Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

TEST REPORT

FCC PART 15 SUBPART C

Report Reference No..... :	**CTL2402261041-WF**	
Compiled by (position+printed name+signature)	Happy Guo (File administrators)	
Supervised by (position+printed name+signature)	Yapeng Jin (Test Engineer)	
Approved by (position+printed name+signature)	Ivan Xie (Manager)	

Test Firm..... :	**Shenzhen CTL Testing Technology Co., Ltd.**
Address..... :	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Applicant's name ..... :	**Yuwei Technology (Dongguan) Co., Ltd.**
Address..... :	Room 301, No.15 Longjing Road, Guanjingtou, Fenggang Town, Dongguan City, Guangdong Province, China
Test specification:	
Standard ..... :	FCC Part 15C
Master TRF..... :	Dated 2011-01
Test item description .....:	Solar Charger
FCC ID..... :	**2AZK8-C18PW**
Trade Mark..... :	N/A
Model/Type reference ..... :	C18PW
Antenna type..... :	Loop Coil Antenna
Date of receipt of test item ..... :	Feb. 27, 2024
Date of Test Date ..... :	Feb. 27, 2024–Mar. 20, 2024
Data of Issue..... :	Mar. 21, 2024
Result..... :	**Pass**

TEST REPORT

Test Report No. :	CTL2402261041-WF	Mar. 21, 2024 Date of issue

Equipment under Test	:	Solar Charger
Type / Model(s)	:	C18PW
Applicant	:	**Yuwei Technology (Dongguan) Co., Ltd.**
Address	:	Room 301, No.15 Longjing Road, Guanjingtou, Fenggang Town, Dongguan City, Guangdong Province, China
Manufacturer	:	**Yuwei Technology (Dongguan) Co., Ltd.**
Address	:	Room 301, No.15 Longjing Road, Guanjingtou, Fenggang Town, Dongguan City, Guangdong Province, China

Test result	Pass *

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

** Modified History **

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2024-03-21	CTL2402261041-WF	Tracy Qi

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.207,15.209, 15.215(c)

ANSI C63.10-2013

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Feb. 27, 2024
Testing commenced on	:	Feb. 27, 2024
Testing concluded on	:	Mar. 20, 2024

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	Input: 5V⎓3A 9V⎓2A Output : 5V⎓3A 9V⎓2.22A 12V⎓1.67A Battery Capacity: 3.85V 10000mAh Wireless Charging: 15W

2.3. Short description of the Equipment under Test (EUT)

A Solar Charger work frequency range 110 KHz–205 KHz.
For more details, refer to the user's manual of the EUT.
Serial number: Prototype

2.4. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting mode for testing.

2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AZK8-C18PW** fileing to comply with FCC Part 15, Subpart C Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9518B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9518B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing 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 399832, December 08, 2017.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	9KHz~30MH	4.10dB	(1)
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

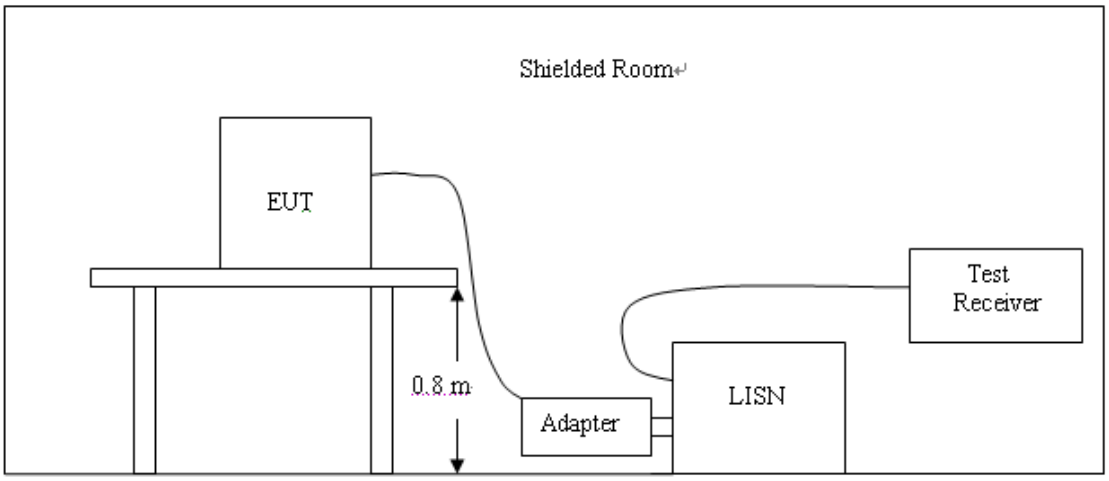
3.5. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ESH2-Z5	860014/010	2023/05/04	2024/05/03
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	2023/02/13	2026/02/12
EMI Test Receiver	R&S	ESCI	1166.5950.03	2023/05/04	2024/05/03
Spectrum Analyzer	Agilent	N9020A	US46220290	2023/05/04	2024/05/03
Spectrum Analyzer	Keysight	N9020A	MY53420874	2023/05/04	2024/05/03
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2021/12/23	2024/12/22
Active Loop Antenna	Da Ze	ZN30900A	/	2021/05/13	2024/05/12
Spectrum Analyzer	RS	FSP	1164.4391.38	2023/05/05	2024/05/04

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC5V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

AC Power Conducted Emission Limit

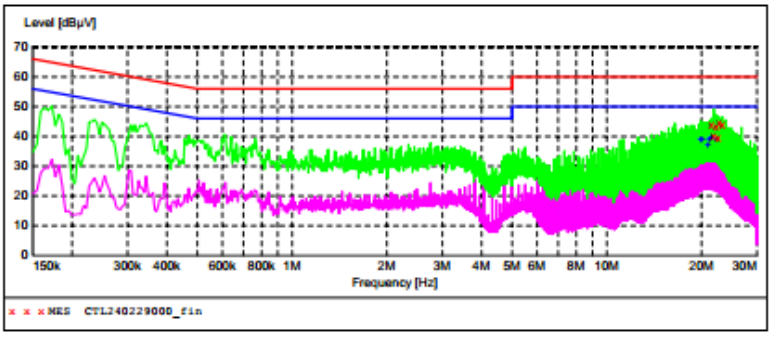
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

TEST RESULTS

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL240229000_fin"

2/29/2024 9:06AM

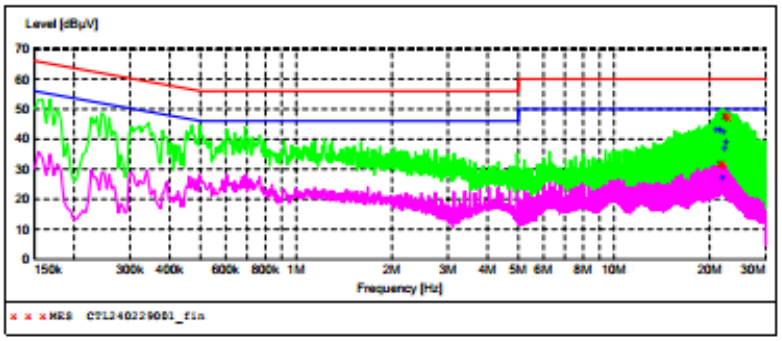
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
21.489000	44.10	11.0	60	15.9	QP	L1	GND
21.885000	40.00	10.9	60	20.0	QP	L1	GND
22.272000	43.10	10.9	60	16.9	QP	L1	GND
22.542000	39.30	10.9	60	20.7	QP	L1	GND
22.798500	44.40	10.8	60	15.6	QP	L1	GND
23.325000	43.80	10.8	60	16.2	QP	L1	GND

MEASUREMENT RESULT: "CTL240229000_fin2"

2/29/2024 9:06AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
19.918500	38.70	11.2	50	11.3	AV	L1	GND
20.179500	39.00	11.1	50	11.0	AV	L1	GND
20.967000	37.20	11.0	50	12.8	AV	L1	GND
21.228000	39.10	11.0	50	10.9	AV	L1	GND
21.489000	39.50	11.0	50	10.5	AV	L1	GND
22.276500	38.90	10.9	50	11.1	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL240229001_fin"

2/29/2024 9:00AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
21.606000	31.80	11.0	60	28.2	QP	N	GND
21.867000	32.00	10.9	60	28.0	QP	N	GND
22.128000	31.40	10.9	60	28.6	QP	N	GND
22.362000	47.70	10.9	60	12.3	QP	N	GND
22.618500	47.60	10.8	60	12.4	QP	N	GND
22.879500	47.30	10.8	60	12.7	QP	N	GND

MEASUREMENT RESULT: "CTL240229001_fin2"

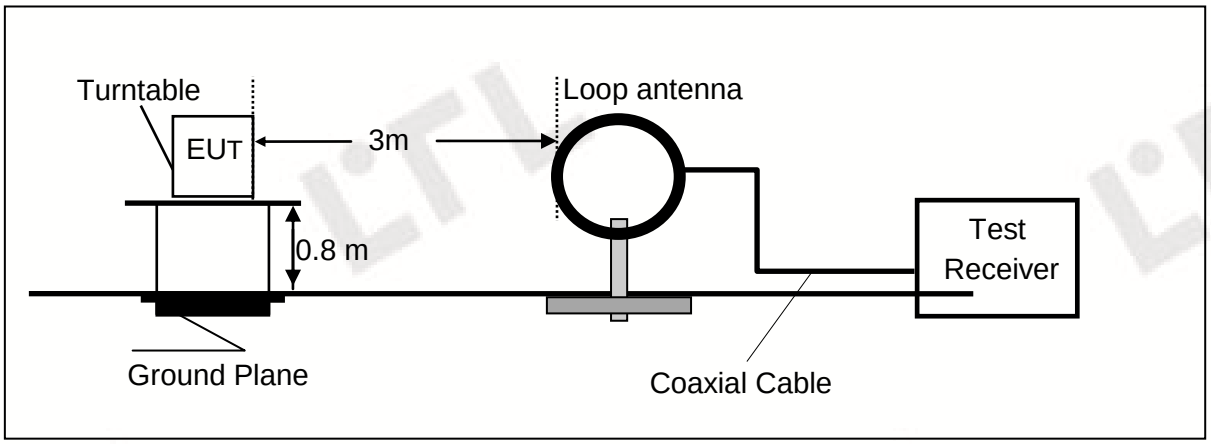
2/29/2024 9:00AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
21.052500	42.80	11.0	50	7.2	AV	N	GND
21.574500	42.90	11.0	50	7.1	AV	N	GND
21.840000	27.10	10.9	50	22.9	AV	N	GND
22.096500	42.10	10.9	50	7.9	AV	N	GND
22.362000	36.50	10.9	50	13.5	AV	N	GND
22.618500	39.20	10.8	50	10.8	AV	N	GND

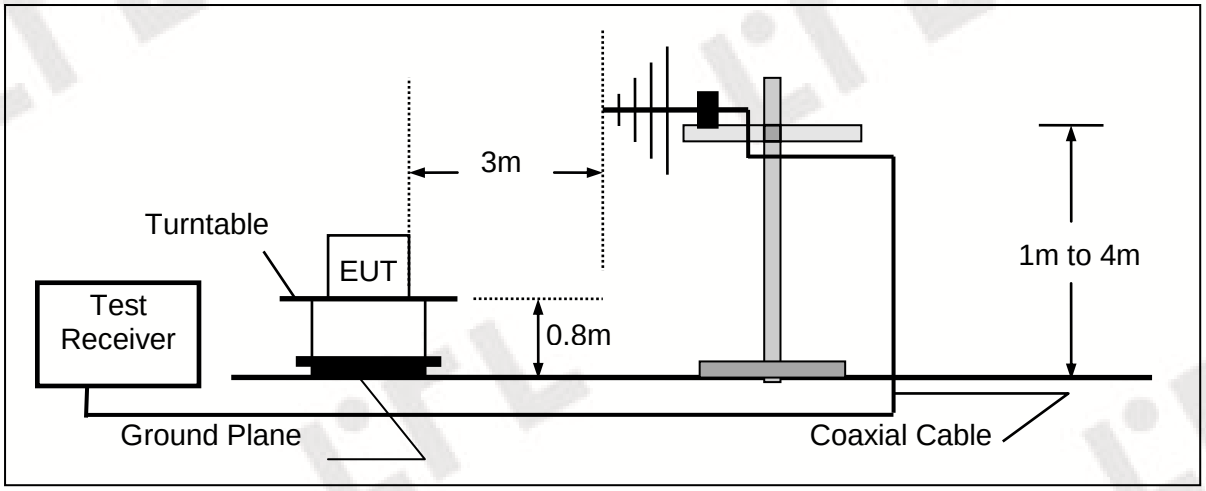
4.2. Radiated Emission

TEST CONFIGURATION

Radiated Emission Test Set-Up
Frequency range 9KHz – 30MHz



Frequency range 30MHz – 1000MHz



TEST PROCEDURE

1 The EUT was placed on a turn table which is 0.8m above ground plane.
2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4 Repeat above procedures until all frequency measurements have been completed.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL – AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

RADIATION LIMIT

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

9k~30MHz:

Frequency Range (MHz)	E-field Strength Limit @ 30m (mV/m)	E-field Strength Limit @ 3m (dBμV/m)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70
Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula: $\text{Extrapolation(dB)} = 40\log_{10}(\text{Measurement Distance}/\text{Specification Distance})$		

Note:
(1) The tighter limit shall apply at the edge between two frequency bands.
(2) dBuV/m = 20*log(uV/m)

30M~1GHz:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

Note:
(1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

TEST RESULTS

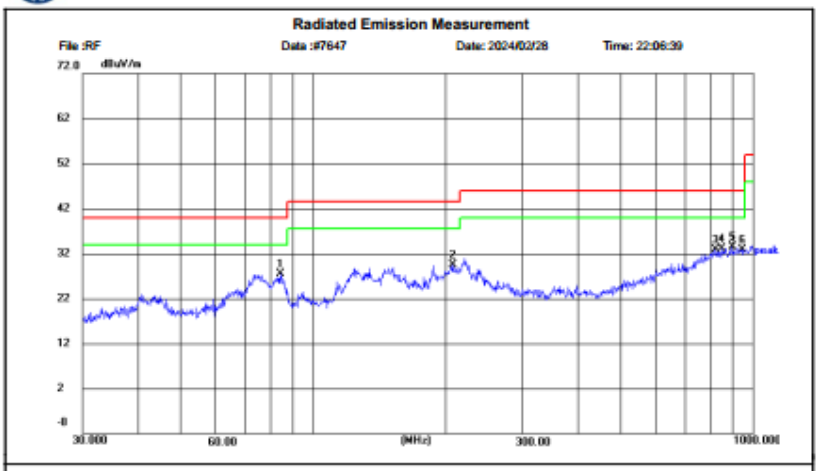
WORST-CASE RADIATED EMISSION BELOW 30 MHz

Frequency	Reading	Polar	Antenna Factor	Cable Loss	Emission Levels	Limits at 3m	Detector Mode
(MHz)	(dBμV/m)	Loop	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	
0.113(F)	60.21	Loop	23.64	0.01	83.86	105.33	PK
0.113(F)	51.79	Loop	23.64	0.01	75.44	85.33	AV
0.167	47.88	Loop	23.55	0.01	71.44	106.78	PK
0.167	38.21	Loop	23.55	0.01	61.77	83.18	AV
1.127	36.25	Loop	24.07	-0.17	60.15	66.57	QP
1.589	33.01	Loop	27.12	-0.25	59.88	63.58	QP
13.452	41.77	Loop	26.90	-0.24	68.43	70.00	QP

Remark: 1. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
2. The test limit distance is 3m limit.
3. PK means Peak Value, QP means Quasi Peak Value, AV means Average Value.
4. F means Fundamental Frequency.

Radiated Emission Test Data 30-1000MHz:

Shenzhen CTL Testing Technology Co., Ltd
Tel: +86-755-89486194



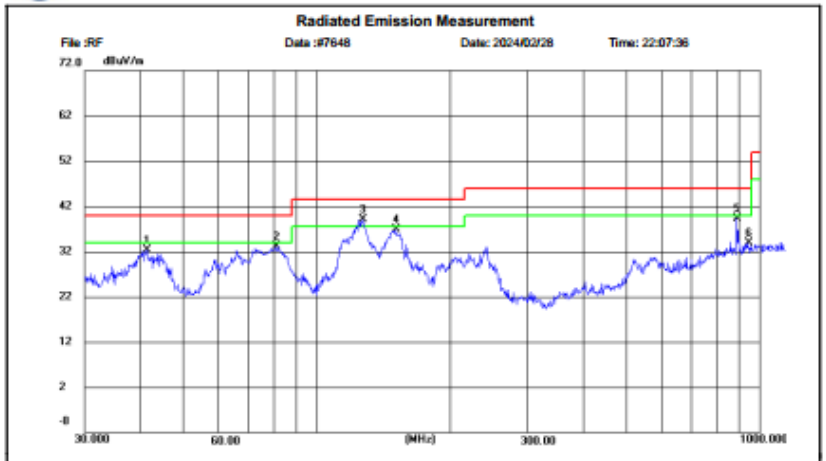
Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_30-1000MHz
EUT: /
M/N: C18PW
Mode: 147.78KHz
Note: Yuwei Technology (Dongguan) Co., Ltd.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	84.4054	17.39	10.11	27.50	40.00	12.50	peak	100	355	P	
2	207.8501	17.84	11.65	29.49	43.50	14.01	peak	100	326	P	
3	818.8340	6.90	25.97	32.87	46.00	13.13	peak	100	30	P	
4	851.0353	6.81	26.25	33.06	46.00	12.94	peak	100	221	P	
5	896.9965	6.96	26.49	33.45	46.00	12.55	peak	100	135	P	
6	945.4400	5.79	27.10	32.89	46.00	13.11	peak	100	259	P	

Shenzhen CTL Testing Technology Co., Ltd
Tel: +86-755-89486194



Site LAB Chamber 2
Limit: FCC Part15 RE-Class C_30-1000MHz
EUT: /
M/N: C18PW
Mode: 147.78KHz
Note: Yuwei Technology (Dongguan) Co., Ltd.

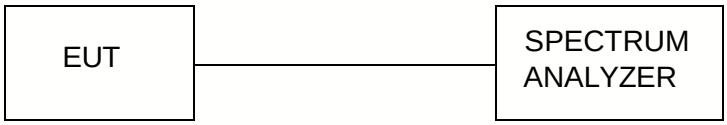
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

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	41.4215	18.04	14.28	32.32	40.00	7.68	peak	100	129	P	
2	80.9275	23.01	10.11	33.12	40.00	6.88	peak	100	273	P	
3	127.6645	25.75	13.36	39.11	43.50	4.39	peak	100	350	P	
4	151.0666	23.25	13.69	36.94	43.50	6.56	peak	100	301	P	
5	887.6099	13.03	26.20	39.23	46.00	6.77	peak	100	81	P	
6	942.1305	6.76	27.10	33.86	46.00	12.14	peak	100	225	P	

4.3. 20dB Bandwidth/99% Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

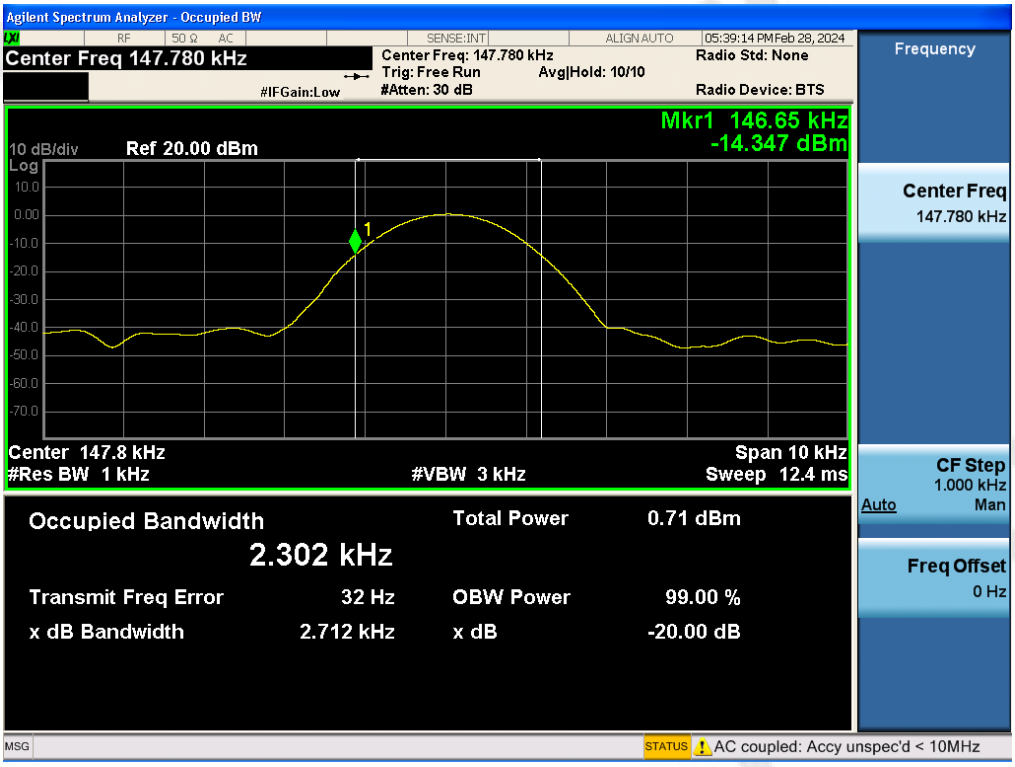
The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1KHz RBW and 3KHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

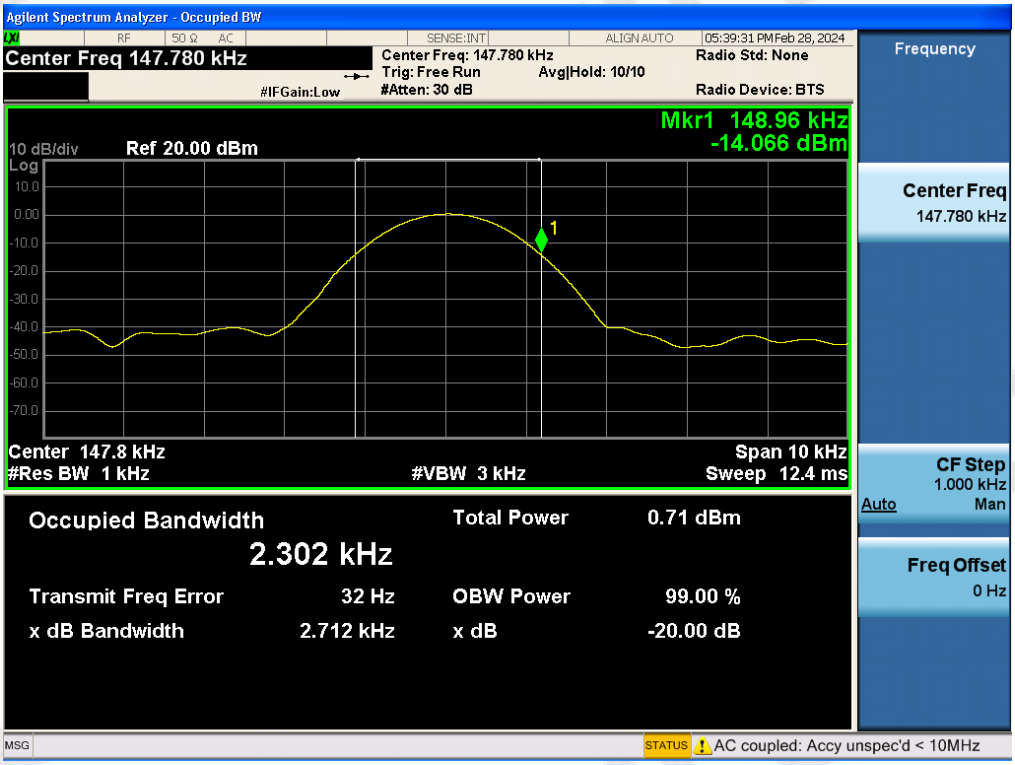
LIMIT

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

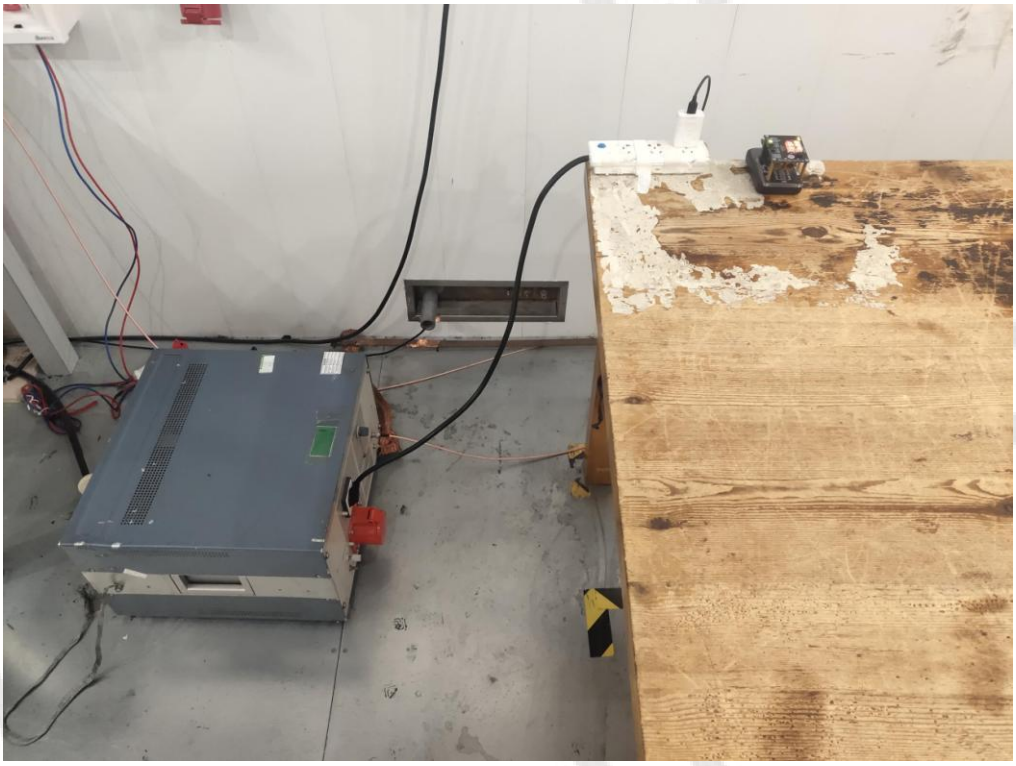
TEST RESULTS

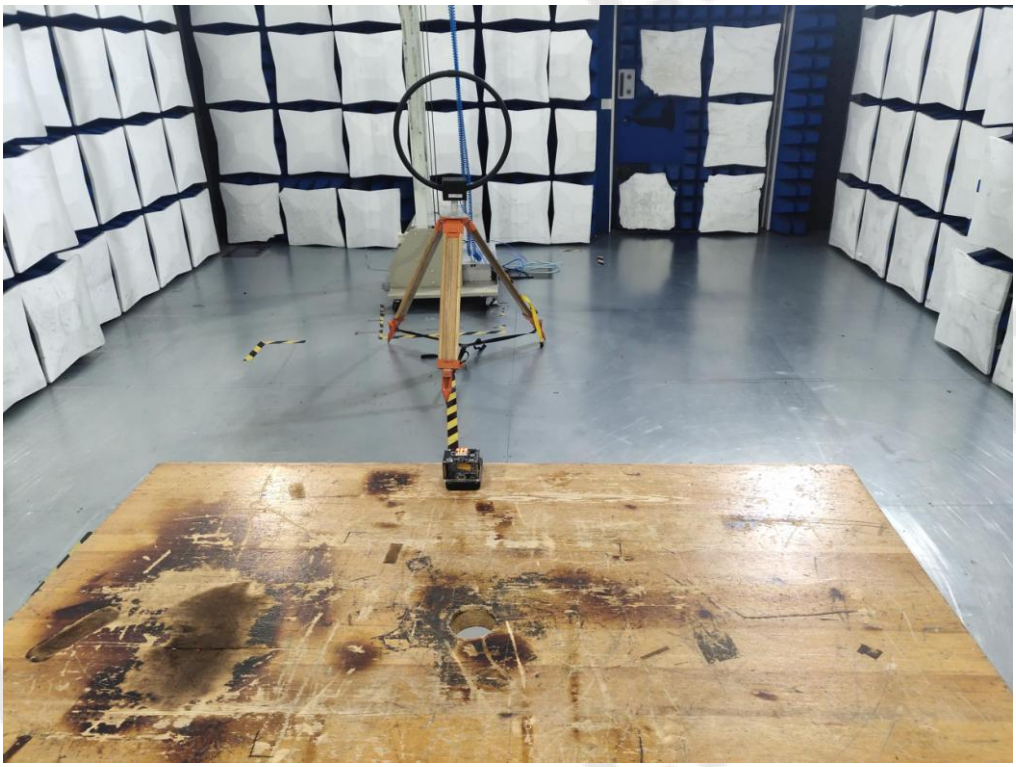
147.78KHz

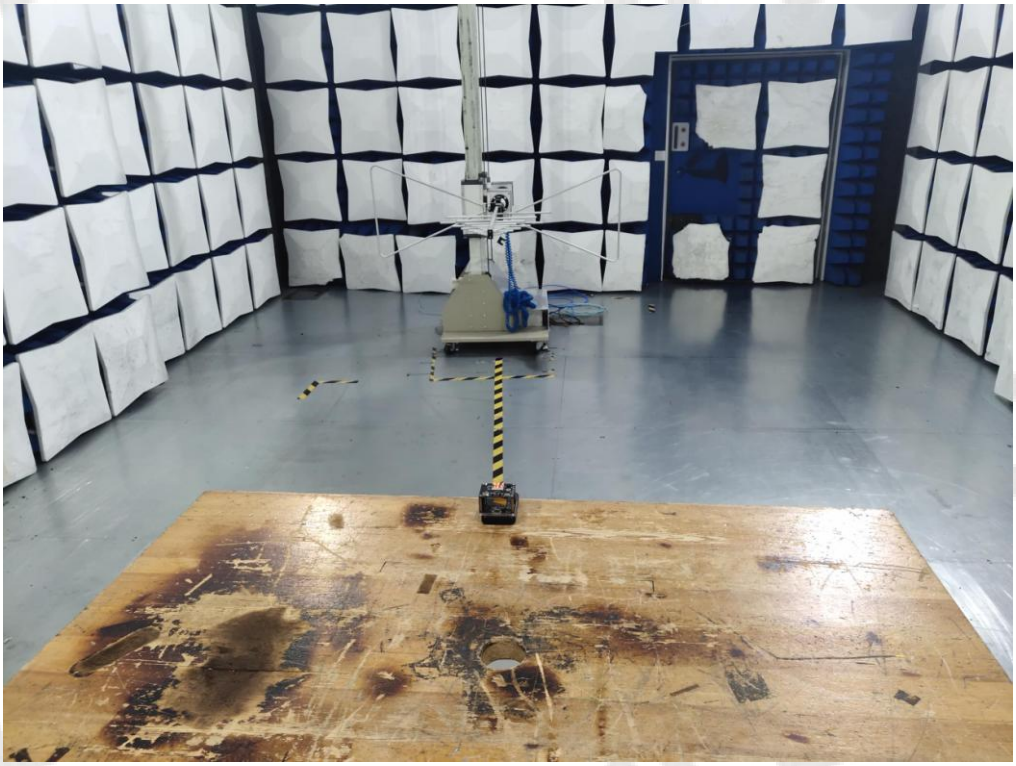



Agilent Spectrum Analyzer - Occupied BW
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
05:39:31 PM Feb 28, 2024
Center Freq 147.780 kHz
Center Freq: 147.780 kHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Mkr1 148.96 kHz
-14.066 dBm
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center Freq
147.780 kHz
Center 147.8 kHz
#Res BW 1 kHz
#VBW 3 kHz
Span 10 kHz
Sweep 12.4 ms
CF Step
1.000 kHz
Auto
Man
Occupied Bandwidth
2.302 kHz
Total Power
0.71 dBm
Transmit Freq Error
32 Hz
OBW Power
99.00 %
x dB Bandwidth
2.712 kHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS
AC coupled: Accy unspec'd < 10MHz

5. Test Setup Photos of the EUT

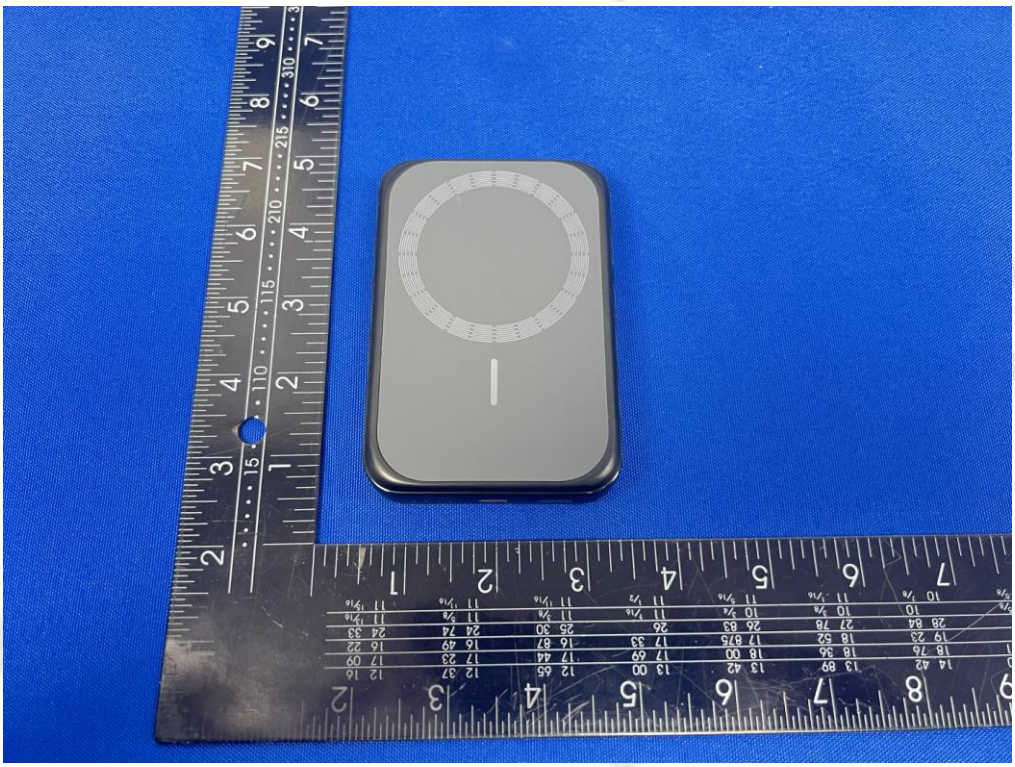


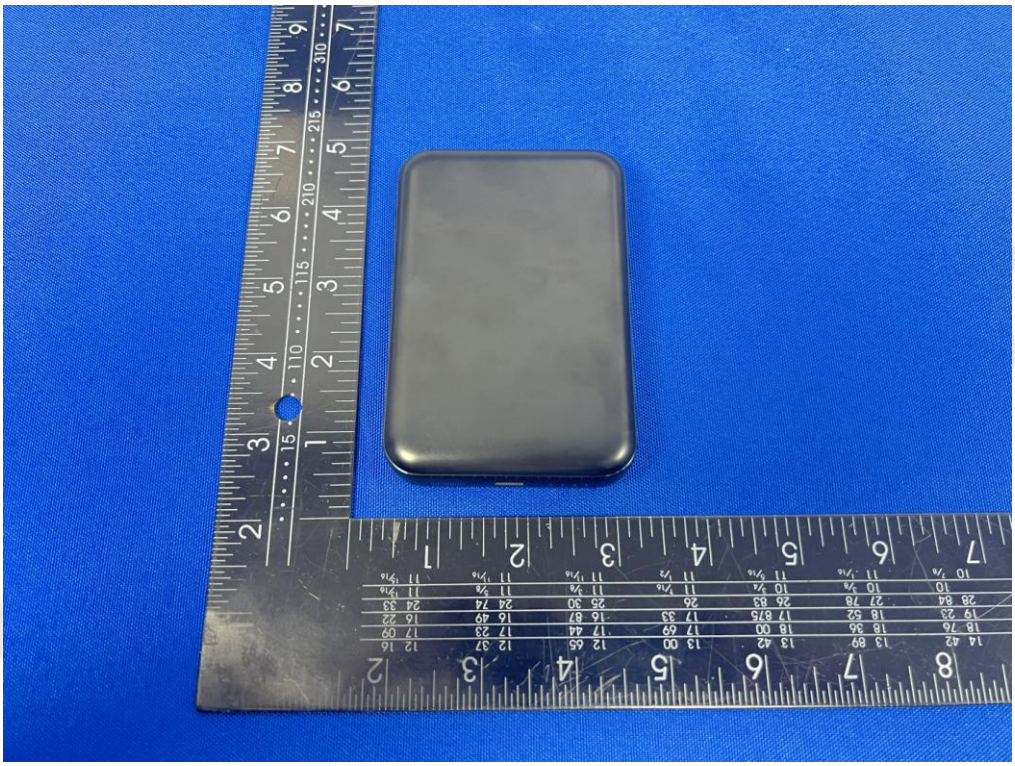


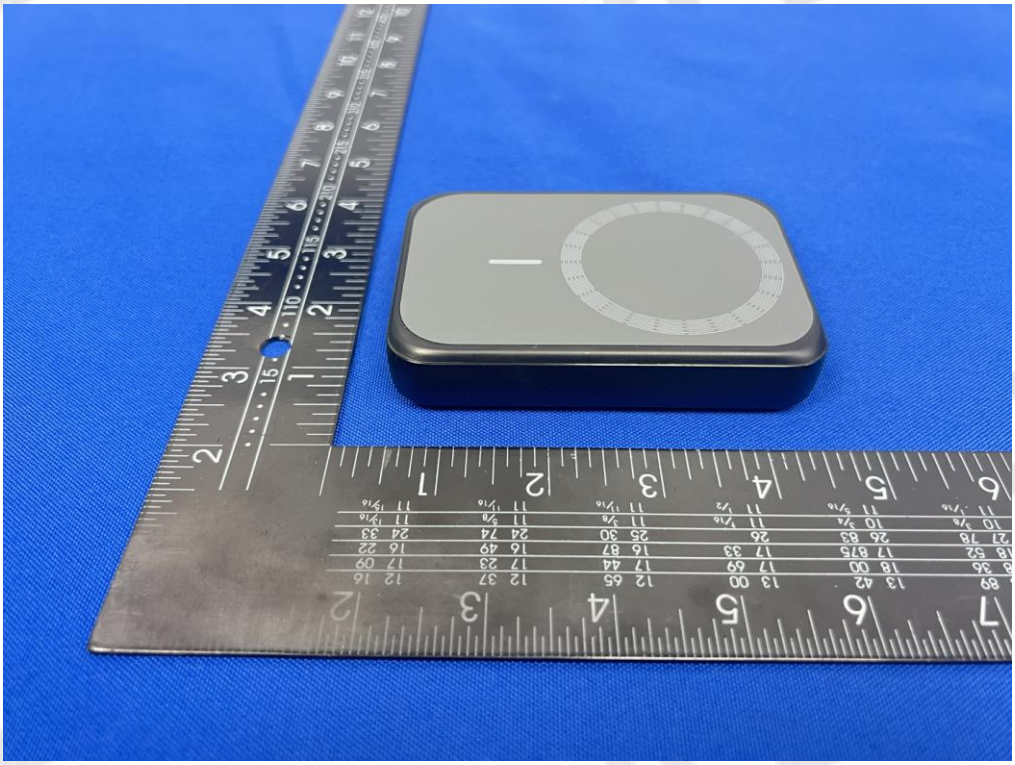


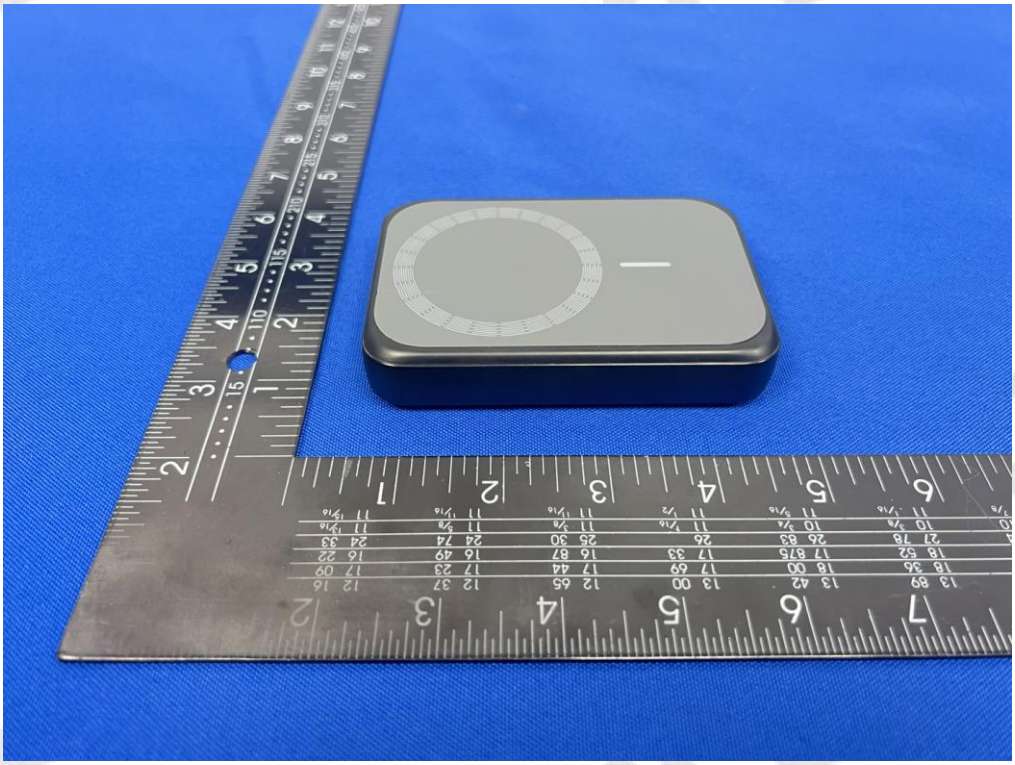
6. External and Internal Photos of the EUT

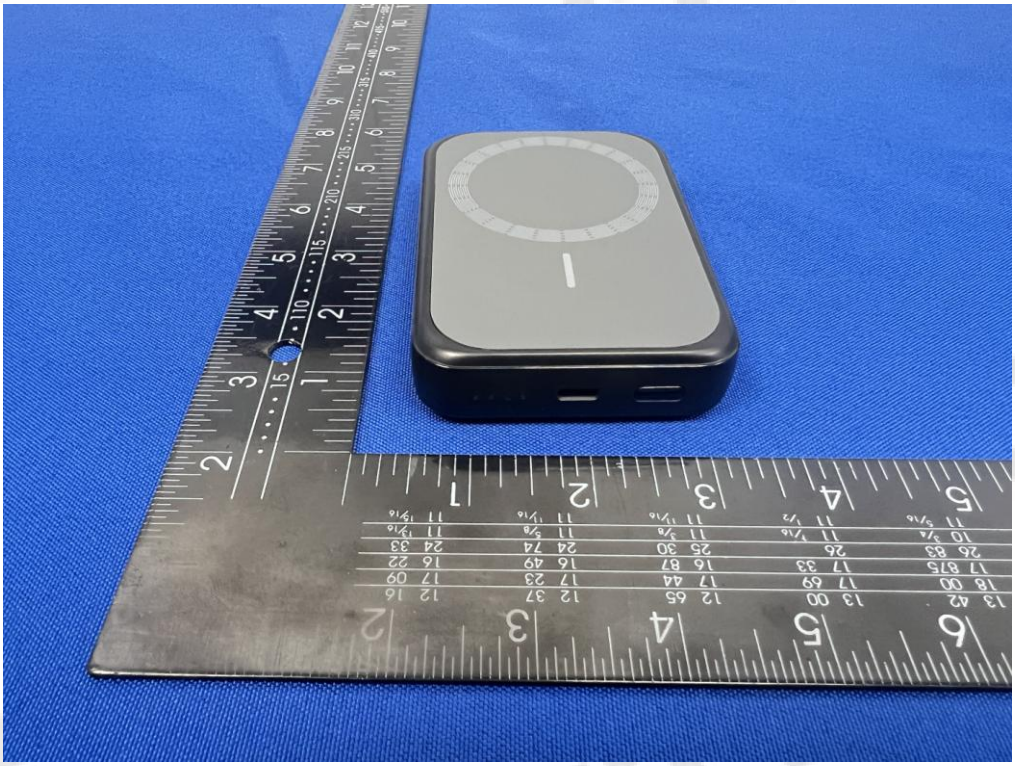
External Photos of EUT



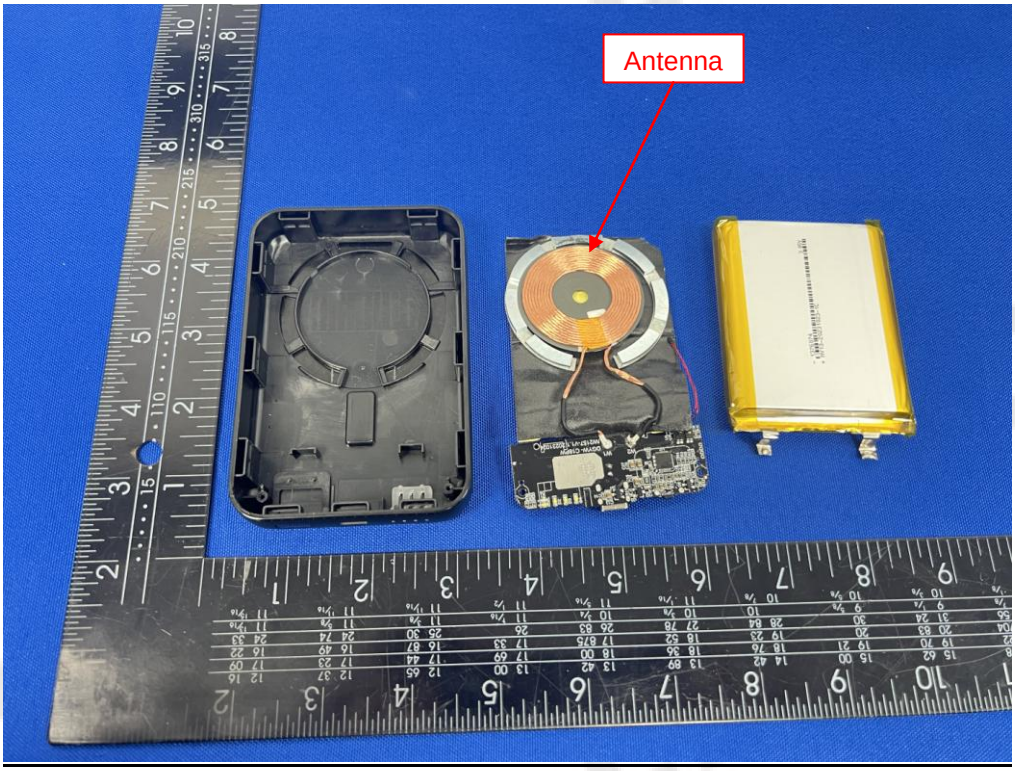


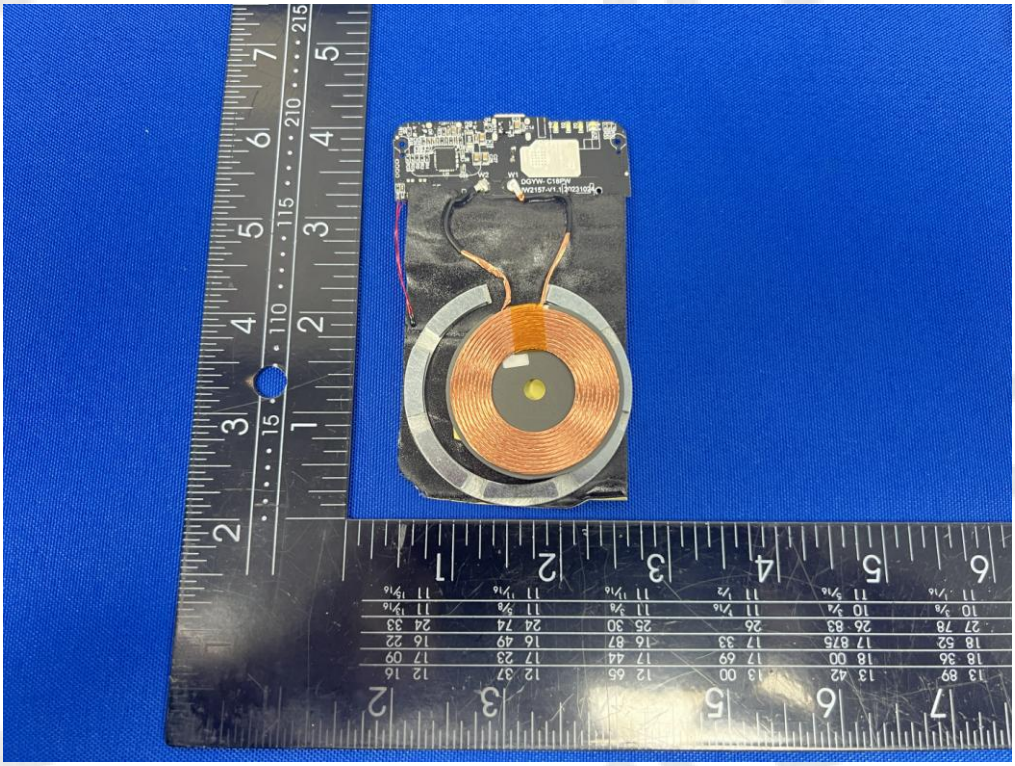


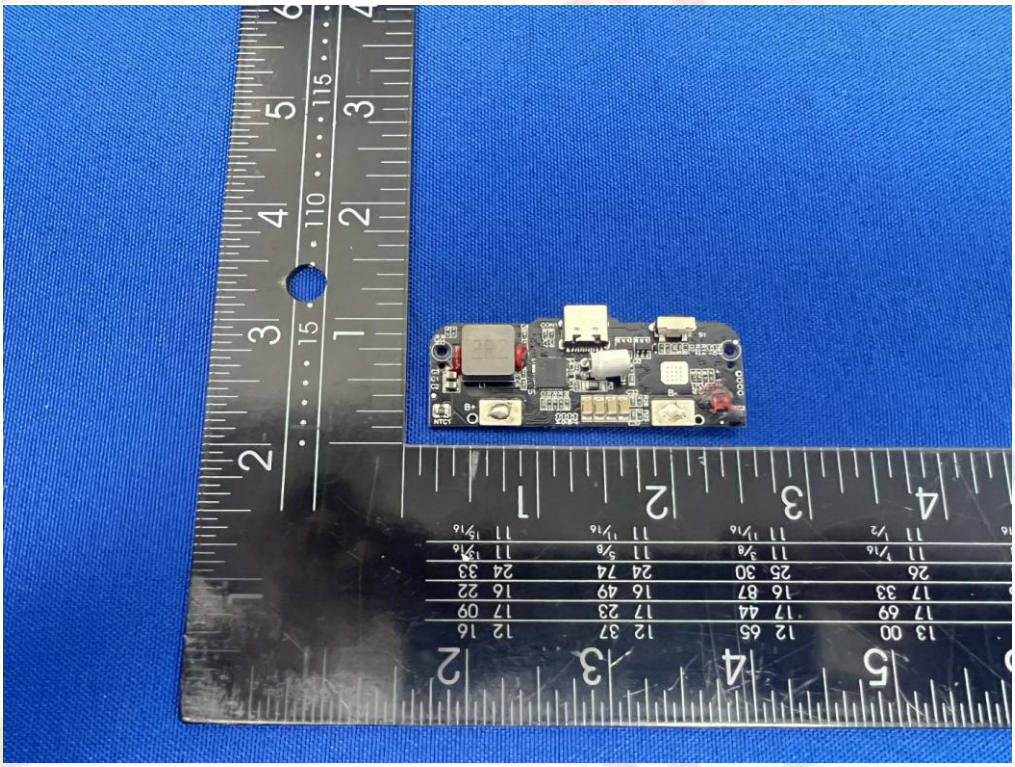


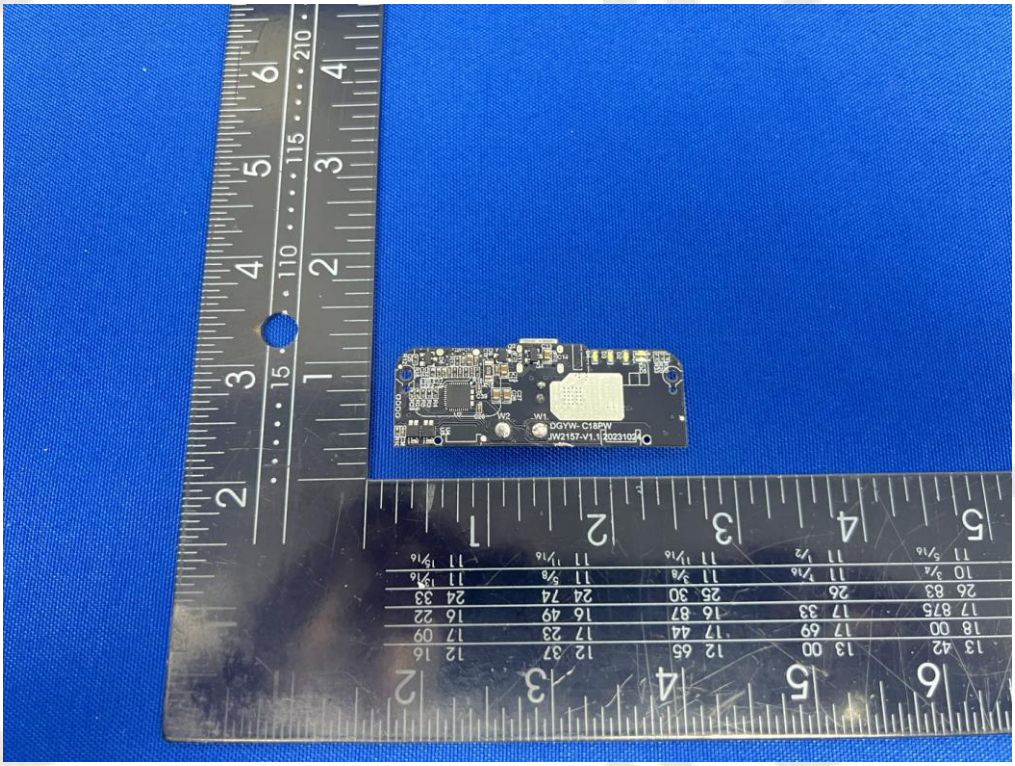


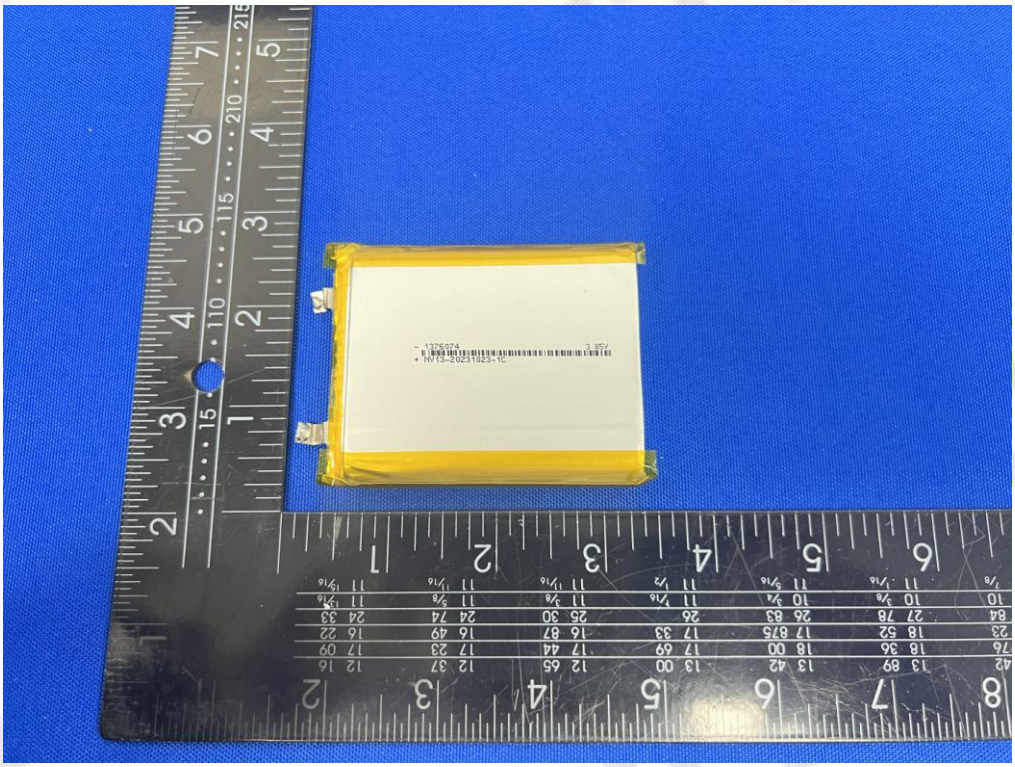
Internal Photos of EUT











.....End of Report.....