

TEST REPORT

of

FCC Part 15 Subpart C

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product: Handheld Transmitter Microphone
Main Model: MT-UM-03
Series Model: N/A
Brand: MyShow
Model Difference: N/A
FCC ID: 2A625-MT-UM-03
FCC Rule Part: §15.236, Cat: DWM
Applicant: Main Technology Co.,Ltd.
Address: 5F., No.132, Wugong 1st Rd., Wugu Dist., New Taipei City
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Test Performed by:



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Report No.: **ISL-22LR0113FC**

Issue Date : **2022/06/28**



Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein. The uncertainty of the measurement does not include in consideration of the test result unless the customer required the determination of uncertainty via the agreement, regulation or standard document specification. This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory Corp.

VERIFICATION OF COMPLIANCE

Applicant: Main Technology Co.,Ltd.
Product Description: Handheld Transmitter Microphone
Brand Name: MyShow
Main Model: MT-UM-03
Model Difference: N/A
FCC ID: 2A625-MT-UM-03
Date of test: 2020/05/27 ~ 2022/06/24
Date of EUT Received: 2022/05/27

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory Corp.

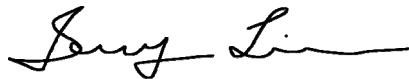
The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:**Date:**

2022/06/28

*Bill Huang / Engineer***Prepared By:****Date:**

2022/06/28

*Gigi Yeh / Senior Engineer***Approved By:****Date:**

2022/06/28

Jerry Liu / Assistant Manager

Version

Version No.	Date	Description
00	2022/06/28	Initial creation of document

Measurement Uncertainty

Parameter	Uncertainty (k=2)
Conducted Emission (AC power line)	± 0.852 dB
Spurious emissions, radiated	± 3.46 dB
RF power, conducted	± 1.386 dB
Power Density	± 1.432 dB
RF Frequency	$\pm 0.00298\%$
DC Voltage	$\pm 0.808\%$

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1 General Information

1.1 Product Description

Product Name	Handheld Transmitter Microphone
Brand Name	MyShow
Model Name	MT-UM-03
Model Difference	N/A
Power Supply	3V dc battery

Frequency Band	510.38MHz-529.68MHz
Output Power	8.09dBm at 529.69MHz
Modulation Type	pi/4 DQPSK
Channel Number	64
Antenna Type	Spring antenna
Antenna Gain	-9.74 dBi

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

A CH 1~32 & B CH 1~32(Total: 64 ch)

A CH	Frequency (MHz)	A CH	Frequency (MHz)	B CH	Frequency (MHz)	B CH	Frequency (MHz)
1	510.38	17	515.18	33	520.38MHz	49	525.18
2	510.68	18	515.48	34	520.68	50	525.48
3	510.98	19	515.78	35	520.98	51	525.78
4	511.28	20	516.08	36	521.28	52	526.08
5	511.58	21	516.38	37	521.58	53	526.38
6	511.88	22	516.68	38	521.88	54	526.68
7	512.18	23	516.98	39	522.18	55	526.98
8	512.48	24	517.28	40	522.48	56	527.28
9	512.78	25	517.58	41	522.78	57	527.58
10	513.08	26	517.88	42	523.08	58	527.88
11	513.38	27	518.18	43	523.38	59	528.18
12	513.68	28	518.48	44	523.68	60	528.48
13	513.98	29	518.78	45	523.98	61	528.78
14	514.28	30	519.08	46	524.28	62	529.08
15	514.58	31	519.38	47	524.58	63	529.38
16	514.88	32	519.68	48	524.88	64	529.68

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2A625-MT-UM-03** filing to comply with Section 15.236 of the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Reference

ETSI EN 300 422-1 V1.4.2 (2011-08)

Electromagnetic compatibility and Radio spectrum Matters (ERM);

Wireless microphones in the 25 MHz to 3 GHz frequency range;

Part 1: Technical characteristics and methods of measurement

1 System Test Configuration

1.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

1.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

1.3 Test Procedure

2.3.1 Conducted Emissions

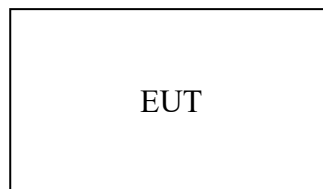
The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6 of ANSI C63.10: 2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m/1.5m (frequency above 1GHz) above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6 and 11 of ANSI C63.10: 2013.

1.4 Configuration of Tested System

Configuration (RE)



Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	---	---	---	---	---	---

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

2 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.236(d)	Maximum radiated power	Compliant
§15.236(f)(2)	Occupied bandwidth	Compliant
§15.236(f)(3)	Frequency stability	Compliant
§15.236(g)	Radiated Emissions	Compliant
§15.236(g)	Necessary Bandwidth	Compliant
§15.207(a)	Conducted Emission	N/A

NOTE:

- (1) “N/A” denotes test is not applicable in this Test Report
 (2) All tests are according to ANSI C63.10:2013

3 Description of Test Modes

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 above was evaluated respectively.

The EUT was operating in continuous TX status, and the following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

Test Channel	Frequency
CH Low	510.38MHz
CH Mid	520.38MHz
CH High	52968MHz

4 Maximum Radiated Power

4.1 Standard Applicable:

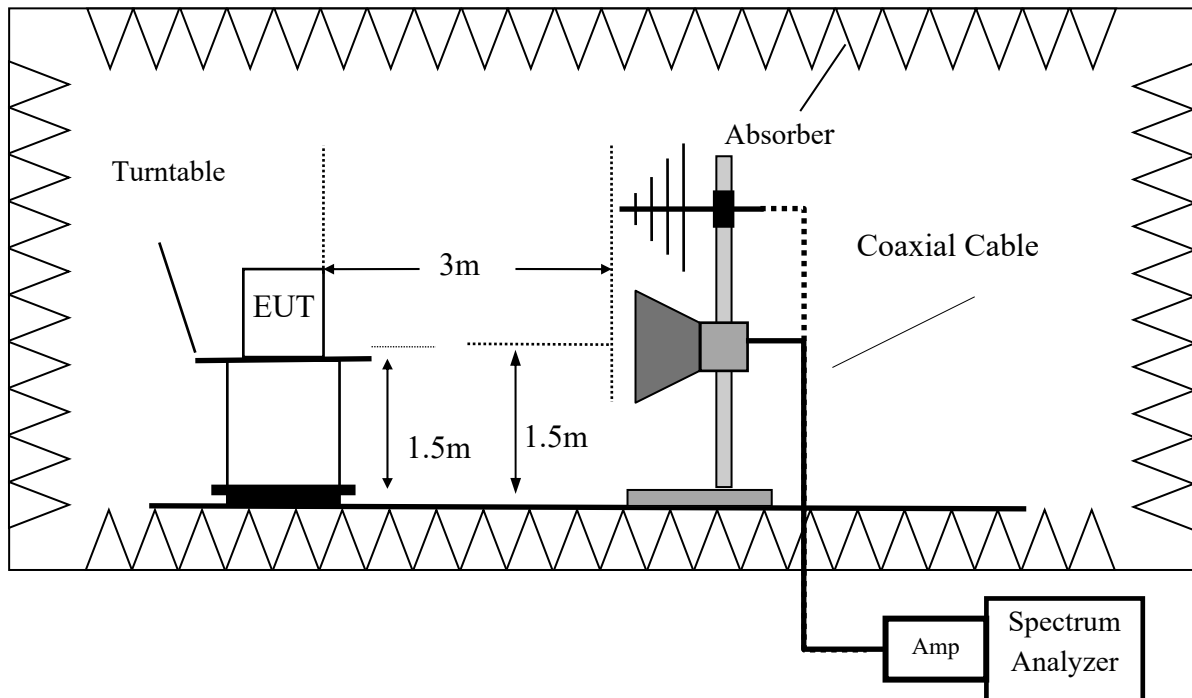
According to §15.236(d)

- (1) In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP
- (2) In the 600 MHz guard band and the 600 MHz duplex gap: 20 mW EIRP.

4.2 Measurement Equipment Used:

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Chamber 16	Spectrum Analyzer (26.5GHz)	Agilent	N9010A	MY52100117	09/01/2021	09/01/2022
Chamber 16	Loop Antenna	EM	EM-6879	271	09/29/2021	09/29/2022
Chamber 16	Bilog Antenna	Schwarzbeck	VULB9168 w 5dB Att.	9168-495	11/11/2021	11/11/2022
Chamber 16	Horn antenna (1GHz - 18GHz)	EM	EM-AH-10180	2011071401	11/25/2021	11/25/2022
Chamber 16	Horn antenna (18GHz-26GHz)	Com-power	AH-826	081001	11/30/2021	11/30/2022
Chamber 16	Horn antenna (26GHz - 40GHz)	Com-power	AH-640	100A	03/18/2022	03/18/2023
Chamber 16	Preamplifier (9kHz - 3GHz)	EM	EM330	060822	12/22/2021	12/22/2022
Chamber 16	Preamplifier (1GHz - 26GHz)	EM	EM01M26G	060559	05/20/2022	05/20/2023
Chamber 16	Preamplifier (26GHz - 40GHz)	MITEQ	JS4-26004000-27-5A	818471	05/12/2022	05/12/2023
Chamber 16	Cable (100kHz-1GHz)	HUBER SU-HNER	Sucoflex 104A	1166 cable 001	12/28/2021	12/28/2022
Chamber 16	Cable (9kHz-18GHz)	HUBER SU-HNER	Sucoflex 104A	1166 cable 002	12/23/2021	12/23/2022
Chamber 16	RF Cable (18GHz-40GHz)	HUBER SU-HNER	Sucoflex 102	27963/2&374 21/2	11/17/2021	11/17/2022
Chamber 16	Signal Generator	Anritsu	MG3692A	20311	12/28/2021	12/28/2022
Chamber 16	Test Software	Audix	E3 Ver:6.12023	N/A	N/A	N/A

4.3 Test Set-up:



4.4 Measurement Procedure:

Depending of the frequency range and bands being tested, different antennas and filters were used, in consequence different setups are employed.

The final measurement is done by varying the antenna height, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emission was measured on the worst case configuration on one channel for each transmission mode.

The radiated output power is calculated as follows:

$$\text{Level} = \text{Reading} + \text{Aux}$$

Where:

$$\text{Aux} = D - G + \text{CL}$$

Aux: total correction factor

Level: radiated output power

Reading: analyzer value

D: free field attenuation of measurement distance

G: antenna gain + amplifier gain

CL: cable loss attenuation

4.5 Measurement Result:

Operation Mode : TX Low CH
 Fundamental Frequency : 510.38MHz
 Temp : 23 °C

Test Date : 2022/06/16
 Test By : Bill
 Hum. : 65%

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	510.38	0.45	5.57	6.02	17.00	-10.98	VERTICAL
1	520.38	1.05	5.74	6.79	17.00	-10.21	HORIZONTAL

Operation Mode : TX High CH
 Fundamental Frequency : 529.68MHz
 Temp : 23 °C

Test Date : 2022/06/16
 Test By : Bill
 Hum. : 65%

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	529.70	2.15	5.89	8.04	17.00	-8.96	VERTICAL
1	529.69	2.20	5.89	8.09	17.00	-8.91	HORIZONTAL

Remark:

$$1. \text{ ERP (dBm)} = \text{Aux (dB)} + \text{Reading (dBm)} \circ$$

5 Occupied Bandwidth

5.1 Standard Applicable:

According to §15.236(f)(2)

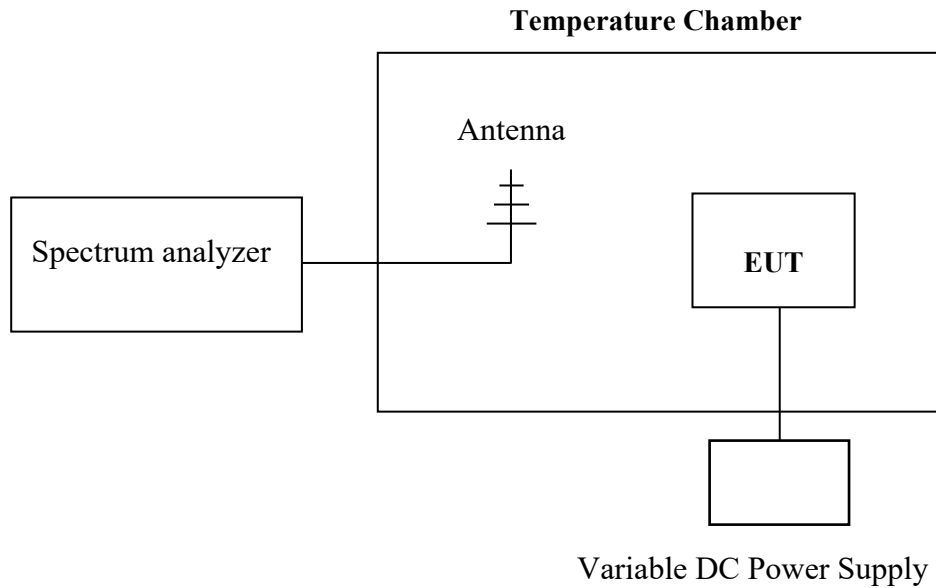
One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

5.2 Measurement Equipment Used:

Location Conducted	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conducted	Power Meter	Anritsu	ML2495A	1116010	09/30/2021	09/30/2022
Conducted	Power Sensor	Anritsu	MA2411B	34NKF50	09/30/2021	09/30/2022
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO33	01/07/2022	01/07/2023
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO34	01/07/2022	01/07/2023
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO35	06/23/2021	06/23/2022
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO36	06/23/2021	06/23/2022
Conducted	Temperature Chamber	KSON	THS-B4H100	2287	04/26/2022	04/26/2023
Conducted	DC Power supply	ABM	8185D	N/A	01/06/2022	01/06/2023
Conducted	AC Power supply	EXTECH	CFC105W	NA	N/A	N/A
Conducted	Spectrum analyzer	Keysight	N9010A	MY56070257	09/28/2021	09/28/2022
Conducted	Test Software	DARE	Radiation Ver:2013.1.23	NA	NA	NA
Conducted	Test Software	R&S	CMUGO Ver:2.0.0	N/A	N/A	N/A
Conducted	Universal Digital Radio Communication Tester	R&S	CMU200	111968	11/18/2021	11/18/2022
Conducted	Wideband Radio Communication Tester	R&S	CMW500	1201.002K50108793-JG	10/26/2021	10/26/2022
Conducted	BT Simulator	Agilent	N4010A	MY48100200	NA	NA
Conducted	GPS Simulator	Welnavigate	GS-50	701523	NA	NA
Conducted (TS8997)	Wideband Radio Communication Tester	R&S	CMW500	168811	09/09/2021	09/09/2022
Conducted (TS8997)	Signal Generator	R&S	SMB100B	101085	09/09/2021	09/09/2022
Conducted (TS8997)	Vector Signal Generator	R&S	SMBV100A	263246	09/09/2021	09/09/2022
Conducted (TS8997)	Signal analyzer 40GHz	R&S	FSV40	101884	09/07/2021	09/07/2022
Conducted (TS8997)	OSP150 extension unit CAM-BUS	R&S	OSP150	101107	09/10/2021	09/10/2022
Conducted (TS8997)	Test Software	R&S	EMC32 Ver:11.10.00	NA	NA	NA

5.3 Test Set-up:

Refer to section 6.3 for details.



5.4 Measurement Procedure:

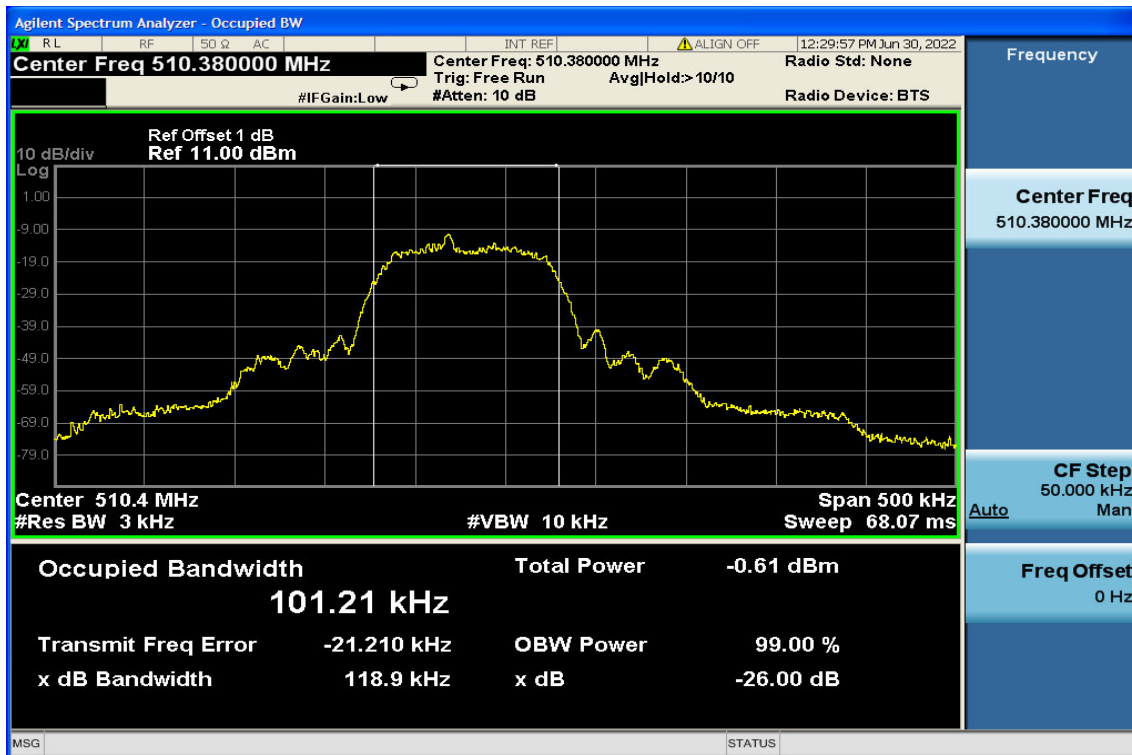
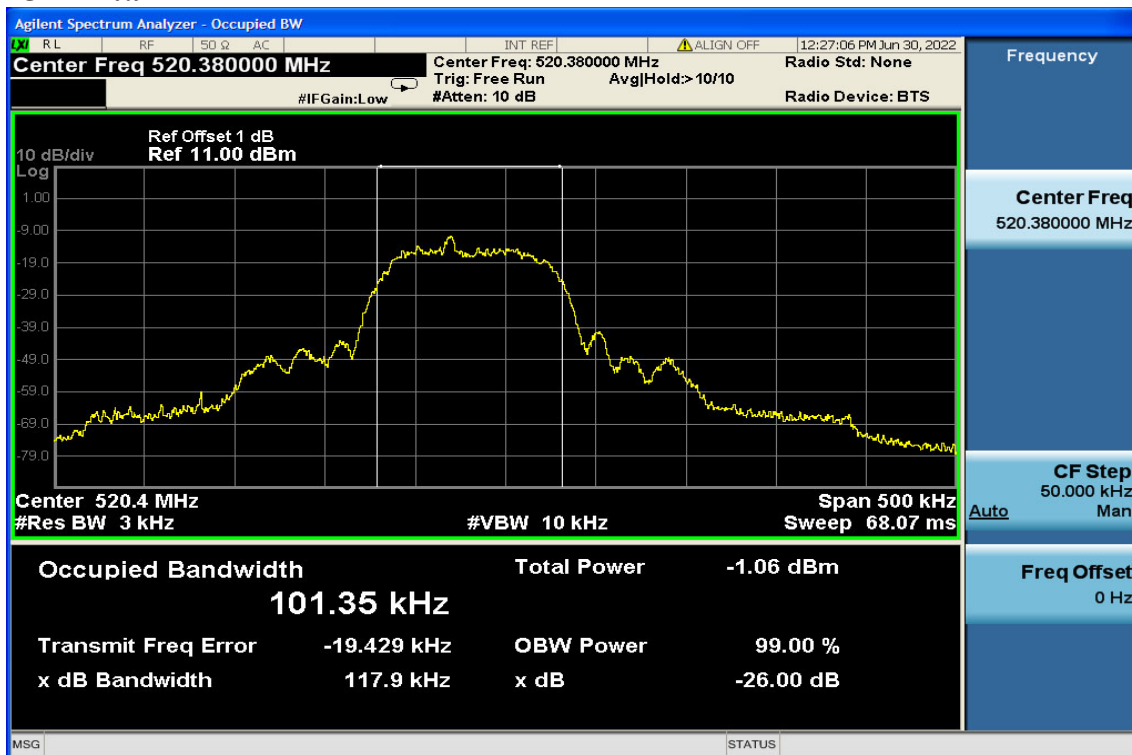
Measurement parameter

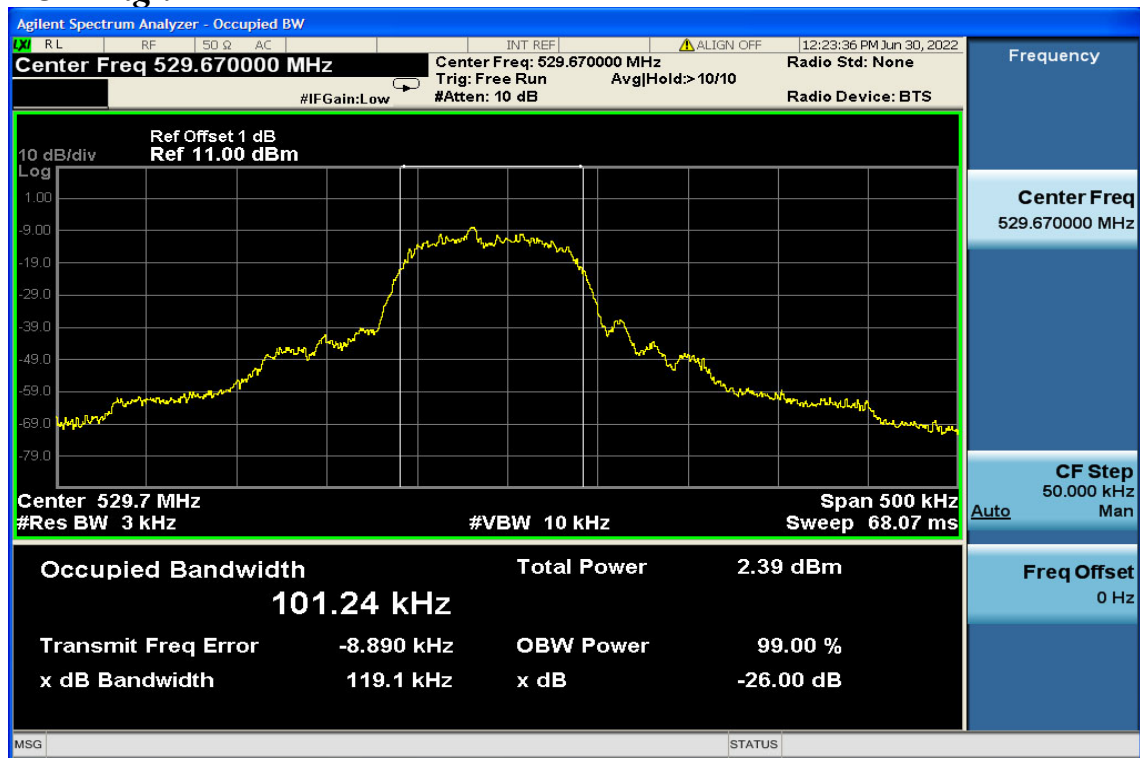
1. Detector: Peak
2. Sweep time: Auto
3. Resolution bandwidth: 1 % to 5 % of the occupied bandwidth
4. Video bandwidth: 3 x resolution bandwidth
5. Span: 2 x emission bandwidth
6. Trace mode: Max. hold
7. Analyzer function: 99% power occupied bandwidth function

5.5 Measurement Result:

Channel	26dB Bandwidth (kHz)	Limit (kHz)
Lower	118.9	< 200
Mid	117.9	< 200
Higher	119.1	< 200

Note: Refer to next page for plots.

CH Low*CH Mid*

CH High

6 Frequency stability

6.1 Standard Applicable

According to §15.236(f)(3)

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

6.2 Measurement Equipment Used:

Refer to section 5.2 for details.

6.3 Test Set-Up:

Refer to section 5.3 for details.

6.4 Measurement Procedure:

1. The EUT was placed inside the environmental test chamber and powered by nominal voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency.
5. Repeat step 3 and 4 with every 10 degrees reduction until the lowest temperature achieved.
6. The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

6.5 Measurement Result:

Low ch

Temperature test					
Limit: 50ppm					
Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)	Result
Vdc	Temperature (°C)	(MHz)			
3	-20	510.3786	-1.4	25.5	Pass
	-10	510.3786	-1.4		Pass
	0	510.3788	-1.2		Pass
	10	510.3789	-1.1		Pass
	20	510.3800	0.0		Pass
	30	510.3820	2.0		Pass
	40	510.3843	4.3		Pass
	50	510.3845	4.5		Pass

voltage test					
Limit: 50ppm					
Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)	Result
Vdc	Temperature (°C)	(MHz)			
3	20	510.3800	0.0	25.5	Pass
3.45	20	510.3845	4.5		Pass
2.55	20	510.3778	-2.2		Pass

Mid ch

Temperature test					
Limit: 50ppm					
Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)	Result
Vdc	Temperature (°C)	(MHz)			
3	-20	520.3787	-1.3	26	Pass
	-10	520.3787	-1.3		Pass
	0	520.3801	0.1		Pass
	10	520.3801	0.1		Pass
	20	520.3800	0.0		Pass
	30	520.3815	1.5		Pass
	40	520.3812	1.2		Pass
	50	520.3811	1.1		Pass

voltage test					
Limit: 50ppm					
Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)	Result
Vdc	Temperature (°C)	(MHz)			
3	20	520.3800	0.0	26	Pass
3.45	20	520.3812	1.2		Pass
2.55	20	520.3788	-1.2		Pass

High ch

Temperature test					
Limit: 50ppm					
Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)	Result
Vdc	Temperature (°C)	(MHz)			
3	-20	529.6773	-2.7	26.5	Pass
	-10	529.6783	-1.7		Pass
	0	529.6786	-1.4		Pass
	10	529.6788	-1.2		Pass
	20	529.6800	0.0		Pass
	30	529.6823	2.3		Pass
	40	529.6840	4.0		Pass
	50	529.6840	4.0		Pass

voltage test					
Limit: 50ppm					
Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)	Result
Vdc	Temperature (°C)	(MHz)			
3	20	529.6800	0.0	26.5	Pass
3.45	20	529.6845	4.5		Pass
2.55	20	529.6780	-2.0		Pass

7 Radiated Emissions

7.1 Standard Applicable:

According to §15.236(g)

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in § 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

State	Frequency		
	47 MHz to 74 MHz 87.5 MHz to 137 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies below 1000 MHz	Frequencies above 1000 MHz
Operation	4 nW	250 nW	1 μ W
Standby	2 nW	2 nW	20 nW

7.2 Measurement Equipment Used:

Refer to section 4.2 for details.

7.3 Test SET-UP:

Refer to section 4.3 for details.

7.4 Measurement Procedure:

Refer to section 4.4 for details.

7.5 Measurement Result:

Refer to next page spectrum analyzer data chart and tabular data sheets.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX mode	Test Date	2022/06/22
Channel number	CH Low	Test By	Bill
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Aux dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	58.13	-80.14	-0.92	-81.06	-54.00	-27.06	Peak	VERTICAL
2	109.54	-80.42	-4.10	-84.52	-54.00	-30.52	Peak	VERTICAL
3	187.14	-81.36	-2.91	-84.27	-54.00	-30.27	Peak	VERTICAL
4	590.66	-68.54	7.73	-60.81	-54.00	-6.81	Peak	VERTICAL
5	693.48	-80.67	9.31	-71.36	-54.00	-17.36	Peak	VERTICAL
6	817.64	-80.83	11.38	-69.45	-54.00	-15.45	Peak	VERTICAL
1	60.07	-80.41	-1.05	-81.46	-54.00	-27.46	Peak	HORIZONTAL
2	123.12	-80.58	-2.67	-83.25	-54.00	-29.25	Peak	HORIZONTAL
3	206.54	-81.33	-3.41	-84.74	-54.00	-30.74	Peak	HORIZONTAL
4	590.66	-68.00	7.73	-60.27	-54.00	-6.27	Peak	HORIZONTAL
5	727.43	-79.98	10.10	-69.88	-54.00	-15.88	Peak	HORIZONTAL
6	825.40	-81.31	11.48	-69.83	-54.00	-15.83	Peak	HORIZONTAL

Remark:

$$1 \text{ ERP (dBm)} = \text{AUX (dBm)} + \text{Reading (dBm)}$$

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX mode	Test Date	2022/06/22
Channel number	CH Mid	Test By	Bill
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Aux dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	61.04	-79.56	-1.27	-80.83	-54.00	-26.83	Peak	VERTICAL
2	120.21	-81.04	-2.96	-84.00	-54.00	-30.00	Peak	VERTICAL
3	193.93	-81.77	-3.34	-85.11	-54.00	-31.11	Peak	VERTICAL
4	579.99	-65.11	7.34	-57.77	-54.00	-3.77	Peak	VERTICAL
5	702.21	-80.60	9.47	-71.13	-54.00	-17.13	Peak	VERTICAL
6	839.95	-80.64	11.68	-68.96	-54.00	-14.96	Peak	VERTICAL
1	57.16	-80.51	-0.86	-81.37	-54.00	-27.37	Peak	HORIZONTAL
2	104.69	-80.04	-4.65	-84.69	-54.00	-30.69	Peak	HORIZONTAL
3	201.69	-80.89	-3.63	-84.52	-54.00	-30.52	Peak	HORIZONTAL
4	579.99	-66.56	7.34	-59.22	-54.00	-5.22	Peak	HORIZONTAL
5	729.37	-81.05	10.15	-70.90	-54.00	-16.90	Peak	HORIZONTAL
6	830.25	-80.74	11.55	-69.19	-54.00	-15.19	Peak	HORIZONTAL

Remark:

$$1 \text{ ERP (dBm)} = \text{AUX (dBm)} + \text{Reading (dBm)}$$

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX mode	Test Date	2022/06/22
Channel number	CH High	Test By	Bill
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Aux dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	102.75	-79.92	-4.88	-84.80	-54.00	-30.80	Peak	VERTICAL
2	123.12	-81.03	-2.67	-83.70	-54.00	-29.70	Peak	VERTICAL
3	184.23	-81.16	-2.72	-83.88	-54.00	-29.88	Peak	VERTICAL
4	589.69	-66.47	7.70	-58.77	-54.00	-4.77	Peak	VERTICAL
5	687.66	-80.00	9.21	-70.79	-54.00	-16.79	Peak	VERTICAL
6	822.49	-80.51	11.44	-69.07	-54.00	-15.07	Peak	VERTICAL
1	59.10	-80.43	-0.98	-81.41	-54.00	-27.41	Peak	HORIZONTAL
2	110.51	-80.88	-3.99	-84.87	-54.00	-30.87	Peak	HORIZONTAL
3	191.99	-81.98	-3.22	-85.20	-54.00	-31.20	Peak	HORIZONTAL
4	589.69	-66.72	7.70	-59.02	-54.00	-5.02	Peak	HORIZONTAL
5	690.57	-80.44	9.26	-71.18	-54.00	-17.18	Peak	HORIZONTAL
6	844.80	-80.16	11.75	-68.41	-54.00	-14.41	Peak	HORIZONTAL

Remark:

$$1 \text{ ERP (dBm)} = \text{AUX (dBm)} + \text{Reading (dBm)}$$

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX mode	Test Date	2022/06/22
Channel number	CH Low	Test By	Bill
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Aux dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	1020.76	-47.61	1.33	-46.28	-30.00	-16.28	Peak	VERTICAL
2	1531.14	-45.07	5.57	-39.50	-30.00	-9.50	Peak	VERTICAL
3	2041.52	-51.10	8.52	-42.58	-30.00	-12.58	Peak	VERTICAL
4	3062.28	-52.83	12.80	-40.03	-30.00	-10.03	Peak	VERTICAL
1	1020.76	-49.50	1.33	-48.17	-30.00	-18.17	Peak	HORIZONTAL
2	1531.14	-49.62	5.57	-44.05	-30.00	-14.05	Peak	HORIZONTAL
3	2042.52	-55.38	8.53	-46.85	-30.00	-16.85	Peak	HORIZONTAL
4	3062.28	-56.42	12.80	-43.62	-30.00	-13.62	Peak	HORIZONTAL

Remark:

1 ERP (dBm) = AUX (dBm) + Reading (dBm)

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX mode	Test Date	2022/06/22
Channel number	CH Mid	Test By	Bill
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Aux dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	1040.76	-44.05	1.53	-42.52	-30.00	-12.52	Peak	VERTICAL
2	1561.14	-43.67	5.77	-37.90	-30.00	-7.90	Peak	VERTICAL
3	2081.52	-48.11	8.77	-39.34	-30.00	-9.34	Peak	VERTICAL
1	1040.76	-50.01	1.53	-48.48	-30.00	-18.48	Peak	HORIZONTAL
2	1561.14	-53.94	5.77	-48.17	-30.00	-18.17	Peak	HORIZONTAL

Remark:

1 ERP (dBm) = AUX (dBm) + Reading (dBm)

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX mode	Test Date	2022/06/22
Channel number	CH High	Test By	Bill
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Aux dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	1059.36	-42.73	1.72	-41.01	-30.00	-11.01	Peak	VERTICAL
2	1589.04	-43.68	5.95	-37.73	-30.00	-7.73	Peak	VERTICAL
3	2118.72	-44.85	9.00	-35.85	-30.00	-5.85	Peak	VERTICAL
1	1059.36	-51.18	1.72	-49.46	-30.00	-19.46	Peak	HORIZONTAL
2	1589.04	-55.61	5.95	-49.66	-30.00	-19.66	Peak	HORIZONTAL

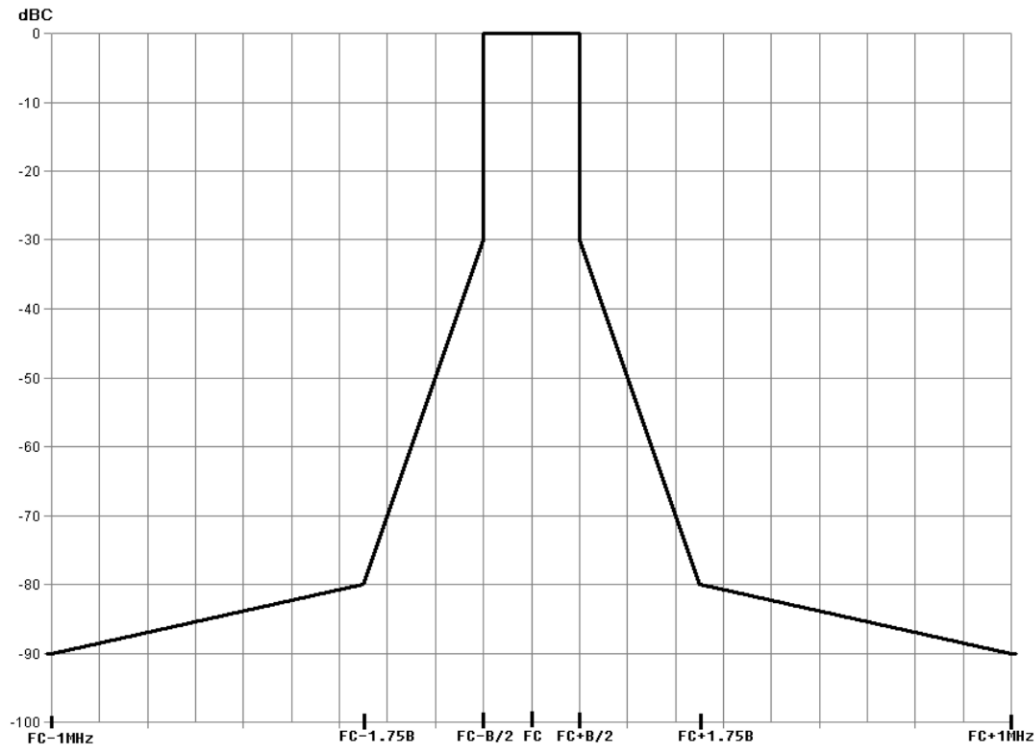
Remark:

1 ERP (dBm) = AUX (dBm) + Reading (dBm)

8 Necessary Bandwidth

8.1 Standard Applicable:

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08) as below:



8.2 Measurement Equipment Used:

Refer to section 5.2 for details.

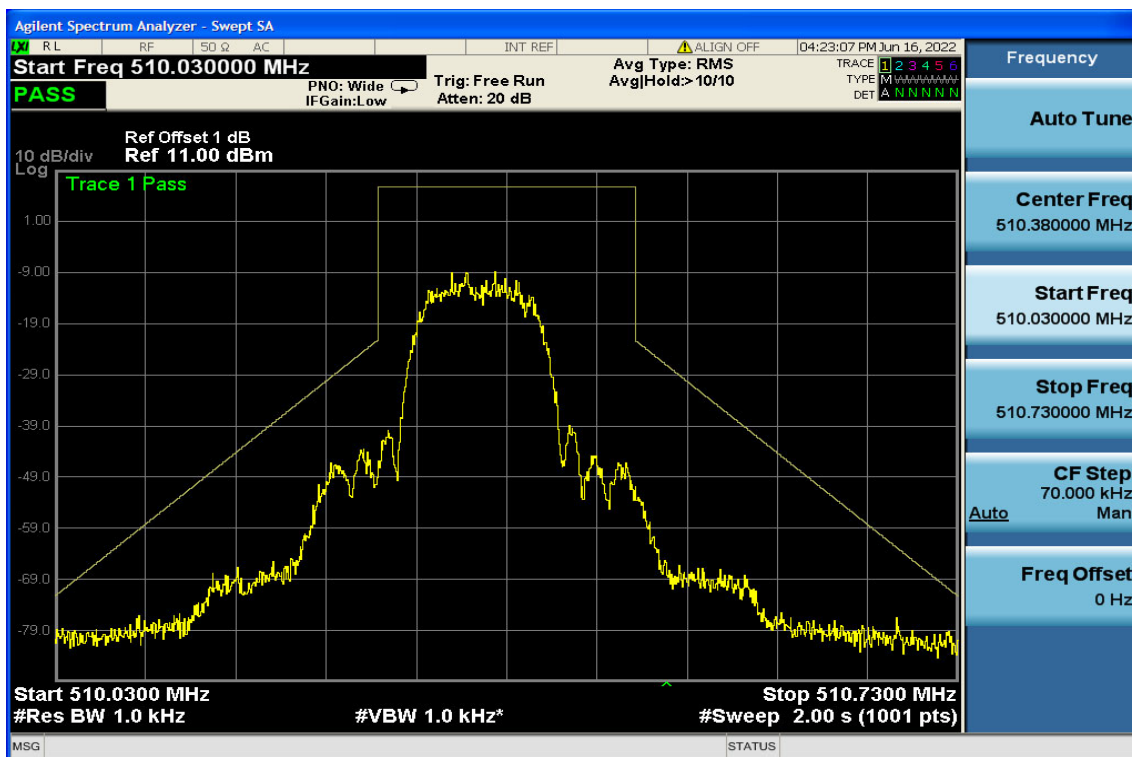
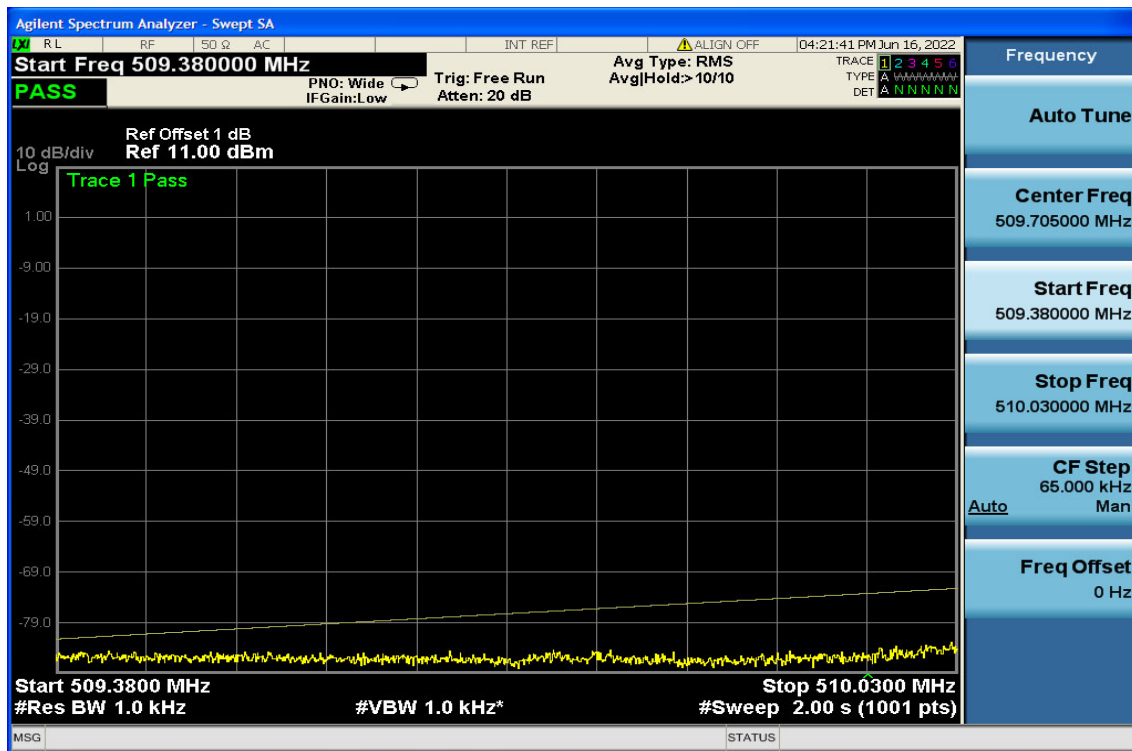
8.3 Test Set-up:

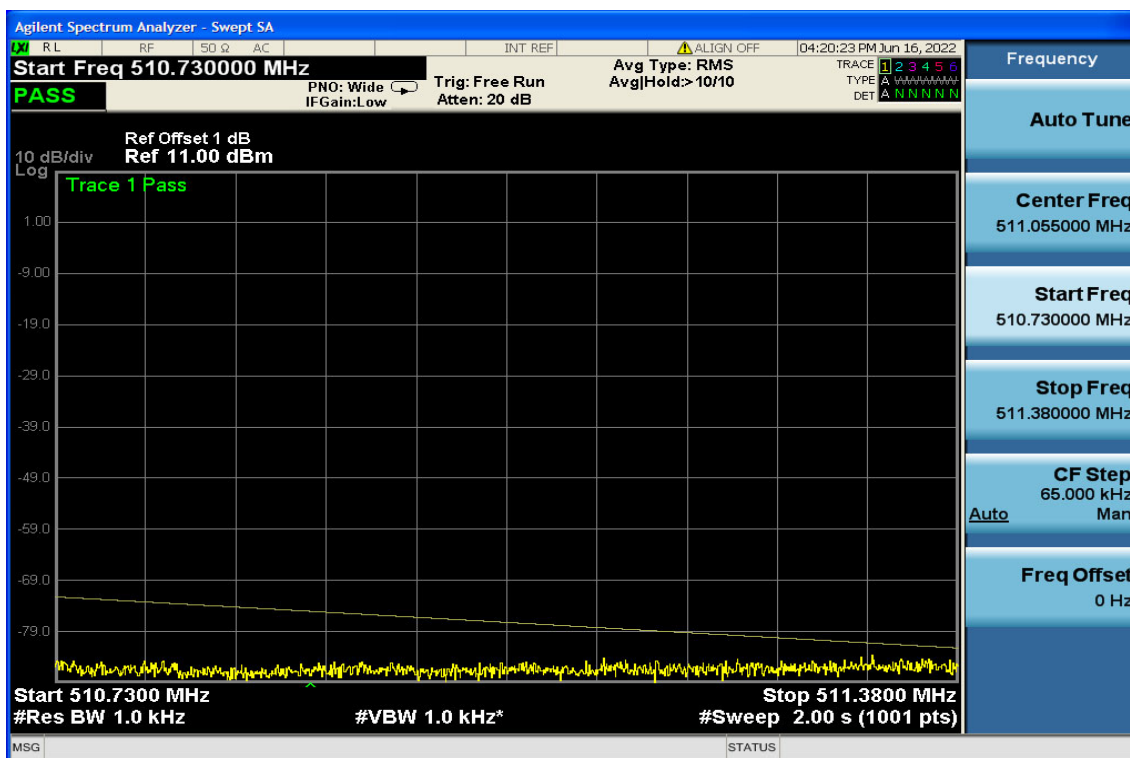
Refer to section 5.3 for details.

8.4 Measurement Procedure:

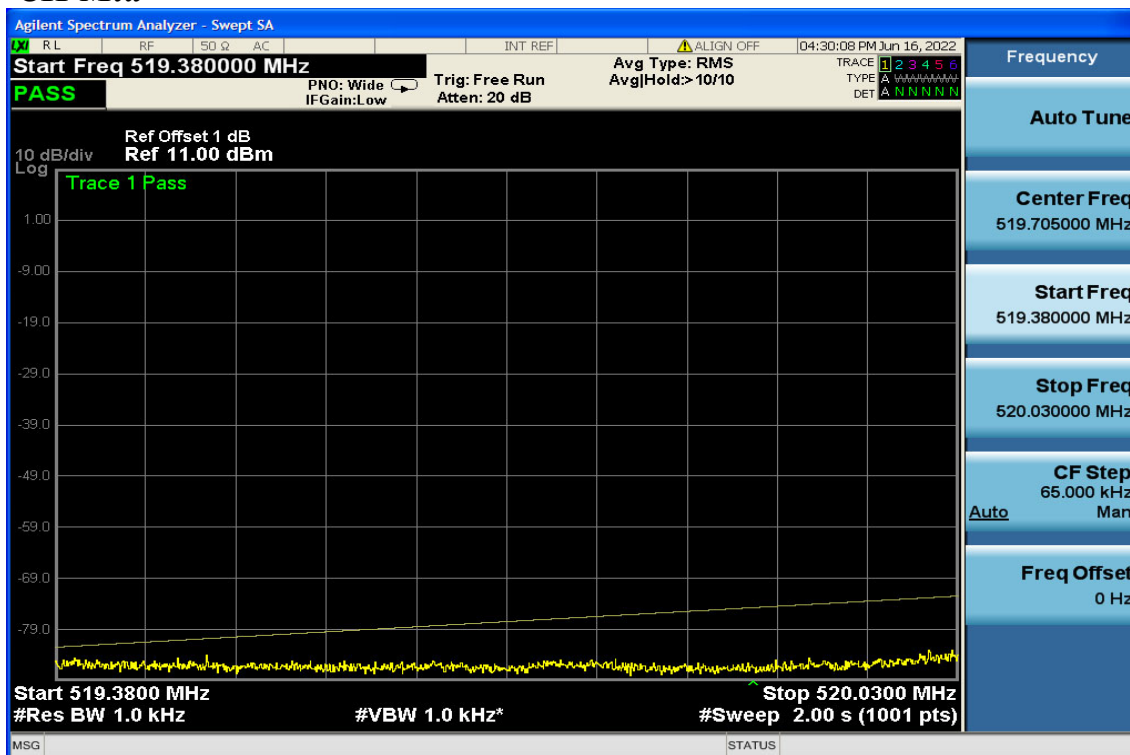
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100kHz, VBW = 3*RBW, Span= cover the complete power envelope of the signal of the UUT Sweep=auto
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

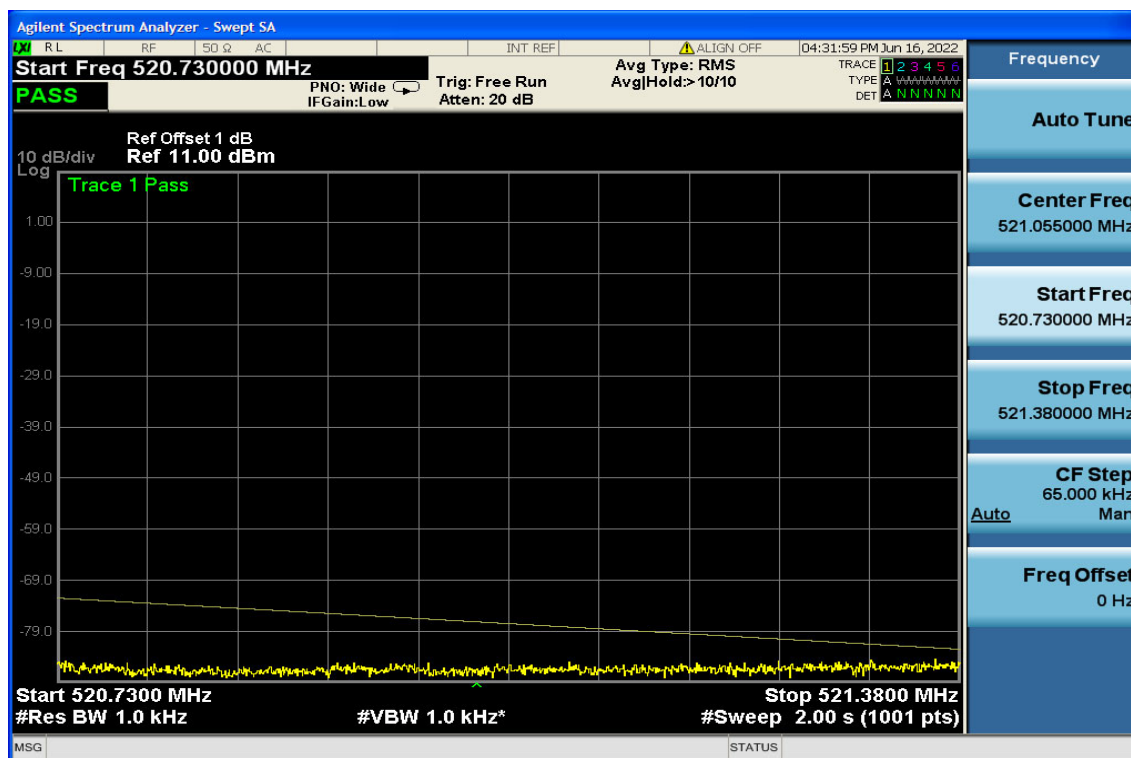
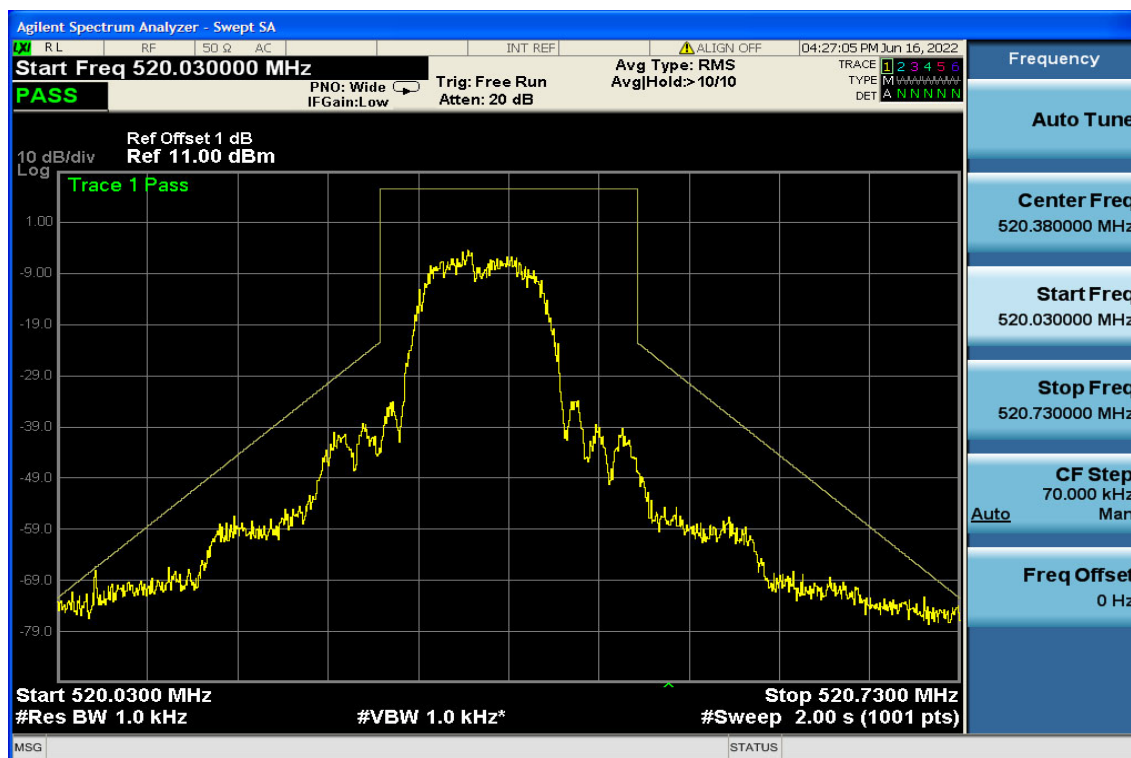
8.5 Measurement Result:

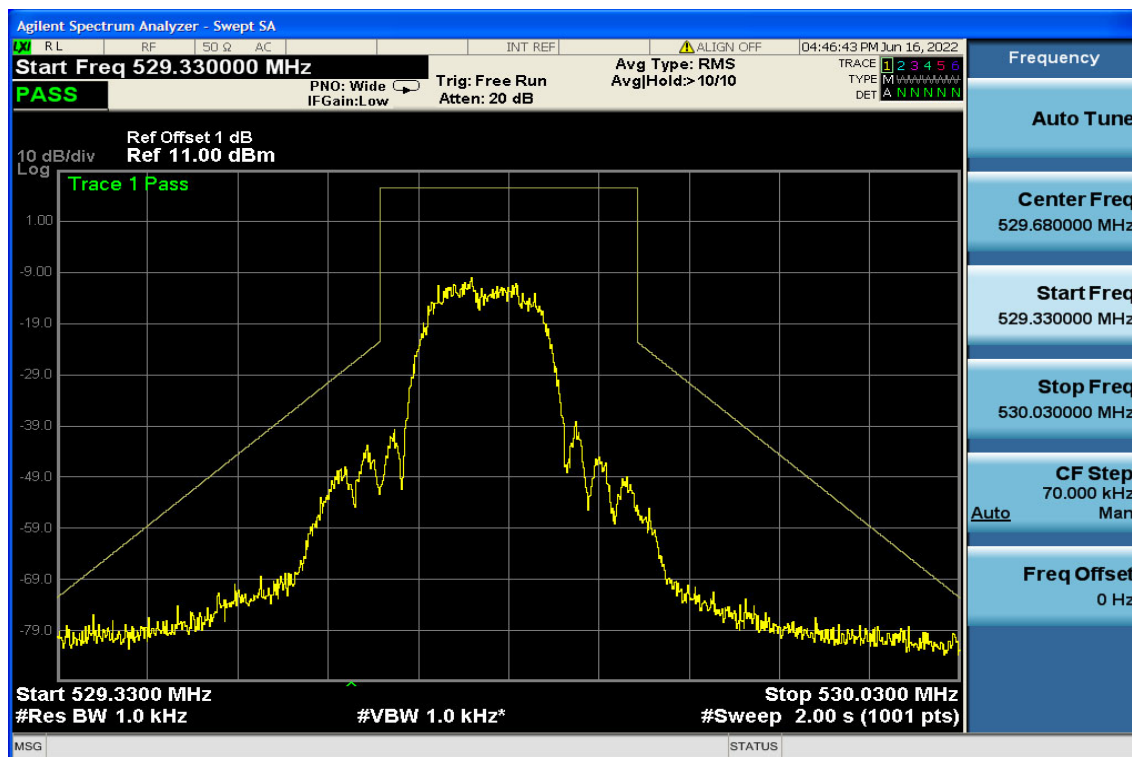
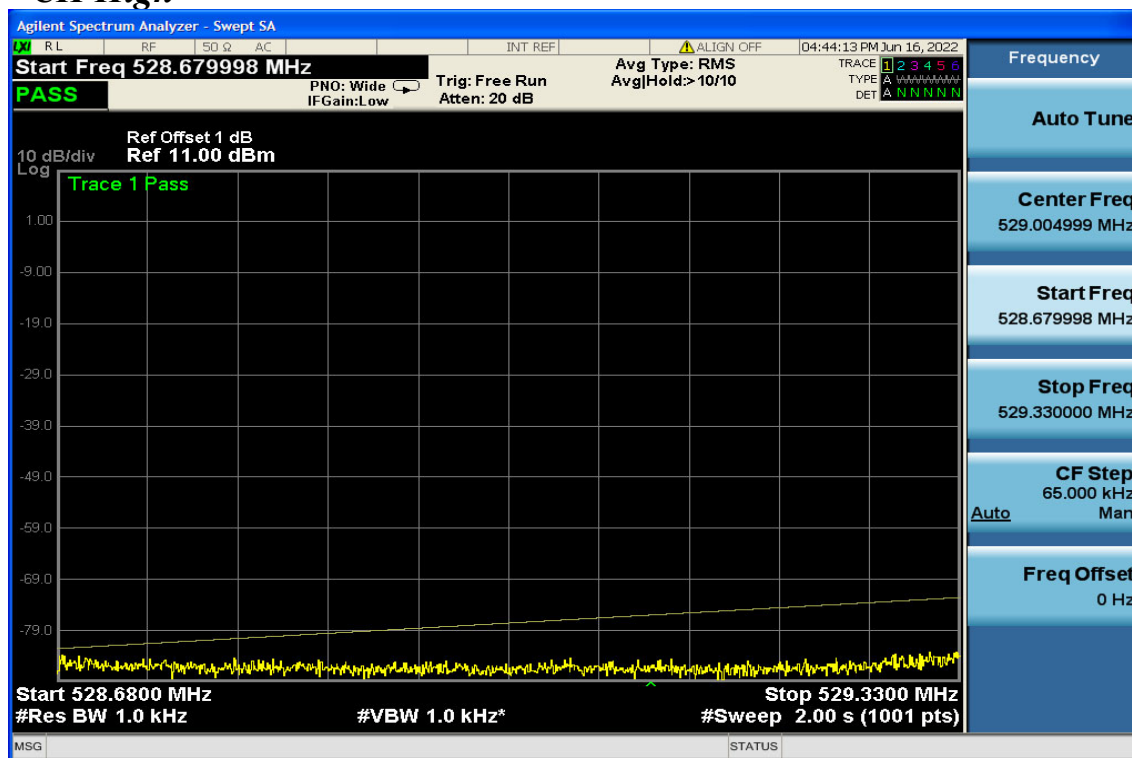
CH Low

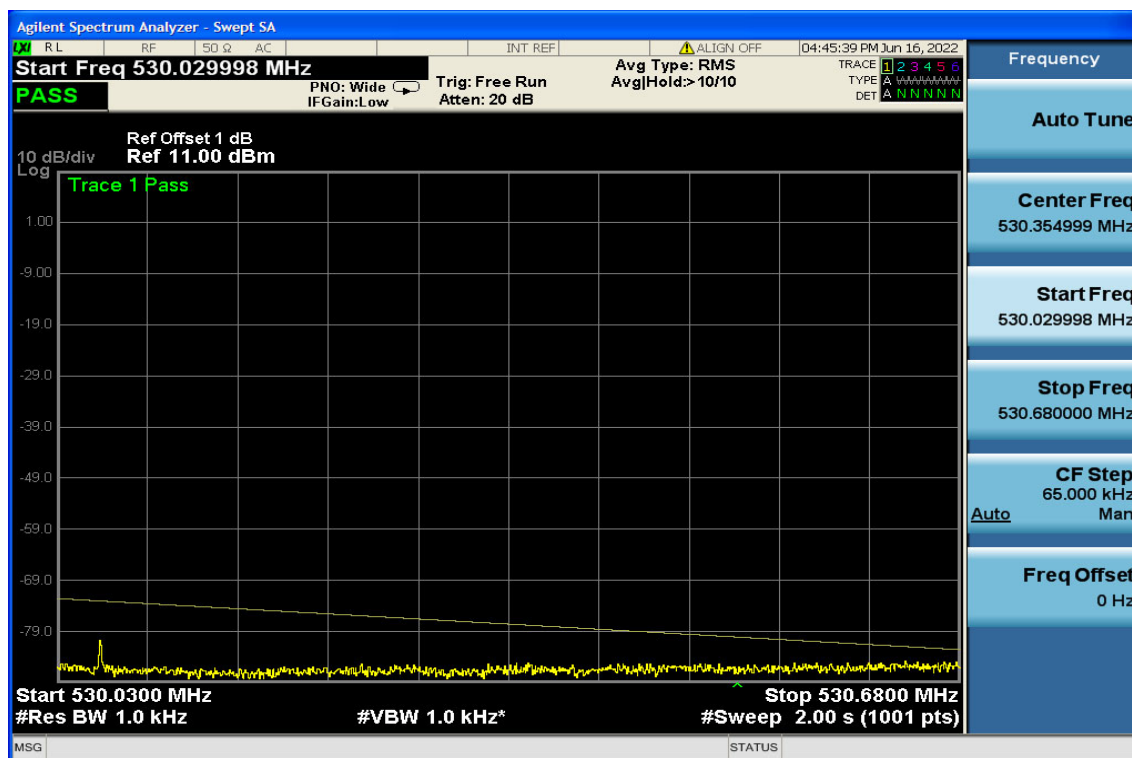


CH Mid





CH High



9 Conducted Emission

9.1 Standard Applicable:

According to §15.207 and RSS-Gen §8.8, frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note		
1.The lower limit shall apply at the transition frequencies		
2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

9.2 Measurement Equipment Used:

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 02	EMI Receiver 14	ROHDE& SCHWARZ	ESCI	101034	05/25/2022	05/25/2023
Conduction 02	Conduction 02-1 Cable	WOKEN	CFD 300-NL	Conduction 02 -1	10/13/2021	10/13/2022
Conduction 02	LISN 26	R&S	ENV216	102378	12/03/2021	12/03/2022
Conduction 02	LISN 21	R&S	ENV216	101476	07/05/2021	07/05/2022
Conduction 02	ISN T4 07	Teseq GmbH	ISN T400A	30449	07/16/2021	07/16/2022
Conduction 02	ISN T8 10	Teseq GmbH	ISN T800	42773	07/16/2021	07/16/2022
Conduction 02	ISN T8 CAT6A 01	SCHWARZBECK	NTFM 8158	8158 0123	01/25/2022	01/25/2023
Conduction 02	CDN ISN ST08A 1	Teseq GmbH	CDN ISN ST08A	43352	10/07/2021	10/07/2022
Conduction 02	Capacitive Voltage Probe 01	SCHAFFNER	CVP 2200A	18711	02/23/2022	02/23/2023

9.3 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10-2013.
2. The AC/DC Power adaptor of PC was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with AC power source.

9.4 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.
4. Both 120V & 240V have been verified, and 120V/60Hz was defined as the worst-case and record in the report.

9.5 Measurement Result:

N/A.