

Product Name: PD CHARGER	Report No.: ITEZA2-202400033E
Product Model: Please refer to the Series model list of product at page 7	Security Classification: Open
Version: A0	Total Page: 28

TIRT Testing Report

Prepared By:	Checked By:	Approved By:	
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<i>Aaron Long</i>	<i>Stone Tang</i>	<i>Joky Wang</i>	

FCC EMC TEST REPORT

Applicant:	Shenzhen Theone Electronic Co.,Ltd
Address:	THEONE Science and Technology Park 101, FengWei Street No.2, Dakang Community, Yuanshan Street, Longgang District, Shenzhen City, Guangdong Province, China.
Manufacturer:	Shenzhen Theone Electronic Co.,Ltd
Address:	THEONE Science and Technology Park 101, FengWei Street No.2, Dakang Community, Yuanshan Street, Longgang District, Shenzhen City, Guangdong Province, China.
Sample No:	1000028597
Product Name:	PD CHARGER
Brand Name:	N/A
Model No.:	Please refer to the Series model list of product at page 7
Test No.:	TP120C

Date of Receipt:	2024/02/29
Date of Test:	2024/03/01~2024/03/05
Issued Date:	2024/03/11
Testing Lab:	TIRT

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History of the test report

Original Report Issue Date: 2024.03.11

- No additional attachment
- Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1. Description of Device (EUT)

Product Name	:	PD CHARGER
Model Number	:	Please refer to the Series model list of product at page 7
Brand Name	:	N/A
Diff	:	There is no difference except the name of the model. All tests are made with the TP120C model
Input	:	AC 110-240V, 50/60Hz, 2.2A Max
Output	:	Type C output: DC 5.0V=3.0A 15.0W, 9.0V=3.0A 27.0W, 12.0=3.0A 36.0W, 15V=3.0A 45.0W, 20.0V=5.0A 100.0W PPS: 3.3-20.0V=6.0A Power: 120.0W Max
Test Voltage	:	AC 120V/60Hz
Highest Frequency	:	Less than 108MHz
Software version	:	N/A
Hardware version	:	N/A

1.2. Accessories of Device (EUT)

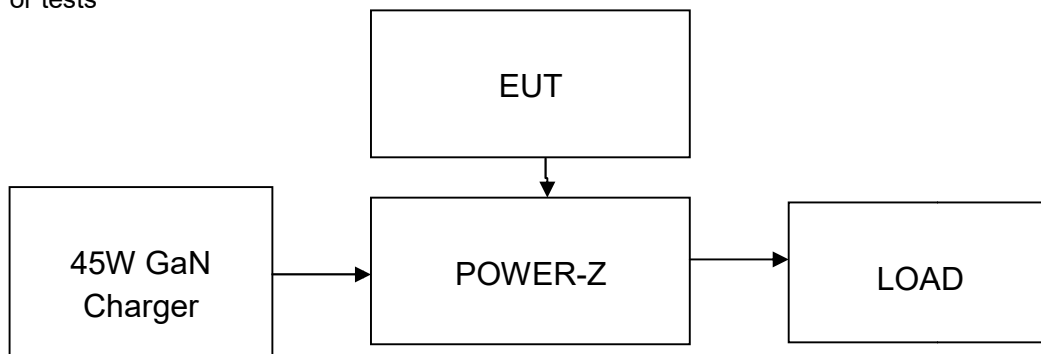
Accessories : /
 Manufacturer : /
 Model : /
 Ratings : /

1.3. Tested Supporting System Details.

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
1	45W GaN Charger	N/A	P445	N/A	N/A
2	POWER-Z	N/A	KM002C 0-50V 0-6A	N/A	N/A
3	Type C Cable	N/A	N/A	N/A	N/A

1.4. Block Diagram of connection between EUT and simulators

For tests



Signal Cable Description of the above Support Units

No.	Port Name	Cable	Length	Shielded (Yes or No)	Detachable (Yes or No)
/	/	/	/	/	/

1.5. Series model list of product

Series model list of product					
TP120C	TP120C-EU	TP120C-US	TP120C-UK	TP120CC	TP120CA
TP120CCA	TP121C	TP121C-EU	TP121C-US	TP121C-UK	TP121CC
TP121CA	TP121CCA	TP100C	TP100C-EU	TP100C-US	TP100C-UK
TP100CC	TP100CA	TP100CCA	TP140C	TP140C-EU	TP140C-US
TP140C-UK	TP140CC	TP140CA	TP140CCA	GP120C	GP120C-EU
GP120C-US	GP120C-UK	GP120CC	GP120CA	GP120CCA	GP100C
GP100C-EU	GP100C-US	GP100C-UK	GP100CC	GP100CCA	GP140C
GP140C-EU	GP140C-US	GP140C-UK	GP140CC	GP140CCA	DGCDQ-BC037-00
DGCDQ-BC037-01	/	/	/	/	/

2. Summary Of Standards And Results

2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

EMISSION			
Description of Test Item	Standard	Limits	Results
Power Line Conducted Emission Test	FCC Part 15 ANSI C63.4:2014	Class B	P
Radiated Emission Test	FCC Part 15 ANSI C63.4:2014	Class B	P

Note:

1. P is an abbreviation for Pass.
2. F is an abbreviation for Fail.
3. N/A is an abbreviation for Not Applicable.
4. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

2.2. Test Mode Description

Mode No.	Test Mode	Test Voltage
Mode 1	Type C output: DC 5.0V=3.0A 15.0W	AC 120V/60Hz
Mode 2	Type C output: DC 9.0V=3.0A 27.0W	AC 120V/60Hz
Mode 3	Type C output: DC 12.0V=3.0A 36.0W	AC 120V/60Hz
Mode 4	Type C output: DC 15.0V=3.0A 45.0W	AC 120V/60Hz
Mode 5	Type C output: DC 20.0V=3.0A 100.0W	AC 120V/60Hz
Mode 6	PPS: DC 3.3V=6.0A	AC 120V/60Hz
Mode 7	PPS: DC 20.0V=6.0A	AC 120V/60Hz

Note:

- 1, Mode 7 is worst case mode tests for Power Line Conducted Emission Test.
- 2, Mode 7 is worst case mode tests for Radiated Emission Test.
- 3, This report only reflected the worst mode in this part.

2.3. Test Equipment List

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Radiated Emission					
EMI Receiver	Rohde&Schwarz	ESIB 40	YH-TIRT-SAC-966-20220911	2024/01/05	2025/01/04
Integral Antenna	Schwarzbeck	VULB 9168	01314	2023/12/11	2024/12/10
Integral Antenna	Rohde&Schwarz	HF907	RSM2991424	2023/12/11	2024/12/10
Preamplifier	Emtrace	RP01A	'02017	2024/01/05	2025/01/04
Preamplifier	Schwarzbeck	BBV9744	00143	2024/01/05	2025/01/04
RF Cable	/	LMR400UF-NMNM-7.0M	/	2024/01/05	2025/01/04
RF Cable	/	SFT2050PUR-NMNM-7.0M	/	2024/01/05	2025/01/04
Conducted Emission					
EMI Receiver	Rohde&Schwarz	ESR7	1316.3003K07-102611-mk	2023/12/24	2024/10/23
LISN	Rohde&Schwarz	ENV216	3560.655.12-102915-Bp	2023/12/24	2024/10/23
ISN	Schwarzbeck	ENY81	1309.8510.03	2023/03/08	2024/03/07
ISN	Schwarzbeck	ENY81-CAT6	1309.8526.03-101976-kh	2023/03/08	2024/03/07
RF Cable	\	SFT2050PUR-NMNM-2.0M	\	2024/01/05	2025/01/04

2.4. Test Facility

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	104 Building C, Xinmingsheng Industrial Park No.132, Zhangge Old Village East Zone, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, P. R. China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Designation Number:	CN1366
Test Firm Registration Number:	820690
Telephone:	+86-0755-27087573

2.5. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement uncertainty levels of TIRT Lab		
Measurement	Measurement Frequency Range	U(dB)
Radiated Emission	30MHz~1GHz	4.6
Radiated Emission	1GHz ~ 18GHz	4.9
Radiated Emission	18GHz ~ 40GHz	4.9
Conduction Emissions	150kHz~30MHz	3.1

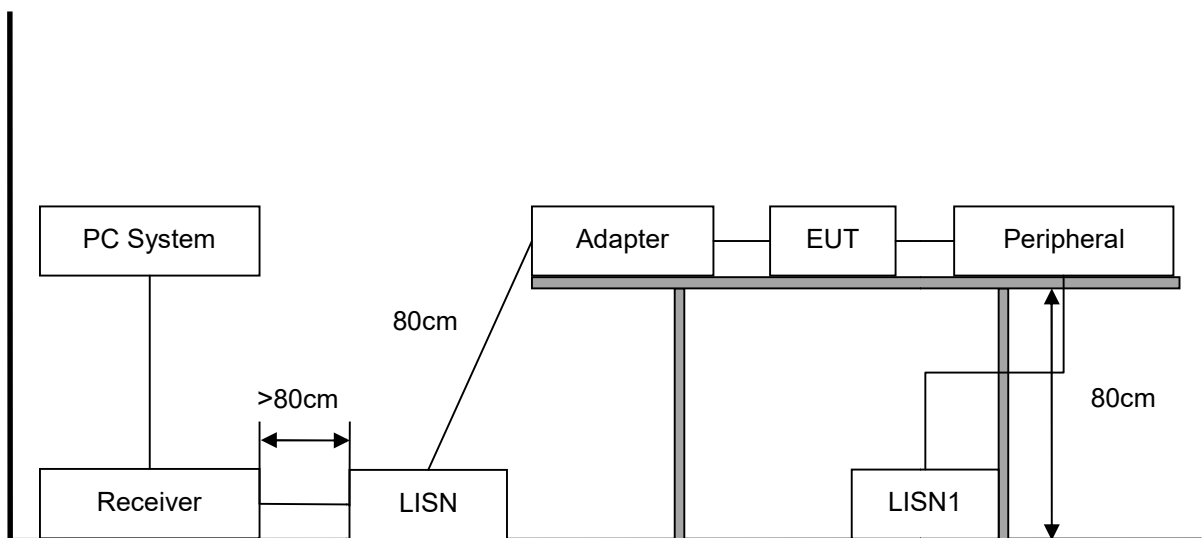
3. Power Line Conducted Emission Test

3.1. Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

- Notes:
1. Emission level=Read level + LISN factor-Preamplifier factor + Cable loss
 2. Decreasing linearly with logarithm of frequency.
 3. The lower limit shall apply at the transition frequencies.

3.2. Block Diagram of Test Setup



3.3. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

- (1) Setup the EUT as shown as Section 3.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

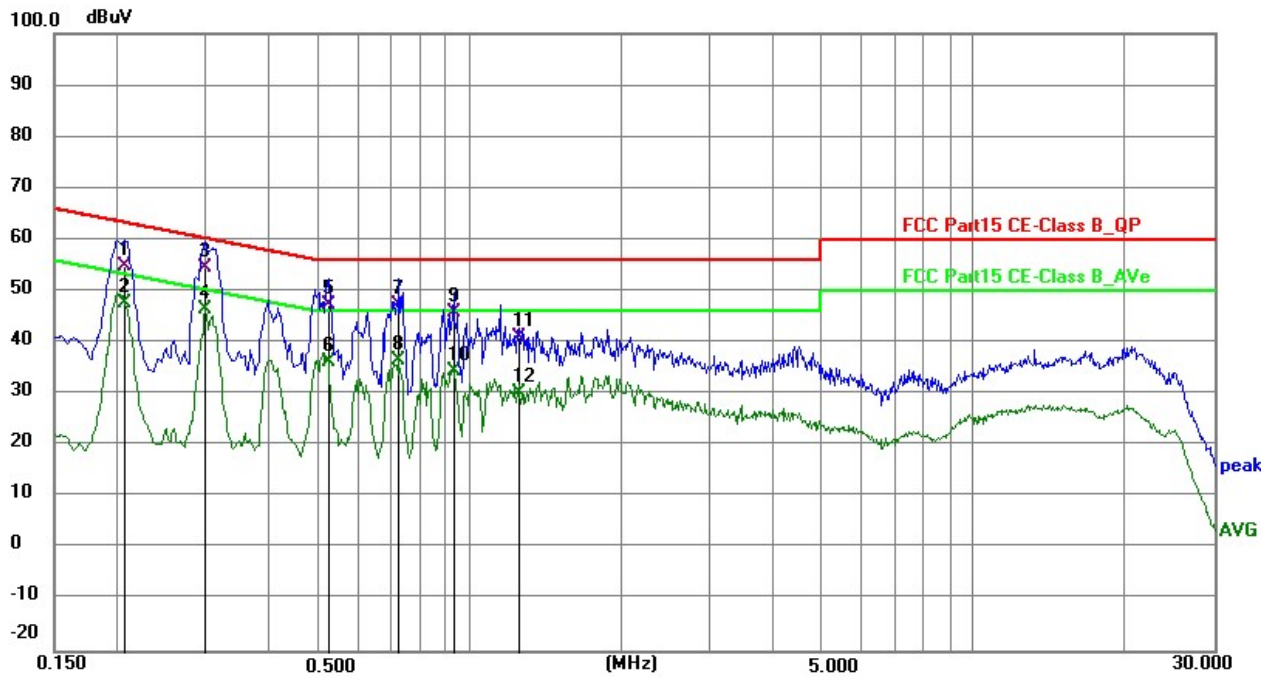
3.5. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on conducted Emission test.
- (2) The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 9kHz.

3.6. Test Results

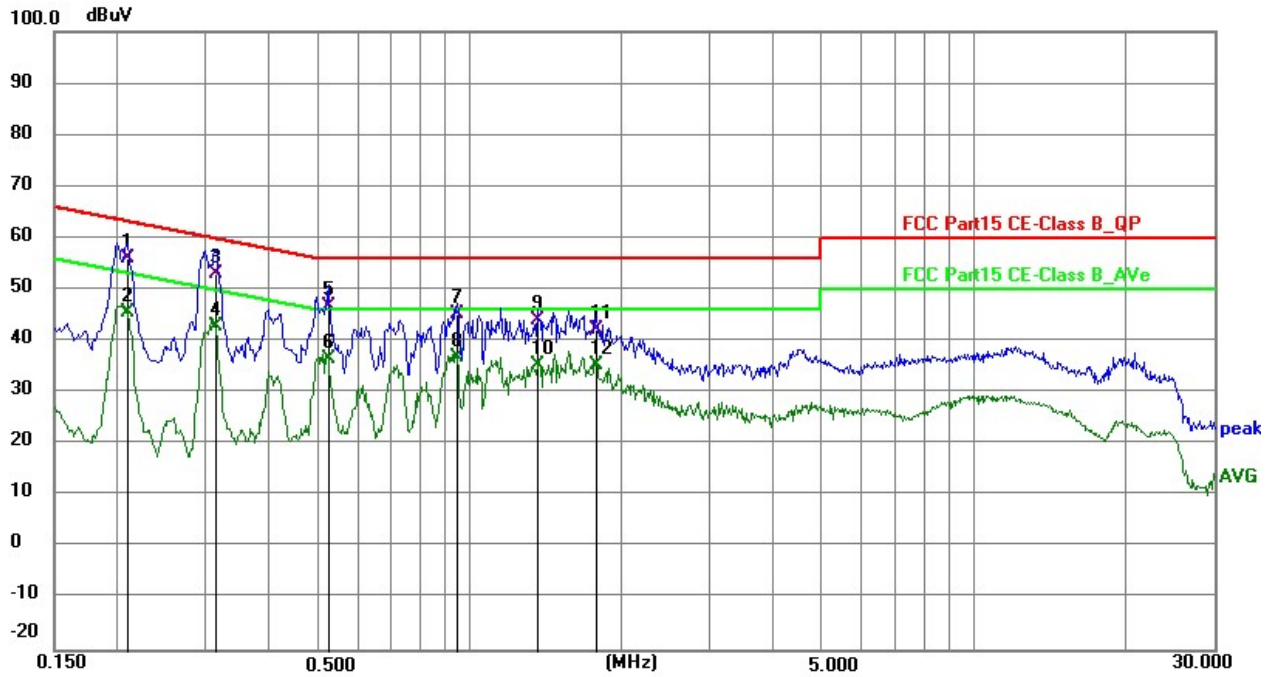
EUT	PD CHARGER	Test Date	2024.03.04
M/N	TP120C	Temperature	24°C
Test Engineer	Aaron Long	Humidity	55%
Test Voltage	AC 120V/60Hz	Pressure	101.6kPa
Test Mode	Mode 7		
Test Results	PASS		
<p>Note:</p> <ol style="list-style-type: none"> 1. The test results are listed in next pages. 2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out. 3. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out. 			

Polarization: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2071	45.29	9.63	54.92	63.32	-8.40	QP	P	
2	0.2071	38.06	9.63	47.69	53.32	-5.63	AVG	P	
3	0.2983	44.88	9.63	54.51	60.29	-5.78	QP	P	
4 *	0.2983	36.83	9.63	46.46	50.29	-3.83	AVG	P	
5	0.5231	37.69	9.62	47.31	56.00	-8.69	QP	P	
6	0.5231	26.57	9.62	36.19	46.00	-9.81	AVG	P	
7	0.7260	37.81	9.63	47.44	56.00	-8.56	QP	P	
8	0.7260	26.82	9.63	36.45	46.00	-9.55	AVG	P	
9	0.9330	36.12	9.64	45.76	56.00	-10.24	QP	P	
10	0.9330	24.74	9.64	34.38	46.00	-11.62	AVG	P	
11	1.2570	31.30	9.64	40.94	56.00	-15.06	QP	P	
12	1.2570	20.65	9.64	30.29	46.00	-15.71	AVG	P	

Polarization: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2084	46.31	9.63	55.94	63.27	-7.33	QP	P	
2	0.2084	35.80	9.63	45.43	53.27	-7.84	AVG	P	
3 *	0.3120	43.30	9.62	52.92	59.92	-7.00	QP	P	
4	0.3120	33.08	9.62	42.70	49.92	-7.22	AVG	P	
5	0.5231	37.19	9.62	46.81	56.00	-9.19	QP	P	
6	0.5231	27.07	9.62	36.69	46.00	-9.31	AVG	P	
7	0.9465	35.58	9.64	45.22	56.00	-10.78	QP	P	
8	0.9465	27.26	9.64	36.90	46.00	-9.10	AVG	P	
9	1.3650	34.55	9.64	44.19	56.00	-11.81	QP	P	
10	1.3650	25.81	9.64	35.45	46.00	-10.55	AVG	P	
11	1.7835	32.46	9.65	42.11	56.00	-13.89	QP	P	
12	1.7835	25.76	9.65	35.41	46.00	-10.59	AVG	P	

4. Radiated Emission Test

4.1. Test Limit

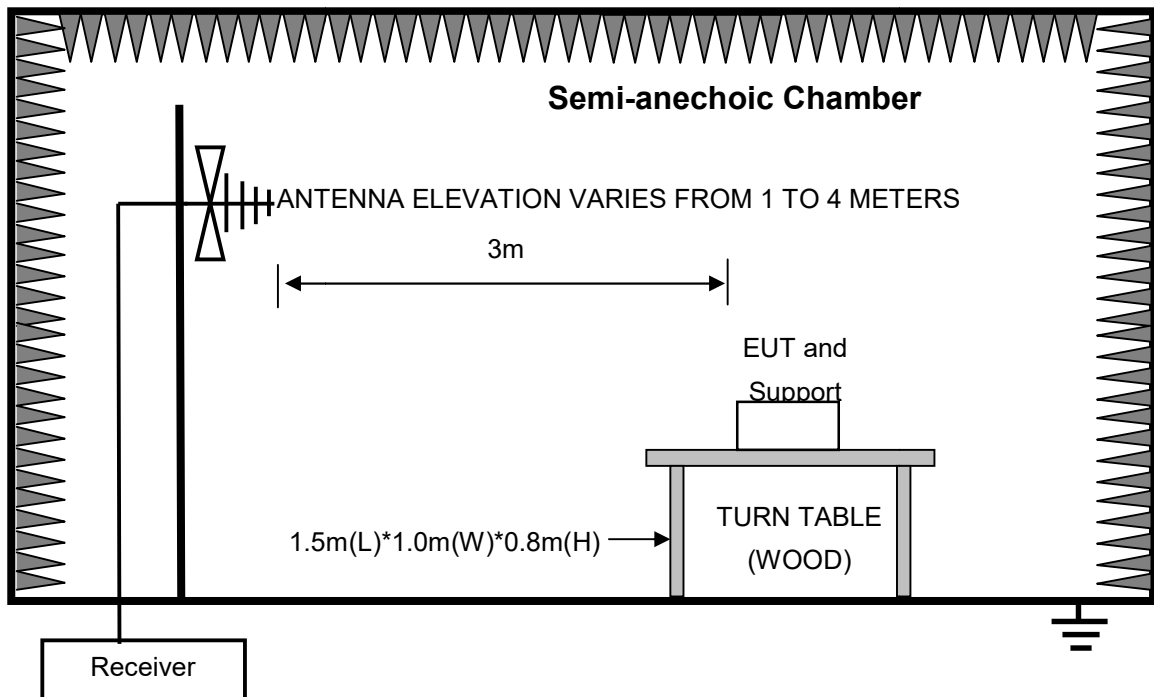
Frequency MHz			Distance (Meters)	Field Strengths Limits dB(μ V)/m
30	~	88	3	40.0
88	~	216	3	43.5
216	~	960	3	46.0
960	~	1000	3	54.0
Above 1GHz			3	74(Peak) 54(Average)

- Notes:
1. The smaller limit shall apply at the cross point between two frequency bands.
 2. Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
 3. Frequency range of radiated measurements:

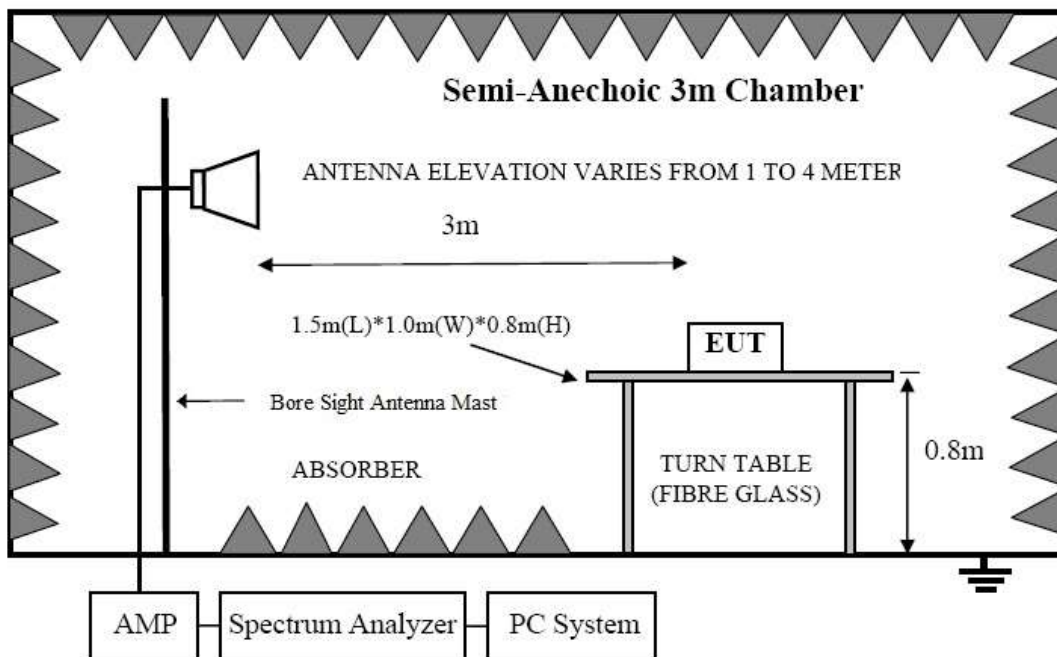
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

4.2. Block Diagram of Test Setup

In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz



4.3. Configuration of EUT on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

4.4. Operating Condition of EUT

- (1) Setup the EUT as shown as Section 4.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

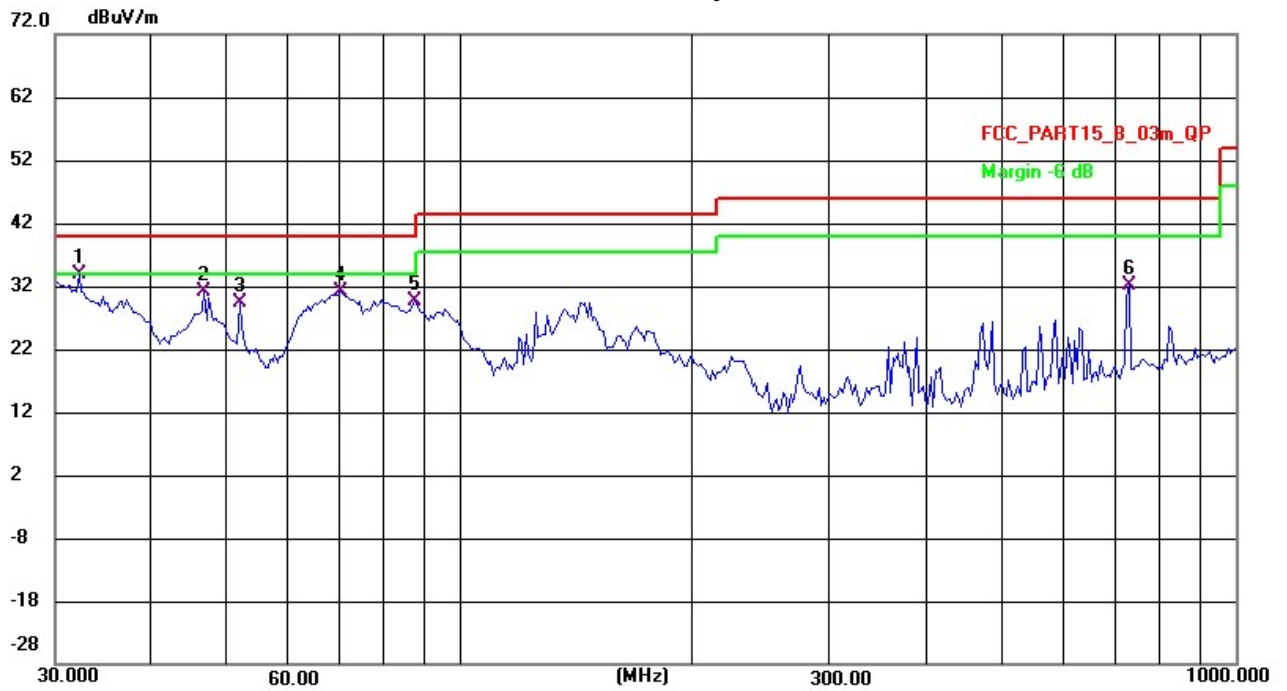
4.5. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on Radiated Emission test.
- (2) For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- (3) The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESR) is set at 120kHz.
- (4) The frequency range from above 1GHz is checked, the bandwidth of spectrum analyzer (Spectrum Analyzer FSV40-N) is set at 1MHz.
- (5) The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.
- (6) The test results are reported on Section 4.7.

4.6. Test Results

For below 1GHz radiated disturbance test result:			
EUT	PD CHARGER	Test Date	2024.03.04
M/N	TP120C	Temperature	23.5°C
Test Engineer	Aaron Long	Humidity	46%
Test Voltage	AC 120/60Hz	Pressure	101.6kPa
Test Mode	Mode 7		
Test Results	PASS		
Note: 1. The test results are listed in next pages. 2. If the limits for the measurement with the quasi-peak detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet limits and the measurement with the quasi-peak detector need not be carried out.			

Antenna Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	32.1840	53.91	-20.07	33.84	40.00	-6.16	QP	100	272	P	
2	46.7077	50.53	-19.50	31.03	40.00	-8.97	QP	100	354	P	
3	51.8997	49.10	-19.69	29.41	40.00	-10.59	QP	100	354	P	
4	70.2095	53.24	-22.12	31.12	40.00	-8.88	QP	100	120	P	
5	87.2980	53.96	-24.35	29.61	40.00	-10.39	QP	100	272	P	
6	728.8971	43.66	-11.65	32.01	46.00	-13.99	QP	100	251	P	

Antenna Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	64.5319	49.49	-21.10	28.39	40.00	-11.61	QP	100	348	P	
2 *	85.4769	54.84	-24.32	30.52	40.00	-9.48	QP	200	35	P	
3	124.9249	51.20	-21.86	29.34	43.50	-14.16	QP	100	5	P	
4	129.3923	54.44	-21.62	32.82	43.50	-10.68	QP	200	42	P	
5	146.8392	53.92	-20.83	33.09	43.50	-10.41	QP	200	5	P	
6	167.8136	48.83	-21.08	27.75	43.50	-15.75	QP	100	156	P	

For above 1GHz radiated disturbance test result:			
EUT	PD CHARGER	Test Date	N/A
M/N	TP120C	Temperature	N/A
Test Engineer	N/A	Humidity	N/A
Test Voltage	N/A	Pressure	N/A
Test Mode	N/A		
Test Results	N/A		

Note: The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the above 1GHz radiated disturbance test not applicable

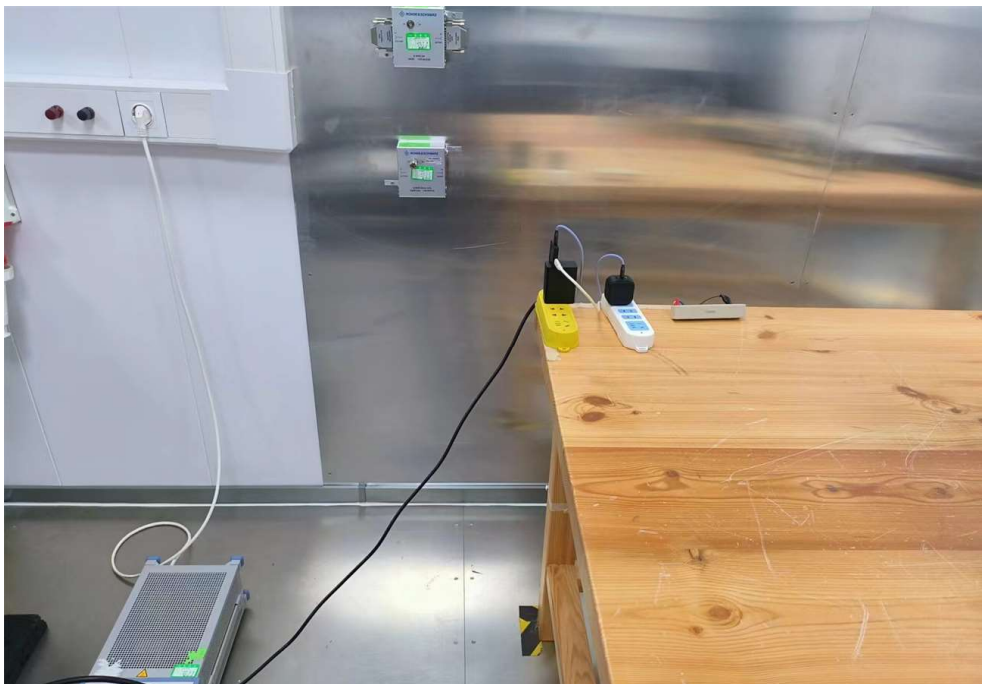
5. Test Setup Photo

5.1. Photo of Radiated Emission Test (In Semi Anechoic Chamber)

30-1000MHz



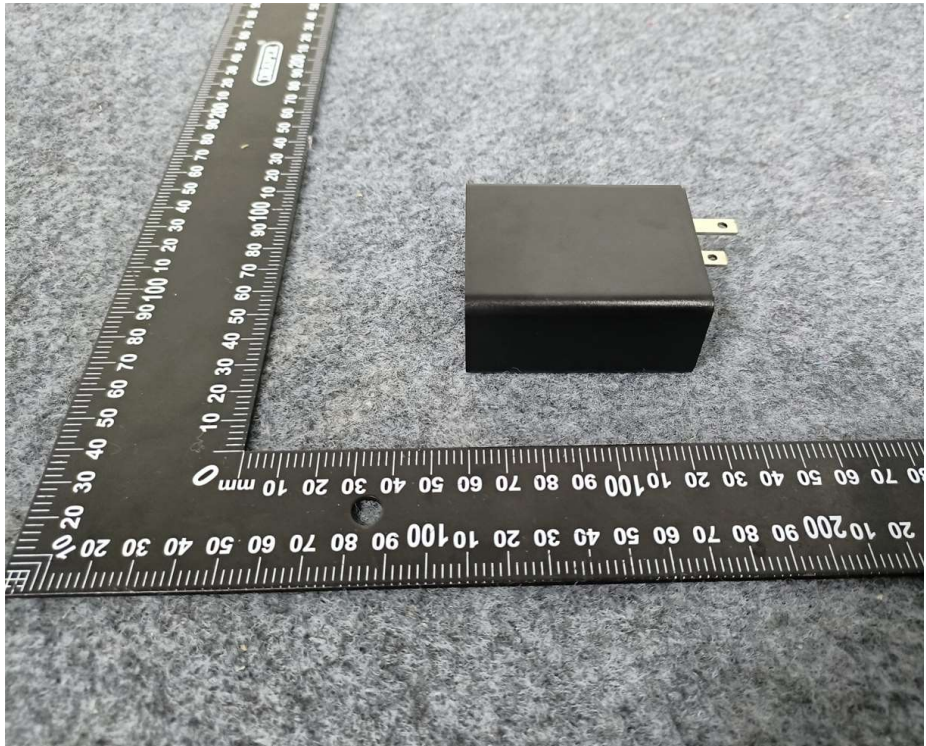
5.2. Photo of Power Line Conducted Emission Test



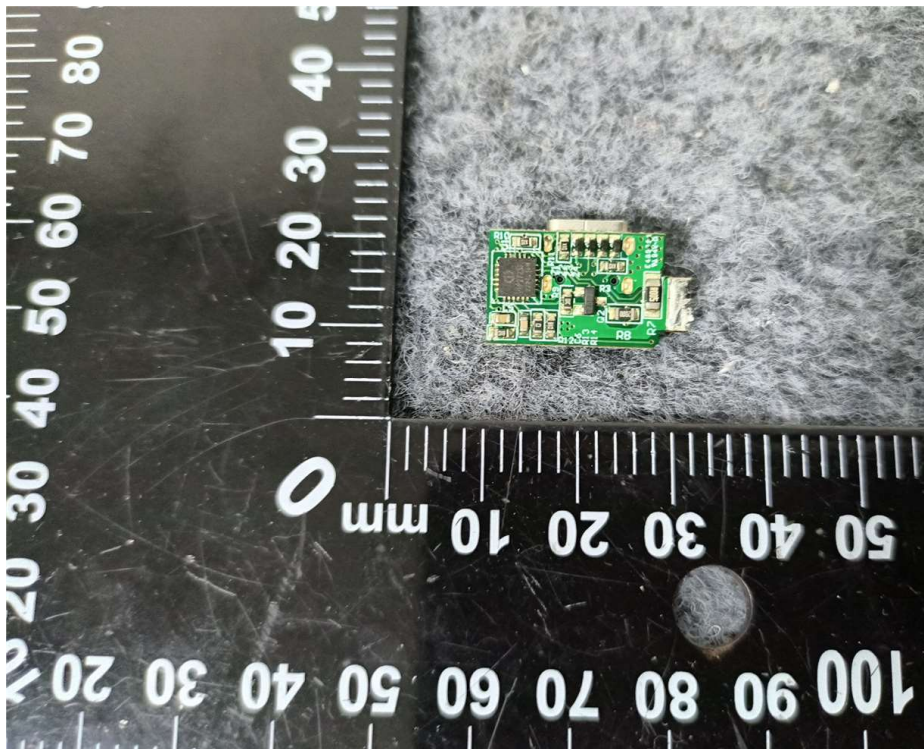
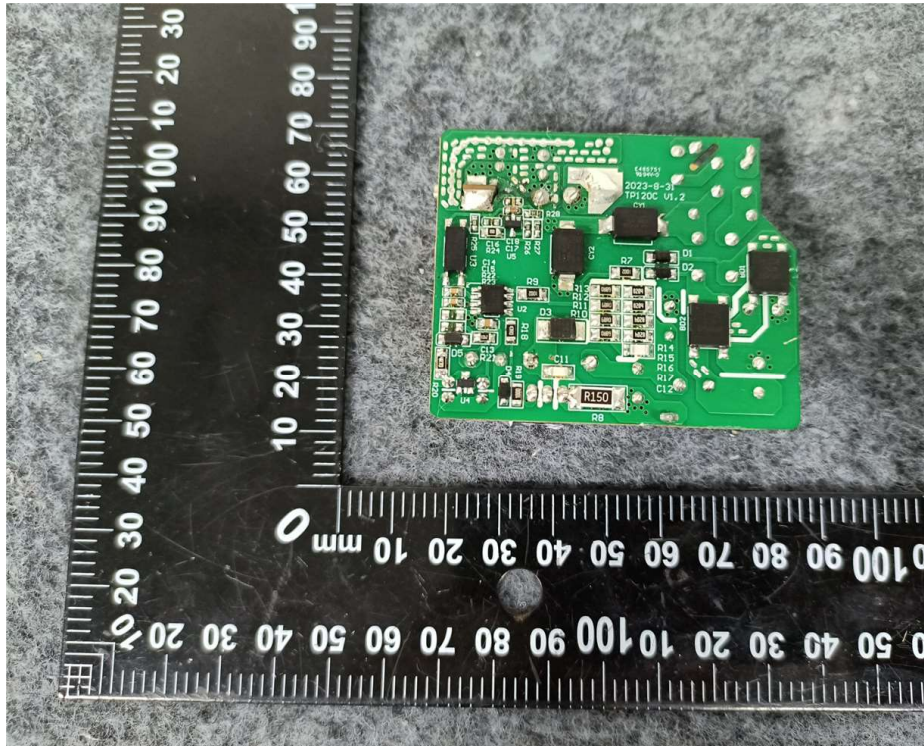
6. Photos Of The EUT

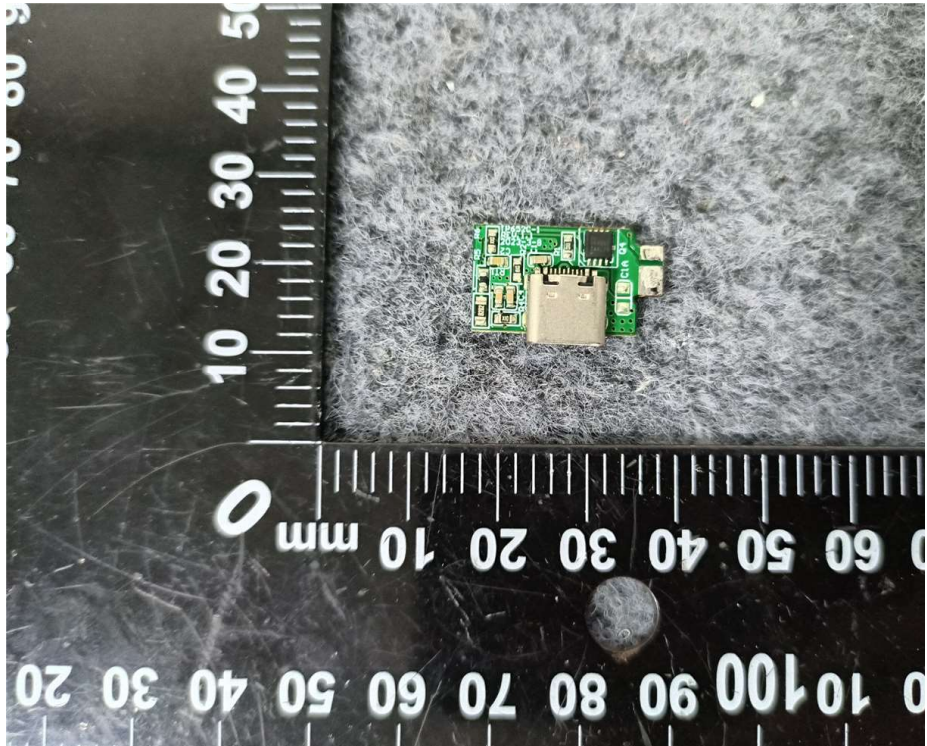












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