FCC Test Report

Applicant	:	**Shenzhen Samkoon Technology Corporation Ltd.**
Address	:	**Building 7, Fashion Industry Park, E'Bu Town, ShenShan Special cooperation zone, Shenzhen City, Guangdong Province**
Product Name	:	**AC Servo Drives**
Report Date	:	**Jul. 07, 2023**

Hunan Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	Shenzhen Samkoon Technology Corporation Ltd.
Manufacturer	:	Shenzhen Samkoon Technology Corporation Ltd.
Product Name	:	AC Servo Drives
Test Model No.	:	R8-2208P-N
Reference Model No.	:	R8-22xxy-z, R8-38xxy-z Remark: xx: The output power('02' means 200W, '04' means 400W, '08' means 750W, '10' means 1000W, '15' means 1500W, '22' means 2200W, '26' means 2600W, '30' means 3000W, '40' means 4000W, '55' means 5500W, '75' means 7500W.....); y: Communication type('P' means Pulse input, 'Z' means EtherCAT, 'C' means CANopen); z: Other code('N' means standard, 'S' means Lite version, 'B' means Dynamic braking)
Trade Mark	:	Samkoon
Rating(s)	:	INPUT: 1PH, AC200-240V, 50/60Hz OUTPUT: 3PH, AC0-240V, 5.5A, 0.8kW

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 Hunan 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 Hunan 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 Hunan Anbotek Compliance Laboratory Limited

Date of Receipt: Jun. 29, 2023

Date of Test: Jun. 29~Jul. 05, 2023

Prepared By: Qing Peng
(Qing Peng)

Approved & Authorized Signer: Andy Wang
(Andy Wang)

1. General Information

1.1. Client Information

Applicant	:	Shenzhen Samkoon Technology Corporation Ltd.
Address	:	Building 7, Fashion Industry Park, E'Bu Town, ShenShan Special cooperation zone, Shenzhen City, Guangdong Province
Manufacturer	:	Shenzhen Samkoon Technology Corporation Ltd.
Address	:	Building 7, Fashion Industry Park, E'Bu Town, ShenShan Special cooperation zone, Shenzhen City, Guangdong Province
Factory	:	Shenzhen Samkoon Technology Corporation Ltd.
Address	:	Building 7, Fashion Industry Park, E'Bu Town, ShenShan Special cooperation zone, Shenzhen City, Guangdong Province

1.2. Description of Device (EUT)

Product Name	:	AC Servo Drives
Test Model No.	:	R8-2208P-N
Reference Model No.	:	R8-22xxy-z, R8-38xxy-z Remark: xx: The output power('02' means 200W, '04' means 400W, '08' means 750W, '10' means 1000W, '15' means 1500W, '22' means 2200W, '26' means 2600W, '30' means 3000W, '40' means 4000W, '55' means 5500W, '75' means 7500W.....); y: Communication type('P' means Pulse input, 'Z' means EtherCAT, 'C' means CANopen); z: Other code('N' means standard, 'S' means Lite version, 'B' means Dynamic braking) (Note: All samples are the same except the model number & appearance, so we prepare "R8-2208P-N" for test only.)
Trade Mark	:	Samkoon
Test Power Supply	:	AC 230V, 50Hz
Test Sample No.	:	1-1-1
Product Description	:	N/A
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

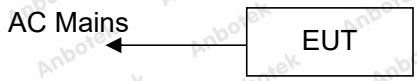
1.3. Auxiliary Equipment Used During Test

N/A	:	

1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	Working

For Mode 1 Block Diagram of Test Setup



1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test	Mode 1	P
Radiated Emission Test (Below 1 GHz)	Mode 1	P
Radiated Emission Test (Above 1GHz)	/	N
P) Indicates “PASS”. F) Indicates “Fail”. N) Indicates “Not applicable”.		

1.6. Test Equipment List

☒ Power Line Conducted Emission Test

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	E215040DT001	Jul. 05, 2023	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	ESCI	100627	Oct. 13, 2022	1 Year
2.	Pre-amplifier	Schwarzbeck	BBV-9745	9745-075	Oct. 23, 2022	1 Year
3.	Bilog Broadband Antenna	SCHWARZBECK	VULB 9163	01109	Oct. 16, 2022	3 Year
4.	Software Name EZ-EMC	Ferrari Technology	EMEC-3A1	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.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 23, 2022	3 Year
3.	Pre-amplifier	SONOMA	310N	186860	Oct. 23, 2022	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A
5.	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	Oct. 13, 2022	1 Year
6.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year

1.7. Measurement Uncertainty

Radiation Uncertainty(30MHz-1GHz)	:	Ur = 4.46 dB (Horizontal)
	:	Ur = 5.04 dB (Vertical)
Radiation Uncertainty(1GHz-6GHz)	:	Ur = 4.92 dB (Horizontal)
	:	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:

Test Location

Hunan Anbotek Compliance Laboratory Limited.

Building 37, Liandong Yougu Industrial Park, No.32, Yulian Road, Xueshi Street, Yuelu District, Changsha, Hunan,China

2. Power Line Conducted Emission Test

2.1. Test Standard and Limit

Test Standard:	FCC 47 CFR Part 15 Subpart B

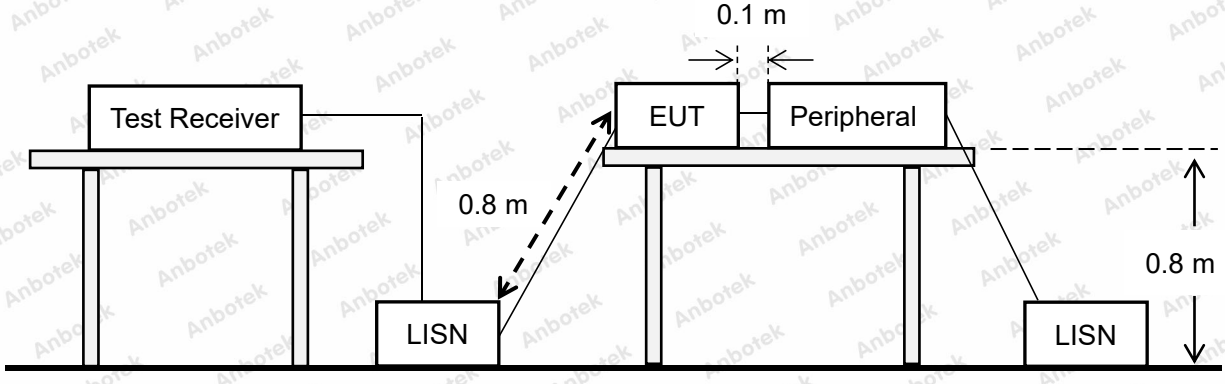
☒ **Limits for conducted emission at the AC mains power ports of Class A equipment**

Frequency (MHz)	Limits (dBμV)	
	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 (dBμV)	
	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.

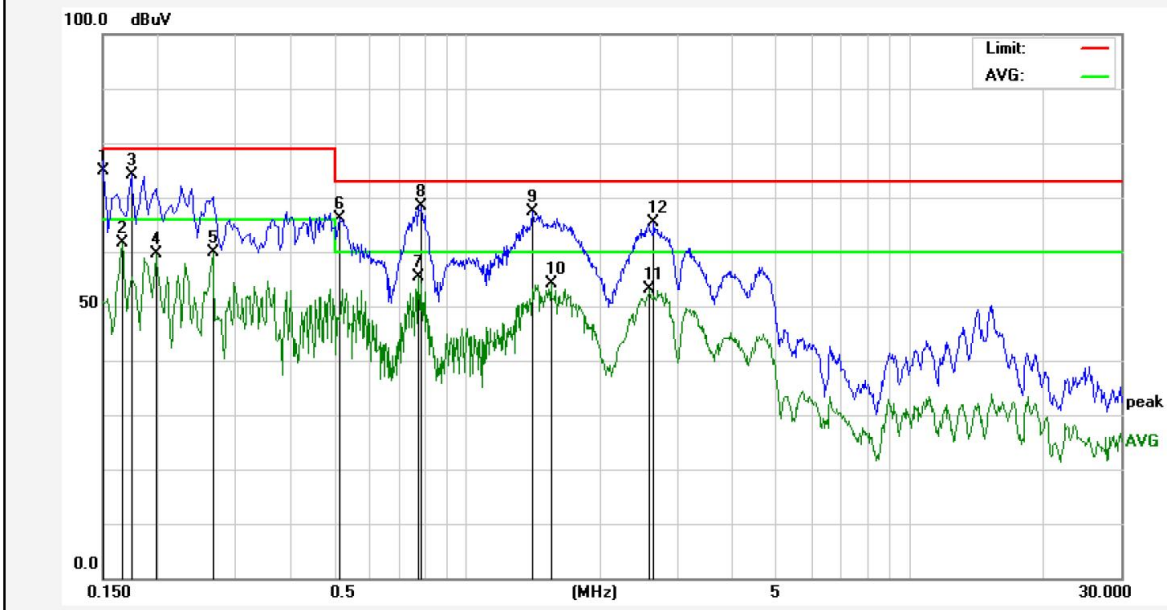
2.4. Test Results

PASS

The test curves are shown in the following pages.

Power Line Conducted Test Data

Test Site: 1# Shielded Room
Test Specification: AC 240V, 60Hz
Comment: Live Line
Temp.: 24.3℃ Hum.: 61%

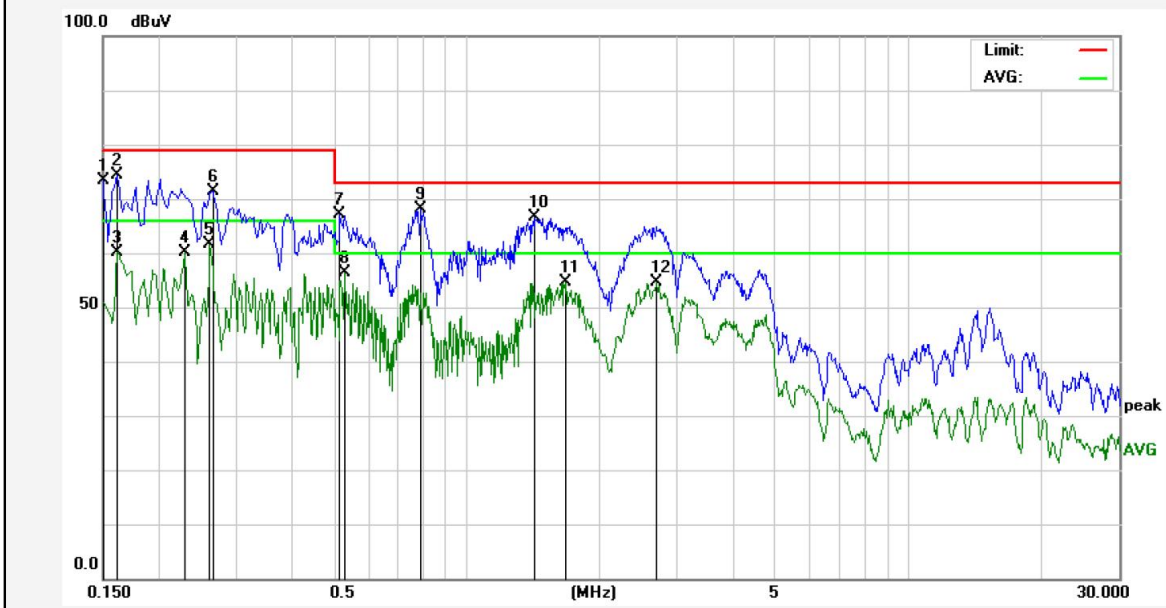


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1499	55.11	19.82	74.93	79.00	-4.07	QP	
2	0.1660	41.85	19.83	61.68	66.00	-4.32	AVG	
3	0.1737	54.34	19.83	74.17	79.00	-4.83	QP	
4	0.1980	39.70	19.83	59.53	66.00	-6.47	AVG	
5	0.2660	40.08	19.83	59.91	66.00	-6.09	AVG	
6	0.5140	46.32	19.85	66.17	73.00	-6.83	QP	
7	0.7780	35.64	19.86	55.50	60.00	-4.50	AVG	
8	0.7900	48.41	19.86	68.27	73.00	-4.73	QP	
9	1.4098	47.54	19.84	67.38	73.00	-5.62	QP	
10	1.5460	34.34	19.84	54.18	60.00	-5.82	AVG	
11	2.5939	33.22	19.84	53.06	60.00	-6.94	AVG	
12	2.6419	45.50	19.84	65.34	73.00	-7.66	QP	

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

Power Line Conducted Test Data

Test Site: 1# Shielded Room
Test Specification: AC 240V, 60Hz
Comment: Neutral Line
Temp.: 24.3℃ Hum.: 61%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1499	53.68	19.82	73.50	79.00	-5.50	QP	
2	0.1620	54.51	19.83	74.34	79.00	-4.66	QP	
3	0.1620	40.40	19.83	60.23	66.00	-5.77	AVG	
4	0.2300	40.40	19.83	60.23	66.00	-5.77	AVG	
5	0.2620	41.80	19.83	61.63	66.00	-4.37	AVG	
6	0.2660	51.56	19.83	71.39	79.00	-7.61	QP	
7	0.5180	47.37	19.85	67.22	73.00	-5.78	QP	
8	0.5299	36.59	19.85	56.44	60.00	-3.56	AVG	
9	0.7900	48.22	19.86	68.08	73.00	-4.92	QP	
10	1.4298	46.86	19.84	66.70	73.00	-6.30	QP	
11	1.6778	34.70	19.84	54.54	60.00	-5.46	AVG	
12	2.6939	34.90	19.84	54.74	60.00	-5.26	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

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

	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT	
			μV/m	(dBμV/m)
Test Limit	30 ~ 88	3	300	49.5
	88 ~ 216	3	500	54.0
	216 ~ 960	3	700	56.9
	960 ~ 1000	3	1000	60.0

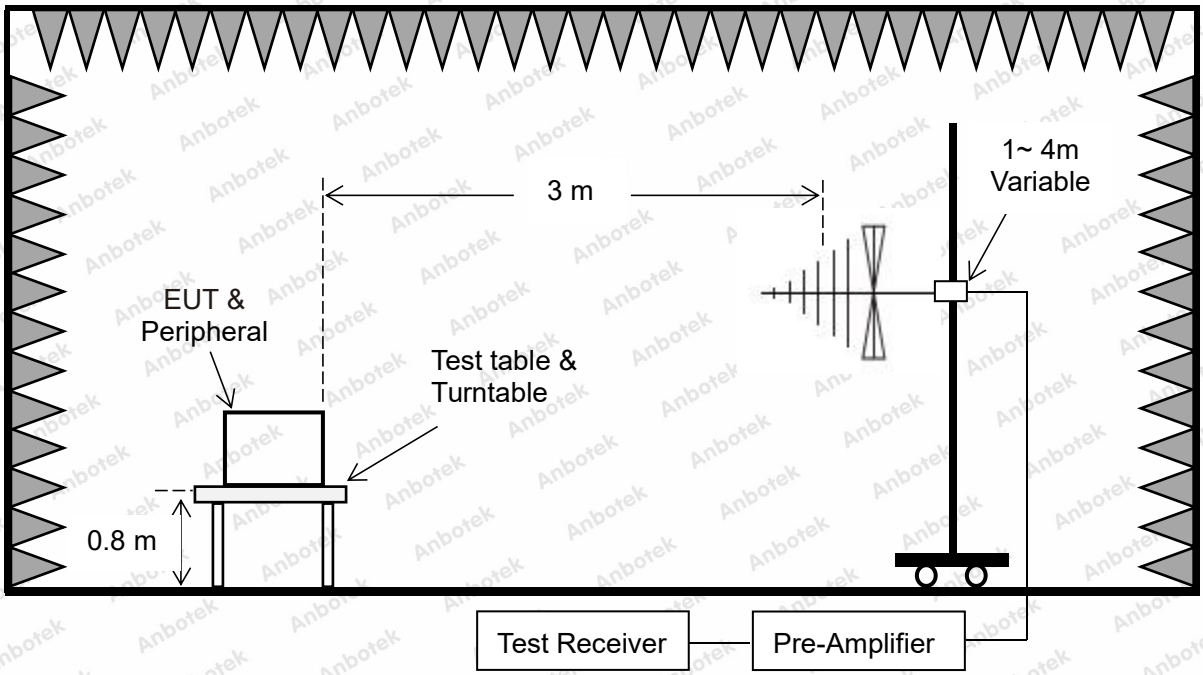
Remark: (1) Emission level (dB)μV = 20 log Emission level μV/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

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

	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT	
			μV/m	(dBμV/m)
Test Limit	30 ~ 88	3	100	40
	88 ~ 216	3	150	43.5
	216 ~ 960	3	200	46
	960 ~ 1000	3	500	54

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.

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.

3.4. Test Results

PASS

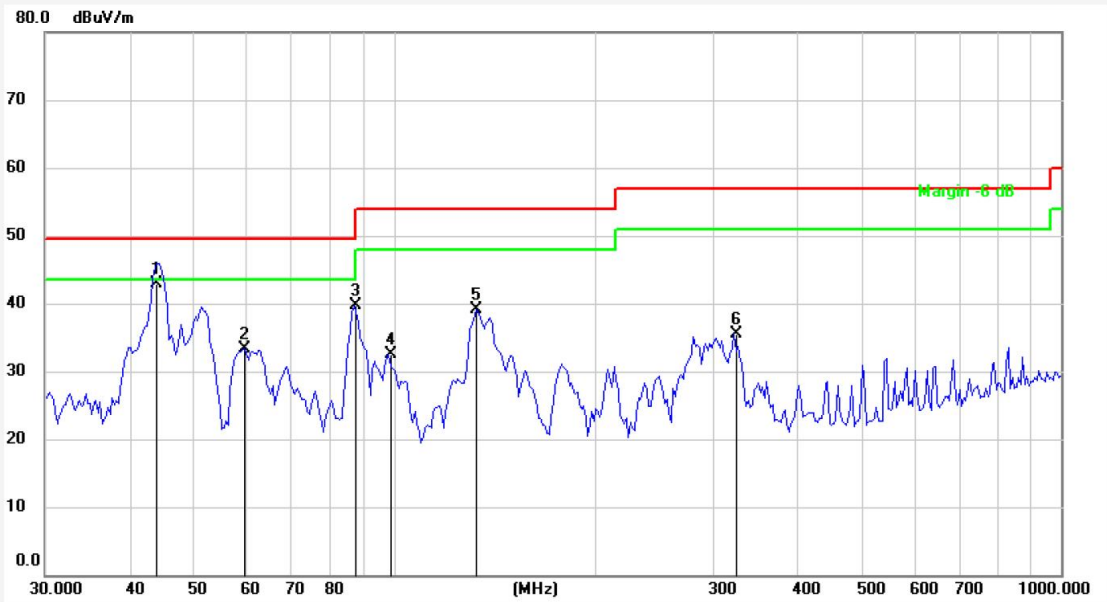
The test curves are shown in the following pages.

Test item:	Radiation Test	Polarization:	Horizontal
Standard:	(RE)FCC 47 CFR Part 15 Subpart B	Power Source:	AC 240V, 60Hz
Frequency Range:	30MHz ~ 1000MHz	Temp.(℃)/Hum.(%RH):	24.5(℃)/56%RH
Distance:	3m		

No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	129.9226	62.76	-20.80	41.96	54.00	-12.04	QP			
2	202.1005	48.79	-18.09	30.70	54.00	-23.30	QP			
3	286.9823	47.65	-15.16	32.49	56.90	-24.41	QP			
4	305.6800	54.25	-14.71	39.54	56.90	-17.36	QP			
5	330.1949	47.53	-14.12	33.41	56.90	-23.49	QP			
6	689.5644	40.31	-7.49	32.82	56.90	-24.08	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 240V, 60Hz
Frequency Range:	30MHz ~ 1000MHz	Temp.(℃)/Hum.(%RH):	24.5(℃)/56%RH
Distance:	3m		



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	44.1202	59.95	-16.98	42.97	49.50	-6.53	QP			
2	59.6493	51.02	-17.68	33.34	49.50	-16.16	QP			
3	87.1117	58.97	-19.29	39.68	49.50	-9.82	QP			
4	98.1419	49.63	-17.20	32.43	54.00	-21.57	QP			
5	132.6850	60.01	-20.96	39.05	54.00	-14.95	QP			
6	323.3204	49.72	-14.28	35.44	56.90	-21.46	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

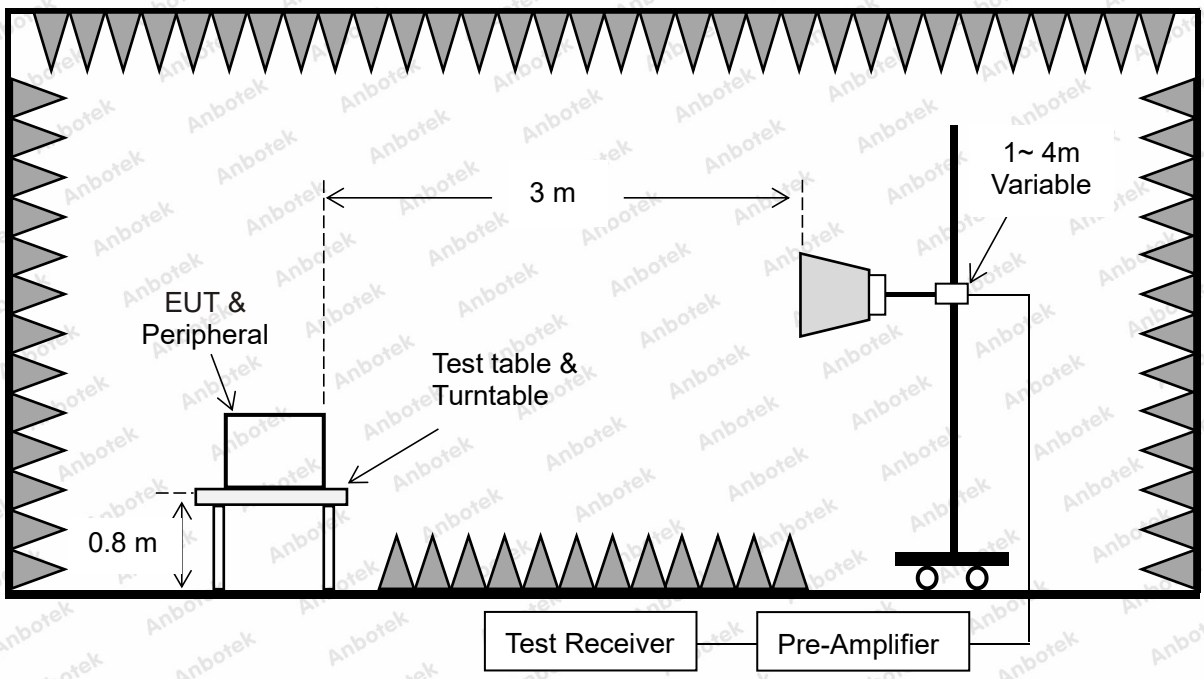
☐ **Limit for radiated emissions at frequencies above 1 GHz for class A equipment**

Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dBμV/m)	
		Peak	Average
1000 ~ 6000	3	79.5	59.5
Remark: N/A			

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

Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dBμV/m)	
		Peak	Average
1000 ~ 6000	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.

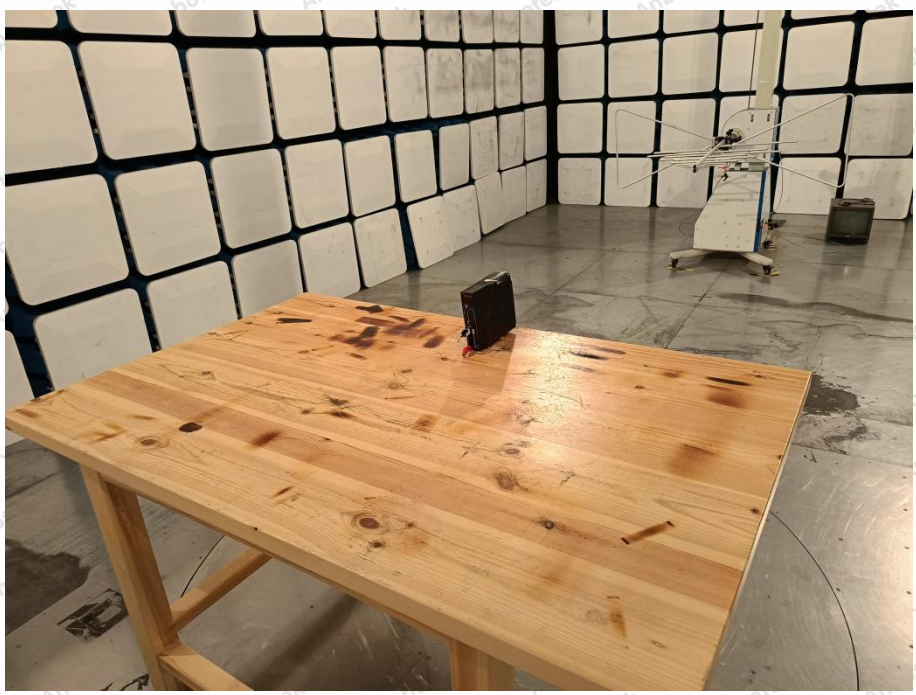
4.4. Test Results

Not applicable.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Power Line Conducted Emission Test

Photo of Radiated Emission Test (Below 1 GHz)



APPENDIX II -- Photo documentation

Photo 1

All

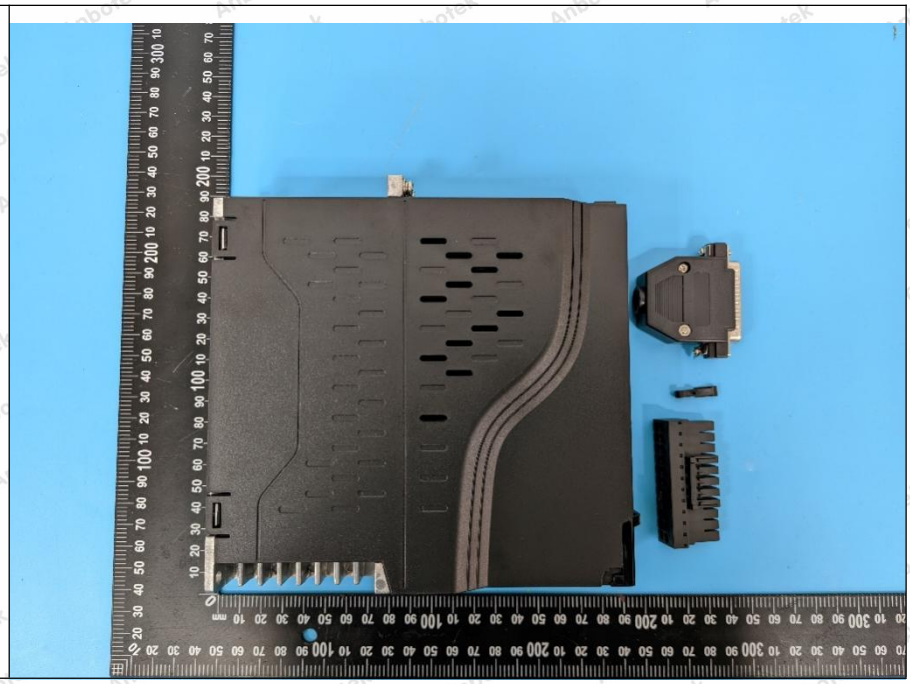


Photo 2

Side

Photo 3

Side

Photo 4

Side

Photo 5

Side

Photo 6

Internal

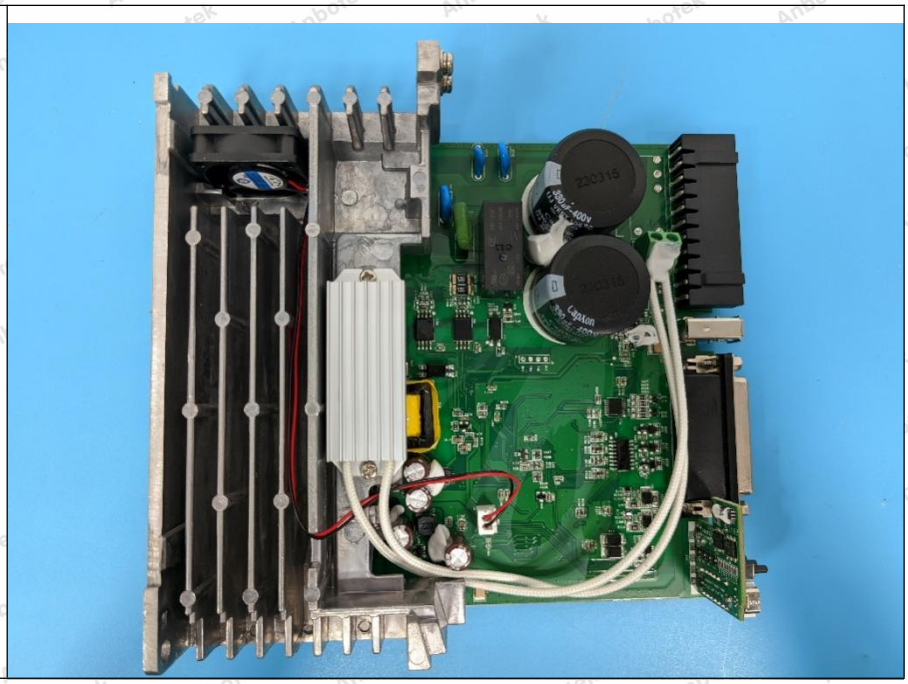


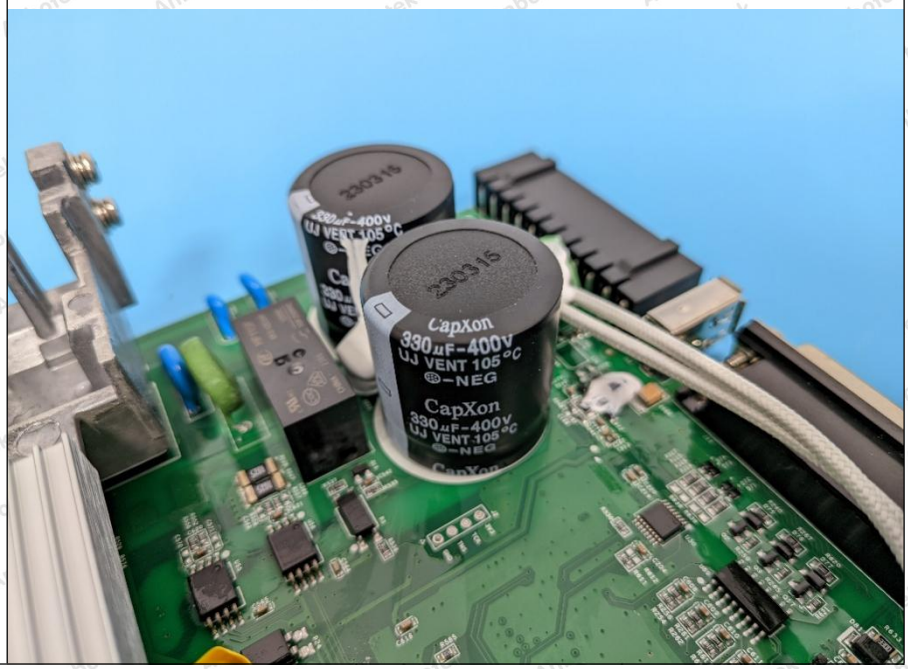
Photo 7 **Internal**	

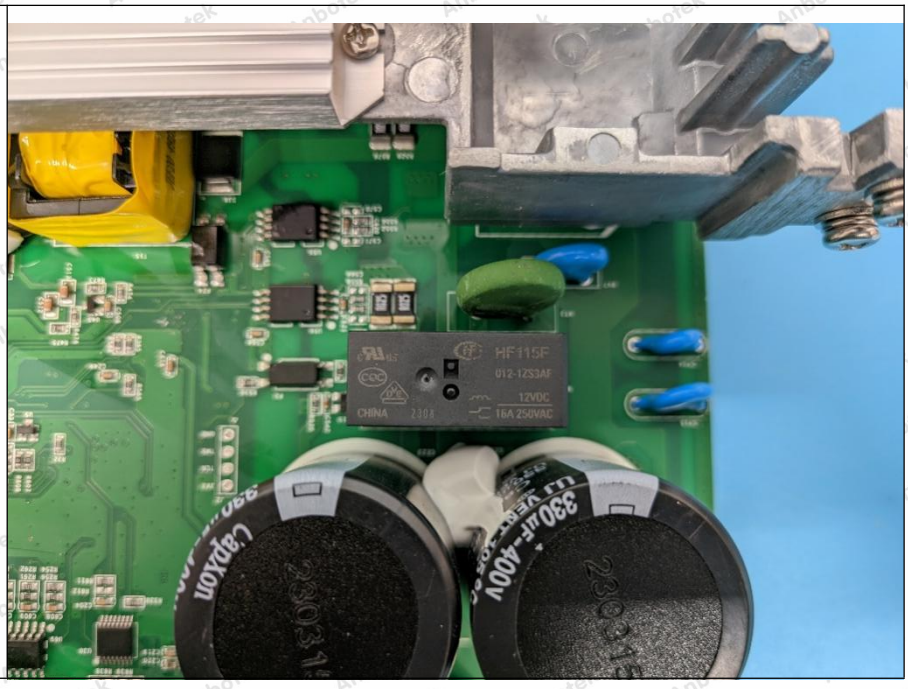
Photo 8 **Internal**	

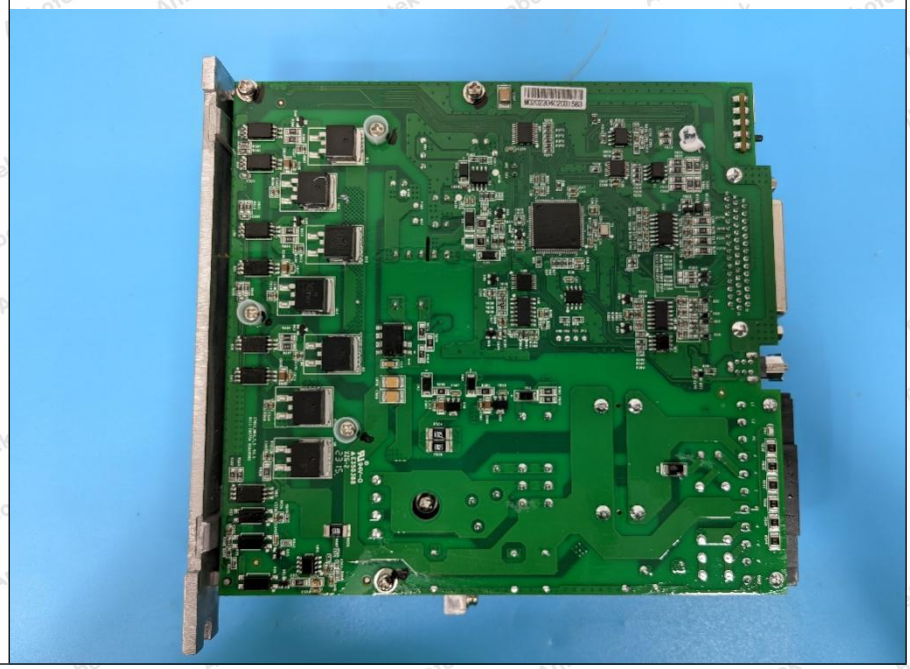
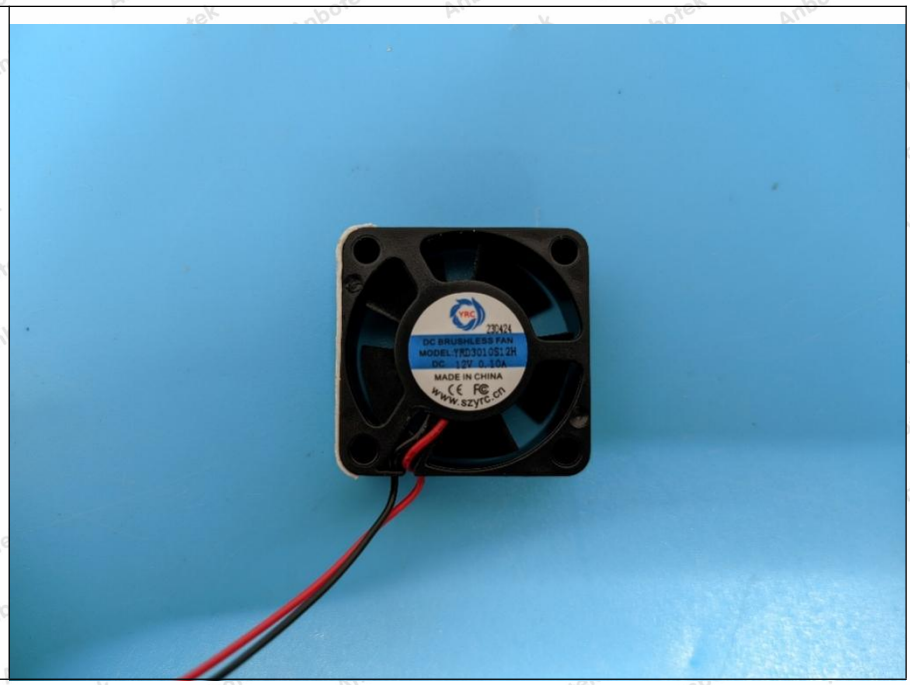
Photo 9 **Internal**	

Photo 10 **Internal**	

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