

TEST REPORT

Product Name : 3 in 1 Wireless Charger
Brand Mark : Digital Ant
Model No. : DA-WC-001
Report Number : BLA-EMC-202401-A2402
FCC ID : 2A5J9-DA-WC-001
Date of Sample Receipt : 2024/1/11
Date of Test : 2024/1/11 to 2024/2/22
Date of Issue : 2024/2/22
Test Standard : 47 CFR Part 15, Subpart C 15.215
Test Result : Pass

Prepared for:

Digital Ant Inc

5543 EDMONDSON PIKE # 66, NASHVILLE TENNESSEE 37211

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

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Date:

2024/2/22



REPORT REVISE RECORD

Version No.	Date	Description
00	2024/2/22	Original

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1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
20dB Bandwidth	47 CFR Part 15.215	ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.215	Pass
Radiated Spurious Emissions	47 CFR Part 15.209	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209	Pass
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15.207	ANSI C63.4:2014	Class B	Pass

2 GENERAL INFORMATION

Applicant	Digital Ant Inc
Address	5543 EDMONDSON PIKE # 66, NASHVILLE TENNESSEE 37211
Manufacturer	Digital Ant Inc
Address	5543 EDMONDSON PIKE # 66, NASHVILLE TENNESSEE 37211
Factory	Shenzhen Laini Information Technology Co., Ltd.
Address	10/F, Venture Park, University Town, No.10 Lishan Road, Taoyuan Subdistrict, Nanshan District, Shenzhen, China
Product Name	3 in 1 Wireless Charger
Test Model No.	DA-WC-001

3 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	V1.0
Software Version	1.0
Operation Frequency:	110KHz-220KHz
Modulation type:	ASK
Antenna Type:	Inductive loop coil Antenna
Antenna Gain:	0dBi (Max)
Power Supply	Input: 9V/2A, 9V/2.7A Output for smart phone: 15W/10W/7.5W/5W Output for earbuds: 5W Output for smart watch: 2.5W

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	AC120V

5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
TM1	Keep the EUT (smart phone 15W output + earbuds+ smart watch) in wireless charging mode
TM2	Keep the EUT (smart phone 15W output) in wireless charging mode
TM3	Keep the EUT (earbuds) in wireless charging mode
TM4	Keep the EUT (smart watch) in wireless charging mode
Remark:Only the data of the worst mode would be recorded in this report.	

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB

7 DESCRIPTION OF SUPPORT UNIT

Load	N/A	N/A	N/A	2.5W MAX
Load	N/A	N/A	N/A	5W MAX
Mobil phone	Iphone	N/A	N/A	N/A

8 TEST FACILITY

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

- FCC — Designation No.: CN1252

BlueAsia of Technical Services(Shenzhen) Co., Ltd 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 files. Designation CN1252.

- ISED — CAB identifier No.: CN0028

BlueAsia of Technical Services(Shenzhen) Co., Ltd has been registered by Certification and Engineering Bureau of ISED for radio equipment testing with CAB identifier CN0028.

9 LABORATORY LOCATION

All tests were performed at:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

10 TEST INSTRUMENTS LIST

Test Equipment Of Radiated Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber 1	SKET	966	N/A	2021/11/10	2024/11/9
Chamber 2	SKET	966	N/A	2022/07/20	2024/11/9
Spectrum	R&S	FSP40	100817	2023/08/30	2024/08/29
Receiver	R&S	ESR7	101199	2023/08/30	2024/08/29
Receiver	R&S	ESPI7	101477	2023/07/07	2024/07/06
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2022/10/12	2025/10/11
Horn Antenna	Schwarzbeck	BBHA9120D	01892 P:00331	2022/09/13	2025/09/12
Horn Antenna	Schwarzbeck	BBHA 9170	1106	2022/04/24	2024/04/23
Amplifier	SKET	LNPA_30M01G-30	SK2021060801	2023/07/07	2024/07/06
Amplifier	SKET	PA-000318G-45	N/A	2023/08/30	2024/08/29
Amplifier	SKET	LNPA_18G40G-50	SK2022071301	2023/07/14	2024/07/13
Filter group	SKET	2.4G/5G Filter group r	N/A	2023/07/07	2024/07/06
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2022/09/14	2025/09/13
1kHz calibration audio source	SKET	MCS-ABT-C35	N/A	2023/09/04	2024/09/03
Free Field Microphone	SKET	MGs MP 663	0414	2023/09/04	2024/09/03
Audio shielding box	SKET	SB-ABT-C35	N/A	2023/03/30	2024/03/29
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A
Signal Generator DTV	ECREDIX	DSG-1000	N/A	N/A	N/A

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Shield room	SKET	833	N/A	2023/11/16	2025/11/15
Receiver	R&S	ESPI3	101082	2023/08/30	2024/08/29
LISN	R&S	ENV216	3560.6550.15	2023/08/30	2024/08/29
LISN	AT	AT166-2	AKK1806000003	2023/08/30	2024/08/29
ISN	TESEQ	ISNT8-cat6	53580	2023/08/30	2024/08/29
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01045	2023/07/07	2024/07/06
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01075	2023/07/07	2024/07/06
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-05	N/A	N/A	N/A

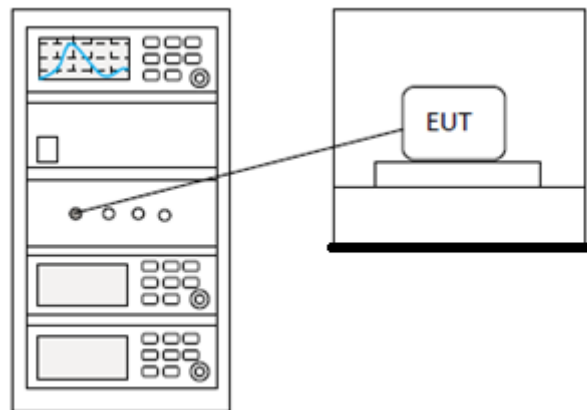
Test Equipment Of RF Conducted Test

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2023/08/30	2024/08/29
Spectrum	Agilent	N9020A	MY49100060	2023/08/30	2024/08/29
Spectrum	Agilent	N9020A	MY54420161	2023/08/30	2024/08/29
Signal Generator	Agilent	N5182A	MY47420955	2023/08/30	2024/08/29
Signal Generator	Agilent	N5181A	MY46240904	2023/07/07	2024/07/06
Signal Generator	R&S	CMW500	132429	2023/08/30	2024/08/29
BluetoothTester	Anritsu	MT8852B	06262047872	2023/08/30	2024/08/29
Power probe	DARE	RPR3006W	14I00889SN042	2023/09/01	2024/08/31
Power detection box	CDKMV	MW100-PSB	MW201020JYT	2023/07/07	2024/07/06
DCPowersupply	zhaoxin	KXN-305D	20K305D1221363	2023/08/30	2024/08/29
DCPowersupply	zhaoxin	RXN-1505D	19R1505D050168	2023/08/30	2024/08/29
2.4GHz/5GHz RF Test software	MTS	MTS 8310	Version 2.0.0.0	N/A	N/A
Audio Analyzer	Audio Precision	ATS-1	ATS141094	2023/07/07	2024/07/06

11 20DB BANDWIDTH

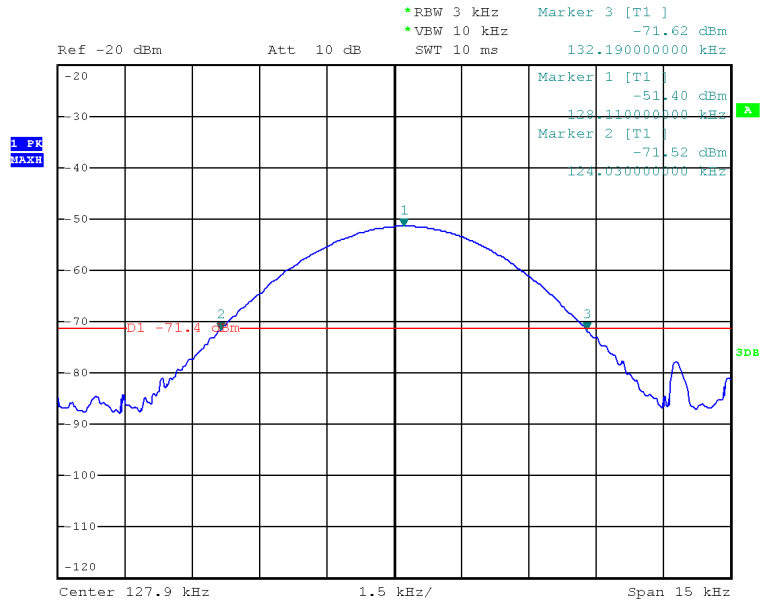
Test Standard	47 CFR Part 15, Subpart C 15.215
Test Method	ANSI C63.10 (2013) Section 7.8.7
Test Mode (Pre-Scan)	TM2, TM3, TM4
Test Mode (Final Test)	TM2, TM3, TM4
Tester	Jozu
Temperature	25℃
Humidity	60%

11.1 BLOCK DIAGRAM OF TEST SETUP



11.2 TEST DATA

(smart phone 15W output):

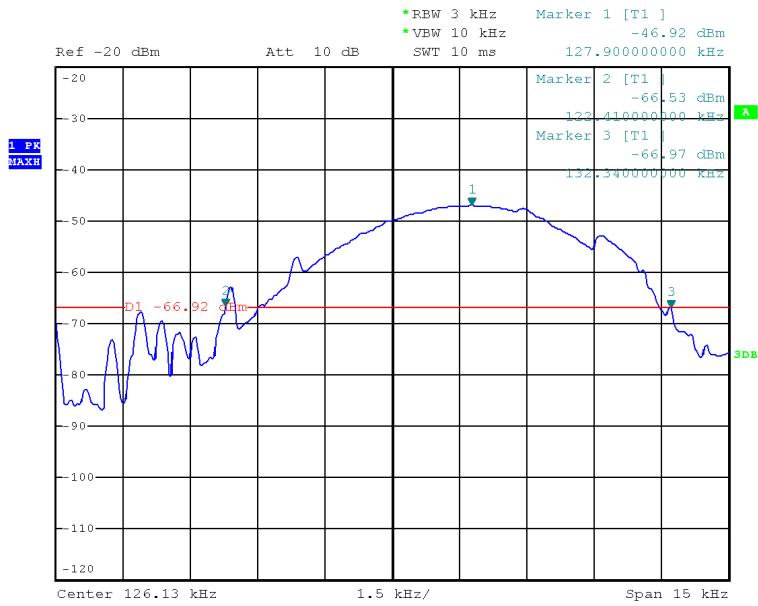


jjjj

Date: 1.FEB.2024 17:57:17

20dB bandwidth (MHz)	Results
0.00816	Passed

(earbuds):

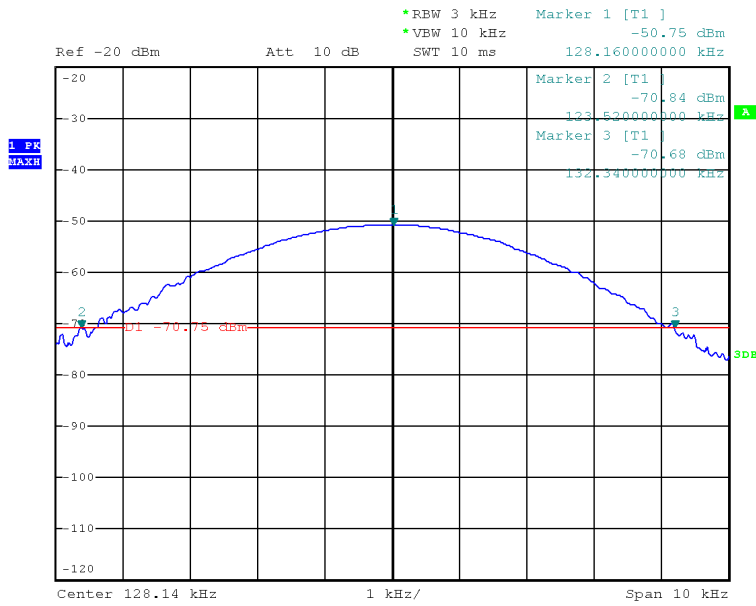


jjjj

Date: 1.FEB.2024 17:53:54

20dB bandwidth (MHz)	Results
0.00993	Passed

(smart watch):



jjjj

Date: 1.FEB.2024 18:08:29

20dB bandwidth (MHz)	Results
0.00882	Passed

12 RADIATED SPURIOUS EMISSIONS

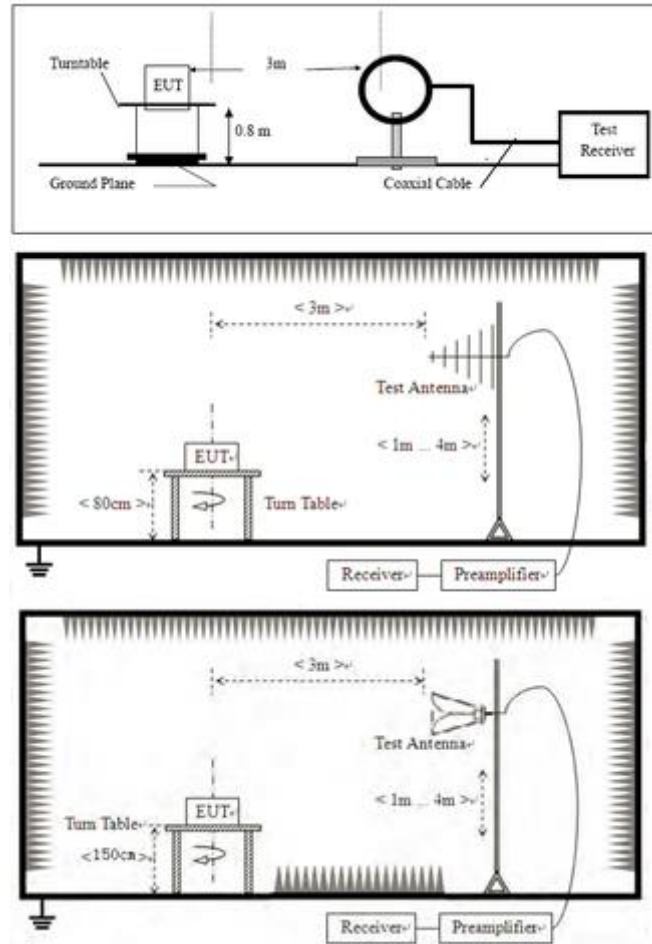
Test Standard	47 CFR Part 15, Subpart C 15.215
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TM1, TM2, TM3, TM4
Test Mode (Final Test)	TM1
Tester	Jozu
Temperature	25℃
Humidity	60%

12.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

12.2 BLOCK DIAGRAM OF TEST SETUP



12.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

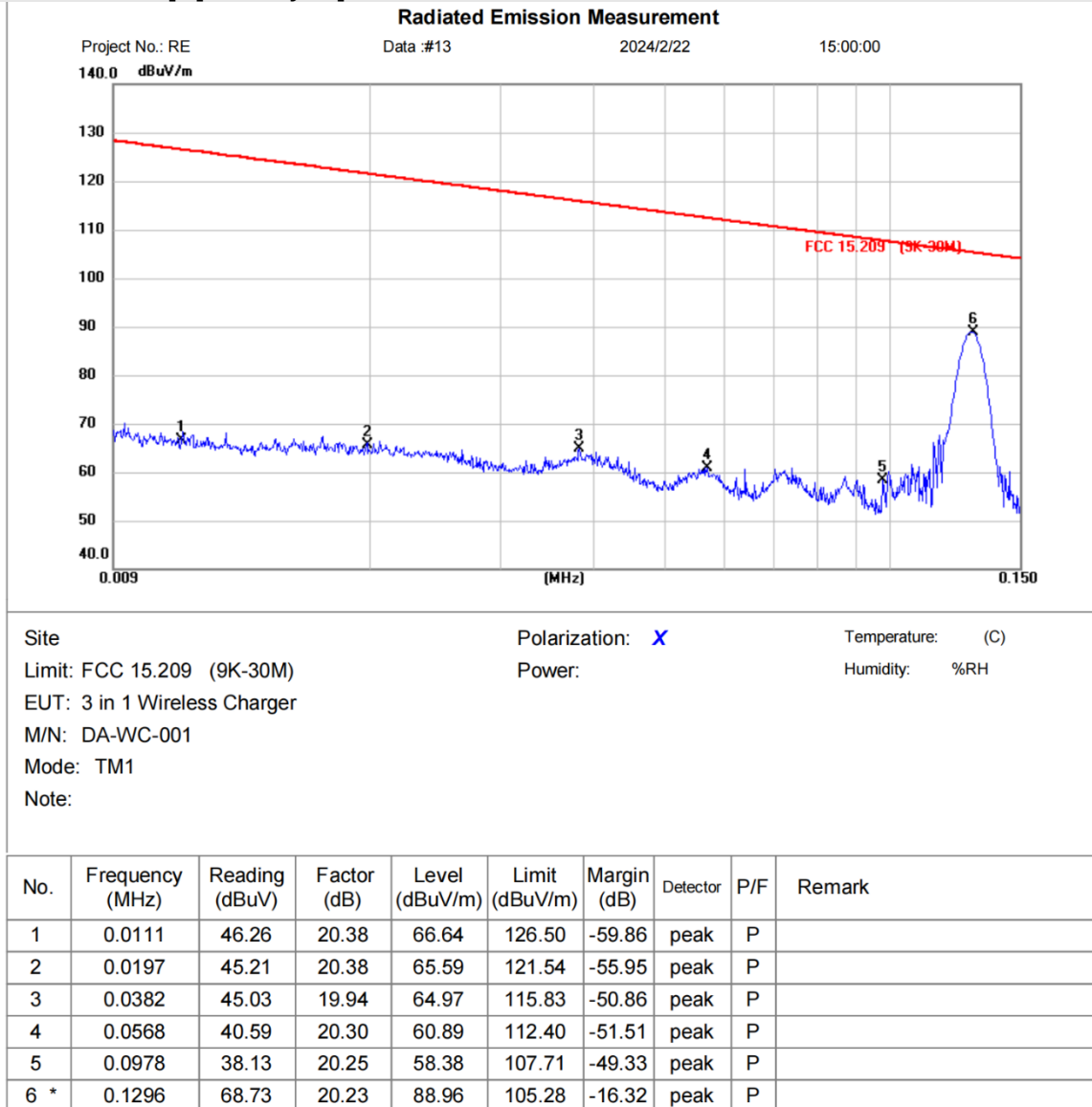
Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

12.4 TEST DATA

9kHz-30MHz:

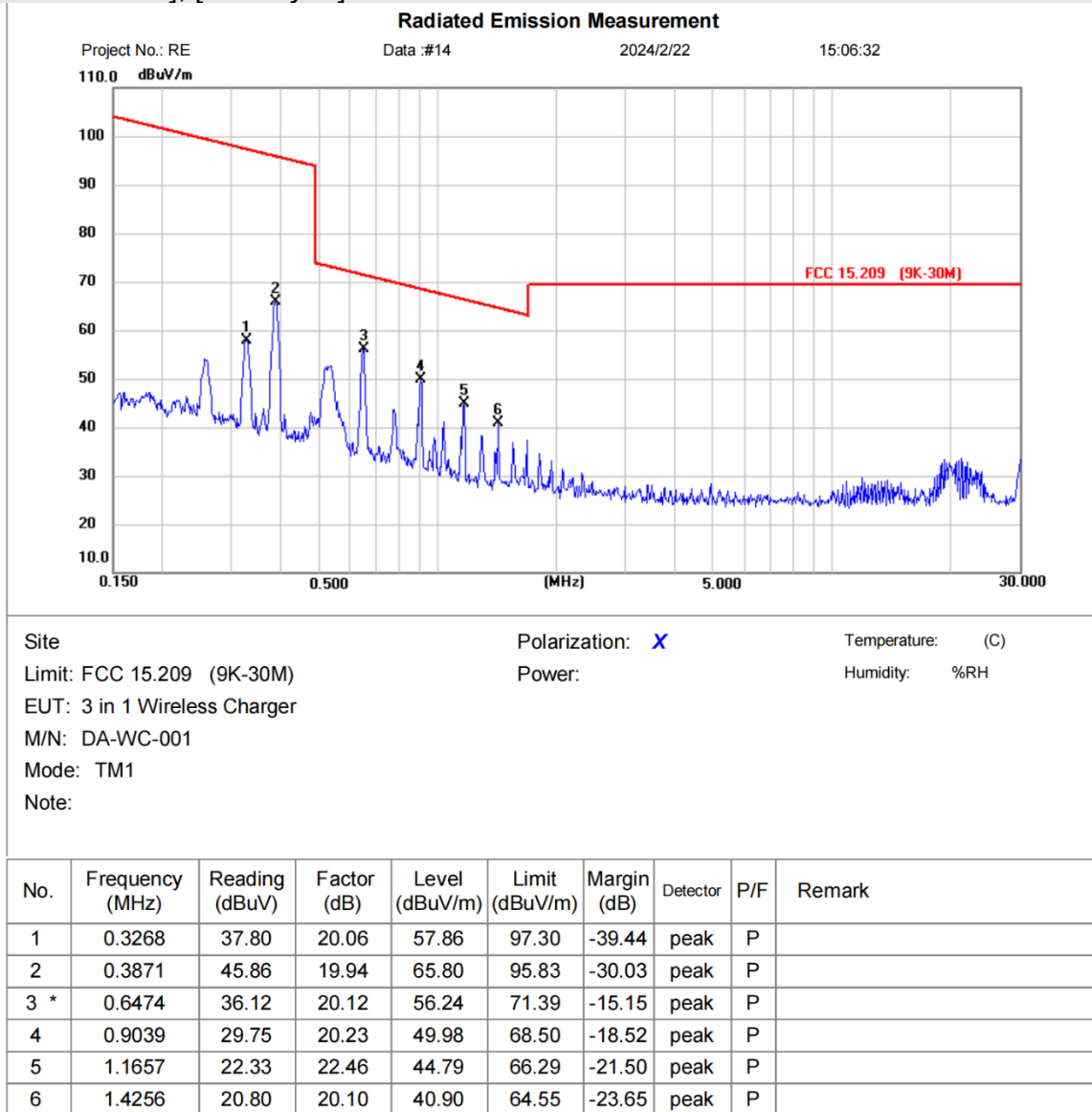
[TestMode: TM1]; [Polarity: x]



*Maximum data x:Over limit /:over margin

Test Result: Pass

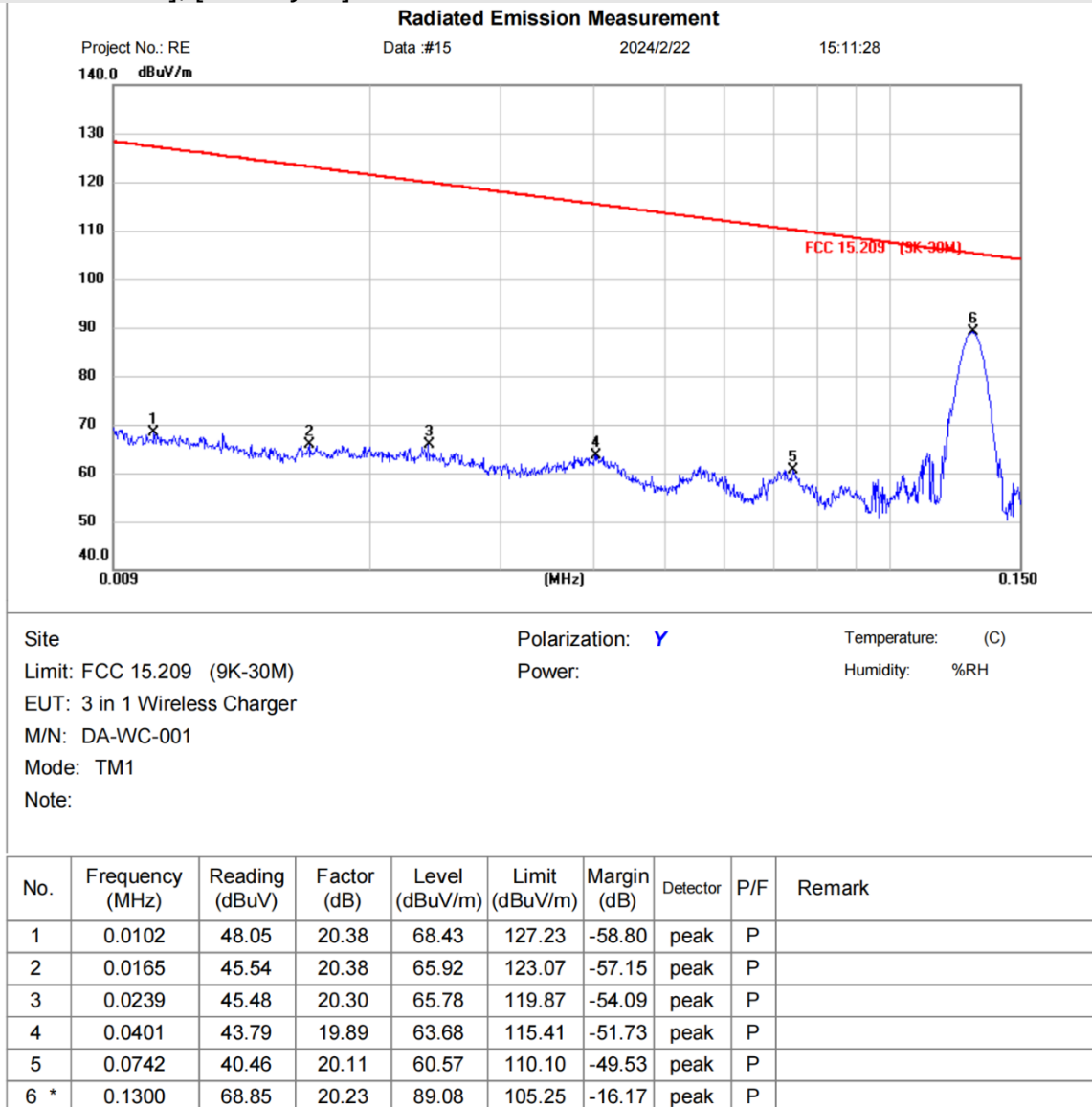
[TestMode: TM1]; [Polarity: x]



**Maximum data x:Over limit l:over margin

Test Result: Pass

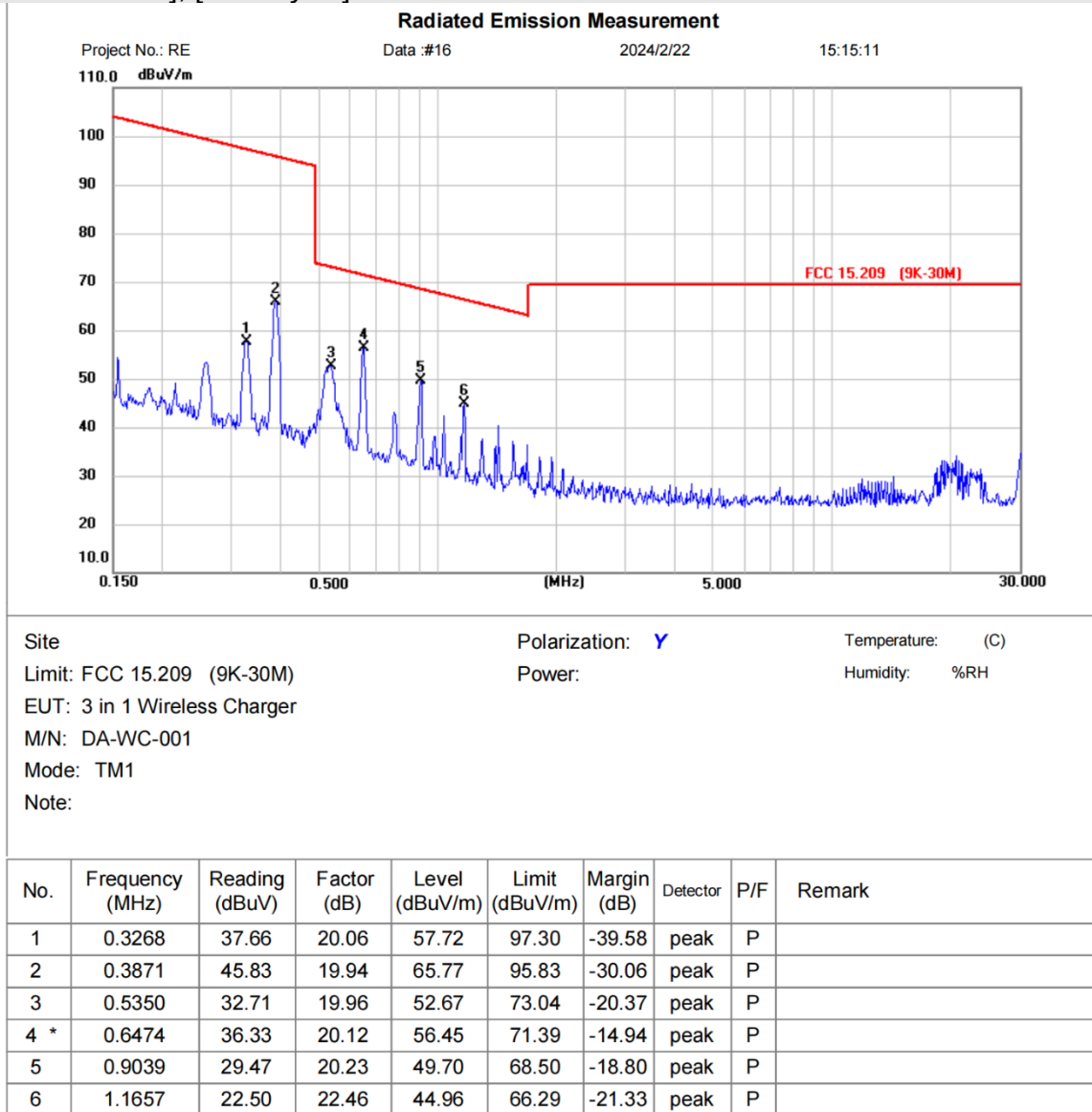
[TestMode: TM1]; [Polarity: Y]



*:Maximum data x:Over limit - :lower margin

Test Result: Pass

[TestMode: TM1]; [Polarity: Y]

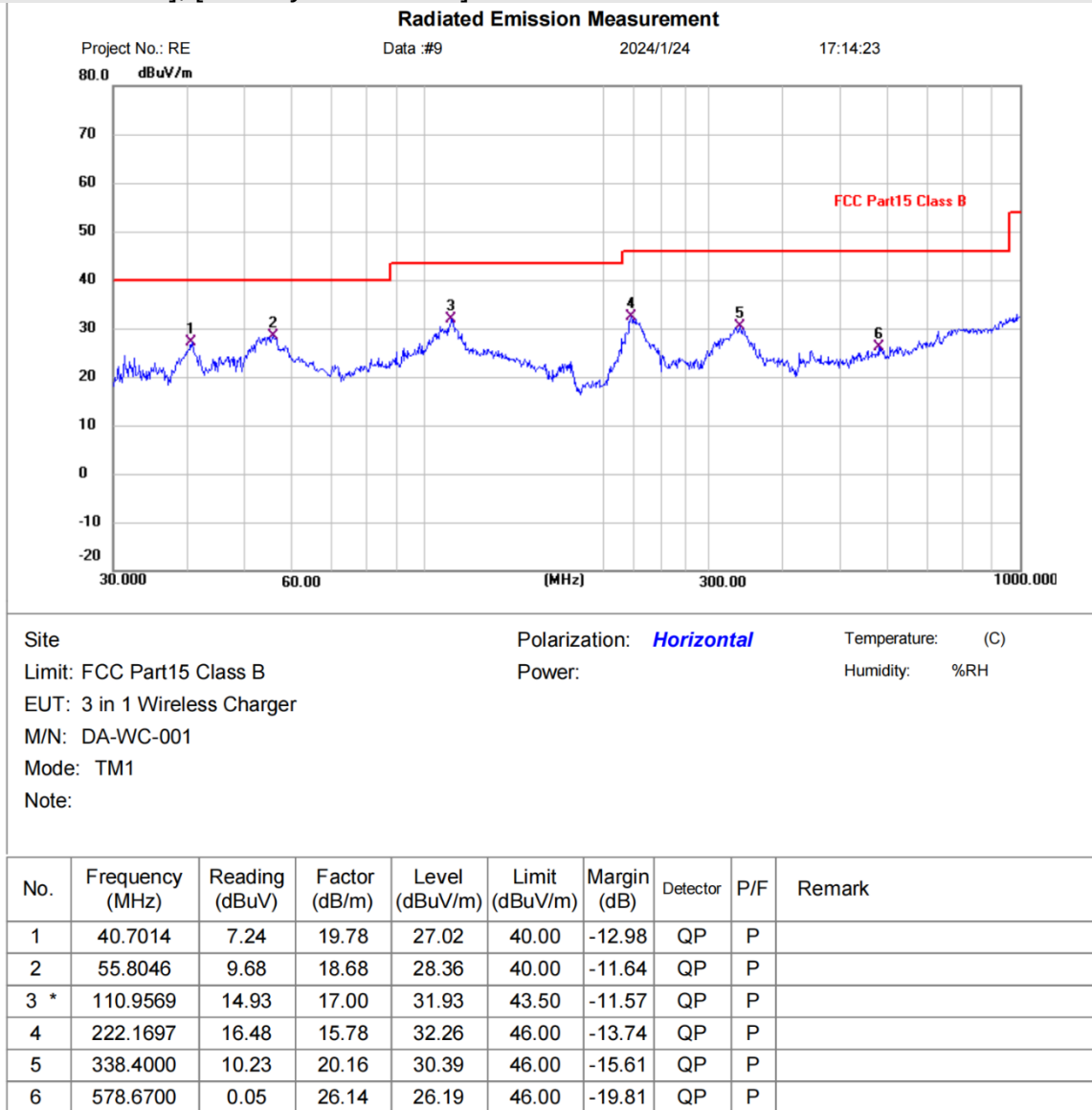


**Maximum data x:Over limit l:over margin

Test Result: Pass

30MHz-1GHz:

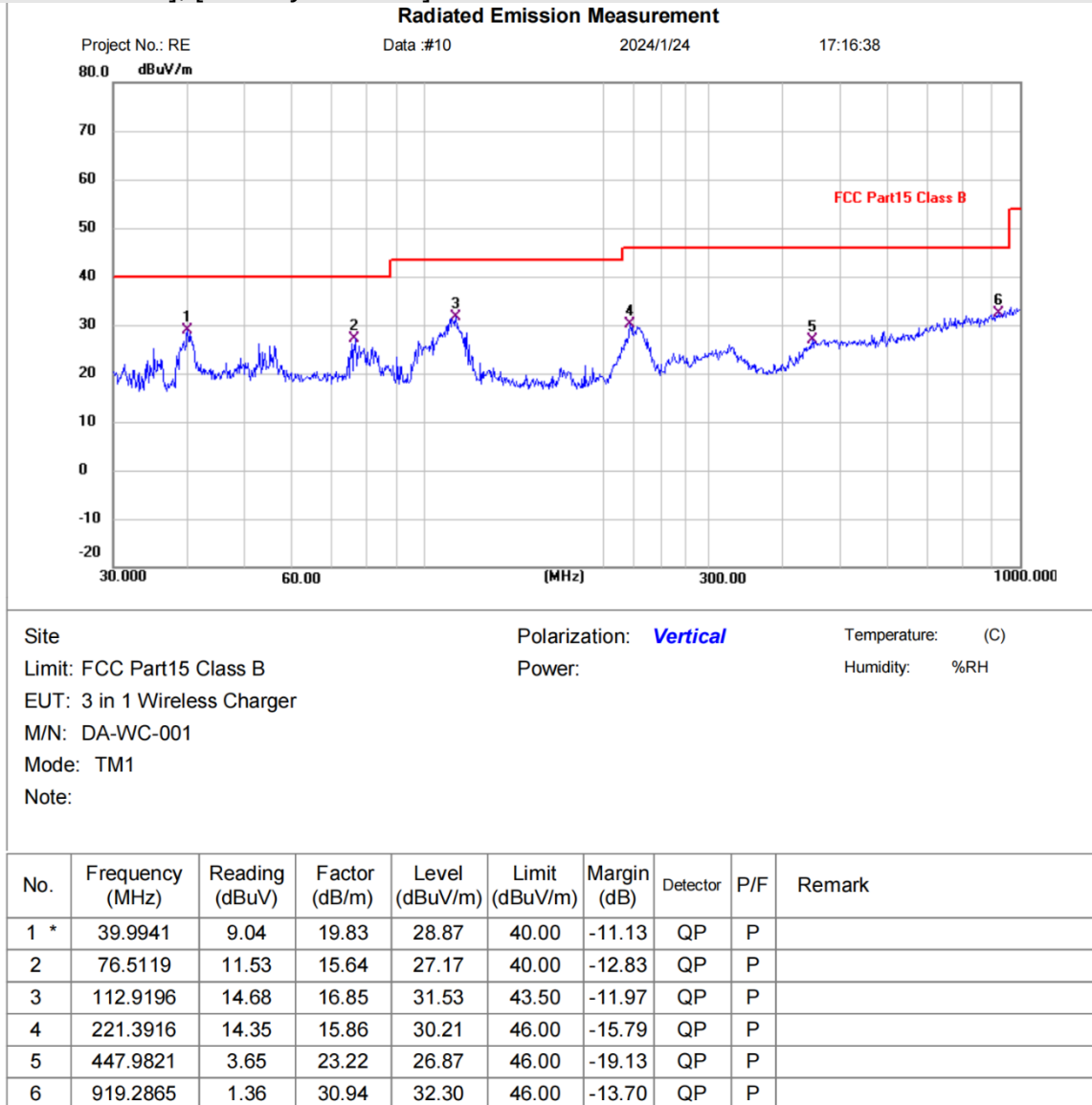
[TestMode: TM1]; [Polarity: Horizontal]



*:Maximum data y:Over limit l:over margin

Test Result: Pass

[TestMode: TM1]; [Polarity: Vertical]



*Maximum data y:Over limit lower margin

Test Result: Pass

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

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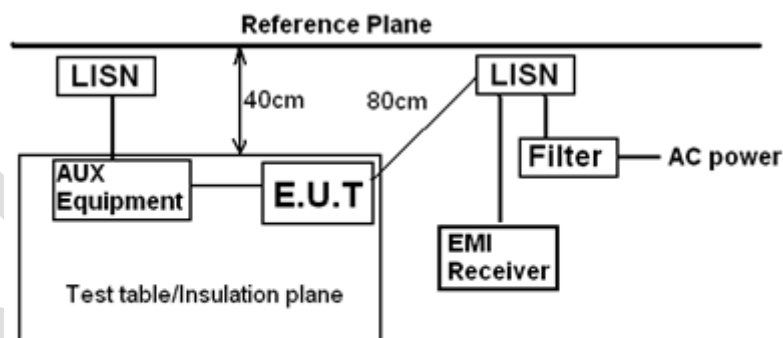
13 CONDUCTED EMISSIONS AT MAINS TERMINALS (150KHZ-30MHZ)

Test Standard	47 CFR Part 15, Subpart B
Test Method	ANSI C63.4:2014
Test Mode (Pre-Scan)	TM1, TM2, TM3, TM4
Test Mode (Final Test)	TM1
Tester	Jozu
Temperature	25℃
Humidity	60%

13.1 LIMITS

Frequency Range	Limit
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average

13.2 BLOCK DIAGRAM OF TEST SETUP



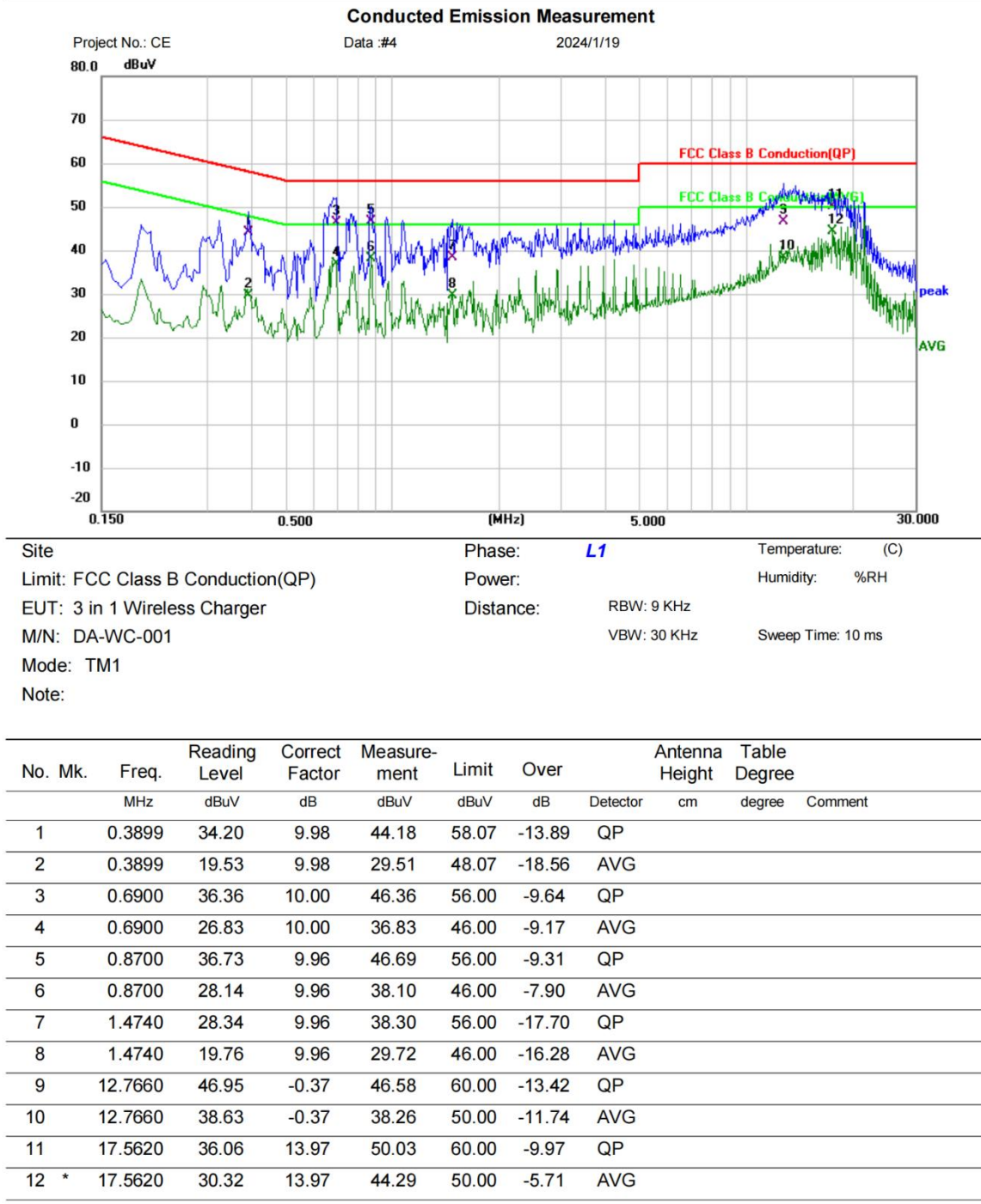
Remark:
E.U.T: Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height=0.8m

13.3 PROCEDURE

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

13.4 TEST DATA

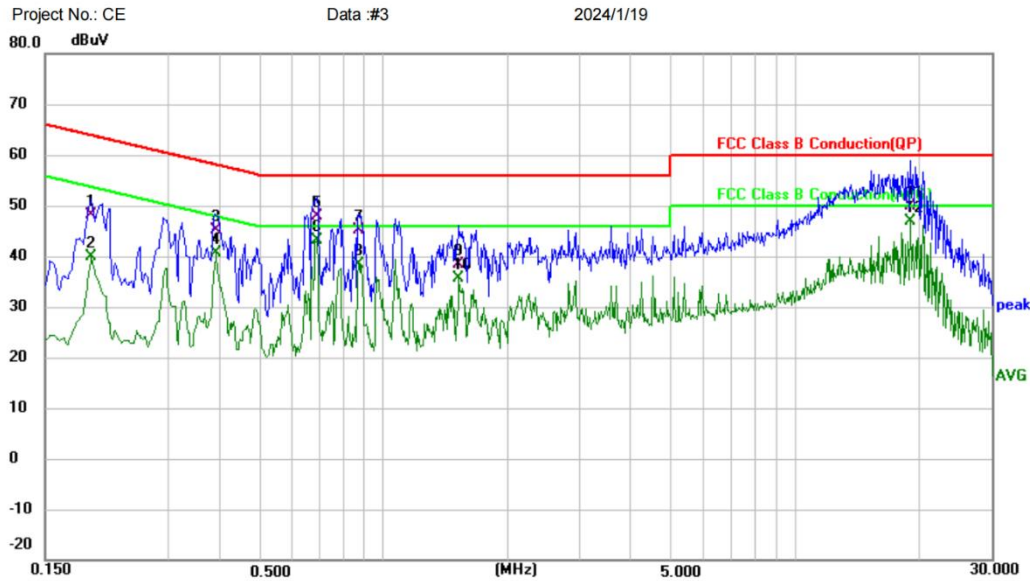
[TestMode: TM1]; [Line: Line] ;[Power:AC120V/60Hz]



Test Result: Pass

[TestMode: TM1]; [Line: Neutral] ;[Power:AC120V/60Hz]

Conducted Emission Measurement



Site	Phase: N	Temperature: (C)
Limit: FCC Class B Conduction(QP)	Power:	Humidity: %RH
EUT: 3 in 1 Wireless Charger	Distance:	RBW: 9 KHz
M/N: DA-WC-001		VBW: 30 KHz
Mode: TM1		Sweep Time: 10 ms
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	cm	degree	Comment
1		0.1940	38.02	10.17	48.19	63.86	-15.67	QP		
2		0.1940	29.75	10.17	39.92	53.86	-13.94	AVG		
3		0.3899	35.44	9.81	45.25	58.07	-12.82	QP		
4		0.3899	30.80	9.81	40.61	48.07	-7.46	AVG		
5		0.6860	37.89	9.96	47.85	56.00	-8.15	QP		
6	*	0.6860	33.26	9.96	43.22	46.00	-2.78	AVG		
7		0.8700	35.34	9.89	45.23	56.00	-10.77	QP		
8		0.8700	28.46	9.89	38.35	46.00	-7.65	AVG		
9		1.5260	28.45	9.94	38.39	56.00	-17.61	QP		
10		1.5260	25.68	9.94	35.62	46.00	-10.38	AVG		
11		19.0540	35.62	14.35	49.97	60.00	-10.03	QP		
12		19.0540	32.56	14.35	46.91	50.00	-3.09	AVG		

Test Result: Pass

Notes:

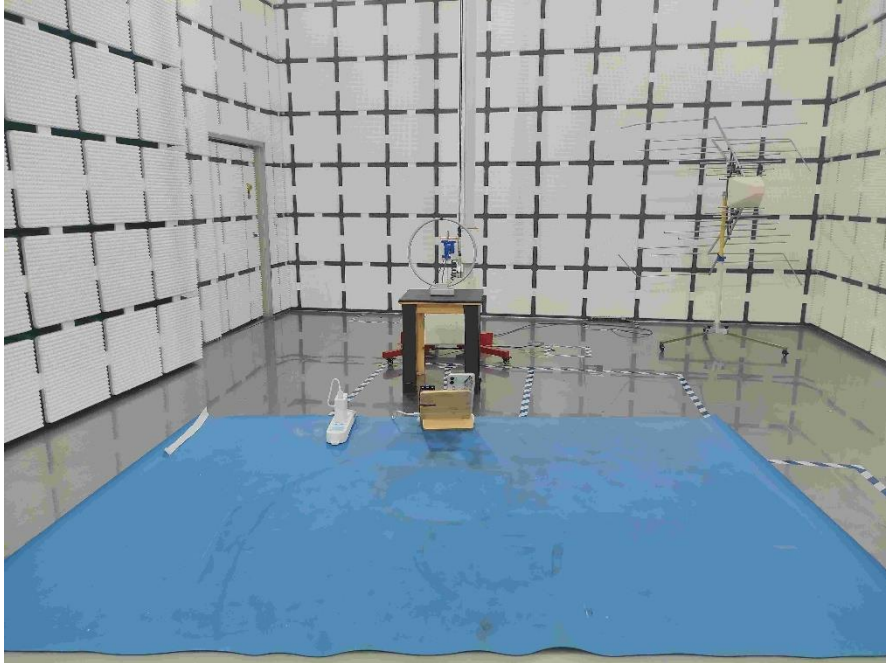
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

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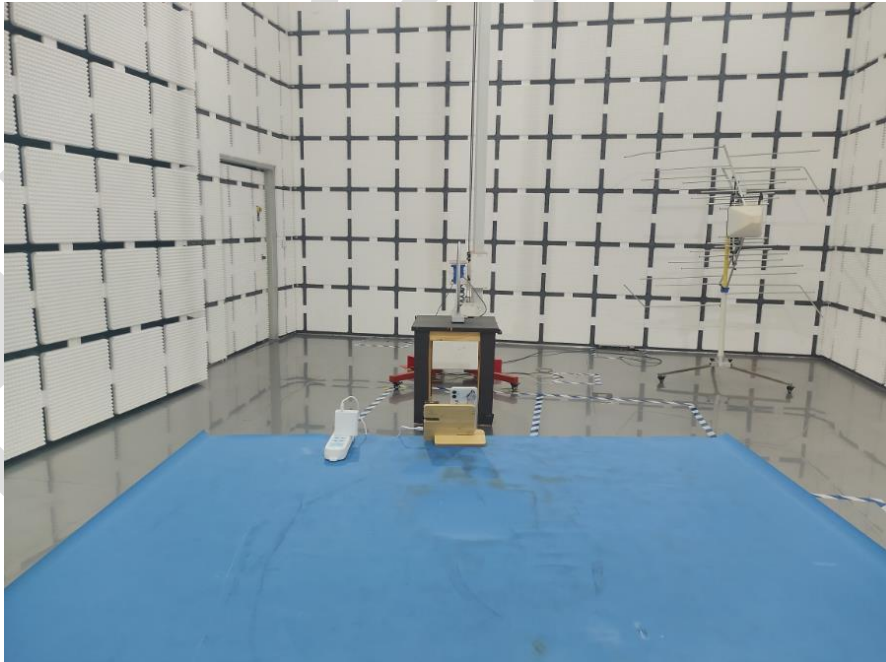
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Radiated Emissions

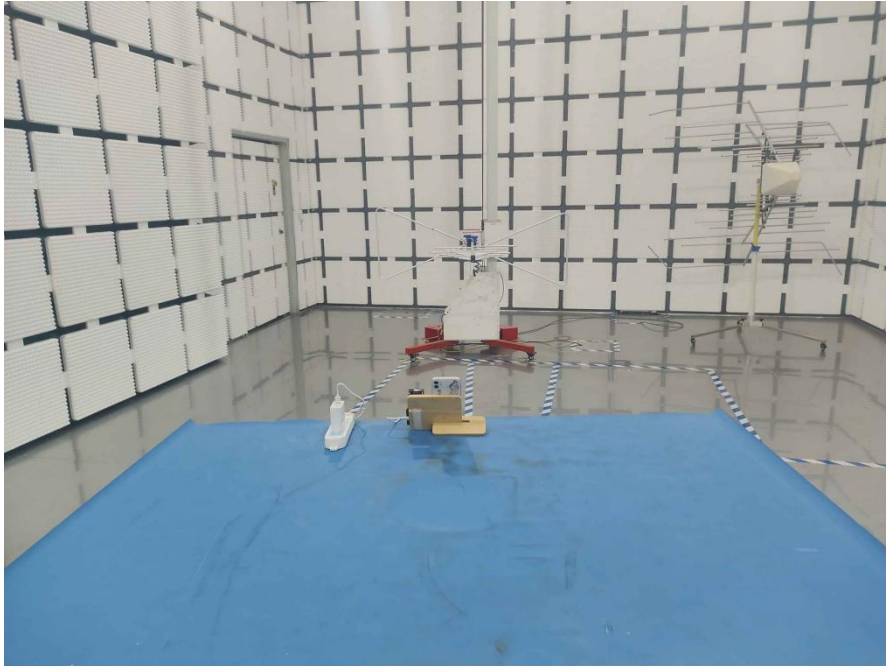
9kHz-30MHz X:



9kHz-30MHz Y:



30MHz-1GHz:



Conducted Emissions at Mains Terminals (150kHz-30MHz)



APPENDIX B: PHOTOGRAPHS OF EUT

Reference to the test report No. BLA-EMC-202401-A2401

----END OF REPORT----

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of BlueAsia, this report can't be reproduced except in full.