FCC Part 15B Test Report

FCC ID:2AXQX-4001360

Report No.	:	TBR-C-202204-0402-232
Applicant	:	Marpac, LLC
Equipment Under Test (EUT)		
EUT Name	:	Hushh Dreamseeker, Hushh+
Model(s)	:	4001360
Series Model No.	:	----
Brand Name	:	Yogasleep
Sample ID	:	202204-0402-01-1#&202204-0402-01-2#
Receipt Date	:	2022-07-11
Test Date	:	2022-07-11 to 2022-07-28
Issue Date	:	2022-08-01
Standards	:	FCC 47 CFR Part 15 Subpart B
Conclusions	:	**PASS**

In the configuration tested, the EUT complied with the standards specified above

The EUT technically complies with the FCC requirements

Test/Witness Engineer	:	Camille Li
Engineer Supervisor	:	Ivan Su
Engineer Manager	:	Ray Lai

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Contents

Revision History

Report No.	Version	Description	Issued Date
TBR-C-202204-0402-232	Rev.01	Initial issue of report	2022-08-01

1. General Information

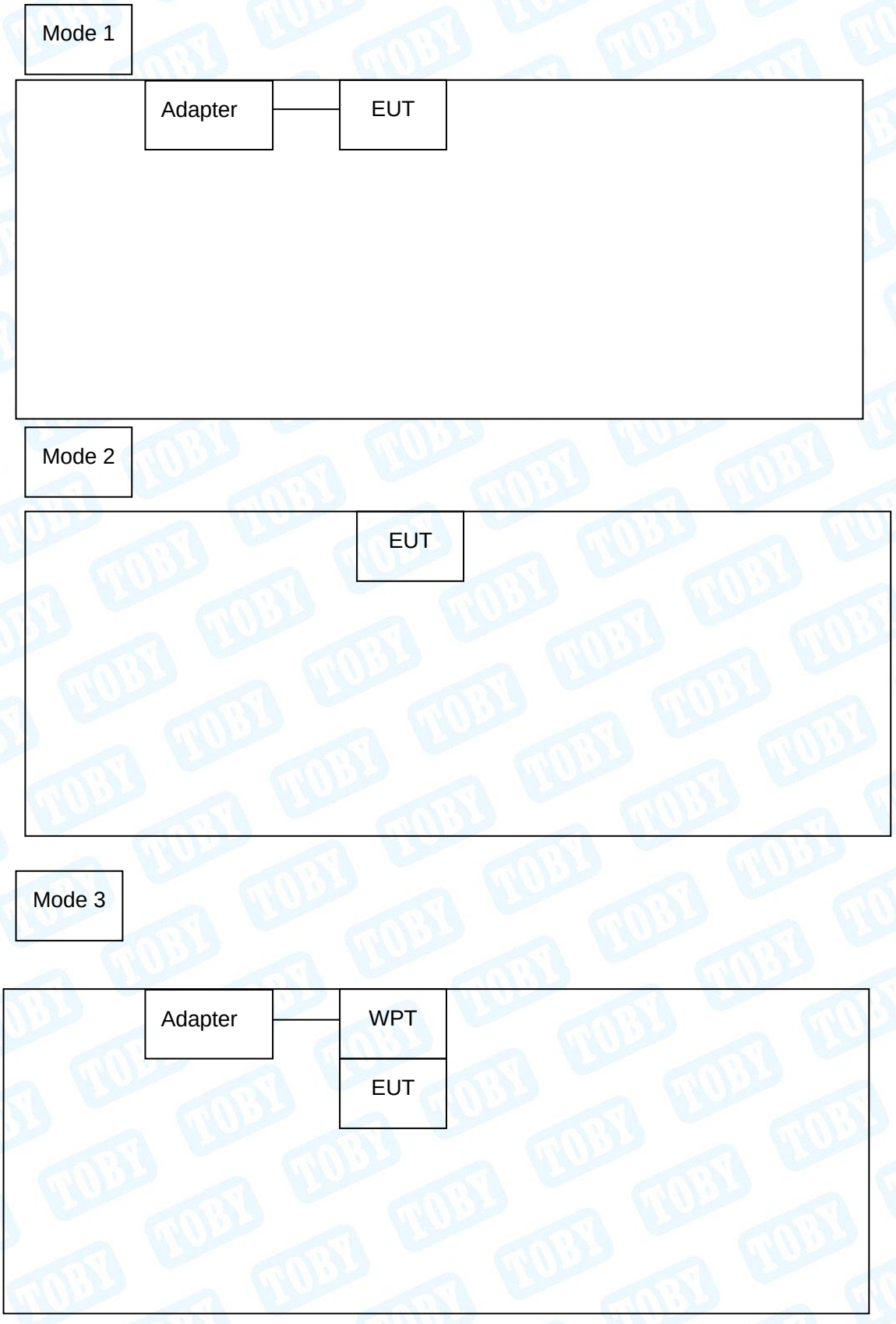
1.1 Client Information

Applicant	:	Marpac, LLC
Address	:	2015 Capital Drive, Wilmington, NC 28405
Manufacturer	:	Shen zhen Hi-FiD Electronics Tech Co., Ltd
Address	:	4F~ 5F B7 & 3F B17, Hengfeng Industrial Town, Zhoushi Road, Bao'an District, Shenzhen City, China. 518126.

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Hushh Dreamseeker, Hushh+
Model(s)	:	4001360
Model Difference	:	----
Brand Name	:	Yogasleep
Fx	:	2.4G
Power Supply	:	Input: 5V⎓, 1A DC 3.7V by 1800mAh Rechargeable Li-ion battery
Equipment	:	☐ Class A ☒ Class B
Class A Equipment: the Equipment is not intended primarily for use in a residential environment. **Class B Equipment:** the Equipment is intended primarily for use in a residential environment. **Fx** is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.		

1.3 Block Diagram Showing The Configuration of System Tested



1.4 Description of Support Units

Equipment Information				
Name	**Model**	**S/N**	**Manufacturer**	**Used " √ "**
Adapter	----	----	HUAWEI	√

Cable Information				
Number	**Shielded Type**	**Ferrite Core**	**Length**	**Note**
Cable 1	Yes	NO	1.05M	Accessory

Remark: The USB Cable provided by the Applicant, The adapter provided by TOBY test lab.

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

Pretest Mode	Description
Mode 1	charging Mode (Adapter)
Mode 2	charging Mode (WPT)

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For Conducted Test	
Final Test Mode	**Description**
Mode 1	charging Mode (Adapter)
For Radiated Test	
Final Test Mode	**Description**
Mode 1	charging Mode (Adapter)
Mode 2	charging Mode (WPT)

1.6 Test standards

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.107, 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.7 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong,, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

1.8 Measurement Uncertainty

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

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.50 dB ±3.10 dB	±4.0 dB ±3.6 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.50 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB	±5.2 dB

2. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE

3. Test Summary

Test Items	Test Requirement	Test Method	Result
Conducted Emission	FCC 47 CFR Part 15 Section 15.107	ANSI C63.4-2014	Pass
Radiated Emission	FCC 47 CFR Part 15 Section 15.109	ANSI C63.4-2014	Pass
Note: N/A is an abbreviation for Not Applicable.			

4. Test Equipment Used

Conducted Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jun. 23, 2022	Jun. 22, 2023
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jun. 23, 2022	Jun. 22, 2023
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jun. 22, 2022	Jun. 21, 2023
LISN	Rohde & Schwarz	ENV216	101131	Jun. 22, 2022	Jun. 21, 2023
Radiation Emission Test (A Site)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jun. 23, 2022	Jun. 22, 2023
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jun. 23, 2022	Jun. 22, 2023
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Feb. 27, 2022	Feb.26, 2024
Horn Antenna	ETS-LINDGREN	3117	00143207	Feb. 26, 2022	Feb.25, 2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Feb. 26, 2022	Feb.25, 2024
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Feb. 26, 2022	Feb.25, 2024
Pre-amplifier	SONOMA	310N	185903	Feb. 26, 2022	Feb.25, 2023
Pre-amplifier	HP	8449B	3008A00849	Feb. 26, 2022	Feb.25, 2023
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Sep. 03, 2021	Sep. 02, 2022
Radiation Emission Test (B Site)					
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 03, 2021	Sep. 02, 2022
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jun. 23, 2022	Jun. 22, 2023
EMI Test Receiver	Rohde & Schwarz	ESU-8	100472/008	Feb. 26, 2022	Feb.25, 2023
Bilog Antenna	SCHWARZBECK	VULB 9168	1225	Dec. 05, 2021	Dec. 04, 2023
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2463	Feb. 26, 2022	Feb.25, 2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Jun. 26, 2022	Jun.25, 2024
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jun. 26, 2022	Jun.25, 2024
HF Amplifier	Tonscend	TAP9E6343	AP21C806117	Sep. 03, 2021	Sep. 02, 2022
HF Amplifier	Tonscend	TAP051845	AP21C806141	Sep. 03, 2021	Sep. 02, 2022
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Sep. 03, 2021	Sep. 02, 2022

5. Label Requirements & Statement Requirements

☒ **Class B**

Label Requirements

Class B digital device subject to certification by the FCC shall carry a warning label which includes the following statement:

*** * * W A R N I N G * * ***

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.

☐ **Class A**

Statement Requirements

The operator's manual for a Class A digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses, and can radiate radio frequency energy and, if not installed and uses in accordance with the instruction manual, may cause harmful interference to radio communications Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

*** * * * * * * * ***

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:
Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

6. Conducted Emission Test

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC Part 15.107

6.1.2. Test Limit

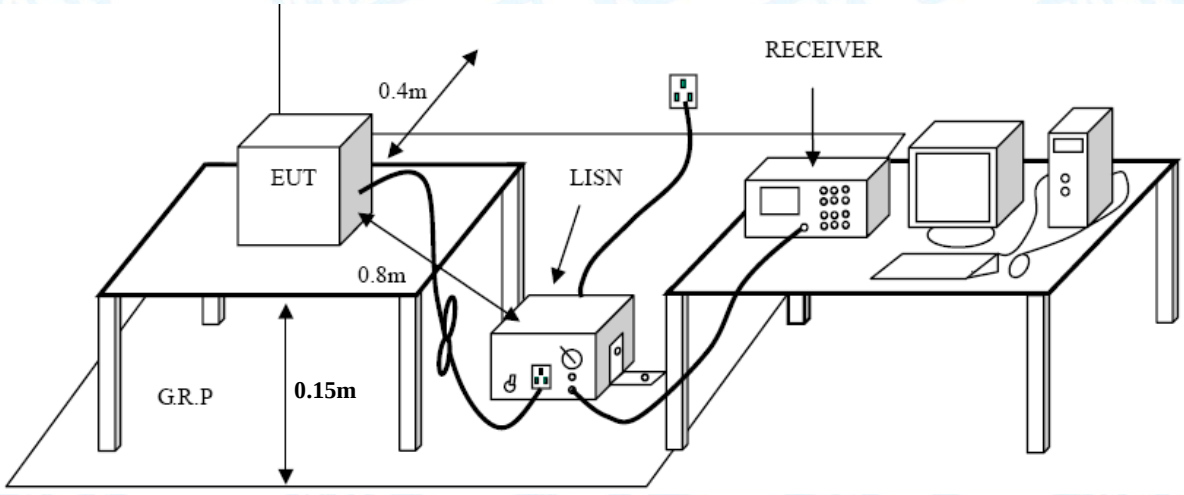
Conducted Emission Test Limit (Class A)

Frequency (MHz)	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
0.15~0.50	79	66
0.50~30	73	60

Conducted Emission Test Limit (Class B)

Frequency (MHz)	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
0.15~0.5	66 ~ 56 *	56 ~ 46 *
0.50~5	56	46
5~30	60	50
*decreasing linearly with logarithm of the frequency		

6.2 Test Setup



6.3 Test Procedure

The EUT was placed 0.15 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

The cables shall be insulated (by up to 15 cm) from the horizontal ground reference plane, and shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

6.4 Deviation From Test Standard

No deviation

6.5 Test Data

Please refer to the Attachment A.

7. Radiated Emission Test

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 15.109

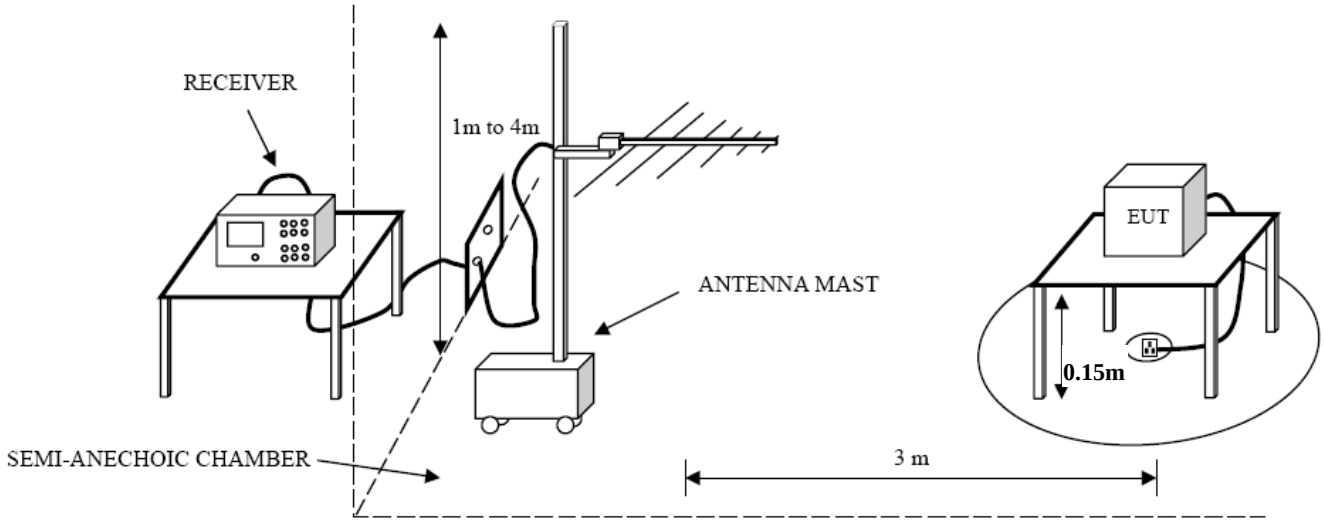
7.1.2 Test Limit

Radiated Emission Test Limit (Class A)	
Frequency MHz	**Field Strengths Limits dB(μV/m)**
30～88	49.0
88～216	53.5
216～960	56.4
Above 960	59.5
Radiated Emission Test Limit (Class B)	
Frequency MHz	**Field Strengths Limits dB(μV/m)**
30～88	40.0
88～216	43.5
216～960	46.0
Above 960	54.0
* The lower limit shall apply at the transition frequency. * The test distance is 3m.	

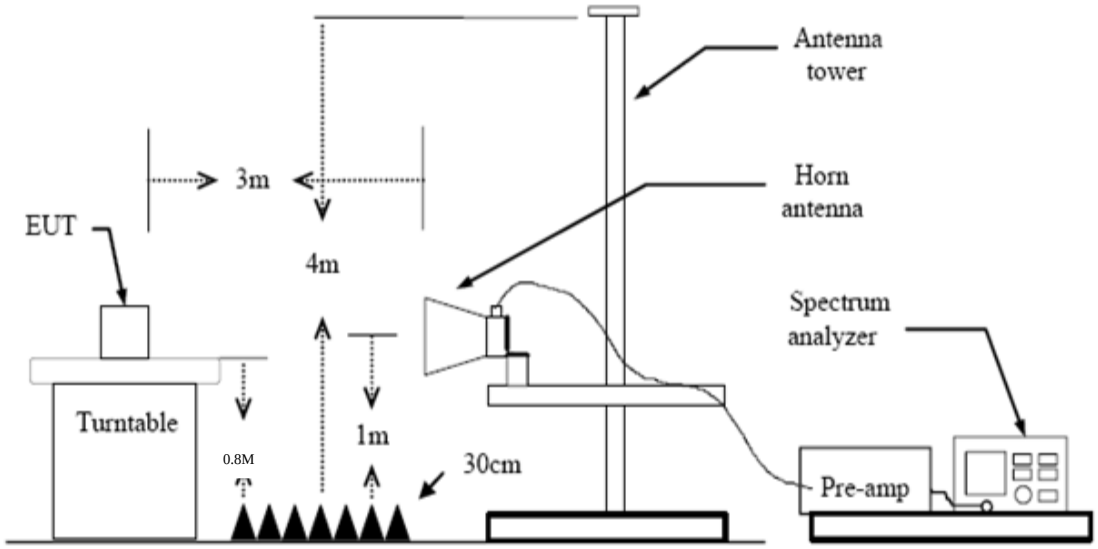
Frequency (MHz)	**Class A Radiated Limit (dBμV/m)- Distance of 3 metres**	
	Linear Average Detector	Peak Detector
＞1000	59.5	79.5
Frequency (MHz)	**Class B Radiated Limit (dBμV/m)-Distance of 3 metres**	
	Linear Average Detector	Peak Detector
＞1000	54	74
Note：		

Highest Frequency Generated or Used in Device	Upper Frequency of Radiated Measurement
Below 1.705 MHz	No radiated testing required
1.705 MHz – 108 MHz	1 GHz
108 MHz – 500 MHz	2 GHz
500 MHz – 1 GHz	5 GHz
Above 1 GHz	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower.

7.2 Test Setup



Below 1G



Above 1G

7.3 Test Procedure

The EUT was placed on the top of a rotating table which is 0.8 meters above the ground. EUT is set 3.0 meters away from the receiving antenna that mounted on a antenna tower. The table was rotated 360 degrees to determine the position of the highest radiation, the antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

Measurements shall be made with a quasi-peak measuring receiver in the frequency range 30MHz to 1000MHz. If the Peak Mode measured value compliance with and lower than quasi-peak mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. Measurements shall be made with a Peak and AVG measuring receiver in the frequency range Above 1000MHz.

7.4 Deviation From Test Standard

No deviation

7.5 Test Data

Please refer to the Attachment B.

8. Photographs - Constructional Details

Photo 1 Appearance of EUT

Photo 2 Appearance of EUT

Photo 3 Appearance of EUT

Photo 4 Appearance of EUT

Photo 5 Appearance of EUT

Photo 6 Appearance of EUT

Photo 7 Internal of EUT

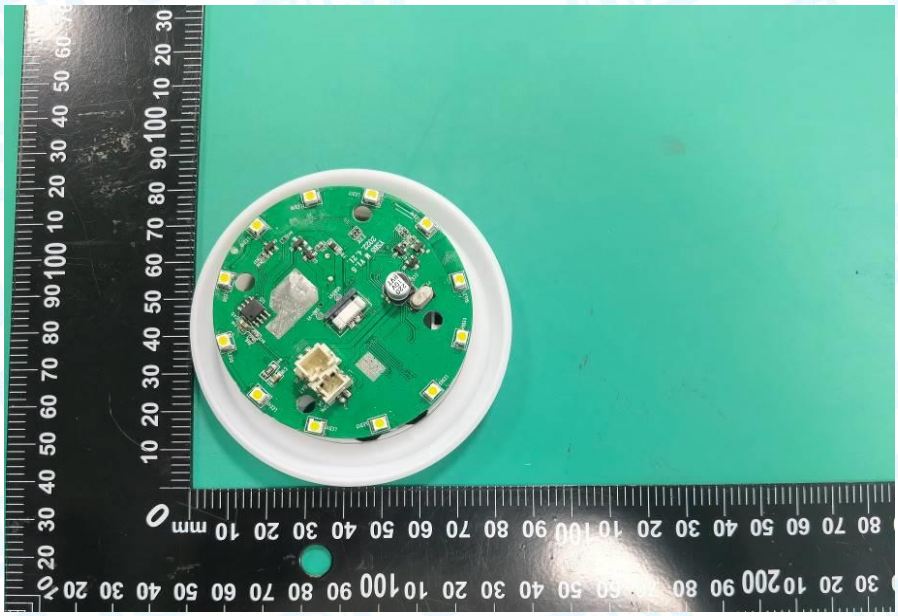


Photo 8 Appearance of PCB

Photo 9 Appearance of PCB

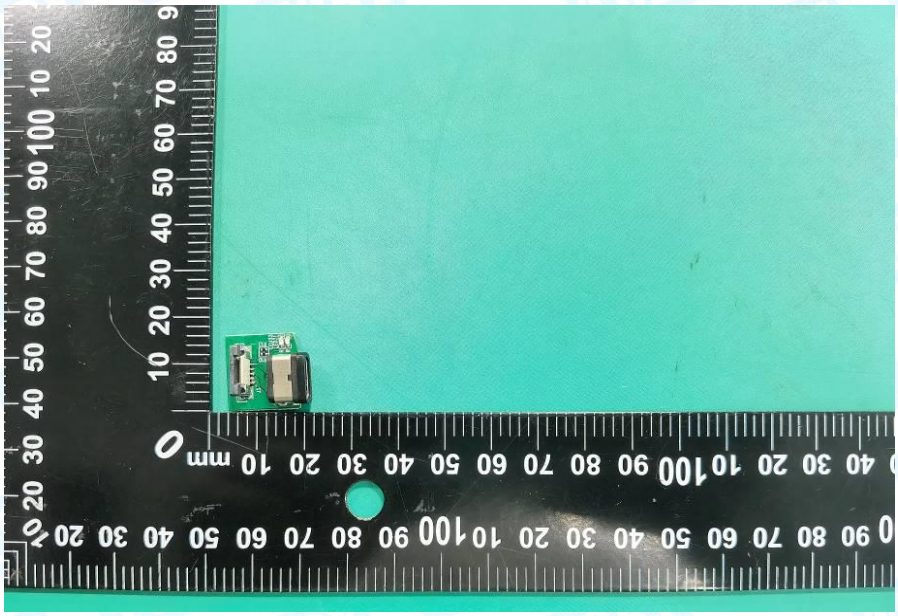


Photo 10 Appearance of PCB

Photo 11 Battery parameters

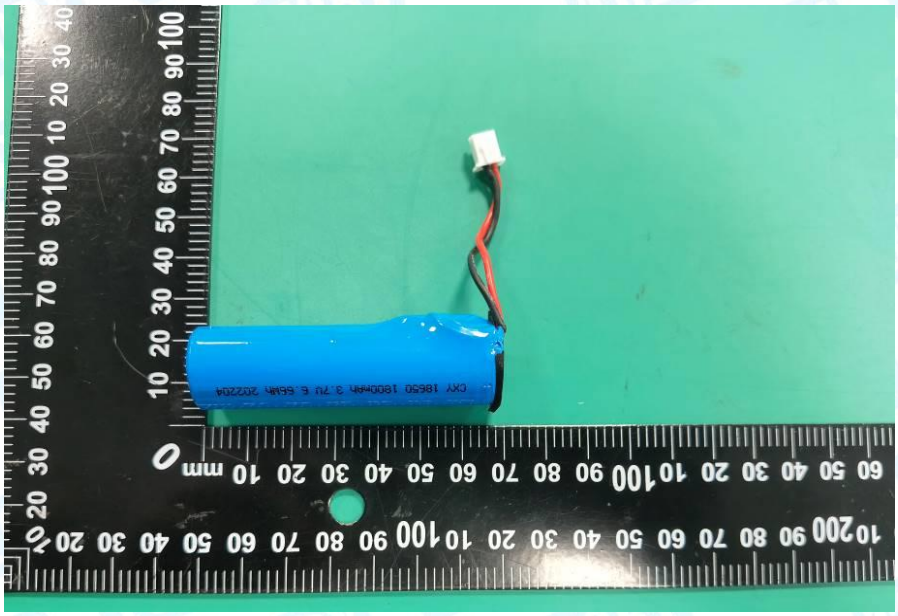
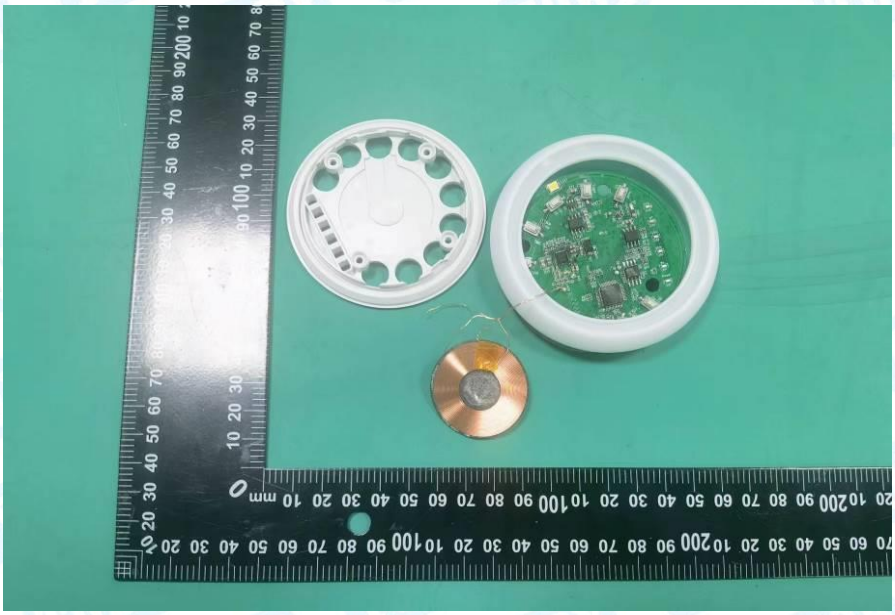
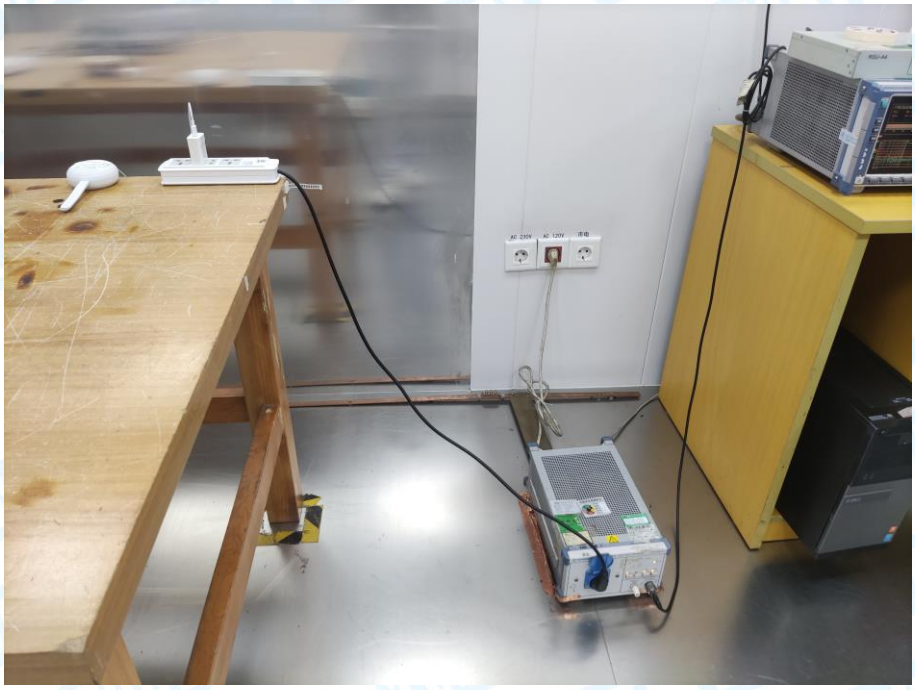


Photo 12 Appearance of PCB



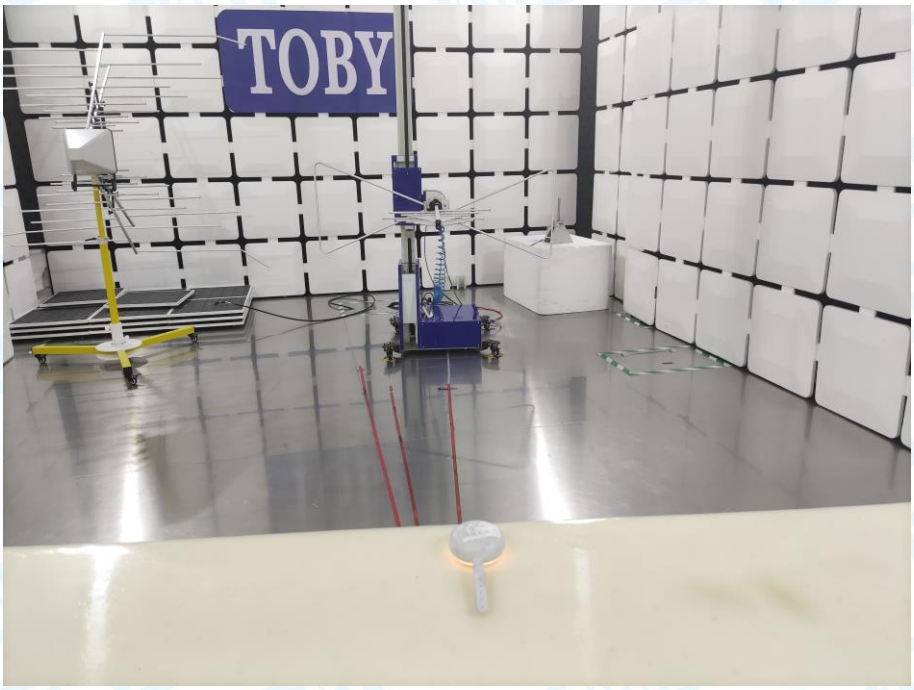
9. Photographs - Test Setup

Conducted Emission Test Setup



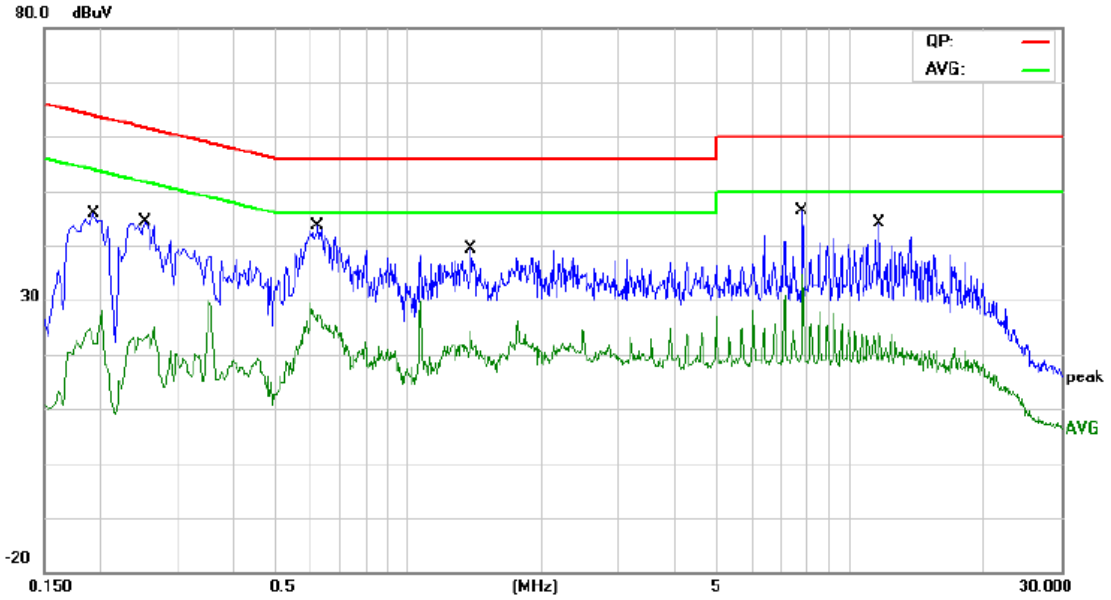
Radiated Emission Test Setup-Below 1GHz

Radiated Emission Test Setup(Below 1G)



Attachment A--Conducted Emission Test Data

Temperature:	24.4℃	**Relative Humidity:**	44%
Test Voltage:	AC 120V/60Hz		
Terminal:	Line		
Test Mode:	Mode 1		
Remark:	Only worse case is reported		

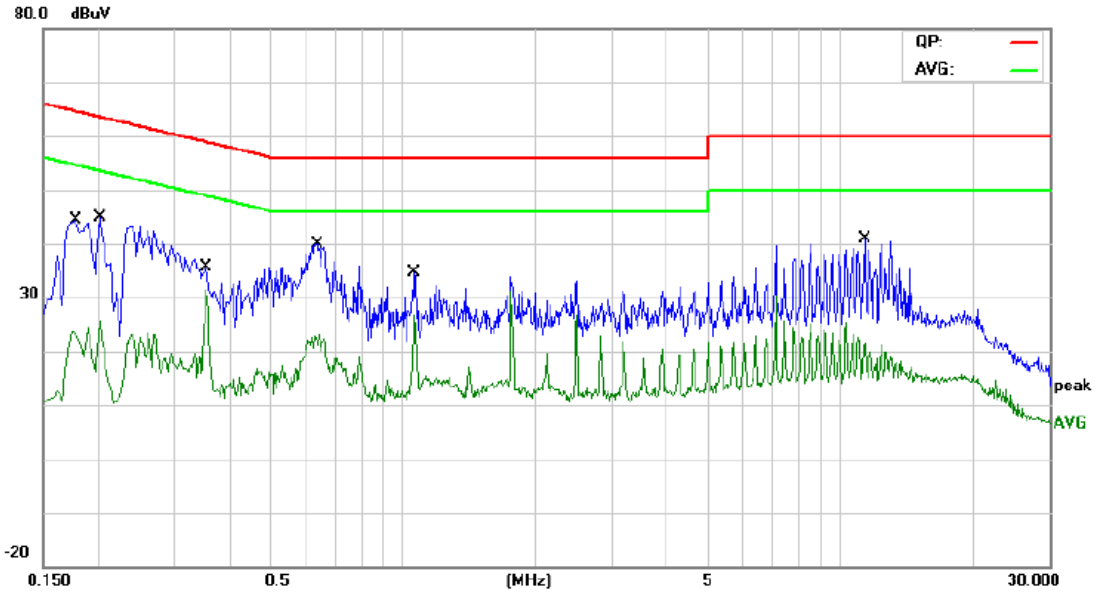


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1940	29.44	11.10	40.54	63.86	-23.32	QP
2		0.1940	10.84	11.10	21.94	53.86	-31.92	AVG
3		0.2540	27.81	11.04	38.85	61.62	-22.77	QP
4		0.2540	9.85	11.04	20.89	51.62	-30.73	AVG
5	*	0.6260	27.19	10.89	38.08	56.00	-17.92	QP
6		0.6260	15.58	10.89	26.47	46.00	-19.53	AVG
7		1.3860	19.25	10.63	29.88	56.00	-26.12	QP
8		1.3860	9.79	10.63	20.42	46.00	-25.58	AVG
9		7.8060	21.67	10.09	31.76	60.00	-28.24	QP
10		7.8060	12.96	10.09	23.05	50.00	-26.95	AVG
11		11.6380	22.41	10.23	32.64	60.00	-27.36	QP
12		11.6380	10.61	10.23	20.84	50.00	-29.16	AVG

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) =QuasiPeak/Average (dBuV)-Limit (dBuV)

Temperature:	24.4℃	**Relative Humidity:**	44%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	Mode 1		
Remark:	Only worse case is reported		



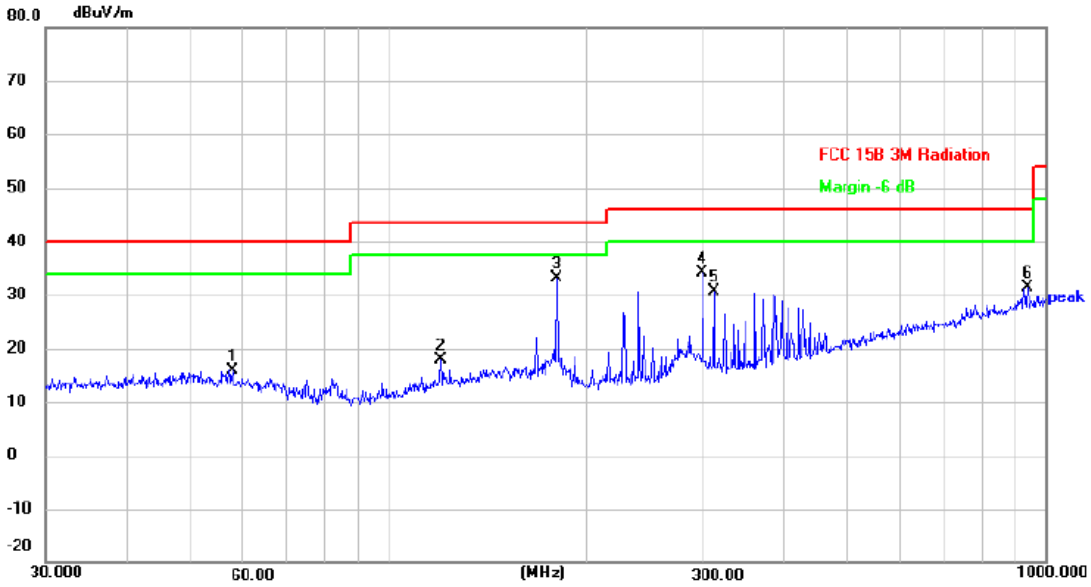
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1780	28.94	11.05	39.99	64.57	-24.58	QP
2		0.1780	9.37	11.05	20.42	54.57	-34.15	AVG
3		0.2020	28.04	11.12	39.16	63.52	-24.36	QP
4		0.2020	7.66	11.12	18.78	53.52	-34.74	AVG
5		0.3540	21.39	10.93	32.32	58.87	-26.55	QP
6		0.3540	19.59	10.93	30.52	48.87	-18.35	AVG
7		0.6340	24.15	10.88	35.03	56.00	-20.97	QP
8		0.6340	11.06	10.88	21.94	46.00	-24.06	AVG
9		1.0620	20.89	10.69	31.58	56.00	-24.42	QP
10	*	1.0620	17.18	10.69	27.87	46.00	-18.13	AVG
11		11.3740	15.81	10.23	26.04	60.00	-33.96	QP
12		11.3740	6.72	10.23	16.95	50.00	-33.05	AVG

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) =QuasiPeak/Average (dBuV)-Limit (dBuV)

Attachment B--Radiated Emission Test Data

----Below 1G

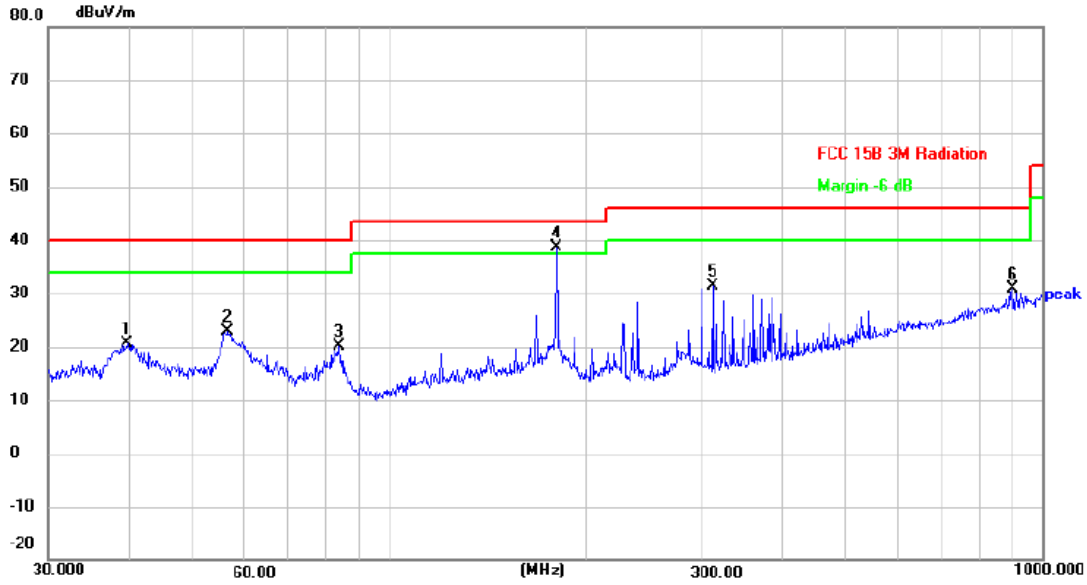
Temperature:	24.3℃	**Relative Humidity:**	45%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	Mode 1		
Remark:	Only showed test data of the worst mode.		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	57.7962	39.24	-23.38	15.86	40.00	-24.14	peak	P
2	119.8556	41.10	-23.29	17.81	43.50	-25.69	peak	P
3 *	180.0165	56.15	-23.13	33.02	43.50	-10.48	peak	P
4	300.3672	54.85	-20.64	34.21	46.00	-11.79	peak	P
5	312.1794	51.18	-20.51	30.67	46.00	-15.33	peak	P
6	938.8326	39.45	-8.11	31.34	46.00	-14.66	peak	P

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

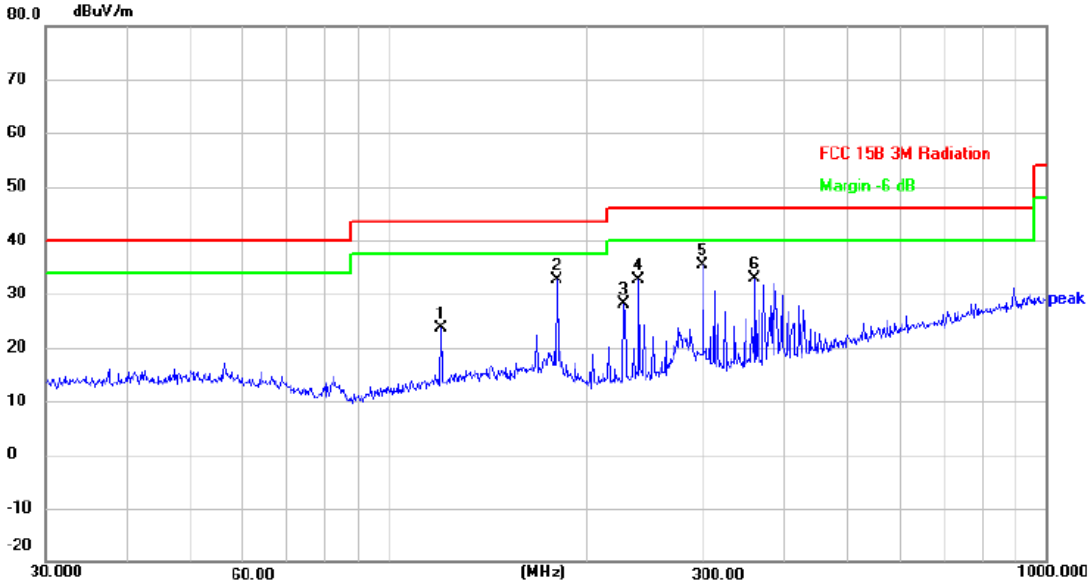
Temperature:	24.3℃	**Relative Humidity:**	45%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	Mode 1		
Remark:	Only showed test data of the worst mode.		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	39.7146	43.62	-23.03	20.59	40.00	-19.41	peak	P
2	56.5929	46.12	-23.25	22.87	40.00	-17.13	peak	P
3	83.5222	46.63	-26.62	20.01	40.00	-19.99	peak	P
4 *	180.0165	61.76	-23.13	38.63	43.50	-4.87	peak	P
5	312.1794	51.99	-20.51	31.48	46.00	-14.52	peak	P
6	900.1474	39.37	-8.55	30.82	46.00	-15.18	peak	P

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

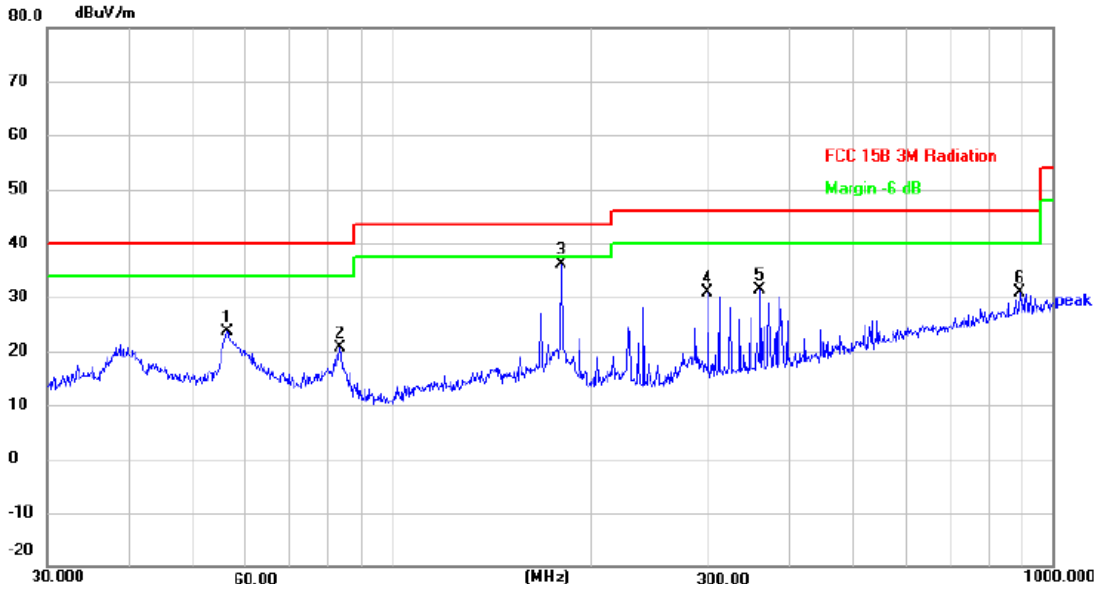
Temperature:	24.3℃	Relative Humidity:	45%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	Mode 2		
Remark:	Only showed test data of the worst mode.		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	119.8556	47.00	-23.29	23.71	43.50	-19.79	peak	P
2	180.0165	55.87	-23.13	32.74	43.50	-10.76	peak	P
3	227.6906	51.29	-23.12	28.17	46.00	-17.83	peak	P
4	239.9874	55.17	-22.53	32.64	46.00	-13.36	peak	P
5 *	300.3672	56.07	-20.64	35.43	46.00	-10.57	peak	P
6	360.4476	52.31	-19.41	32.90	46.00	-13.10	peak	P

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Temperature:	24.3℃	Relative Humidity:	45%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	Mode 2		
Remark:	Only showed test data of the worst mode.		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	56.1974	46.80	-23.20	23.60	40.00	-16.40	peak	P
2	83.2298	47.24	-26.64	20.60	40.00	-19.40	peak	P
3 *	180.0165	59.29	-23.13	36.16	43.50	-7.34	peak	P
4	300.3672	51.50	-20.64	30.86	46.00	-15.14	peak	P
5	360.4476	50.83	-19.41	31.42	46.00	-14.58	peak	P
6	890.7278	39.61	-8.66	30.95	46.00	-15.05	peak	P

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

-----END OF REPORT-----