



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 : **08 30, 2023**

Shenzhen Tian Hai Test Technology Co., Ltd.



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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. : U120, U120 Ocean
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 Anbotek 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 Anbotek 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 Anbotek Compliance Laboratory Limited

Date of Receipt : 08. 19, 2023
Date of Test : 08. 19~08. 30, 2023

Tested by : 
(Suny Zhuo)

Reviewed by : 
(Blue Hu)

Approved & Authorized Signer : 
(Binglee)



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.	:	U120, U120 Ocean
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

Conducted Emission				
Kind of Equipment	Manufacturer	Type	S/N	Calibrate until
EMI Test Receiver	R&S	ESR7	102333	2023-11-13
L.I.S.N	Schwarzbeck	NNLK 8128	5089	2023-11-13
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	231	2023-11-13
Pulse Limiter	Schwarzbeck	VTSD 9561-F	847	2023-11-13
Test software	FALA	/	EMC-CON 3A1.1	/
Radiated Emission (3m)				
EMI Test Receiver	R&S	ESR7	102333	2023-11-13
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2024-04-20
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2023-11-20
Pre-Amplifier	Schwarzbeck	BBV 9718 B	00109	2023-11-13
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2023-11-13
Pre-Amplifier	GUANGGU ELECTRONIC	GLNA18-40GK-5 372	20210331001	2023-11-13
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00148	2023-11-13
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2023-11-20
Horn Antenna	A-INFO	LB-180400-KF	J258792	2023-11-20
Test software	FALA	/	FA-03A2 RE	/

1.7. Measurement Uncertainty

Test Item	Test Items	Polarization	Uncertainty
Conducted Emission At Mains Terminals	150kHz to 30MHz	LINE/NEUTRAL	2.35 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Horizontal	5.78 dB
	30 MHz ~ 1,000 MHz	Vertical	5.78 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.



1.8 Description of Test Facility

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

FCC-Registration No.: 6827.01

Shenzhen Tian Hai Test Technology Co., Ltd, 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. 6827.01

Test Location

Shenzhen Tian Hai Test Technology Co., Ltd.

125-126, No.66, Zhangge Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, China



2.1. Test Standard and Limit

☐ **Limits for conducted emission at the AC mains power ports of Class A equipment**

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

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.



2.3. 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

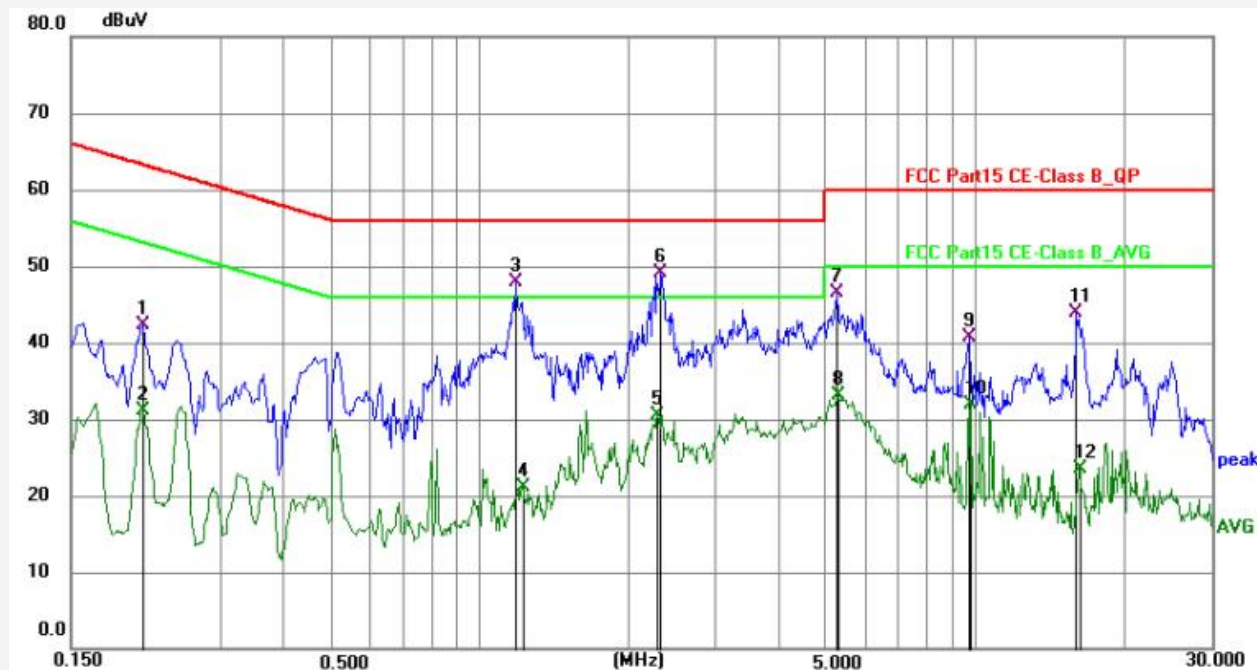
During the test, pre-scan all modes, only the worst case is recorded in the report.

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%



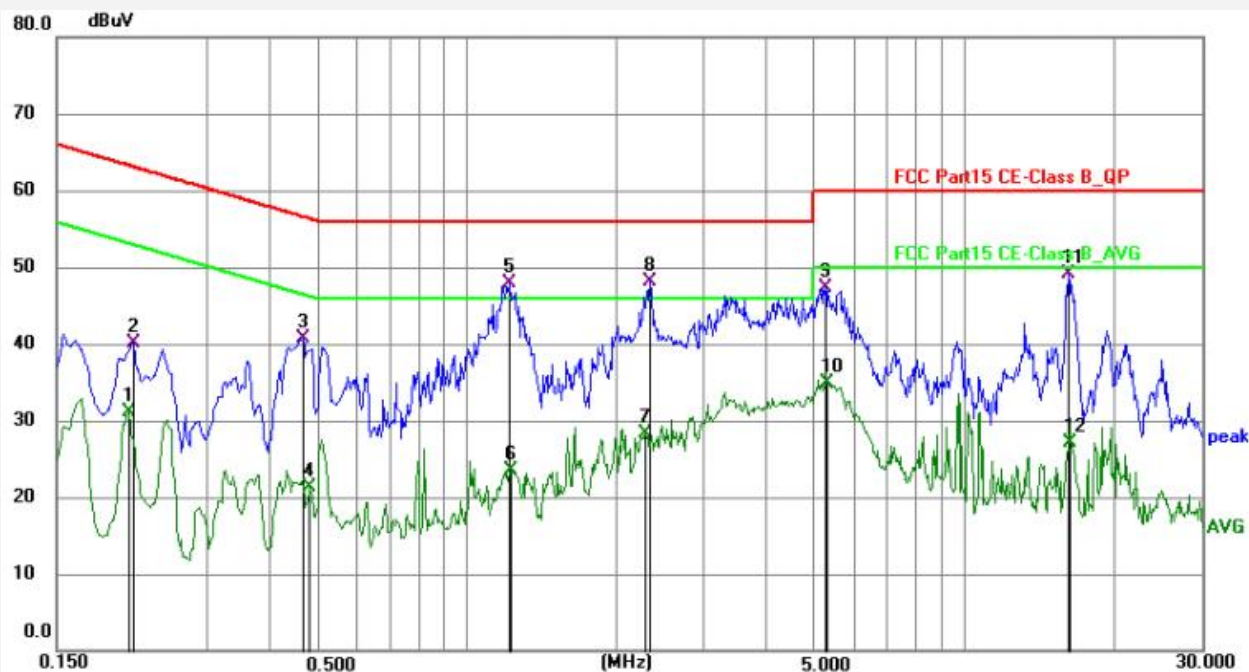
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2084	31.66	10.58	42.24	63.27	-21.03	QP	P
2	0.2084	20.45	10.58	31.03	53.27	-22.24	AVG	P
3	1.1895	37.19	10.66	47.85	56.00	-8.15	QP	P
4	1.2161	10.48	10.66	21.14	46.00	-24.86	AVG	P
5	2.2919	19.87	10.68	30.55	46.00	-15.45	AVG	P
6 *	2.3325	38.40	10.68	49.08	56.00	-6.92	QP	P
7	5.2743	35.74	10.72	46.46	60.00	-13.54	QP	P
8	5.2880	22.30	10.72	33.02	50.00	-16.98	AVG	P
9	9.7520	30.03	10.75	40.78	60.00	-19.22	QP	P
10	9.8375	21.22	10.75	31.97	50.00	-18.03	AVG	P
11	16.0165	33.02	10.87	43.89	60.00	-16.11	QP	P
12	16.2280	12.66	10.87	23.53	50.00	-26.47	AVG	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	0.2084	20.45	10.58	31.03	53.27	-22.24	AVG	P
2	0.2129	29.54	10.58	40.12	63.09	-22.97	QP	P
3	0.4686	30.12	10.62	40.74	56.54	-15.80	QP	P
4	0.4828	10.78	10.62	21.40	46.29	-24.89	AVG	P
5	1.2210	37.24	10.66	47.90	56.00	-8.10	QP	P
6	1.2300	12.87	10.66	23.53	46.00	-22.47	AVG	P
7	2.2919	17.55	10.68	28.23	46.00	-17.77	AVG	P
8 *	2.3370	37.46	10.68	48.14	56.00	-7.86	QP	P
9	5.2700	36.49	10.72	47.21	60.00	-12.79	QP	P
10	5.3150	24.27	10.72	34.99	50.00	-15.01	AVG	P
11	16.1646	38.26	10.87	49.13	60.00	-10.87	QP	P
12	16.3490	16.17	10.88	27.05	50.00	-22.95	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	
			μV/m	(dBμV/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 μV/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	
			μV/m	(dBμV/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 μV/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.
(4) Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.



3.2. Test Setup

Figure 1. Below 30MHz

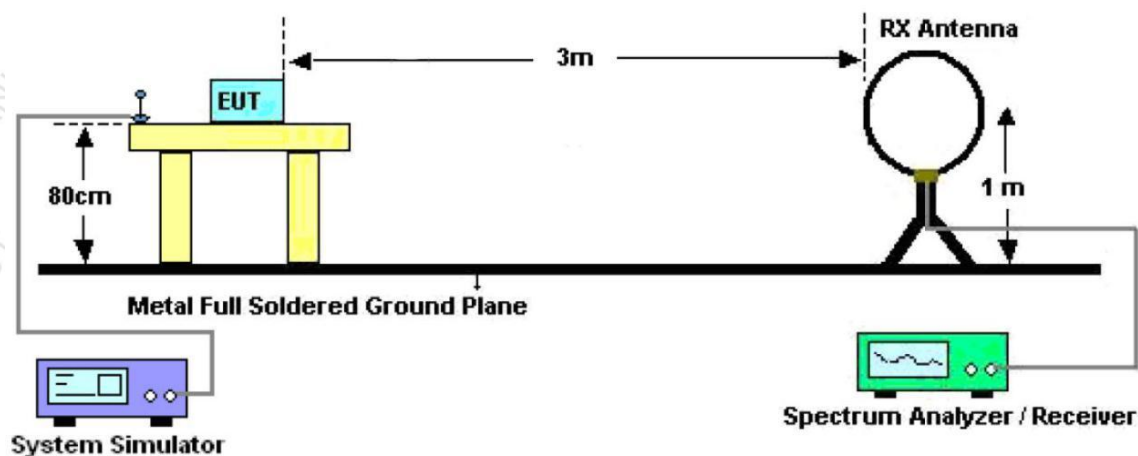
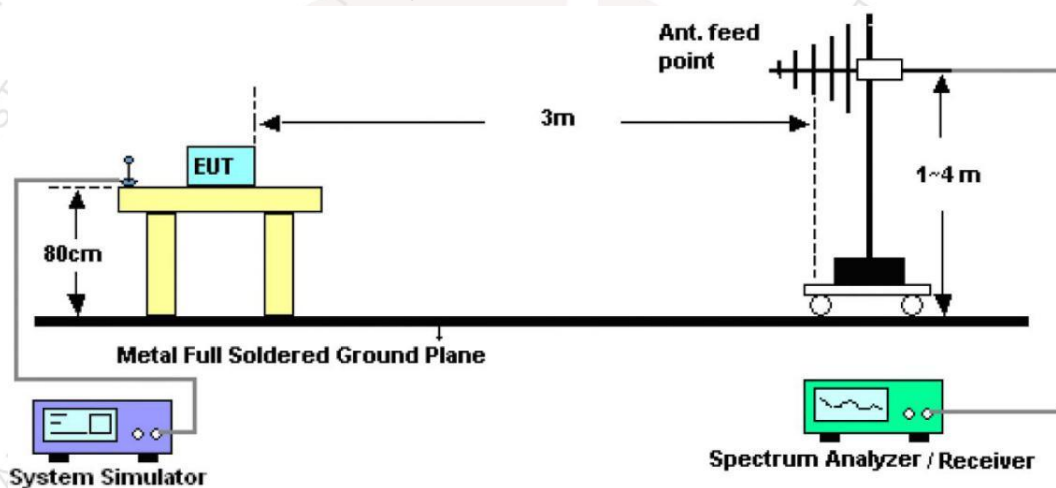


Figure 2. 30MHz to 1GHz





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.

The bandwidth of the Receiver is set at 120 kHz.

3.4. Test Results

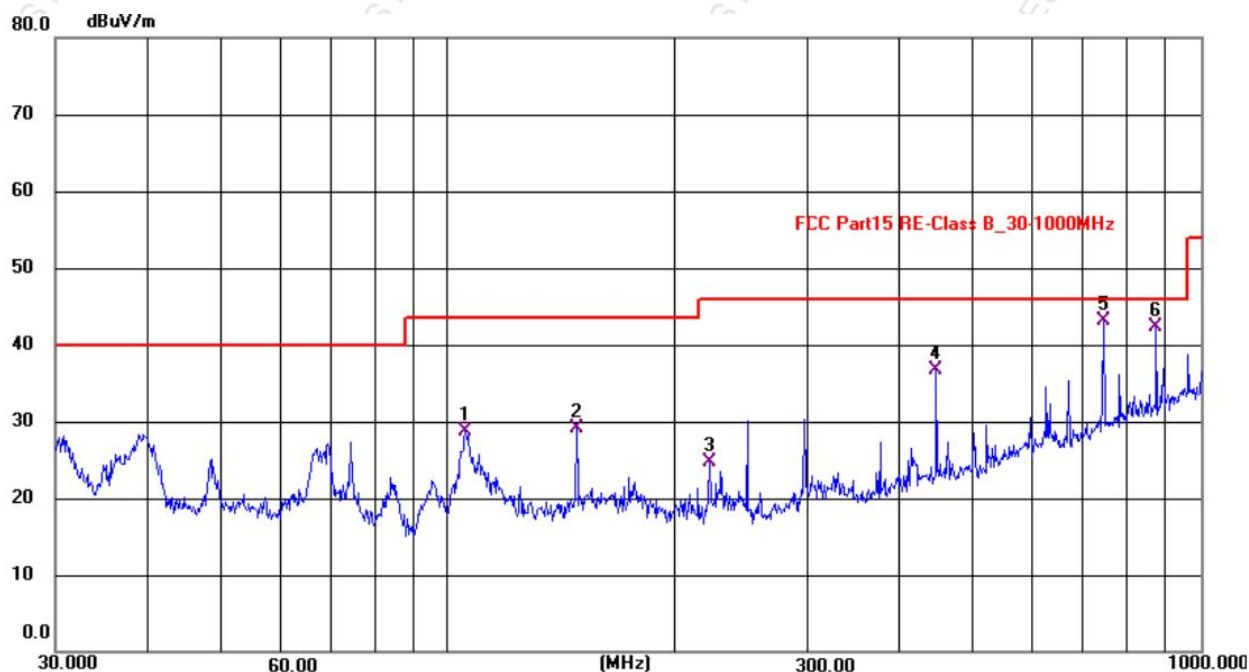
PASS

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

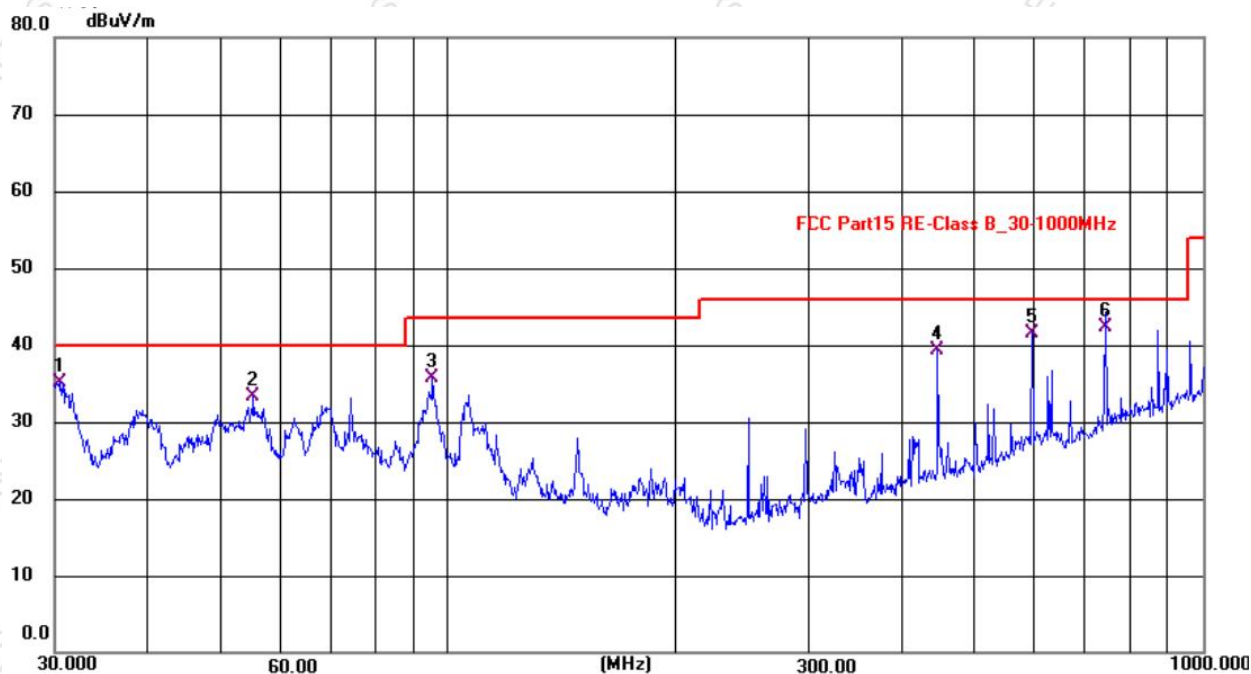


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	105.4565	47.25	-18.58	28.67	43.50	-14.83	QP
2	148.4410	44.33	-15.18	29.15	43.50	-14.35	QP
3	222.9502	43.34	-18.64	24.70	46.00	-21.30	QP
4	445.6320	48.00	-11.21	36.79	46.00	-9.21	QP
5 *	743.5611	48.37	-5.21	43.16	46.00	-2.84	QP
6	875.2469	45.94	-3.67	42.27	46.00	-3.73	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	30.5306	50.82	-15.64	35.18	40.00	-4.82	QP
2	55.1239	48.44	-15.17	33.27	40.00	-6.73	QP
3	95.0929	54.66	-18.99	35.67	43.50	-7.83	QP
4	445.6320	50.61	-11.21	39.40	46.00	-6.60	QP
5	594.0903	49.99	-8.43	41.56	46.00	-4.44	QP
6 *	743.5611	47.54	-5.21	42.33	46.00	-3.67	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

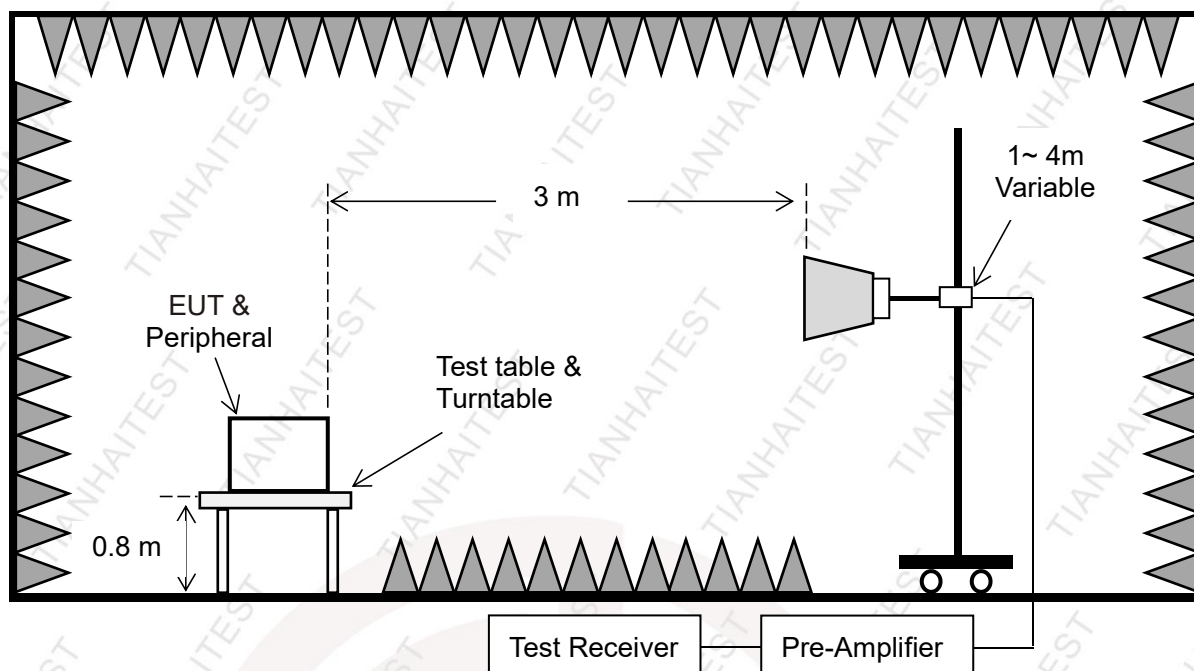
Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dB μ V/m)	
		Peak	Average
Above 960	3	80	60
Remark: N/A			

☒ 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.



Test Results (1GHz-40GHz)

Test channel: Lowest

Peak value:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5180.00	45.63	15.59	61.22	74.00	-12.78	Vertical
10360.00	42.33	16.32	58.65	74.00	-15.35	Vertical
15540.00	47.12	14.25	61.37	74.00	-12.63	Vertical
20720.00	43.11	15.02	58.13	74.00	-15.87	Vertical
25900.00	*			74.00		Vertical
31080.00	*			74.00		Vertical
5180.00	44.26	14.68	58.94	74.00	-15.06	Horizontal
10360.00	42.33	17.49	59.82	74.00	-14.18	Horizontal
15540.00	47.12	15.56	62.68	74.00	-11.32	Horizontal
20720.00	43.11	15.37	58.48	74.00	-15.52	Horizontal
25900.00	*			74.00		Horizontal
31080.00	*			74.00		Horizontal

Average value:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
5180.00	36.23	6.11	42.34	54.00	-11.66	Vertical
10360.00	33.59	7.69	41.28	54.00	-12.72	Vertical
15540.00	37.74	8.07	45.81	54.00	-8.19	Vertical
20720.00	35.66	8.26	43.92	54.00	-10.08	Vertical
25900.00	*			54.00		Vertical
31080.00	*			54.00		Vertical
5180.00	32.36	7.84	40.20	54.00	-13.80	Horizontal
10360.00	36.97	8.29	45.26	54.00	-8.74	Horizontal
15540.00	31.22	7.07	38.29	54.00	-15.71	Horizontal
20720.00	32.28	7.26	39.54	54.00	-14.46	Horizontal
25900.00	*			54.00		Horizontal
31080.00	*			54.00		Horizontal



Test channel: Middle						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5200.00	46.12	14.25	60.37	74.00	-13.63	Vertical
10400.00	48.59	15.69	64.28	74.00	-9.72	Vertical
15600.00	47.48	14.24	61.72	74.00	-12.28	Vertical
20800.00	50.25	15.02	65.27	74.00	-8.73	Vertical
26000.00	*			74.00		Vertical
31200.00	*			74.00		Vertical
5200.00	47.02	14.22	61.24	74.00	-12.76	Horizontal
10400.00	46.35	14.48	60.83	74.00	-13.17	Horizontal
15600.00	48.88	15.00	63.88	74.00	-10.12	Horizontal
20800.00	50.27	15.34	65.61	74.00	-8.39	Horizontal
26000.00	*			74.00		Horizontal
31200.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
5200.00	35.56	6.11	41.67	54.00	-12.33	Vertical
10400.00	34.49	7.69	42.18	54.00	-11.82	Vertical
15600.00	37.55	8.07	45.62	54.00	-8.38	Vertical
20800.00	36.63	8.26	44.89	54.00	-9.11	Vertical
26000.00	*			54.00		Vertical
31200.00	*			54.00		Vertical
5200.00	36.41	6.08	42.49	54.00	-11.51	Horizontal
10400.00	36.47	7.25	43.72	54.00	-10.28	Horizontal
15600.00	35.48	8.01	43.49	54.00	-10.51	Horizontal
20800.00	36.47	8.22	44.69	54.00	-9.31	Horizontal
26000.00	*			54.00		Horizontal
31200.00	*			54.00		Horizontal



Test channel: Highest						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5240.00	45.89	14.22	60.11	74.00	-13.89	Vertical
10480.00	48.47	14.48	62.95	74.00	-11.05	Vertical
15720.00	49.98	15.00	64.98	74.00	-9.02	Vertical
20960.00	51.14	15.34	66.48	74.00	-7.52	Vertical
26200.00	*			74.00		Vertical
31440.00	*			74.00		Vertical
5240.00	49.78	14.21	63.99	74.00	-10.01	Horizontal
10480.00	48.71	14.47	63.18	74.00	-10.82	Horizontal
15720.00	46.63	15.28	61.91	74.00	-12.09	Horizontal
20960.00	50.17	15.34	65.51	74.00	-8.49	Horizontal
26200.00	*			74.00		Horizontal
31440.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
5240.00	36.66	6.11	42.77	54.00	-11.23	Vertical
10480.00	35.57	7.69	43.26	54.00	-10.74	Vertical
15720.00	38.89	8.07	46.96	54.00	-7.04	Vertical
20960.00	39.01	8.38	47.39	54.00	-6.61	Vertical
26200.00	*			54.00		Vertical
31440.00	*			54.00		Vertical
5240.00	35.88	6.08	41.96	54.00	-12.04	Horizontal
10480.00	37.41	7.25	44.66	54.00	-9.34	Horizontal
15720.00	37.58	8.01	45.59	54.00	-8.41	Horizontal
20960.00	38.89	8.22	47.11	54.00	-6.89	Horizontal
26200.00	*			54.00		Horizontal
31440.00	*			54.00		Horizontal

Remark:

1. Result =Reading + Factor
2. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.
3. The modulation of 11b, 11g, 11N20, 11N40, 11A, 11AC20, 11AC40, and 11AC80 was tested, and the worst mode was 11A



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 -----