

FCC TEST REPORT

FCC ID: 2AN8FMSL-M6023Q

Product Name:	UVC Sterilizer w/ Wireless Power Bank
Trademark:	N/A
Model Number:	MSL-M6023Q 7121-78
Prepared For :	ShenZhen Mossloo Industrial CO., Ltd.
Address :	Road One No.4, Science Industrial Park, Shangxue Village, Bantian Street, Longgang District, Shenzhen, China
Prepared By :	Shenzhen BCTC Testing Co., Ltd.
Address :	BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	Jul. 29, 2020 to Aug. 4, 2020
Date of Report :	Aug. 5, 2020
Report No.:	BCTC2007002342-2E

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TEST REPORT DECLARATION

Applicant : ShenZhen Mossloo Industrial CO., Ltd.
Address : Road One No.4, Science Industrial Park, Shangxue Village,
Bantian Street, Longgang District, Shenzhen, China
EUT Description : UVC Sterilizer w/ Wireless Power Bank
Model Number : MSL-M6023Q

Test Standards:

FCC Part 15 C

This device described above has been tested by BCTC, and the test results show that the equipment under And it is applicable only to the tested sample identified in the report.

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Prepared by(Engineer): Willem Wang

Willem Wang

Reviewer(Supervisor): Eric Yang

Eric Yang

Approved(Manager): Zero Zhou

Zero Zhou



1. GENERAL INFORMATION

1.1. Report information

- 1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BCTC approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BCTC in any way guarantees the later performance of the product/equipment.
- 1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, BCTC therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BCTC, unless the applicant has authorized BCTC in writing to do so.

1.2. Measurement Uncertainty

Available upon request.

1.3. Test Facility

Site Description
Name of Firm : Shenzhen BCTC Testing Co., Ltd.

Site Location : BCTC Building & 1-2F, East of B Building,
Pengzhou Industrial, Fuyuan 1st Road, Qiaotou
Community, Fuyong Street, Bao'an District,
Shenzhen, China

1.4. Test Uncertainty

Conducted Emission = $\pm 2.66\text{dB}$
Uncertainty
Radiated Emission Uncertainty = $\pm 4.15\text{dB}$

2. PRODUCT DESCRIPTION

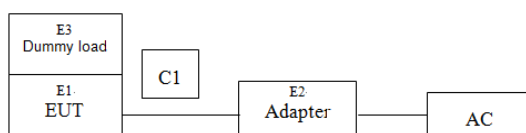
2.1.EUT Description

Description	: UVC Sterilizer w/ Wireless Power Bank
Applicant	: ShenZhen Mossloo Industrial CO., Ltd. Road One No.4, Science Industrial Park, Shangxue Village, Bantian Street, Longgang District, Shenzhen, China
Manufacturer	: ShenZhen Mossloo Industrial CO., Ltd. Road One No.4, Science Industrial Park, Shangxue Village, Bantian Street, Longgang District, Shenzhen, China
Model Number	: MSL-M6023Q 7121-78
Model Difference	: All the model are the same circuit and RF module, except model names.
Power Supply	: Battery: DC 3.7V Input:DC5V/2A USB Output: DC5V/2A Wireless Output: 5W
Work Frequency	: 112-220KHz

2.2.Test mode

Test Modes	keeping TX+Charging mode
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2.3.Block Diagram of EUT Configuration



2.4.Test Conditions

Temperature: 23~26℃

Relative Humidity: 54~63 %

2.5. Description Of Support Units (Conducted Mode)

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.	Series No.	Note
E1	UVC Sterilizer w/ Wireless Power Bank	N/A	MSL-M6023Q	N/A	EUT
E2	Adapter	N/A	BCTC-002	N/A	Auxiliary
E3	Dummy load	N/A	DL01	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO	NO	1.0M	DC cable unshielded

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

3. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted disturbance	Pass
Radiated disturbance	Pass

Remark: “N/A” means “Not applicable.”

4. TEST EQUIPMENT USED

4.1. For Conducted Emission Test

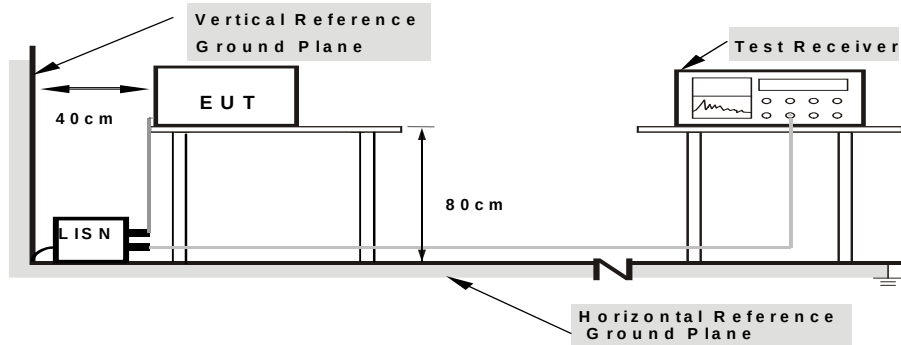
Disturbance voltages Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	Jun. 08, 2020	Jun. 07, 2021
LISN	R&S	ENV216	101375	Jun. 04, 2020	Jun. 03, 2021
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

4.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45109572	Jun. 08, 2020	Jun. 07, 2021
2	Test Receiver (9kHz-7GHz)	R&S	ESR7	101154	Jun. 08, 2020	Jun. 07, 2021
3	Bilog Antenna (30MHz-3GHz)	SCHWARZBEC K	VULB9163	VULB9163-942	Jun. 08, 2020	Jun. 07, 2021
4	Horn Antenna (1GHz-18GHz)	SCHWARZBEC K	BBHA9120D	1541	Jun. 10, 2020	Jun. 09, 2021
5	Horn Antenna (18GHz-40GHz)	SCHWARZBEC K	BBHA9170	00822	Jun. 10, 2020	Jun. 09, 2021
6	Amplifier (9KHz-6GHz)	SCHWARZBEC K	BBV9744	9744-0037	Jun. 04, 2020	Jun. 03, 2021
7	Amplifier (0.5GHz-18GHz)	SCHWARZBEC K	BBV9718	9718-309	Jun. 04, 2020	Jun. 03, 2021
8	Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	Jun. 08, 2020	Jun. 07, 2021
9	Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519B	00014	Jun. 08, 2020	Jun. 07, 2021
10	RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 08, 2020	Jun. 07, 2021
11	RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	Jun. 08, 2020	Jun. 07, 2021
12	RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	Jun. 08, 2020	Jun. 07, 2021
13	Power Metter	Keysight	E4419B	\	Jun. 08, 2020	Jun. 07, 2021
14	Power Sensor (AV)	Keysight	E9 300A	\	Jun. 08, 2020	Jun. 07, 2021
15	Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	Jun. 04, 2020	Jun. 03, 2021
16	Spectrum Analyzer 9kHz-40GHz	Agilent	FSP40	100363	Jun. 13, 2020	Jun. 12, 2021
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

5. CONDUCTED EMISSION TEST

5.1. Block Diagram of Test Setup



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure.
 The specification used was with the FCC Part 15.207 limits.

5.2. Test Standard

FCC§15.207

5.3. Conducted Emission Limit

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

5.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet FCC Part 15.207 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

5.5. Operating Condition of EUT

5.5.1. Setup the EUT and simulators as shown in Section 5.1.

5.5.2. Turn on the power of all equipments.

5.5.3. Let the EUT work in test modes (EUT Working) and test it.

5.6. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESR3) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

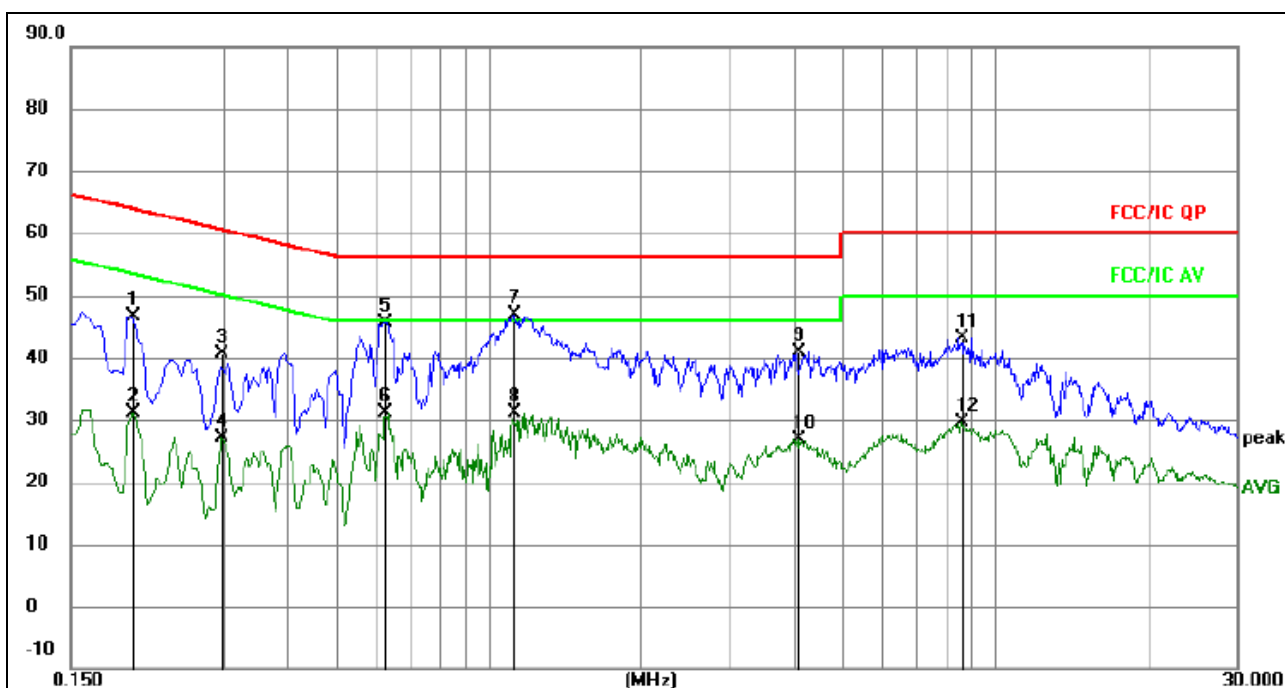
The bandwidth of the test receiver (R&S Test Receiver ESR3) is set at 10KHz.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

5.7. Test Result

PASS

EUT:	UVC Sterilizer w/ Wireless Power Bank	Model Name :	MSL-M6023Q
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	AC120V/60Hz	Test Mode:	Wireless charger

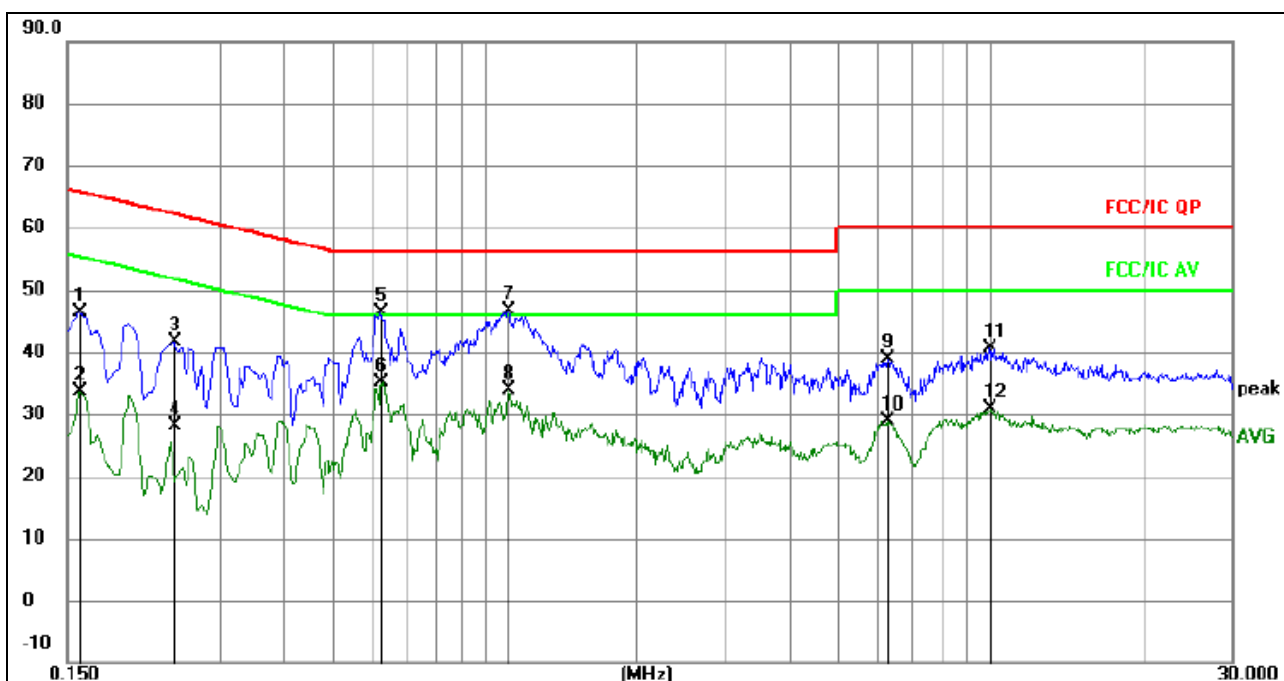


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No. Mk.	Freq. MHz	Reading Level	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	0.1995	37.28	9.46	46.74	63.63	-16.89	QP
2	0.1995	21.78	9.46	31.24	53.63	-22.39	AVG
3	0.2985	31.14	9.58	40.72	60.28	-19.56	QP
4	0.2985	17.44	9.58	27.02	50.28	-23.26	AVG
5	0.6269	35.78	9.90	45.68	56.00	-10.32	QP
6	0.6269	21.19	9.90	31.09	46.00	-14.91	AVG
7 *	1.1264	37.34	9.57	46.91	56.00	-9.09	QP
8	1.1264	21.50	9.57	31.07	46.00	-14.93	AVG
9	4.1010	31.26	9.74	41.00	56.00	-15.00	QP
10	4.1010	17.04	9.74	26.78	46.00	-19.22	AVG
11	8.5695	33.42	9.70	43.12	60.00	-16.88	QP
12	8.5695	19.84	9.70	29.54	50.00	-20.46	AVG

EUT:	UVC Sterilizer w/ Wireless Power Bank	Model Name :	MSL-M6023Q
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	AC120V/60Hz	Test Mode:	Wireless charger


Remark:

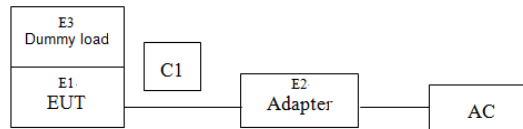
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBμV	dBμV	dB	Detector
1		0.1590	36.83	9.51	46.34	65.52	-19.18	QP
2		0.1590	24.09	9.51	33.60	55.52	-21.92	AVG
3		0.2445	32.14	9.51	41.65	61.94	-20.29	QP
4		0.2445	18.53	9.51	28.04	51.94	-23.90	AVG
5		0.6270	36.39	9.90	46.29	56.00	-9.71	QP
6		0.6270	25.32	9.90	35.22	46.00	-10.78	AVG
7	*	1.1130	37.07	9.57	46.64	56.00	-9.36	QP
8		1.1130	24.41	9.57	33.98	46.00	-12.02	AVG
9		6.2835	29.21	9.75	38.96	60.00	-21.04	QP
10		6.2835	19.16	9.75	28.91	50.00	-21.09	AVG
11		9.9330	31.05	9.69	40.74	60.00	-19.26	QP
12		9.9330	21.09	9.69	30.78	50.00	-19.22	AVG

6. RADIATED EMISSION MEASUREMENT

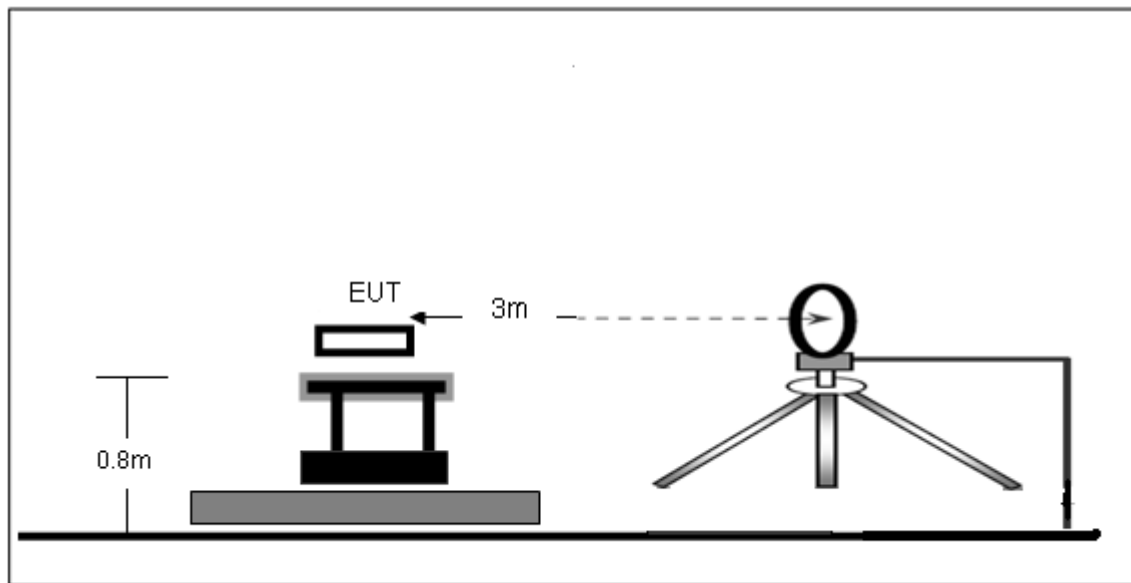
6.1. Block Diagram of Test Setup

6.1.1. Block Diagram of connection between the EUT and the simulators

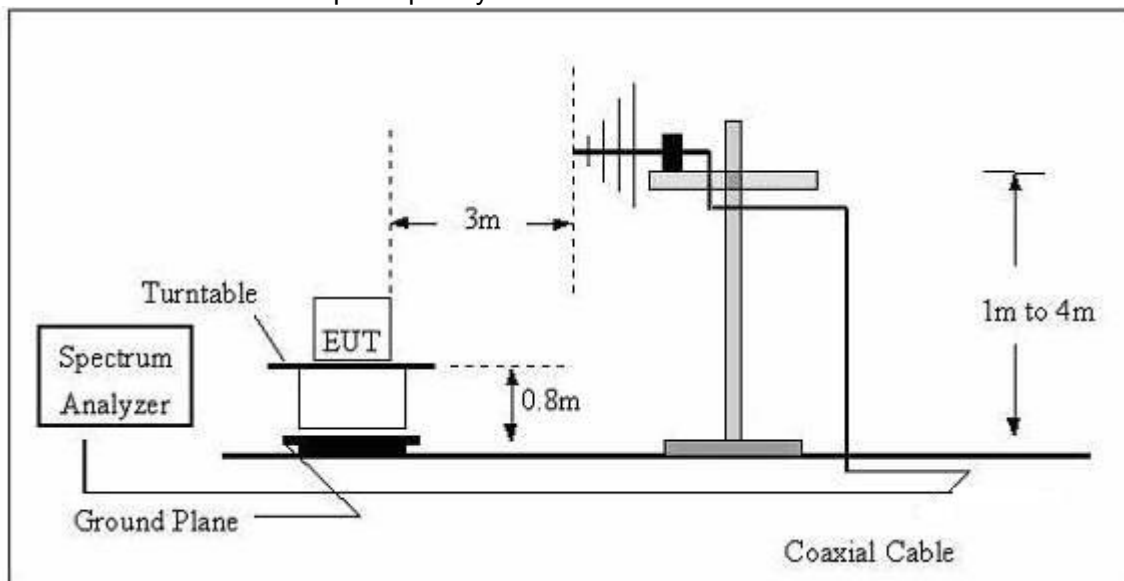


6.1.2. Anechoic Chamber Test Setup Diagram

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

6.2. Test Standard and Limit

FCC §15.209; §15.205

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz~1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz~30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

6.3.EMI Test Receiver Setup

The system was investigated from 9kHz to1GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector
9 kHz – 150 kHz	200 kHz	1 kHz	QP
150 kHz – 30MHz	9kHz	30kHz	QP
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

Note: For the frequency bands 9-90 kHz and 110-490 kHz, the test was based on average detector.

6.4.Test Procedure

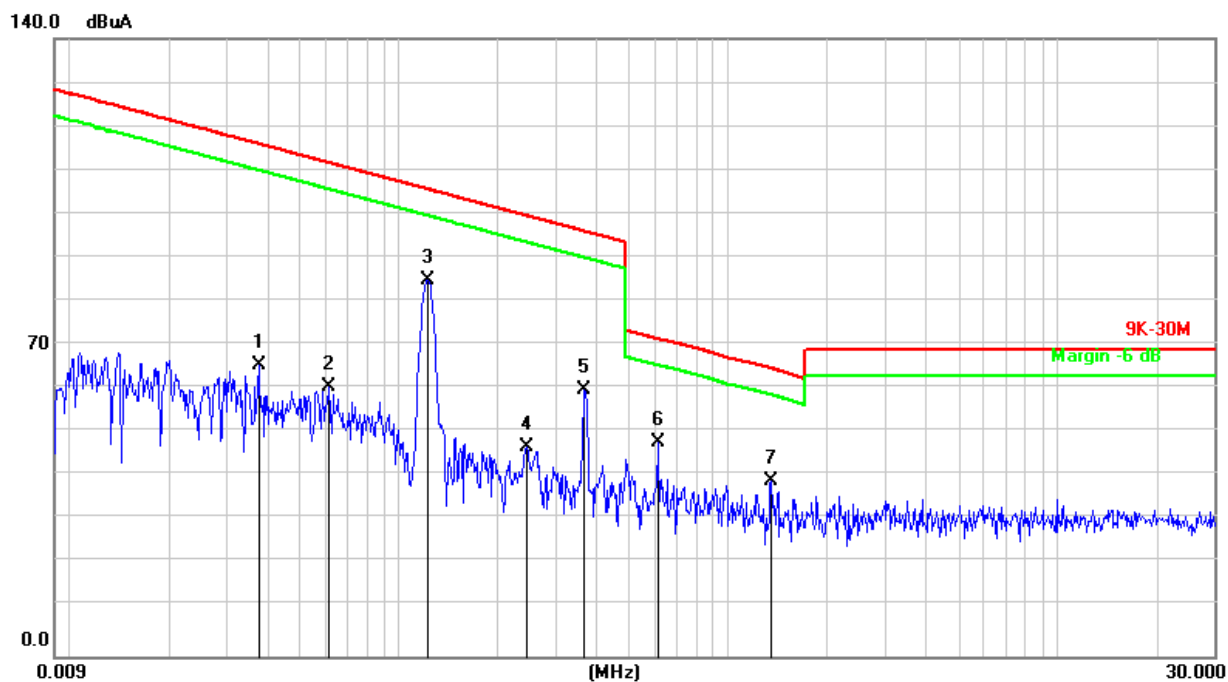
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

6.5.Test Result

PASS

9kHz-30MHz

EUT:	UVC Sterilizer w/ Wireless Power Bank	Model Name :	MSL-M6023Q
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Voltage :	AC120V/60Hz		
Test Mode :	Wireless charger		



Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
0.0374	46.88	19.01	65.89	136.15	-70.26	PK
0.0374	41.55	19.01	60.56	116.15	-55.59	AV
0.0614	41.68	19.32	61.00	131.84	-70.84	PK
0.0614	37.49	19.32	56.81	111.84	-55.03	AV
0.1226	66.01	19.34	85.35	125.83	-40.48	PK
0.1226	62.33	19.34	81.67	105.83	-24.16	AV
0.2444	26.69	20.64	47.33	119.84	-72.51	PK
0.2444	21.16	21.26	42.42	99.84	-57.42	AV
0.3665	40.73	19.75	60.48	116.32	-55.84	PK
0.3665	34.61	19.75	54.36	96.32	-41.96	AV
0.6110	27.98	20.54	48.52	71.88	-23.36	QP
1.3532	18.35	21.27	39.62	64.98	-25.36	QP

Note:

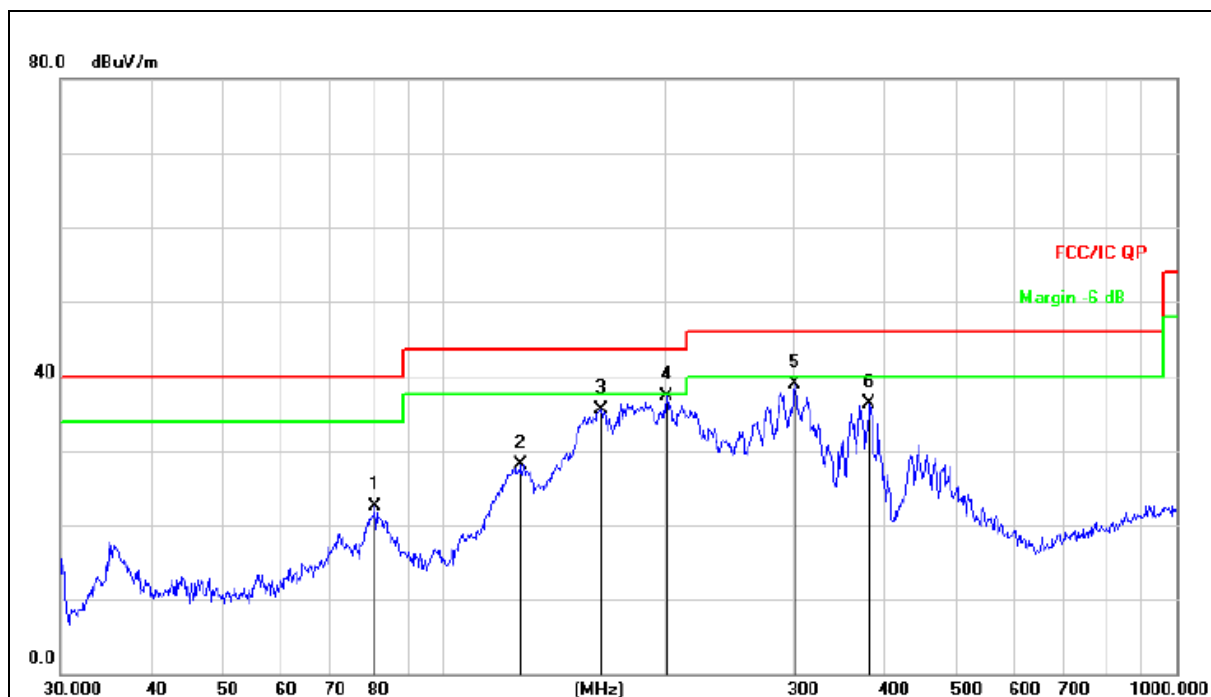
Pre-scan in the all of mode, the worst case in of was recorded.

Factor = antenna factor + cable loss – pre-amplifier.

Margin = Emission Level- Limit.

30MHz-1GHz

EUT:	UVC Sterilizer w/ Wireless Power Bank	Model Name :	MSL-M6023Q
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Voltage :	AC120V/60Hz		
Test Mode :	Wireless charger		

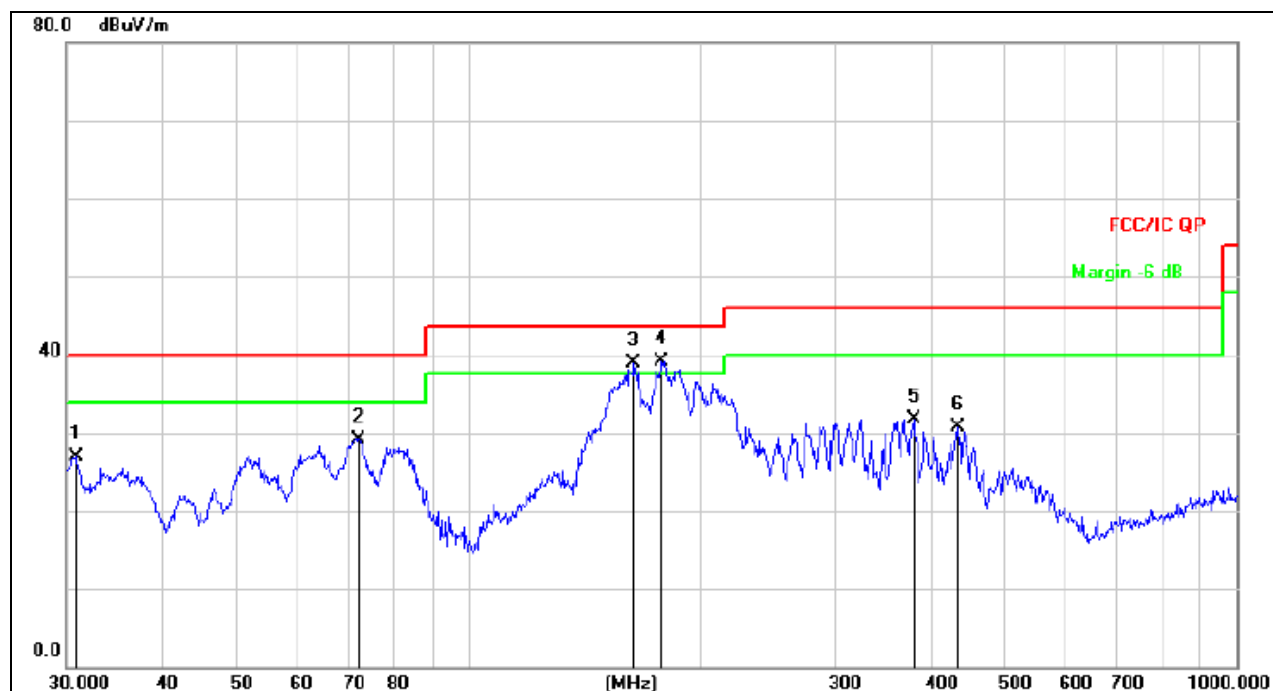


Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		80.6442	42.77	-20.26	22.51	40.00	-17.49	QP
2		127.2176	46.23	-18.03	28.20	43.50	-15.30	QP
3		163.7550	54.11	-18.62	35.49	43.50	-8.01	QP
4	*	201.3930	53.66	-16.27	37.39	43.50	-6.11	QP
5		301.4224	52.55	-13.56	38.99	46.00	-7.01	QP
6		381.2487	47.83	-11.52	36.31	46.00	-9.69	QP

EUT:	UVC Sterilizer w/ Wireless Power Bank	Model Name :	MSL-M6023Q
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Voltage :	AC120V/60Hz		
Test Mode :	Wireless charger		



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		30.8535	43.93	-17.12	26.81	40.00	-13.19	QP
2		72.0843	47.82	-18.65	29.17	40.00	-10.83	QP
3	!	164.3301	57.43	-18.58	38.85	43.50	-4.65	QP
4	*	178.7584	56.83	-17.66	39.17	43.50	-4.33	QP
5		379.9141	43.21	-11.55	31.66	46.00	-14.34	QP
6		434.0651	40.98	-10.33	30.65	46.00	-15.35	QP

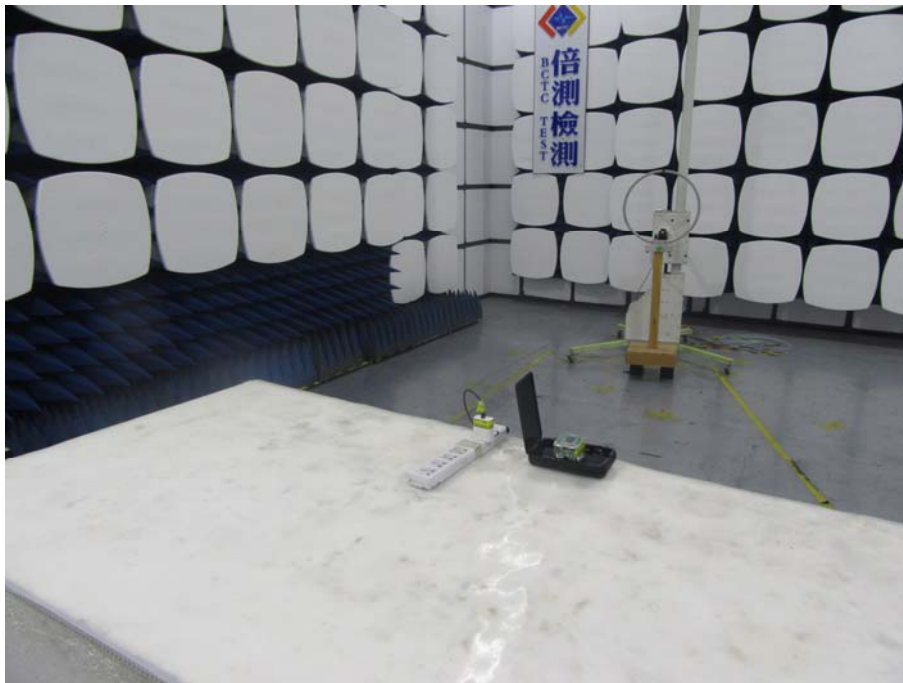
7. EUT TEST PHOTOS

Conducted Measurement Photos



Radiated Measurement Photos

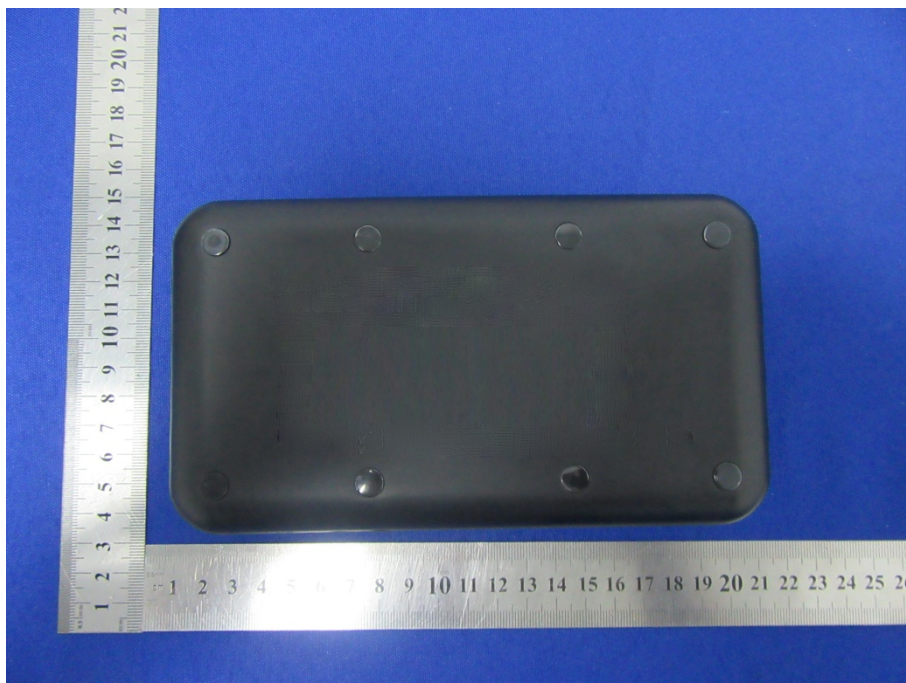
9KHz-30MHz



30MHz-1GHz



8. EUT PHOTOS





***** END OF REPORT *****