TECHNICAL REPORT

Report No.:	TW2112369E
File Reference No.:	2021-12-31
Applicant:	Ningbo Allstar O&E Technology Co.,Ltd.
Product:	Wireless Power Bank
Model No.:	AST-WR167
Trademark:	N/A
Test Standards:	FCC Part 15 Subpart C
Test Result:	It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, for the evaluation of electromagnetic compatibility

Approved By:

Jack Chung

Manager

Dated: December 31, 2021

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 744189

The 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.: 744189.

Industry Canada (IC) —Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.
Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China
Telephone: +86 755 83448688
Fax: +86 755 83442996
Site on File with the Federal Communications Commission – United Sates
Registration Number: 744189
For 3m Anechoic Chamber

1.2 Applicant Details

Applicant: Ningbo Allstar O&E Technology Co.,Ltd.
Address: No. 19 Huijin Road, Huijin Road, Luotuo Street, Zhenhai, Ningbo, China
Telephone: 0574-86307000
Fax: 0574-86307001

1.3 Description of EUT

Product: Wireless Power Bank
Manufacturer: Ningbo Allstar O&E Technology Co.,Ltd.
Address: No. 19 Huijin Road, Huijin Road, Luotuo Street, Zhenhai, Ningbo, China
Trademark: N/A
Model Number: AST-WR167
Additional Model Name N/A
Additional Trade Name N/A
Rating: Micro USB input: DC5V, 2A
Type C input: DC5V, 2A
USB A Output: DC5V, 2A
Wireless output: 5W
Battery: DC3.7V, 4000mAh, 14.8Wh Li-ion battery
Hardware Version: AST-WR167
Software Version: 9610/WD-0062
Serial No.: AST-WR167-211227
Operation Frequency: See below table

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)

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01	0.1115	06	0.140	11	0.165	16	0.190
02	0.120	07	0.145	12	0.170	17	0.195
03	0.125	08	0.150	13	0.175	18	0.200
04	0.130	09	0.155	14	0.180	19	0.205
05	0.135	10	0.160	15	0.185		

Test channel	Frequency (MHz)
CH13	0.175 MHz

Modulation Type: MSK
Antenna Designation Inductive Loop Antenna with gain 0dBi Max (Declared by the applicant)

1.4 Submitted Sample
1 Samples

1.5 Test Duration
2021-12-28 to 2021-12-31

1.6 Test Uncertainty
Conducted Emissions Uncertainty =3.6dB
Radiated Emissions below 9kHz-30MHz Uncertainty =4.3dB
Radiated Emissions below 30MHz-1GHz Uncertainty =4.7dB
Radiated Emissions above 1GHz Uncertainty =6.0dB
Conducted Power Uncertainty =6.0dB
Occupied Channel Bandwidth Uncertainty =5%

1.7 Test Engineer
The sample tested by
Print Name: Terry Tang

Note: AC power in mode and battery power mode all have been tested, only worse case is reported

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2021-06-18	2022-06-17
LISN	R&S	EZH3-Z5	100294	2021-06-18	2022-06-17
LISN	R&S	EZH3-Z5	100253	2021-06-18	2022-06-17
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2021-06-18	2022-06-17
Loop Antenna	EMCO	6507	00078608	2021-06-18	2024-06-17
Spectrum	R&S	FSIQ26	100292	2021-06-18	2022-06-17
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2021-06-18	2022-06-17
Horn Antenna	R&S	BBHA 9120D	9120D-631	2021-07-02	2024-07-01
Power meter	Anritsu	ML2487A	6K00003613	2021-06-18	2022-06-17
Power sensor	Anritsu	MA2491A	32263	2021-06-18	2022-06-17
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2021-07-02	2024-07-01
9*6*6 Anechoic	--	--	N/A	2021-07-02	2022-07-01
EMI Test Receiver	RS	ESVB	826156/011	2021-06-18	2022-06-17
EMI Test Receiver	RS	ESH3	860904/006	2021-06-18	2022-06-17
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2021-06-18	2022-06-17
Spectrum	HP/Agilent	E4407B	MY50441392	2021-06-18	2022-06-17
Spectrum	RS	FSP	1164.4391.38	2021-01-16	2022-01-15
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/FA	--	2021-06-18	2022-06-17
RF Cable	Zhengdi	7m	--	2021-06-18	2022-06-17
RF Switch	EM	EMSW18	060391	2021-06-18	2022-06-17
Pre-Amplifier	Schwarebeck	BBV9743	#218	2021-06-18	2022-06-17
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2021-06-18	2022-06-17
LISN	SCHAFFNER	NNB42	00012	2021-01-06	2022-01-05

2.2 Automation Test Software

For Conducted Emission Test

Name	Version
EZ-EMC	Ver.EMC-CON 3A1.1

For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

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3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.203	Antenna requirements	**Pass**	Compliant
FCC Part 15, Paragraph 15.207	Conducted Emission Test	**Pass**	Compliant
FCC Part 15, Paragraph 15.209 (a) (f)	General Requirement	**Pass**	Compliant
FCC Part 15, Paragraph 15.215	20dB Bandwidth Testing	**Pass**	Compliant

3.2 Test Standards

FCC Part 15 Subpart C , ANSI C63.4 :2014 and ANSI C63.10 :2013

4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

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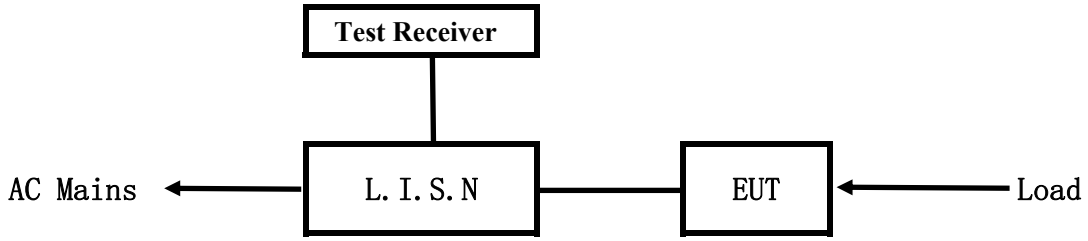
5. Power Line Conducted Emission Test

5.1 Schematics of the test



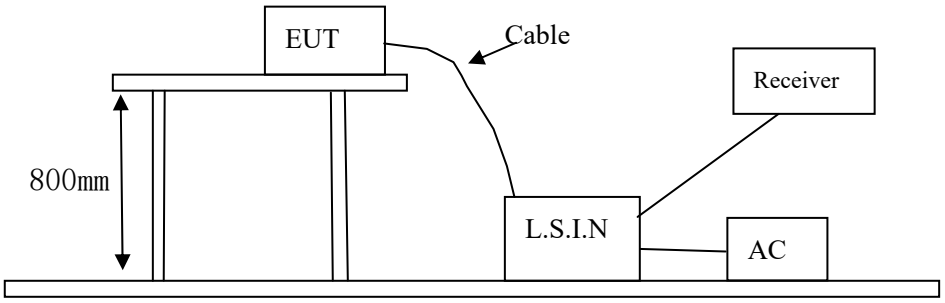
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10 –2013.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC ID
Wireless Power Bank	Ningbo Allstar O&E Technology Co.,Ltd.	AST-WR167	2AQJK-AST-WR167

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

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C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	MEIZU	UP0830S	Input: 100-240V~, 50-60Hz, 0.7A; Output: DC5V/3A, DC8V/3A or 12V/2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2013.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

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

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz. (The average detector is necessary when the Quasi-peak emission level beyond the average Limit.)

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A: Conducted Emission on Live Terminal (150kHz to 30MHz)

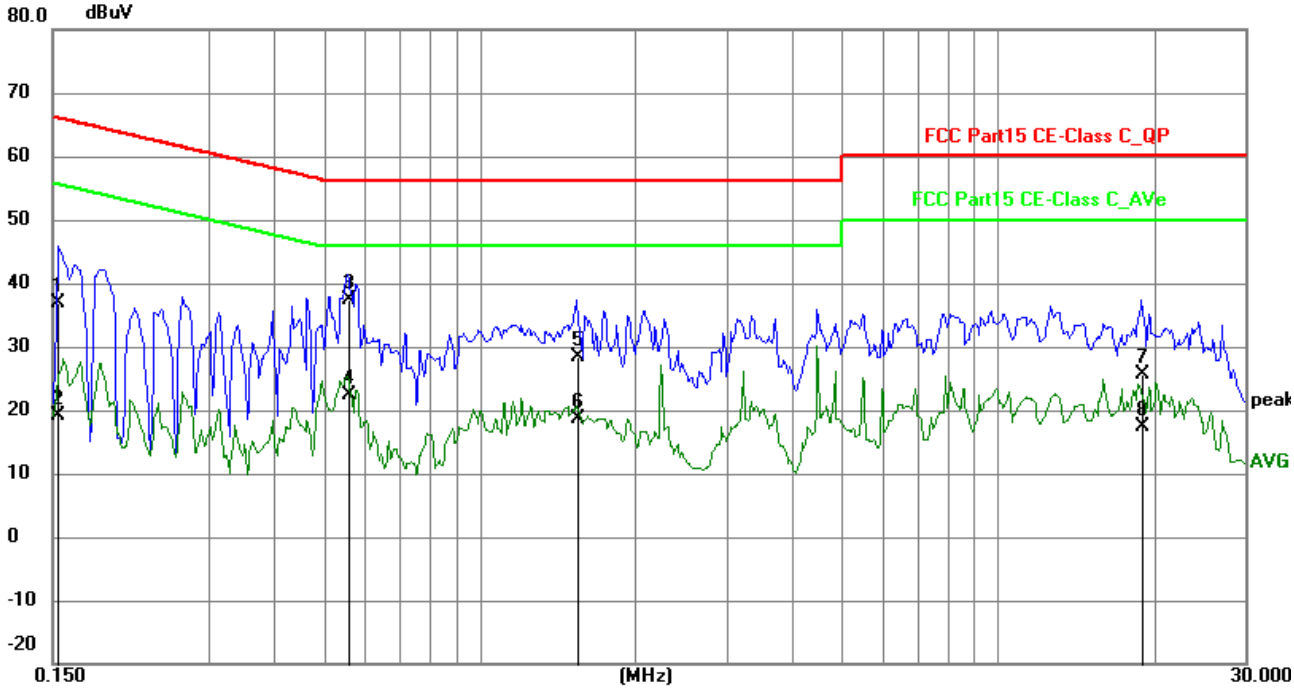
EUT Operating Environment

Temperature: 25℃ Humidity:75%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Keep Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1539	27.10	9.78	36.88	65.79	-28.91	QP	P
2	0.1539	9.39	9.78	19.17	55.79	-36.62	AVG	P
3	0.5556	27.57	9.77	37.34	56.00	-18.66	QP	P
4	0.5556	12.64	9.77	22.41	46.00	-23.59	AVG	P
5	1.5423	18.68	9.80	28.48	56.00	-27.52	QP	P
6	1.5423	8.83	9.80	18.63	46.00	-27.37	AVG	P
7	18.9315	14.90	10.62	25.52	60.00	-34.48	QP	P
8	18.9315	6.83	10.62	17.45	50.00	-32.55	AVG	P

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

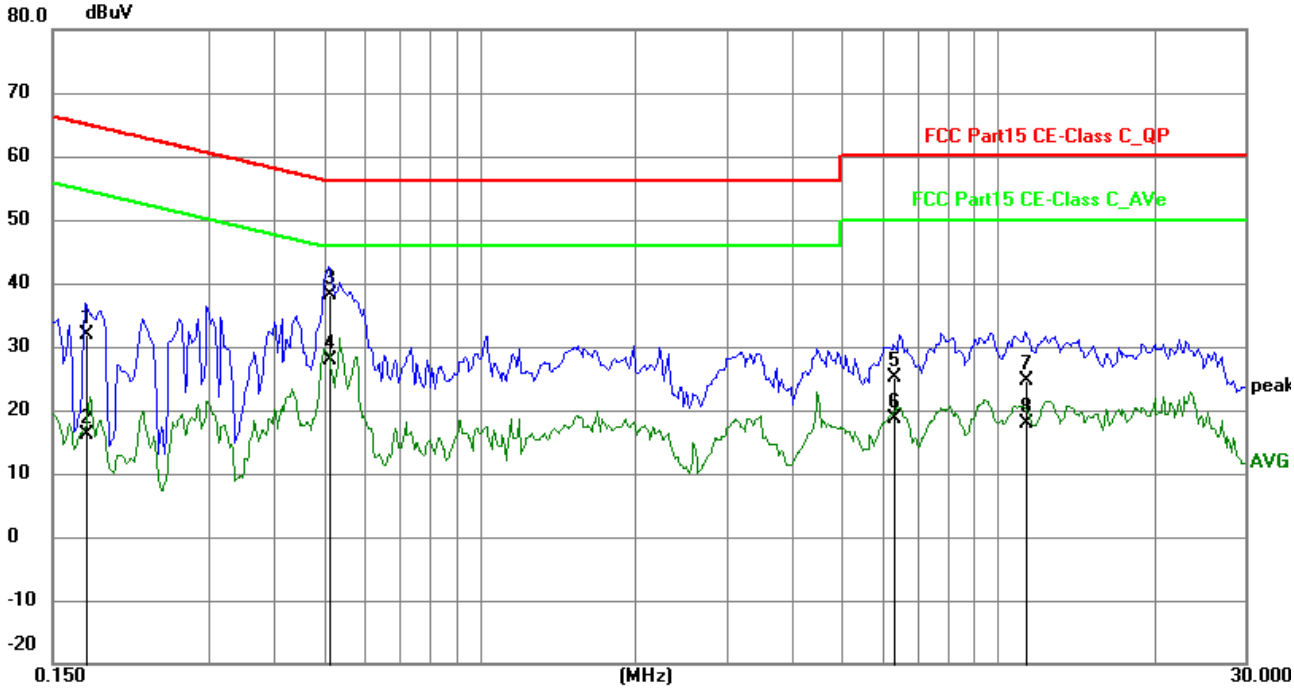
EUT Operating Environment

Temperature: 25℃ Humidity:75%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Keep Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1734	22.20	9.77	31.97	64.80	-32.83	QP	P
2	0.1734	6.37	9.77	16.14	54.80	-38.66	AVG	P
3	0.5127	28.24	9.77	38.01	56.00	-17.99	QP	P
4	0.5127	18.13	9.77	27.90	46.00	-18.10	AVG	P
5	6.2916	15.04	9.98	25.02	60.00	-34.98	QP	P
6	6.2916	8.54	9.98	18.52	50.00	-31.48	AVG	P
7	11.2758	14.39	10.22	24.61	60.00	-35.39	QP	P
8	11.2758	7.76	10.22	17.98	50.00	-32.02	AVG	P

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6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at TIMEWAY EMC Laboratory. This site is on file with the FCC laboratory division, Registration No.744189

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.

(3) The frequency spectrum from 9 kHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with RBW=120 kHz/VBW=300 kHz; All readings from 9 kHz to 30 MHz are quasi-peak values with RBW=10 kHz/VBW=30 kHz. For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission test in these three bands are based on measurements employing an average detector. Measurements were made at 3 meters.

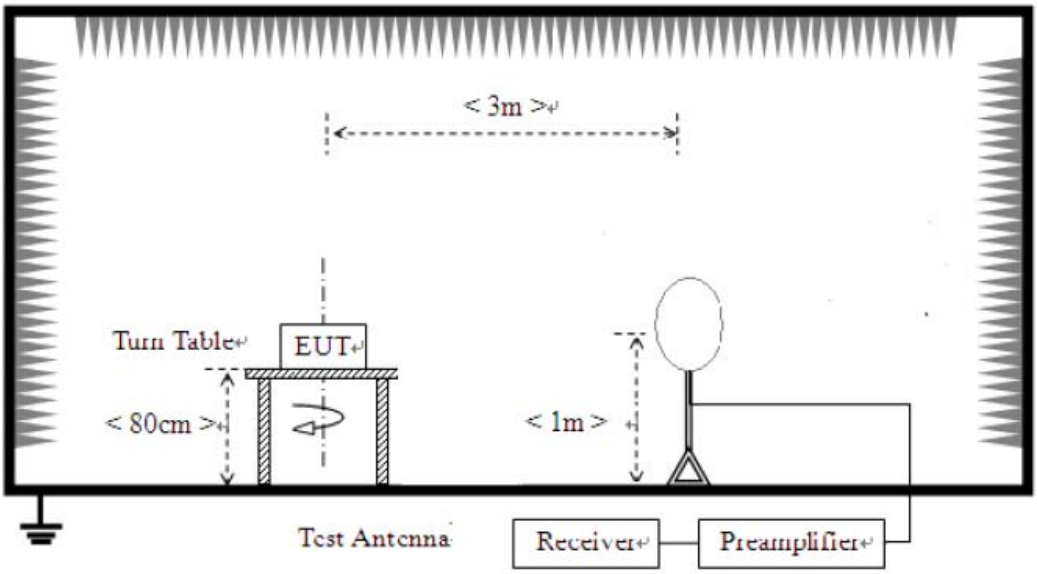
(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.

(6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

9kHz-30MHz



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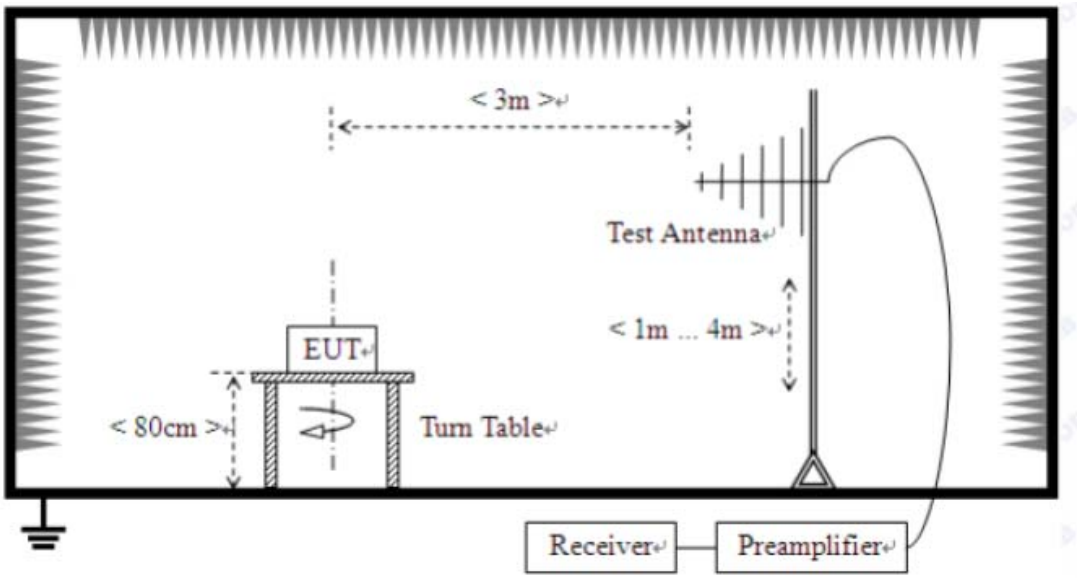
30MHz-1000MHz



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

B. Frequencies in restricted band are compiled to limit on Paragraph 15.209.

Limits for frequency below 30MHz

Frequency Range (MHz)	Distance (m)	Field strength (V/m)
0.009-0.490	300	2400/F(kHz)
0.490-1.705	30	24000/F(kHz)
1.705-30	30	30

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Limits for frequency above 30MHz

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6.5 Test result

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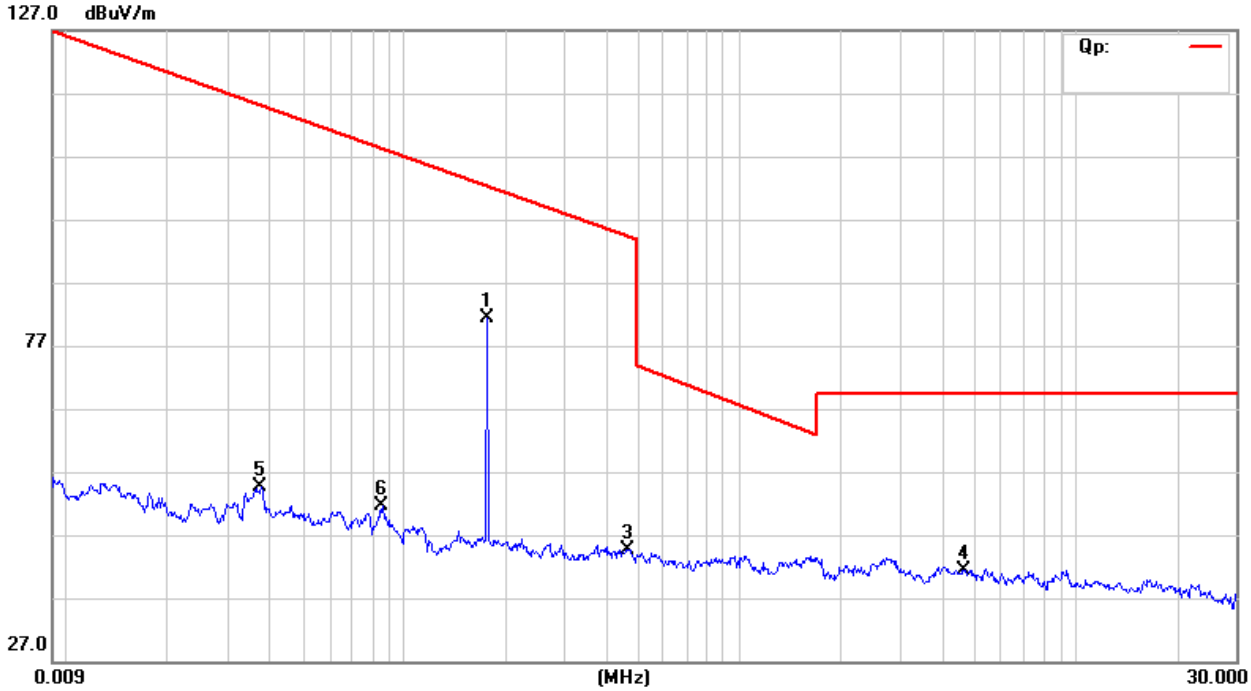
Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

9 kHz~30 MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.1750	71.58	9.77	81.35	102.7	-21.39	peak	
2		0.1750	66.96	9.77	76.73	102.7	-26.01	AVG	
3		0.4641	34.94	9.77	44.71	94.27	-49.56	peak	
4		4.6287	31.48	9.91	41.39	69.53	-28.14	peak	
5		0.0374	44.53	10.04	54.57	116.1	-61.58	peak	
6		0.0858	41.72	9.79	51.51	108.9	-57.42	peak	

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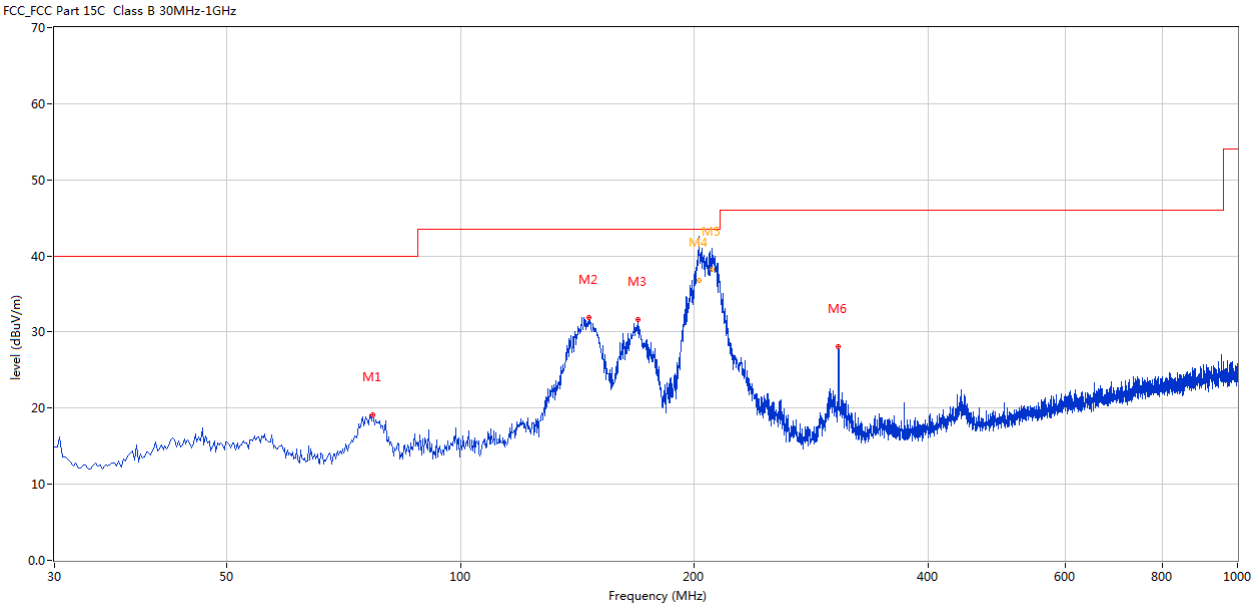
A. General Radiated Emission Data

Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	77.033	19.15	-17.60	40.0	-20.85	Peak	214.00	200	Horizontal	Pass
2	146.371	31.93	-17.27	43.5	-11.57	Peak	360.00	200	Horizontal	Pass
3	168.918	31.66	-16.11	43.5	-11.84	Peak	174.00	100	Horizontal	Pass
4	202.799	41.80	-13.40	43.5	-1.70	Peak	360.00	168	Horizontal	Pass
4*	202.799	36.75	-13.40	43.5	-6.75	QP	360.00	168	Horizontal	Pass
5	210.552	42.09	-13.60	43.5	-1.41	Peak	226.00	159	Horizontal	Pass
5*	210.552	38.17	-13.60	43.5	-5.33	QP	226.00	159	Horizontal	Pass
6	306.381	28.10	-10.95	46.0	-17.90	Peak	28.00	100	Horizontal	Pass

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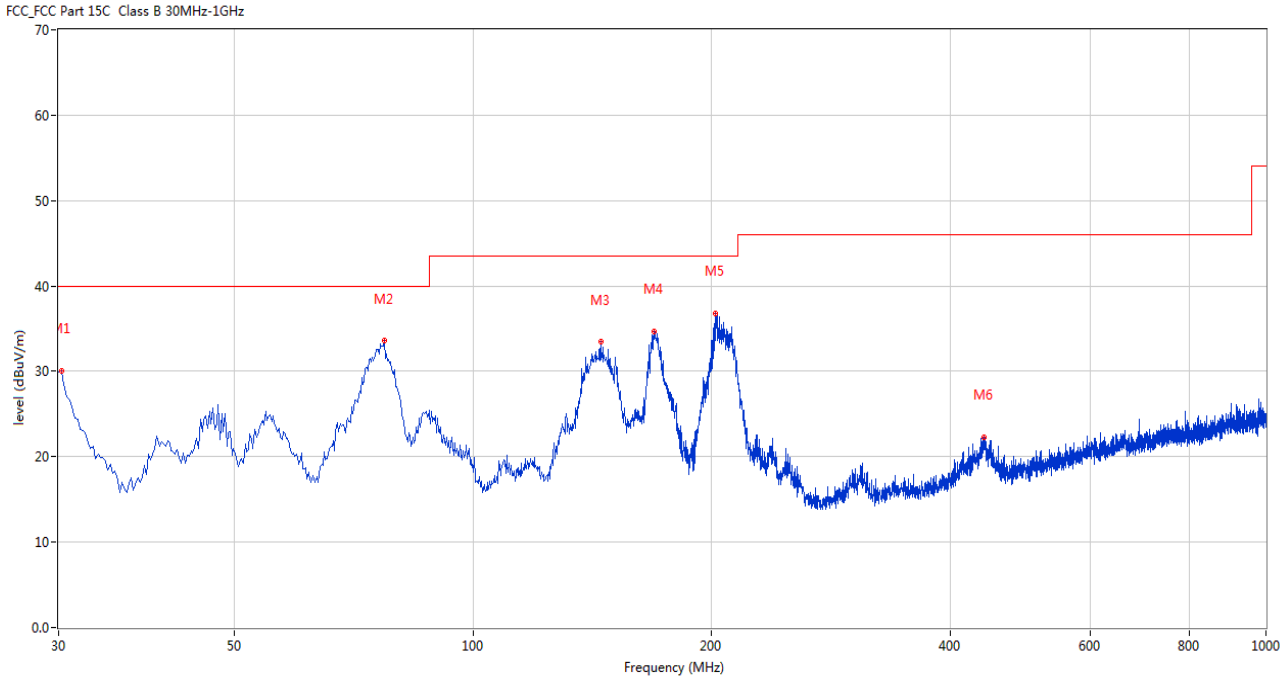
B. **General Radiated Emission Data**

Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: **Pass**

Please refer to following diagram for individual



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.242	30.06	-14.31	40.0	-9.94	Peak	300.00	100	Vertical	Pass
2	77.276	33.56	-17.58	40.0	-6.44	Peak	0.00	100	Vertical	Pass
3	144.916	33.42	-17.22	43.5	-10.08	Peak	309.00	100	Vertical	Pass
4	168.918	34.73	-16.11	43.5	-8.77	Peak	359.00	100	Vertical	Pass
5	202.132	36.77	-13.40	43.5	-6.73	Peak	293.00	100	Vertical	Pass
6	441.420	22.34	-7.99	46.0	-23.66	Peak	295.00	100	Vertical	Pass

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7.0 20dB Bandwidth Testing

7.1 Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

7.3 Test Data

Frequency (MHz)	20dB Bandwidth Emission (kHz)	Limit (kHz)	Result
0.175	3.4569	--	Pass

Refer to attached plots:

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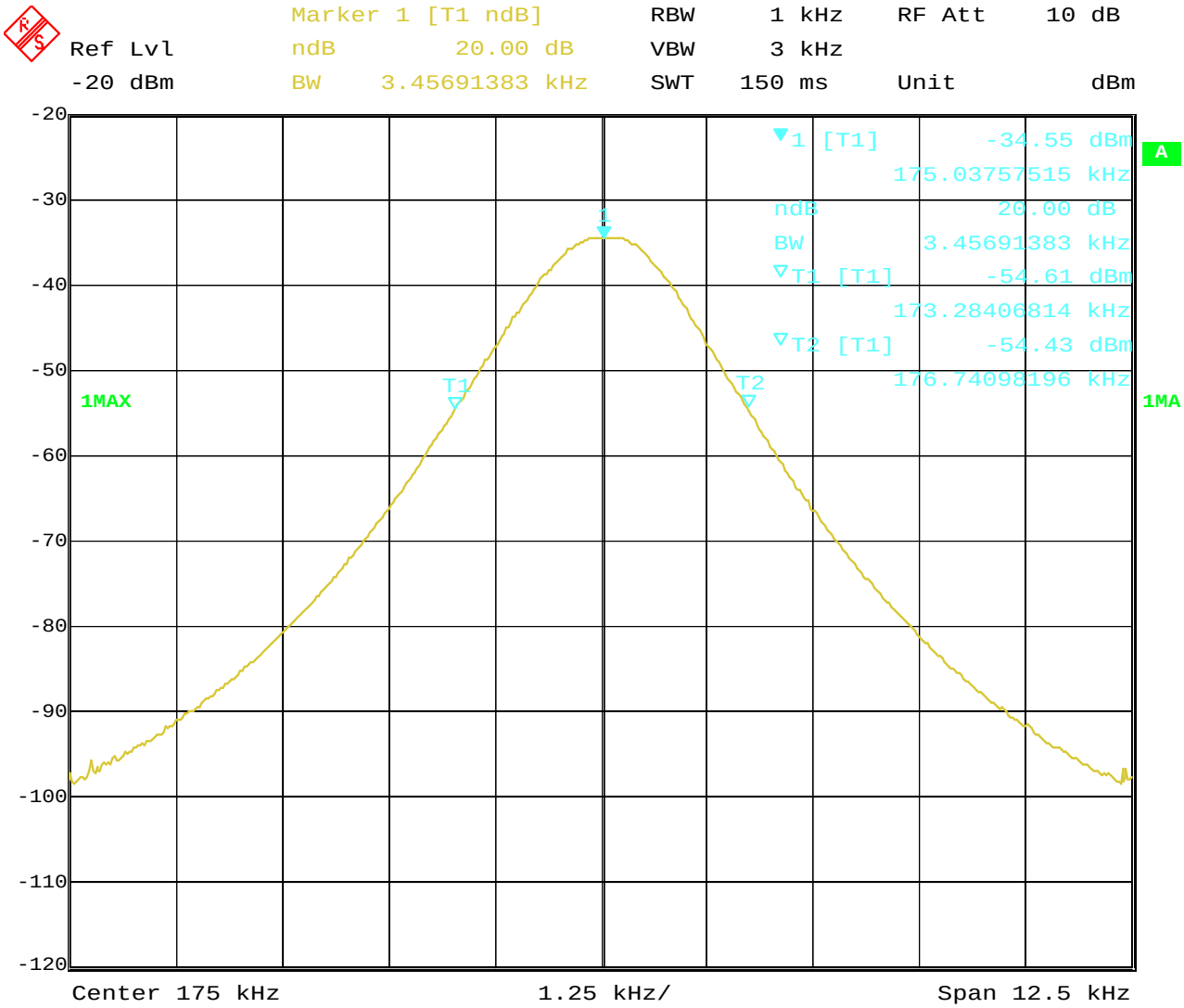
20dB Bandwidth



Date: 30.DEC.2021 11:50:37

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8.0 **Antenna Requirement**

8.1 Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

8.2 Antenna Connected constructions

The antenna is Inductive Loop Antenna. The antenna gain is 0dBi. So it meets the requirement of 15.203

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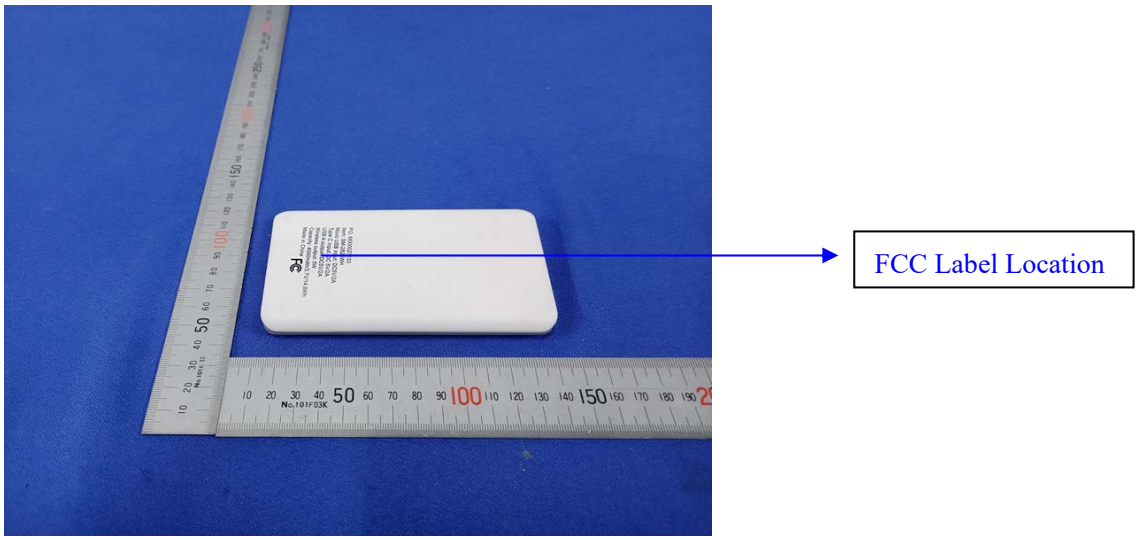
9.0 FCC ID Label

FCC ID: 2AQJK-AST-WR167

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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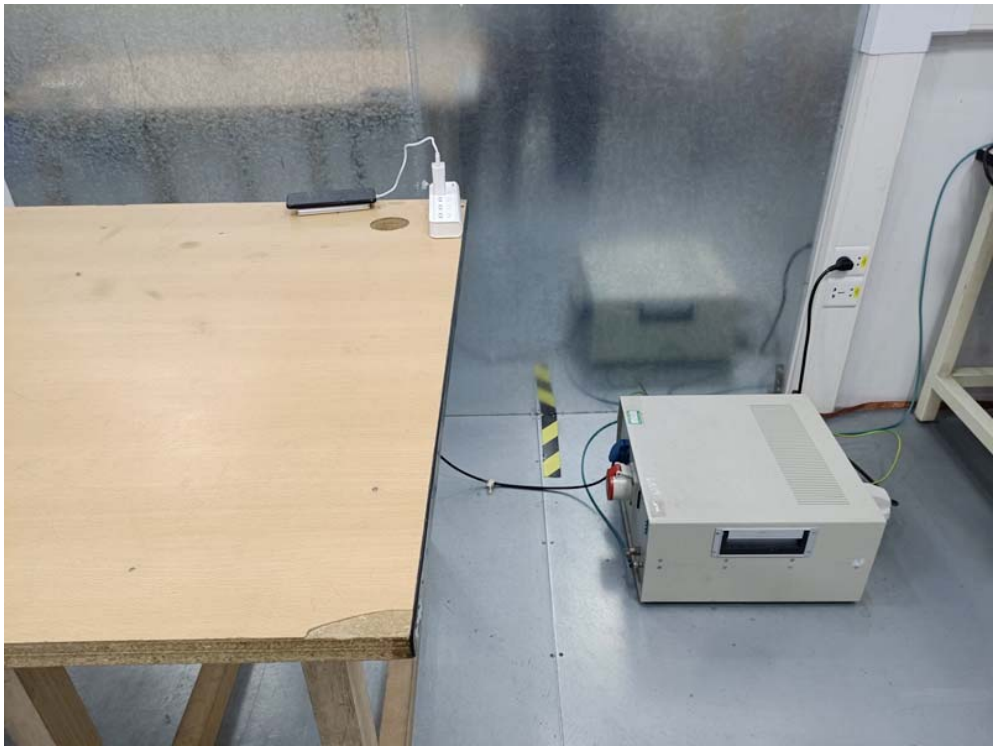
10.0. Photo of testing

10.1 Conducted test View



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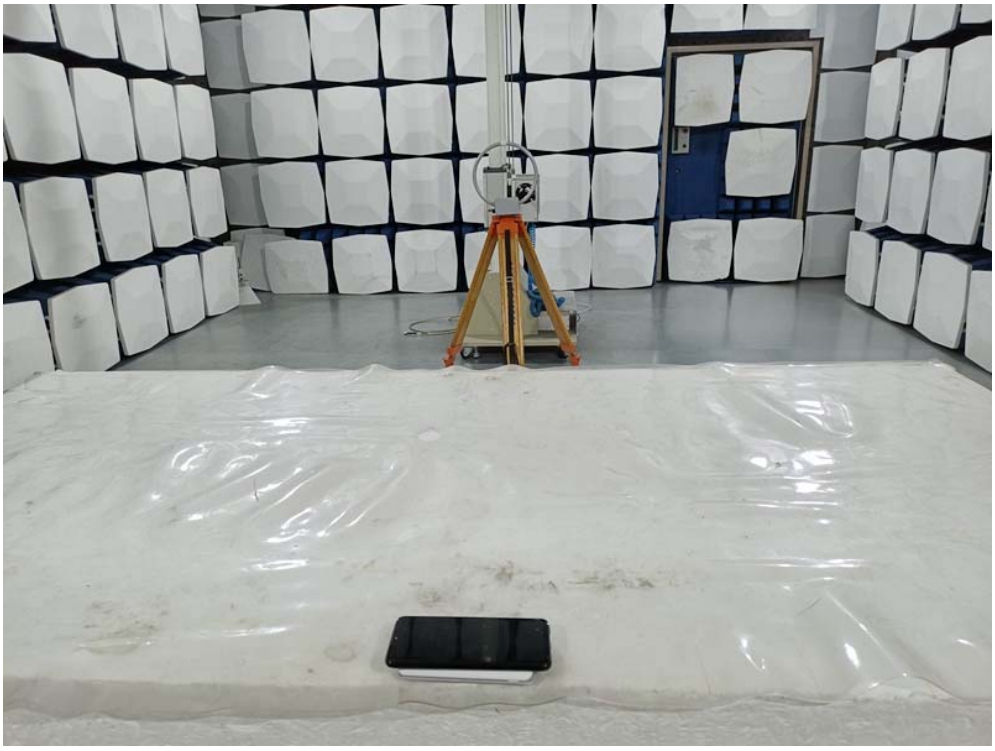
10.2 Radiated emission test view



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Photographs – EUT

Outside View

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Photographs – EUT

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Inside View

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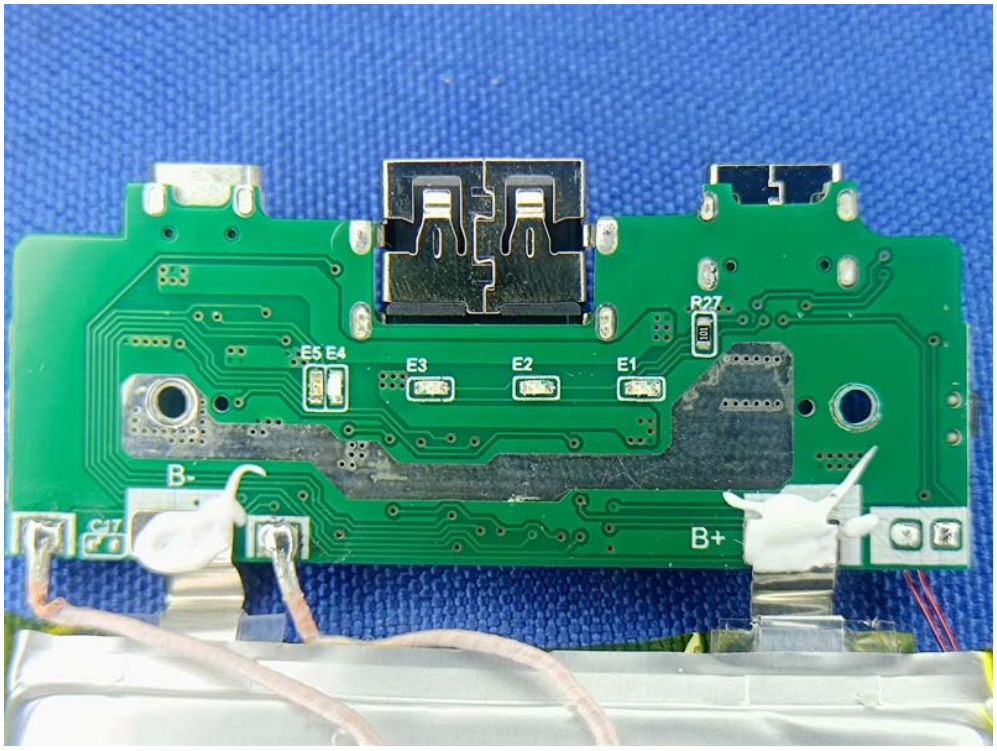
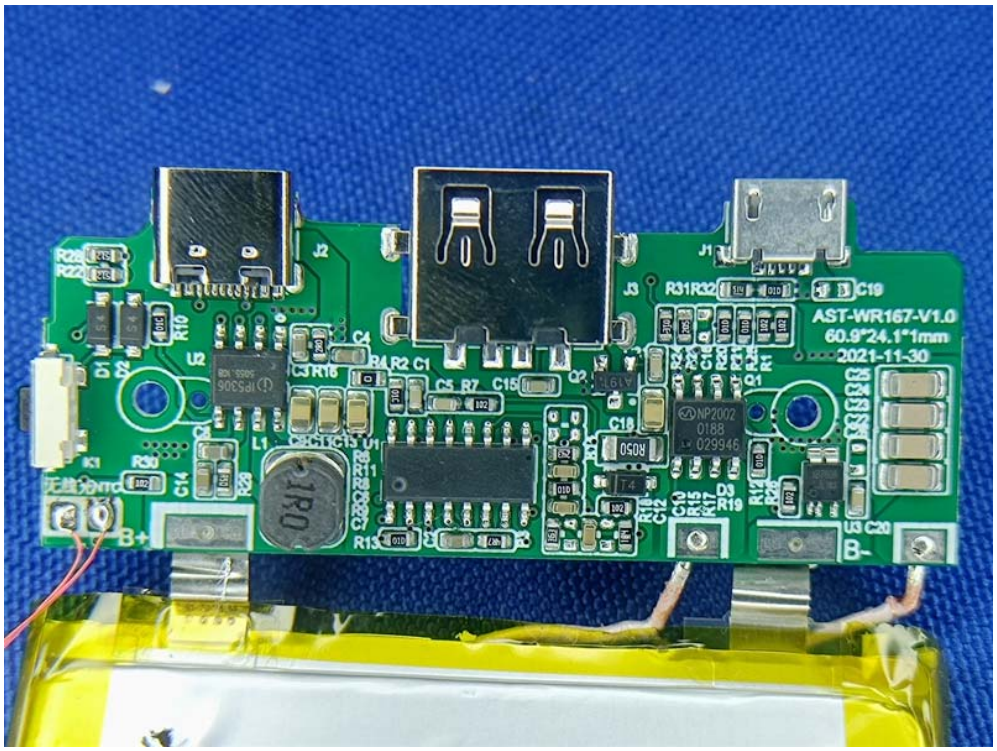
Inside View





-End of the report-

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