



FCC Test Report

Applicant : LINHAI SHUNSHENG DECORATIVE LIGHTING CO.,LTD

Address : Zhongtai Village, Shaojiadu Street, Linhai City, Taizhou City, Zhejiang P.R. China

Product Name : Low Voltage LED lighting string

Report Date : June 11, 2024

Shenzhen Tian Hai Test Technology Co., Ltd.



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TEST REPORT

Applicant : LINHAI SHUNSHENG DECORATIVE LIGHTING CO.,LTD
Manufacturer : Zhongtai Village, Shaojiadu Street, Linhai City, Taizhou City, Zhejiang P.R.
China
Product Name : Low Voltage LED lighting string
Model No. : SSLXXXX-Y-D-V
Trade Mark : /
Rating(s) : DC 24V power from class 2 power unit:
Model: GP-SW240DC0250-IPSS(US) A
Input:AC 120V, 60Hz, 0.22A
Output:DC 24V, 250mA 6W
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 Tian Hai Test Technology Co., Ltd. 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 Tian Hai Test Technology Co., Ltd. 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 Tian Hai Test Technology Co., Ltd.



Date of Receipt

08. 19, 2023

Date of Test

08. 19, 2023~06. 11, 2024

Tested by

Suny. Zhou

(Suny Zhuo)

Reviewed by

Blue Hu

(Blue Hu)

Approved & Authorized Signer

Binglee

(Binglee)



1. General Information

1.1. Client Information

Applicant	:	LINHAI SHUNSHENG DECORATIVE LIGHTING CO.,LTD
Address	:	Zhongtai Village, Shaojiadu Street, Linhai City, Taizhou City, Zhejiang P.R. China
Manufacturer	:	LINHAI SHUNSHENG DECORATIVE LIGHTING CO.,LTD
Address	:	Zhongtai Village, Shaojiadu Street, Linhai City, Taizhou City, Zhejiang P.R. China
Factory	:	LINHAI SHUNSHENG DECORATIVE LIGHTING CO.,LTD
Address	:	Zhongtai Village, Shaojiadu Street, Linhai City, Taizhou City, Zhejiang P.R. China

1.2. Description of Device (EUT)

Product Name	:	Low Voltage LED lighting string
Model No.	:	SSLXXXX-Y-D-V
Trade Mark	:	/
Test Power Supply	:	DC 24V power from class 2 power unit: Model: GP-SW240DC0250-IPSS(US) A Input:AC 120V, 60Hz, 0.22A Output:DC 24V, 250mA 6W
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	Model	Manufacturer
/	/	/
/	/	/
/	/	/



1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	Coloured lantern

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	ALL Mode	P
§15.109	Radiated Emission Test (Below 1 GHz)	ALL Mode	P
§15.109	Radiated Emission Test (Above 1GHz)	ALL Mode	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	2024-11-13
L.I.S.N	Schwarzbeck	NNLK 8128	5089	2024-11-13
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	231	2024-11-13
Pulse Limiter	Schwarzbeck	VTSD 9561-F	847	2024-11-13
Test software	FALA	/	EMC-CON 3A1.1	/
Radiated Emission (3m)				
EMI Test Receiver	R&S	ESR7	102333	2024-11-13
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2025-04-22
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2024-11-15
Pre-Amplifier	Schwarzbeck	BBV 9718 B	00109	2024-11-13
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2024-11-13
Pre-Amplifier	GUANGGU ELECTRONIC	GLNA18-40GK-5 372	20210331001	2024-11-20
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00148	2024-11-20
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2024-11-14
Horn Antenna	A-INFO	LB-180400-KF	J258792	2024-11-20
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.: 173438

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. 173438

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. 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.

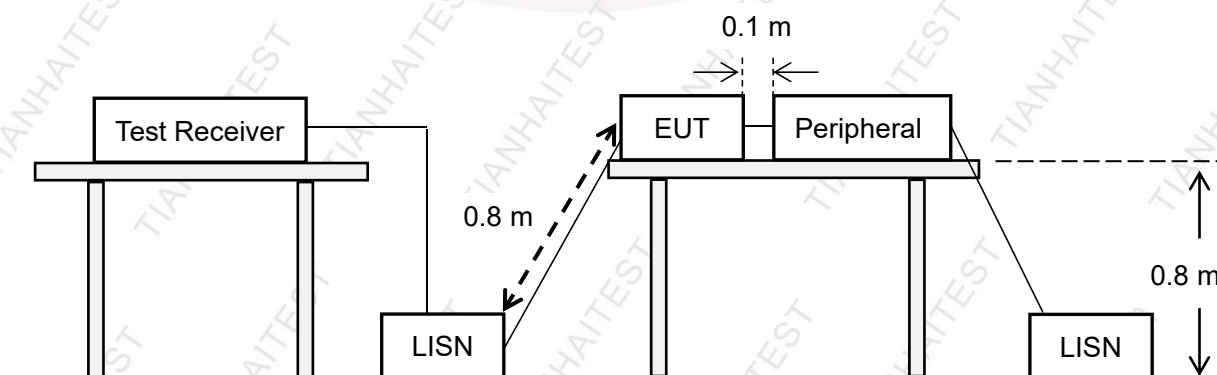
☒ Limits for conducted emission at the AC mains power ports of Class B equipment

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.

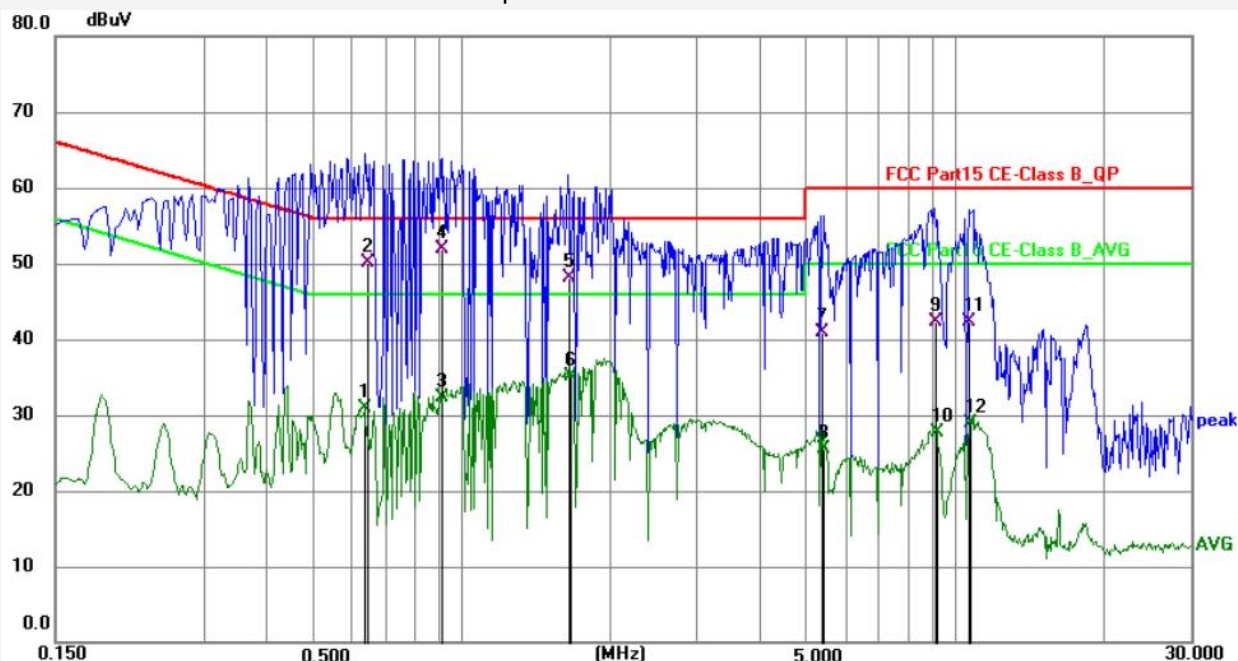
AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case AC 120V/60Hz.

Please to see 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%



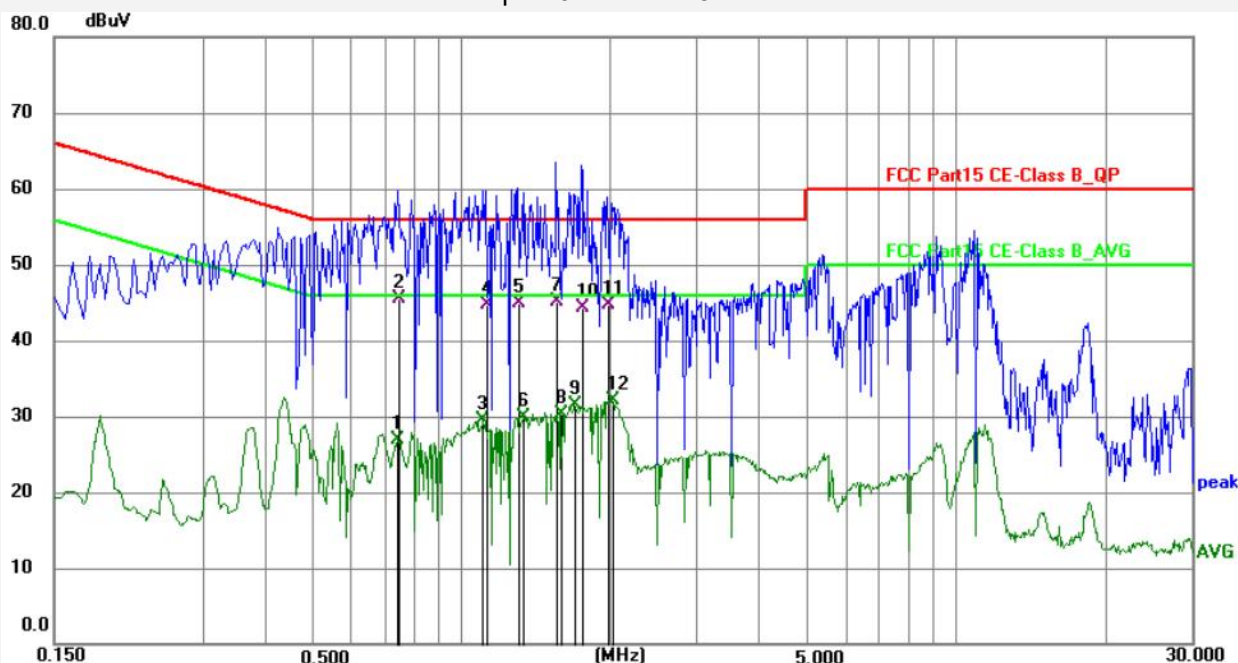
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.6360	20.25	10.64	30.89	46.00	-15.11	AVG	P
2	0.6405	39.56	10.64	50.20	56.00	-5.80	QP	P
3	0.9060	21.66	10.65	32.31	46.00	-13.69	AVG	P
4 *	0.9105	41.25	10.65	51.90	56.00	-4.10	QP	P
5	1.6440	37.52	10.68	48.20	56.00	-7.80	QP	P
6	1.6575	24.46	10.68	35.14	46.00	-10.86	AVG	P
7	5.3610	30.28	10.72	41.00	60.00	-19.00	QP	P
8	5.3880	14.88	10.72	25.60	50.00	-24.40	AVG	P
9	9.0870	31.55	10.75	42.30	60.00	-17.70	QP	P
10	9.1635	16.86	10.75	27.61	50.00	-22.39	AVG	P
11	10.6980	31.54	10.76	42.30	60.00	-17.70	QP	P
12	10.7700	18.17	10.77	28.94	50.00	-21.06	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%



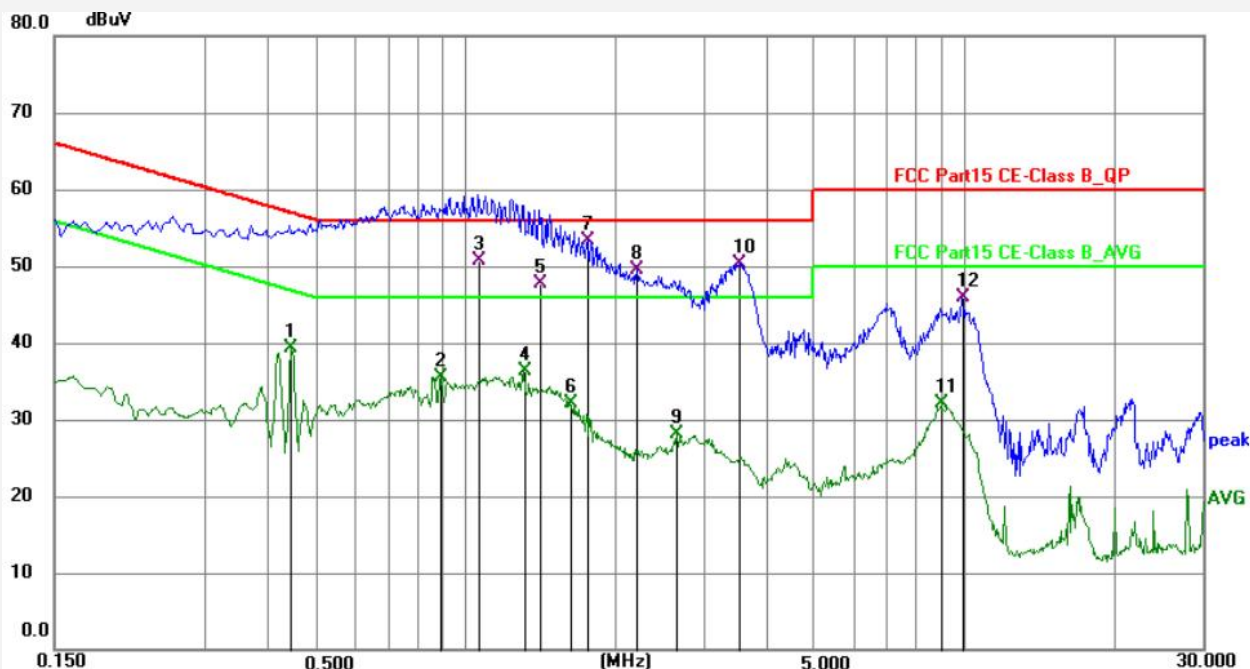
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.7439	16.32	10.64	26.96	46.00	-19.04	AVG	P
2 *	0.7440	34.86	10.64	45.50	56.00	-10.50	QP	P
3	1.1084	18.92	10.66	29.58	46.00	-16.42	AVG	P
4	1.1220	34.04	10.66	44.70	56.00	-11.30	QP	P
5	1.2975	34.24	10.66	44.90	56.00	-11.10	QP	P
6	1.3424	19.25	10.66	29.91	46.00	-16.09	AVG	P
7	1.5540	34.42	10.68	45.10	56.00	-10.90	QP	P
8	1.5854	19.53	10.68	30.21	46.00	-15.79	AVG	P
9	1.6979	20.76	10.68	31.44	46.00	-14.56	AVG	P
10	1.7475	33.62	10.68	44.30	56.00	-11.70	QP	P
11	1.9725	34.12	10.68	44.80	56.00	-11.20	QP	P
12	2.0174	21.38	10.68	32.06	46.00	-13.94	AVG	P

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



Power Line Conducted Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 2
Test Specification: AC 120V, 60Hz
Comment: Live Line
Temp.: 26°C Hum.: 54%



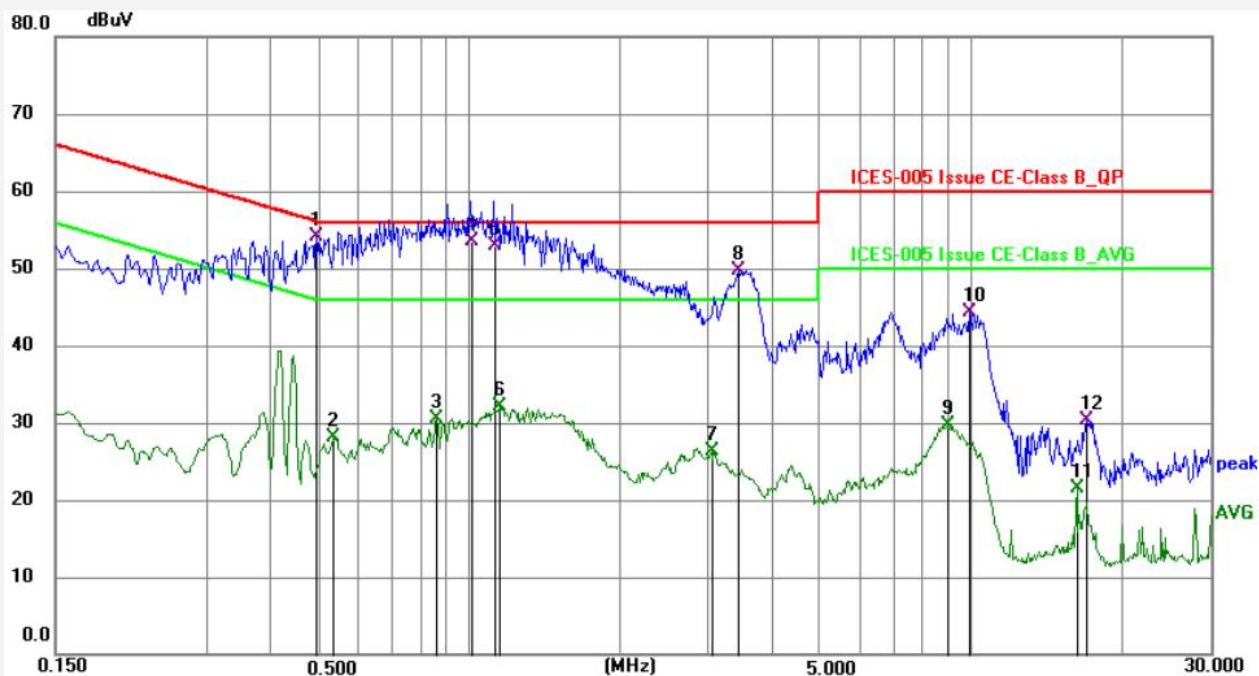
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.4470	28.75	10.62	39.37	46.93	-7.56	AVG	P
2	0.8925	24.90	10.65	35.55	46.00	-10.45	AVG	P
3	1.0635	40.04	10.66	50.70	56.00	-5.30	QP	P
4	1.3110	25.71	10.66	36.37	46.00	-9.63	AVG	P
5	1.4055	37.04	10.66	47.70	56.00	-8.30	QP	P
6	1.6215	21.41	10.68	32.09	46.00	-13.91	AVG	P
7 *	1.7565	42.54	10.68	53.22	56.00	-2.78	QP	P
8	2.2065	38.77	10.68	49.45	56.00	-6.55	QP	P
9	2.6520	17.50	10.69	28.19	46.00	-17.81	AVG	P
10	3.5295	39.63	10.70	50.33	56.00	-5.67	QP	P
11	8.9825	21.26	10.75	32.01	50.00	-17.99	AVG	P
12	9.8690	35.06	10.75	45.81	60.00	-14.19	QP	P

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



Power Line Conducted Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 2
Test Specification: AC 120V, 60Hz
Comment: Neutral Line
Temp.: 26°C Hum.: 54%



No.	Frequency (MHz)	Reading (dBpW)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1 *	0.4964	43.43	10.62	54.05	56.06	-2.01	QP	P
2	0.5370	17.56	10.62	28.18	46.00	-17.82	AVG	P
3	0.8655	19.89	10.65	30.54	46.00	-15.46	AVG	P
4	1.0045	42.94	10.66	53.60	56.00	-2.40	QP	P
5	1.1170	42.28	10.66	52.94	56.00	-3.06	QP	P
6	1.1490	21.37	10.66	32.03	46.00	-13.97	AVG	P
7	3.0569	15.69	10.69	26.38	46.00	-19.62	AVG	P
8	3.4394	39.02	10.70	49.72	56.00	-6.28	QP	P
9	8.9733	18.82	10.82	29.64	50.00	-20.36	AVG	P
10	9.9184	33.38	10.85	44.23	60.00	-15.77	QP	P
11	16.2280	10.73	10.87	21.60	50.00	-28.40	AVG	P
12	16.9615	19.35	10.89	30.24	60.00	-29.76	QP	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

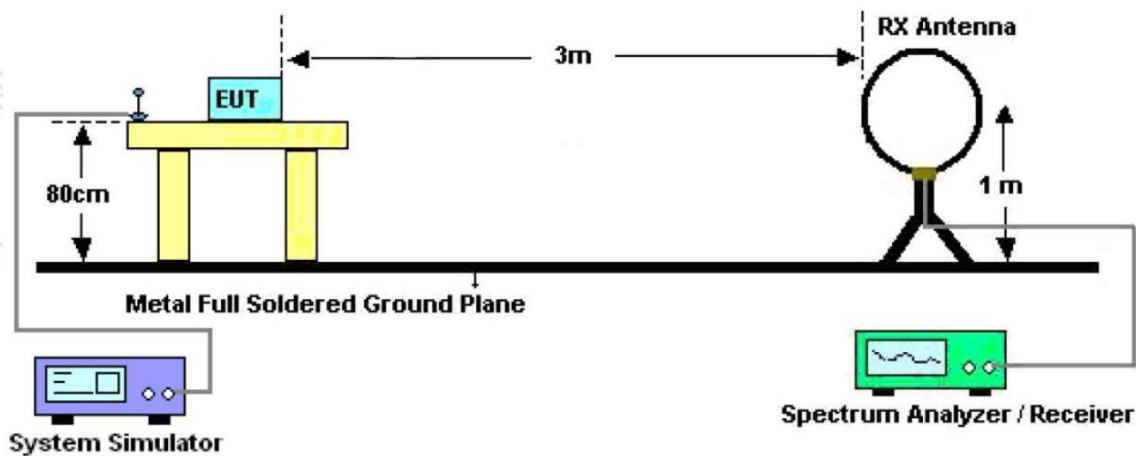
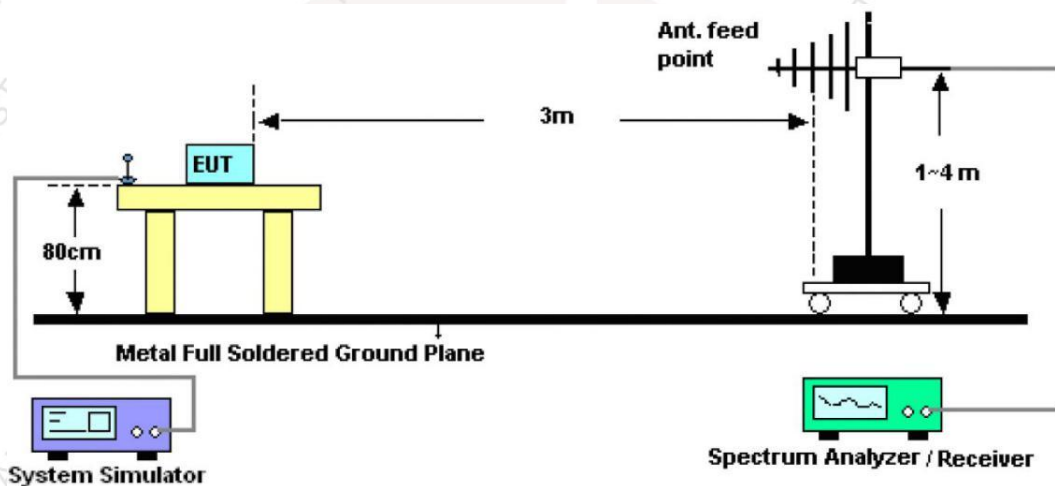


Figure 2. 30MHz to 1GHz





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

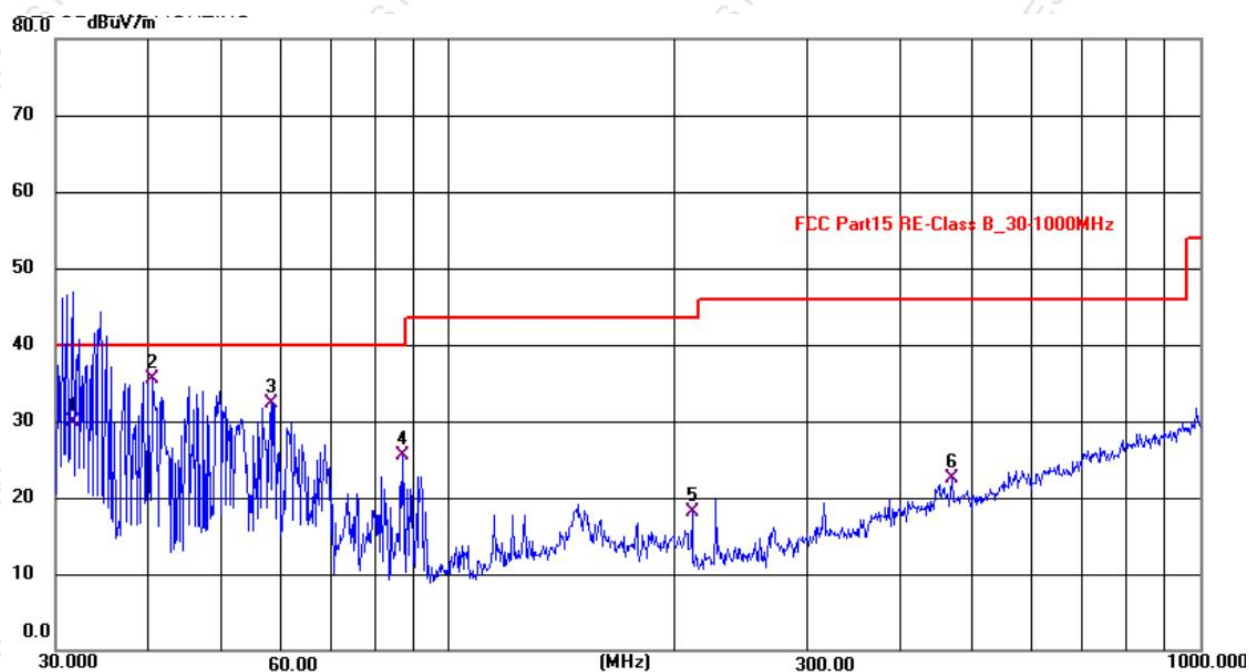
PASS

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 Power Source: AC 120V, 60Hz
Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum.(%RH): 22(°C)/45%RH
Distance: 3m Test Mode: Mode 1

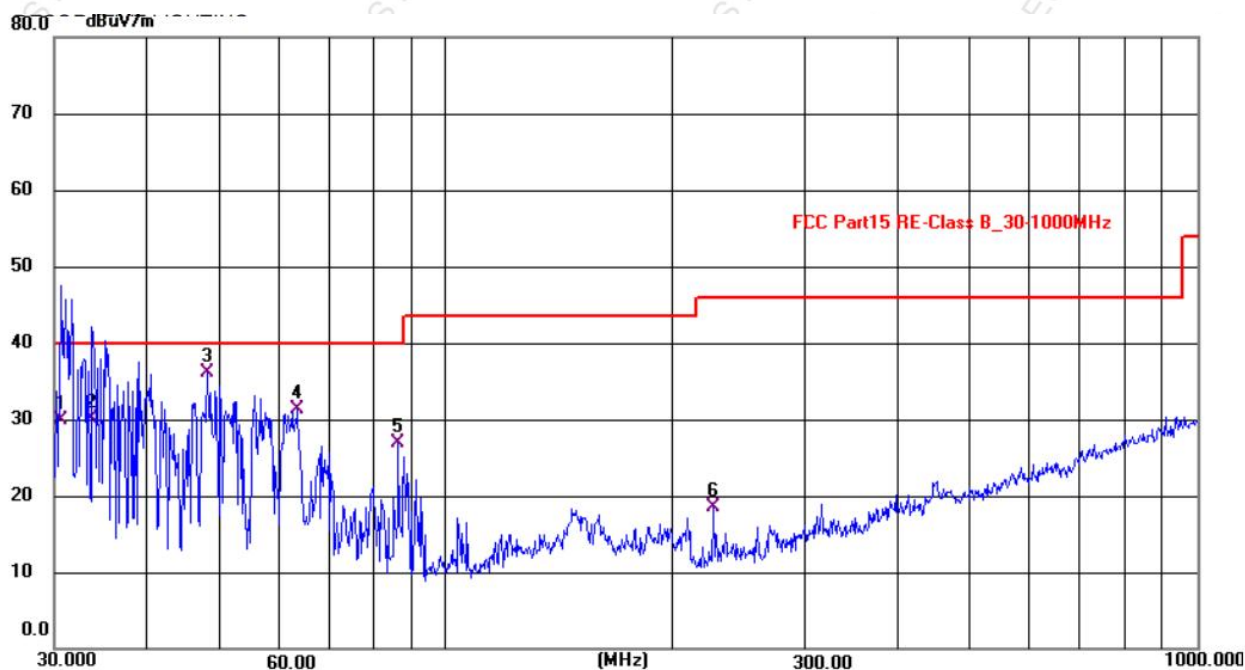


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.7313	45.29	-15.29	30.00	40.00	-10.00	QP
2 *	40.5591	49.80	-14.26	35.54	40.00	-4.46	QP
3	58.2030	48.35	-15.98	32.37	40.00	-7.63	QP
4	86.9591	45.23	-19.77	25.46	40.00	-14.54	QP
5	210.7860	36.44	-18.40	18.04	43.50	-25.46	QP
6	468.8762	33.21	-10.73	22.48	46.00	-23.52	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

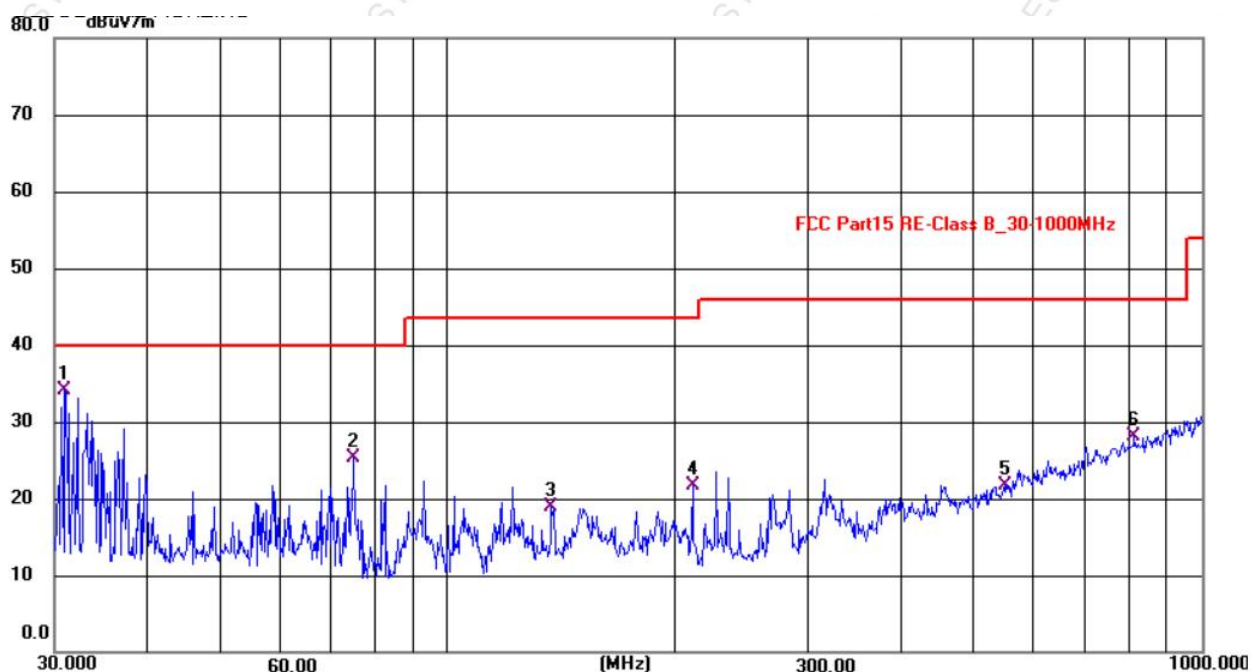


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.6916	45.59	-15.59	30.00	40.00	-10.00	QP
2	33.7394	45.70	-15.60	30.10	40.00	-9.90	QP
3 *	48.0782	51.34	-15.28	36.06	40.00	-3.94	QP
4	63.3132	47.73	-16.42	31.31	40.00	-8.69	QP
5	86.2001	46.78	-19.85	26.93	40.00	-13.07	QP
6	227.2918	36.89	-18.38	18.51	46.00	-27.49	QP

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



Test item: Radiation Test Polarization: Horizontal
Standard: (RE)FCC 47 CFR Part 15 Power Source: AC 120V, 60Hz
Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum.(%RH): 22(°C)/45%RH
Distance: 3m Test Mode: Mode 2

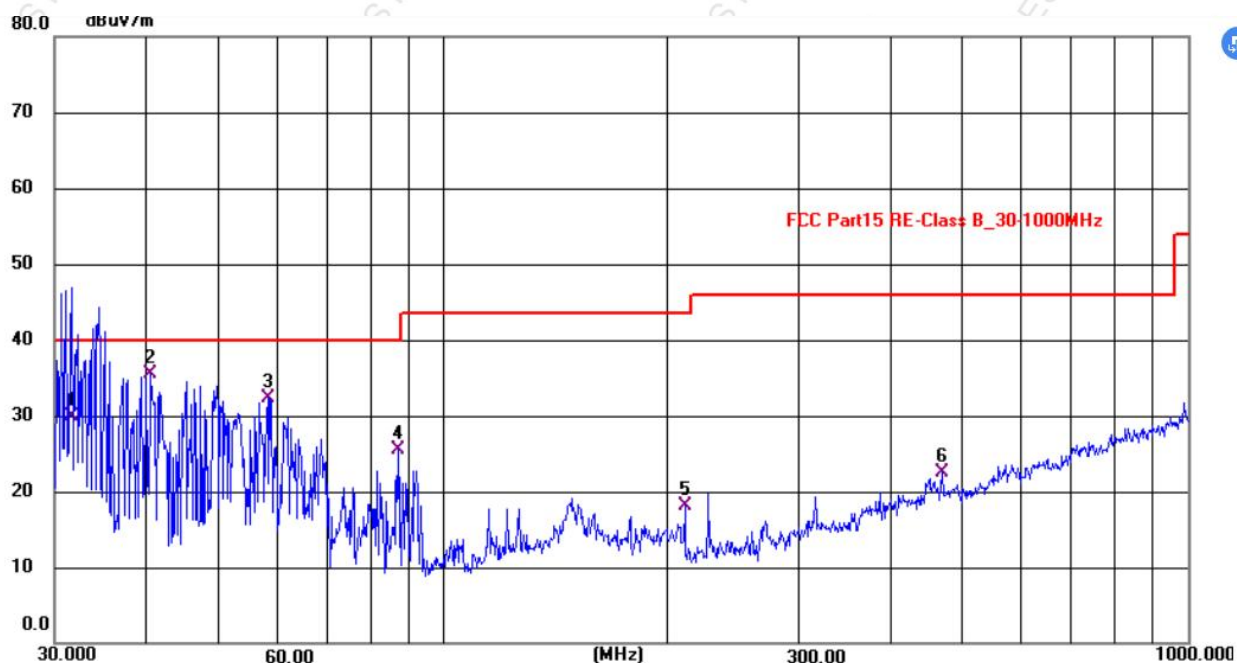


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	31.0162	49.68	-15.49	34.19	40.00	-5.81	QP
2	75.0506	43.47	-18.19	25.28	40.00	-14.72	QP
3	136.9391	34.85	-15.87	18.98	43.50	-24.52	QP
4	210.7860	40.10	-18.40	21.70	43.50	-21.80	QP
5	549.0195	30.94	-9.22	21.72	46.00	-24.28	QP
6	813.1115	31.67	-3.62	28.05	46.00	-17.95	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 2



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB/m)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector
1	31.7313	45.29	-15.29	30.00	40.00	-10.00	QP
2 *	40.5591	49.80	-14.26	35.54	40.00	-4.46	QP
3	58.2030	48.35	-15.98	32.37	40.00	-7.63	QP
4	86.9591	45.23	-19.77	25.46	40.00	-14.54	QP
5	210.7860	36.44	-18.40	18.04	43.50	-25.46	QP
6	468.8762	33.21	-10.73	22.48	46.00	-23.52	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

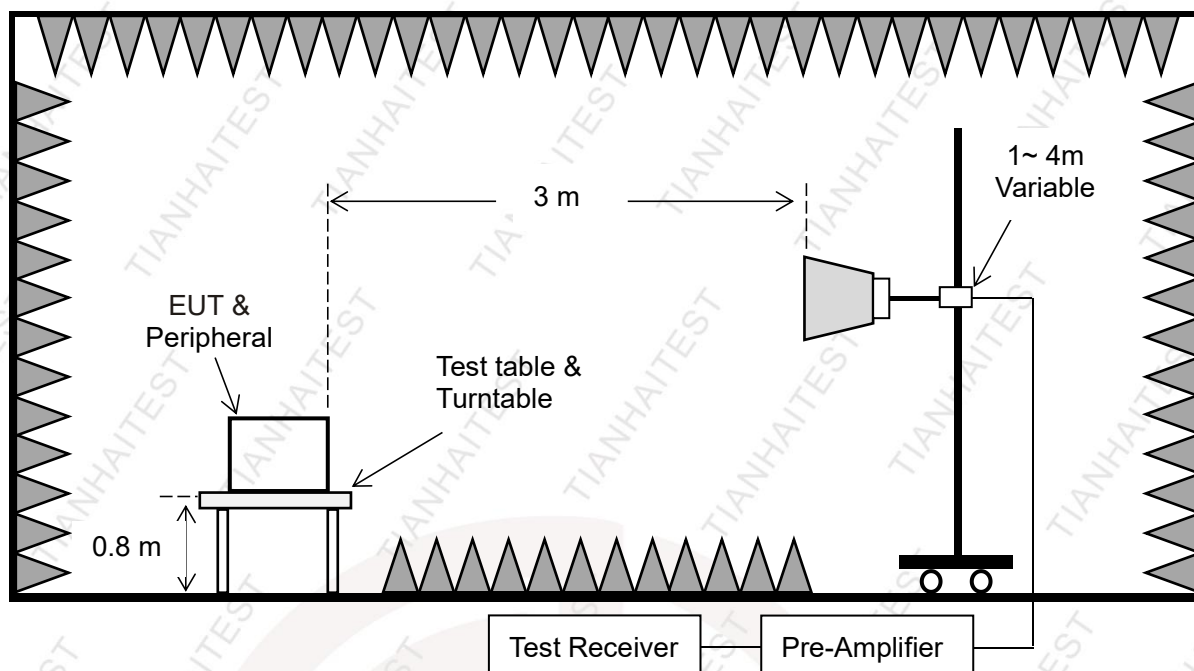
Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dB μ V/m)	
		Peak	Average
Above 960	3	80	60
Remark: N/A			

☒ 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

Note:

The highest working frequency of EUT is below 108MHz.



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 -----