Changzhou Positive Energy Electrical Equipment Co., Ltd.

TEST REPORT

SCOPE OF WORK:
FCC Part 15 subpart B – EMC report

Model:
ZNL-VCCCDDD

REPORT NUMBER
240500497HAN-001

ISSUE DATE
May 17, 2024

DOCUMENT CONTROL NUMBER
TTRFFCCPART15b_V1

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Report no. 240500497HAN-001

Applicant	:	**Changzhou Positive Energy Electrical Equipment Co., Ltd.** **NO 12-2, Meihua Road, Zhonglou District, Changzhou, Jiangsu, 213000**
Manufacturer	:	**Same as applicant**
Factory	:	**Same as applicant**

Summary

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2023): Radio Frequency Devices (Subpart B)

ANSI C63.4 (2014) +A1 (2017): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

PREPARED BY:	**REVIEWED BY:**
Jed Wang	Offa Zhou
Project Engineer	Reviewer

Contents

Revision History

Report No.	Version	Description	Issued Date
240500497HAN-001	Rev. 01	Initial issue of report	May 17, 2024

Measurement result summary

TEST ITEM	FCC REFERENCE	TEST RESULT	NOTE
Conducted emission	15.107	Pass	-
Radiation emission	15.109	Pass	-

Notes:

1. NA =Not Applicable
2. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.
3. Additions, Deviations and Exclusions from Standards: None.

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product Name	:	CLASS 2 POWER SUPPLY
Type/Model	:	ZNL-VCCCDDD where“CCC" is 3 digits from 050 to 310 Class 2 Power Sup lies which represents the rated output voltage after divided by 10. (e.g.: 150 = 15.0 Vdc, 310 = 31.0 Vdc); “DDD” is 3 digits from 005 to 200 which represents the rated output current after divided by 100. (e.g.: 030 =0.3 A,100=1.0 A). Max output power is 15W.
Description of EUT	:	The appliance in this report is CLASS 2 POWER SUPPLY. After technical evaluation, the model ZNL-V150100 was selected for testing, and the worst test data is listed in the report as representative.
Rating	:	Input: 100-240V~, 50-60Hz, 0.5A Output: DC 15V, 1A, 15W
Brand name	:	ZNL
Mains lead	:	1.8 m
Data cable	:	None
I/O Port	:	None
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Highest operating frequency	:	<108MHz
Sample received date	:	May 16, 2024
Sample identification No.	:	/
Date of test	:	May 16, 2024 ~ May 17, 2024

1.2 Description of Test Facility

Name	:	Intertek Testing Services Zhejiang Ltd.
Address	:	Building No. 2, Juanhu Science and Technology Innovation Park, No. 500 Shuiyueting East Road, Haining City, Zhejiang Province, China
Telephone	:	+86 573 8713 7201
The test facility is recognized, certified, or accredited by these organizations	:	CNAS Accreditation Lab Registration No. CNAS L13980

☒ Subcontractor:

Name	:	Shenzhen DACE Testing Technology Co., Ltd.
Address	:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Tel	:	/
Fax	:	/
The test facility is recognized, certified, or accredited by these organizations	:	CNAS Accreditation Lab Registration No. CNAS L18943

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2023): Radio Frequency Devices (Subpart B).

ANSI C63.4 (2014) +A1 (2017):
Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz.

2.2 Mode of operation during the test

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency. Other voltage and frequency is specified if used.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	EZ_EMC	farad technology co.ltd	V 1.1.42
Radiated emission	EZ_EMC	farad technology co.ltd	V 1.1.42

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	15Ω cement resistor	-	-
-	-	-	-

2.5 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Conducted emission	23	57	NA
Radiated Emission	22	55	NA

Notes: NA =Not Applicable

2.6 Instrument list

Conducted emissions from AC mains power ports (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
loop antenna	EVERFINE	LLA-2	80900L-C	2024-02-19	2025-02-18
Power absorbing clamp	SCHWARZ BECK	MESS-ELEKTRONIK	/	2024-03-25	2025-03-24
Electric Network	SCHWARZ BECK	CAT5 8158	CAT5 8158#207	/	/
Cable	SCHWARZ BECK	/	/	2024-03-20	2025-03-19
Pulse Limiter	SCHWARZ BECK	VTSD 9561-F Pulse limiter 10dB Ateennator	561-G071	2023-12-12	2024-12-11
50ΩCoaxial Switch	Anritsu	MP59B	M20531	/	/
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607K03-102109-MH	2023-06-13	2024-06-12
L.I.S.N	R&S	ESH3-Z5	831.5518.52	2023-12-12	2024-12-11

Radiated emissions (30MHz-1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Cable(HF)2	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
Cable(HF)1	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
Cable(LF)2	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
Cable(LF)1	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
control	Positioning Controller	Model MF-7802	MF780208362	2023-12-27	2024-12-26
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607K03-102109-MH	2023-06-13	2024-06-12
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	/	MF-7802	/	/	/
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04

2.7 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Disturbance (0.15~30MHz)	±3.41dB
Radiated Emission (Below 1GHz)	±5.79dB
Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3 Conducted emission

Test result: PASS

3.1 Limits

3.1.1 Limits for conducted emission of class A device

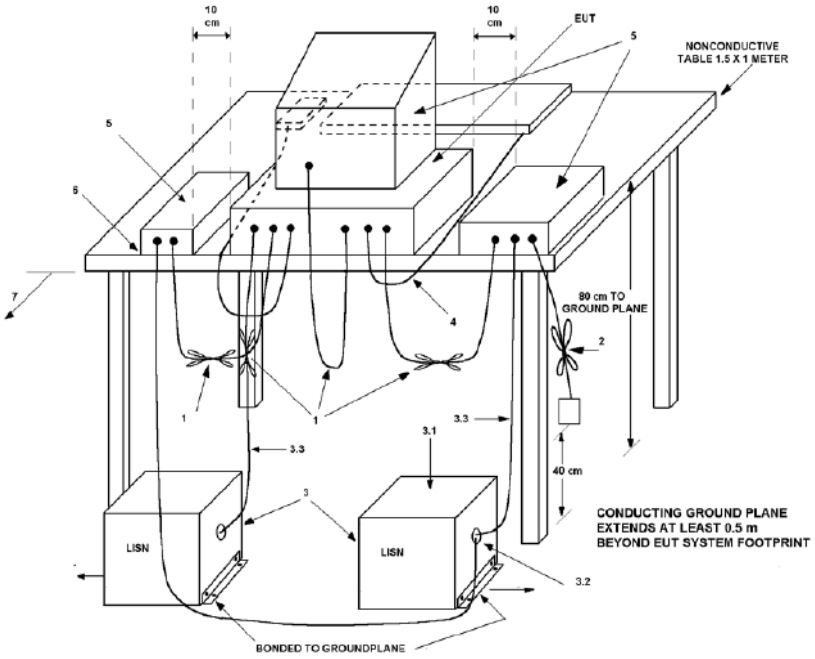
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.1.2 Limits for conducted emission of class B device

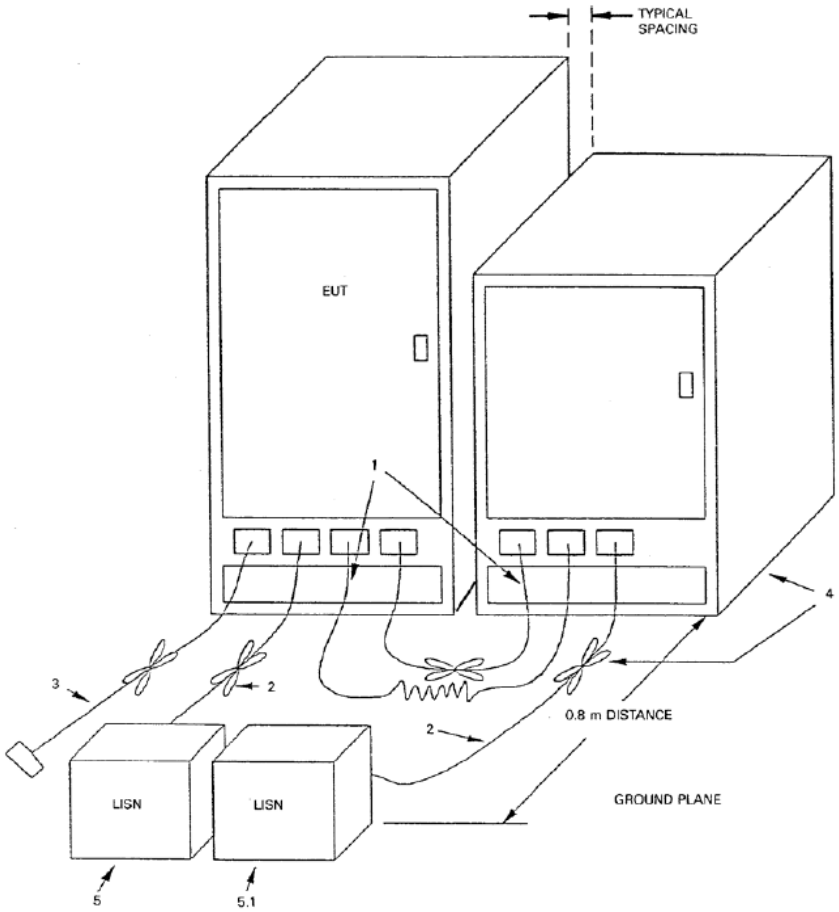
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.2 Test setup

☒ For table top equipment



☐ For floor standing equipment

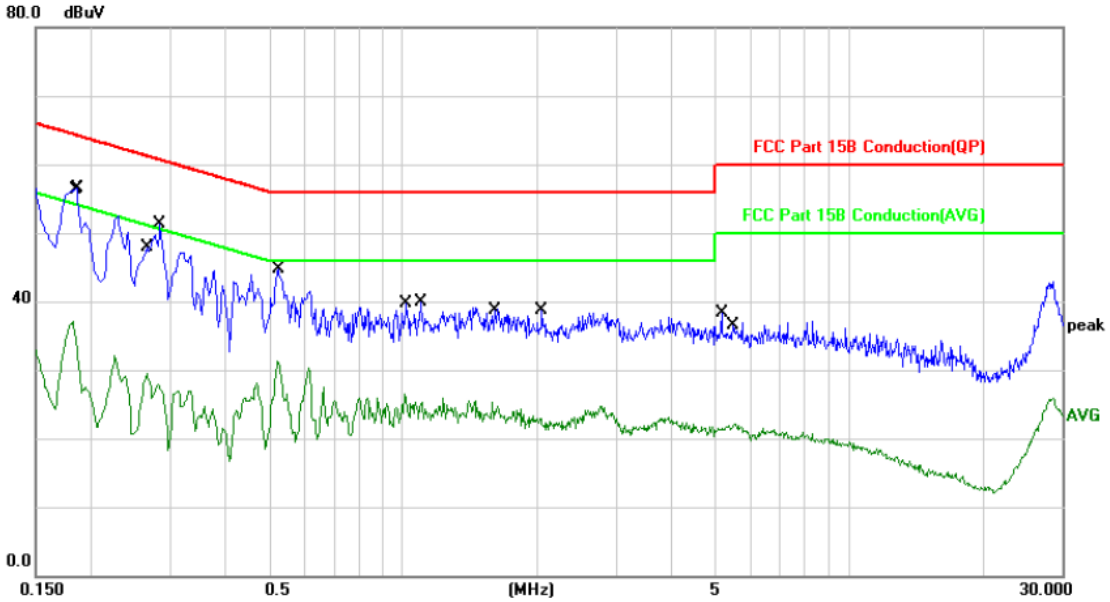


3.3 Test Setup and Test Procedure

Measurement was performed in shielded room, and instruments used were following clause 4 and clause 5 of ANSI 63.4.
Detailed test procedure was following clause 7.3 of ANSI 63.4.
EUT arrangement and operation conditions were according to clause 6 and clause 7 of ANSI 63.4.
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

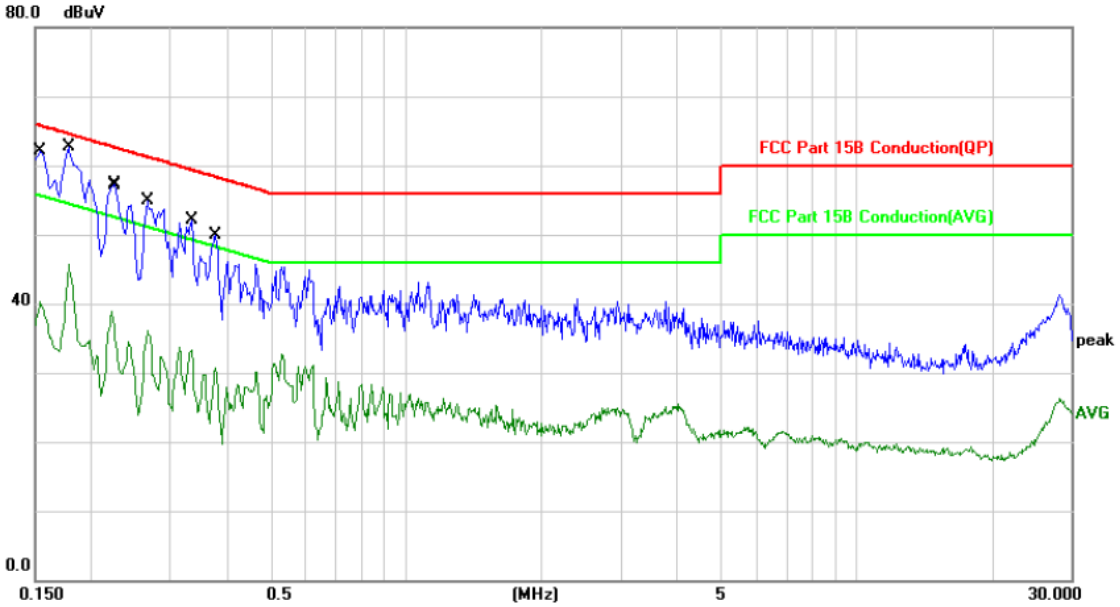
3.4 Test Protocol

L-Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1819	26.99	10.03	37.02	54.39	-17.37	AVG
2	*	0.1860	46.55	10.03	56.58	64.21	-7.63	QP
3		0.2660	19.43	10.02	29.45	51.24	-21.79	AVG
4		0.2860	41.19	10.02	51.21	60.64	-9.43	QP
5		0.5220	21.27	9.97	31.24	46.00	-14.76	AVG
6		0.5260	34.73	9.97	44.70	56.00	-11.30	QP
7		1.0100	16.16	10.31	26.47	46.00	-19.53	AVG
8		1.0940	29.89	9.93	39.82	56.00	-16.18	QP
9		1.5859	15.45	9.94	25.39	46.00	-20.61	AVG
10		2.0540	28.62	9.98	38.60	56.00	-17.40	QP
11		5.1820	28.10	10.15	38.25	60.00	-21.75	QP
12		5.5500	11.99	10.16	22.15	50.00	-27.85	AVG

N-Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1539	52.06	10.04	62.10	65.78	-3.68	QP
2		0.1539	30.36	10.04	40.40	55.78	-15.38	AVG
3		0.1780	46.77	10.03	56.80	64.57	-7.77	QP
4		0.1780	35.60	10.03	45.63	54.57	-8.94	AVG
5		0.2220	28.87	10.03	38.90	52.74	-13.84	AVG
6		0.2268	46.28	10.03	56.31	62.56	-6.25	QP
7		0.2660	44.97	10.02	54.99	61.24	-6.25	QP
8		0.2660	25.98	10.02	36.00	51.24	-15.24	AVG
9		0.3339	42.15	10.01	52.16	59.35	-7.19	QP
10		0.3339	23.21	10.01	33.22	49.35	-16.13	AVG
11		0.3780	39.84	10.00	49.84	58.32	-8.48	QP
12		0.3780	20.61	10.00	30.61	48.32	-17.71	AVG

4 Radiated emission

Test result: **PASS**

4.1 Radiated emission limits

4.1.1 Limits for radiated emission of class A device

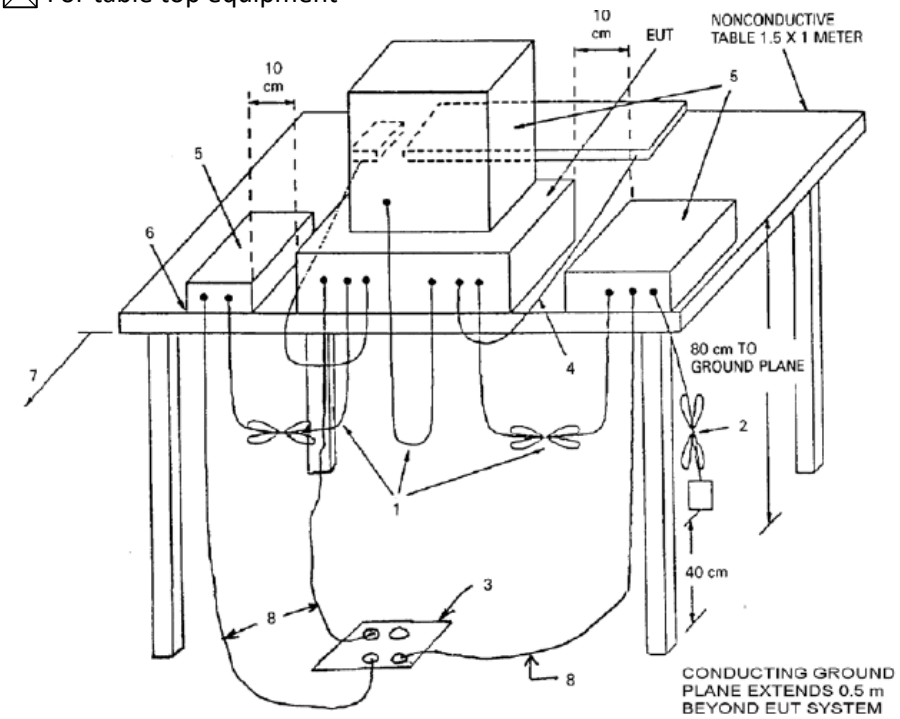
Frequency (MHz)	Permitted limit in dBμV/m (Quasi-peak) of Measurement Distance 10m
30 ~ 88	39
88 ~ 216	43.5
216 ~ 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.1.2 Limits for radiated emission of class B device

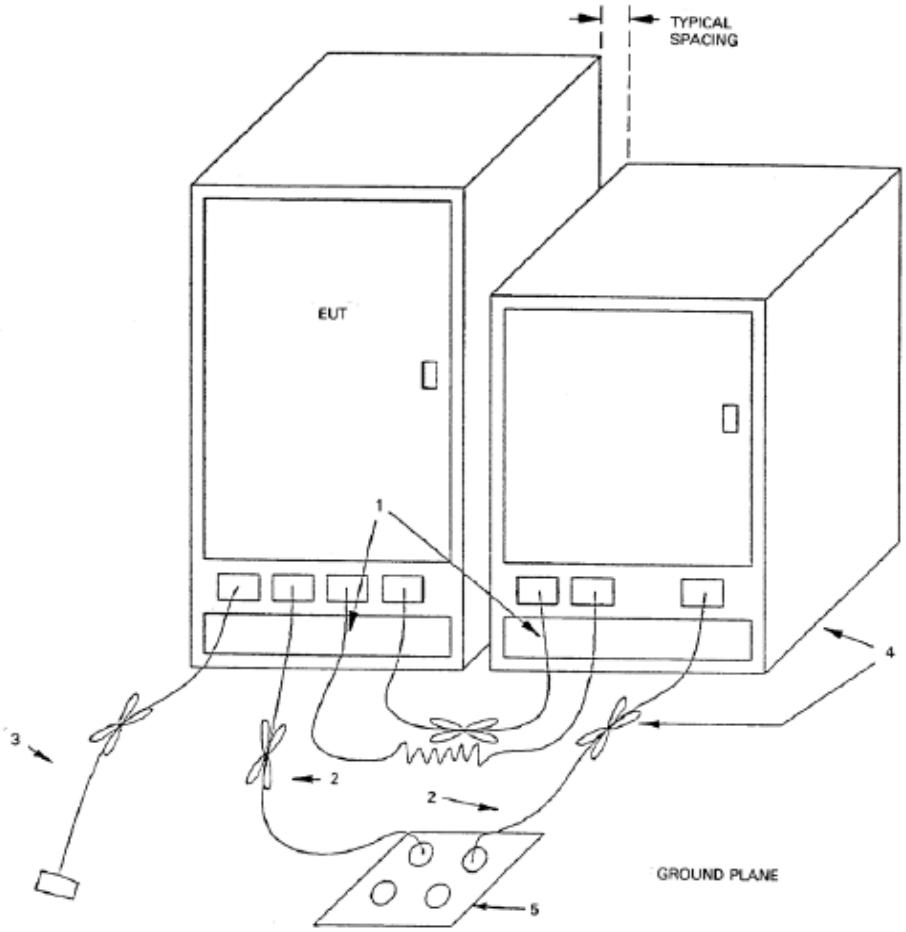
Frequency (MHz)	Permitted limit in dBμV/m (Quasi-peak) of Measurement Distance 3m
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.2 Block diagram and test set up

☒ For table top equipment



☐ For floor standing equipment



4.3 Test Setup and Test Procedure

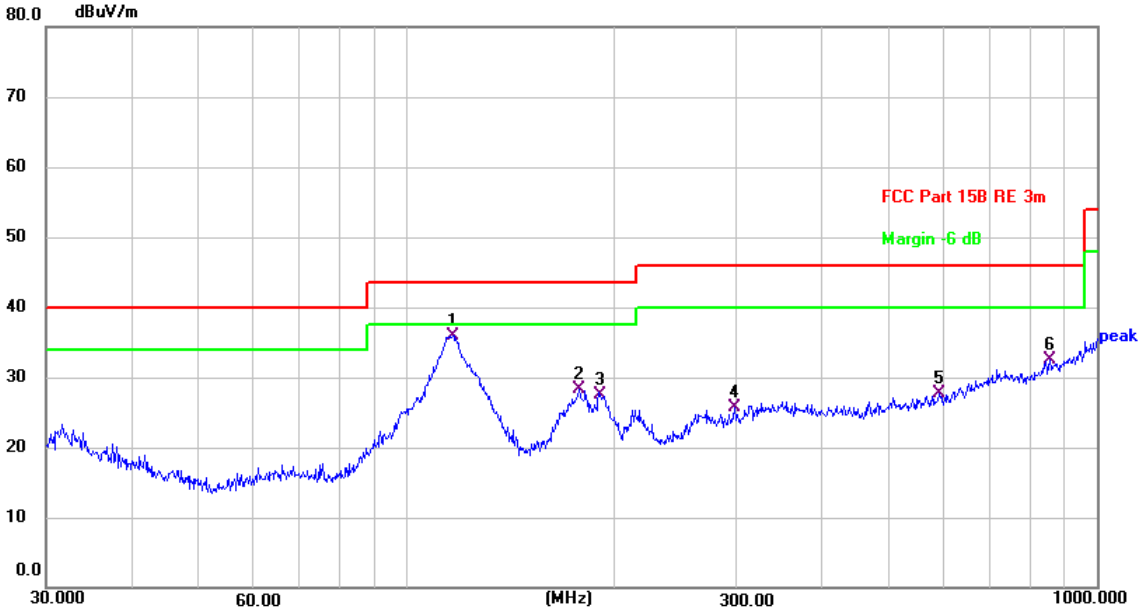
The measurement was performed in a semi-anechoic chamber.

The distance from EUT to receiving antenna is 3 meter.
Measurement was performed according to clause 4 and clause 5 of ANSI 63.4.
Test procedure was according to clause 8.3 of ANSI 63.4.
EUT arrangement and operate condition were according to clause 6 and clause 8 of ANSI 63.4.
The bandwidth setting on R&S Test Receiver was 120 kHz.
The required measurement frequency range was checked.

4.4 Test Protocol

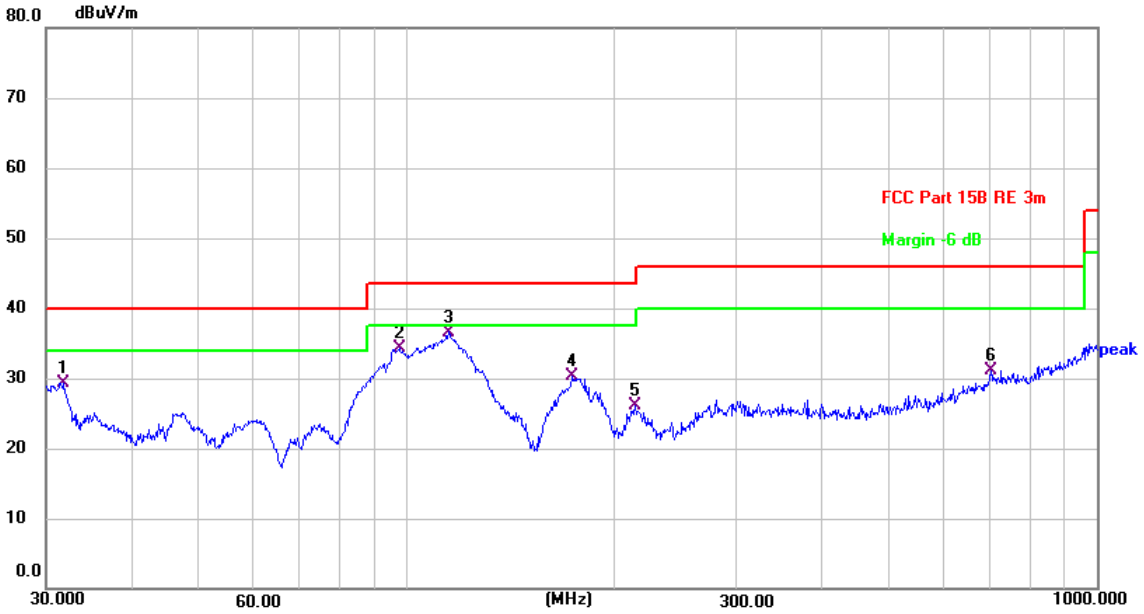
Test Curve:

Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	116.5401	40.87	-4.98	35.89	43.50	-7.61	QP
2	177.5092	31.42	-3.17	28.25	43.50	-15.25	QP
3	190.4050	30.61	-3.03	27.58	43.50	-15.92	QP
4	298.2681	25.17	0.60	25.77	46.00	-20.23	QP
5	590.9737	24.69	2.92	27.61	46.00	-18.39	QP
6	854.0247	25.58	6.93	32.51	46.00	-13.49	QP

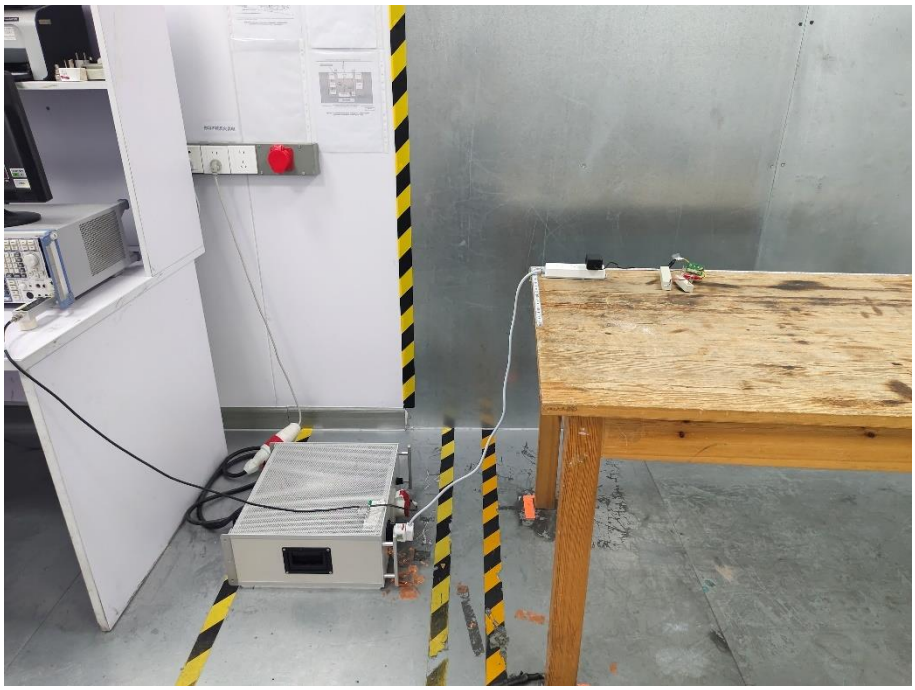
Vertical



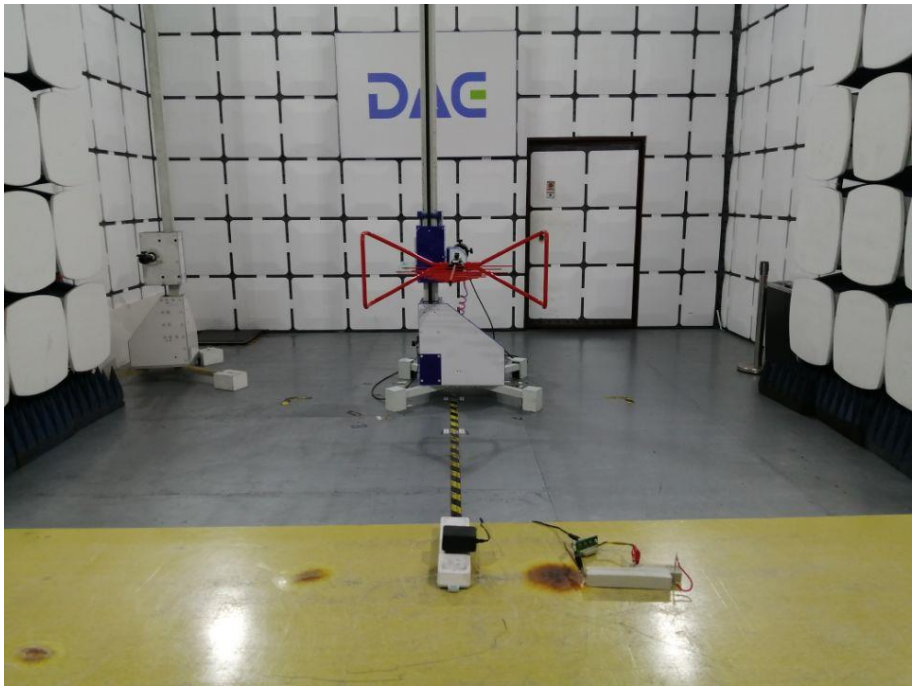
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	31.8427	32.76	-3.36	29.40	40.00	-10.60	QP
2	97.4560	39.92	-5.64	34.28	43.50	-9.22	QP
3 *	114.9169	41.63	-5.03	36.60	43.50	-6.90	QP
4	173.8135	33.47	-3.24	30.23	43.50	-13.27	QP
5	214.5143	28.86	-2.70	26.16	43.50	-17.34	QP
6	701.7610	26.00	5.14	31.14	46.00	-14.86	QP

Appendix I: Photograph of Test setup

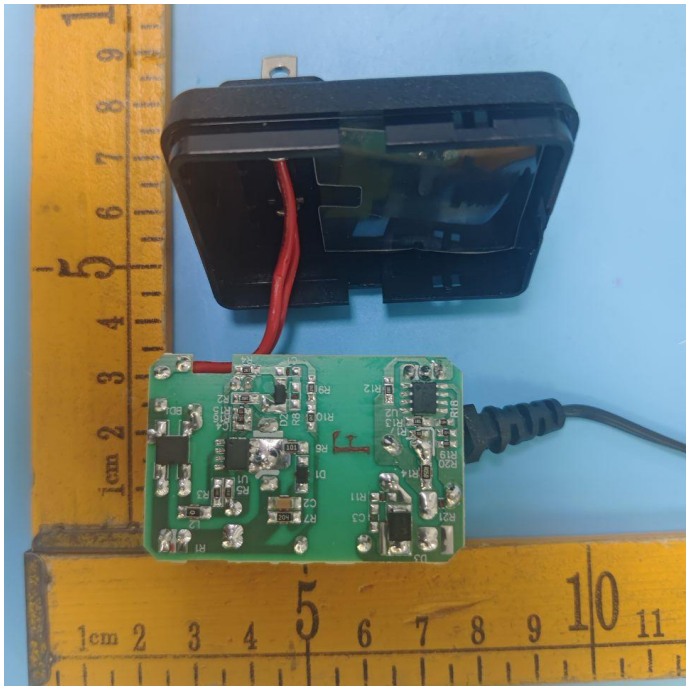
Conducted emission



Radiated Emission



Appendix II: Photograph of equipment under test



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