




시험 성적서 TEST REPORT

페이지(page) : (1) / (총(Total) 34)

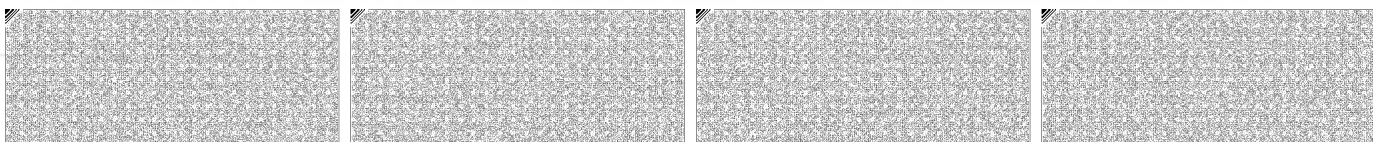


성적서 번호 Report No.		ICRT-TR-E222690-0A	
신청자 Client	기관명 Name	ventaron	
	주소 Address	59, Wonpogongwon 1-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Republic of Korea	
시험대상품목 Sample description		Magnito Mouse	
모델명 Type designation		VM-M300S	
정격 Ratings		DC 3.0 V	
시험장소 Place of test		<input checked="" type="checkbox"/> 고정시험(Inside test) <input type="checkbox"/> 현장시험(Field test) 주소지(Address): 112, Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea	
시험기간 Date of test		31. Oct. 2022	
시험방법/항목 Test Method/Item		FCC Part 15 Subpart C §15.247	
시험결과 Test Results		Refer to 3. Test Summary	
확인 Affirmation	작성자 Tested by	기술책임자 Technical Manager	
	성명 Name	Seong-Hun, Jeong (서명) (Signature)	Tae-Yang, Yoon (서명) (Signature)
<input type="checkbox"/> 위 성적서는 고객이 제공한 시료에 대한 시험결과입니다. The above test report is certified that the above mentioned products have been tested for the sample.			
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2022. 11. 02			
주식회사 아이씨알 대표이사		The head of INTERNATIONAL CERTIFICATION REGISTRAR	

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The authenticity of the test report can be checked on the G4B or ICR website.

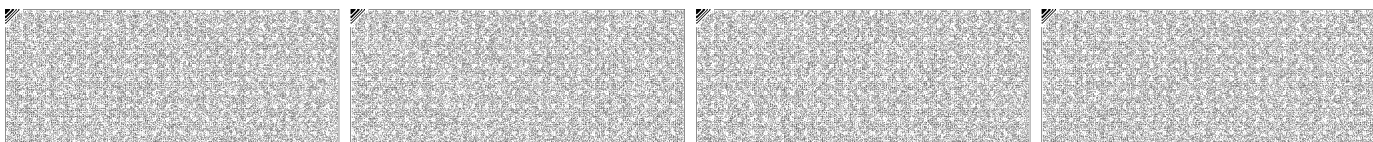
경기도 김포시 양촌읍 황금3로7번길 112 / Tel: 02-6351-9001 ~ 6





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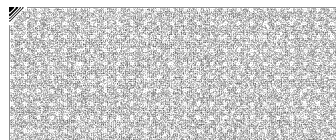
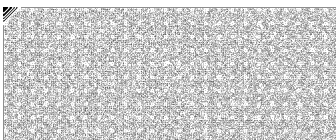
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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
ICRT-TR-E222690-0A	2022-11-02	Initial Issue	All





1. Applicant & Manufacturer & Test Laboratory Information

1.1 Applicant information

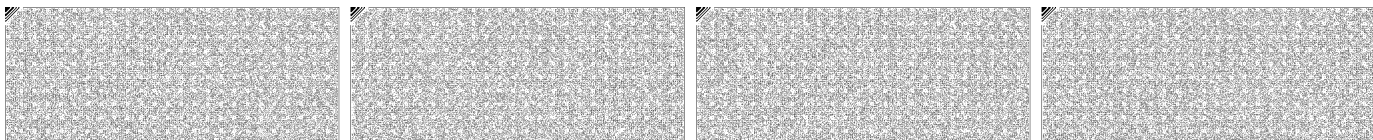
Applicant	ventaron
Address	59, Wonpogongwon 1-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Republic of Korea
Contact Person	SANGMIN SHIN
Telephone No.	82-10-9830-7786
Fax No.	-
E-mail	ssm77@ventaron.net

1.2 Manufacturer Information

Manufacturer	Dongguan Lingjie Electronics & Technology Co., Ltd
Address	No.23, ZhenXing North Road, TeiYuan Community, XieGang Town, DongGuan City GuangDong province, China

1.3 Test Laboratory Information

Conducted tests were performed at	
Laboratory	ICR Co., Ltd.
Address	112, Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea
Telephone No.	+82-2-6351-9002
Fax No.	+82-2-6351-9007
RRA No.	KR0165
KOLAS No.	KT652





2. Equipment under Test(EUT) Information

2.1 General Information

Product Name	Magnito Mouse
Brand Name	-
Model Name	VM-M300S
Additional Model Name	VM-M300W, VM-M300G, VM-M300P, VM-300B
FCC ID	2A8OG-VM-M300S
Power Supply	DC 3.0 V

2.2 Additional Information

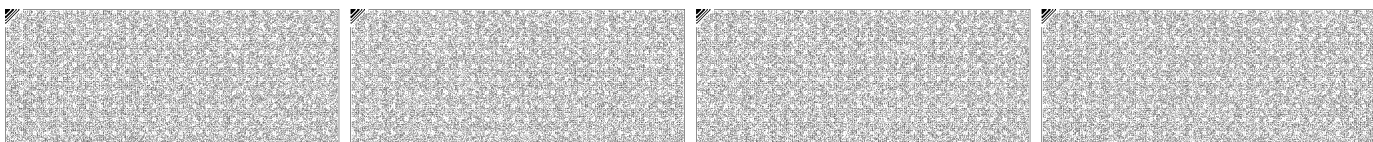
Equipment Class	DTS - Digital Transmission System
Device Type	Stand-alone
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	-6.96 dBm
Number of Channel	40
Modulation Type	GFSK
Antenna Type	PCB Antenna
Antenna Gain	2.34 dBi
Antenna Operating Mode	Single Antenna Equipment with only one antenna

2.3 Mode of operation during the test

- The EUT is continuous transmission mode during the test with set at Low Channel, Middle Channel, and High Channel. To get a maximum radiated emission levels from the EUT, the EUT was moved throughout the XY, YZ, XZ planes.

2.4 Modifications of EUT

- None





3. Test Summary

3.1 Test standards and results

FCC Part 15 Subpart C			
Clause	Test items	Applied	Results
§15.247 (a) (2)	6 dB Bandwidth	☒	PASS
§15.247 (b) (3)	Maximum Conducted Output Power	☒	PASS
§15.247 (e)	Power Spectral Density	☒	PASS
§15.247 (d)	Conducted Spurious Emission & Band edge	☒	PASS
§15.247 (d) & §15.209 & §15.205	Radiated Spurious Emission & Band edge	☒	PASS
§15.203	Antenna Requirement	☒	PASS

3.2 Purpose of the test

- To determine whether the equipment under test fulfills the requirements of the standards stated in FCC Part 15 Subpart C Section 15.247.

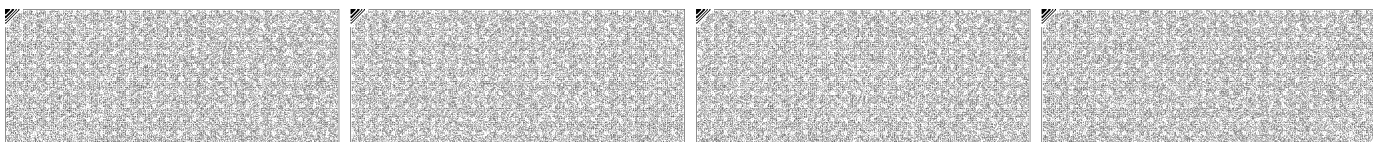
3.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

3.4 Configuration of Test System

3.4.1 Radiated emission test

Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m Semi Anechoic Chamber. The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.





3.5 Antenna requirement

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

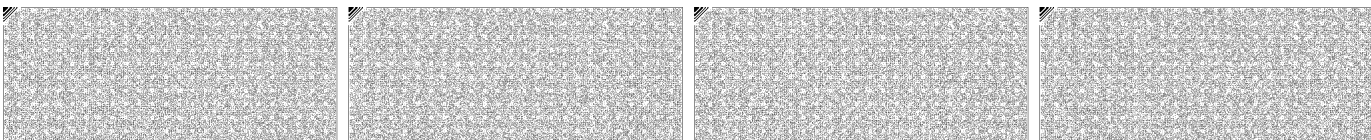
The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.5.1 Result: Pass

The transmitter has a **PCB Antenna**. The directional gain of the antenna is **2.34 dB i**.

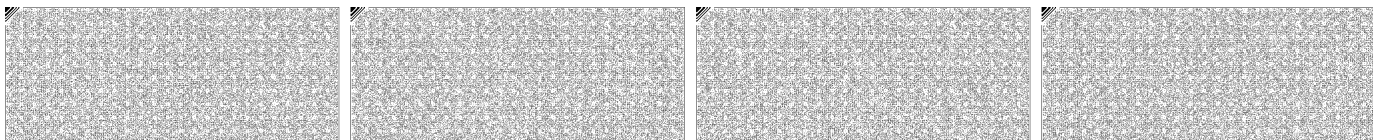




4. Used equipment on test

	Description	Model Name	Manufacturer	Serial Number	Next Cal. (cycle)
<input checked="" type="checkbox"/>	Spectrum analyzer	FSW85	R&S	101306	2023-03-02 (1Y)
<input checked="" type="checkbox"/>	Signal Generator	SMB100A	R&S	180607	2023-03-03 (1Y)
<input checked="" type="checkbox"/>	DC Power Supply	XDL 35-5P	Sorensen	J00385373	2023-03-03 (1Y)
<input checked="" type="checkbox"/>	10 dB Attenuator	WA54-10-11	Weinschel	-	2023-03-07 (1Y)
<input checked="" type="checkbox"/>	Loop Antenna	HFH2-Z2	Rohde & Schwarz	100506	2023-07-05 (2Y)
<input checked="" type="checkbox"/>	TRILOG BROADBAND ANTENNA	VULB9162	SCHWARZBECK	143	2022-12-08 (2Y)
<input checked="" type="checkbox"/>	RF Pre Amplifier	SCU08	Rohde & Schwarz	100747	2023-04-13 (1Y)
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR7	Rohde & Schwarz	102034	2023-04-13 (1Y)
<input checked="" type="checkbox"/>	Horn Antenna	HF907	Rohde & Schwarz	102556	2023-08-22 (1Y)
<input checked="" type="checkbox"/>	RF Pre Amplifier	SCU18	Rohde & Schwarz	102342	2023-04-13 (1Y)
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR26	Rohde & Schwarz	101462	2023-04-13 (1Y)
<input checked="" type="checkbox"/>	Horn Antenna	LB-42-10-C-KF	AIBFO Inc.	J202024625	2023-03-10 (1Y)
<input checked="" type="checkbox"/>	PreAmplifier	AMF-4F-18265-35-8P-1	MITEQ	771846	2023-03-07 (1Y)

※ All test equipment used is calibration on a regular basis.





5. 6 dB Bandwidth

5.1 Operating environment

Temperature : 23 °C
Relative humidity : 47 %

5.2 Measurement method

Standard : §15.247 (a) (2)

5.3 Limit

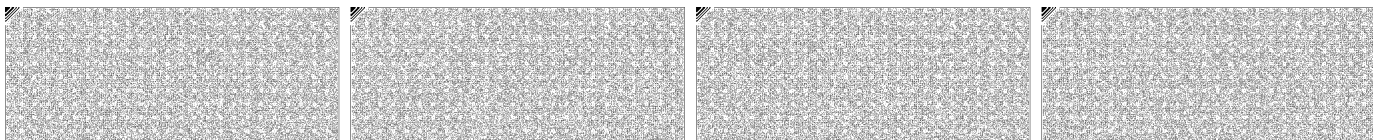
Standard : §15.247 (a) (2)

5.4 Test data

Operating mode : Transmit mode
Test Result : Pass

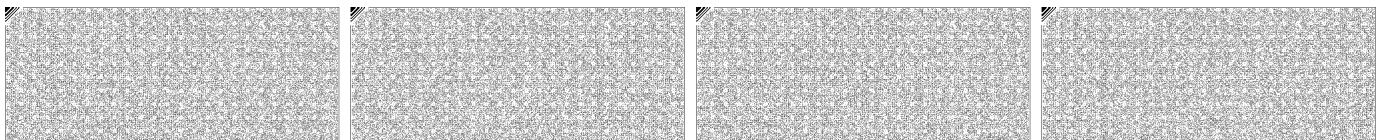
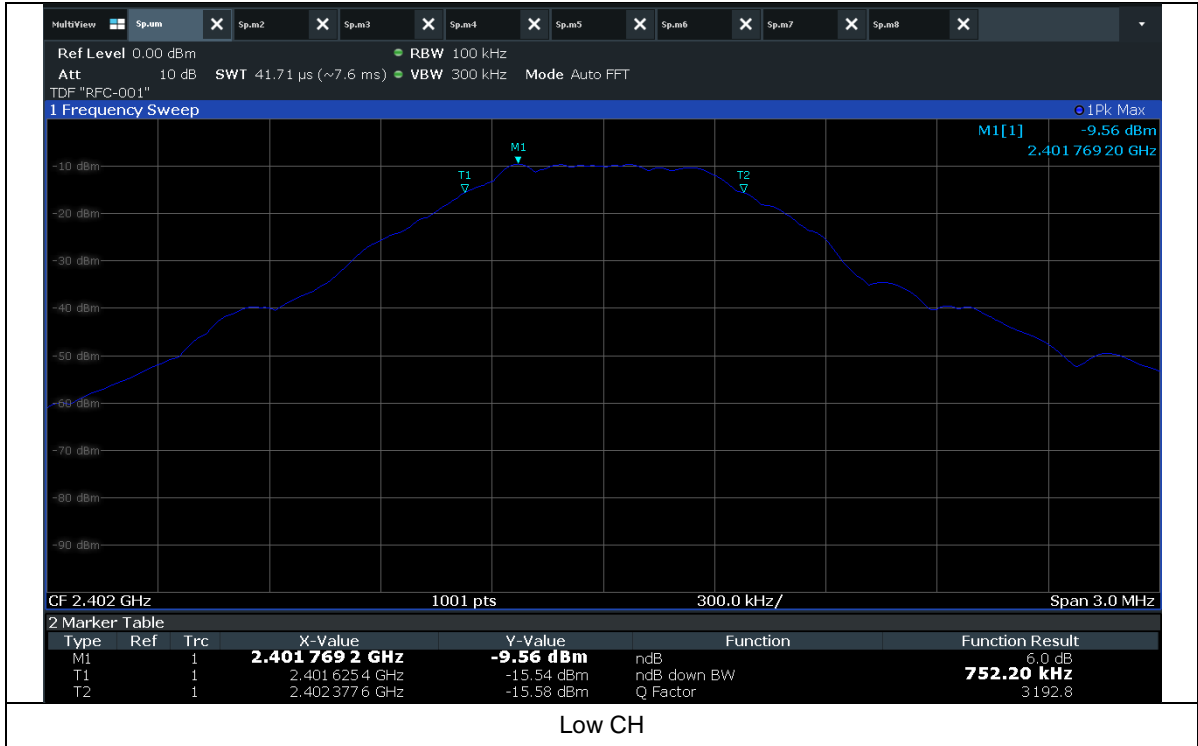
5.4.1 Measured Results

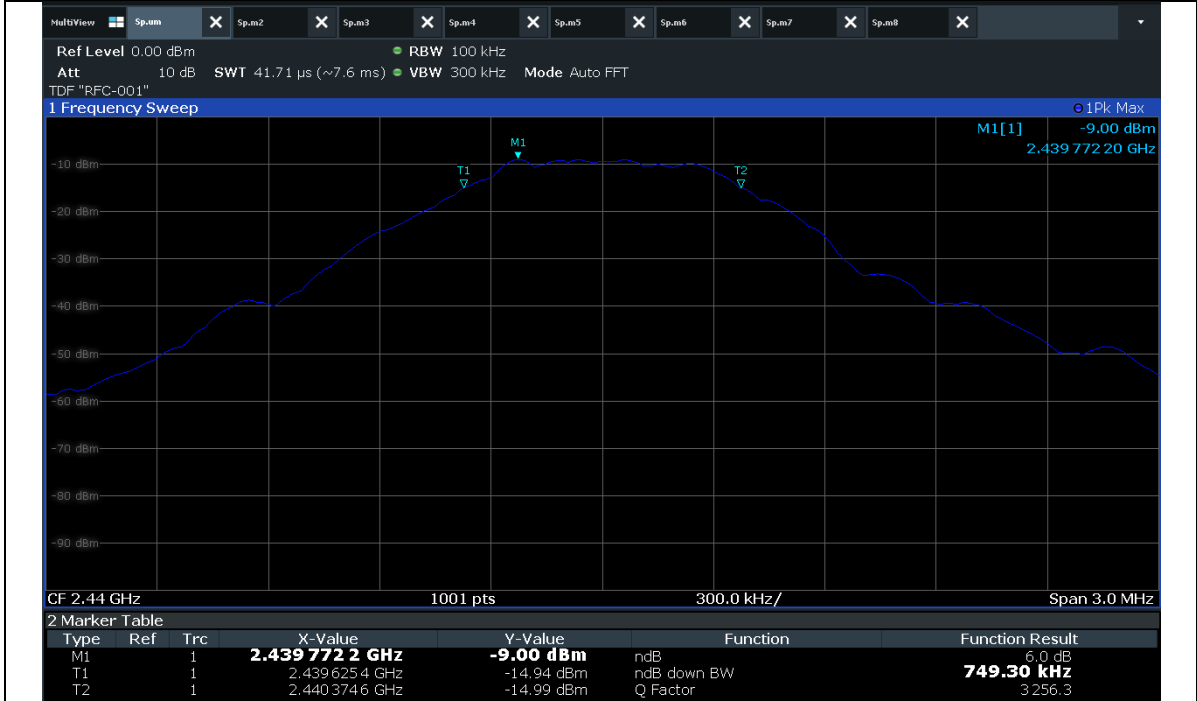
Modulation Type	Channel (Frequency)	Measured Value (kHz)	Limit (kHz)
Bluetooth LE	0 (2 402 MHz)	752.20	at least 500
	19 (2 440 MHz)	749.30	
	39 (2 480 MHz)	755.20	



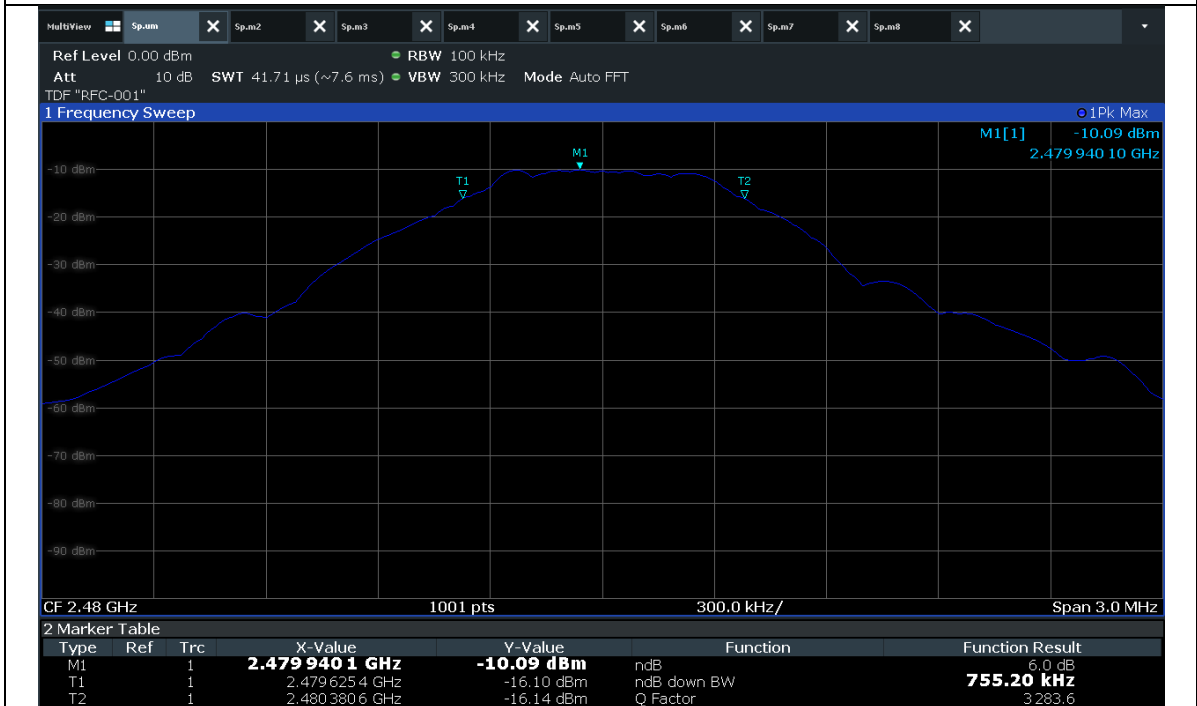


5.4.2 Measured Graph (6 dB Bandwidth)

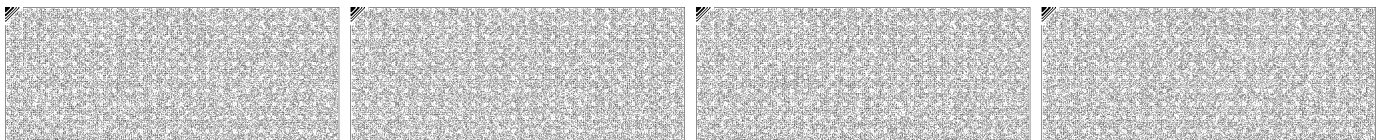




Mid CH



High CH





6. Maximum Conducted Output Power

6.1 Operating environment

Temperature : 23 °C
Relative humidity : 47 %

6.2 Measurement method

Standard : §15.247 (b) (3)

6.3 Limit

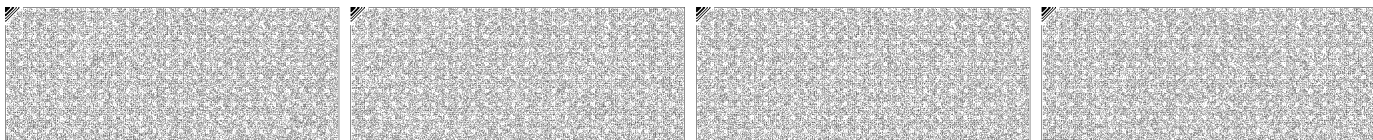
Standard : §15.247 (b) (3)

6.4 Test data

Operating mode : Transmit mode
Test Result : Pass

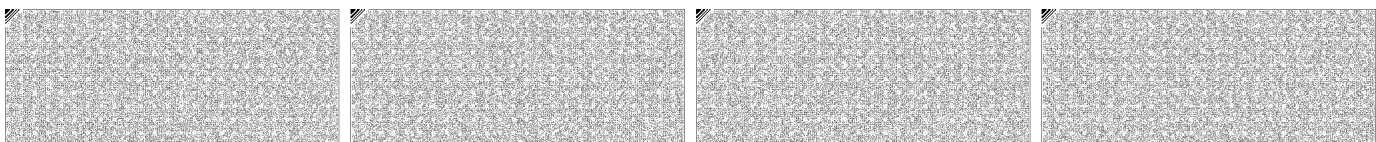
6.4.1 Measured Results

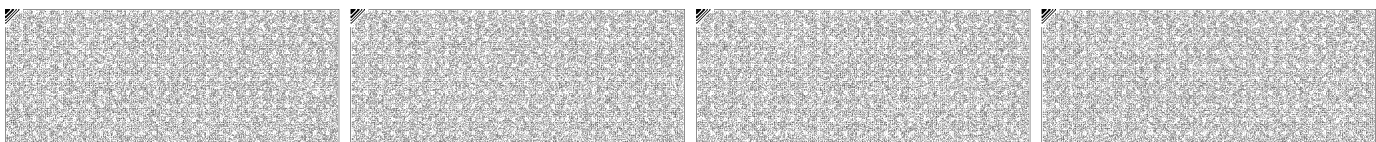
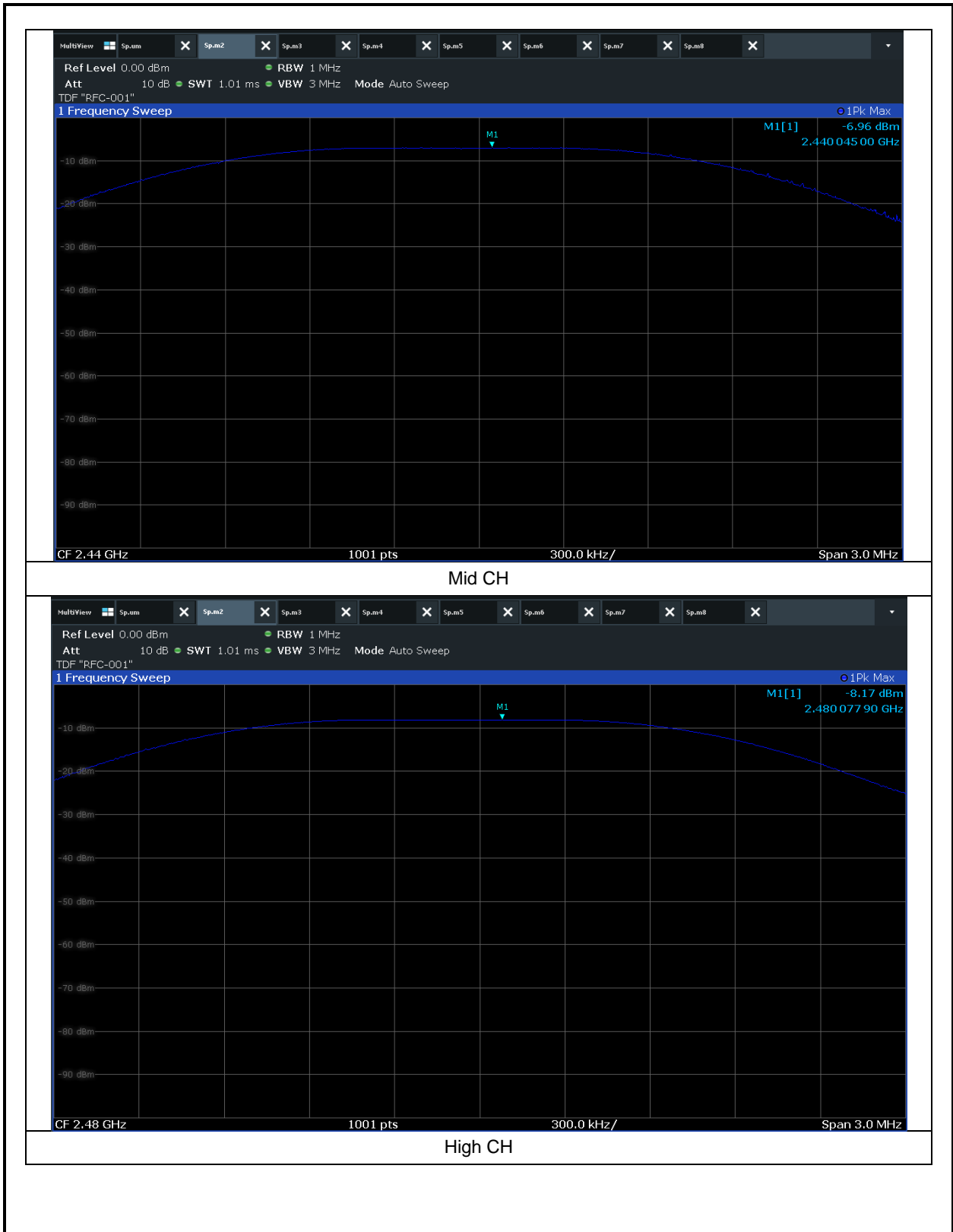
Modulation Type	Channel (Frequency)	Highest signal level (dBm)	Limit (dBm)
Bluetooth LE	0 (2 402 MHz)	-7.57	30 (1 Watt)
	19 (2 440 MHz)	-6.96	
	39 (2 480 MHz)	-8.17	





6.4.2 Measured Graph







7. Power Spectral Density

7.1 Operating environment

Temperature : 23 °C

Relative humidity : 47 %

7.2 Measurement method

Standard : §15.247 (e)

7.3 Limit

Standard : §15.247 (e)

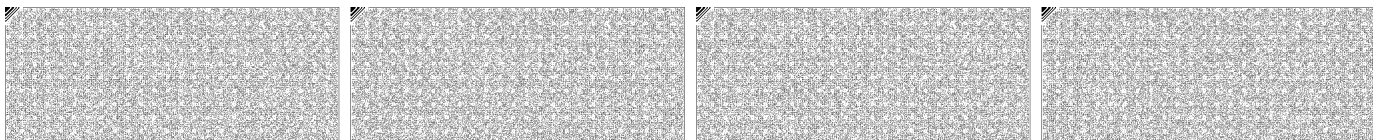
7.4 Test data

Operating mode : Transmit mode

Test Result : Pass

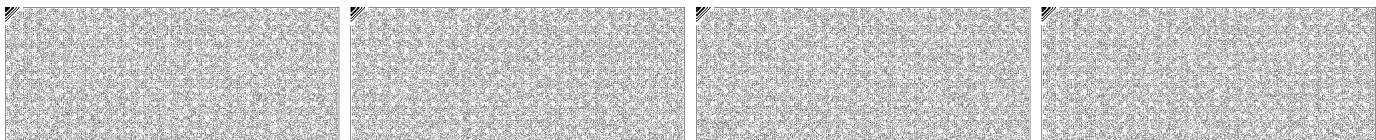
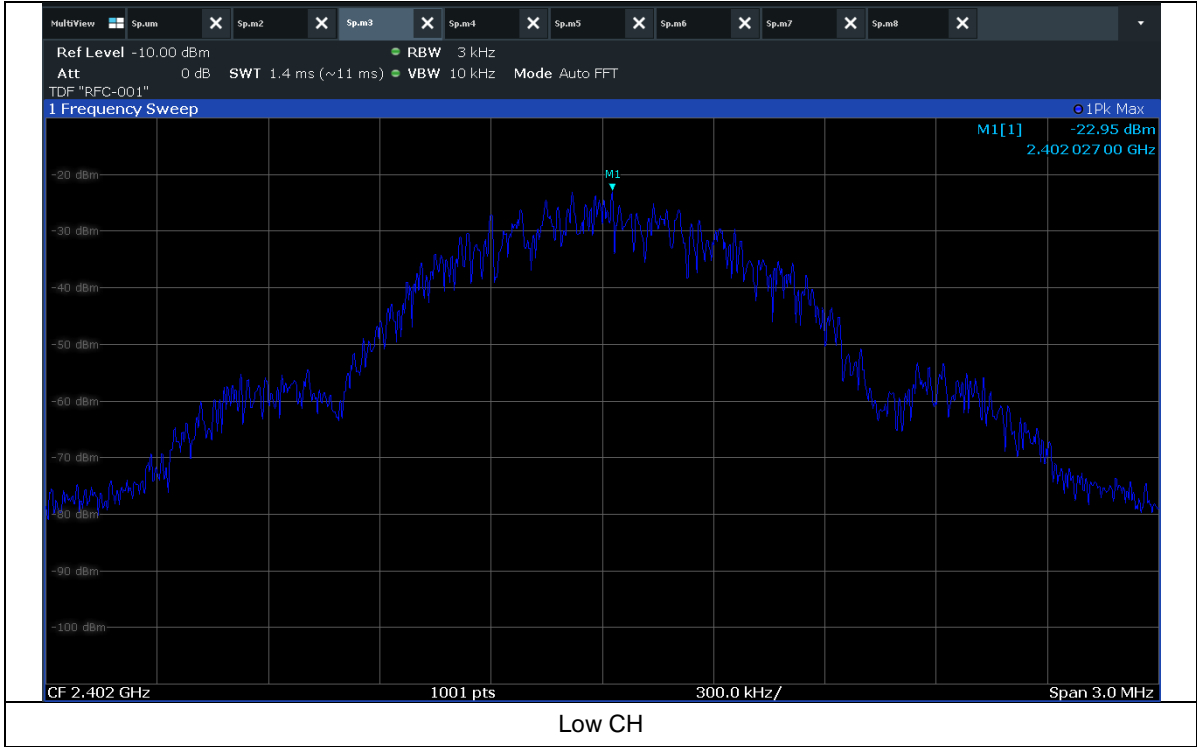
7.4.1 Measured Results

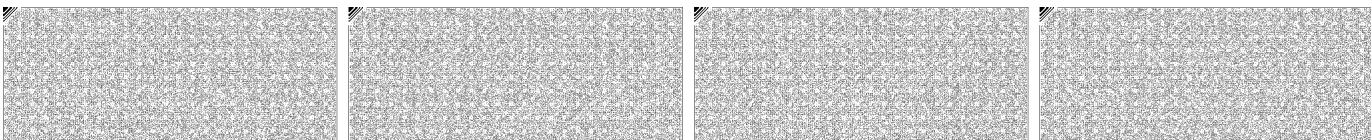
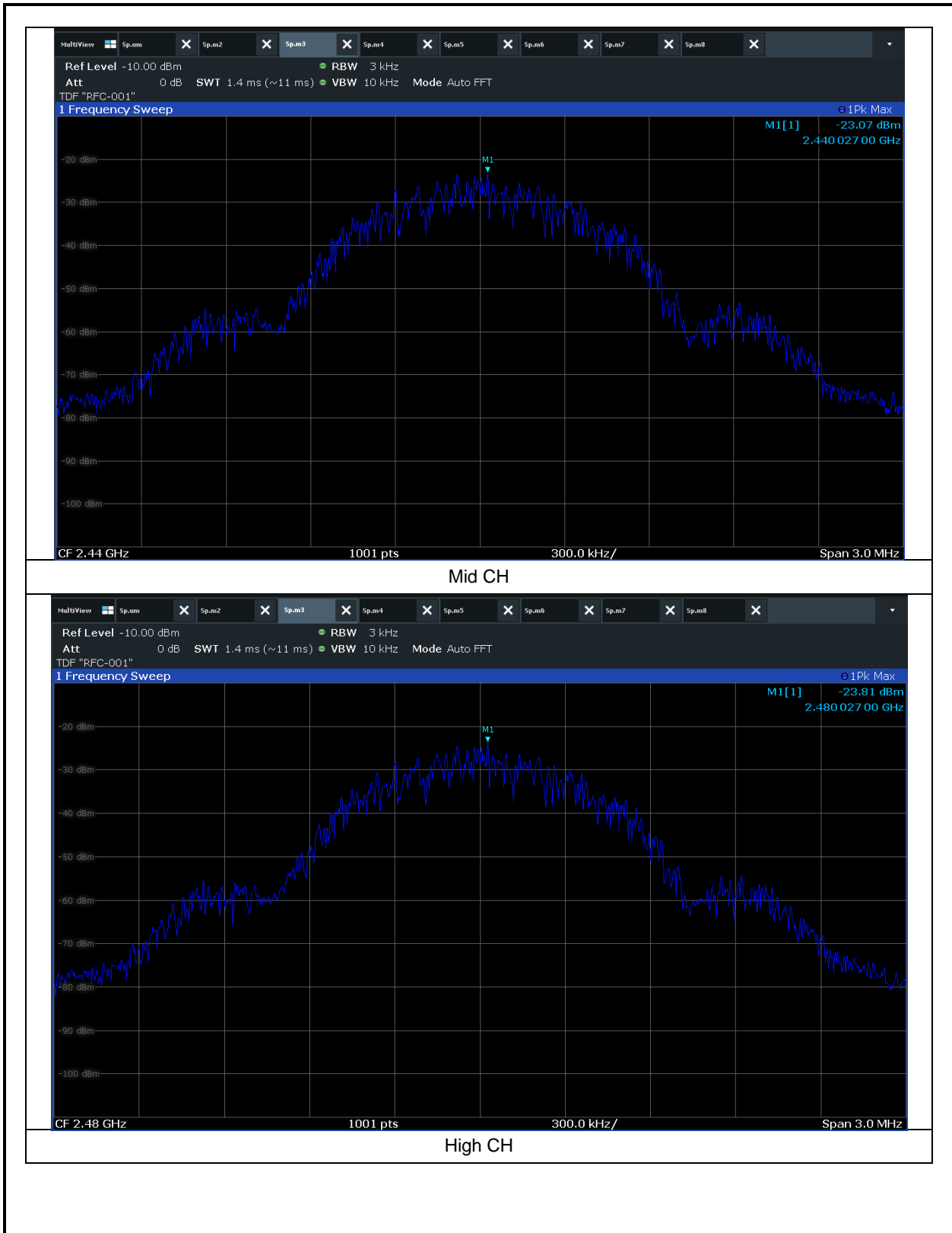
Modulation Type	Channel (Frequency)	Highest signal level (dBm)	Limit (dBm/3kHz)
Bluetooth LE	0 (2 402 MHz)	-22.95	8
	19 (2 440 MHz)	-23.07	
	39 (2 480 MHz)	-23.81	





7.4.2 Measured Graph







8. Conducted Spurious Emission

8.1 Operating environment

Temperature : 23 °C
Relative humidity : 47 %

8.2 Measurement method

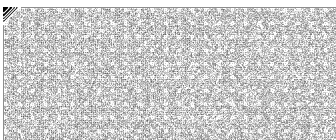
Standard : §15.247 (d)

8.3 Limit

Standard : §15.247 (d)

8.4 Test data

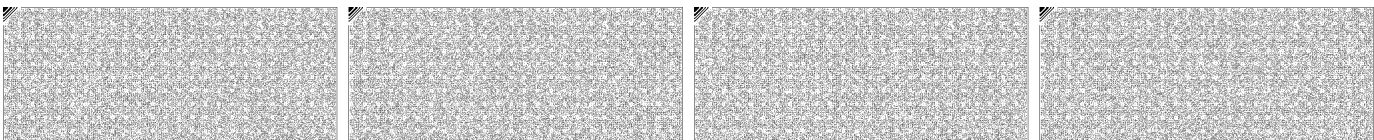
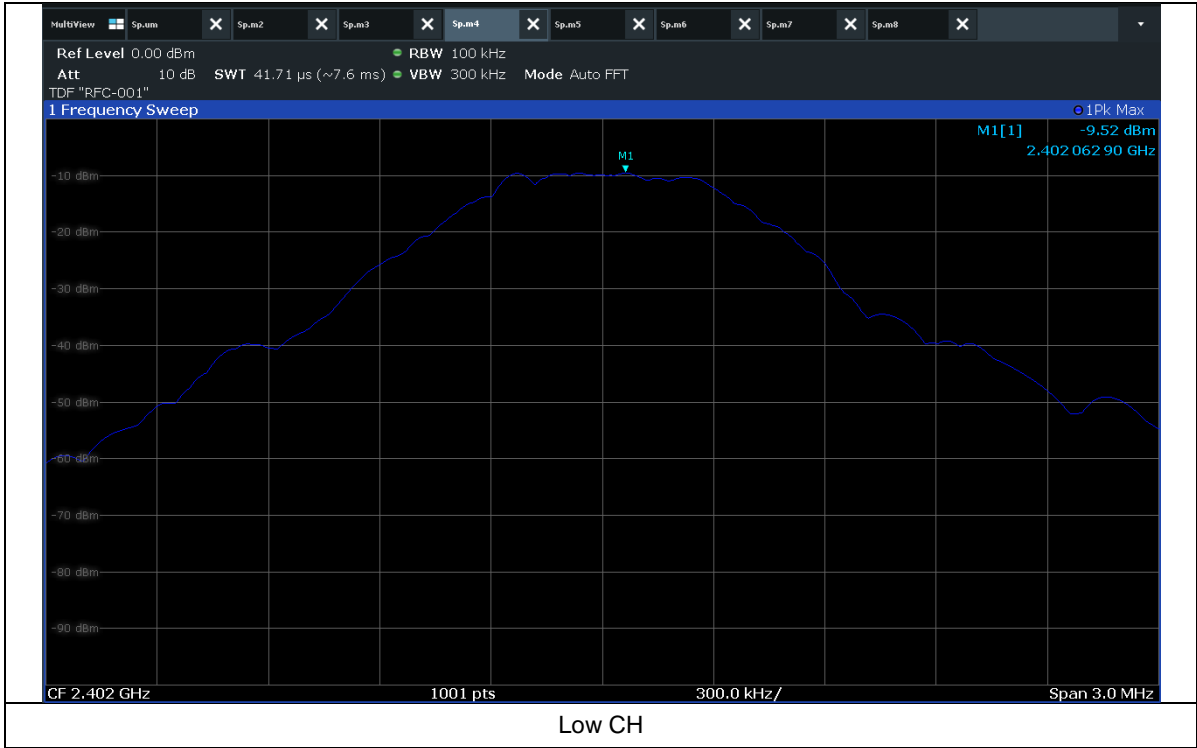
Operating mode : Transmit mode
Test Result : Pass

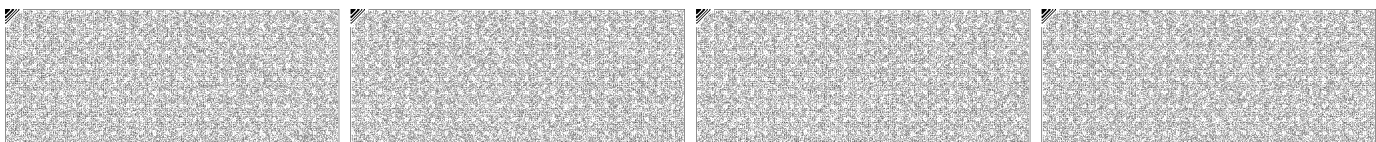
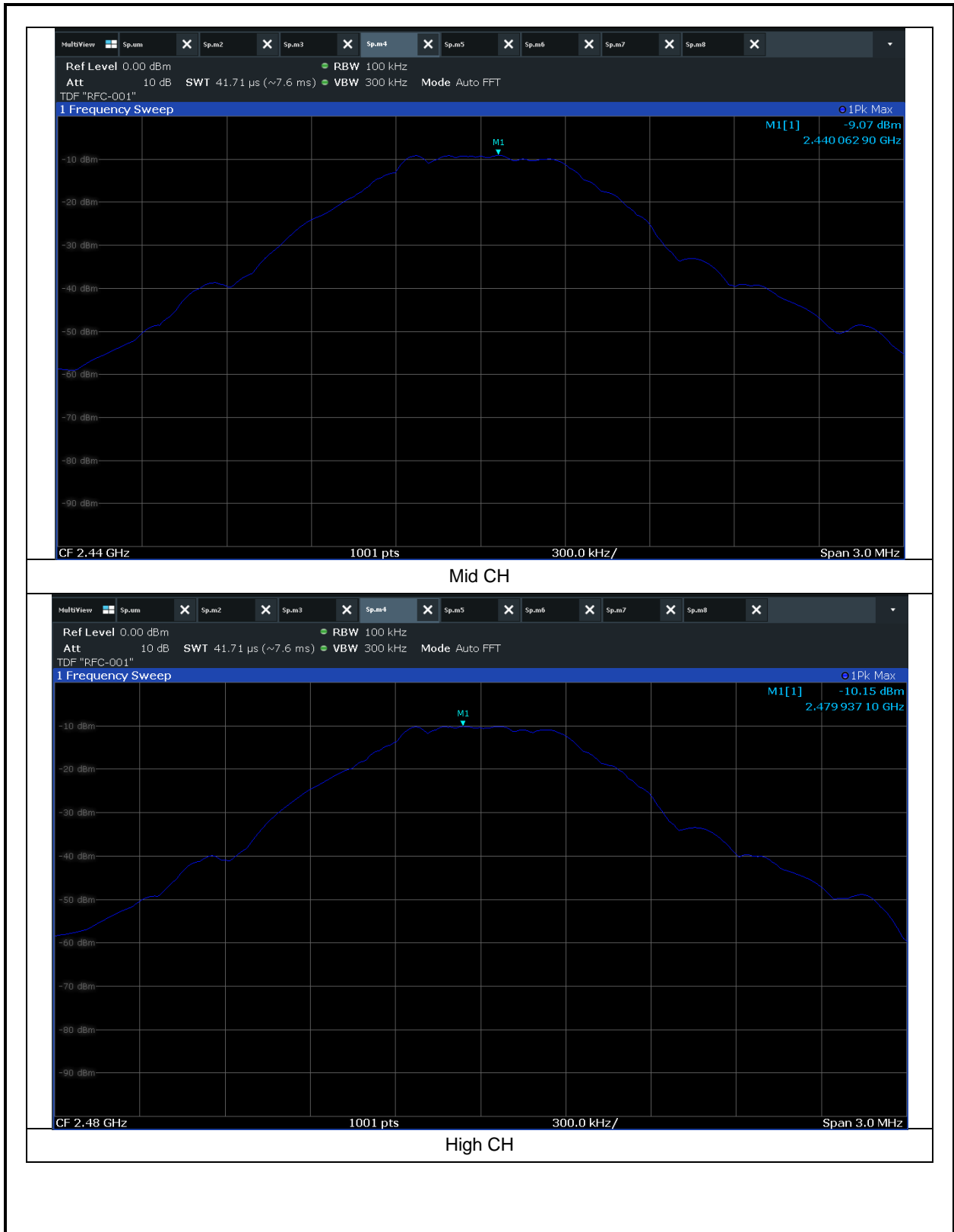




8.4.1 Measured Results

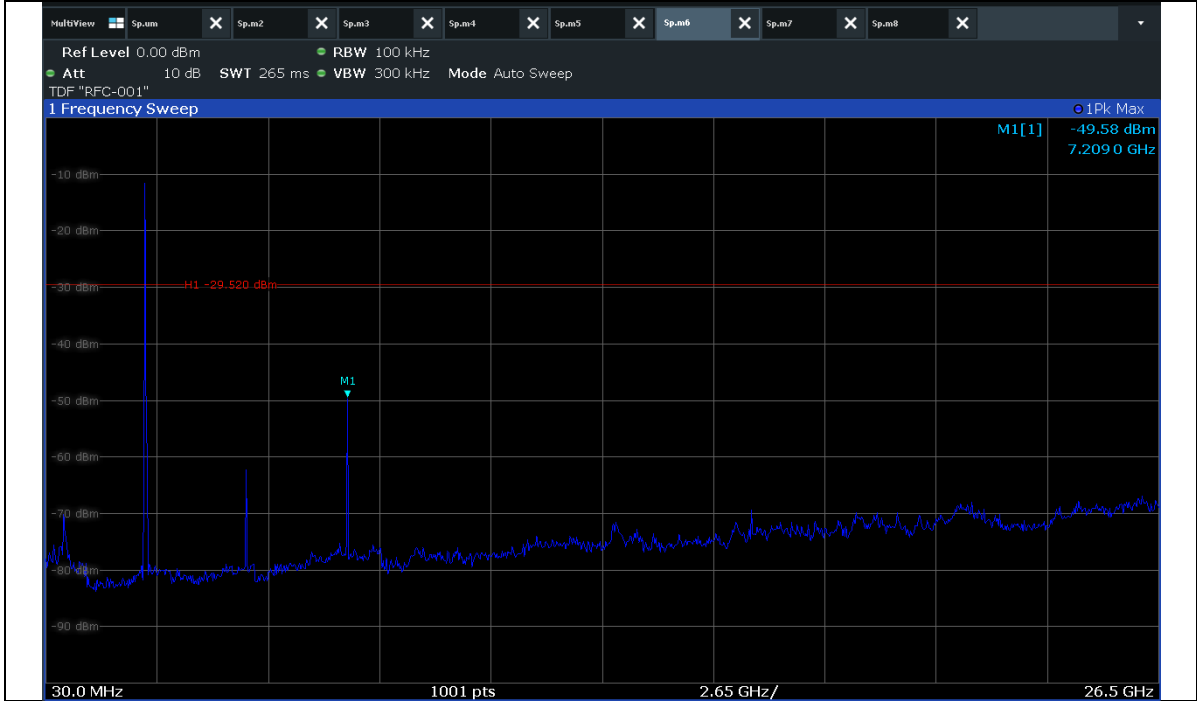
8.4.1.1 Signal level (dB m)



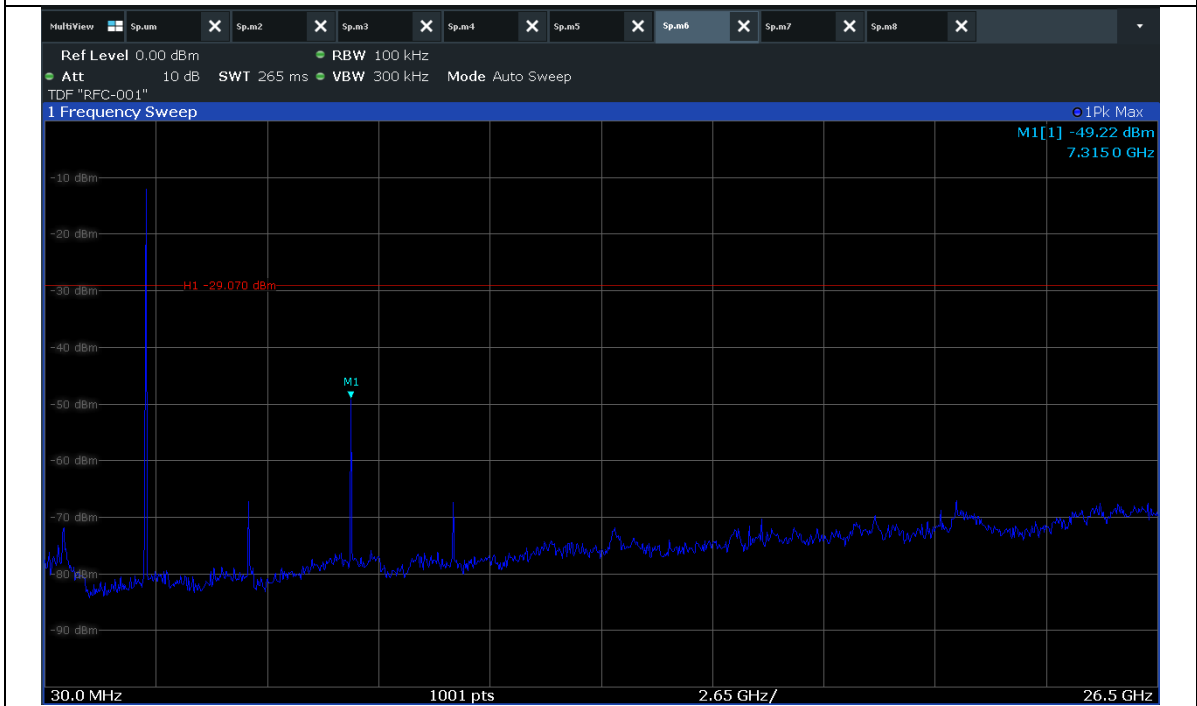




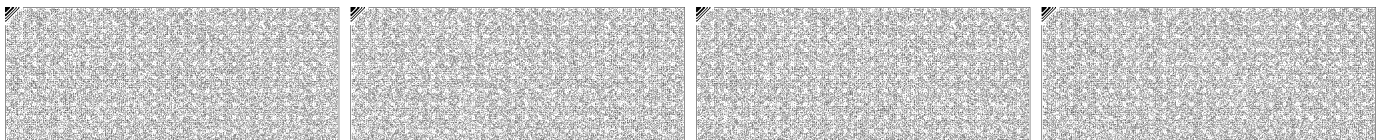
8.4.1.2 Unwanted Emissions In Non-Restricted Frequency Bands

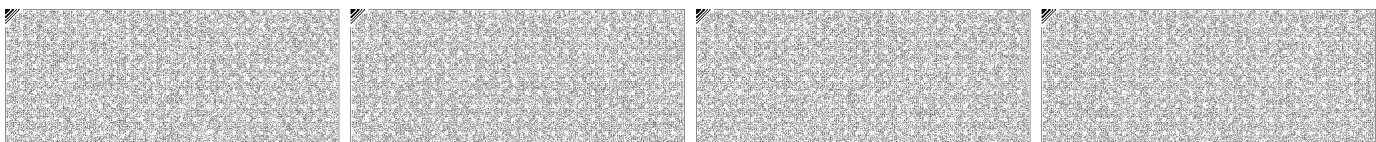
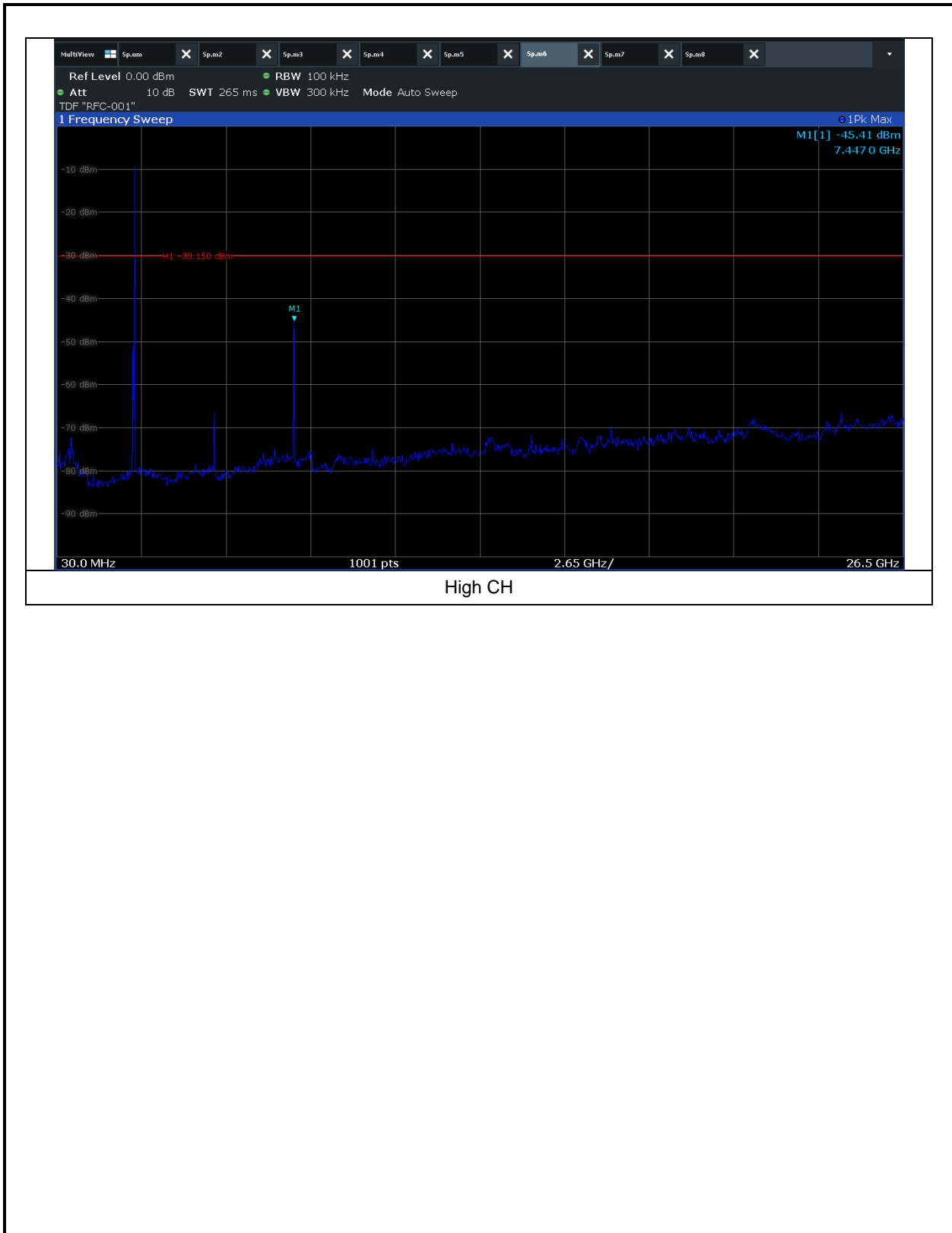


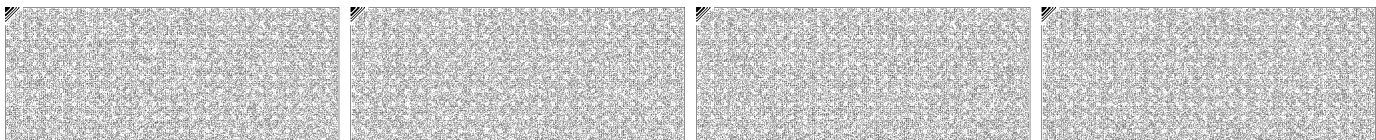
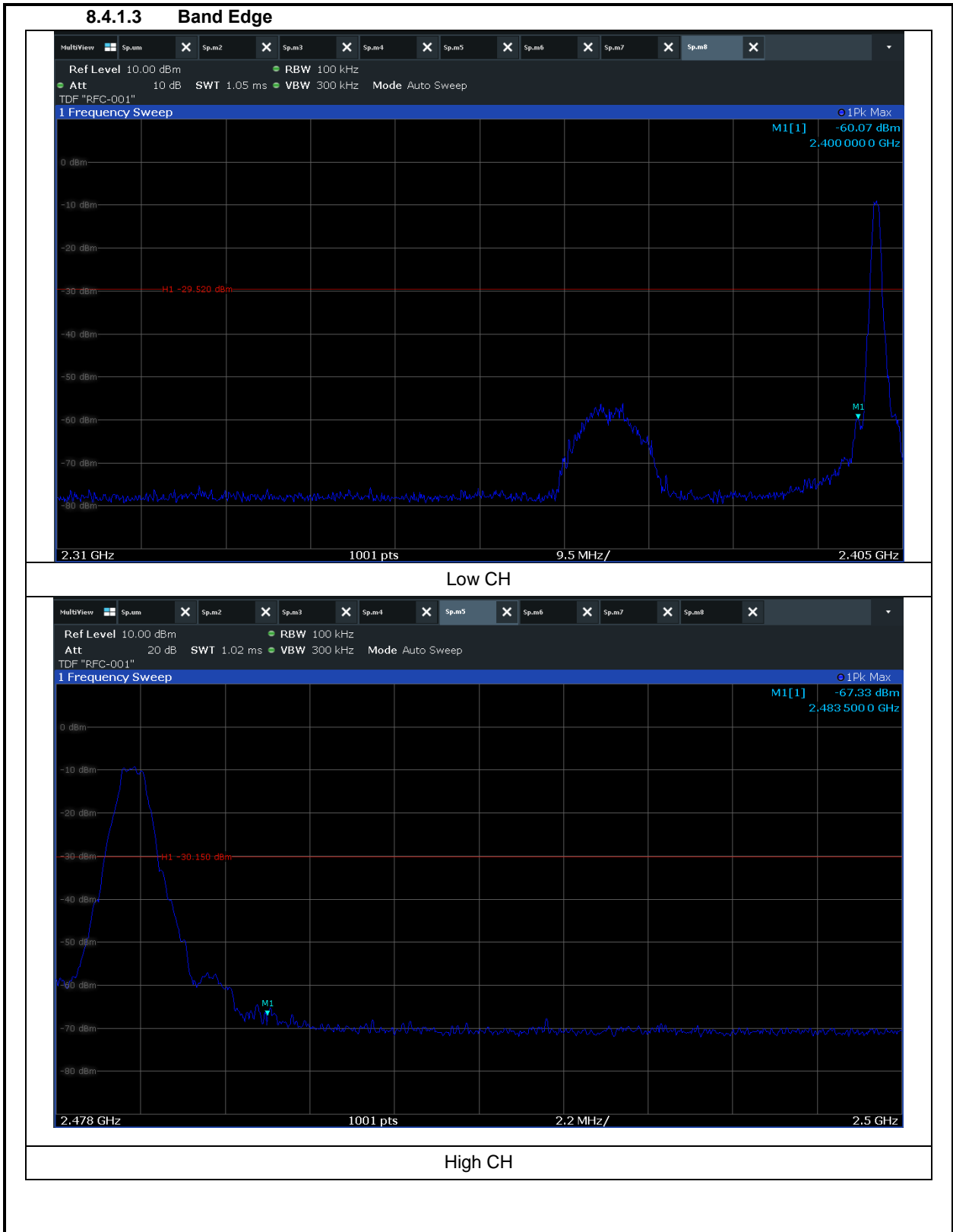
Low CH



Mid CH







9. Radiated Spurious Emission

9.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 %

9.2 Measurement method

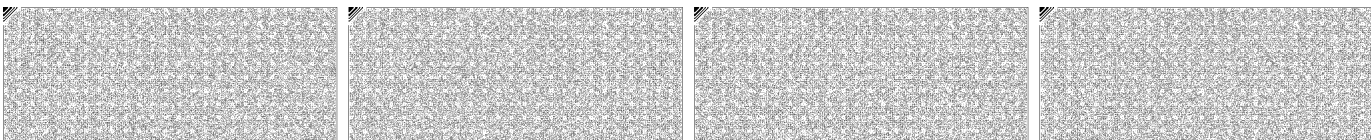
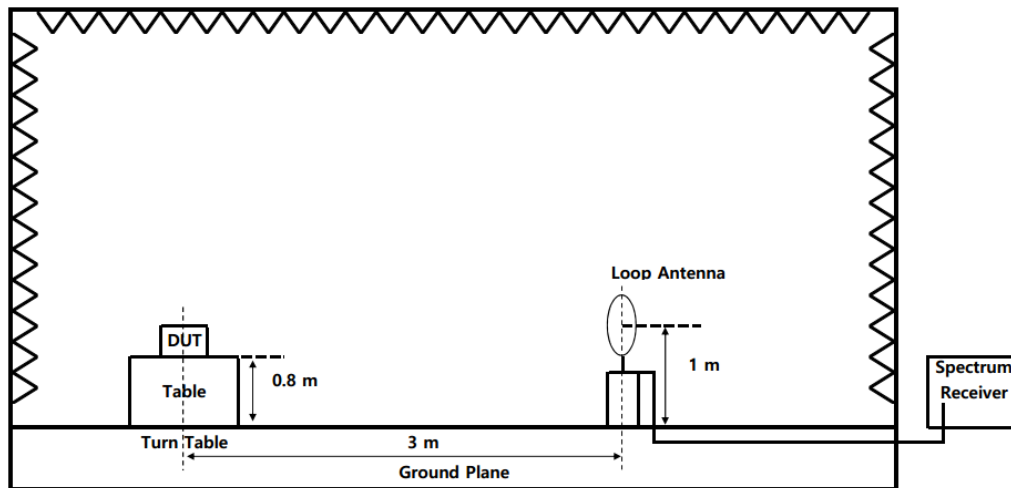
Standard : §15.247 (d), §15.209, §15.205

9.3 Test setup

The radiated emissions measurements were performed on the 3 m, Semi-Anechoic Chamber. The EUT was placed on a non-conductive turntable above the ground plane.

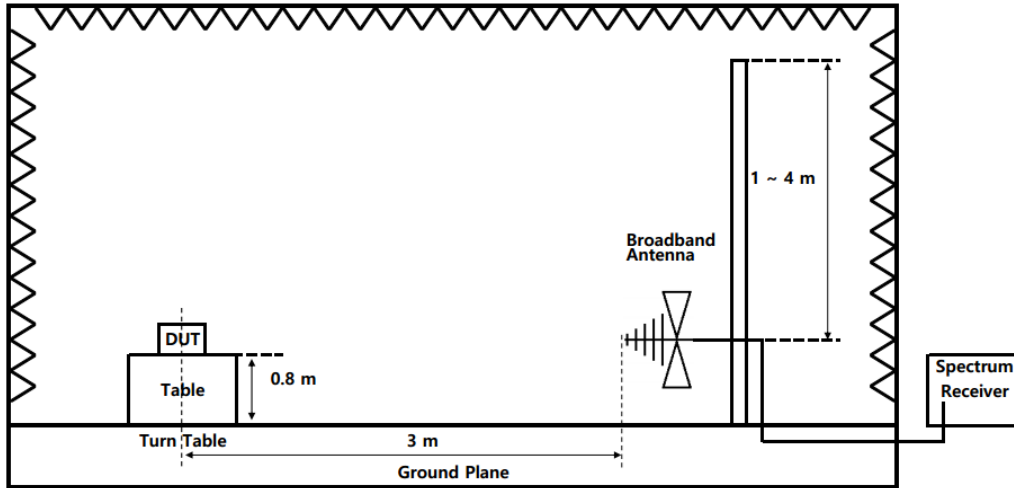
The frequency spectrum from 9 kHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

9.3.1 Below 30 MHz

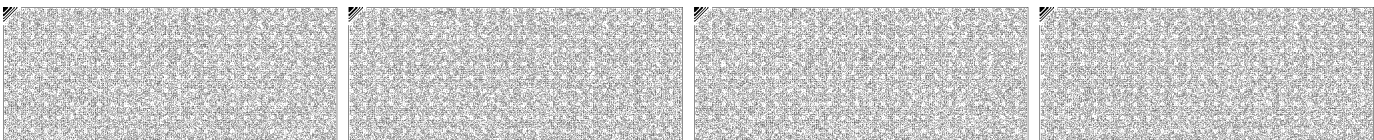
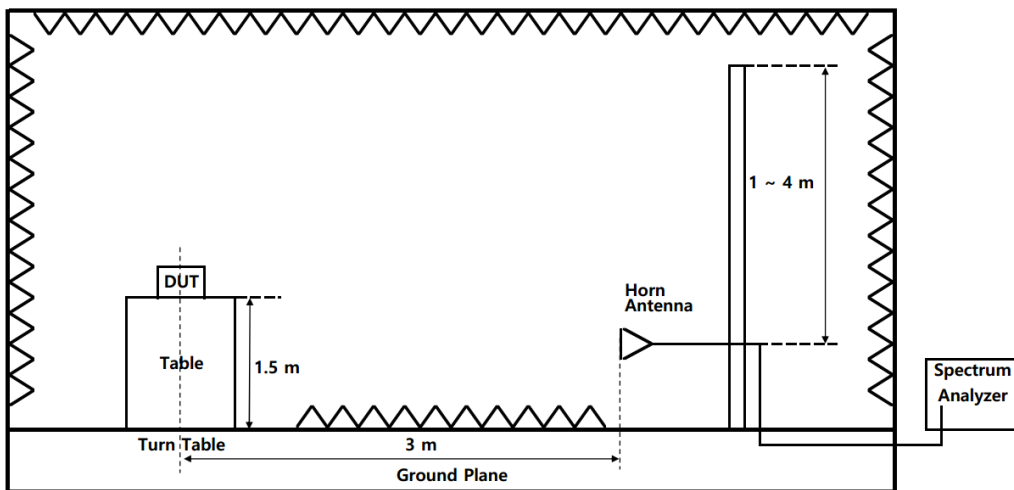




9.3.2 30 MHz to 1 GHz



9.3.3 Above 1 GHz





9.4 Test data

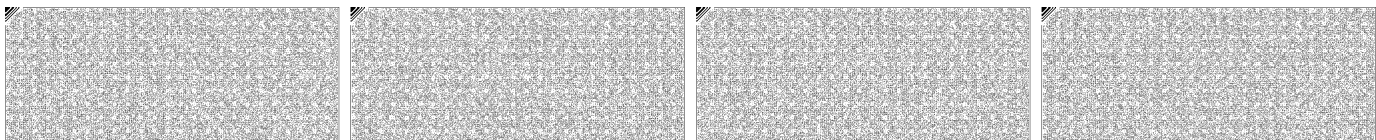
Operating mode : Transmit mode

Test Result : Pass

9.4.1 Test data for Restricted band

Frequency (MHz)	Reading (dB μ V)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low CH							
2 389.23	54.82	Peak	V	-14.50	40.32	73.98	33.66
	32.92	Average	V		18.42	53.98	35.56
High CH							
2 484.07	55.91	Peak	V	-14.10	41.81	73.98	32.17
	33.33	Average	V		19.23	53.98	34.75

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr. Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr. Factor
- ※ Margin = Limit - Result



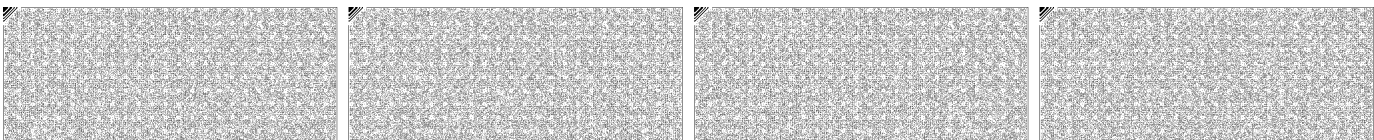


9.4.2 Test data for Spurious & Harmonic

9.4.2.1 Measurement Results for below 30 MHz

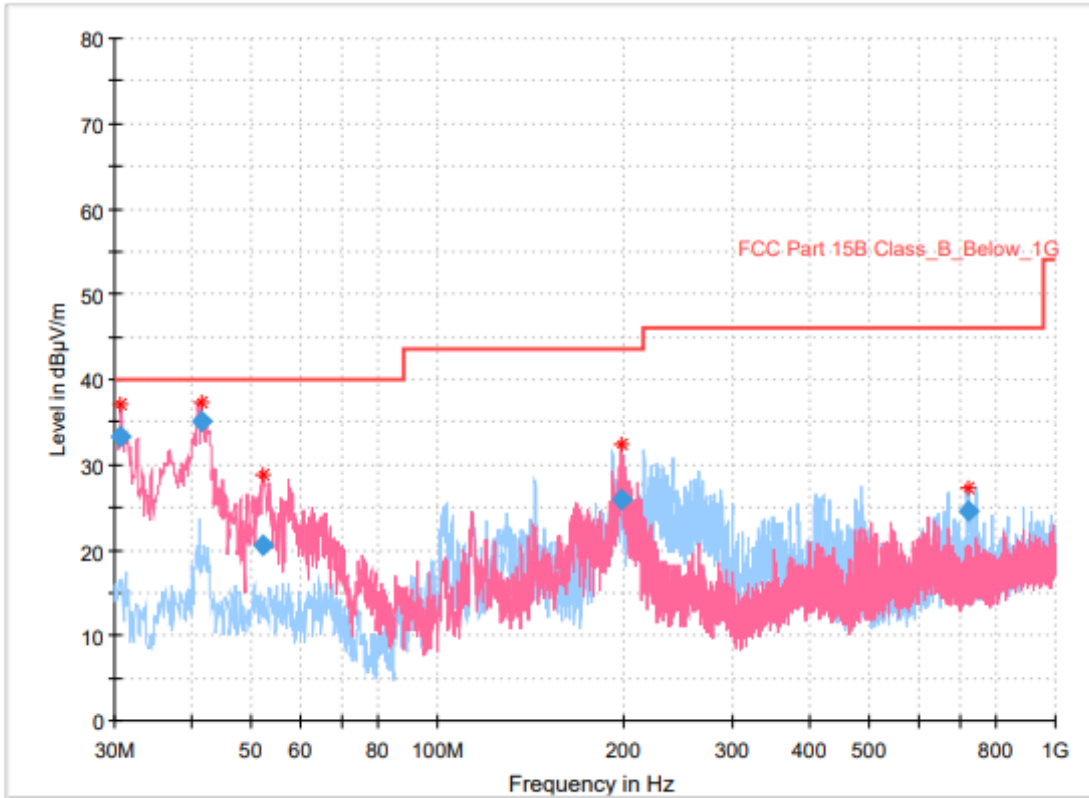
Frequency (MHz)	Reading (dB μ V)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low CH							
It was not found any emissions peaks found from the EUT.							
Mid CH							
It was not found any emissions peaks found from the EUT.							
High CH							
It was not found any emissions peaks found from the EUT.							

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr. Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr. Factor
- ※ Margin = Limit - Result





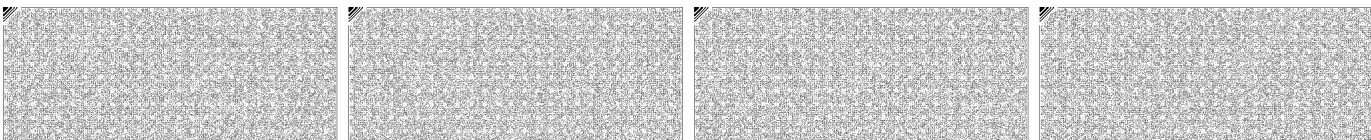
9.4.2.2 Measurement Results for below 1 GHz

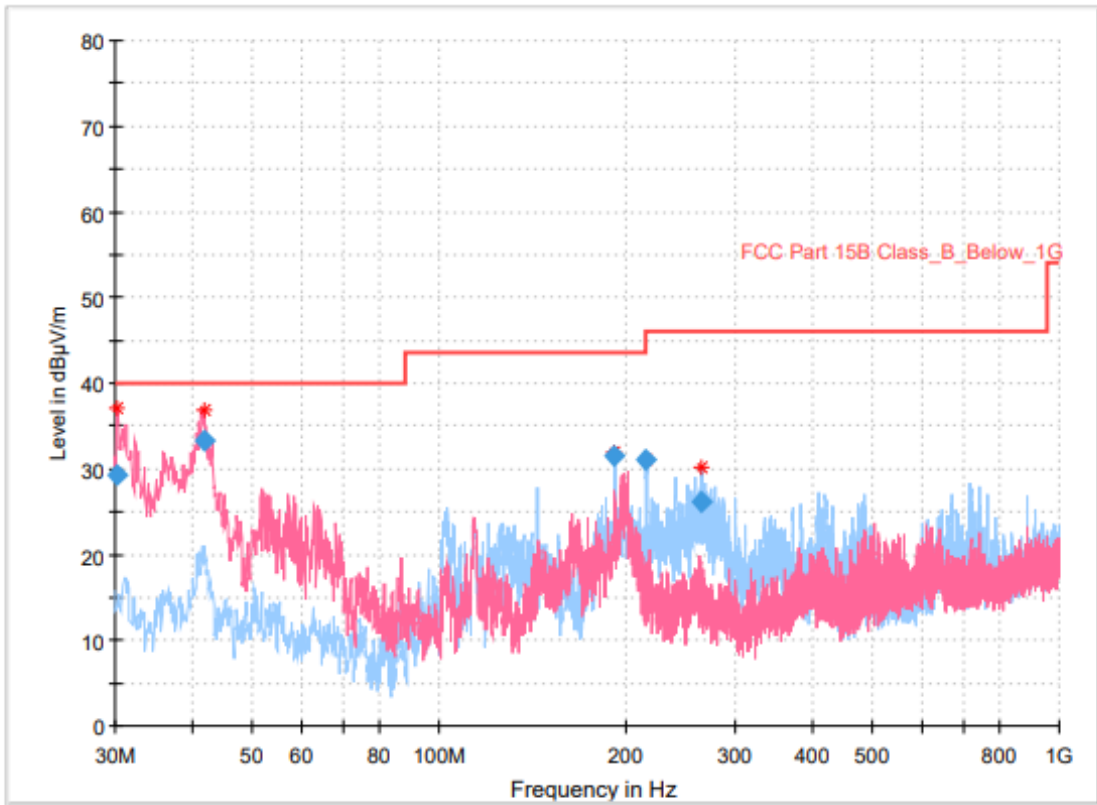


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.776000	33.28	40.00	6.72	1000.0	120.000	99.9	V	110.0	-26.4
41.446000	35.19	40.00	4.81	1000.0	120.000	99.9	V	110.0	-23.3
52.116000	20.50	40.00	19.50	1000.0	120.000	99.9	V	110.0	-22.4
198.489000	25.87	43.50	17.63	1000.0	120.000	99.9	V	128.0	-23.7
720.446000	24.48	46.00	21.52	1000.0	120.000	99.9	H	64.0	-11.8

Low CH

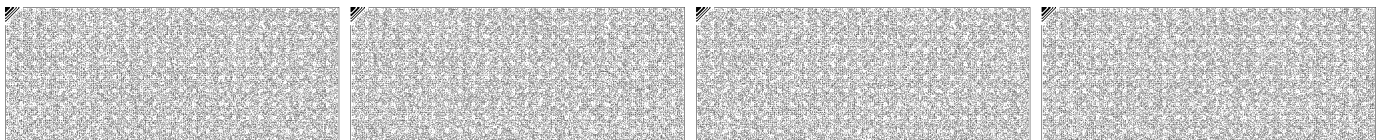


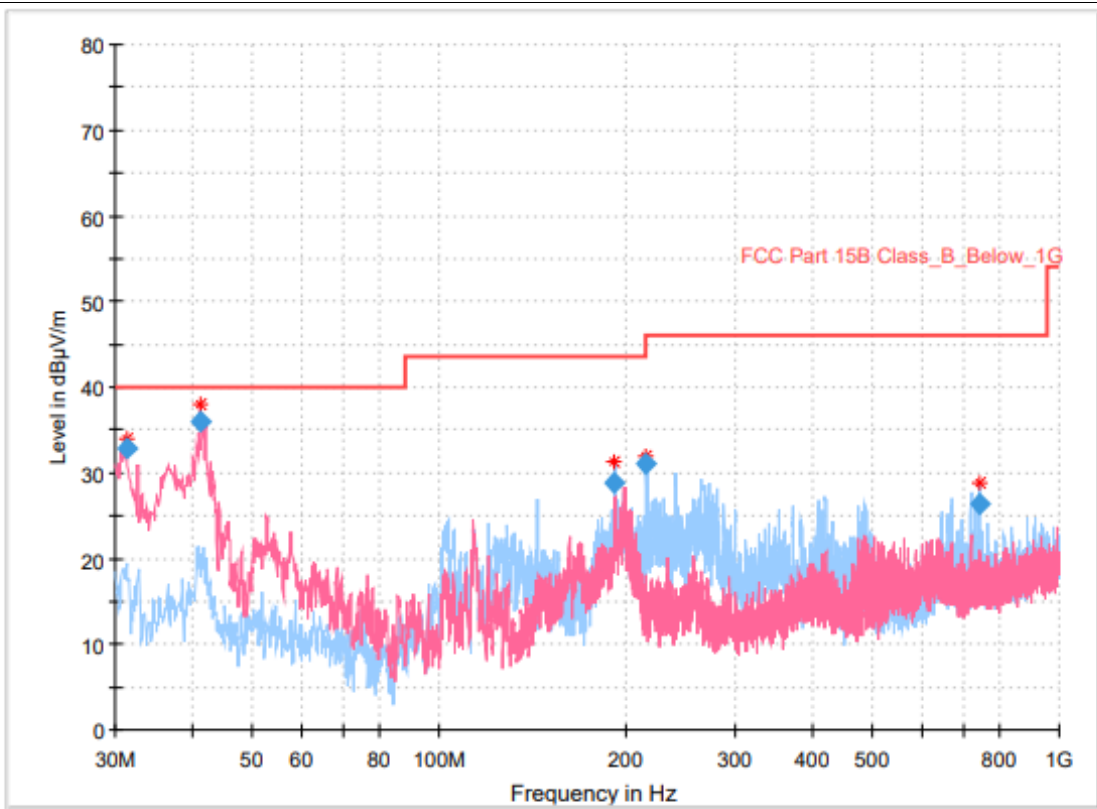


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.194000	29.20	40.00	10.80	1000.0	120.000	99.9	V	28.0	-26.2
41.834000	33.31	40.00	6.69	1000.0	120.000	99.9	V	178.0	-23.1
191.990000	31.55	43.50	11.95	1000.0	120.000	99.9	H	140.0	-24.7
215.949000	31.01	43.50	12.49	1000.0	120.000	99.9	H	0.0	-24.2
264.449000	26.04	46.00	19.96	1000.0	120.000	99.9	H	32.0	-21.9

Mid CH

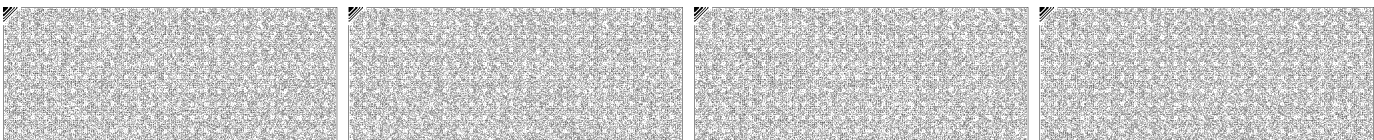




Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.261000	32.79	40.00	7.21	1000.0	120.000	99.9	V	353.0	-26.4
41.252000	36.00	40.00	4.00	1000.0	120.000	99.9	V	78.0	-23.3
191.796000	28.77	43.50	14.73	1000.0	120.000	99.9	H	4.0	-24.7
215.949000	30.96	43.50	12.54	1000.0	120.000	99.9	H	0.0	-24.2
744.017000	26.27	46.00	19.73	1000.0	120.000	99.9	H	114.0	-11.1

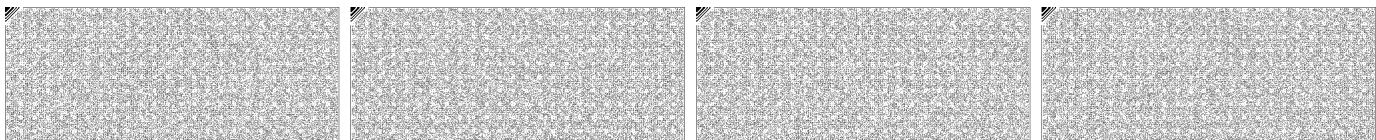
High CH



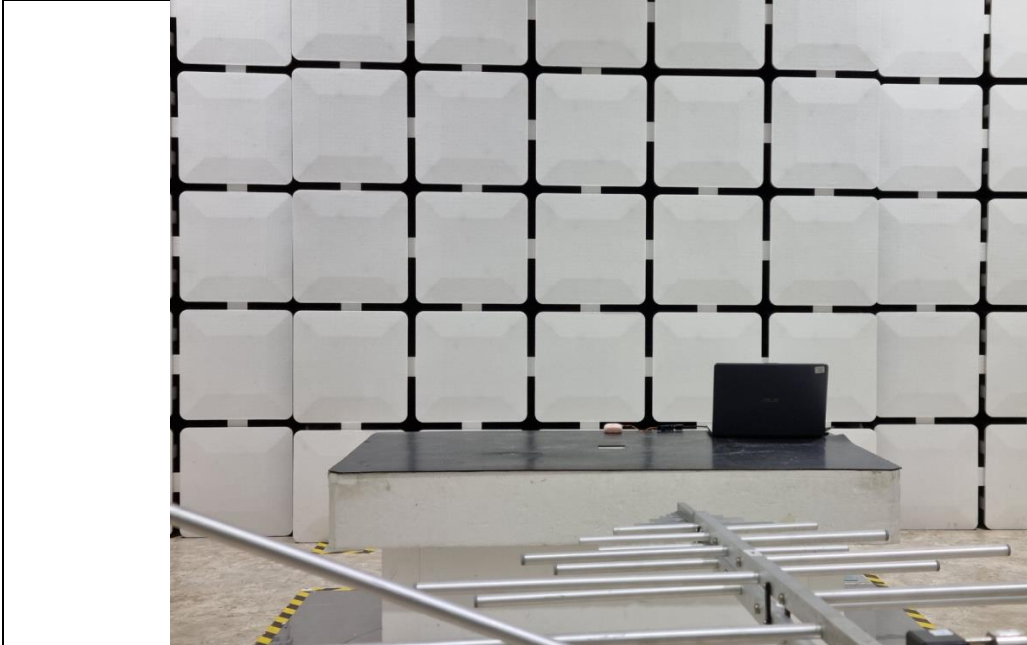


9.4.2.3 Measurement Results for Above 1 GHz							
Frequency (MHz)	Reading (dBμV)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
4 802.90	48.05	Peak	V	-4.00	44.05	73.98	29.93
	30.77	Average	V		26.77	53.98	27.21
7 208.40	40.13	Peak	V	0.70	40.83	73.98	33.15
	26.72	Average	V		27.42	53.98	26.56
9 612.20	39.96	Peak	V	3.60	43.56	73.98	30.42
	25.98	Average	V		29.58	53.98	24.40
Mid CH							
4 879.40	52.30	Peak	V	-3.40	48.90	73.98	25.08
	35.78	Average	V		32.38	53.98	21.60
7 320.60	49.34	Peak	V	0.70	50.04	73.98	23.94
	33.14	Average	V		33.84	53.98	20.14
9 758.40	39.97	Peak	H	3.90	43.87	73.98	30.11
	25.94	Average	H		29.84	53.98	24.14
High CH							
4 959.30	47.76	Peak	V	-3.20	44.56	73.98	29.42
	31.55	Average	V		28.35	53.98	25.63
7 441.30	48.74	Peak	V	1.00	49.74	73.98	24.24
	31.28	Average	V		32.28	53.98	21.70
9 916.50	39.01	Peak	V	4.20	43.21	73.98	30.77
	25.22	Average	V		29.42	53.98	24.56

※ Ant. Pol. : Antenna Polarization
 ※ Corr. Factor. : Antenna Factor + Cable Loss - Amplifier Gain
 ※ Result = Reading + Corr. Factor
 ※ Margin = Limit – Result



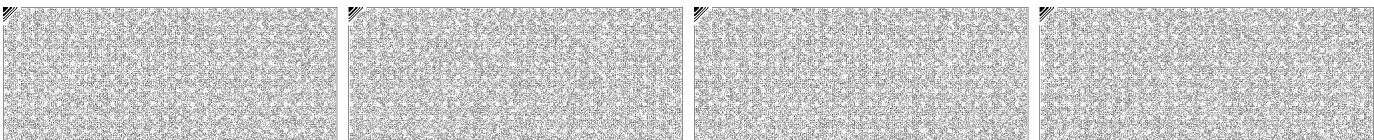
10. Test Setup Photos

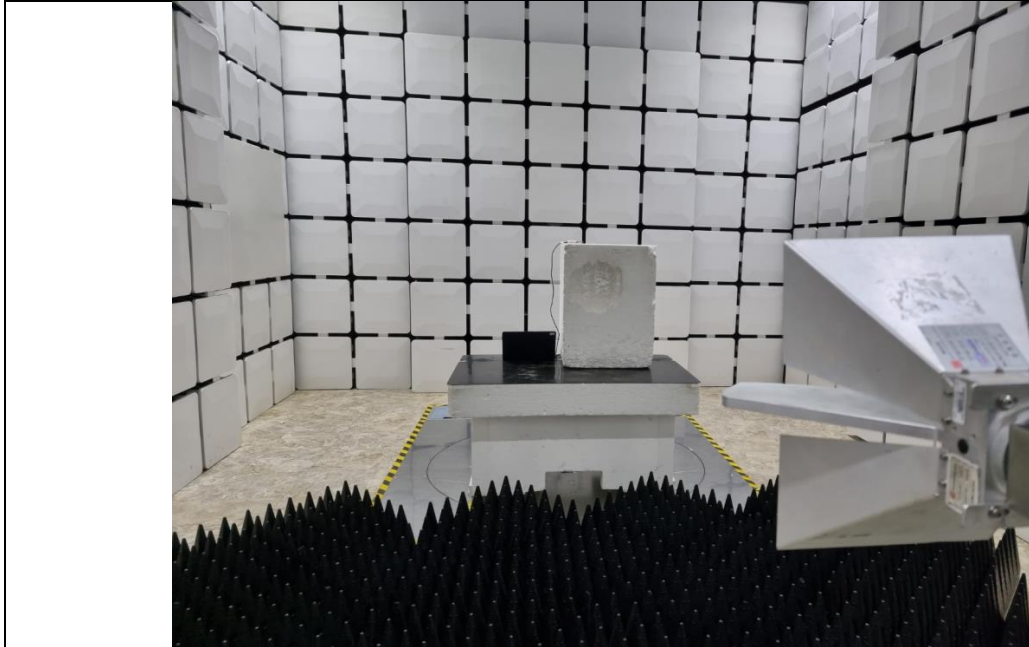


Below 1G Front

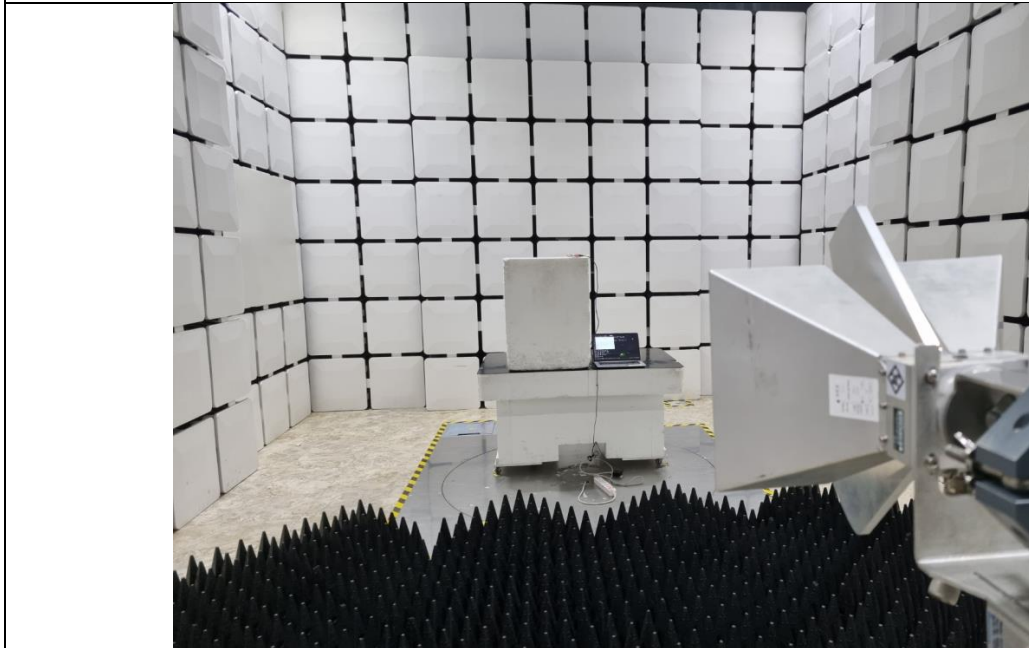


Below 1G Rear





Above 1G Front



Above 1G Rear

- END -

