FCC TEST REPORT

FCC ID: 2APMC-MJ-109LP

On Behalf of

Pretty Art(Shenzhen)Co., Ltd.

Phonograph

Model No.: MJ-102LP, MJ-106LP, MJ-108LP, MJ-109LP, MJ-112LP, MJ-128LP, MJ-228, MJ-108, MJ-109, MJ-205, MJ-206

Prepared for	:	Pretty Art(Shenzhen)Co., Ltd.
Address	:	The 4th Floor, The 3rd Building, Xinxintian Industrial Zone, Xinsha Road, Sha'er Community, Shajing Street, Bao'an District, Shenzhen City, China.

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	A2109177-C03-R05
Date of Receipt	:	May 18, 2022
Date of Test	:	May 18, 2022– June 1, 2022
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TEST REPORT DECLARATION

Applicant	:	Pretty Art(Shenzhen)Co., Ltd.
Address	:	The 4th Floor, The 3rd Building, Xinxintian Industrial Zone, Xinsha Road,Sha'er Community, Shajing Street, Bao'an District, Shenzhen City, China.
Manufacturer	:	Pretty Art(Shenzhen)Co., Ltd.
Address	:	The 4th Floor, The 3rd Building, Xinxintian Industrial Zone, Xinsha Road,Sha'er Community, Shajing Street, Bao'an District, Shenzhen City, China.
EUT Description	:	Phonograph
		(A) Model No. : MJ-102LP, MJ-106LP, MJ-108LP, MJ-109LP, MJ-112LP, MJ-128LP, MJ-228, MJ-108, MJ-109, MJ-205, MJ-206
		(B) Trademark : **Meageal**

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247,

ANSI C63.10-2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Yannis Wen Project Engineer	Yannis Wen
Approved by (name + signature)…....:	Jack Xu Project Manager	Jack Xu
Date of issue…… ……..:	June 1, 2022	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	June 1, 2022	Initial released Issue	Yannis Wen

1. Summary Of Standards And Results

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Test Item	Standards Paragraph	Result
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1)	P
Bandwidth	FCC Part 15: 15.215	P
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1)	P
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)	P
Dwell Time	FCC Part 15: 15.247(a)(1)	P
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d)	P
Band Edge Compliance	FCC Part 15: 15.247(d)	P
Power Line Conducted Emissions	FCC Part 15: 15.207	P
Antenna requirement	FCC Part 15: 15.203	P
Note:	1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable.	

2. General Information

2.1. Description of Device (EUT)

Description/PMN	:	Phonograph
Model Number/HVIN(s)	:	MJ-102LP, MJ-106LP, MJ-108LP, MJ-109LP, MJ-112LP, MJ-128LP, MJ-228, MJ-108, MJ-109, MJ-205, MJ-206
Diff.	:	There is no difference between the models except the appearance color. So all the test were performed on the model MJ-109LP.
Trademark	:	**Meageal**
Test Voltage	:	DC 15V from adapter
Radio Technology	:	Bluetooth EDR
Operation frequency	:	2402MHz-2480MHz
Modulation	:	GFSK, π/4-DQPSK
Channel No.	:	79 Channels
Channel Separation	:	1MHz
Antenna Type	:	Internal Antenna, max gain -0.68dBi. Antenna information is provided by applicant.
Software version	:	V1.0
Hardware version	:	V1.0

Remark:

1. The worst-case simultaneous transmission configuration was evaluated with no non-compliance found. Results in this report are only for Bluetooth EDR function, and there is no other transmitter involved.

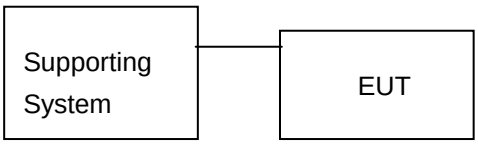
2.2. Accessories of Device (EUT)

Accessories	:	SWITCHING ADAPTOR
Manufacturer	:	MFR SHENZHENFUJIA APPLIANCE CO., LTD.
Model	:	FJ-SW1501500N
Input	:	100-240~50/60Hz 0.6A Max
Output	:	15.0V ⎓ 1.5A 22.5W

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1.	Smartphone	APPLE	iPhone SE	DX3RXCH7H2Y8	--
2	Vinyl CD	--	--	--	--

2.4. Block Diagram of connection between EUT and simulators



2.5. Test Mode Description

The test software “RFTestTool.app” was used to control EUT work in Continuous TX mode, and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
Carrier Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
GFSK / Pi/4-DQPSK hopping on Tx Mode	CH0 to CH78	2402 to 2480
GFSK / Pi/4-DQPSK hopping off Tx Mode	CH0	2402
	CH39	2441
	CH78	2480

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	25℃
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961
Designation Number: CN1236
July 15, 2019 Certificated by IC
Registration Number: CN0085

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	**Uncertainty**
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8}GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

2.9. Test Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2020.09.02	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	102137	2021.08.25	1Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2021.08.25	1Year
Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-102082-Wa	2021.08.25	1Year
Receiver	R&S	ESCI	101165	2021.08.25	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB 9168#627	2021.08.30	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2106	2021.08.30	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00059	2021.08.30	2Year
RF Cable	Resenberger	Cable 1	RE1	2021.08.25	1Year
RF Cable	Resenberger	Cable 2	RE2	2021.08.25	1Year
RF Cable	Resenberger	Cable 3	CE1	2021.08.25	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2021.08.25	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2021.08.25	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126-466	2021.08.25	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2021.08.25	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	00946	2021.08.30	2 Year
Preamplifier	SKET	LNPA_1840-50	SK2018101801	2021.08.25	1 Year
Power Meter	Agilent	E9300A	MY41496628	2021.08.25	1 Year
Power Sensor	DARE	RPR3006W	15100041SNO91	2021.08.25	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000-40-880	100631	2022.04.21	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	20140927-6	2021.08.25	1 Year

3. Maximum Peak Output Power

3.1. Limit

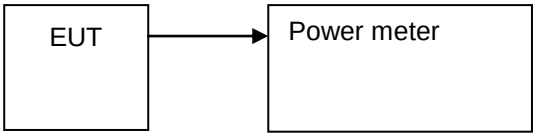
Please refer FCC part 15.247 & RSS-247..

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

The transmitter output is connected to the RF Power meter. The Power meter is set to the peak power detection.

3.3. Test Setup



3.4. Test Result

Mode	Freq (MHz)	PK Output Power (dBm)	Limit (dBm)	Result
GFSK	2402	2.122	21	Pass
	2441	2.654	21	Pass
	2480	2.157	21	Pass
π/4 DQPSK	2402	2.038	21	Pass
	2441	2.678	21	Pass
	2480	2.542	21	Pass
Conclusion: PASS				

4. Bandwidth

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in RSS-GEN, FCC Section 15.247(a)(1), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

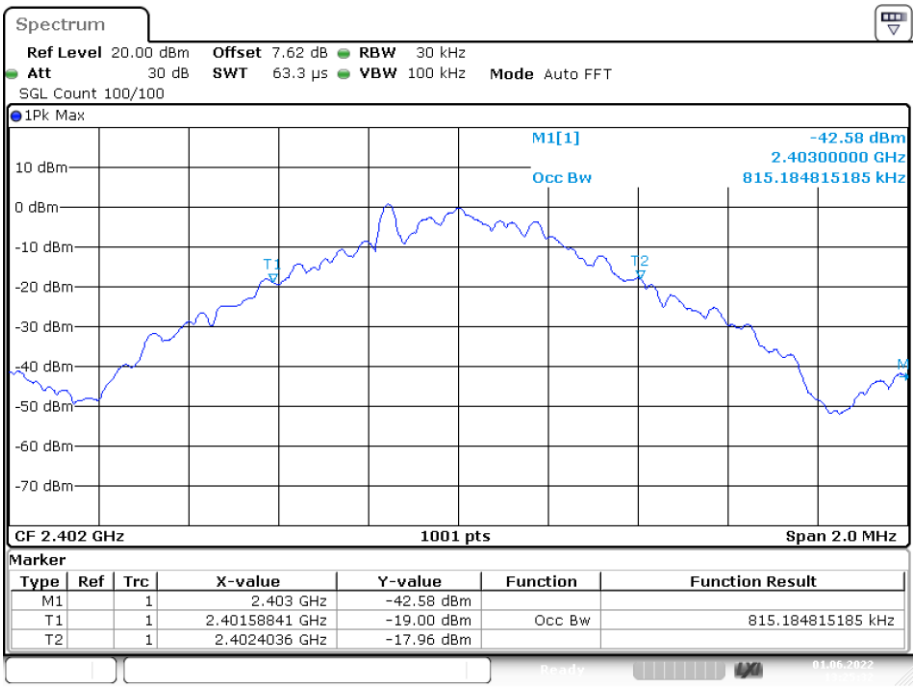
4.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3. Test Result

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	Ant 1	0.815	0.854	/	Pass
NVNT	1-DH1	2441	Ant 1	0.831	0.85	/	Pass
NVNT	1-DH1	2480	Ant 1	0.815	0.85	/	Pass
NVNT	2-DH1	2402	Ant 1	1.171	1.292	/	Pass
NVNT	2-DH1	2441	Ant 1	1.157	1.22	/	Pass
NVNT	2-DH1	2480	Ant 1	1.169	1.196	/	Pass

OBW NVNT 1-DH1 2402MHz Ant1



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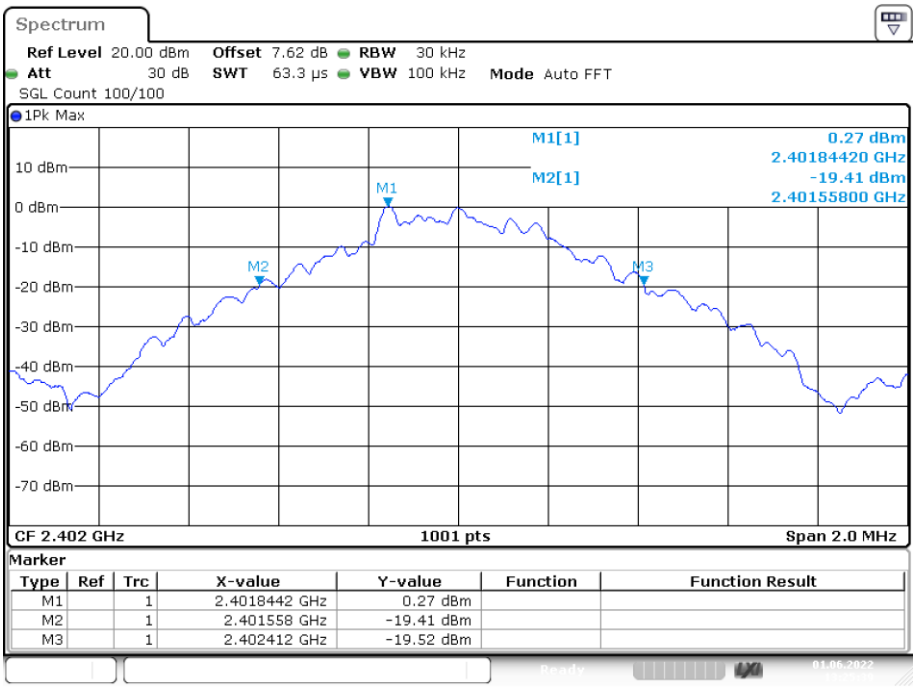
-20 dB BW NVNT 1-DH1 2402MHz Ant1



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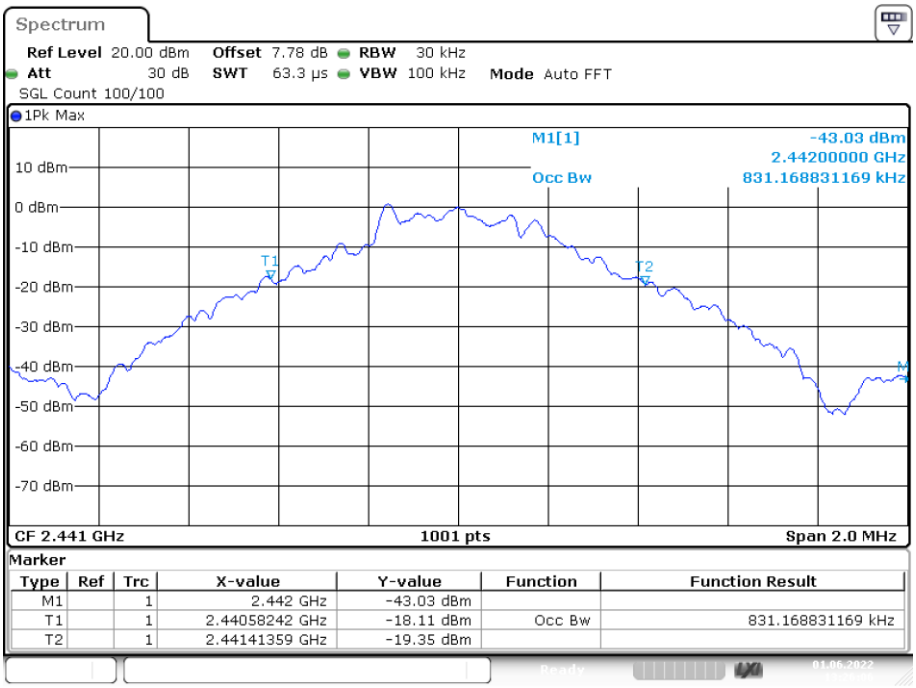
OBW NVNT 1-DH1 2441MHz Ant1



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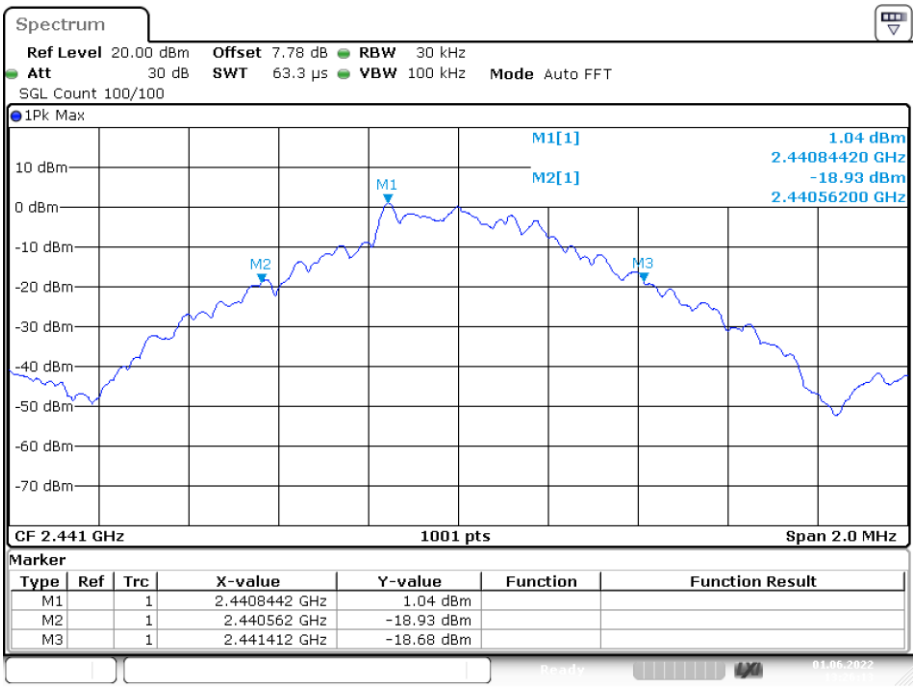
-20 dB BW NVNT 1-DH1 2441MHz Ant1



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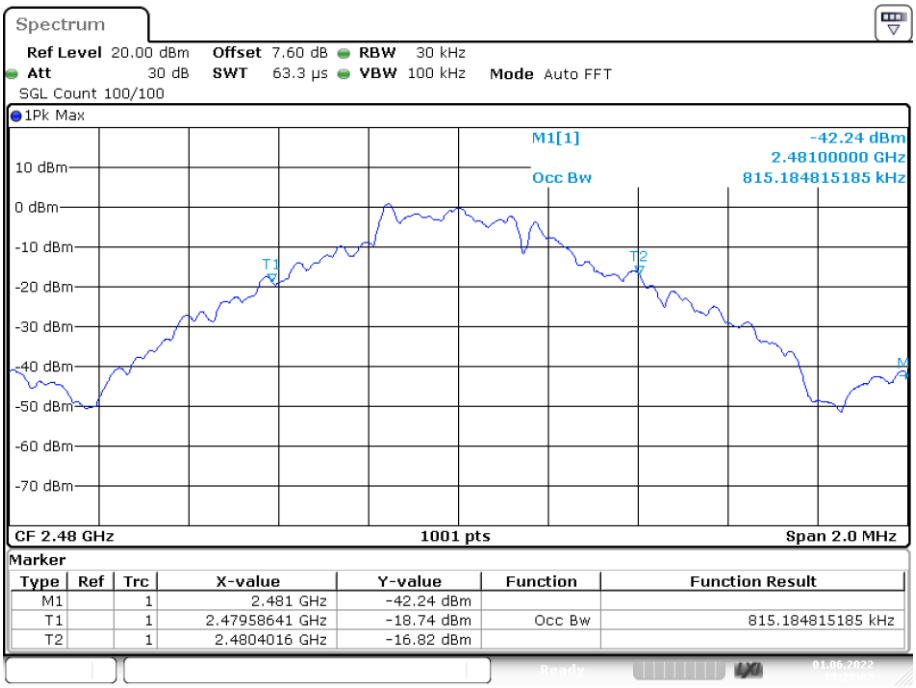
OBW NVNT 1-DH1 2480MHz Ant1



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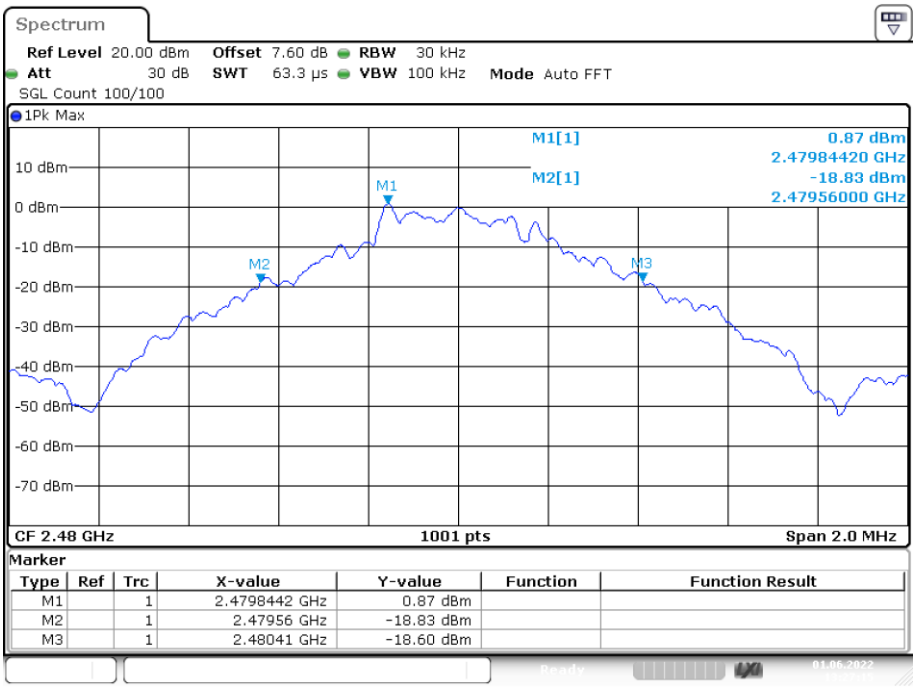
-20 dB BW NVNT 1-DH1 2480MHz Ant1



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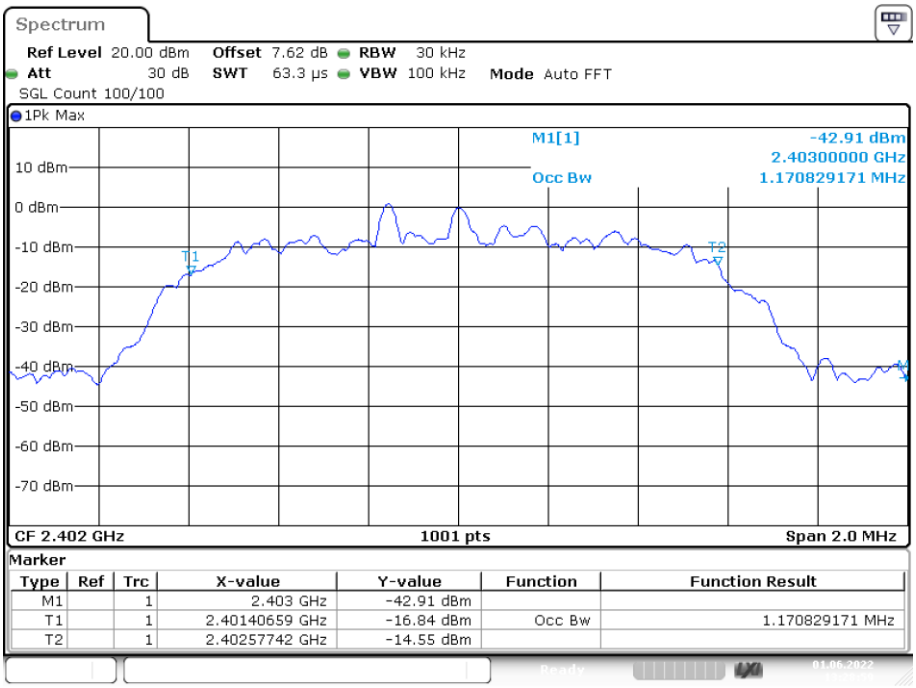
OBW NVNT 2-DH1 2402MHz Ant1



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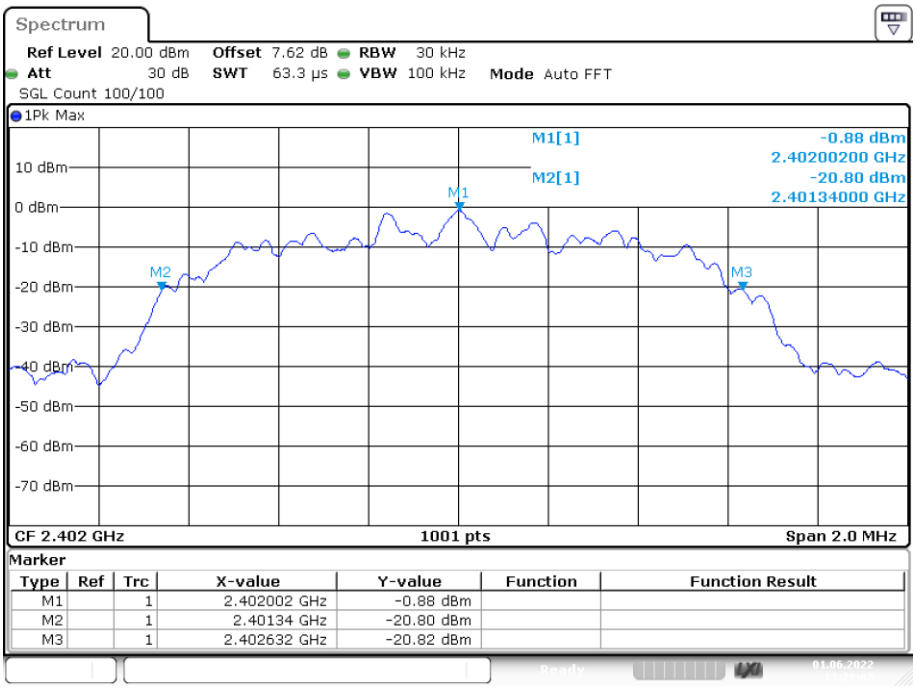
-20 dB BW NVNT 2-DH1 2402MHz Ant1



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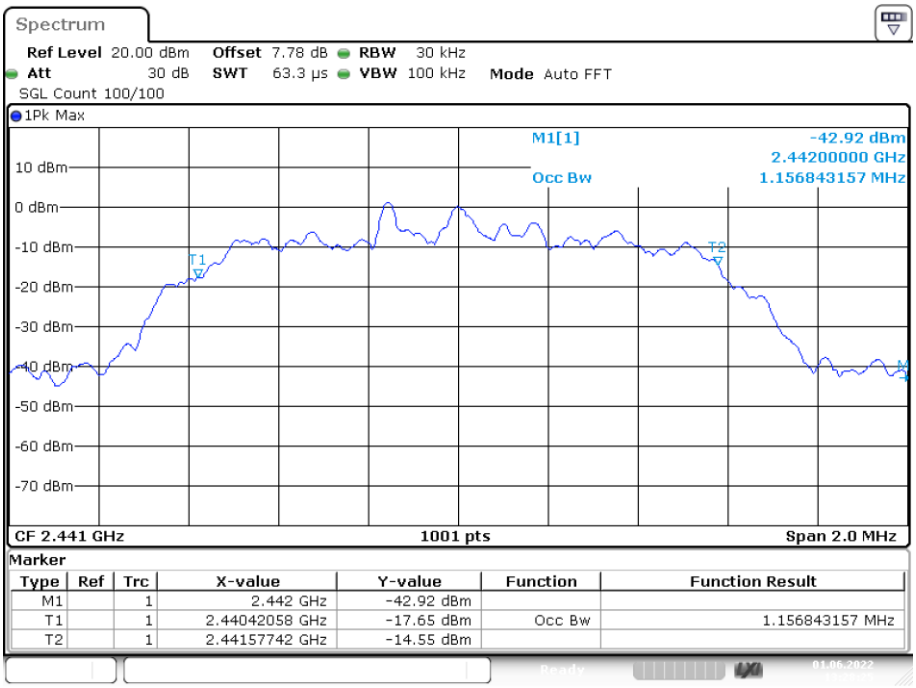
OBW NVNT 2-DH1 2441MHz Ant1



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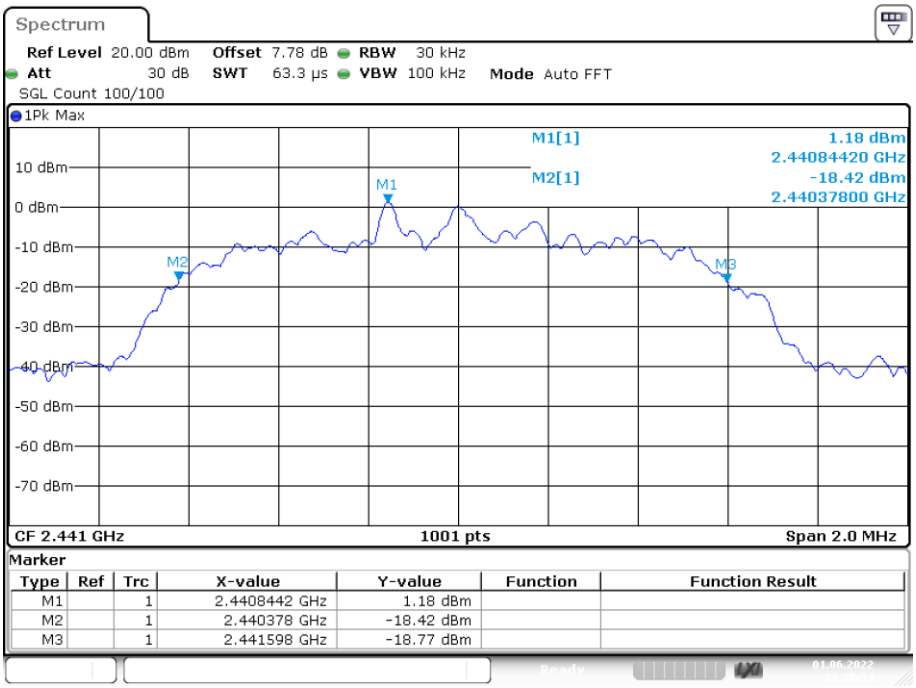
-20 dB BW NVNT 2-DH1 2441MHz Ant1



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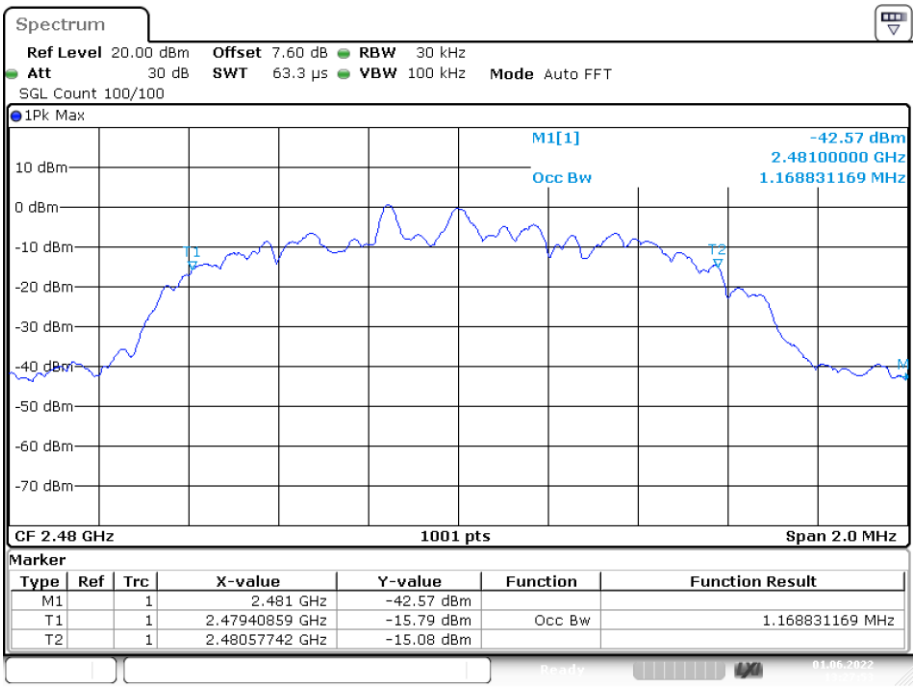
OBW NVNT 2-DH1 2480MHz Ant1



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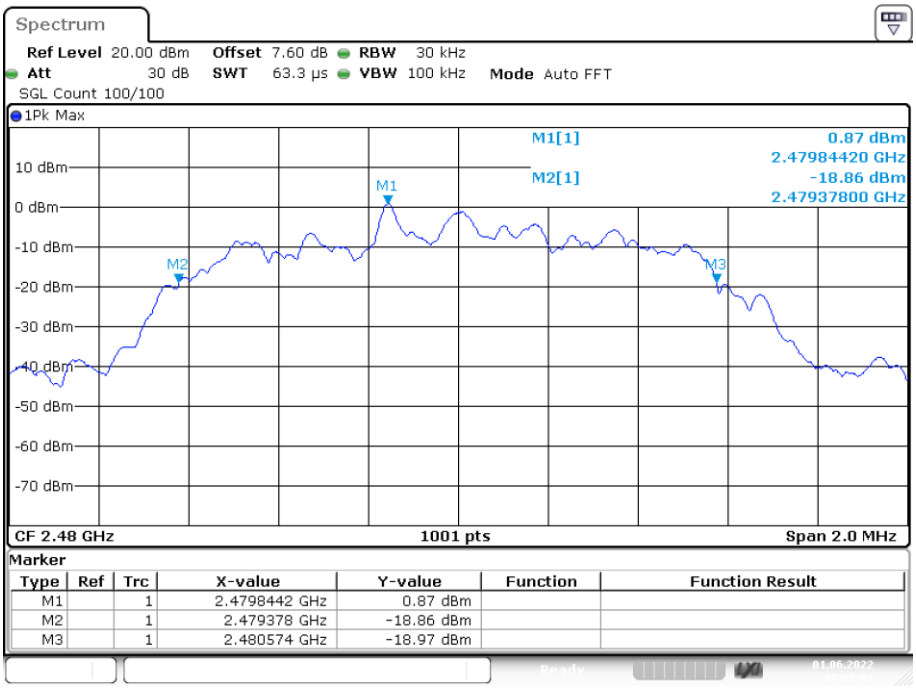
-20 dB BW NVNT 2-DH1 2480MHz Ant1



Date: 1.JUN.2022 13:28:00

5. Carrier Frequency Separation

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

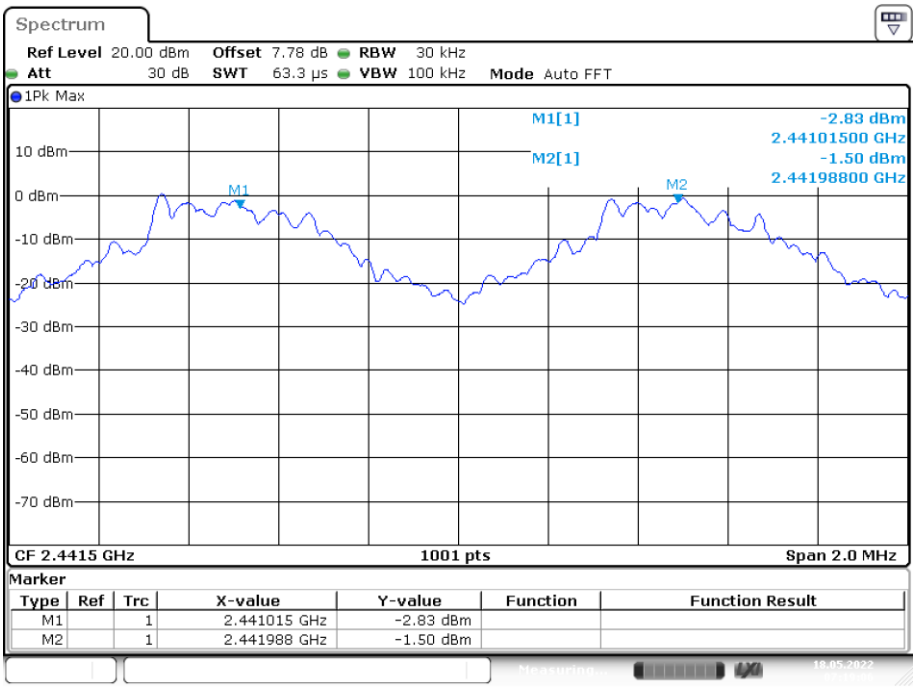
5.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

5.3. Test Result

Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2441.015	2441.988	0.973	0.567	Pass
NVNT	2-DH1	2440.842	2441.844	1.002	0.813	Pass

CFS NVNT 1-DH1 2441MHz Ant1



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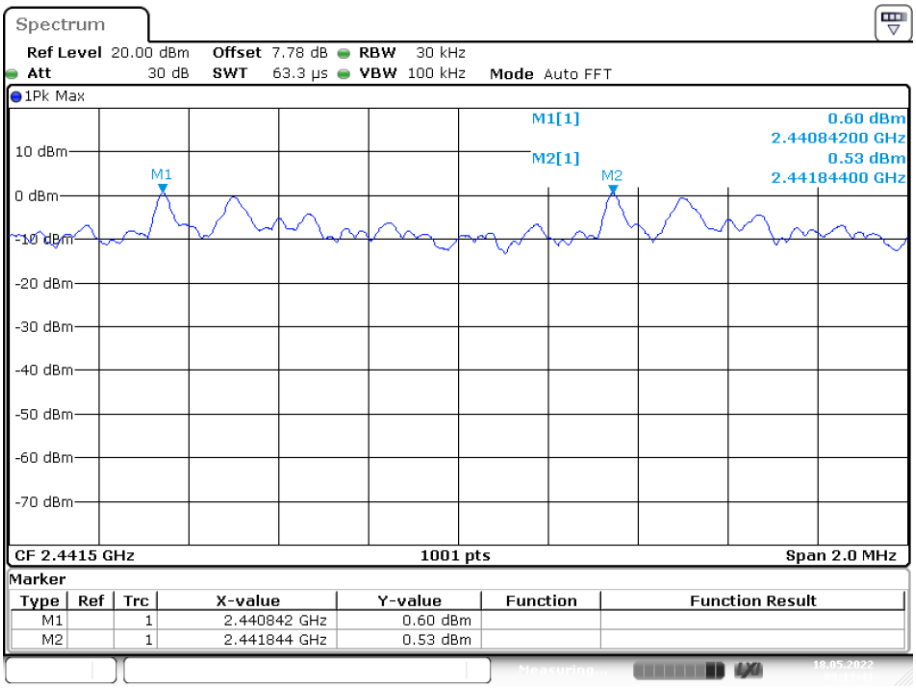
CFS NVNT 2-DH1 2441MHz Ant1



Date: 18.MAY.2022 09:13:40

6. Number Of Hopping Channel

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

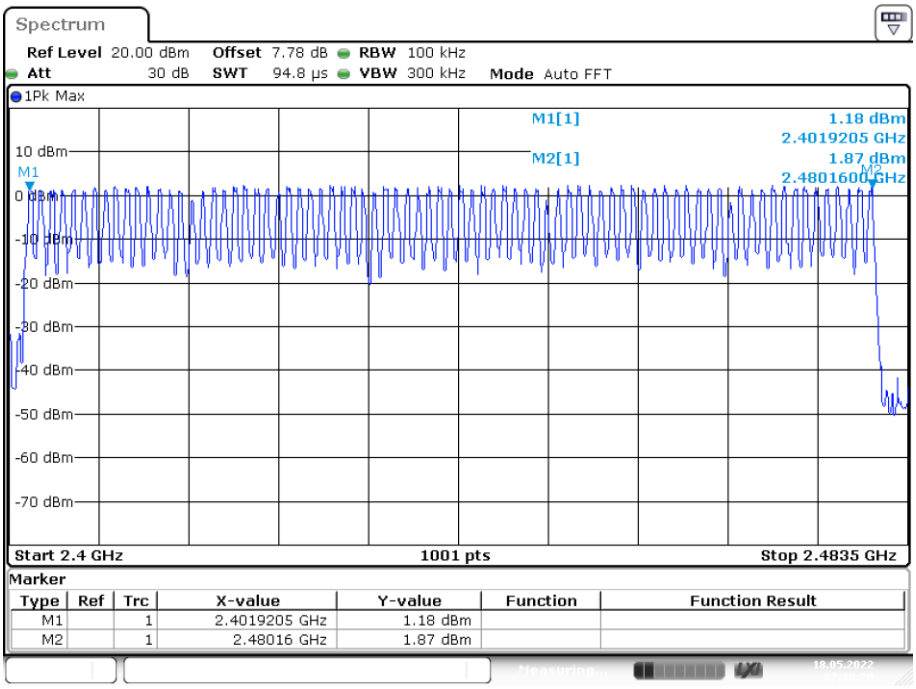
6.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The number of hopping channel was measured by spectrum analyzer with 100kHz RBW and 300KHz VBW.

6.3. Test Result

Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH1	79	15	Pass
NVNT	2-DH1	79	15	Pass

Hopping No. NVNT 1-DH1 2441MHz Ant1



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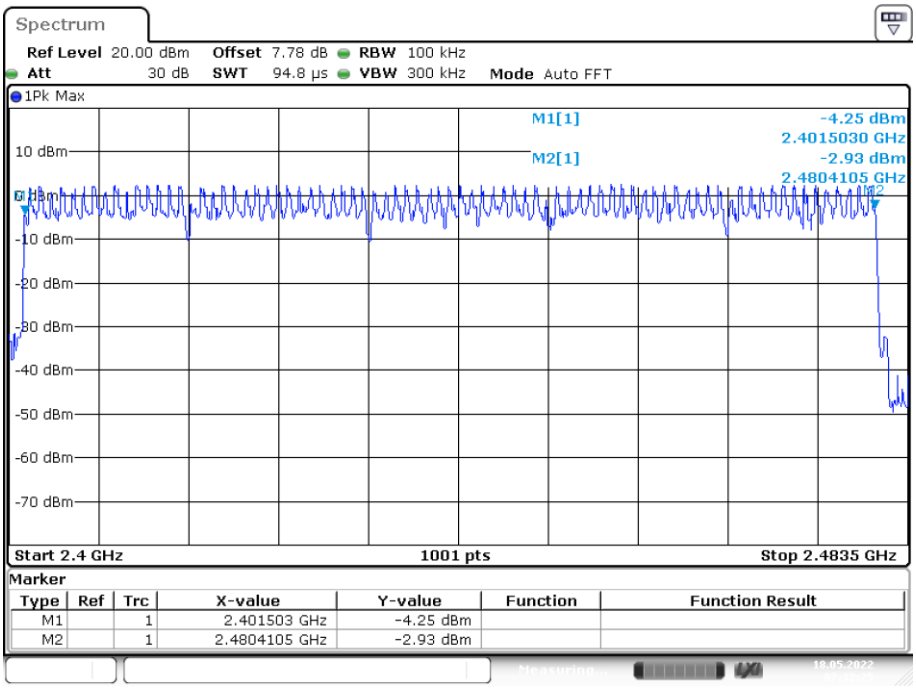
Hopping No. NVNT 2-DH1 2441MHz Ant1



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7. Dwell Time

7.1. Test limit

Please refer FCC part 15.247 & RSS-247.

Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 sec- onds multiplied by the number of hopping channel employed.

7.2. Test Procedure

7.2.1. Place the EUT on the table and set it in transmitting mode.

7.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3. Set center frequency of spectrum analyzer = operating frequency.

7.2.4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.

7.2.5. Repeat above procedures until all frequency measured were complete.

7.3. Test Result

PASS.

Detailed information please see the following page.

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	Ant1	0.376	120.320	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.633	261.280	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.88	307.200	31600	400	Pass
NVNT	2-DH1	2441	Ant1	0.387	123.840	31600	400	Pass
NVNT	2-DH3	2441	Ant1	1.638	262.080	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.897	309.013	31600	400	Pass

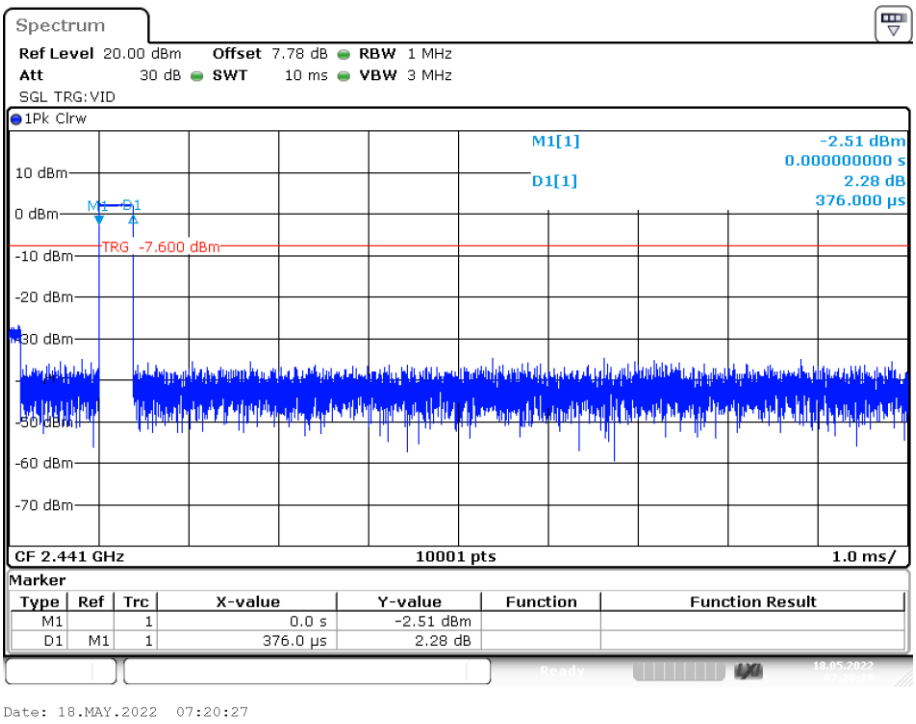
Note: A period time = 0.4 (s) * 79 = 31.6(s)

DH1 Dwell Time = Pulse Time * (1600/(2*79)) * A period time

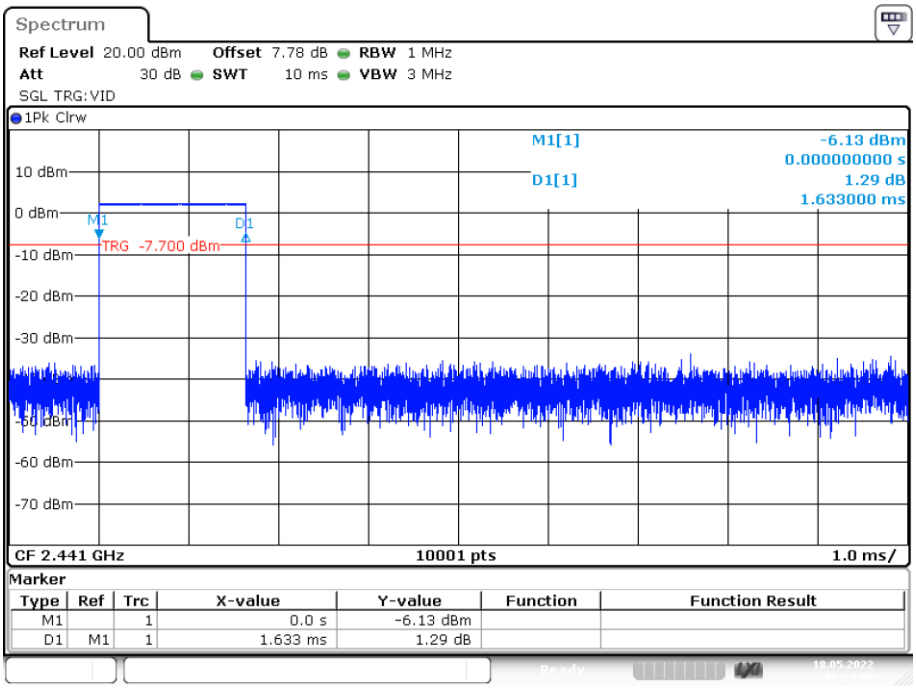
DH3 Dwell Time = Pulse Time * (1600/(4*79)) * A period time

DH5 Dwell Time = Pulse Time * (1600/(6*79)) * A period time

Dwell NVNT 1-DH1 2441MHz Ant1 One Burst

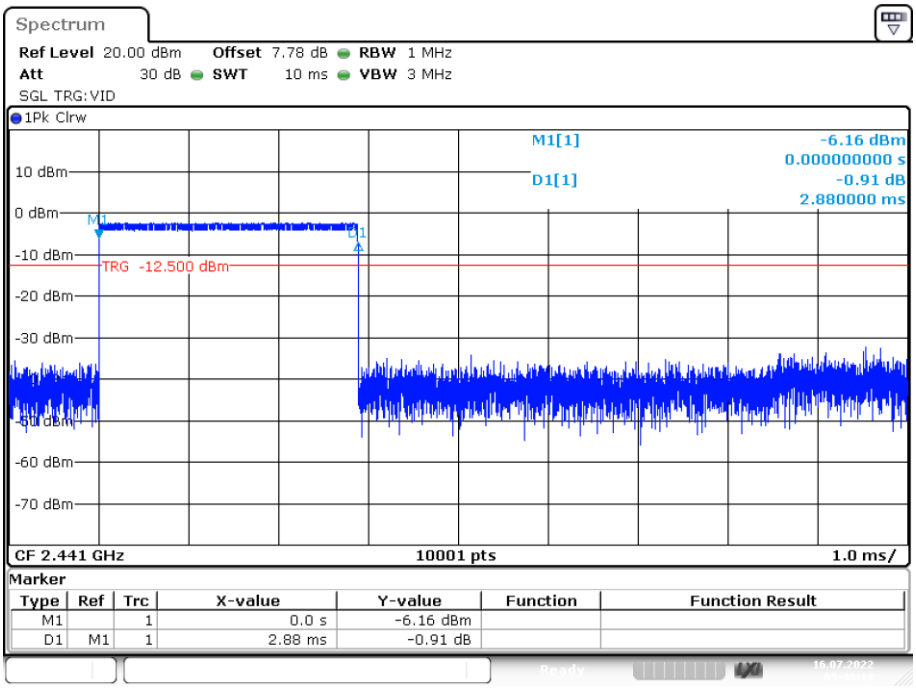


Dwell NVNT 1-DH3 2441MHz Ant1 One Burst



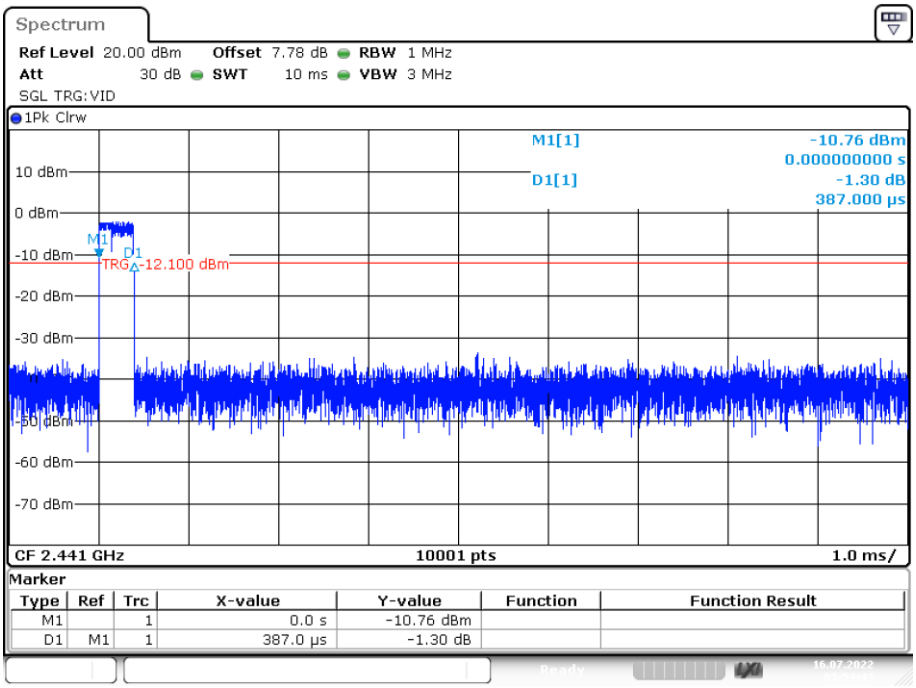
Date: 18.MAY.2022 07:24:07

Dwell NVNT 1-DH5 2441MHz Ant1 One Burst



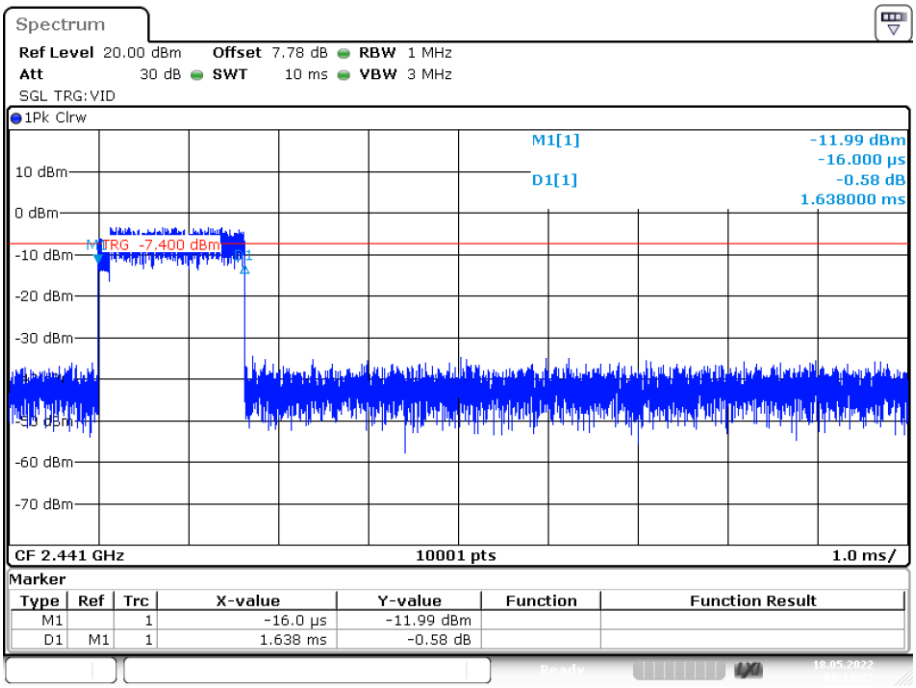
Date: 18.MAY.2022 07:25:33

Dwell NVNT 2-DH1 2441MHz Ant1 One Burst



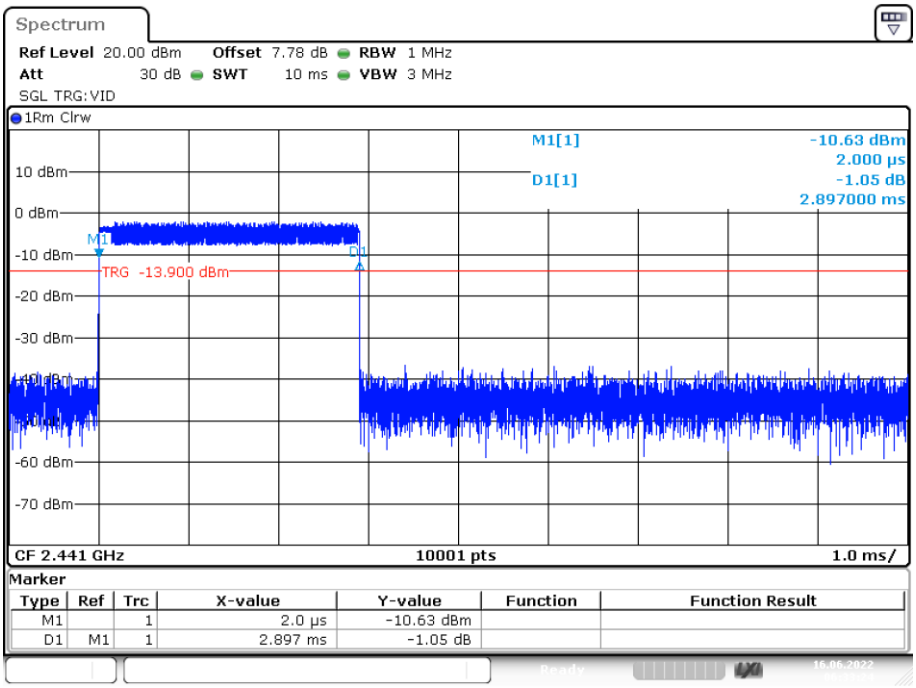
Date: 18.MAY.2022 07:32:34

Dwell NVNT 2-DH3 2441MHz Ant1 One Burst



Date: 18.MAY.2022 09:14:26

Dwell NVNT 2-DH5 2441MHz Ant1 One Burst



Date: 18.MAY.2022 11:17:54

8. Radiated Emissions

8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

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])

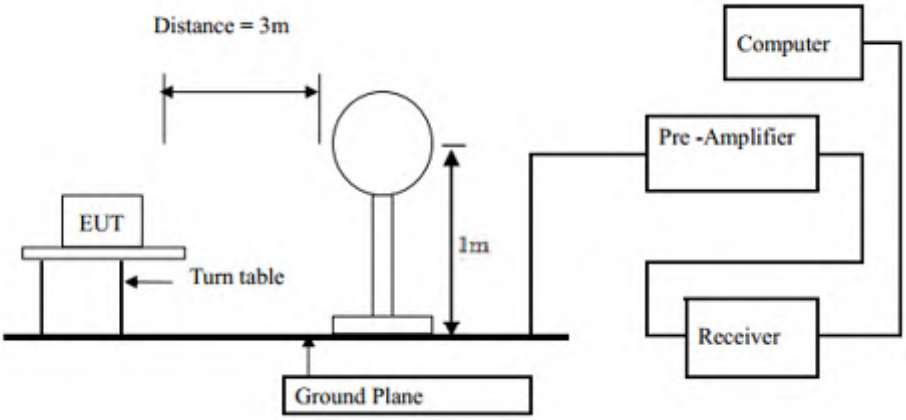
15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

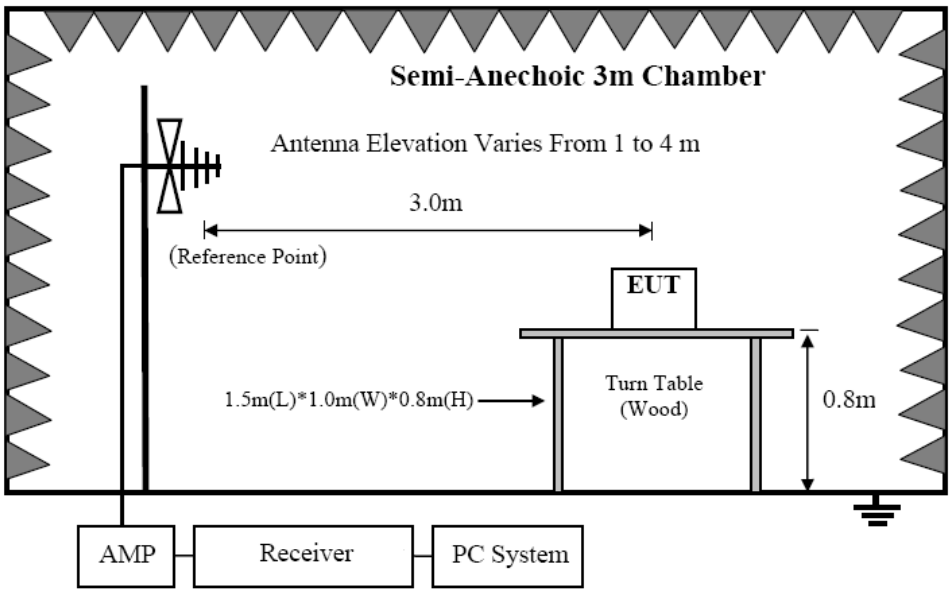
Note: The peak limit is 20 dB higher than the average limit

8.2. Block Diagram of Test setup

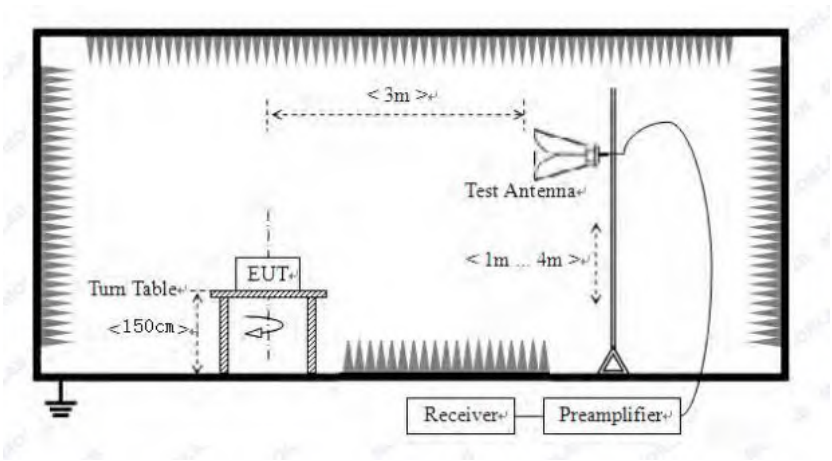
8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

8.3. Test Procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.

(2) Setup EUT and simulator

(3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

(4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated

(5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 :2013on Radiated Emission test.

(6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

8.4. Test Result

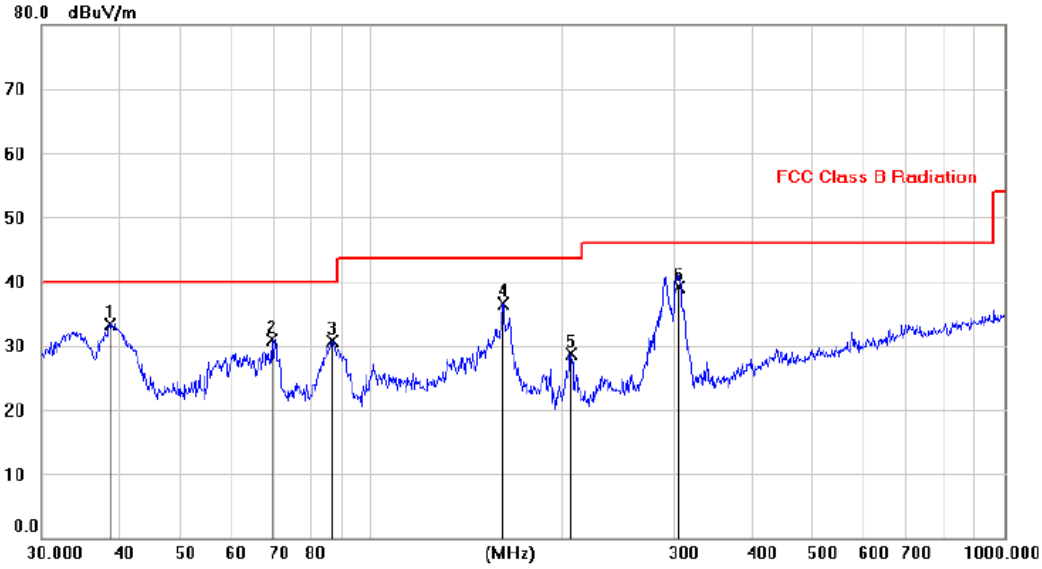
We have scanned from 9kHz to the 10th harmonic of the EUT's highest frequency.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

From 30MHz to 1000MHz: Conclusion: PASS

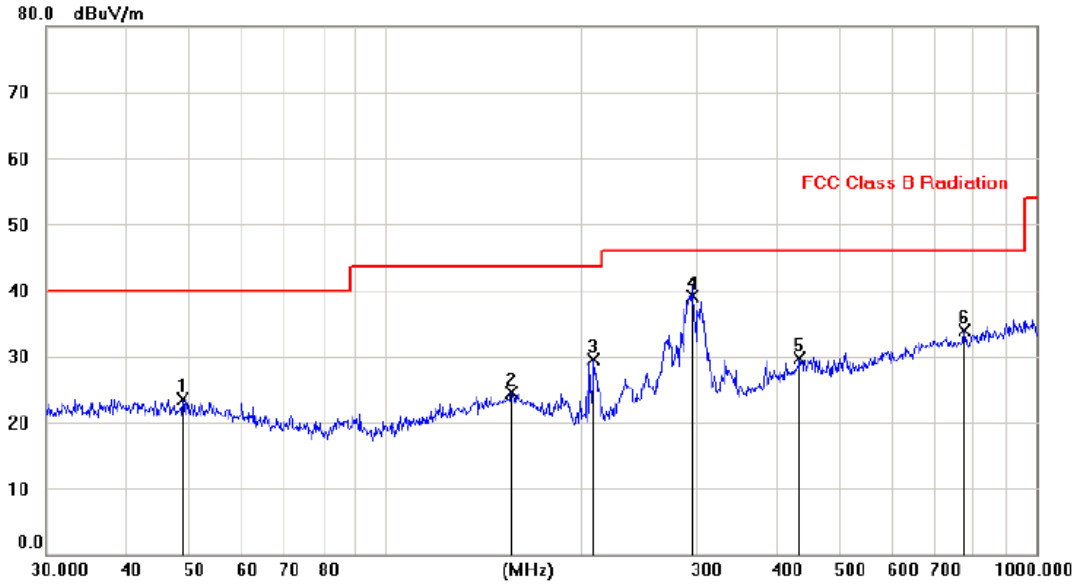
Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	38.5124	19.05	14.29	33.34	40.00	-6.66	peak			
2		69.4542	19.43	11.41	30.84	40.00	-9.16	peak			
3		86.5838	20.76	10.00	30.76	40.00	-9.24	peak			
4		161.2855	21.62	14.92	36.54	43.50	-6.96	peak			
5		206.8081	17.74	11.02	28.76	43.50	-14.74	peak			
6		305.8587	24.81	14.24	39.05	46.00	-6.95	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		48.7288	9.38	14.05	23.43	40.00	-16.57	peak			
2		156.2567	9.48	15.05	24.53	43.50	-18.97	peak			
3		209.1418	18.39	11.06	29.45	43.50	-14.05	peak			
4	*	296.8768	25.11	14.03	39.14	46.00	-6.86	QP			
5		433.2034	12.54	17.16	29.70	46.00	-16.30	peak			
6		775.7889	11.24	22.75	33.99	46.00	-12.01	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2441MHz (AC 120V/ 60Hz) was listed in this report.

From 1G-25GHz

Test Mode: GFSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	46.72	V	34.81	10.18	35.59	56.11	74	-17.89	PK
4804	36.09	V	34.85	10.18	35.21	45.92	54	-8.08	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	46.25	H	34.93	10.18	35.17	56.19	74	-17.81	PK
4804	37.88	H	34.25	10.18	35.15	47.16	54	-6.84	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX Mid									
4882	42.51	V	34.51	10.2	34.97	52.24	74	-21.76	PK
4882	36.73	V	34.40	10.2	35.47	45.86	54	-8.14	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	44.67	H	34.57	10.2	34.98	54.46	74	-19.54	PK
4882	36.22	H	34.89	10.2	34.96	46.35	54	-7.65	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX High									
4960	45.99	V	34.78	10.22	35.61	55.38	74	-18.62	PK
4960	34.47	V	34.41	10.22	35.09	44.01	54	-9.99	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	42.54	H	34.72	10.22	34.82	52.65	74	-21.35	PK
4960	34.02	H	34.93	10.22	35.13	44.04	54	-9.96	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/

Note:
1, Result = Read level + Antenna factor + cable loss-Amp factor
2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

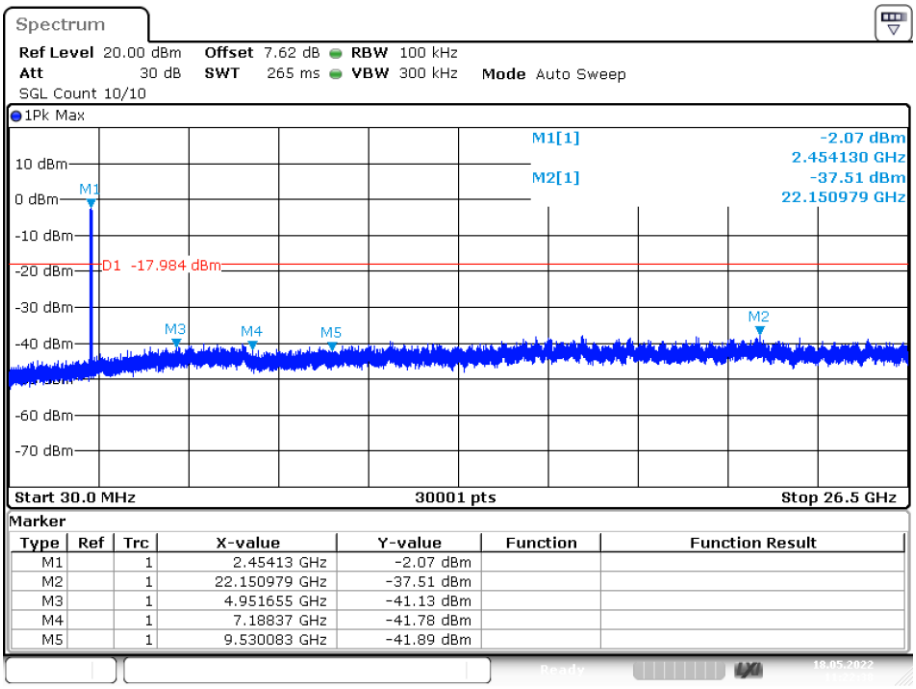
From 1G-25GHz

Test Mode: π/4 DQPSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	46.39	V	34.74	10.18	35.73	55.58	74	-18.42	PK
4804	36.18	V	34.61	10.18	35.52	45.44	54	-8.56	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	48.58	H	34.91	10.18	35.03	58.64	74	-15.36	PK
4804	38.86	H	34.80	10.18	35.18	48.66	54	-5.34	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX Mid									
4882	45.55	V	34.64	10.2	35.49	54.89	74	-19.11	PK
4882	34.67	V	34.66	10.2	34.91	44.62	54	-9.38	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	45.07	H	34.64	10.2	35.44	54.47	74	-19.53	PK
4882	37.60	H	34.63	10.2	35.03	47.39	54	-6.61	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: π/4 DQPSK TX High									
4960	46.69	V	34.46	10.22	35.28	56.10	74	-17.90	PK
4960	35.87	V	34.69	10.22	35.58	45.21	54	-8.79	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	45.51	H	34.47	10.22	35.66	54.55	74	-19.45	PK
4960	35.44	H	34.85	10.22	34.93	45.58	54	-8.42	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/

Note:
1, Result = Read level + Antenna factor + cable loss-Amp factor
2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

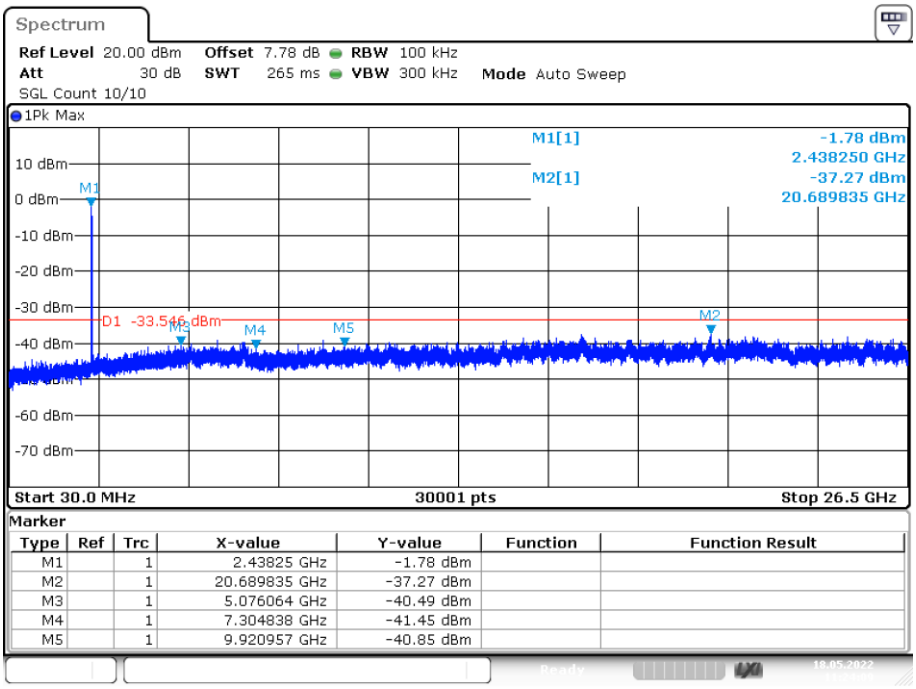
Conducted RF Spurious Emission

Tx. Spurious NVNT 1-DH1 2402MHz Ant1 Emission



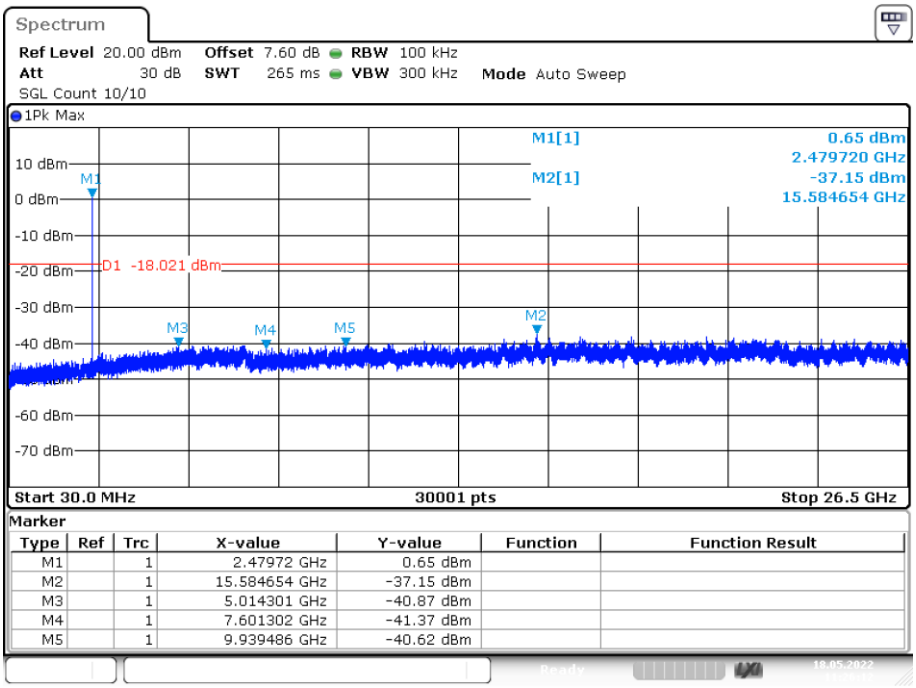
Date: 18.MAY.2022 11:22:37

Tx. Spurious NVNT 1-DH1 2441MHz Ant1 Emission



Date: 18.MAY.2022 11:24:10

Tx. Spurious NVNT 1-DH1 2480MHz Ant1 Emission

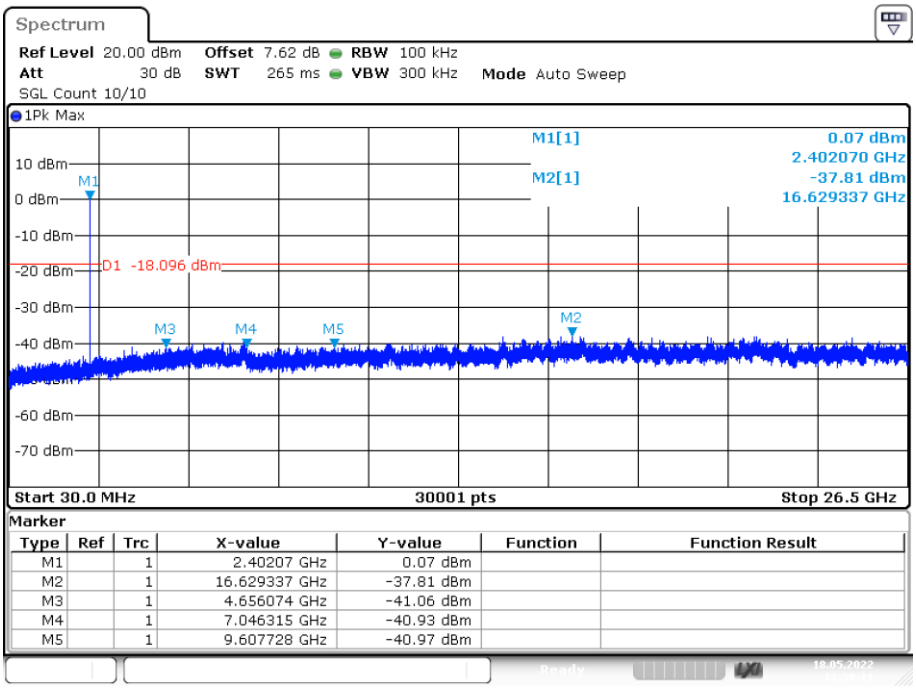


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47972 GHz	0.65 dBm		
M2		1	15.584654 GHz	-37.15 dBm		
M3		1	5.014301 GHz	-40.87 dBm		
M4		1	7.601302 GHz	-41.37 dBm		
M5		1	9.939486 GHz	-40.62 dBm		

Date: 18.MAY.2022 11:26:11

Tx. Spurious NVNT 2-DH1 2402MHz Ant1 Emission

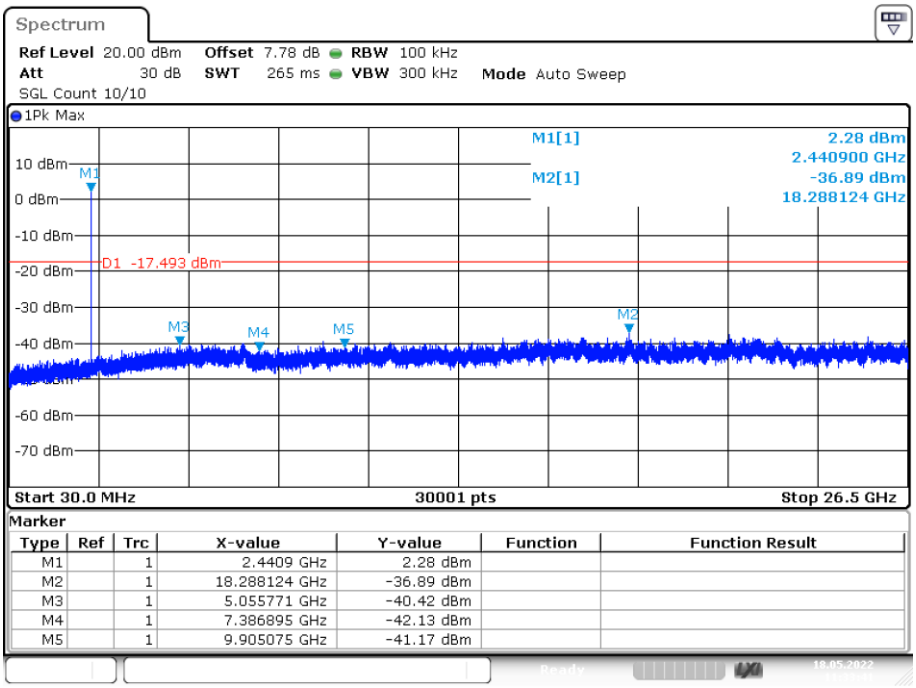


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40207 GHz	0.07 dBm		
M2		1	16.629337 GHz	-37.81 dBm		
M3		1	4.656074 GHz	-41.06 dBm		
M4		1	7.046315 GHz	-40.93 dBm		
M5		1	9.607728 GHz	-40.97 dBm		

Date: 18.MAY.2022 11:30:11

Tx. Spurious NVNT 2-DH1 2441MHz Ant1 Emission

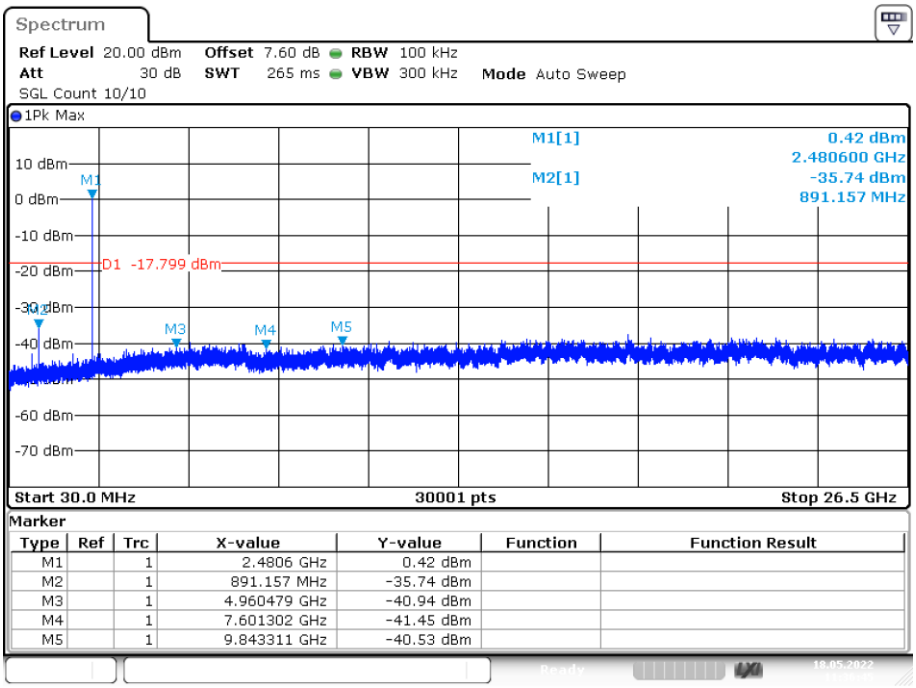


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4409 GHz	2.28 dBm		
M2		1	18.288124 GHz	-36.89 dBm		
M3		1	5.055771 GHz	-40.42 dBm		
M4		1	7.386895 GHz	-42.13 dBm		
M5		1	9.905075 GHz	-41.17 dBm		

Date: 18.MAY.2022 11:33:41

Tx. Spurious NVNT 2-DH1 2480MHz Ant1 Emission



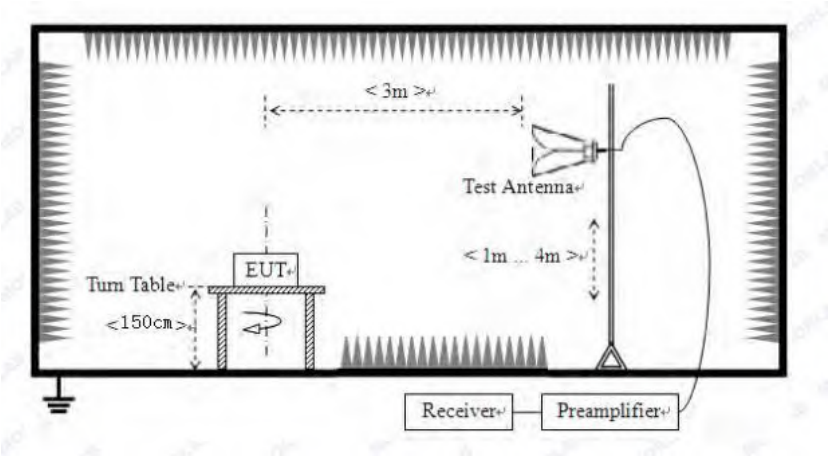
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4806 GHz	0.42 dBm		
M2		1	891.157 MHz	-35.74 dBm		
M3		1	4.960479 GHz	-40.94 dBm		
M4		1	7.601302 GHz	-41.45 dBm		
M5		1	9.843311 GHz	-40.53 dBm		

Date: 18.MAY.2022 11:36:45

9. Band Edge Compliance

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in FCC part 15.209 and RSS-GEN, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with FCC part 15.209 and RSS-GEN limits.

9.3. Test Procedure

Refer to ANSI C 63.10, Clause 6.10.

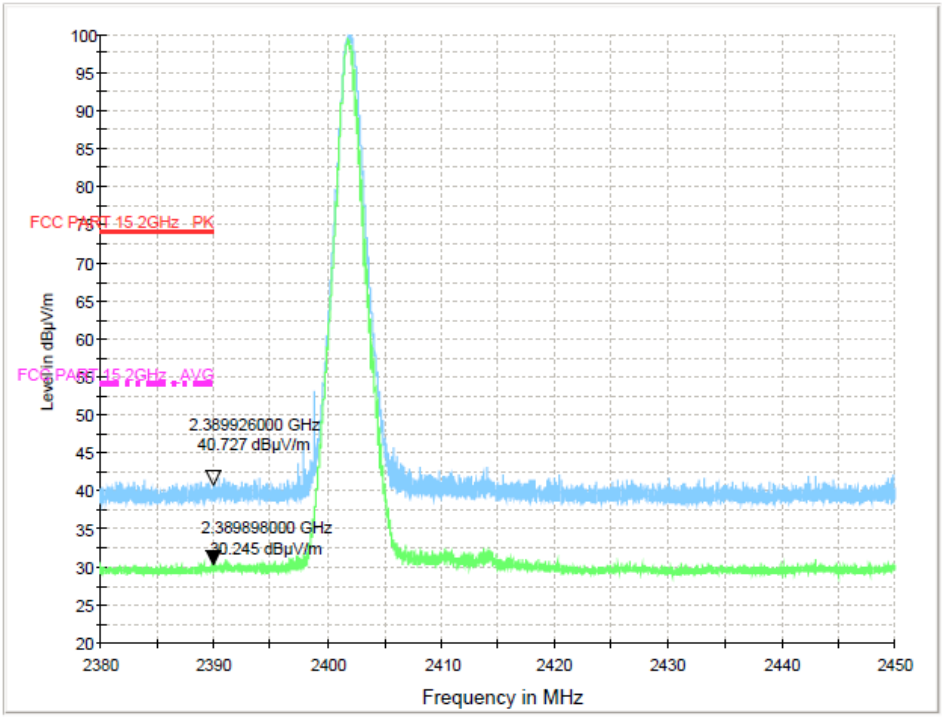
All restriction band and non- restriction band have been tested, only worse case is reported.

9.4. Test Result

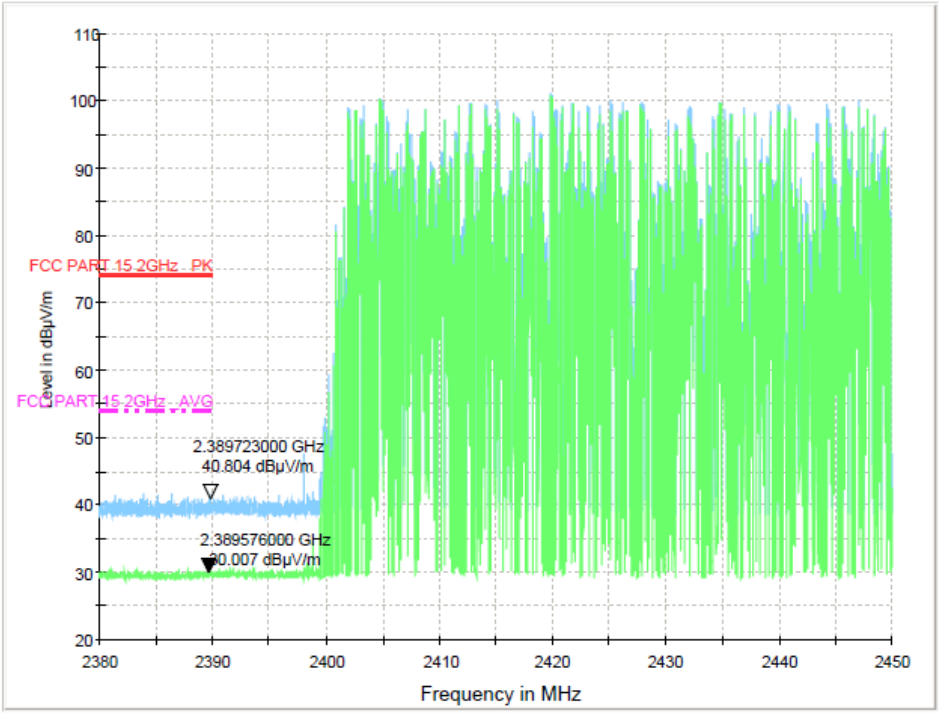
PASS. (See below detailed test data)

Radiated Method:

Test Mode: GFSK-Low

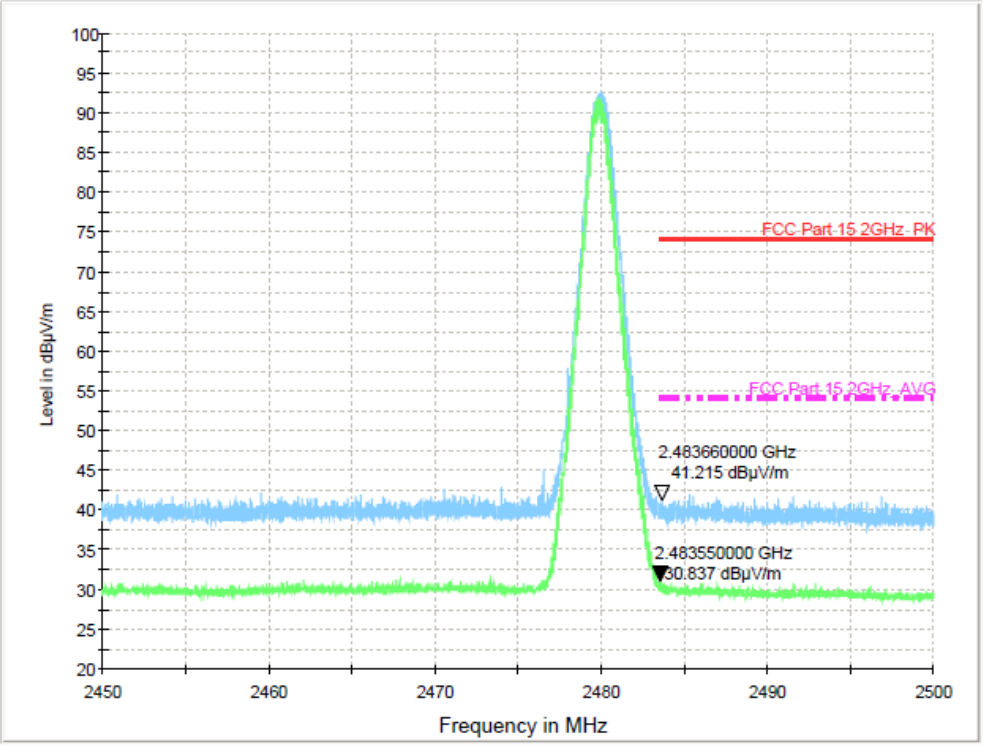


hopping-off

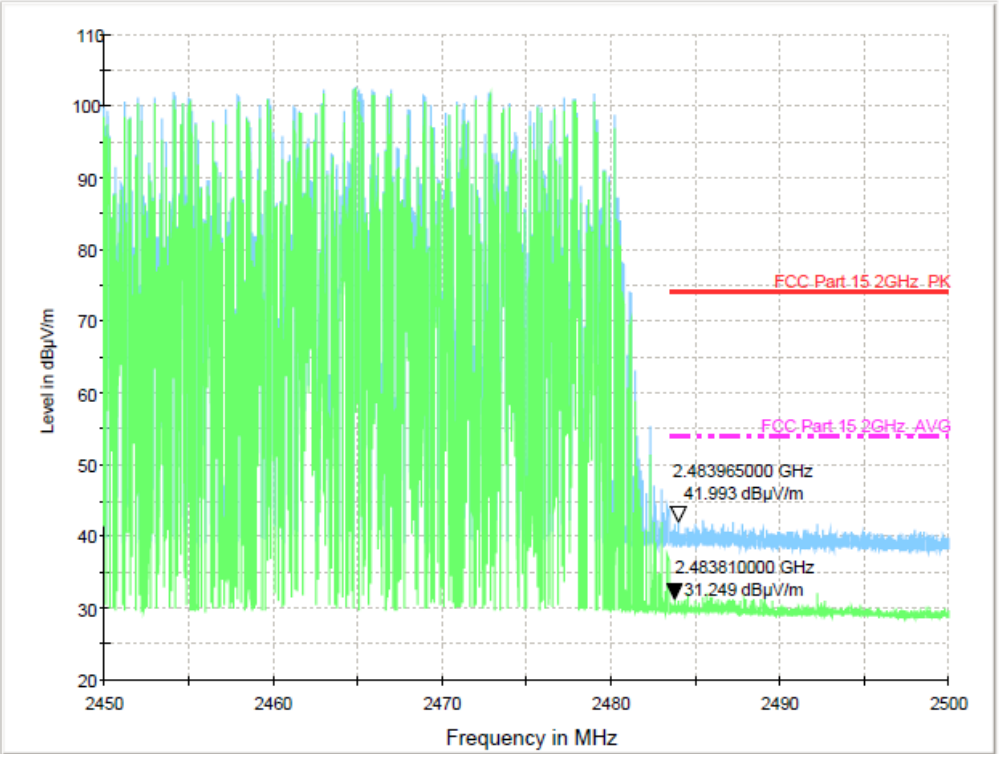


hopping-on

Test Mode: GFSK-High

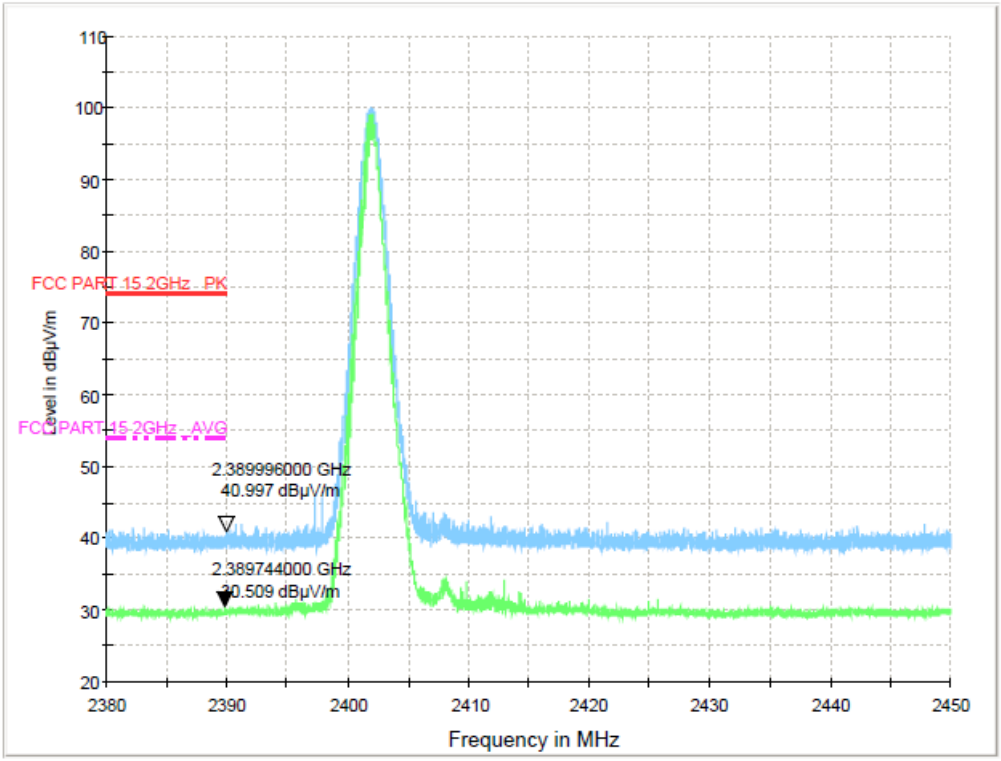


hopping-off

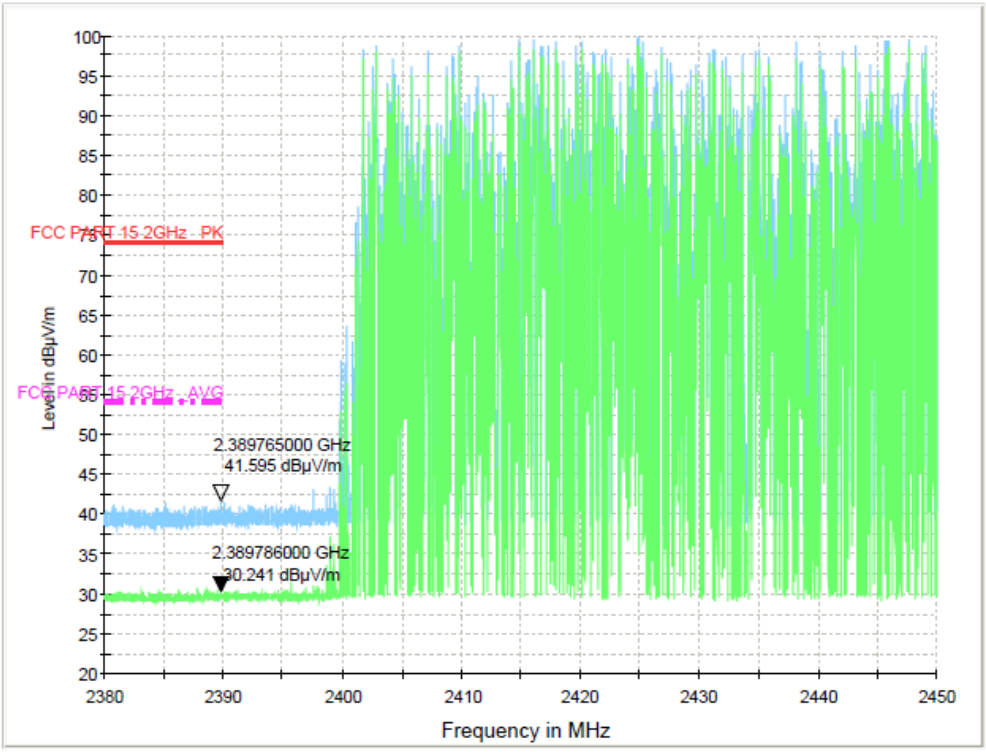


hopping-on

Test Mode: π/4 DQPSK-Low

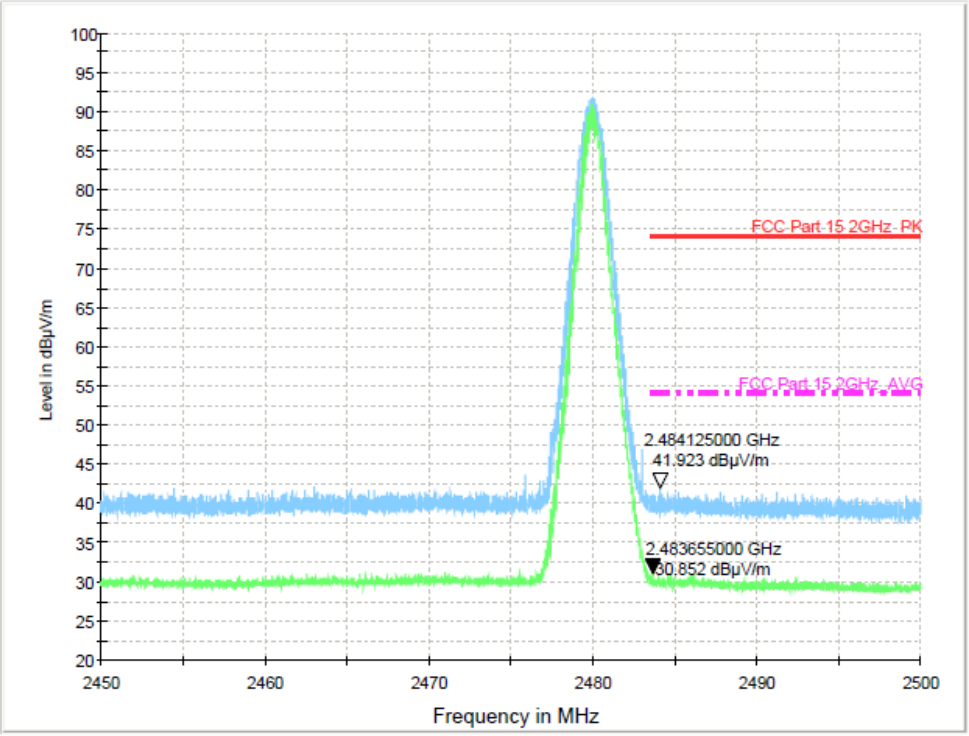


hopping-off

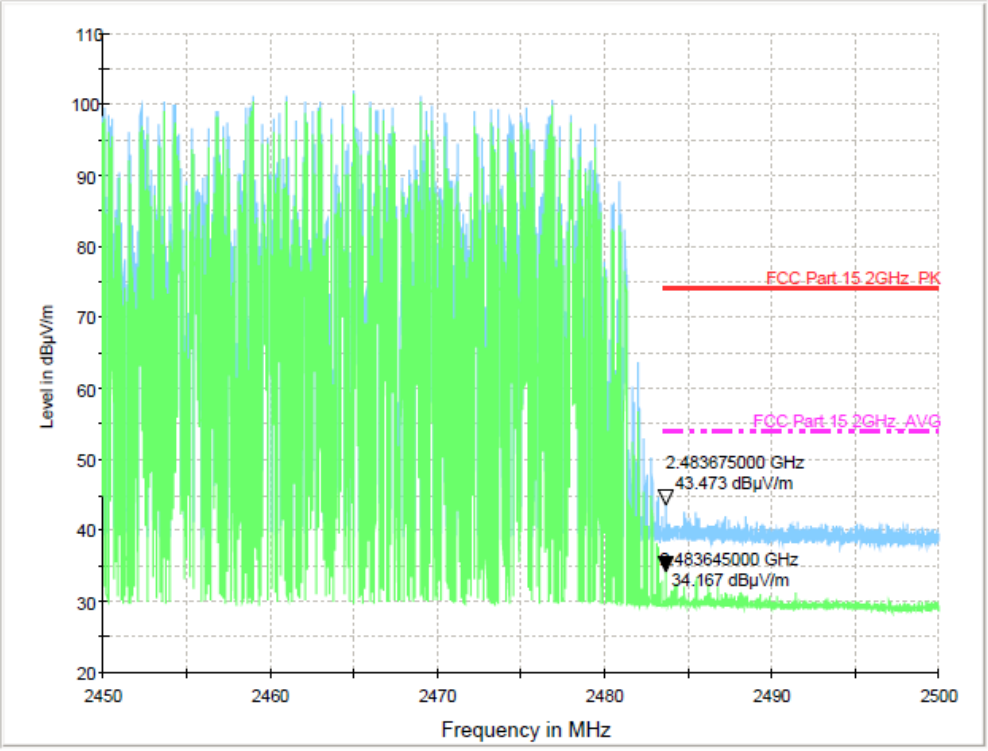


hopping-on

Test Mode: π/4 DQPSK-High



hopping-off



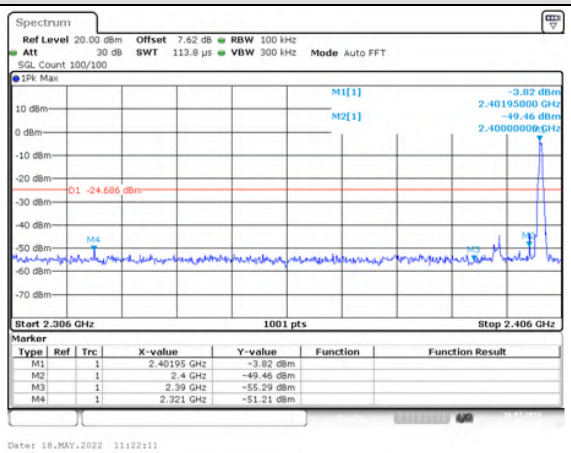
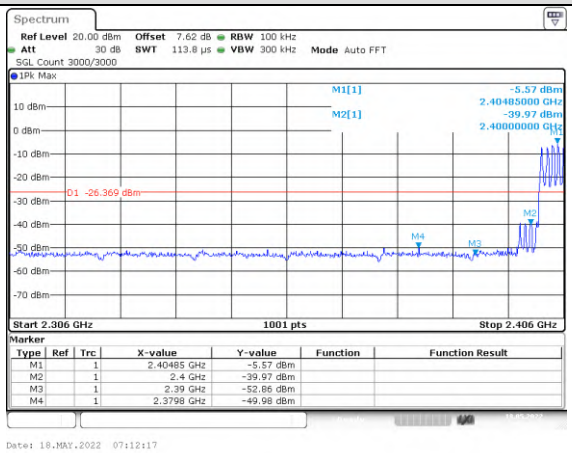
hopping-on

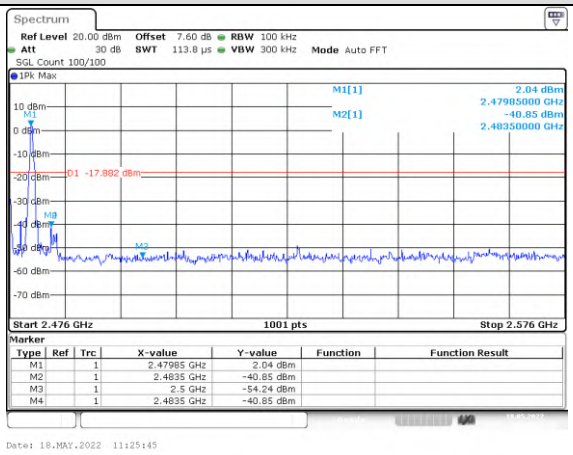
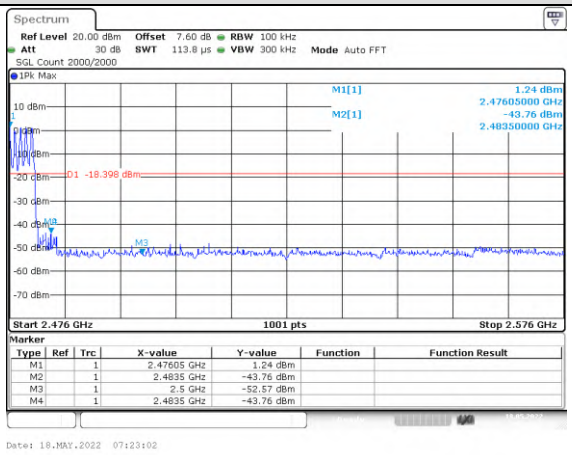
Note: 1. *:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

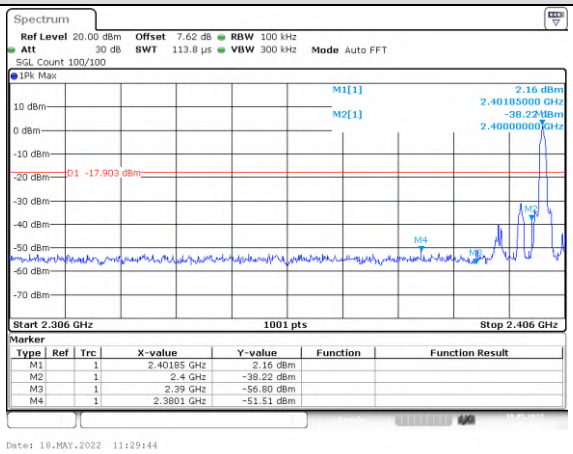
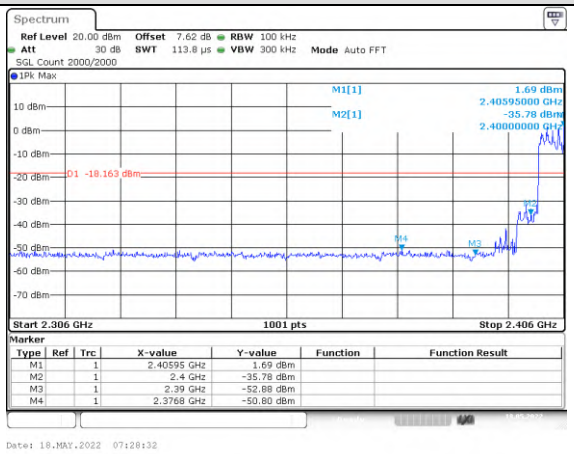
Conducted Method

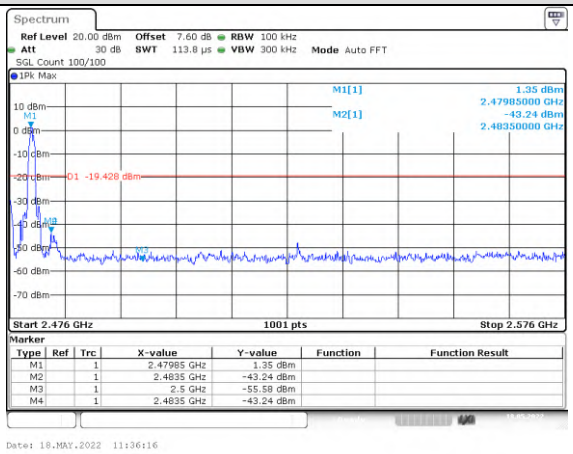
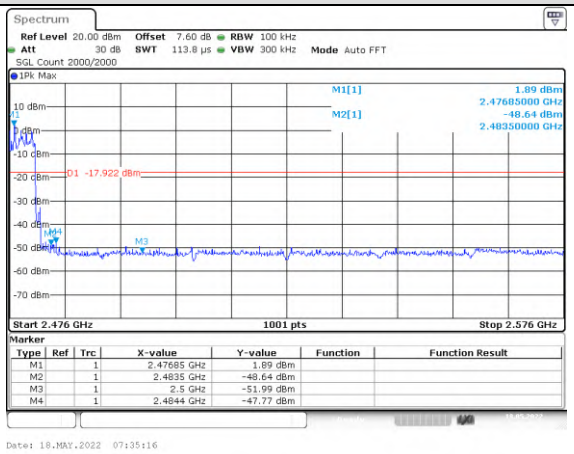
GFSK Mode:

Test channel:	Lowest channel
	
No-hopping mode	Hopping mode

Test channel:	Highest channel
	
No-hopping mode	Hopping mode

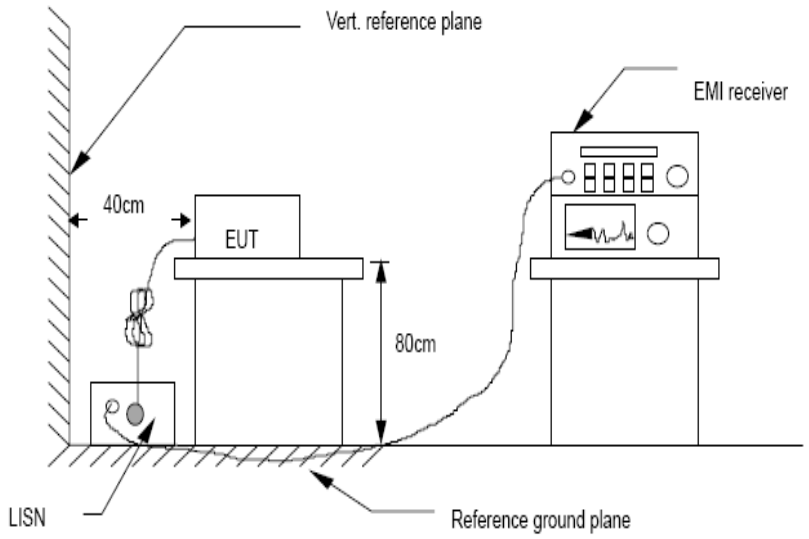
Pi/4QPSK Mode:

Test channel:	Lowest channel
	
No-hopping mode	Hopping mode

Test channel:	Highest channel
	
No-hopping mode	Hopping mode

10. Power Line Conducted Emissions

10.1.Block Diagram of Test Setup



10.2.Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

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

2. The lower limit shall apply at the transition frequencies.

10.3.Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.

(2) Setup the EUT and simulator as shown in 10.1

(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013on conducted Emission test.

(4) The bandwidth of test receiver is set at 10KHz.

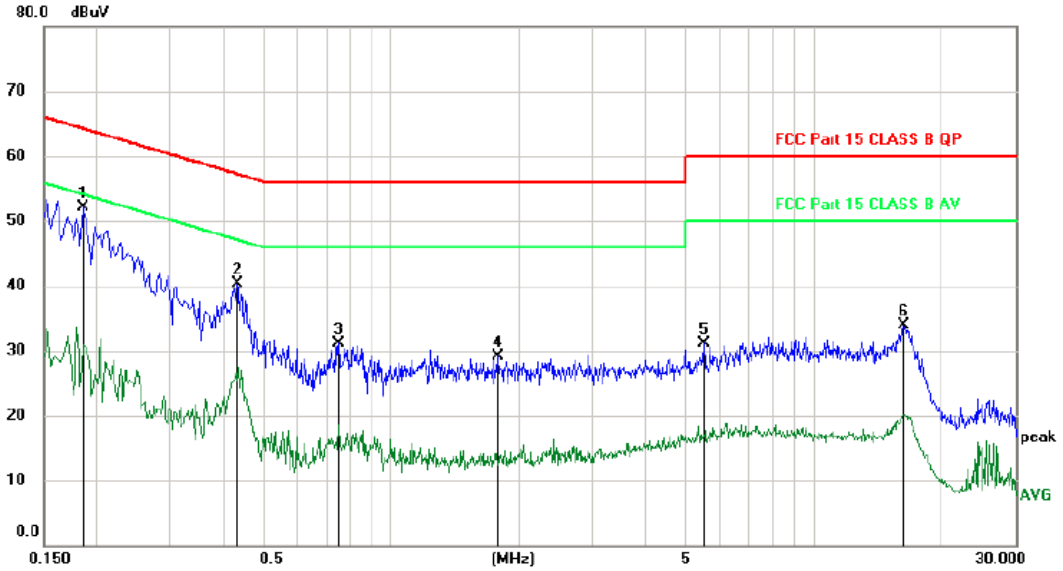
(5) The frequency range from 150 KHz to 30MHz is checked.

10.4.Test Result

PASS. (See below detailed test data)

Note: If peak Result comply with AV limit, QP and AV Result is deemed to comply with AV limit

Line:

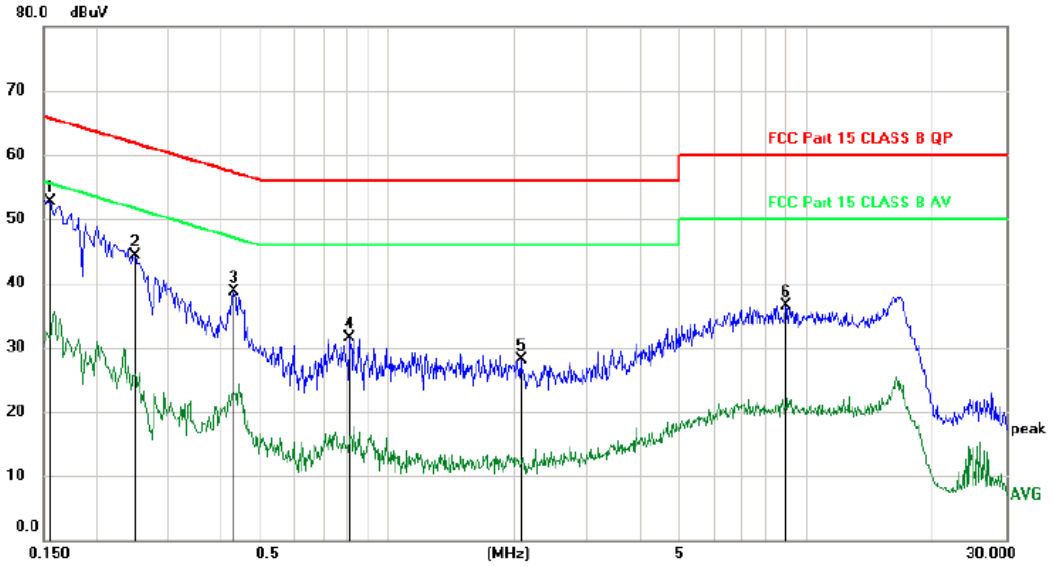


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1860	42.09	9.92	52.01	64.21	-12.20	peak	
2		0.4320	30.39	9.95	40.34	57.21	-16.87	peak	
3		0.7500	21.23	9.94	31.17	56.00	-24.83	peak	
4		1.7850	19.18	9.89	29.07	56.00	-26.93	peak	
5		5.4780	20.96	10.06	31.02	60.00	-28.98	peak	
6		16.2420	23.48	10.36	33.84	60.00	-26.16	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Neutral:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1560	42.70	9.94	52.64	65.67	-13.03	peak	
2		0.2490	34.25	9.97	44.22	61.79	-17.57	peak	
3		0.4290	28.79	9.95	38.74	57.27	-18.53	peak	
4		0.8130	21.54	9.94	31.48	56.00	-24.52	peak	
5		2.0850	18.13	9.88	28.01	56.00	-27.99	peak	
6		8.9310	26.39	10.18	36.57	60.00	-23.43	peak	

*:Maximum data x:Over limit !:over margin (Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2441MHz (AC 120V/ 60Hz) was listed in this report.

11. Antenna Requirements

11.1.Limit

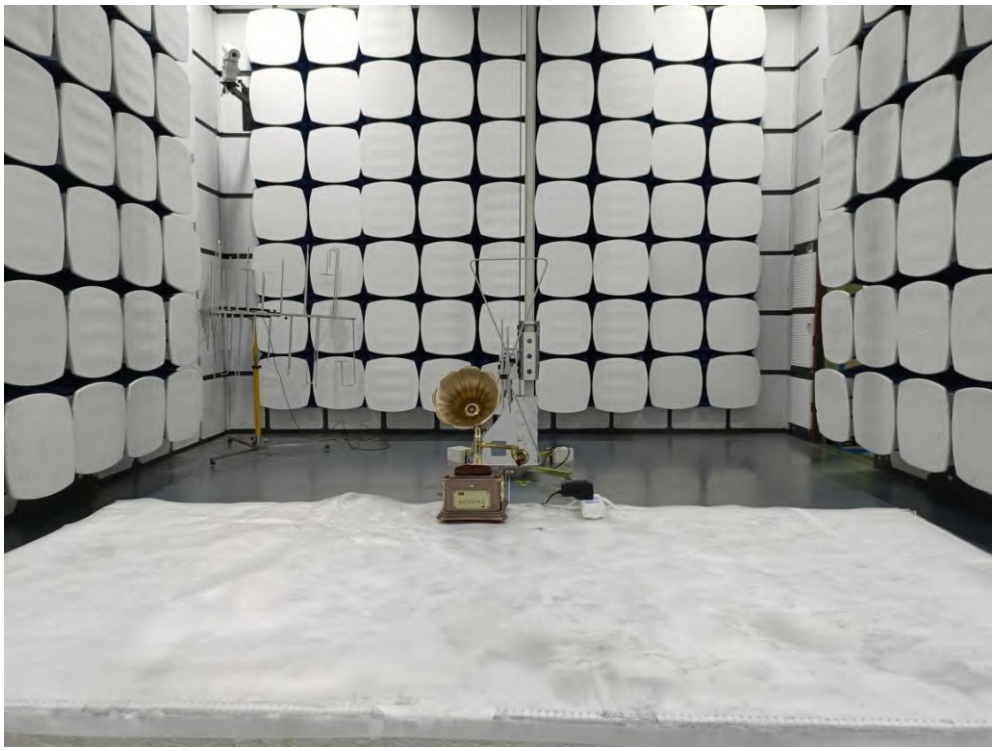
For intentional device, according to FCC 47 CFR Section 15.203 and RSS-GEN, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

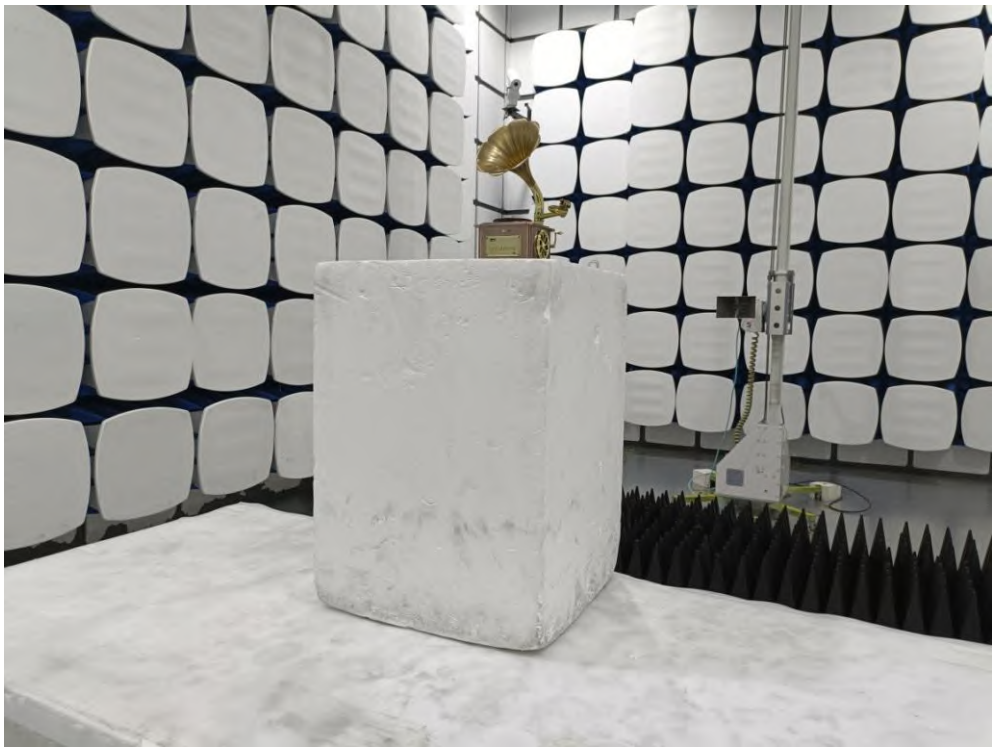
11.2.Result

The EUT antenna is internal antenna and max gain is -0.68dBi. It complies with the standard requirement.

12. Test Setup Photo

12.1. Photos of Radiated emission

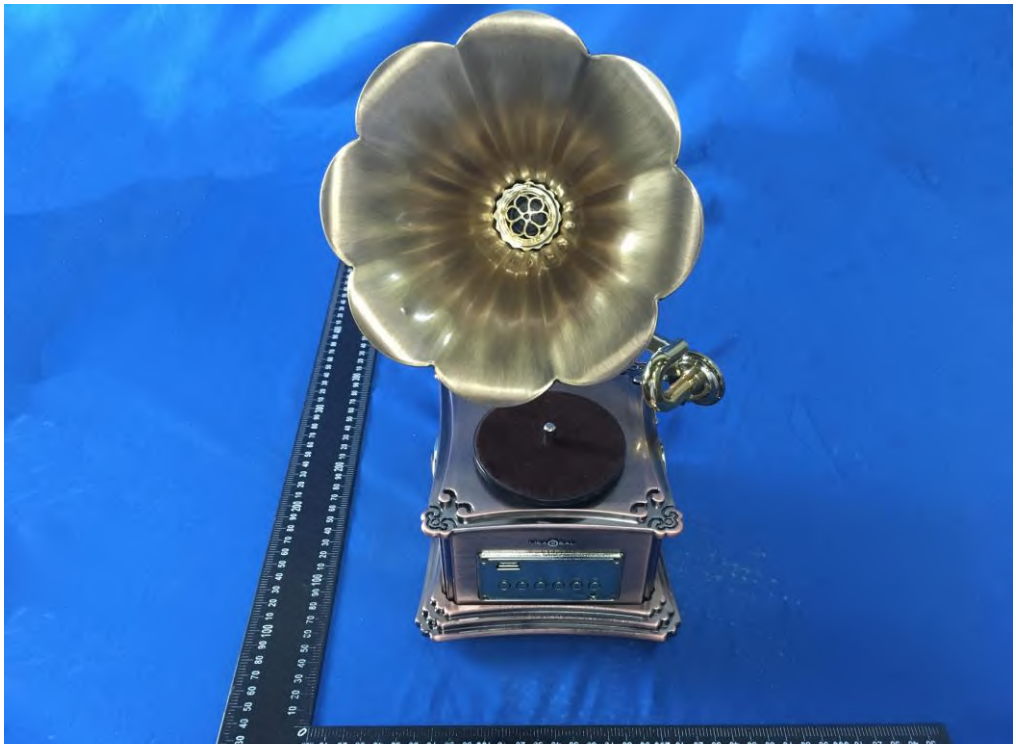


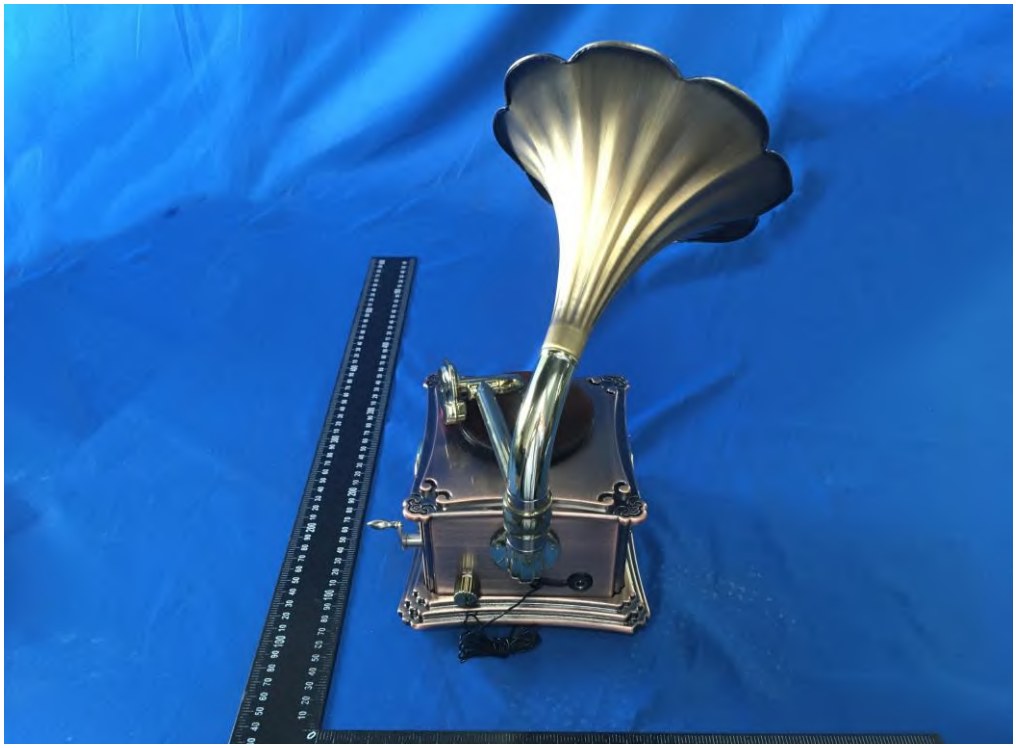


12.2.Photos of Conducted Emission test

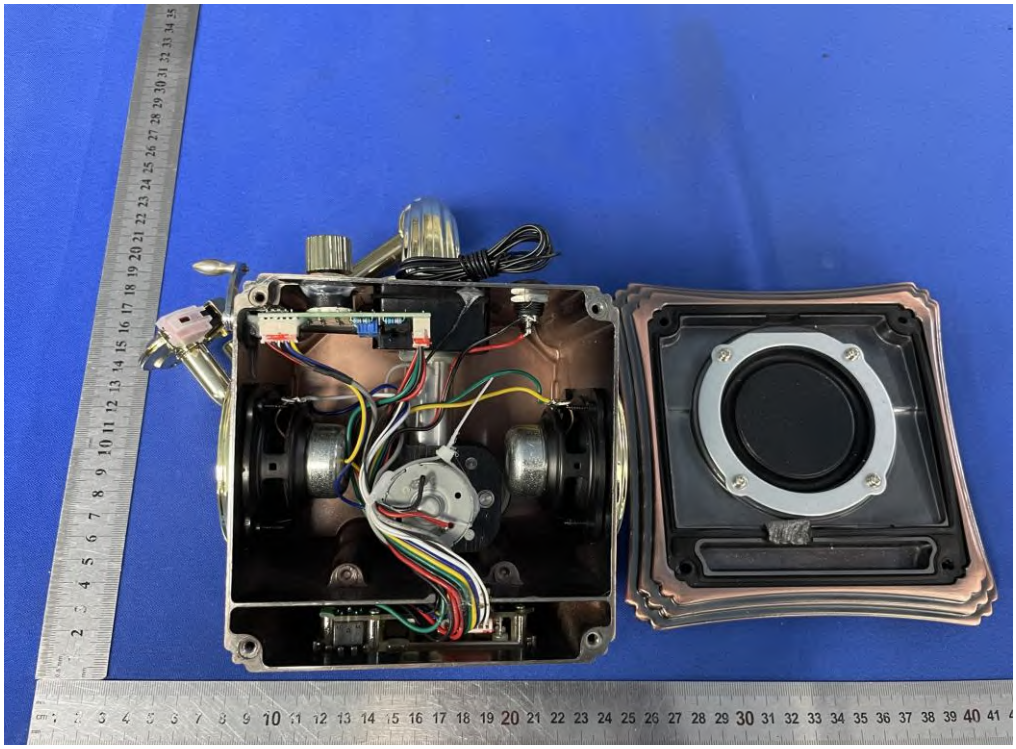
13. EUT Photo

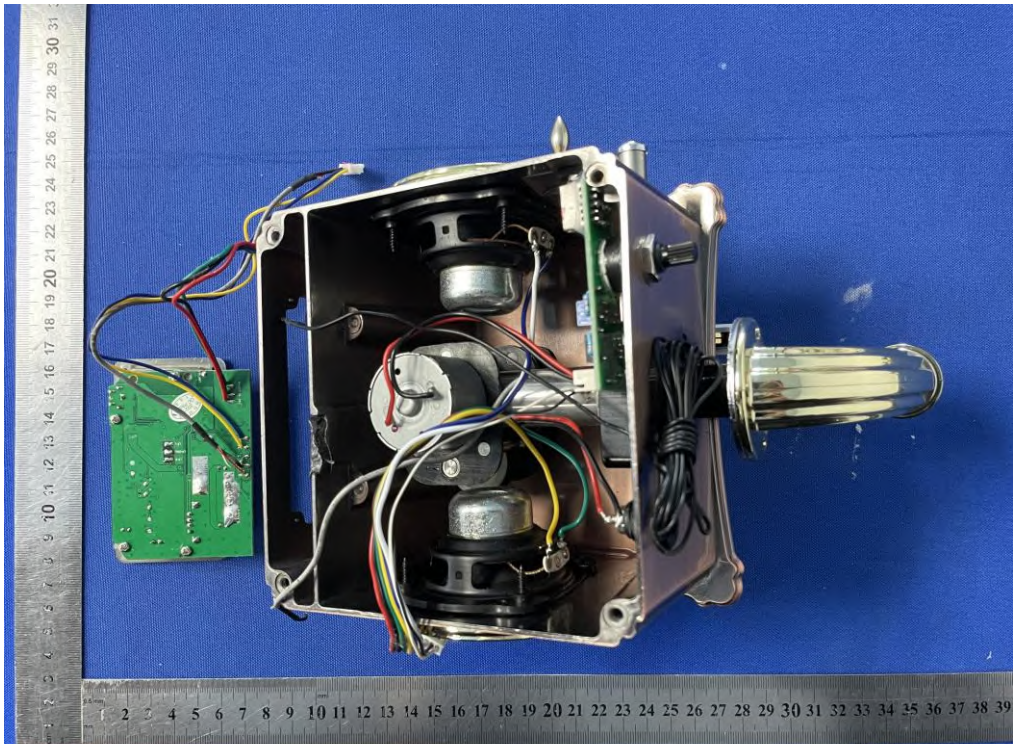
PUSH
SWITCHING ADAPTOR
Fonte de Alimentação AC/DC
开关电源适配器/電源供應器
MODEL/MODELO/型号/型號:FJ-SW1501500N
INPUT/ENTRADA/输入/輸入:100-240V~ 50/60Hz 0.6A Max
OUTPUT/SAIDA/输出/輸出:15.0V 1.5A, 22.5W
EFFICIENCY LEVEL
LISTED
R45089
RoHS
MFR:SHENZHEN FUJIA APPLIANCE CO., LTD

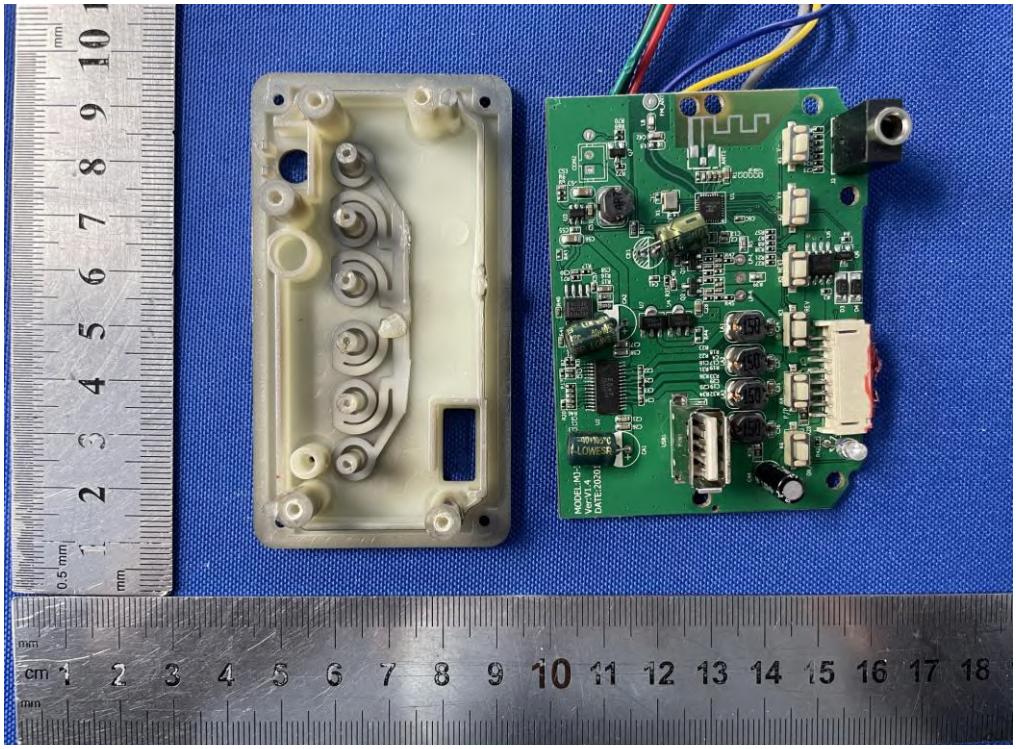


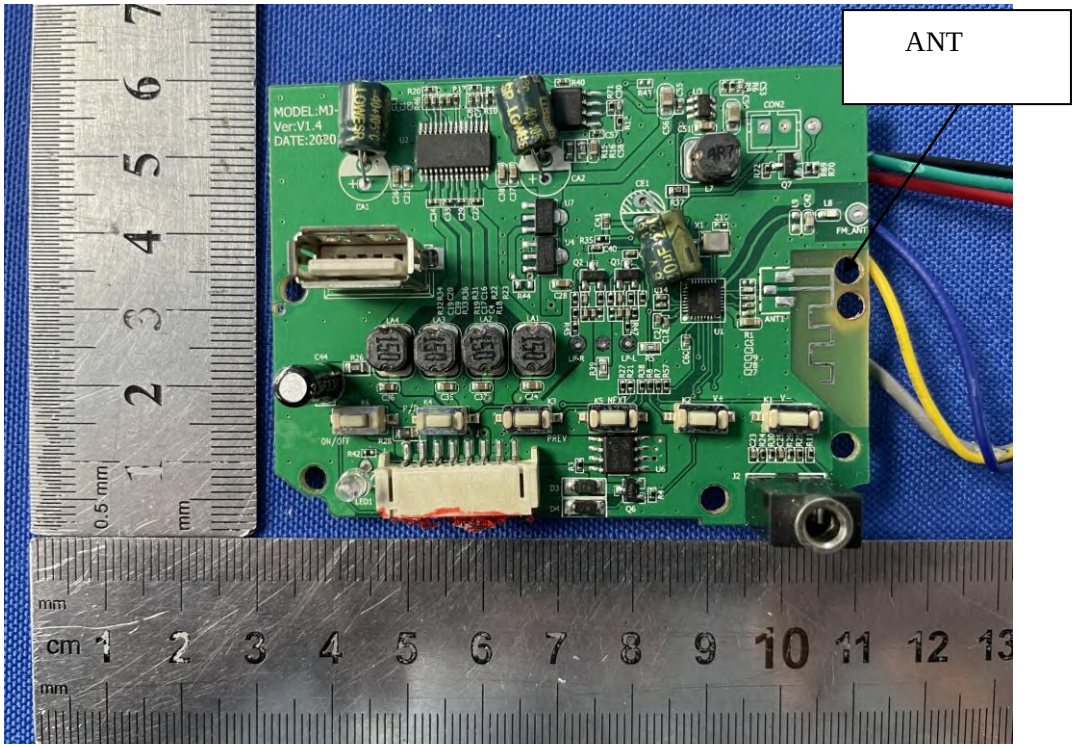


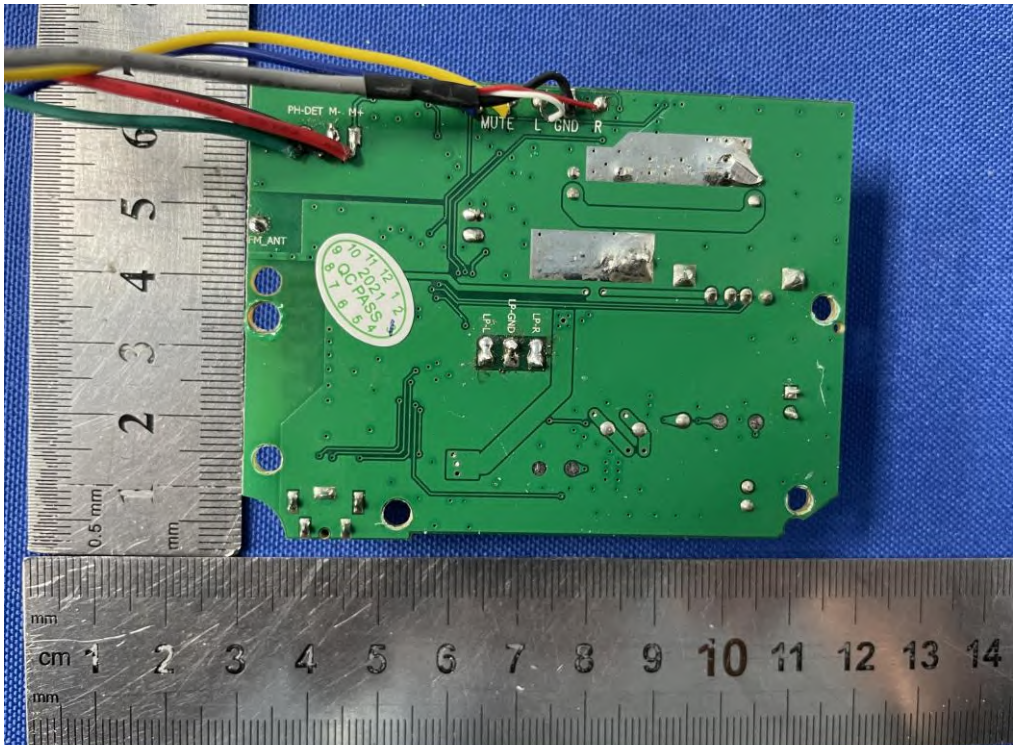
AUX

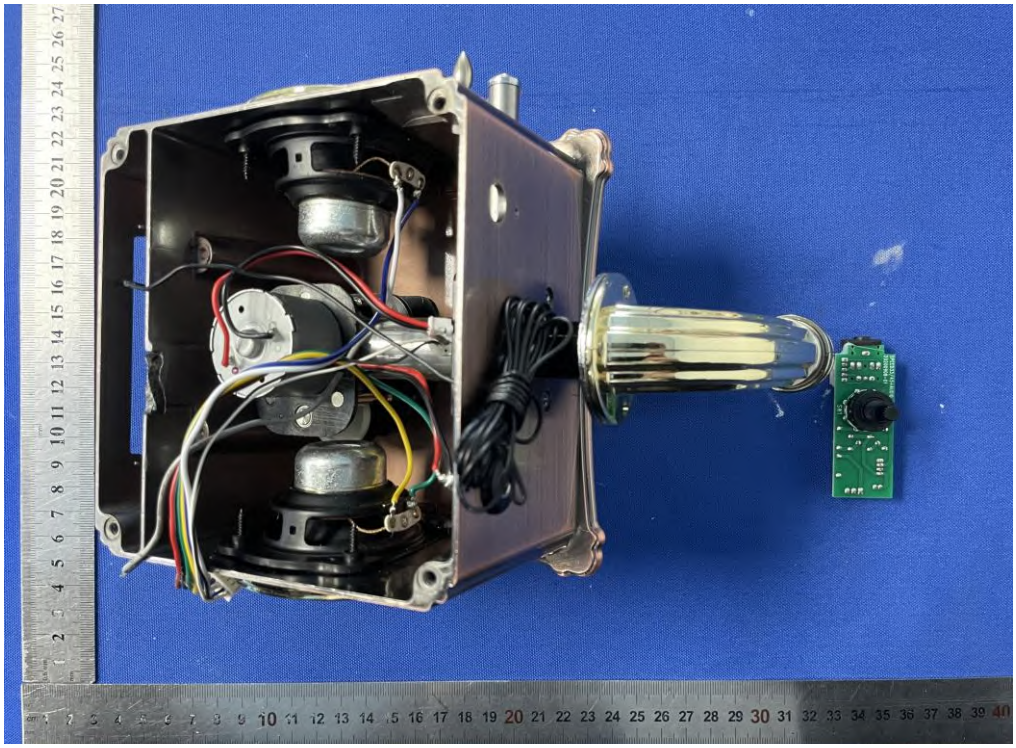


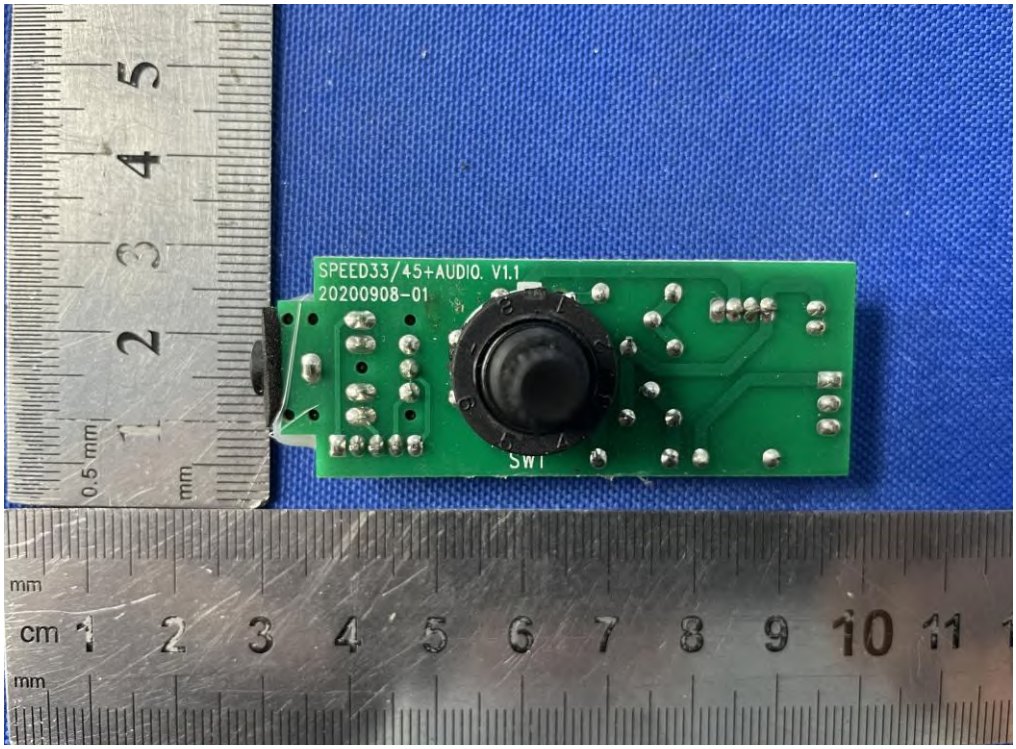


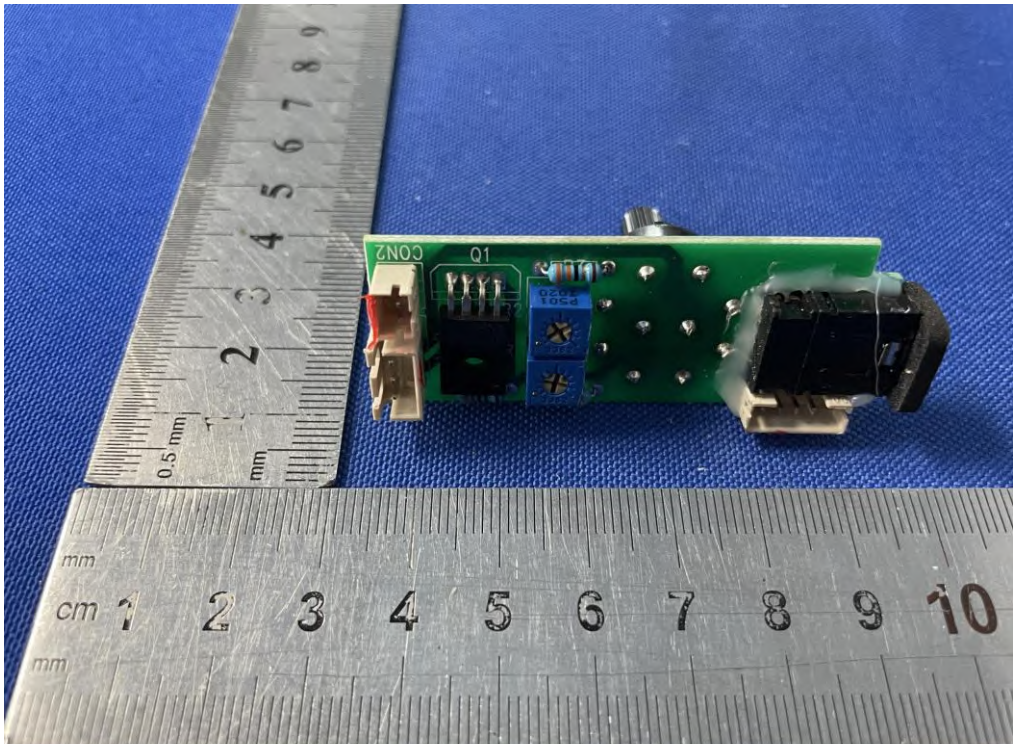


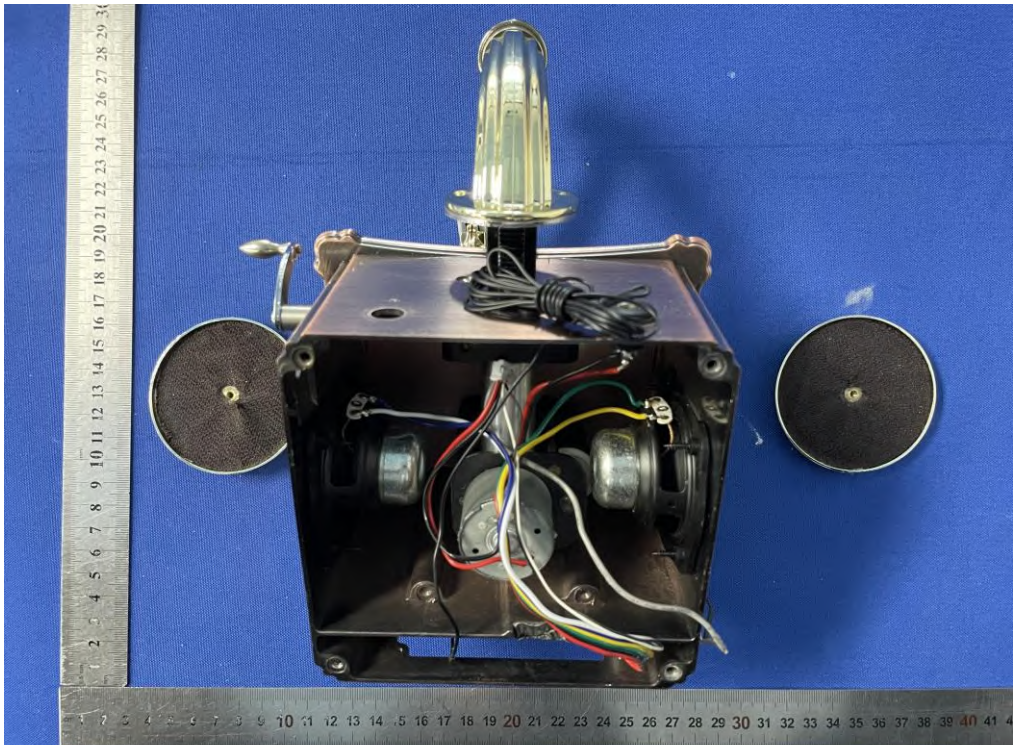

ANT
MODEL:MJ-
Ver:V1.4
DATE:2020

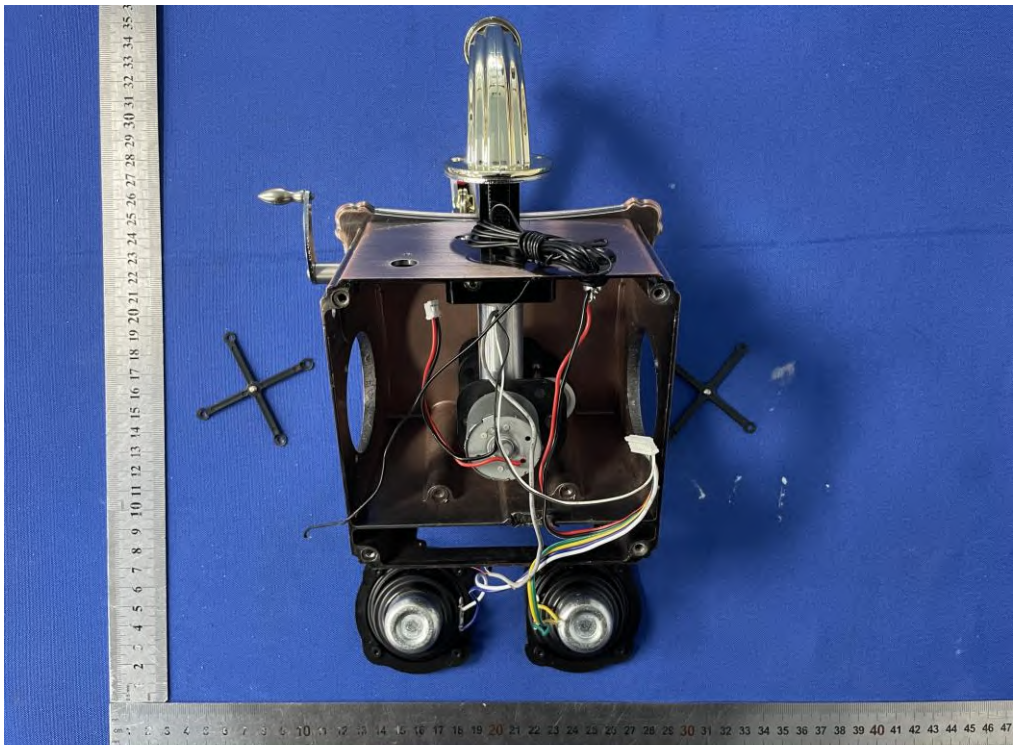

PH-DET M- M+
MUTE L GND R
FM_ANT

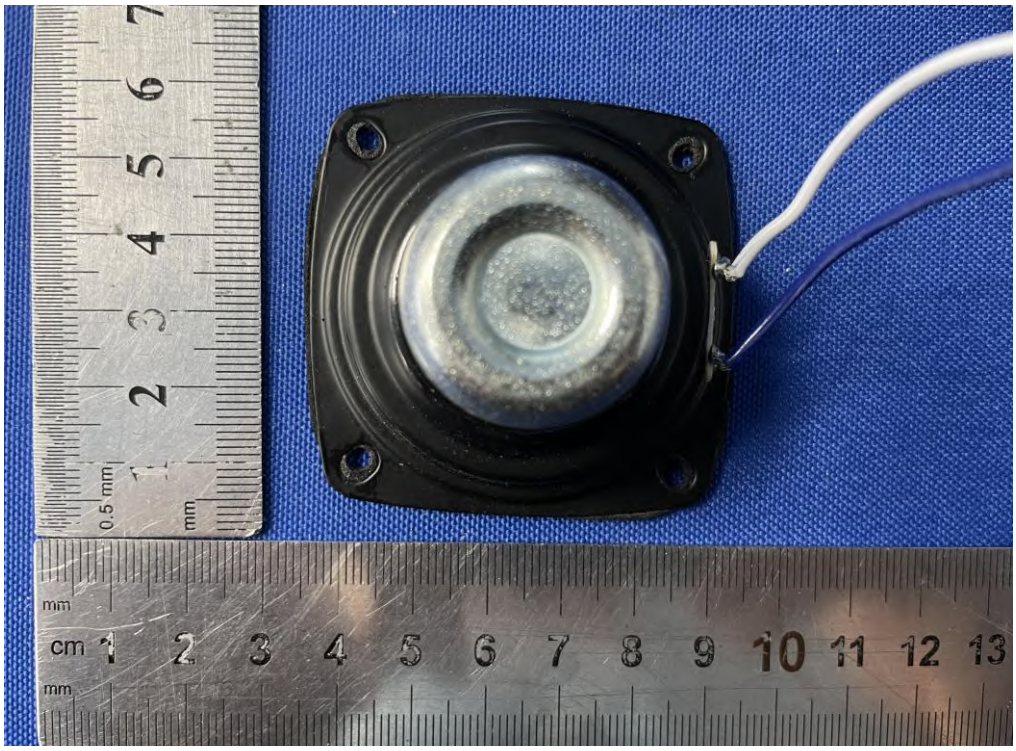



SPEED33/45+AUDIO. V1.1
20200908-01
SW1


CON2
Q1
cm 1 2 3 4 5 6 7 8 9 10
mm







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