

FCC Test Report

Applicant : **Bolin Technology Co.Ltd**

Address : **5th floor, Building 4, jinrui Nuclear, High-tech industrial Park, Huawang Road,Dalang, Longhua,shenzhen**

Product Name : **BirdDog PTZ Camera**

Report Date : **June 15, 2023**

Shenzhen Anbotech Compliance Laboratory Limited



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TEST REPORT

Applicant : Bolin Technology Co.Ltd
Manufacturer : 5th floor, Building 4, jinrui Nuclear, High-tech industrial Park, Huawang Road,Dalang, Longhua,shenzhen
Product Name : BirdDog PTZ Camera
Model No. : X120 Black
Trade Mark : /
Rating(s) : INPUT: 100-240V-50-60HZ 0.8A
OUTPUT: 12.0V- 2.0A 24.0W
Test Standard(s) : FCC 47 CFR Part 15 Subpart B: 2022
Test Method(s) : ANSI C63.4-2014

The device described above is tested by Shenzhen Anbotech Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC 47 CFR Part 15 Subpart B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Anbotech Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Anbotech Compliance Laboratory Limited

Date of Receipt:

Apr. 26, 2023

Date of Test:

Apr. 26~June 15, 2023

Prepared By:

Ella Liang

(Ella Liang)

Approved & Authorized Signer:

KingKong Jin

(KingKong Jin)



1. General Information

1.1. Client Information

Applicant	:	Bolin Technology Co.Ltd
Address	:	5th floor, Building 4, jinrui Nuclear, High-tech industrial Park, Huawang Road,Dalang, Longhua,shenzhen
Manufacturer	:	Bolin Technology Co.Ltd
Address	:	5th floor, Building 4, jinrui Nuclear, High-tech industrial Park, Huawang Road,Dalang, Longhua,shenzhen
Factory	:	Bolin Technology Co.Ltd
Address	:	5th floor, Building 4, jinrui Nuclear, High-tech industrial Park, Huawang Road,Dalang, Longhua,shenzhen

1.2. Description of Device (EUT)

Product Name	:	BirdDog PTZ Camera
Model No.	:	X120 Black
Trade Mark	:	/
Test Power Supply	:	INPUT: 100-240V-50-60HZ 0.8A OUTPUT: 12.0V- 2.0A 24.0W
Test Sample No.	:	1-2-1(Normal Sample)
Adapter	:	MODEL:GME24A-120200FDS
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

Description	Manufacturer
Display screen	PHILIPS
Laptops	Hewlett-Packard
Network cable	/



1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup



1.5. Test Summary

Standard Section	Test Items	Test Mode	Status
§15.107	Power Line Conducted Emission Test	Mode 1	P
§15.109	Radiated Emission Test (Below 1 GHz)	Mode 1	P
§15.109	Radiated Emission Test (Above 1GHz)	Mode 1	P

P) Indicates “PASS”.
F) Indicates “Fail”.
N) Indicates “Not applicable”.

1.6. Test Equipment List

☒ Power Line Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 23, 2022	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	Jul. 05, 2022	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
5.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A



☒ Radiated Emission Test (Below 1 GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 23, 2022	1 Year
2.	Pre-amplifier	SONOMA	310N	186860	Oct. 23, 2022	1 Year
3.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 23, 2022	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

☒ Radiated Emission Test (Above 1GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 23, 2022	1 Year
2.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A
3.	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	Oct. 13, 2022	1 Year
4.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year

1.7. Measurement Uncertainty

Radiation	:	Ur = 4.46 dB (Horizontal)
Uncertainty(30MHz-1GHz)	:	Ur = 5.04 dB (Vertical)
Radiation	:	Ur = 4.92 dB (Horizontal)
Uncertainty(1GHz-6GHz)	:	Ur = 4.92 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB
Disturbance Uncertainty	:	Ud = 3.4 dB



1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128



2. Power Line Conducted Emission Test

2.1. Test Standard and Limit

Test Standard:	FCC 47 CFR Part 15 Subpart B
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☐ Limits for conducted emission at the AC mains power ports of Class A equipment

Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0
0.50 ~ 30.00	73.0	60.0

Remark: The lower limit shall apply at the transition frequencies.

☒ Limits for conducted emission at the AC mains power ports of Class B equipment

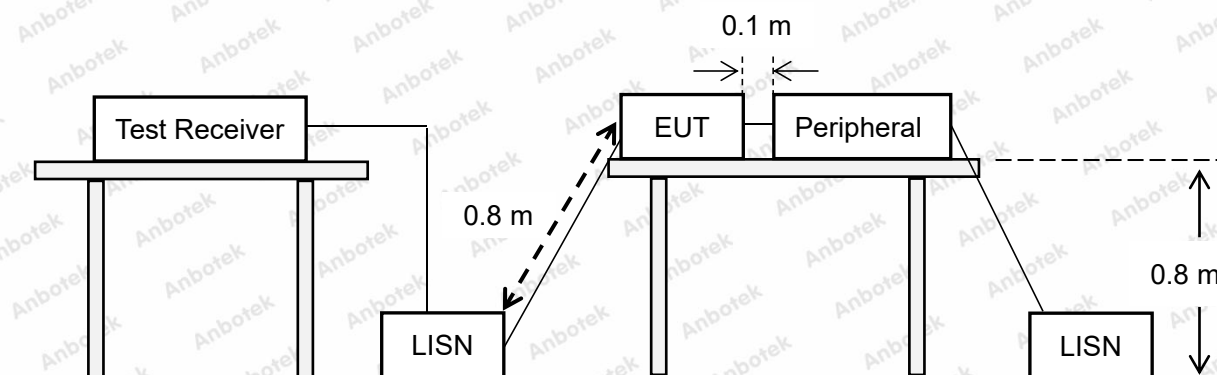
Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

Remark:

(1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

2.2. Test Setup



2.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane, and the back of the EUT is 0.4 m away from the vertical ground reference plane, and at least 0.8 m from any other metal surface or ground plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plate, at least 0.8 m away from other metal objects.

Connect EUT to the power mains through an LISN. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the center into a bundle no longer than 0.4 m, so that its length is shortened to 1 m. All the peripherals are connecting to the other LISN.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

Set the test-receiver to quasi peak detect function and average detect function, and to measure the conducted emissions values.

2.4. Test Results

PASS

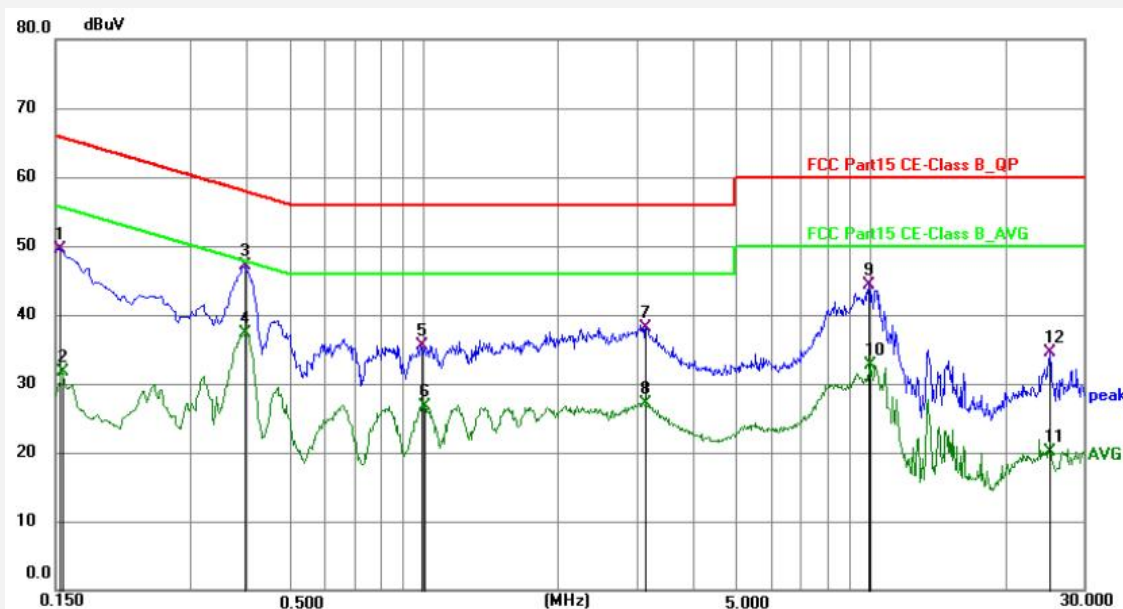
During the test, pre-scan all modes, only the worst case is recorded in the report.

The test curves are shown in the following pages.



Power Line Conducted Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz
Comment: Live Line
Temp.: 26°C Hum.: 54%



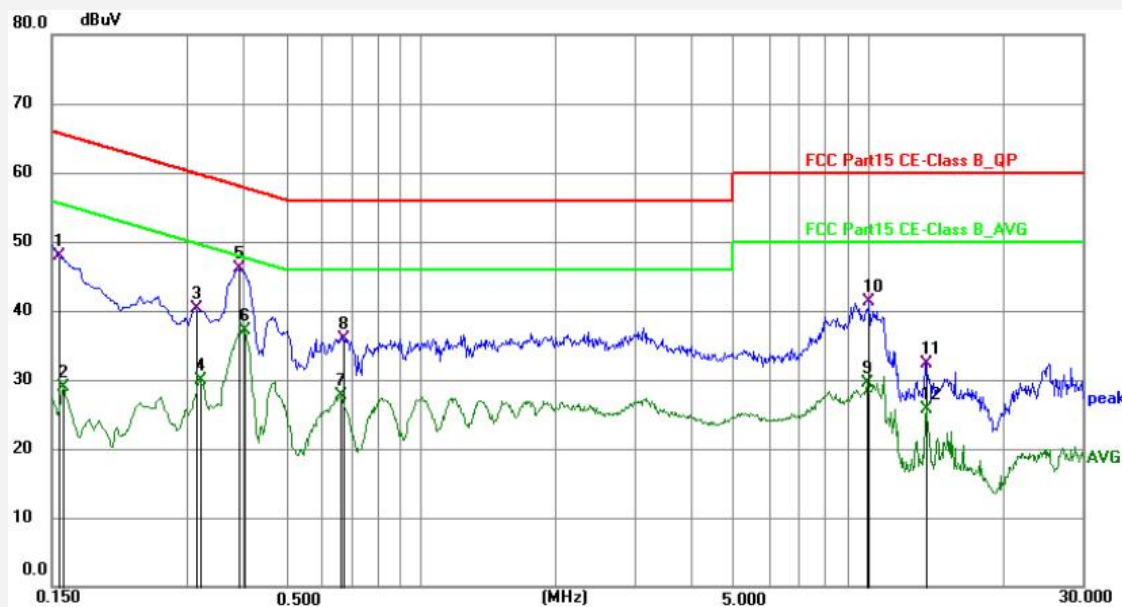
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1532	38.85	10.57	49.42	65.82	-16.40	QP	P
2	0.1545	21.08	10.57	31.65	55.75	-24.10	AVG	P
3	0.3975	36.42	10.60	47.02	57.91	-10.89	QP	P
4 *	0.3975	26.71	10.60	37.31	47.91	-10.60	AVG	P
5	0.9870	24.75	10.66	35.41	56.00	-20.59	QP	P
6	1.0095	16.00	10.66	26.66	46.00	-19.34	AVG	P
7	3.1560	27.32	10.70	38.02	56.00	-17.98	QP	P
8	3.1560	16.49	10.70	27.19	46.00	-18.81	AVG	P
9	9.9365	33.58	10.75	44.33	60.00	-15.67	QP	P
10	10.0585	21.98	10.75	32.73	50.00	-17.27	AVG	P
11	25.0570	9.25	10.94	20.19	50.00	-29.81	AVG	P
12	25.3180	23.65	10.94	34.59	60.00	-25.41	QP	P

Note: Result = Reading + Factor Over Limit = Result - Limit



Power Line Conducted Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz
Comment: Neutral Line
Temp.: 26°C Hum.: 54%



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1545	37.24	10.57	47.81	65.75	-17.94	QP	P
2	0.1590	18.29	10.57	28.86	55.52	-26.66	AVG	P
3	0.3120	29.77	10.60	40.37	59.92	-19.55	QP	P
4	0.3209	19.35	10.60	29.95	49.68	-19.73	AVG	P
5	0.3930	35.41	10.60	46.01	58.00	-11.99	QP	P
6 *	0.4020	26.46	10.60	37.06	47.81	-10.75	AVG	P
7	0.6630	17.14	10.64	27.78	46.00	-18.22	AVG	P
8	0.6675	25.32	10.64	35.96	56.00	-20.04	QP	P
9	9.9365	18.75	10.85	29.60	50.00	-20.40	AVG	P
10	10.0629	30.49	10.85	41.34	60.00	-18.66	QP	P
11	13.3570	21.51	10.85	32.36	60.00	-27.64	QP	P
12	13.4200	14.77	10.85	25.62	50.00	-24.38	AVG	P

Note: Result = Reading + Factor Over Limit = Result - Limit



3. Radiated Emission Test (Below 1 GHz)

3.1. Test Standard and Limit

Test Standard	FCC 47 CFR Part 15 Subpart B
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☐ Limit for radiated emissions at frequencies up to 1 GHz for class A equipment

Test Limit	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT	
			$\mu\text{V/m}$	(dB $\mu\text{V/m}$)
	30 ~ 88	3	300	49.5
	88 ~ 216	3	500	54.0
	216 ~ 960	3	700	56.9
	Above 960	3	1000	60.0

Remark: (1) Emission level (dB) μV = 20 log Emission level $\mu\text{V/m}$
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

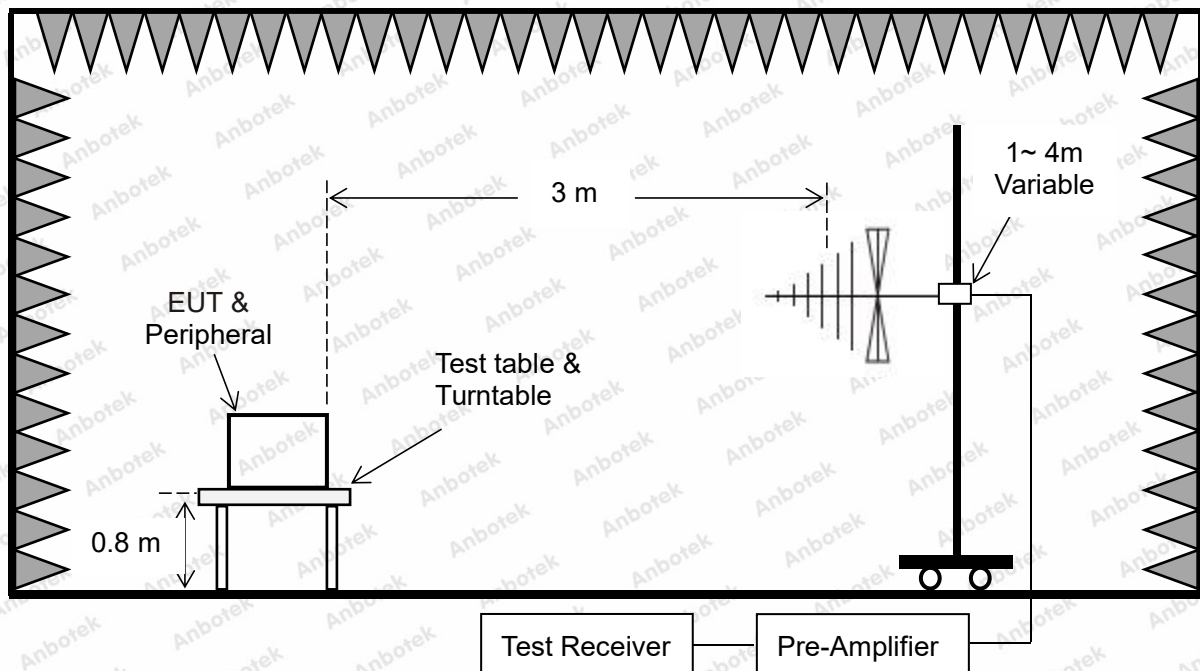
☒ Limit for radiated emissions at frequencies up to 1 GHz for class B equipment

Test Limit	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT	
			$\mu\text{V/m}$	(dB $\mu\text{V/m}$)
	30 ~ 88	3	100	40.0
	88 ~ 216	3	150	43.5
	216 ~ 960	3	200	46.0
	Above 960	3	501	54.0

Remark: (1) Emission level (dB) μV = 20 log Emission level $\mu\text{V/m}$
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.



3.2. Test Setup



3.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT was set 3 m away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 m to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.



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The bandwidth of the Receiver is set at 120 kHz.

3.4. Test Results

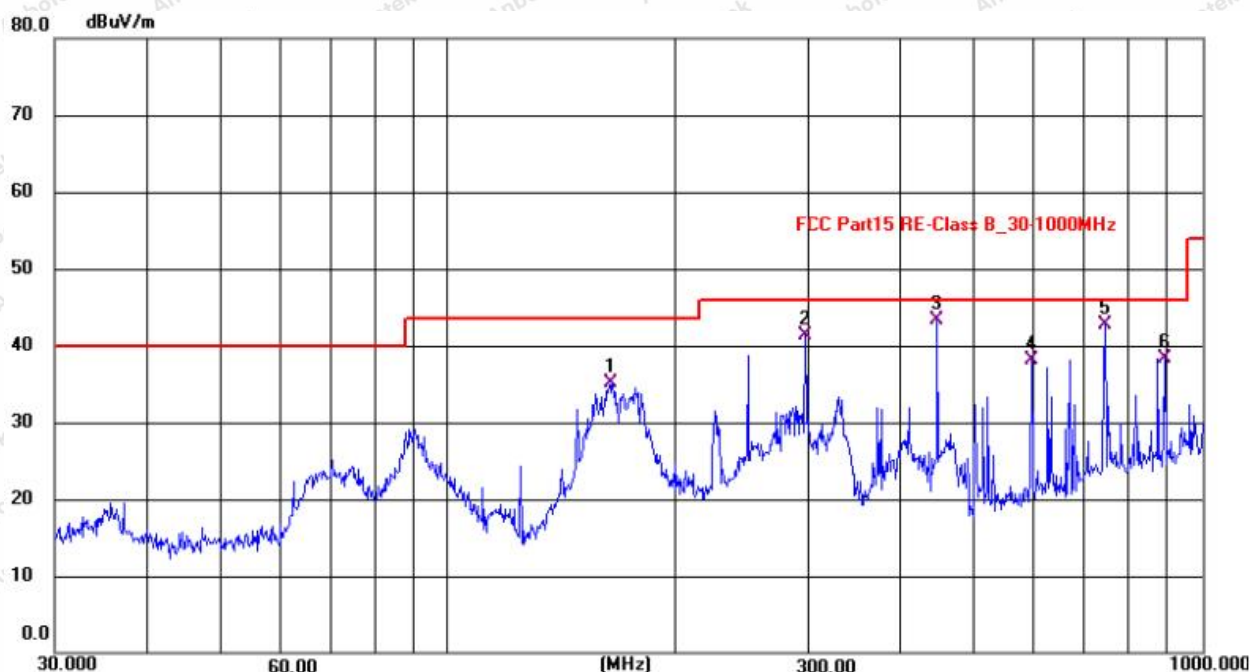
PASS

During the test, pre-scan all modes, only the worst case is recorded in the report.

The test curves are shown in the following pages.



Test item: Radiation Test Polarization: Horizontal
Standard: (RE)FCC 47 CFR Part 15 Subpart B Power Source: AC 120V, 60Hz
Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum.(%RH): 22(°C)/45%RH
Distance: 3m Test Mode: Mode 1

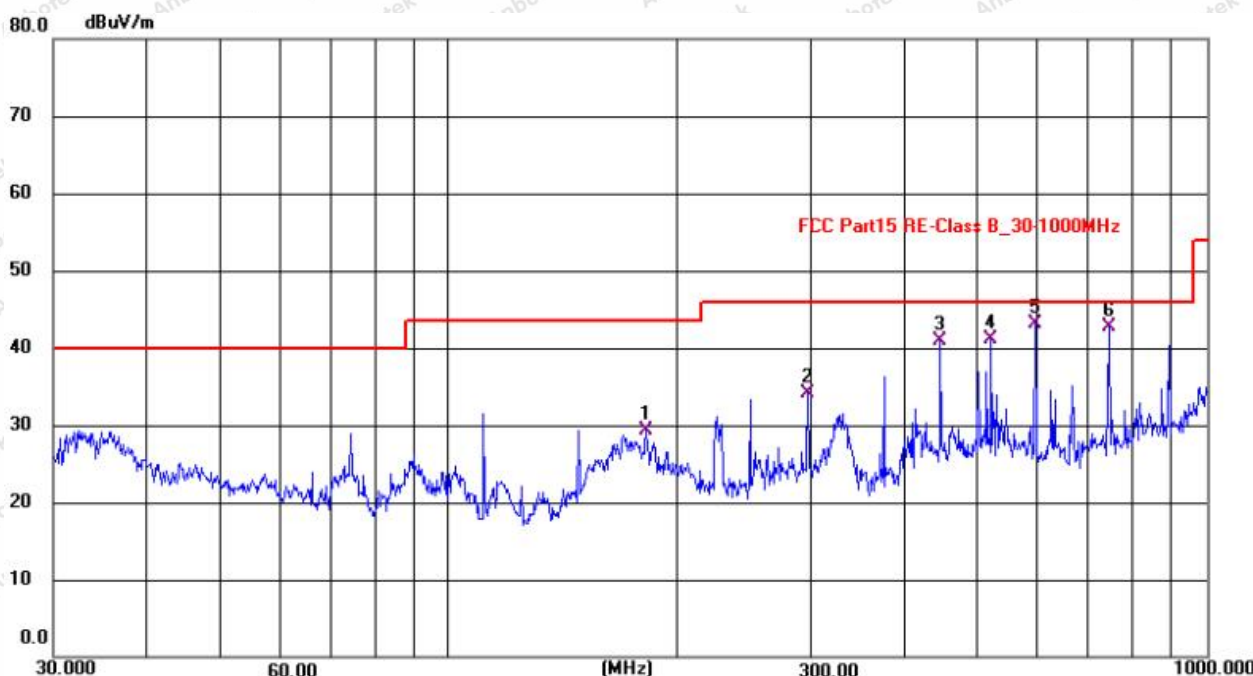


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	165.4866	50.02	-14.89	35.13	43.50	-8.37	QP
2	297.2240	56.42	-15.20	41.22	46.00	-4.78	QP
3 *	445.6320	54.54	-11.21	43.33	46.00	-2.67	QP
4	594.0903	46.61	-8.43	38.18	46.00	-7.82	QP
5	743.5611	47.86	-5.21	42.65	46.00	-3.35	QP
6	892.2908	41.11	-2.87	38.24	46.00	-7.76	QP

Note: Result= Reading + Factor Over Limit=Result-Limit



Test item: Radiation Test Polarization: Vertical
Standard: (RE)FCC 47 CFR Part 15 Subpart B Power Source: AC 120V, 60Hz
Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum.(%RH): 22(°C)/45%RH
Distance: 3m Test Mode: Mode 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	182.5592	46.67	-17.35	29.32	43.50	-14.18	QP
2	297.2240	49.28	-15.20	34.08	46.00	-11.92	QP
3	445.6320	52.17	-11.21	40.96	46.00	-5.04	QP
4	519.9757	51.57	-10.51	41.06	46.00	-4.94	QP
5 *	594.0904	51.50	-8.43	43.07	46.00	-2.93	QP
6	743.5611	48.01	-5.21	42.80	46.00	-3.20	QP

Note: Result= Reading + Factor Over Limit=Result-Limit



4. Radiated Emission Test (Above 1GHz)

4.1. Test Standard and Limit

Test Standard	FCC 47 CFR Part 15 Subpart B
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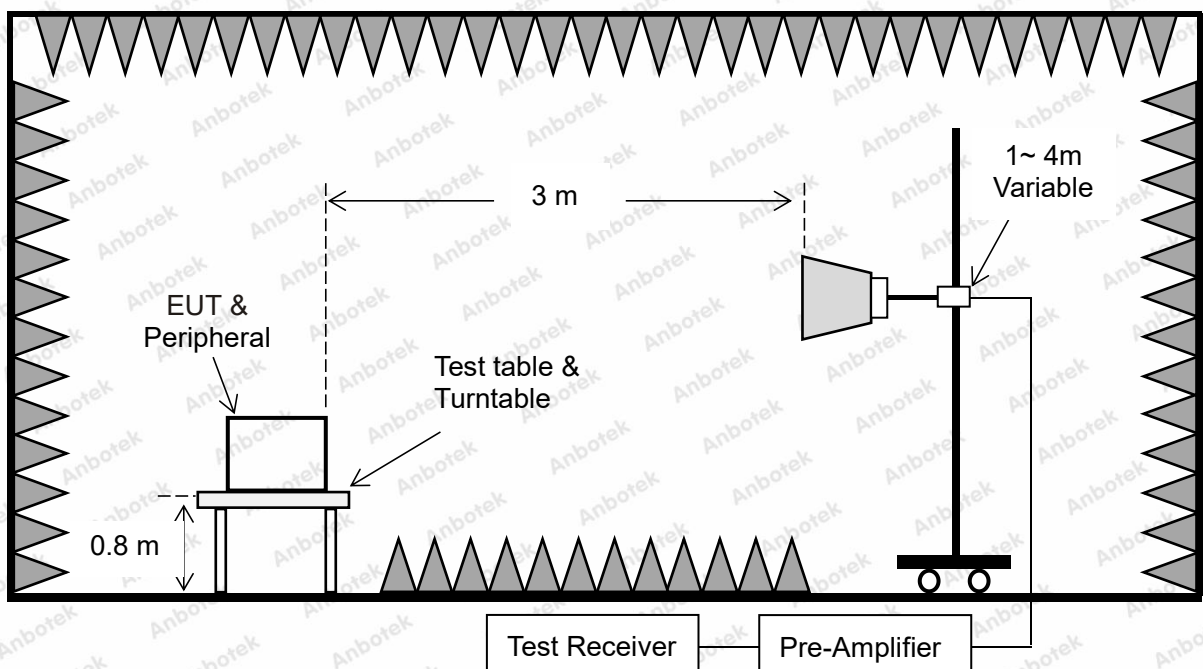
☐ Limit for radiated emissions at frequencies above 1 GHz for class A equipment

Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dB μ V/m)	
		Peak	Average
Above 960	3	80	60
Remark: N/A			

☒ Limit for radiated emissions at frequencies above 1 GHz for class B equipment

Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dB μ V/m)	
		Peak	Average
Above 960	3	74	54
Remark: N/A			

4.2. Test Setup



4.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT was set 3 m away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 m to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The test receiver is set to peak and average detects function.

The bandwidth of the test receiver is set at 1MHz.

4.4. Test Results

PASS

During the test, pre-scan all modes, only the worst case is recorded in the report.

The test curves are shown in the following pages.



Test Frequency:		1GHz~6GHz					
Temp.(°C)/Hum.(%RH):		24.2(°C)/52%RH					
Power Source:		AC 120V, 60Hz					
Test Mode:		Mode 1					
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
1090.115	42.57	-7.99	34.58	74.00	-39.42	H	PEAK
1131.013	34.82	-7.11	26.88	74.00	-46.29	H	PEAK
1145.700	32.84	-7.55	25.46	74.00	-48.71	H	PEAK
1304.325	41.04	-7.33	33.71	74.00	-40.29	H	PEAK
1320.188	42.48	-2.41	40.28	74.00	-33.93	H	PEAK
2496.950	28.77	-2.20	26.57	74.00	-47.43	H	PEAK
2496.950	26.81	2.18	28.99	74.00	-45.01	H	AVG
3884.037	35.57	2.30	37.87	74.00	-36.13	H	AVG
3914.000	24.03	9.55	33.74	74.00	-40.42	H	AVG
5500.800	32.66	9.71	42.37	74.00	-31.63	H	AVG
5600.450	30.63	14.50	45.36	74.00	-28.87	H	AVG
5905.430	22.21	14.73	36.94	74.00	-37.06	H	AVG
1090.115	41.15	-7.99	35.15	54.00	-20.84	V	PEAK
1131.013	36.25	-7.11	27.17	54.00	-24.86	V	PEAK
1145.700	32.47	-7.55	25.79	54.00	-29.08	V	PEAK
1304.325	40.87	-7.33	34.35	54.00	-20.46	V	PEAK
1320.188	43.33	-2.41	48.50	54.00	-13.08	V	PEAK
2496.950	27.48	-2.20	34.77	54.00	-28.72	V	PEAK
2496.950	25.54	2.18	28.90	54.00	-26.28	V	AVG
3884.037	36.36	2.30	36.98	54.00	-15.34	V	AVG
3914.000	24.44	9.55	48.03	54.00	-20.01	V	AVG
5500.800	32.61	9.71	45.87	54.00	-11.68	V	AVG
5600.450	31.27	14.50	38.60	54.00	-8.23	V	AVG
5905.430	24.11	14.73	48.38	54.00	-15.16	V	AVG
Note: Level=Read Level +Factor Over Limit=Level-Limit							



APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

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

