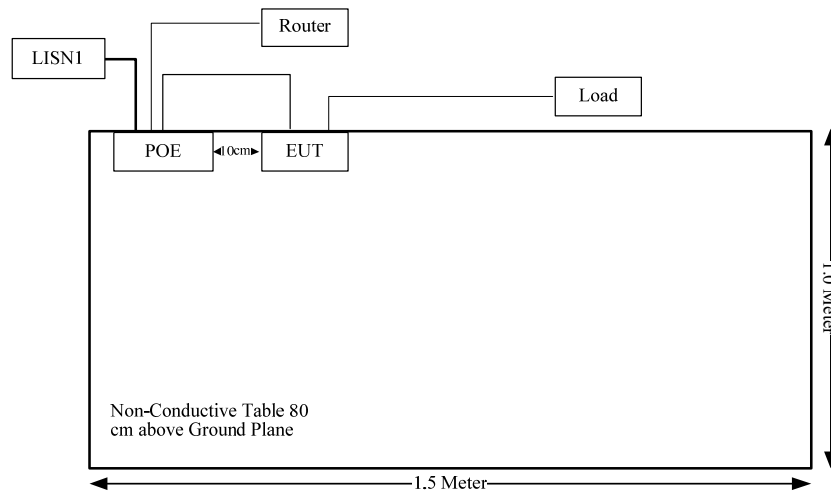
1.2.4 Block Diagram of Test Setup

AC line conducted emissions:

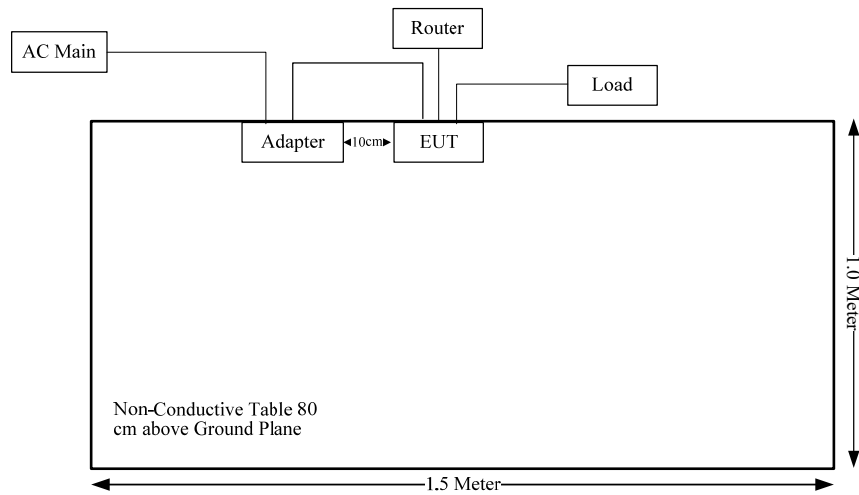
AC/DC Adapter Mode:



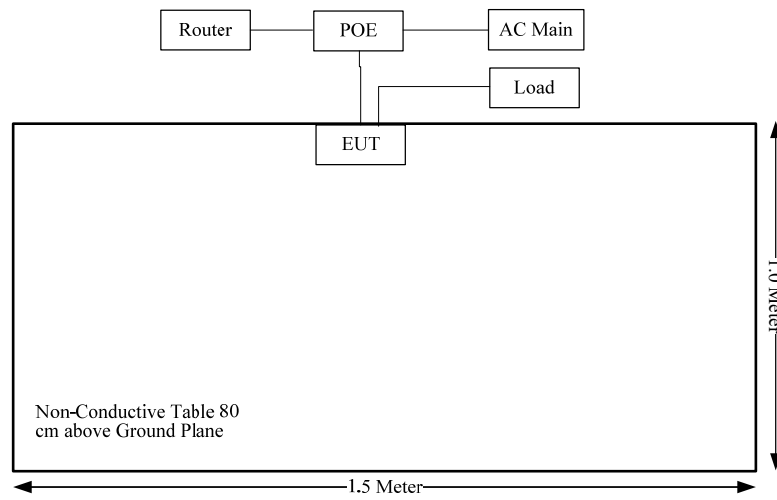
POE Adapter Mode:



Radiated emissions:
AC/DC Adapter Mode:



POE Adapter Mode:



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)

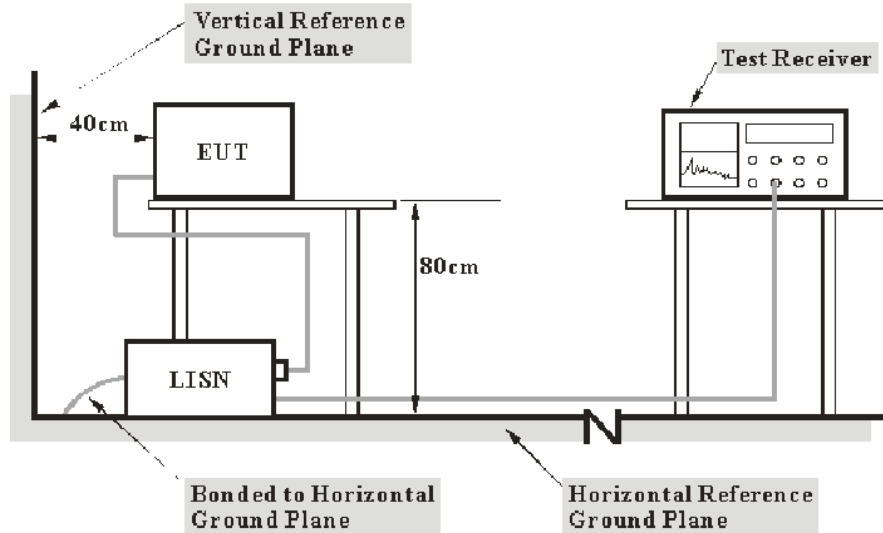
2. SUMMARY OF TEST RESULTS

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

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

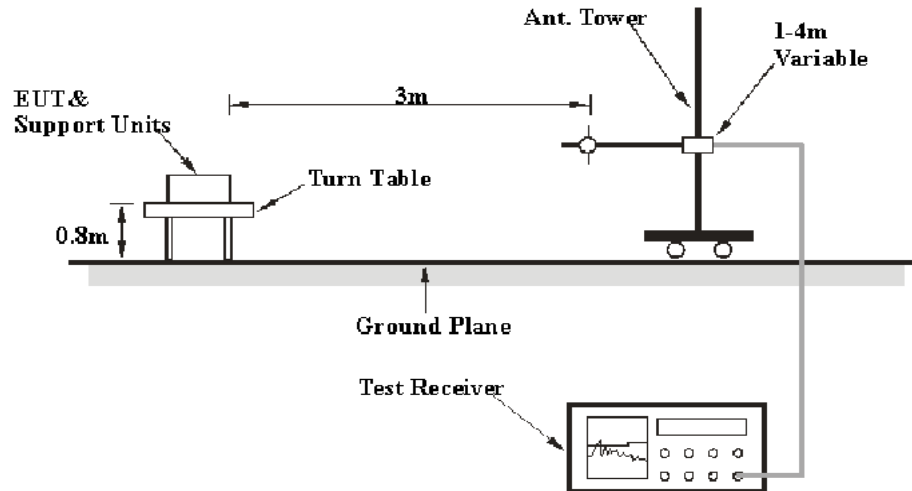
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

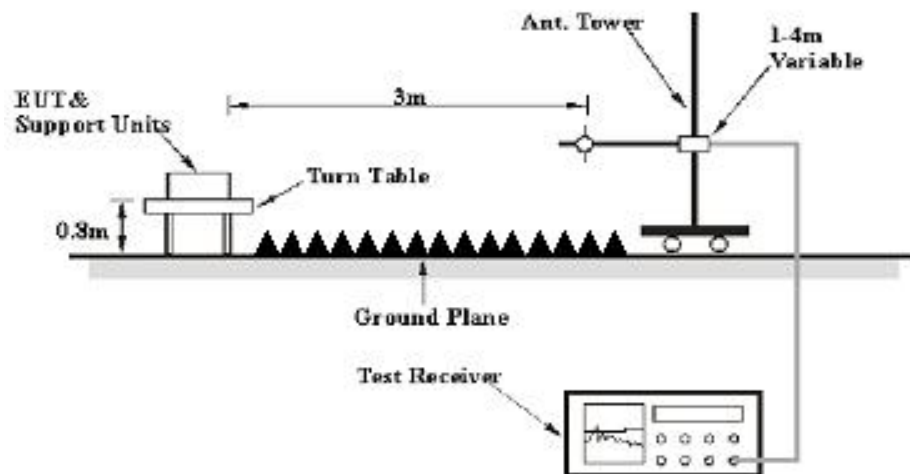
3.2 Radiation Spurious Emissions

3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission 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	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:

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:	CR21100121-RF-S1	Test Date:	2021-12-15
Test Site:	CE	Test Mode:	Operating
Tester:	Nick Tang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.2	Relative Humidity: (%)	70	ATM Pressure: (kPa)	101.2
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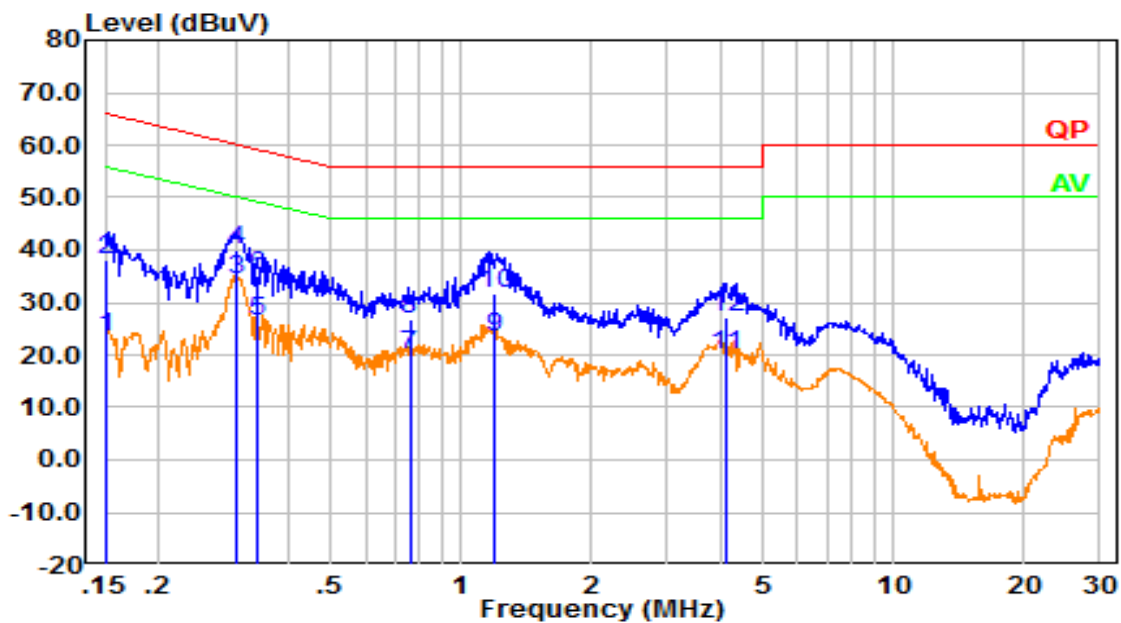
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2021-04-25	2022-04-24
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).*

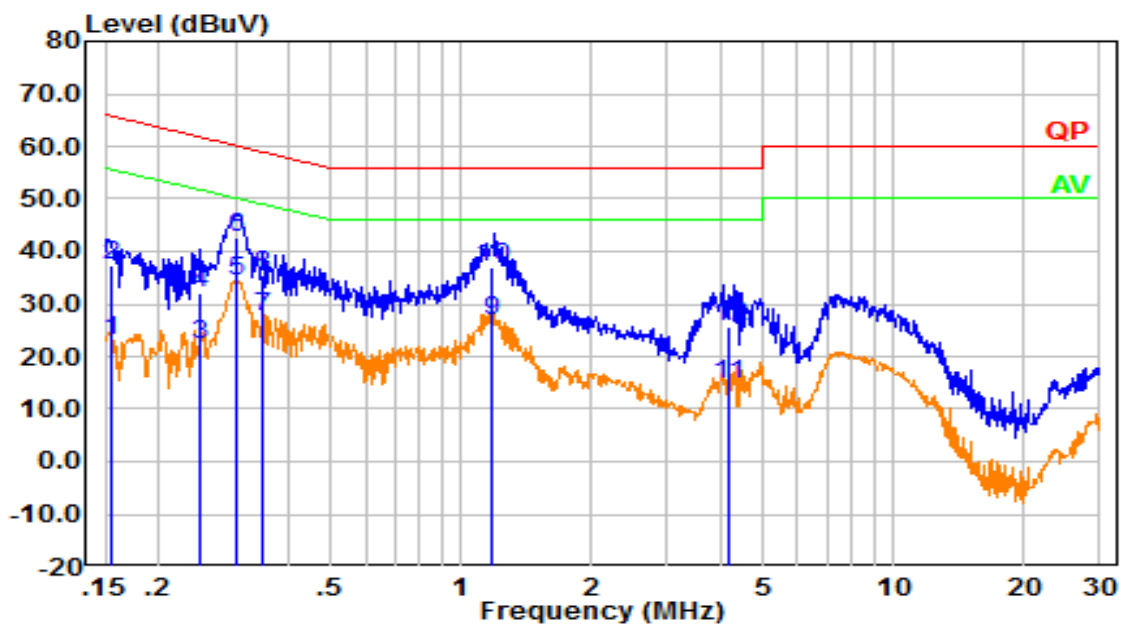
AC/DC Adapter Mode:

Line:



No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB)	Result (dB μ V)	Limit (dB μ V)	Margin (dB)	Detector
1	0.151	13.83	9.61	23.44	55.94	32.50	Average
2	0.151	28.38	9.61	37.99	65.94	27.95	QP
3	0.300	24.88	9.61	34.49	50.24	15.75	Average
4	0.300	30.27	9.61	39.88	60.24	20.36	QP
5	0.337	16.69	9.61	26.30	49.28	22.98	Average
6	0.337	25.57	9.61	35.18	59.28	24.10	QP
7	0.760	10.21	9.62	19.83	46.00	26.17	Average
8	0.760	17.04	9.62	26.66	56.00	29.34	QP
9	1.188	13.68	9.62	23.30	46.00	22.70	Average
10	1.188	22.17	9.62	31.79	56.00	24.21	QP
11	4.090	10.24	9.65	19.89	46.00	26.11	Average
12	4.090	17.65	9.65	27.30	56.00	28.70	QP

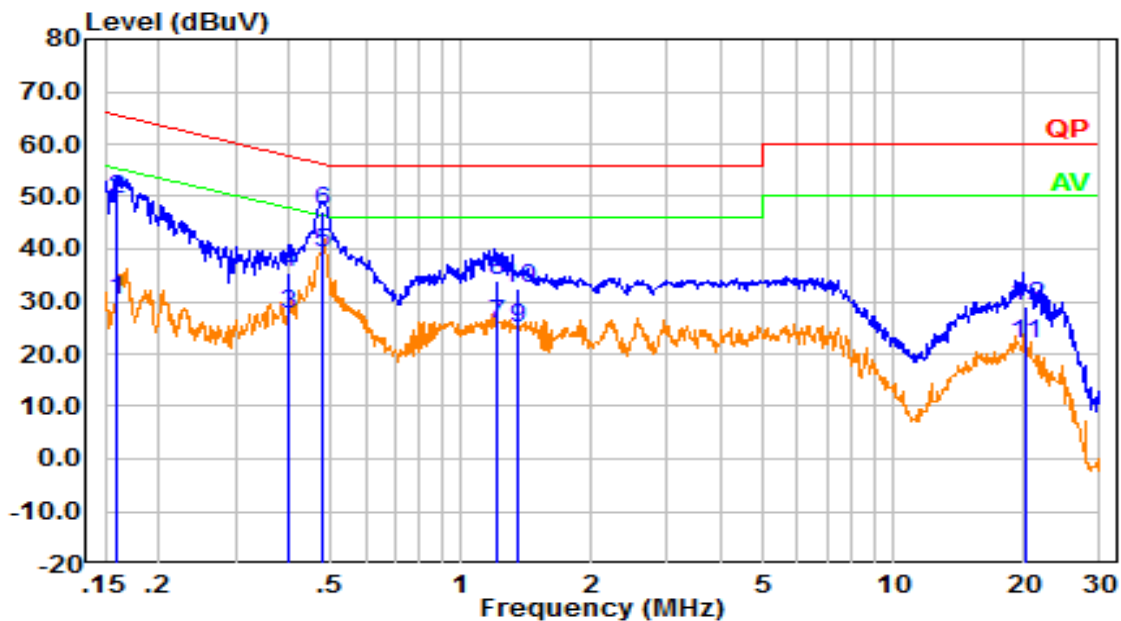
Neutral:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.154	13.51	9.61	23.12	55.76	32.64	Average
2	0.154	27.67	9.61	37.28	65.76	28.48	QP
3	0.250	12.84	9.61	22.45	51.76	29.31	Average
4	0.250	22.48	9.61	32.09	61.76	29.67	QP
5	0.303	24.70	9.61	34.31	50.17	15.86	Average
6	0.303	32.92	9.61	42.53	60.17	17.64	QP
7	0.349	18.02	9.61	27.63	49.00	21.37	Average
8	0.349	25.95	9.61	35.56	59.00	23.44	QP
9	1.170	17.18	9.62	26.80	46.00	19.20	Average
10	1.170	27.39	9.62	37.01	56.00	18.99	QP
11	4.141	5.22	9.65	14.87	46.00	31.13	Average
12	4.141	16.07	9.65	25.72	56.00	30.28	QP

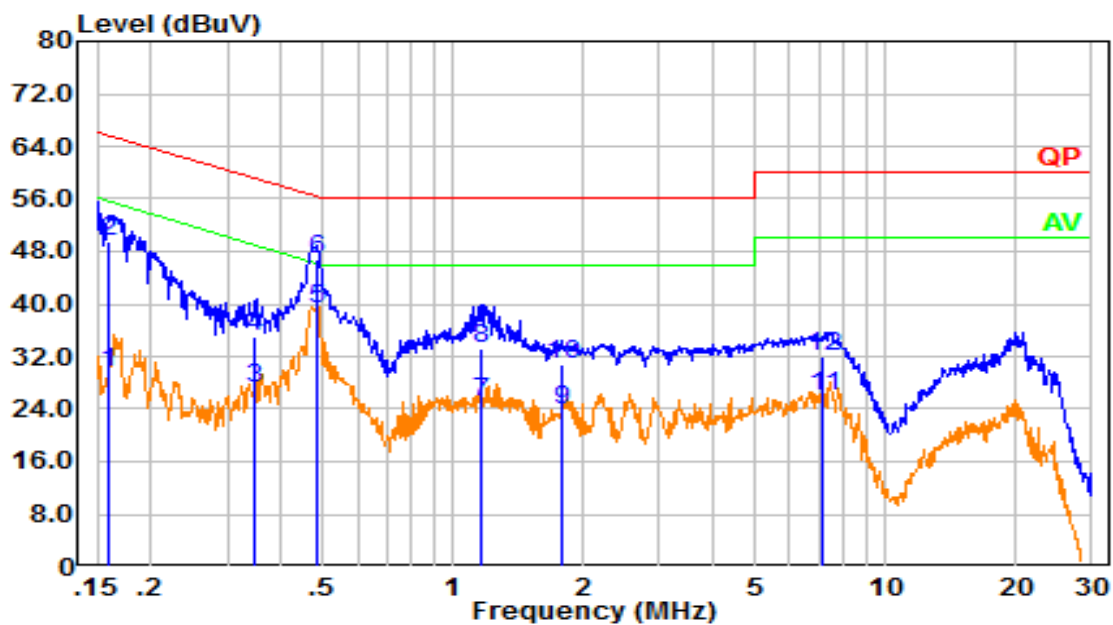
POE Adapter Mode:

Line:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.160	20.49	9.61	30.10	55.46	25.36	Average
2	0.160	39.87	9.61	49.48	65.46	15.98	QP
3	0.397	18.11	9.61	27.72	47.92	20.20	Average
4	0.397	25.83	9.61	35.44	57.92	22.48	QP
5	0.480	29.54	9.61	39.15	46.34	7.19	Average
6	0.480	37.43	9.61	47.04	56.34	9.30	QP
7	1.205	15.96	9.62	25.58	46.00	20.42	Average
8	1.205	24.44	9.62	34.06	56.00	21.94	QP
9	1.360	15.14	9.62	24.76	46.00	21.24	Average
10	1.360	22.77	9.62	32.40	56.00	23.60	QP
11	20.182	12.10	9.80	21.90	50.00	28.10	Average
12	20.182	19.38	9.80	29.18	60.00	30.82	QP

Neutral:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.160	20.11	9.61	29.72	55.46	25.74	Average
2	0.160	39.90	9.61	49.51	65.46	15.95	QP
3	0.349	17.65	9.61	27.26	48.99	21.73	Average
4	0.349	25.33	9.61	34.94	58.99	24.05	QP
5	0.481	29.55	9.61	39.16	46.33	7.17	Average
6	0.481	37.31	9.61	46.92	56.33	9.41	QP
7	1.156	15.51	9.62	25.13	46.00	20.87	Average
8	1.156	23.52	9.62	33.14	56.00	22.86	QP
9	1.794	14.23	9.63	23.86	46.00	22.14	Average
10	1.794	21.04	9.63	30.67	56.00	25.33	QP
11	7.176	16.29	9.66	25.96	50.00	24.04	Average
12	7.176	22.49	9.66	32.15	60.00	27.85	QP

4.2 Radiation Spurious Emissions

Serial Number:	CR21100121-RF-S1	Test Date:	2021-12-16
Test Site:	966-2	Test Mode:	Operating
Tester:	Carl Liang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.1	Relative Humidity: (%)	43	ATM Pressure: (kPa)	101.1
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Test Equipment List and Details:

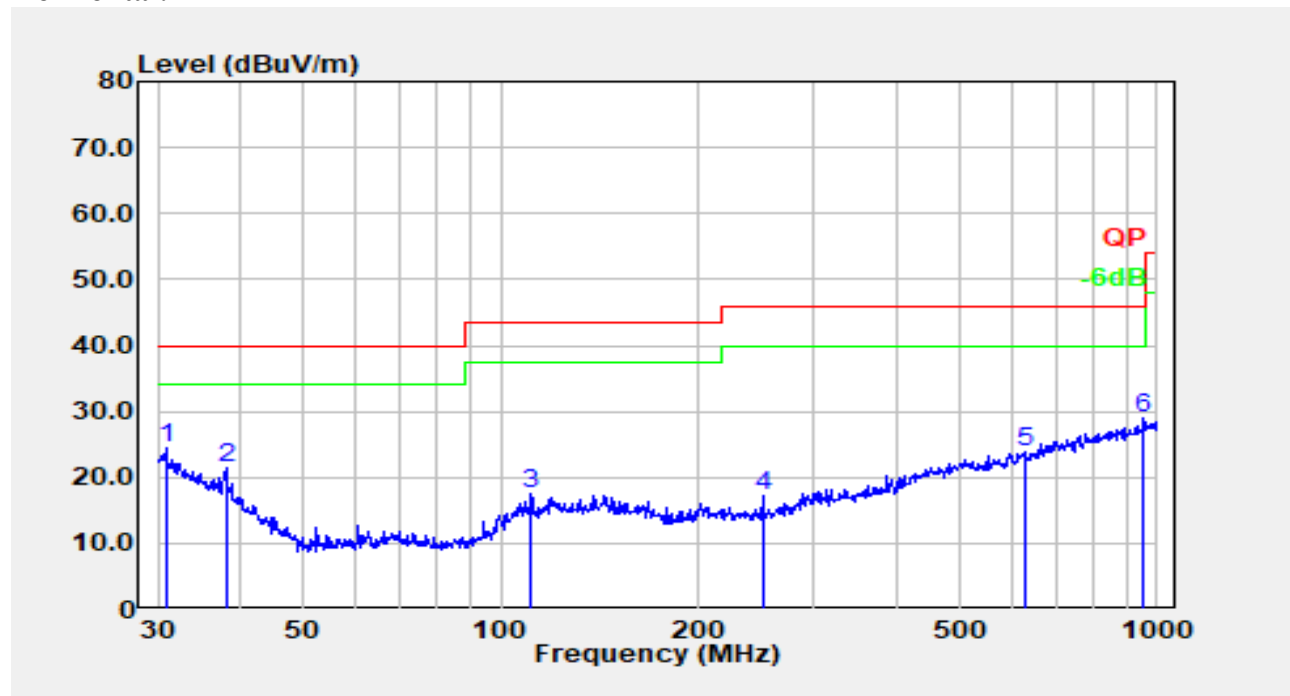
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17
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).*

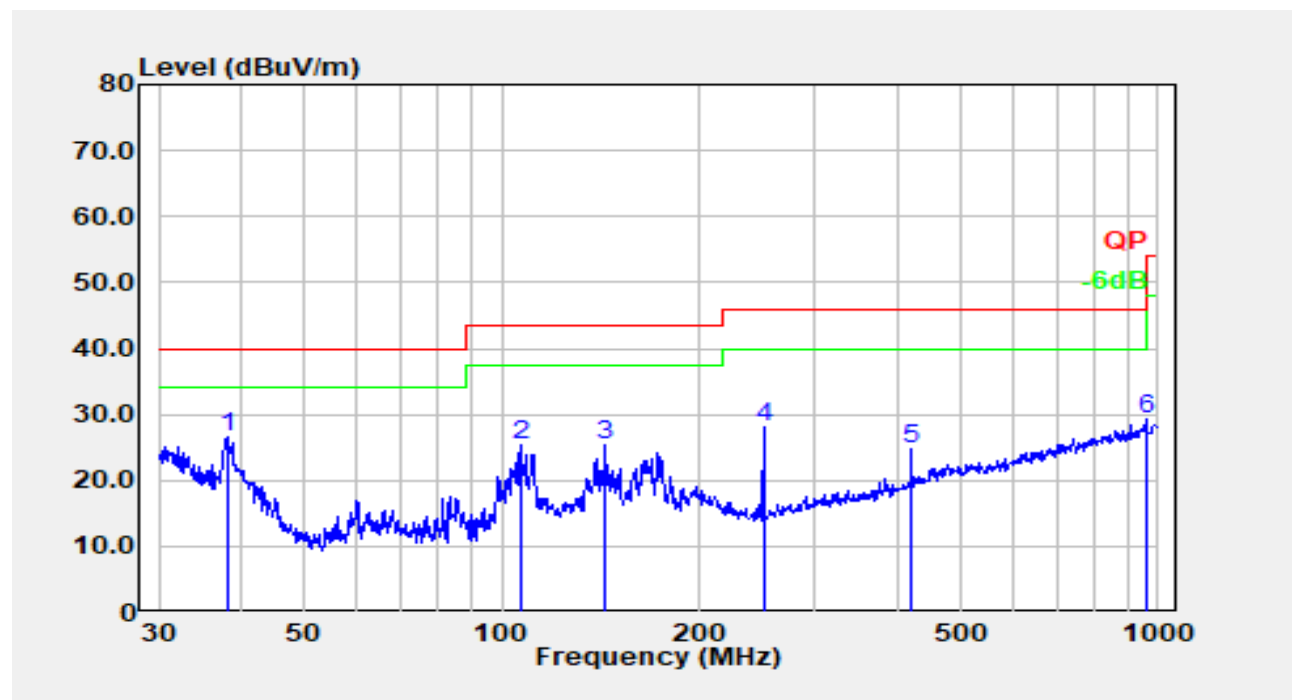
1) 30MHz-1GHz:

AC/DC Adapter Mode:

Horizontal:



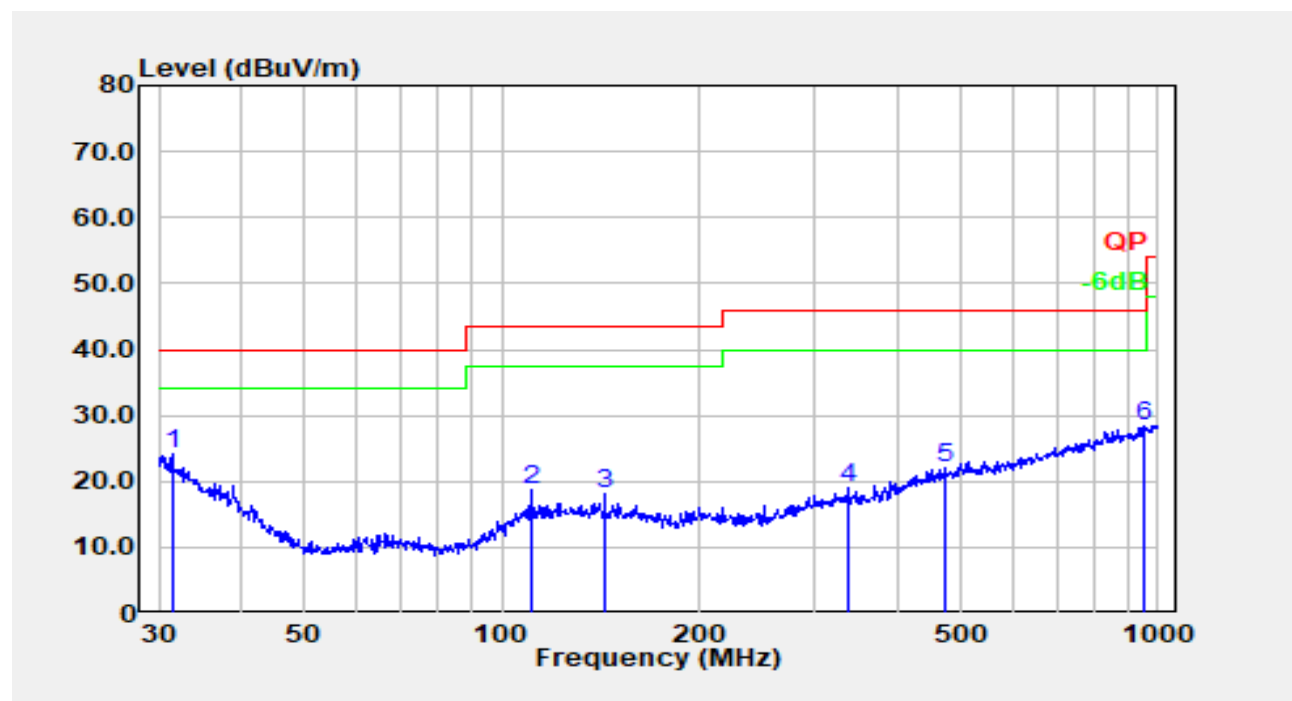
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.962	29.10	-4.53	24.57	40.00	15.43	Peak
2	38.078	31.50	-9.97	21.53	40.00	18.47	Peak
3	111.347	30.08	-12.48	17.60	43.50	25.90	Peak
4	250.301	30.60	-13.25	17.34	46.00	28.66	Peak
5	631.688	28.78	-4.89	23.88	46.00	22.12	Peak
6	955.438	29.15	-0.27	28.88	46.00	17.12	Peak

Vertical:

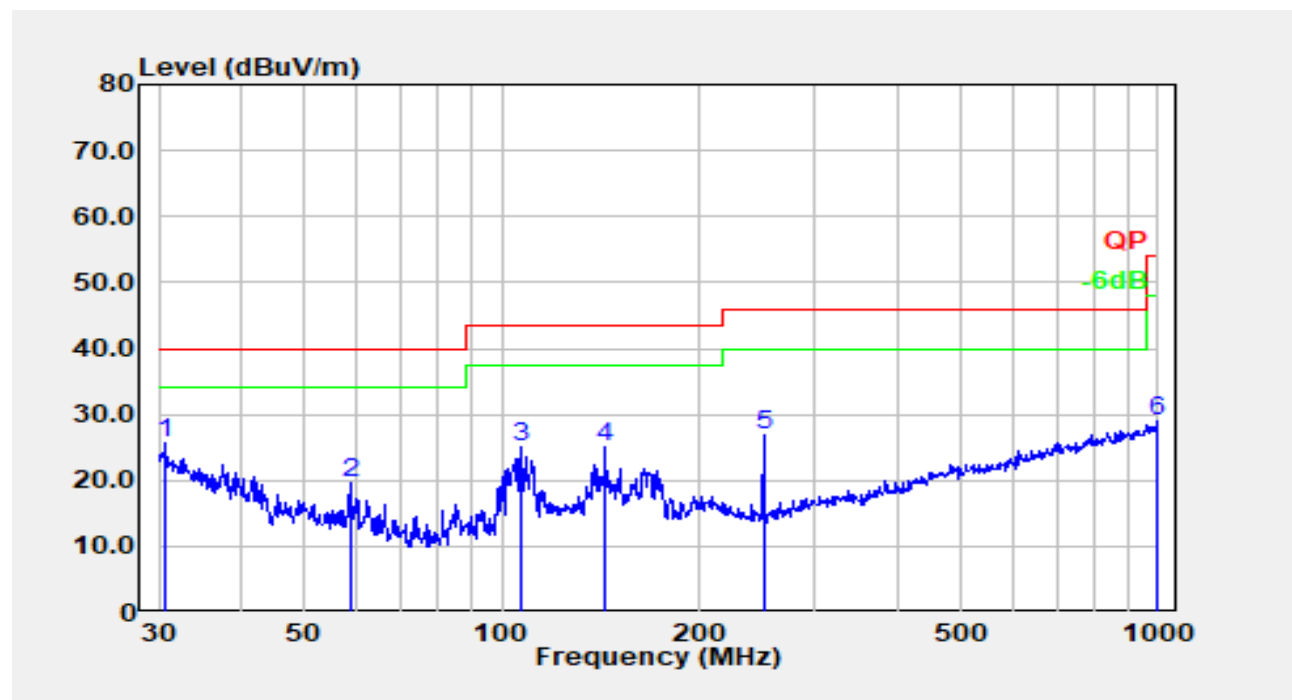
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	38.078	36.59	-9.97	26.61	40.00	13.39	Peak
2	106.759	38.65	-13.22	25.42	43.50	18.08	Peak
3	143.326	37.65	-12.18	25.47	43.50	18.03	Peak
4	250.301	41.35	-13.25	28.10	46.00	17.90	Peak
5	420.580	32.90	-8.12	24.78	46.00	21.22	Peak
6	958.794	29.38	-0.18	29.20	46.00	16.80	Peak

POE Adapter Mode:

Horizontal:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	31.399	29.16	-4.86	24.30	40.00	15.70	Peak
2	110.569	31.17	-12.55	18.63	43.50	24.87	Peak
3	143.326	30.16	-12.18	17.98	43.50	25.52	Peak
4	336.035	29.31	-10.33	18.98	46.00	27.02	Peak
5	472.176	28.48	-6.56	21.91	46.00	24.09	Peak
6	955.438	28.79	-0.27	28.52	46.00	17.48	Peak

Vertical:

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