

FCC RADIO TEST REPORT

FCC ID: 2A4FX-T20

Sample : Desktop multi-function wireless charging stand(T20)

Trade Name : N/A

Main Model : T20

Additional Model : T30, T40, T50, T60

Report No. : 23061403ER-61

Prepared for

Shenzhen Leiden Digital Technology Co., Ltd
Room 602A, Building F, Second Industrial Zone, No.131 Bulan Road,
Shanglilang Community, Nanwan, Longgang District,
Shenzhen, Guangdong China

Prepared by

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Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

TEST RESULT CERTIFICATION

Applicant.....: Shenzhen Leiden Digital Technology Co., Ltd

Address.....: Room 602A, Building F, Second Industrial Zone, No.131 Bulan Road, Shanglilang Community, Nanwan, Longgang District, Shenzhen, Guangdong China

Manufacturer.....: Shenzhen Leiden Digital Technology Co., Ltd

Address.....: Room 602A, Building F, Second Industrial Zone, No.131 Bulan Road, Shanglilang Community, Nanwan, Longgang District, Shenzhen, Guangdong China

Product description

Product.....: Desktop multi-function wireless charging stand(T20)

Trade Name.....: N/A

Model Name.....: T20, T30, T40, T50, T60

Test Methods.....: FCC Rules and Regulations Part 15 Subpart C Section 15.209
ANSI C63.10: 2013

This device described above has been tested by Global United Technology Services Co. Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests: Jun. 14, 2023 ~ Jun. 20, 2023

Date of Issue.....: Jul. 15, 2023

Test Result: Pass

Prepared By:



Date:

2023-7-15

Project Engineer

Check By:



Date:

2023-7-15

Reviewer

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1 TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

Item	FCC Rules	Description Of Test	Result
1	FCC Part 15.207	Conducted Emission	Pass
2	FCC Part 15.209(a)	Radiated Emission	Pass
3	FCC Part 15.203	Antenna Requirement	Pass

1.2 TEST FACILITY

Test Firm : Global United Technology Services Co. Ltd.

Address : No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

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

• **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen 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 files.

• **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

• **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9KHz ~ 150KHz	2.96	
		150KHz ~ 30MHz	2.44	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9KHz ~ 30MHz	2.50	
		30MHz ~ 1000MHz	4.80	
		1000MHz ~ 6000MHz	4.13	

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product:	Desktop multi-function wireless charging stand(T20)
Trade Name:	N/A
Main Model:	T20
Additional Model:	T30, T40, T50, T60
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: T20.
FCC ID:	2A4FX-T20
Operation Frequency:	110-205KHz
Number of Channels:	3CH
Modulation Type:	ASK
Antenna Type:	Coil Antenna
Antenna Gain:	0dBi
Battery:	N/A
Adapter:	N/A
Power Source:	DC 5V or 9V or 12V by adapter

2.2 CARRIER FREQUENCY OF CHANNELS

Test List					
ANT	Frequency (KHz)	ANT	Frequency (KHz)	ANT	Frequency (KHz)
01	121.8	02	133.6	03	127.4

2.3 TEST MODE

NO.	TEST MODE DESCRIPTION
1	ANT 1 + Full load
2	ANT 1 + Half load
3	ANT 1 + Null load
4	ANT 2 + Full load
5	ANT 2 + Half load
6	ANT 2 + Null load
7	ANT 3 + Full load
8	ANT 3 + Half load
9	ANT 3 + Null load
10	ANT 1 + ANT 2 + ANT 3 + Full load
11	ANT 1 + ANT 2 + ANT 3 + Half load
12	ANT 1 + ANT 2 + ANT 3 + Null load
Note: The mode 10 was the worst case and only the data of the worst case record in this report.	

2.4 TEST SETUP

Operation of EUT during testing:



2.5 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Desktop multi-function wireless charging stand(T20)	N/A	T20	EUT
E-2	Adapter	Xiaomi	MDY-11-EX	AE
E-3	Phone	HUAWEI	P40 Pro	AE
E-4	AirPods	APPLE	AirPods Pro	AE
E-5	Apple Watch	APPLE	Series 6	AE

Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

2.6 MEASUREMENT INSTRUMENTS LIST

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 14, 2023	April 13, 2024
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Coaxial Cable	GTS	N/A	GTS213	April 21, 2023	April 20, 2024
8	Coaxial Cable	GTS	N/A	GTS211	April 21, 2023	April 20, 2024
9	Coaxial cable	GTS	N/A	GTS210	April 21, 2023	April 20, 2024
10	Coaxial Cable	GTS	N/A	GTS212	April 21, 2023	April 20, 2024
11	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
12	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023
13	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 14, 2023	April 13, 2024
14	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 14, 2023	April 13, 2024
15	Horn Antenna (18-26.5GHz)	/	UG-598AU	GTS664	Oct. 30, 2022	Oct. 29, 2023
16	Horn Antenna (26.5-40GHz)	AH Systems	SAS-573	GTS665	Oct. 30, 2022	Oct. 29, 2023
17	FSV-Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 13, 2023	March 12, 2024
18	Amplifier	/	LNA-1000-30S	GTS650	April 14, 2023	April 13, 2024
19	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS668	Dec. 20, 2022	Dec.19, 2023
20	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 19, 2023	April 18, 2024

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	July 12, 2022	July 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	April 14, 2023	April 13, 2024
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Thermo meter	JINCHUANG	GSP-8A	GTS642	April 19, 2023	April 18, 2024
7	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	April 14, 2023	April 13, 2024
8	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 14, 2023	April 13, 2024
9	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 14, 2023	April 13, 2024
10	Antenna end assembly	Weinschel	1870A	GTS560	April 14, 2023	April 13, 2024

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 14, 2023	April 13, 2024
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 14, 2023	April 13, 2024
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 14, 2023	April 13, 2024
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 14, 2023	April 13, 2024
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 14, 2023	April 13, 2024
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 14, 2023	April 13, 2024
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 14, 2023	April 13, 2024
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 19, 2023	April 18, 2024

3 CONDUCTED EMISSION

3.1 TEST LIMIT

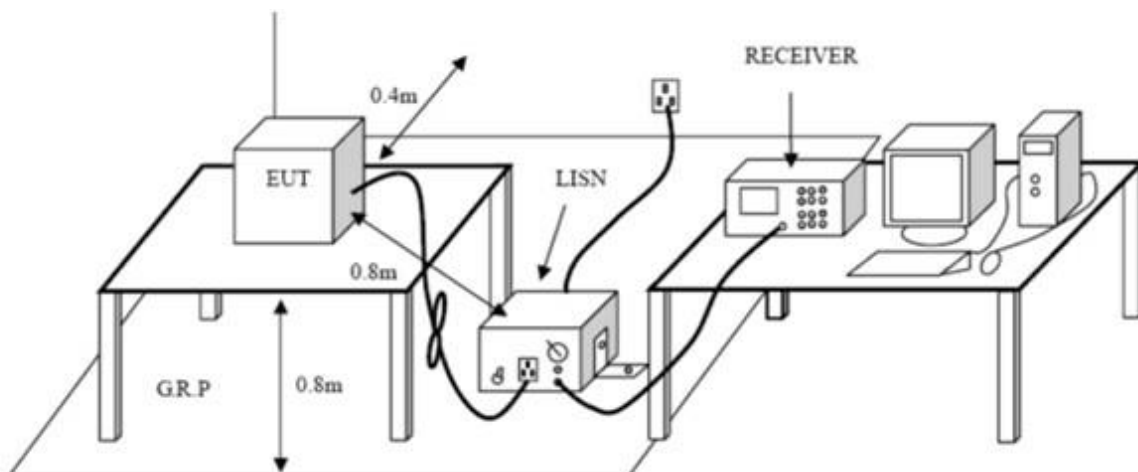
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	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.

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 TEST SETUP



3.3 TEST PROCEDURE

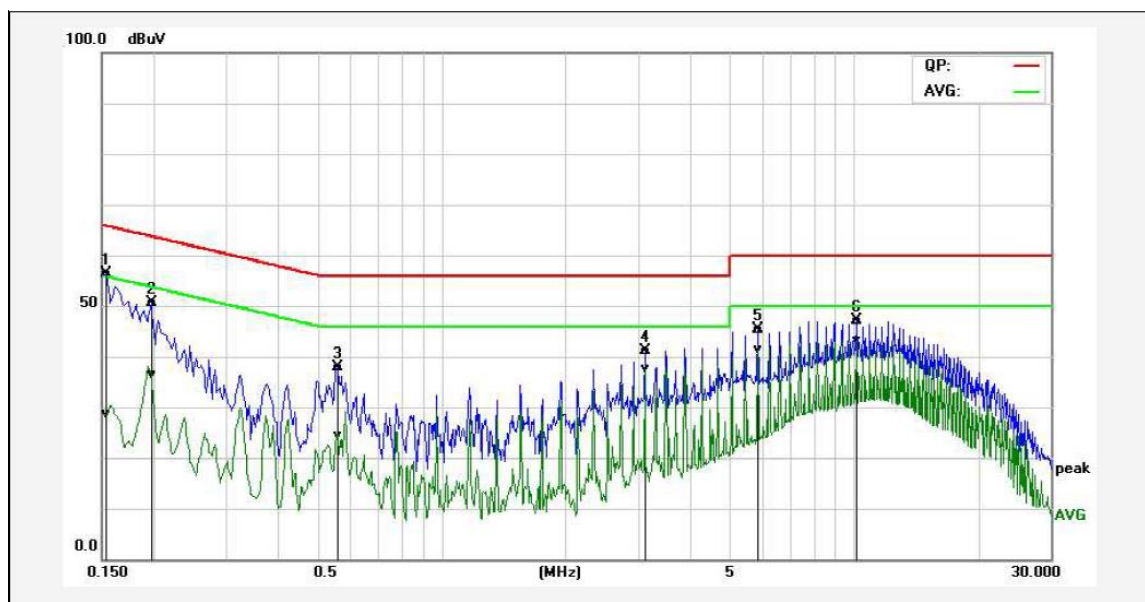
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is placed on a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's 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.

3.4 TEST RESULT

PASS

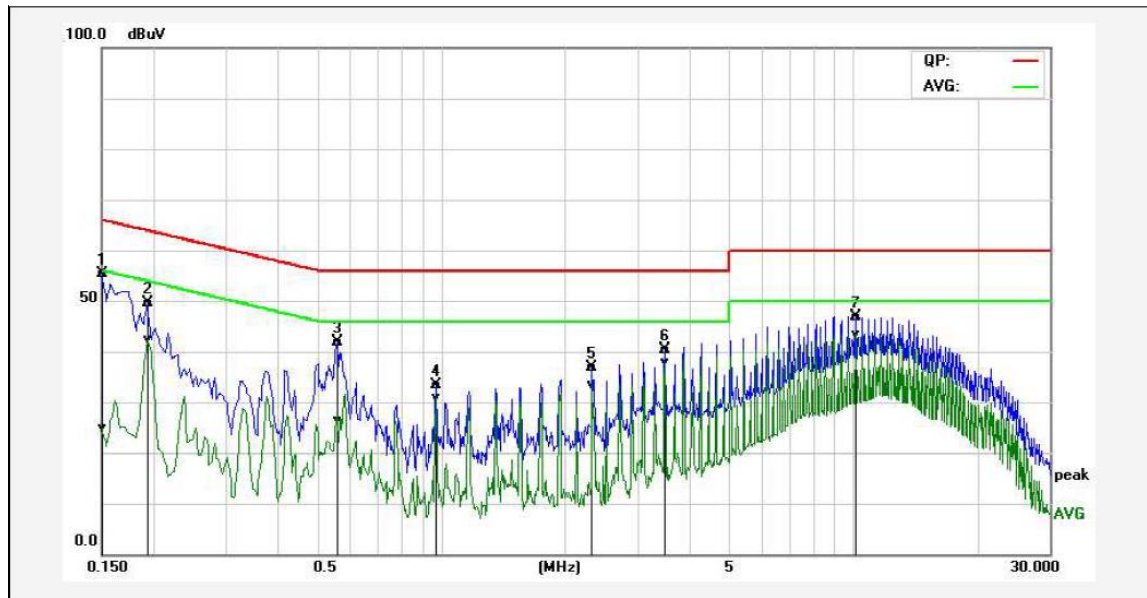
Remark: EUT was tested at AC 120V and 240V, only the worst result of AC 120V was reported.

Temperature:	24°C	Relative Humidity:	48%
Test Date:	Jun. 15, 2023	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode 10		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1539	46.14	18.46	10.12	56.26	28.58	65.78	55.79	-9.52	-27.21	Pass
2P	0.1980	40.38	26.30	10.14	50.52	36.44	63.69	53.69	-13.17	-17.25	Pass
3P	0.5620	27.88	14.38	10.10	37.98	24.48	56.00	46.00	-18.02	-21.52	Pass
4P	3.1180	30.89	27.38	10.21	41.10	37.59	56.00	46.00	-14.90	-8.41	Pass
5P	5.8460	35.20	31.28	10.21	45.41	41.49	60.00	50.00	-14.59	-8.51	Pass
6*	10.1340	36.90	32.98	10.15	47.05	43.13	60.00	50.00	-12.95	-6.87	Pass

Temperature:	24°C	Relative Humidity:	48%
Test Date:	Jun. 15, 2023	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode 10		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1500	45.41	14.96	10.01	55.42	24.97	65.99	56.00	-10.57	-31.03	Pass
2P	0.1940	39.49	32.34	10.03	49.52	42.37	63.86	53.86	-14.34	-11.49	Pass
3P	0.5620	31.78	16.37	9.99	41.77	26.36	56.00	46.00	-14.23	-19.64	Pass
4P	0.9740	23.39	20.97	10.02	33.41	30.99	56.00	46.00	-22.59	-15.01	Pass
5P	2.3300	26.83	23.31	10.04	36.87	33.35	56.00	46.00	-19.13	-12.65	Pass
6P	3.4940	30.35	27.75	10.09	40.44	37.84	56.00	46.00	-15.56	-8.16	Pass
7*	10.1340	36.85	33.18	10.10	46.95	43.28	60.00	50.00	-13.05	-6.72	Pass

Remark: 1. Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

2. The test mode 10 was the worst case and only the data of the worst case record in this report.

4 RADIATED EMISSION

4.1 TEST LIMIT

CFR 47 Part 15, section 15.205

Only spurious emissions are permitted in any of the frequency bands listed the tables in these sections :

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

CFR 47 Part 15, section 15.209

The emissions from an intentional radiator shall not exceed the limits in the tables in these sections using an average detector:

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

Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	$20\log(2400/F(\text{KHz})) + 40\log(300/3)$	3
0.490-1.705	$20\log(24000/F(\text{KHz})) + 40\log(30/3)$	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

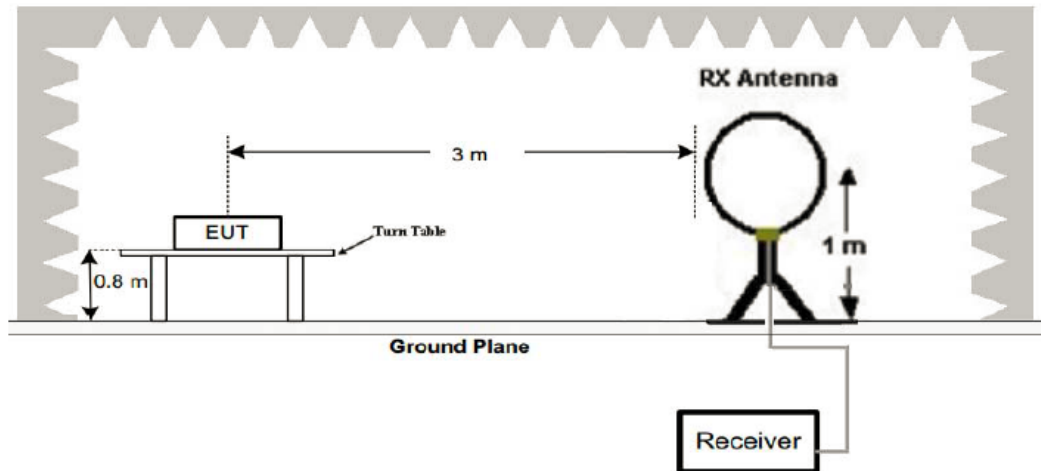
CFR 47 Part 15, section 15.35

When average radiated emission measurements are specified, the limit on the peak level of the radio Frequency emission is 20dB above the maximum permitted average emission limit.

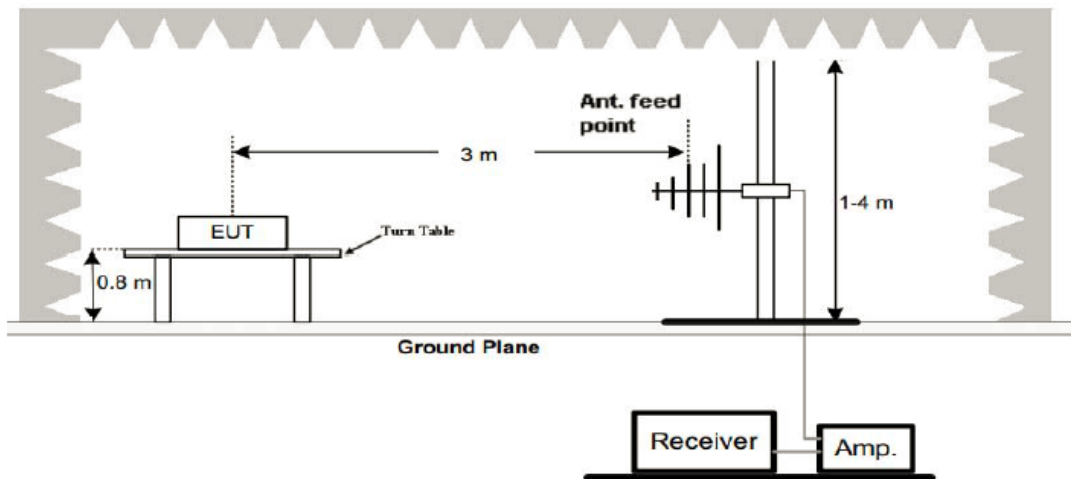
Transmitter Spurious Emissions 9KHz-30MHz			
	9-150KHz	150-490KHz	490KHz-30MHz
Resolution Bandwidth	200Hz	9KHz	9KHz
Video Bandwidth	2KHz	100KHz	100KHz
Detector	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto

4.2 TEST SETUP

1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency 30MHz~1GHz



4.3 TEST PROCEDURE

1. Measurement distance is 3m.
2. For the measurement range up to 30MHz in the following plots the field strength result from 3m.
3. Distance measurement are extrapolated to 300m and 30m distance respectively, by 40dB/decade.
According to part 15.31(f)(2), per antenna factor scaling.
4. Measurements below 1000MHz are performed with a peak detector and compared to average limits.
Measurements with an average detector are not required.

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 TEST RESULT

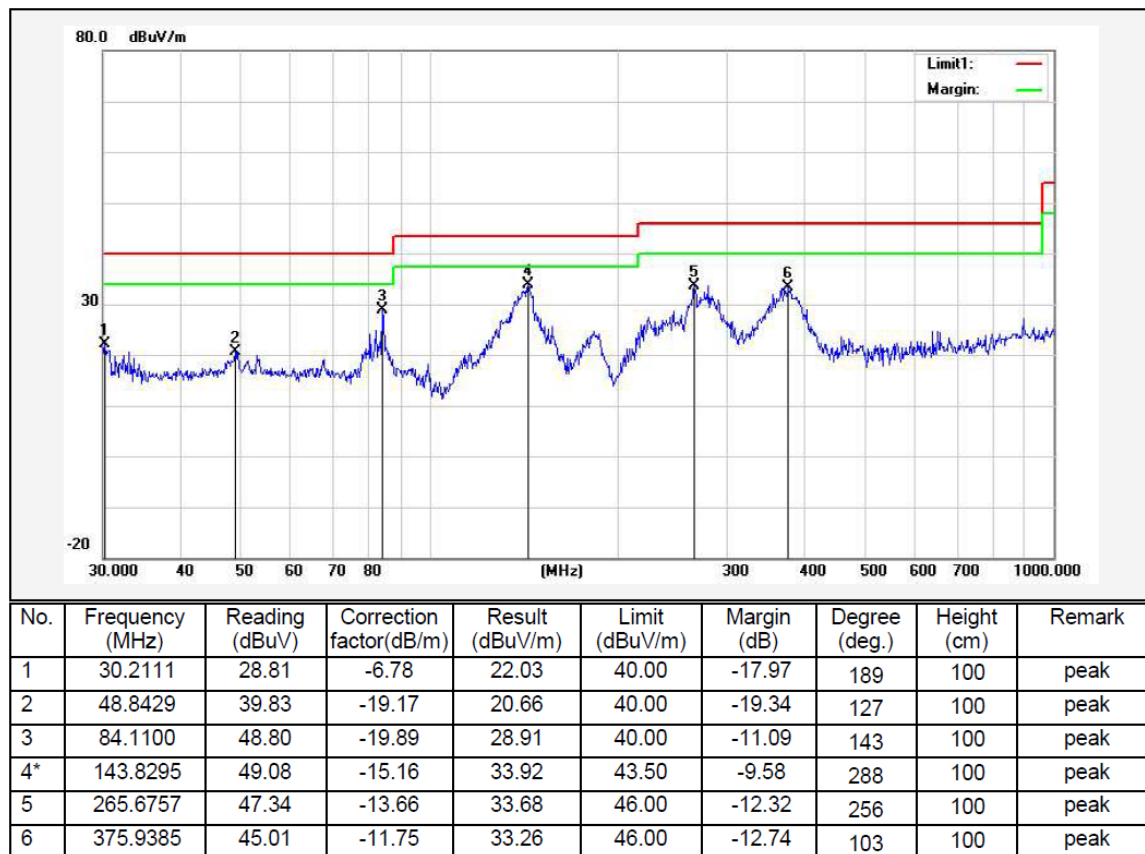
PASS

For 9KHz-30MHz Test Results:

Frequency (MHz)	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limits 3m (dBuV/m)	Margin (dBuV/m)
0.1218	PK	70.11	15.46	85.57	105.89	-20.32
0.1336	PK	65.47	15.61	84.12	105.09	-20.97
0.1274	PK	62.89	15.34	83.29	105.50	-22.21
0.816	PK	37.07	15.92	52.99	69.37	-16.38
1.754	PK	28.65	16.24	44.89	69.50	-24.61
2.513	PK	32.17	15.27	47.44	69.50	-22.06
4.786	PK	31.73	15.61	47.34	69.50	-22.16
8.241	PK	31.54	15.63	47.17	69.50	-22.33

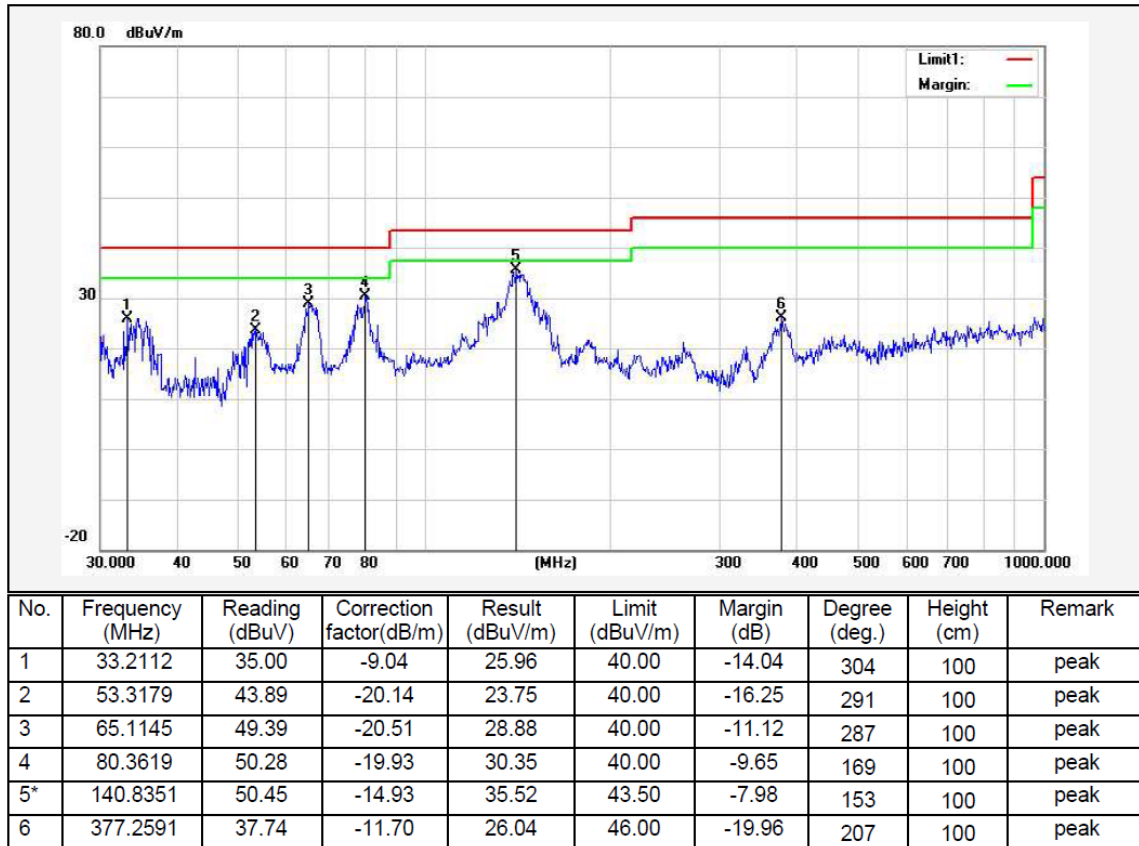
For 30MHz-1GHz Test Results:

Temperature:	24°C	Relative Humidity:	48%
Test Date:	Jun. 15, 2023	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode 10		



Remark: Result = Reading Level + Factor, Margin = Result – Limit
 Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	24°C	Relative Humidity:	48%
Test Date:	Jun. 15, 2023	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode 10		



Remark: Result = Reading Level + Factor, Margin = Result – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Remark:

- * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- The test mode 10 was the worst case and only the data of the worst case record in this report.

5 ANTENNA REQUIREMENT

Standard Applicable:

For intentional device, according to FCC 47 CFR Section 15.203, 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.

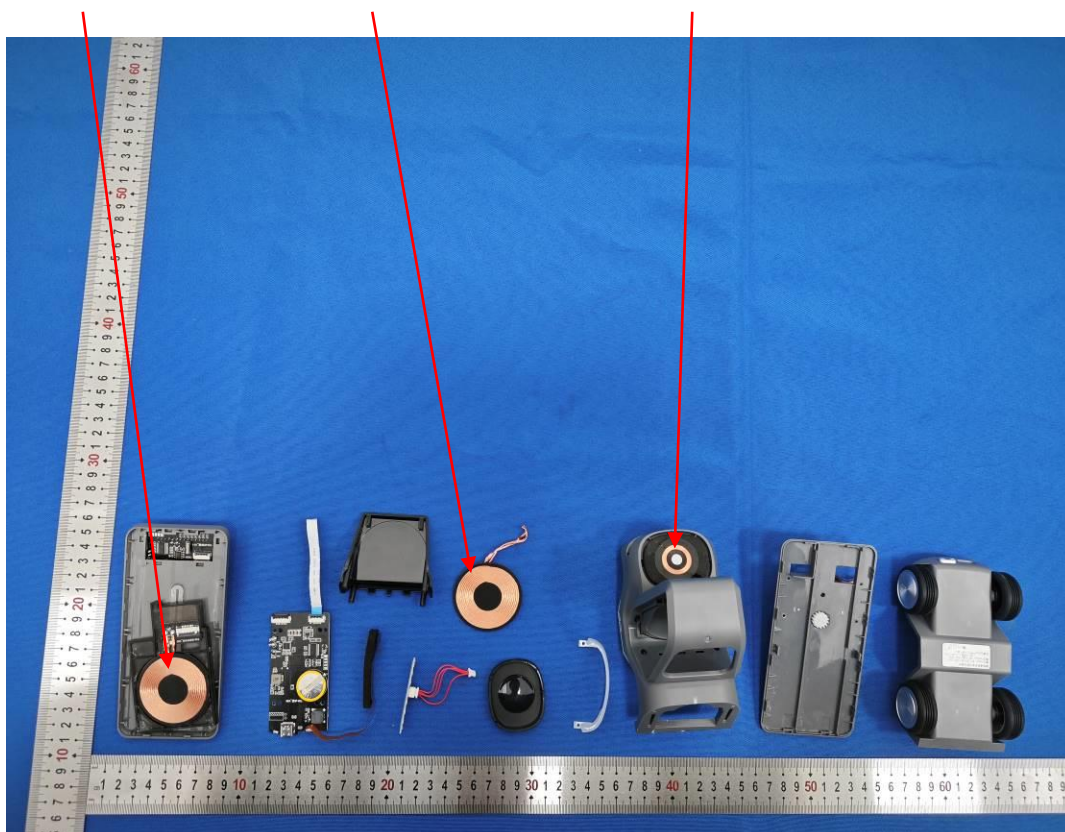
Antenna Connected Construction:

The antenna used in this product is Coil Antenna, The directional gains of antenna used for transmitting is 0dBi.

ANTENNA 1:

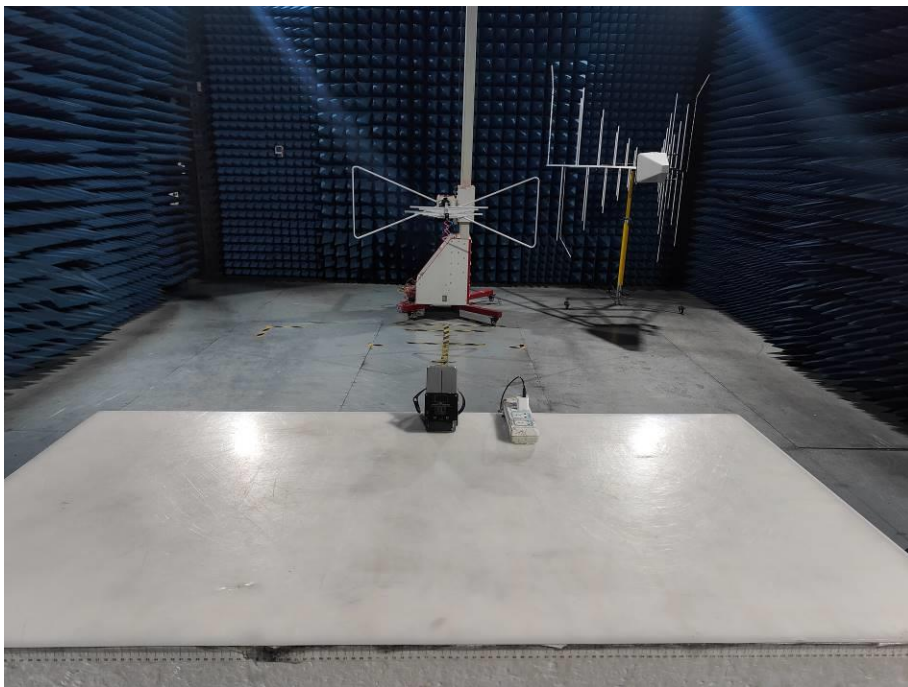
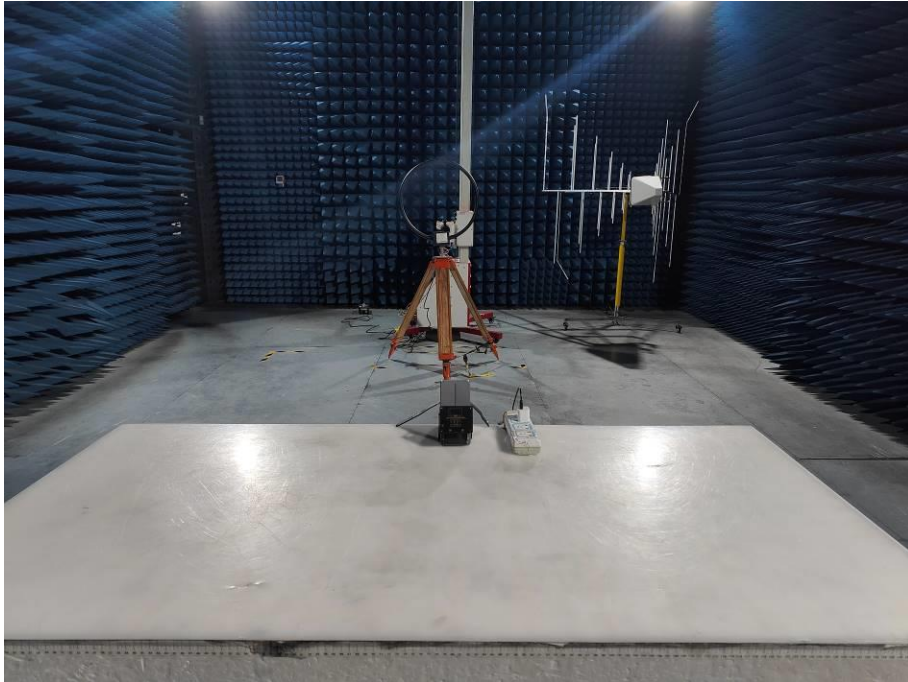
ANTENNA 2:

ANTENNA 3:

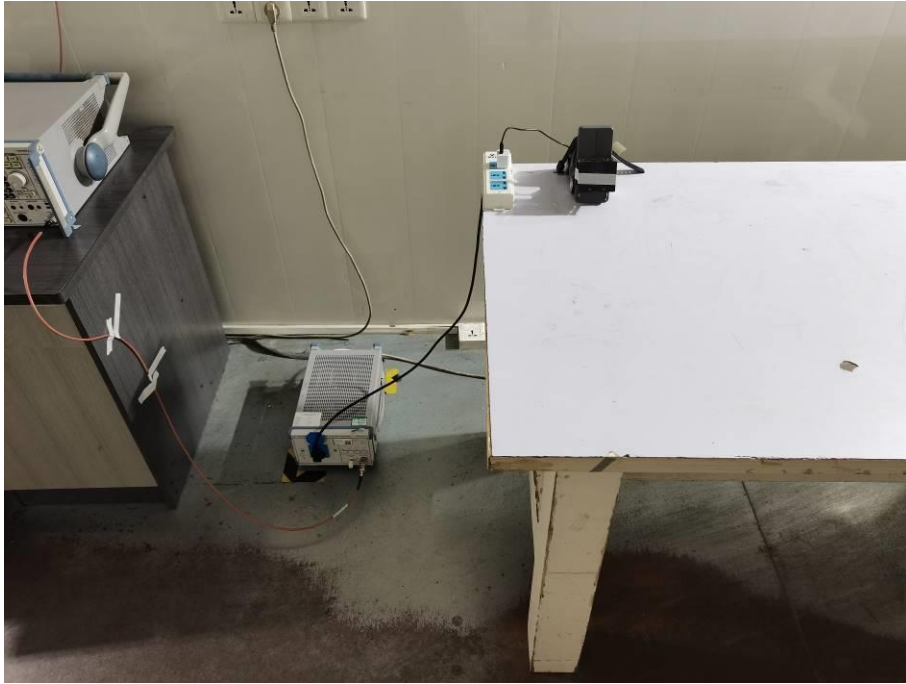


6 PHOTO OF TEST

6.1 RADIATED EMISSION



6.2 CONDUCTED EMISSION



End of Report