

FCC Test Report

Client Name : EDA Technology Shanghai Co.,Ltd

Client Address : Room 301, Building 24, Shengchuang
Enterprise Park, No.1661 Jialuo Road, Jiading
District, Shanghai, PRC

Product Name : CM4 Sensing

Report Date : Apr. 10, 2023

Shenzhen Anbotech Compliance Laboratory Limited




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TEST REPORT

Applicant : EDA Technology Shanghai Co.,Ltd
Manufacturer : EDA Technology Shanghai Co.,Ltd
Product Name : CM4 Sensing
Model No. : ED-CM4SEN, ED-CM4SEN-PJ, ED-CM4SEN-PT
Trade Mark : 
Rating(s) : Input: 9-28V===2A
USB1/USB2 output: 5.0VDC, 0.5A
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

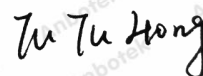
Date of Receipt:

Dec. 29, 2022

Date of Test:

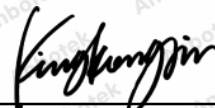
Dec. 29, 2022~Mar. 24, 2023

Prepared By:



(TuTu Hong)

Approved & Authorized Signer:



(Kingkong Jin)




1. General Information

1.1. Client Information

Applicant	:	EDA Technology Shanghai Co.,Ltd
Address	:	Room 301, Building 24, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC
Manufacturer	:	EDA Technology Shanghai Co.,Ltd
Address	:	Room 301, Building 24, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC
Factory	:	EDA Technology Shanghai Co.,Ltd
Address	:	Room 301, Building 24, Shengchuang Enterprise Park, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

1.2. Description of Device (EUT)

Product Name	:	CM4 Sensing
Model No.	:	ED-CM4SEN, ED-CM4SEN-PJ, ED-CM4SEN-PT (Note: All samples are the same except the model number & the terminal of the power connector, so we prepare "ED-CM4SEN" for test only.)
Trade Mark	:	
Test Power Supply	:	AC 120V, 60Hz for adapter
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N.A.
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	Rating(s)
Mouse	Manufacturer: Lenovo Model: moiuuo
Keyboard	Manufacturer: DELL Model: KB216P
AOC display	Manufacturer: AOC Model: LV273HUPR Input: AC100-240~50/60Hz 1.5A
Adapter	Model: BX-1202500B Input: 100-240V 50/60Hz 0.8A Max Output: 12V= 2.5A

1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	Working+HDMI+SD Card+SIM+keyboard+mouse+LAN

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-0 02	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

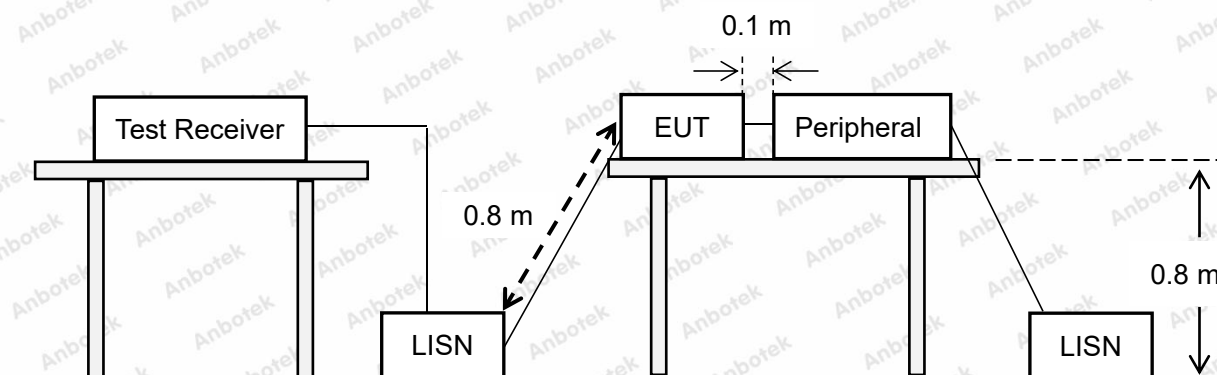
Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

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

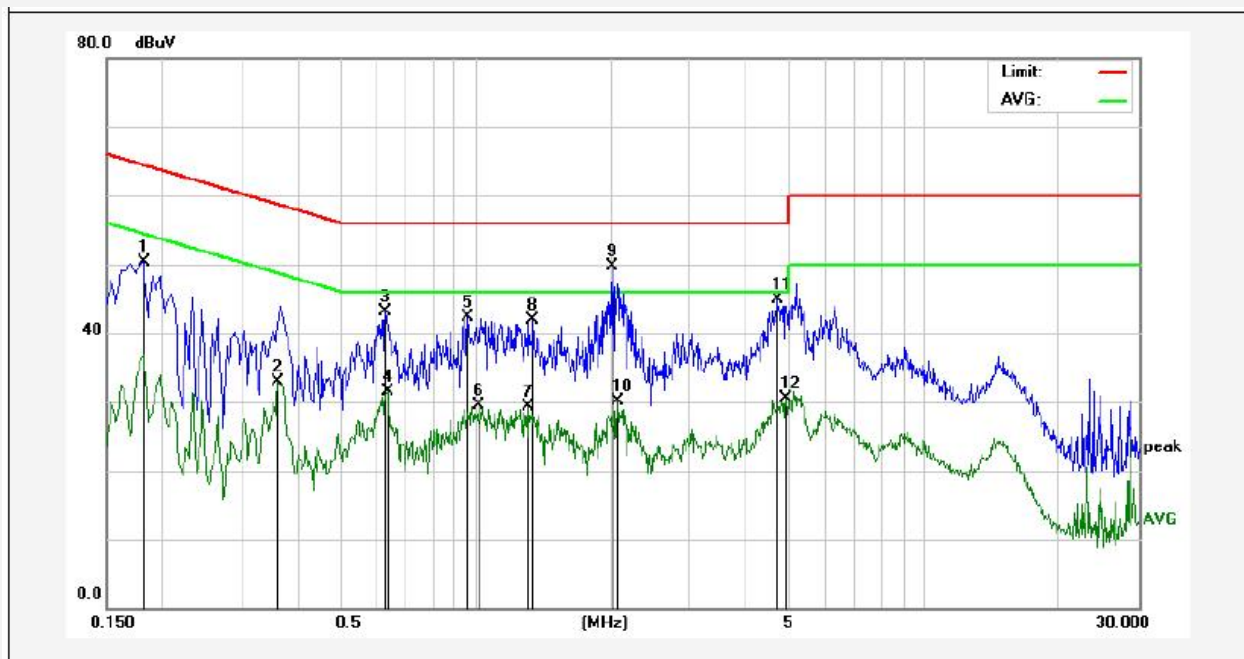
PASS

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 for adapter
Comment: Live Line
Temp.: 22.7°C Hum.: 56%



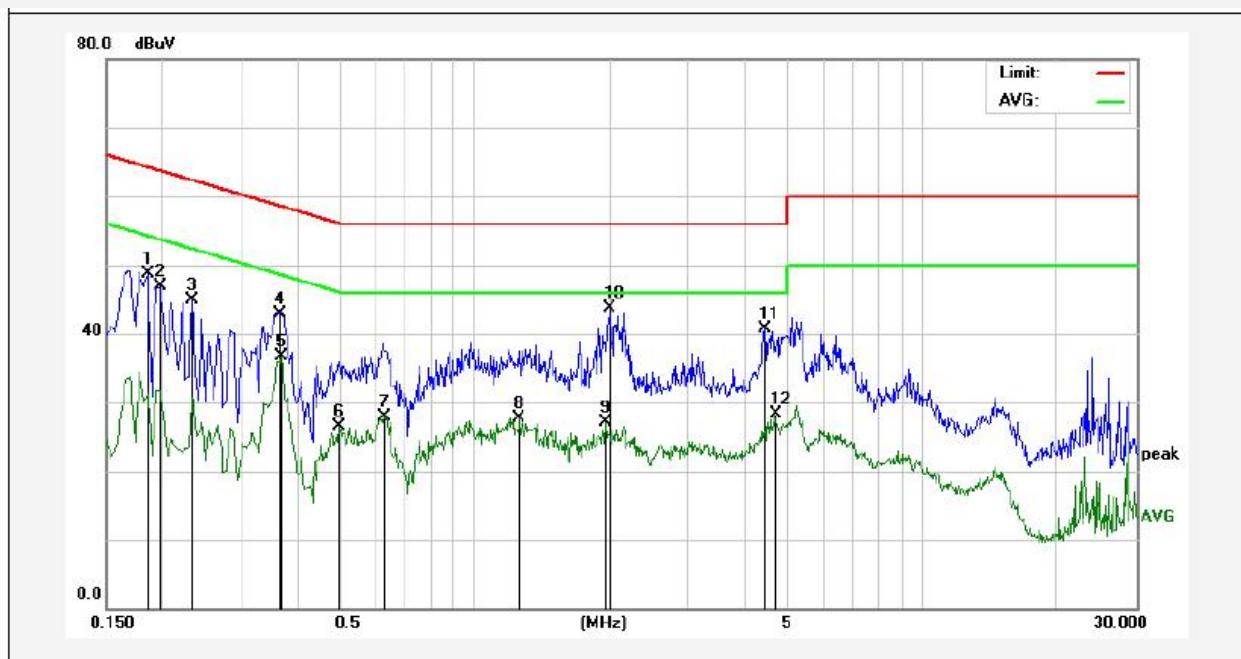
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1819	40.79	9.58	50.37	64.39	-14.02	QP	
2	0.3620	23.07	9.77	32.84	48.68	-15.84	AVG	
3	0.6300	33.36	9.84	43.20	56.00	-12.80	QP	
4	0.6340	21.60	9.84	31.44	46.00	-14.56	AVG	
5	0.9620	32.52	9.85	42.37	56.00	-13.63	QP	
6	1.0140	19.56	9.85	29.41	46.00	-16.59	AVG	
7	1.3140	19.42	9.85	29.27	46.00	-16.73	AVG	
8	1.3420	32.06	9.85	41.91	56.00	-14.09	QP	
9	2.0140	39.89	9.85	49.74	56.00	-6.26	QP	
10	2.0740	20.30	9.86	30.16	46.00	-15.84	AVG	
11	4.6979	35.05	9.79	44.84	56.00	-11.16	QP	
12	4.9100	20.76	9.77	30.53	46.00	-15.47	AVG	

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 for adapter
Comment: Neutral Line
Temp.: 22.7°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1860	39.03	9.58	48.61	64.21	-15.60	QP	
2	0.1980	37.38	9.57	46.95	63.69	-16.74	QP	
3	0.2340	35.32	9.62	44.94	62.30	-17.36	QP	
4	0.3660	33.17	9.77	42.94	58.59	-15.65	QP	
5	0.3700	26.91	9.77	36.68	48.50	-11.82	AVG	
6	0.4980	16.65	9.84	26.49	46.03	-19.54	AVG	
7	0.6300	18.13	9.84	27.97	46.00	-18.03	AVG	
8	1.2620	17.95	9.85	27.80	46.00	-18.20	AVG	
9	1.9580	17.26	9.85	27.11	46.00	-18.89	AVG	
10	2.0100	33.91	9.85	43.76	56.00	-12.24	QP	
11	4.4500	30.96	9.80	40.76	56.00	-15.24	QP	
12	4.6940	18.47	9.79	28.26	46.00	-17.74	AVG	

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

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.

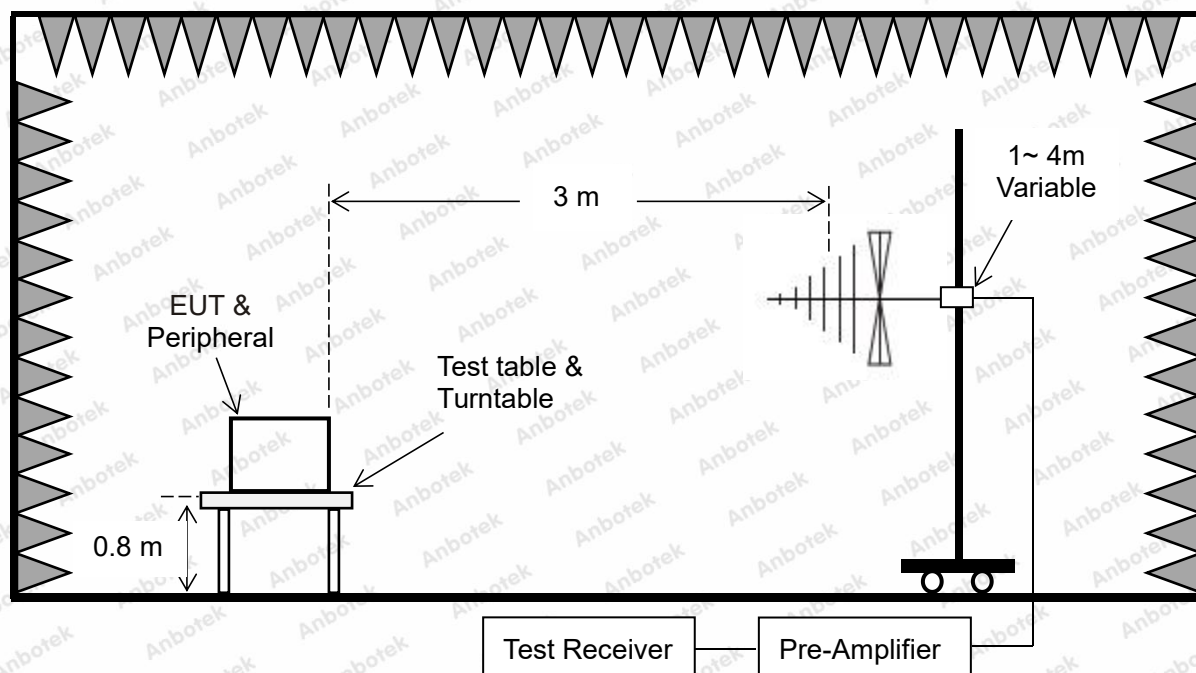
☒ Limit for radiated emissions at frequencies up to 1 GHz for class B equipment

Test Limit	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT	
			$\mu\text{V/m}$	(dB $\mu\text{V/m}$)
	30 ~ 88	3	100	40
	88 ~ 216	3	150	43.5
	216 ~ 960	3	200	46

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.

The bandwidth of the Receiver is set at 120 kHz.



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3.4. Test Results**PASS**

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 for
adapter

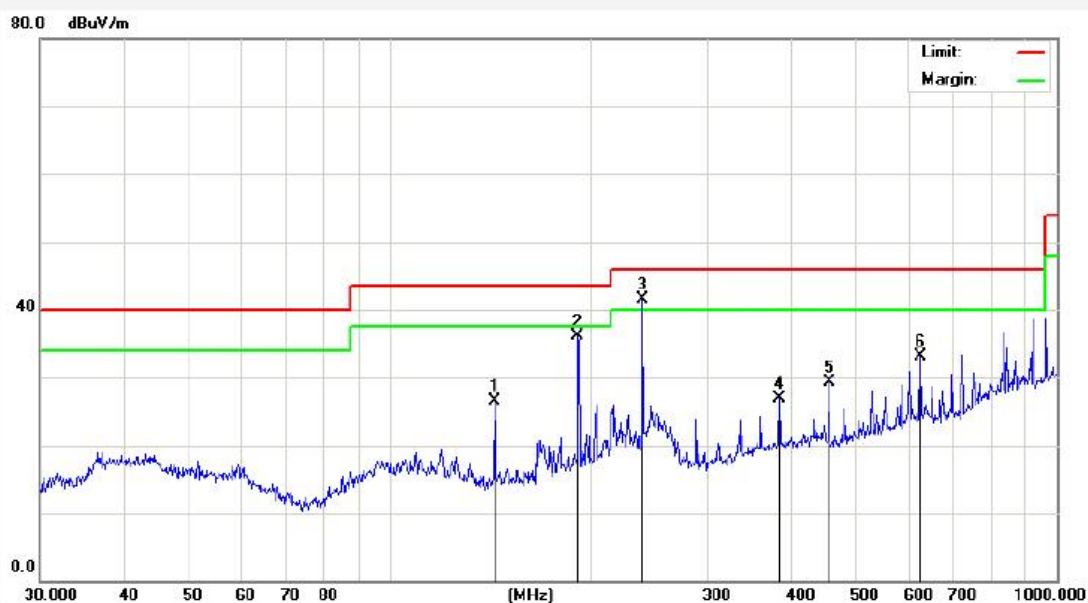
Frequency Range: 30MHz ~ 1000MHz

Temp.(°C)/Hum.(%RH): 24.2(°C)/52%RH

Distance: 3m

Test Mode:

Mode 1

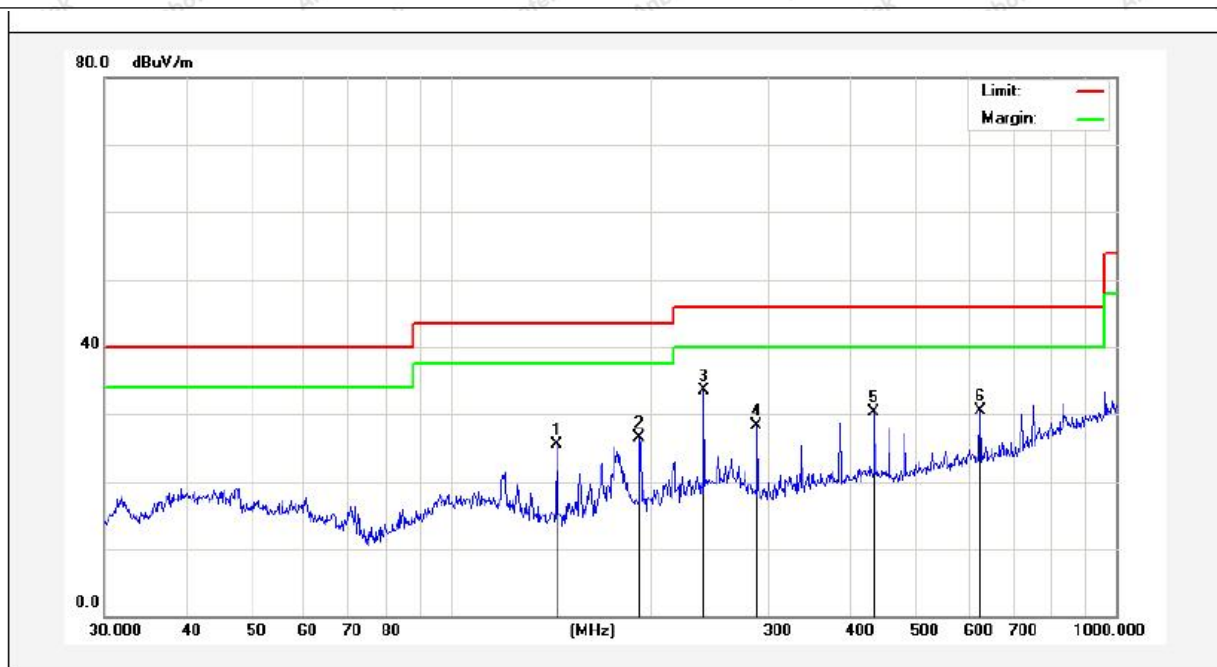


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	143.8295	47.91	-21.43	26.48	43.50	-17.02	QP	300	12	
2	191.7450	55.88	-19.74	36.14	43.50	-7.36	QP	300	124	
3	239.9874	59.09	-17.49	41.60	46.00	-4.40	QP	300	215	
4	383.9318	40.04	-13.19	26.85	46.00	-19.15	QP	300	312	
5	455.9058	41.42	-12.12	29.30	46.00	-16.70	QP	300	214	
6	625.0780	43.66	-10.55	33.11	46.00	-12.89	QP	300	21	

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 for adapter
Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum:(%RH): 24.2(°C)/52%RH
Distance: 3m Test Mode: Mode 1



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	143.8293	42.85	-17.43	25.42	43.50	-18.08	QP	300	12	
2	191.7450	41.33	-14.92	26.41	43.50	-17.09	QP	300	215	
3	239.9874	47.08	-13.49	33.59	46.00	-12.41	QP	300	14	
4	287.9904	43.25	-14.89	28.36	46.00	-17.64	QP	300	124	
5	432.5457	41.61	-11.24	30.37	46.00	-15.63	QP	300	312	
6	625.0778	39.60	-9.05	30.55	46.00	-15.45	QP	300	321	

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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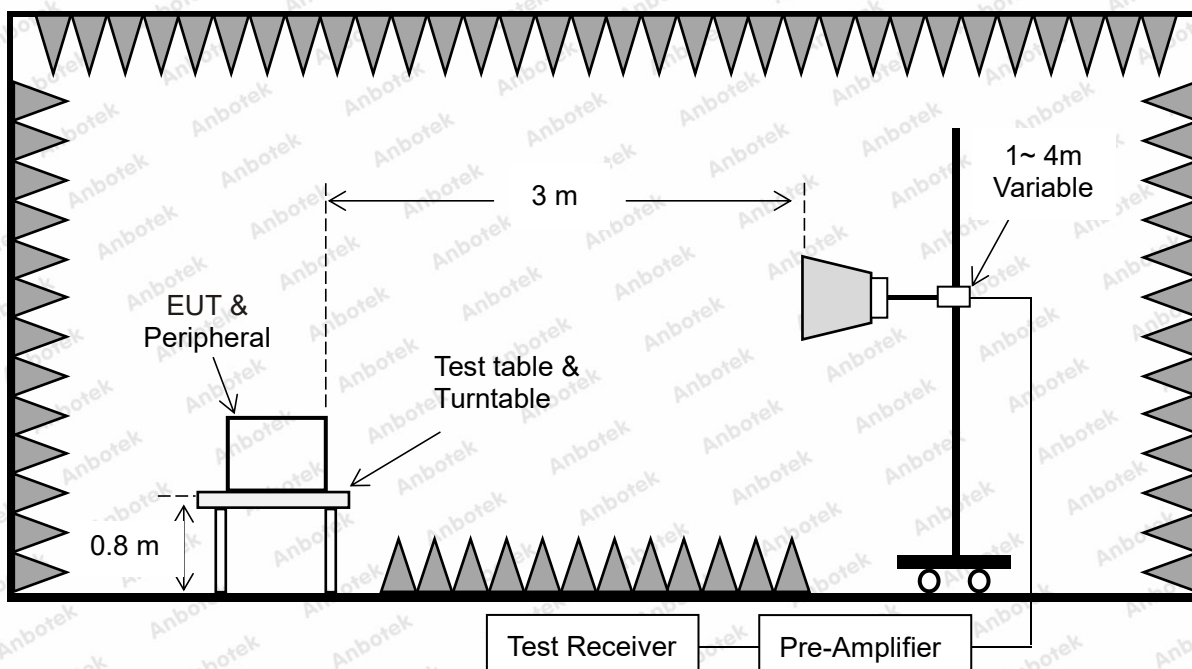
☐ Limit for radiated emissions at frequencies above 1 GHz for class A equipment

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

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 for adapter					
Test Mode:		Mode 1					
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
1420.08	52.29	-2.24	50.05	74.00	-23.95	H	PEAK
2164.42	52.41	-2.46	49.95	74.00	-24.05	H	PEAK
1933.71	47.04	-4.43	42.60	74.00	-31.40	H	PEAK
4083.43	53.40	-4.78	48.63	74.00	-25.37	H	PEAK
4542.88	46.82	-4.90	41.92	74.00	-32.08	H	PEAK
4952.09	51.67	-5.32	46.35	74.00	-27.65	H	PEAK
1420.08	36.73	-2.24	34.49	54.00	-19.51	H	AVG
2164.42	43.32	-2.46	40.86	54.00	-13.14	H	AVG
1933.71	38.44	-4.43	34.01	54.00	-19.99	H	AVG
4083.43	39.51	-4.78	34.74	54.00	-19.26	H	AVG
4542.88	40.25	-4.90	35.35	54.00	-18.65	H	AVG
4952.09	40.32	-5.32	35.00	54.00	-19.00	H	AVG
1382.54	55.14	-3.05	52.09	74.00	-21.91	V	PEAK
1994.52	49.61	-3.19	46.42	74.00	-27.58	V	PEAK
1992.14	51.61	-4.18	47.43	74.00	-26.57	V	PEAK
3961.12	46.28	-4.95	41.33	74.00	-32.67	V	PEAK
4348.05	49.11	-5.38	43.74	74.00	-30.26	V	PEAK
4902.89	52.53	-5.55	46.98	74.00	-27.02	V	PEAK
1382.54	37.27	-3.05	34.22	54.00	-19.78	V	AVG
1994.52	44.71	-3.19	41.52	54.00	-12.48	V	AVG
1992.14	40.19	-4.18	36.01	54.00	-17.99	V	AVG
3961.12	44.01	-4.95	39.06	54.00	-14.94	V	AVG
4348.05	40.83	-5.38	35.45	54.00	-18.55	V	AVG
4902.89	44.16	-5.55	38.62	54.00	-15.38	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 -----

