TEST REPORT

Applicant Name :	VTech Telecommunications Ltd
Address :	23/F Tai Ping Ind Center Block 1 57 Ting Kok Rd Tai Po NT,Hong Kong
Report Number :	RA230418-20204E-RF-00A
FCC ID:	EW780-0756-01

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	DECT 6.0 Cordless Phone
Model No.:	CL82207
Multiple Model(s) No.:	Refer to page 5
Trade Mark:	AT&T
Date Received:	2023/04/18
Report Date:	2023/05/25

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Andy Yu

EMC Engineer

Approved By:

Candy Li

EMC Engineer

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230418-20204E-RF-00A	Original Report	2023-05-25

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	DECT 6.0 Cordless Phone
Tested model	CL82207
Multiple Model(s)	FP: CL82107, CL82167, CL82257, CL82267, CL82307, CL82357, CL82407, CL82507, CL82567, CL82XY7 (model difference see product declaration letter of similarity)
Frequency Range	Bluetooth: 2402~2480MHz
Maximum conducted Peak output power	Bluetooth: 4.5dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification*	0 dBi (provided by the applicant)
Voltage Range	DC 6V from adapter
Test Sample serial number	24S8_1 for Conducted and Radiated Emissions Test 24S8_9 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter 1 Information	Model: E004-1A060040VU Input: AC 100-120V, 50/60Hz, 0.1A Output: DC 6.0V, 0.4A
Adapter 2 Information	Model: A318-060040W-US1 Input: AC 100-120V, 50-60Hz, 0.15A Output: DC 6.0V, 0.4A
Adapter 3 Information	Model: DSA-3PFM-05 BUS 060040 Input: AC 100-120V, 50/60Hz, 0.15A Output: DC 6.0V, 0.4A, 2.4W
Adapter 4 Information	Model: VT05UUS06040 Input: AC 100-120V, 60Hz, 150mA Output: DC 6V, 400mA

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.71dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
	1GHz - 18GHz	4.96dB
	18GHz - 26.5GHz	5.16dB
	26.5GHz - 40GHz	4.64dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

"UniTool_4v91.exe" exercise software was used and the power level is default*. The power level was provided by the manufacturer.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

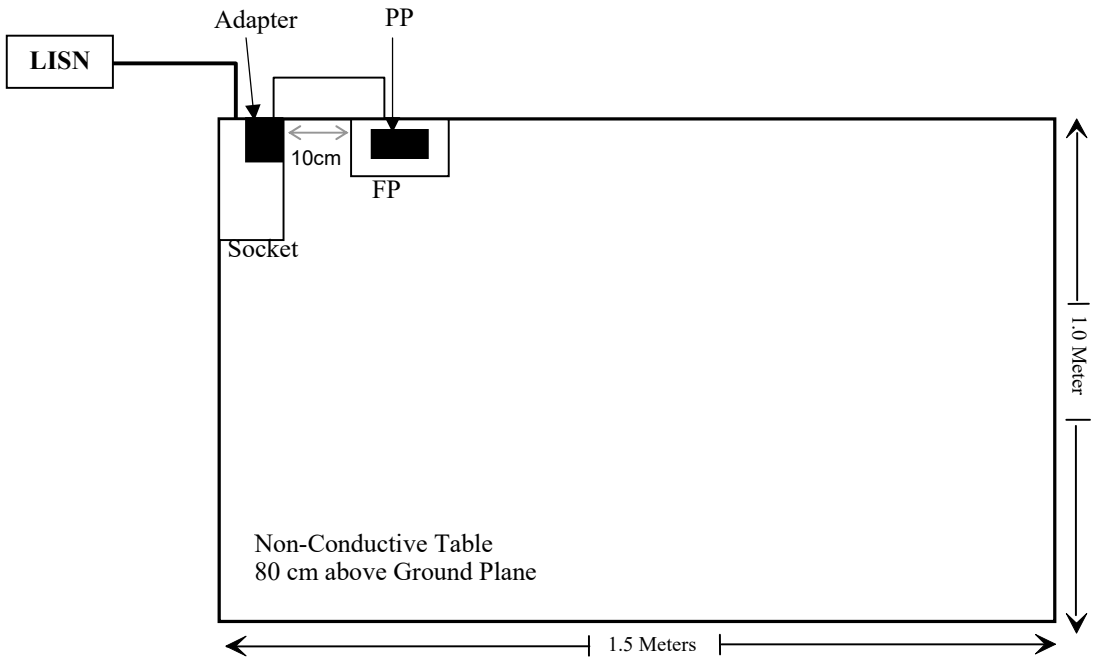
Manufacturer	Description	Model	Serial Number
VTech	DECT 6.0 Cordless Phone (PP)	CL82207	Unknown

External I/O Cable

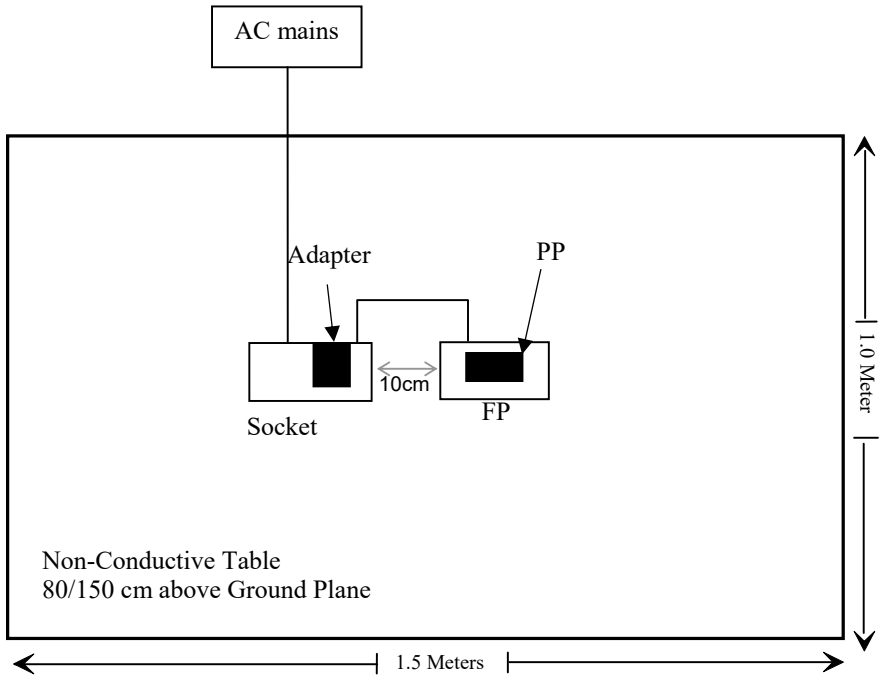
Cable Description	Length (m)	From Port	To
Unshielded un-detachable DC cable	2.0	Adapter	EUT(FP)
Unshielded un-detachable AC cable	1.2	LISN/ AC mains	Socket

Block Diagram of Test Setup

For Conducted Emissions



For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1310 & §2.1091	RF Exposure Evaluation	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliant
§15.247(a)(1)	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2022/11/25	2023/11/24
Rohde & Schwarz	L.I.S.N.	ESH3-Z5	100305	2022/12/01	2023/11/30
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2022/12/07	2023/12/06
Unknown	RF Coaxial Cable	No.17	N0350	2022/11/25	2023/11/24
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2022/12/26	2025/12/25
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
Wainwright	High Pass Filter	WHKX3.6/18G-10SS	5	2022/11/25	2023/11/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101590	2022/11/25	2023/11/24
Tonscend	RF Control Unit	JS0806-2	19G8060182	2022/10/24	2023/10/23
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1091 – RF EXPOSURE EVALUATION

Applicable Standard

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.4 –MPE-Based Exemption:

An alternative to the SAR-based exemption is provided in § 1.1307(b)(3)(i)(C), for a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power. For this case, a RF source is an RF exempt device if its ERP (watts) is no more than a frequency-dependent value, as detailed tabular form in Appendix B. These limits have been derived based on the basic specifications on Maximum Permissible Exposure (MPE) considered for the FCC rules in § 1.1310(e)(1).

Table to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

f = frequency in MHz;
R = minimum separation distance from the body of a nearby person (appropriate units, e.g., m);

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Result

Mode	Frequency (MHz)	Tune up conducted power*	Antenna Gain		ERP		Evaluation Distance (m)	MPE-Based Exemption Threshold (mW)
		(dBm)	(dBi)	(dBd)	(dBm)	(mW)		
Bluetooth	2402-2480	5.0	0	-2.15	2.85	1.93	0.2	768
DECT	1921.536-1928.448	20.5	0	-2.15	18.35	68.39	0.2	768

Note 1: The tune-up power was declared by the applicant.
Note 2: 0dBd=2.15dBi.
Note 3: The DECT function can transmit at the same time with the Bluetooth function.

Simultaneous transmitting consideration (worst case):

The ratio= ERP_{DECT} /limit+ERP_{BT}/limit= 68.39/768+1.93/768=0.09＜1.0

Result: Compliant.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 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.

Antenna Connector Construction

The EUT has one internal antenna arrangement, which was permanently attached, the antenna gain is 0dBi, fulfill the requirement of this section. Please refer to the EUT photos.

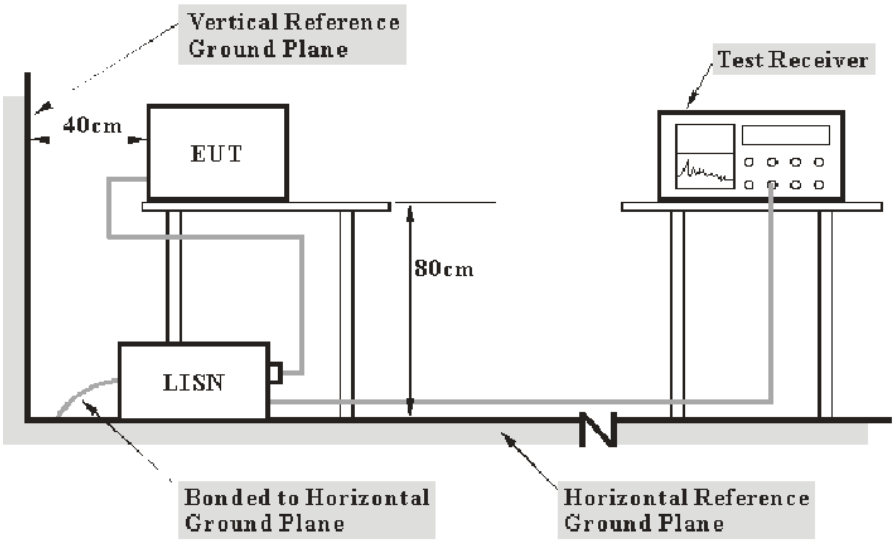
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



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

The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Transd Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Transd Factor = LISN VDF + Cable Loss

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a over limit of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Over Limit = level – Limit
Level= reading level+ Transd Factor

Test Data

Environmental Conditions

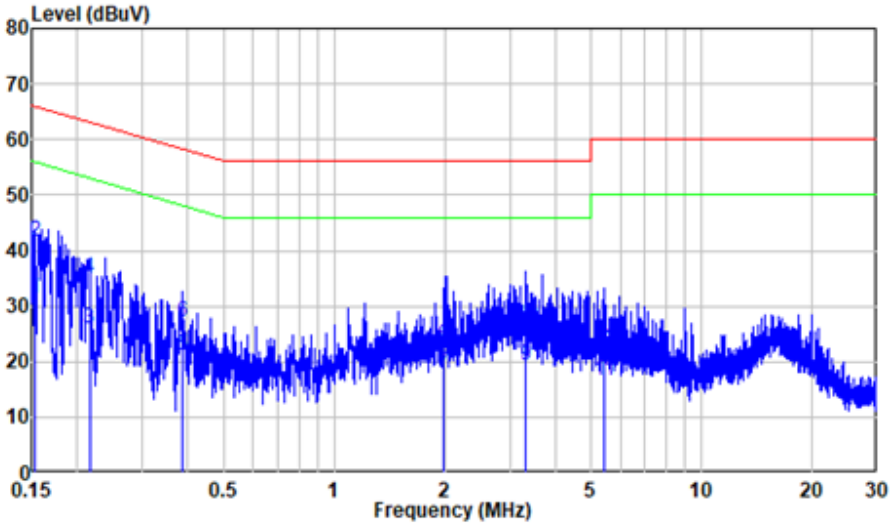
Temperature:	23 ℃
Relative Humidity:	49 %
ATM Pressure:	101.2 kPa

The testing was performed by Jerry Wu on 2023-05-15.

EUT operation mode: Transmitting (the worst case is 8DPSK Mode, Low channel)

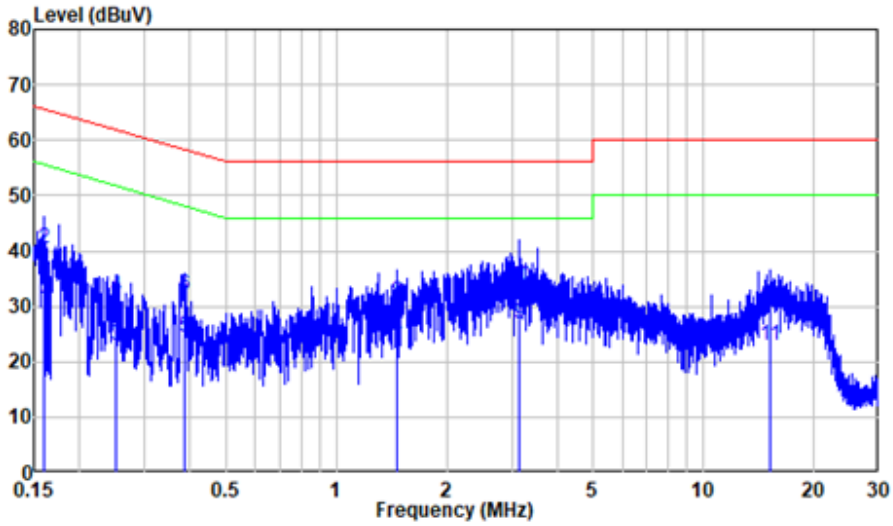
For Adapter 1

AC 120V/60 Hz, Line



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.153	10.36	21.00	31.36	55.85	-24.49	Average
2	0.153	10.36	31.24	41.60	65.85	-24.25	QP
3	0.215	10.31	15.57	25.88	52.99	-27.11	Average
4	0.215	10.31	24.83	35.14	62.99	-27.85	QP
5	0.386	10.48	10.61	21.09	48.14	-27.05	Average
6	0.386	10.48	16.76	27.24	58.14	-30.90	QP
7	1.979	10.39	7.76	18.15	46.00	-27.85	Average
8	1.979	10.39	12.68	23.07	56.00	-32.93	QP
9	3.304	10.50	8.92	19.42	46.00	-26.58	Average
10	3.304	10.50	16.01	26.51	56.00	-29.49	QP
11	5.411	10.56	5.95	16.51	50.00	-33.49	Average
12	5.411	10.56	11.75	22.31	60.00	-37.69	QP

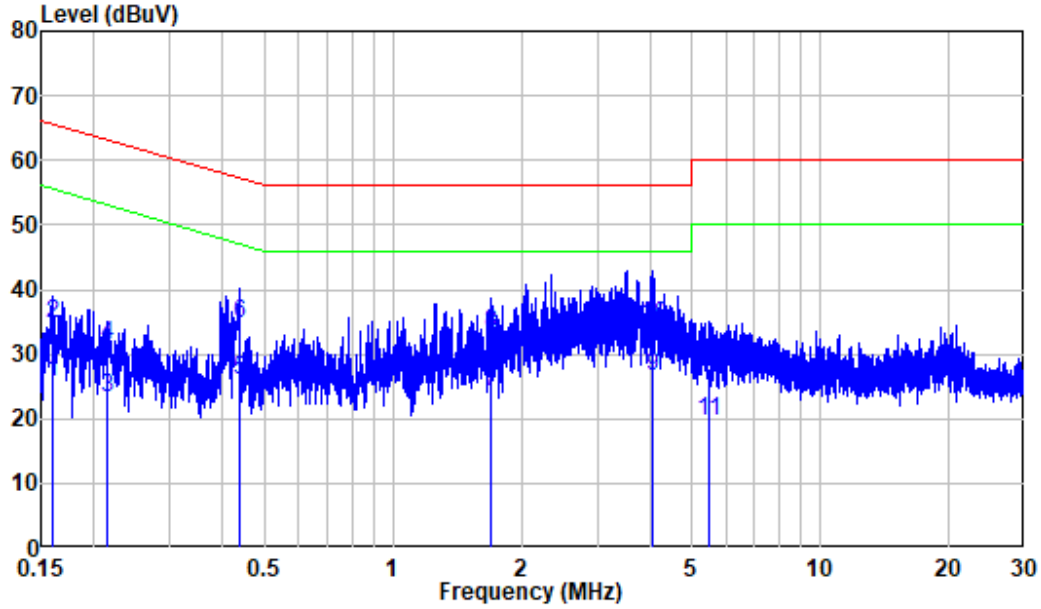
AC 120V/60 Hz, Neutral



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.159	10.28	19.24	29.52	55.50	-25.98	Average
2	0.159	10.28	30.23	40.51	65.50	-24.99	QP
3	0.252	10.33	12.58	22.91	51.69	-28.78	Average
4	0.252	10.33	21.28	31.61	61.69	-30.08	QP
5	0.384	10.41	14.11	24.52	48.19	-23.67	Average
6	0.384	10.41	21.56	31.97	58.19	-26.22	QP
7	1.467	10.44	12.06	22.50	46.00	-23.50	Average
8	1.467	10.44	20.41	30.85	56.00	-25.15	QP
9	3.144	10.53	16.31	26.84	46.00	-19.16	Average
10	3.144	10.53	23.11	33.64	56.00	-22.36	QP
11	15.126	10.18	12.83	23.01	50.00	-26.99	Average
12	15.126	10.18	19.74	29.92	60.00	-30.08	QP

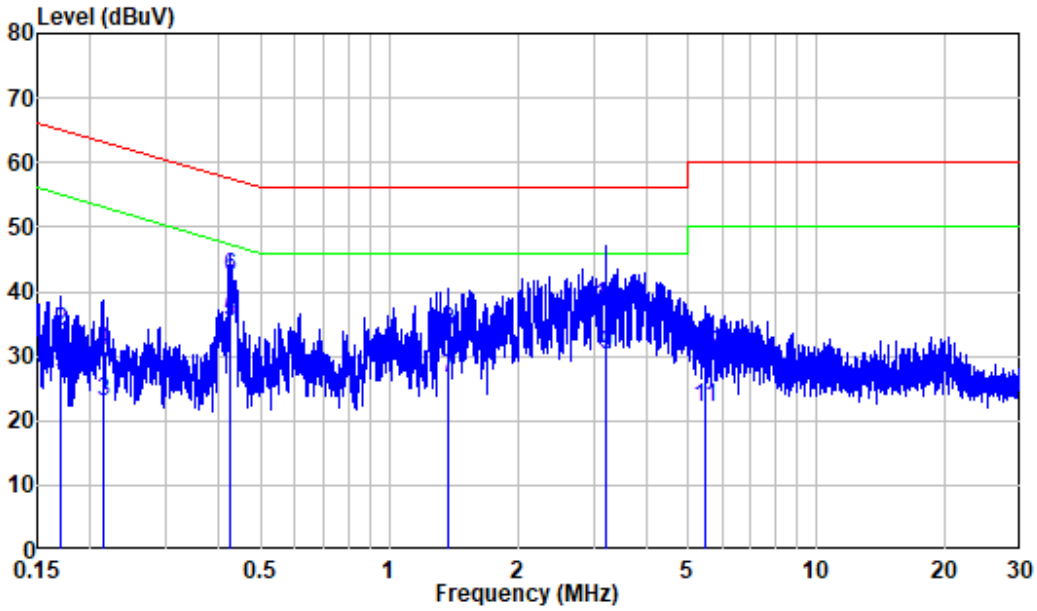
For Adapter 2

AC 120V/60 Hz, Line



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.160	10.36	15.19	25.55	55.46	-29.91	Average
2	0.160	10.36	24.37	34.73	65.46	-30.73	QP
3	0.215	10.31	12.91	23.22	53.02	-29.80	Average
4	0.215	10.31	21.02	31.33	63.02	-31.69	QP
5	0.436	10.52	15.55	26.07	47.14	-21.07	Average
6	0.436	10.52	24.31	34.83	57.14	-22.31	QP
7	1.687	10.40	13.74	24.14	46.00	-21.86	Average
8	1.687	10.40	22.84	33.24	56.00	-22.76	QP
9	4.035	10.54	15.93	26.47	46.00	-19.53	Average
10	4.035	10.54	23.80	34.34	56.00	-21.66	QP
11	5.480	10.57	9.18	19.75	50.00	-30.25	Average
12	5.480	10.57	17.12	27.69	60.00	-32.31	QP

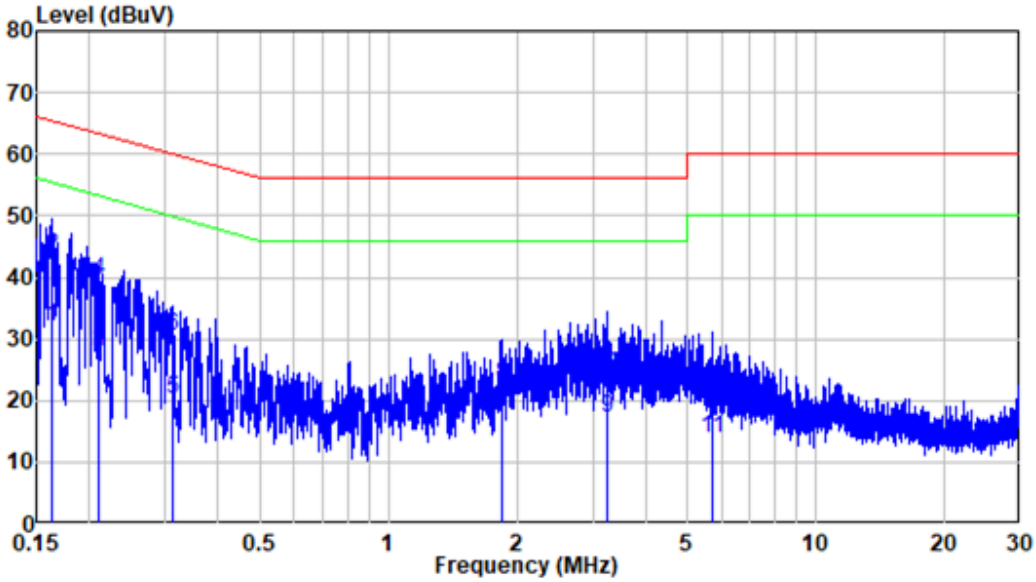
AC 120V/60 Hz, Neutral



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.170	10.28	15.50	25.78	54.94	-29.16	Average
2	0.170	10.28	23.54	33.82	64.94	-31.12	QP
3	0.213	10.30	12.58	22.88	53.07	-30.19	Average
4	0.213	10.30	20.35	30.65	63.07	-32.42	QP
5	0.425	10.43	24.95	35.38	47.34	-11.96	Average
6	0.425	10.43	31.71	42.14	57.34	-15.20	QP
7	1.367	10.42	16.00	26.42	46.00	-19.58	Average
8	1.367	10.42	23.26	33.68	56.00	-22.32	QP
9	3.220	10.53	19.71	30.24	46.00	-15.76	Average
10	3.220	10.53	27.34	37.87	56.00	-18.13	QP
11	5.473	10.51	11.60	22.11	50.00	-27.89	Average
12	5.473	10.51	19.78	30.29	60.00	-29.71	QP

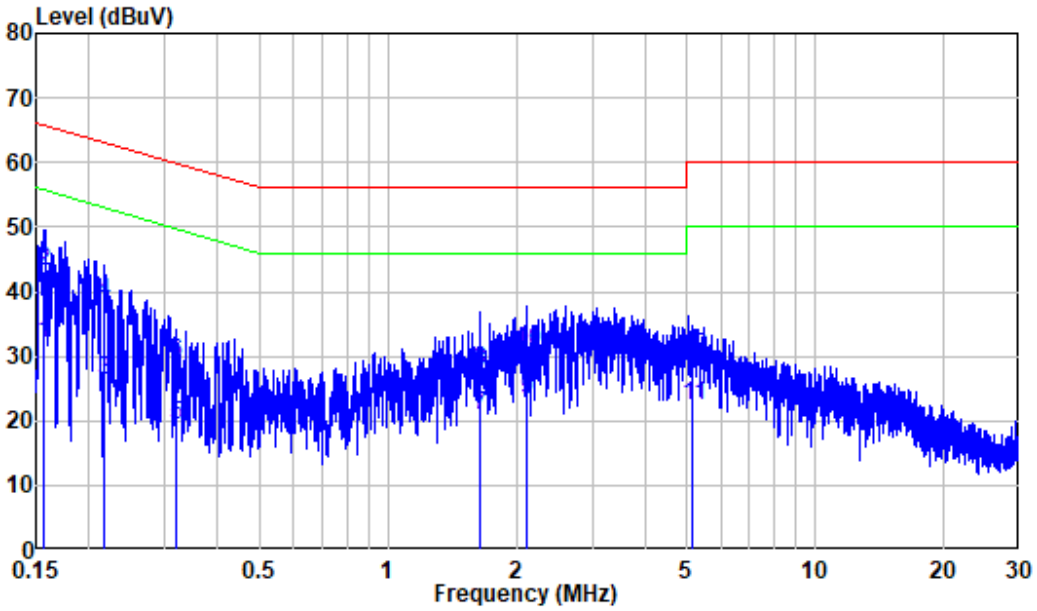
For Adapter 3

AC 120V/60 Hz, Line



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.163	10.35	21.74	32.09	55.32	-23.23	Average
2	0.163	10.35	33.24	43.59	65.32	-21.73	QP
3	0.210	10.30	17.41	27.71	53.20	-25.49	Average
4	0.210	10.30	29.14	39.44	63.20	-23.76	QP
5	0.313	10.42	9.88	20.30	49.89	-29.59	Average
6	0.313	10.42	20.15	30.57	59.89	-29.32	QP
7	1.832	10.40	6.84	17.24	46.00	-28.76	Average
8	1.832	10.40	12.20	22.60	56.00	-33.40	QP
9	3.248	10.50	6.81	17.31	46.00	-28.69	Average
10	3.248	10.50	13.54	24.04	56.00	-31.96	QP
11	5.721	10.57	3.20	13.77	50.00	-36.23	Average
12	5.721	10.57	11.61	22.18	60.00	-37.82	QP

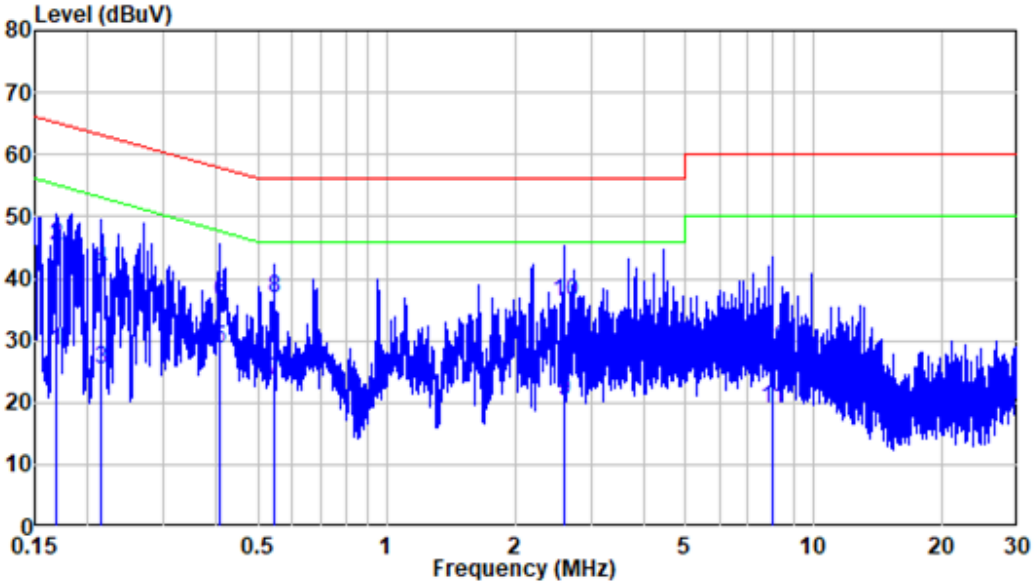
AC 120V/60 Hz, Neutral



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.157	10.28	21.63	31.91	55.61	-23.70	Average
2	0.157	10.28	32.82	43.10	65.61	-22.51	QP
3	0.217	10.30	15.94	26.24	52.91	-26.67	Average
4	0.217	10.30	28.01	38.31	62.91	-24.60	QP
5	0.320	10.37	8.95	19.32	49.70	-30.38	Average
6	0.320	10.37	18.72	29.09	59.70	-30.61	QP
7	1.642	10.45	10.50	20.95	46.00	-25.05	Average
8	1.642	10.45	17.19	27.64	56.00	-28.36	QP
9	2.112	10.50	12.89	23.39	46.00	-22.61	Average
10	2.112	10.50	20.19	30.69	56.00	-25.31	QP
11	5.170	10.51	11.98	22.49	50.00	-27.51	Average
12	5.170	10.51	19.51	30.02	60.00	-29.98	QP

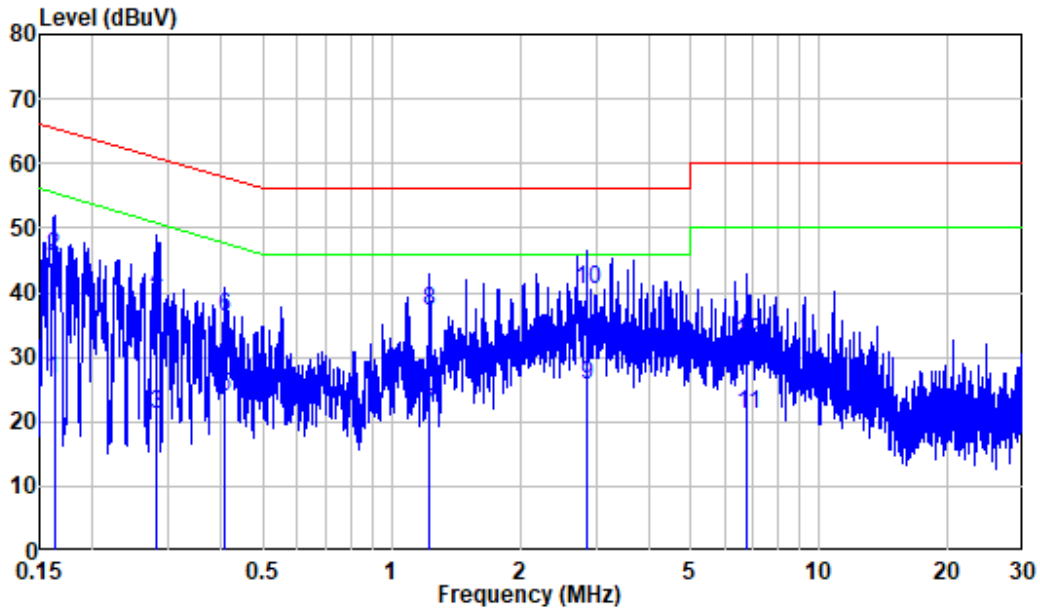
For Adapter 4

AC 120V/60 Hz, Line



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.169	10.34	17.99	28.33	55.01	-26.68	Average
2	0.169	10.34	35.03	45.37	65.01	-19.64	QP
3	0.215	10.31	15.03	25.34	53.01	-27.67	Average
4	0.215	10.31	31.05	41.36	63.01	-21.65	QP
5	0.405	10.49	18.08	28.57	47.75	-19.18	Average
6	0.405	10.49	25.75	36.24	57.75	-21.51	QP
7	0.544	10.60	12.99	23.59	46.00	-22.41	Average
8	0.544	10.60	26.38	36.98	56.00	-19.02	QP
9	2.593	10.46	9.86	20.32	46.00	-25.68	Average
10	2.593	10.46	25.81	36.27	56.00	-19.73	QP
11	7.993	10.61	8.39	19.00	50.00	-31.00	Average
12	7.993	10.61	18.03	28.64	60.00	-31.36	QP

AC 120V/60 Hz, Neutral



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.162	10.28	16.23	26.51	55.35	-28.84	Average
2	0.162	10.28	35.19	45.47	65.35	-19.88	QP
3	0.281	10.35	10.85	21.20	50.79	-29.59	Average
4	0.281	10.35	29.77	40.12	60.79	-20.67	QP
5	0.406	10.42	13.40	23.82	47.73	-23.91	Average
6	0.406	10.42	25.68	36.10	57.73	-21.63	QP
7	1.228	10.40	10.89	21.29	46.00	-24.71	Average
8	1.228	10.40	26.64	37.04	56.00	-18.96	QP
9	2.854	10.52	15.09	25.61	46.00	-20.39	Average
10	2.854	10.52	29.92	40.44	56.00	-15.56	QP
11	6.787	10.52	10.63	21.15	50.00	-28.85	Average
12	6.787	10.52	21.77	32.29	60.00	-27.71	QP

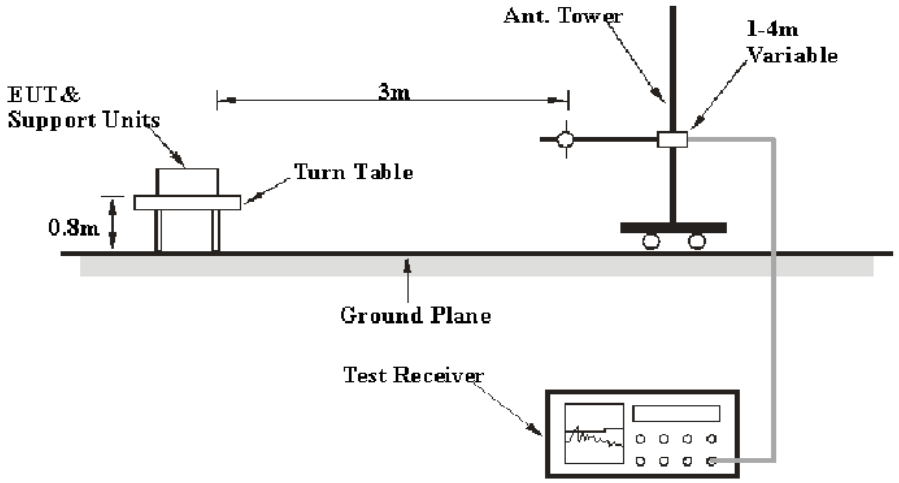
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

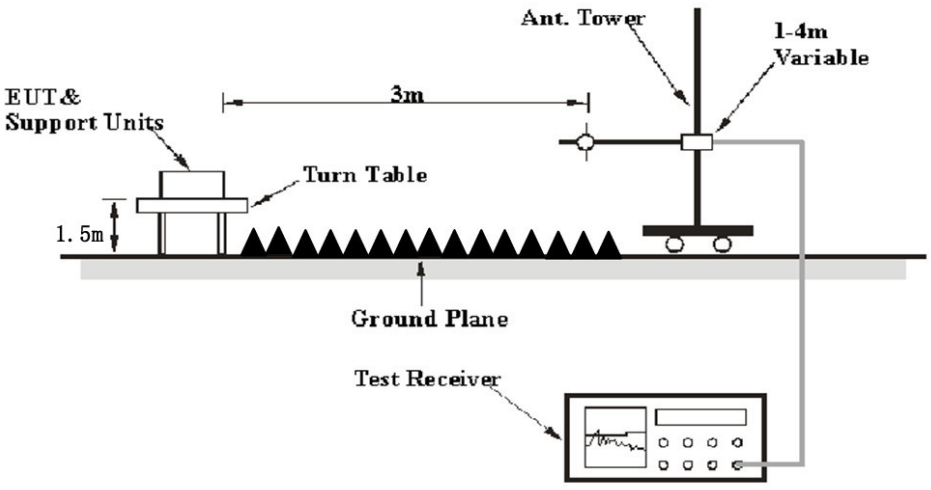
FCC §15.205; §15.209; §15.247(d)

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK

For average measurement:

Use the duty cycle factor correction factor method per 15.35(c).
Duty cycle=On time/100milliseconds, On time=N1*L1+N2*L2+…Nn-1*Ln-1+Nn*Ln,
Where N1 is number of type 1 pulses, L1 is length of type 1 pulse, etc.
Average Emission Level=Peak Emission Level+20*log(Duty cycle)

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Corrected Factor & Margin Calculation

The Corrected Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit or Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a overlimit/margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin/Over Limit = Corrected Amplitude (Absolute Level)/Level-Limit
Corrected Amplitude/Level = Reading + Corrected Factor

Test Data

Environmental Conditions

Temperature:	24~25.2 ℃
Relative Humidity:	52~55 %
ATM Pressure:	101 kPa

The testing was performed by Jason Liu on 2023-05-16 for below 1GHz Zeki Ma on 2023-05-11 for above 1GHz.

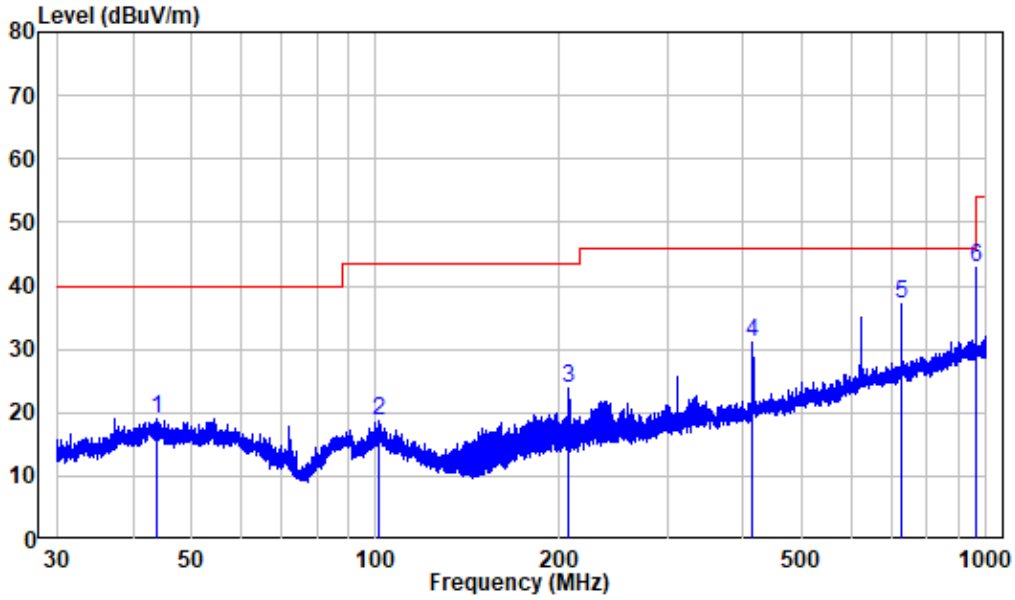
Test mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case X-axes of orientation was recorded)

30MHz-1GHz: *(the worst case is 8DPSK Mode, Low channel)*

Note: When the test result of Peak was more than 6dB below the limit of QP, just the Peak value was recorded.

For Adapter 1

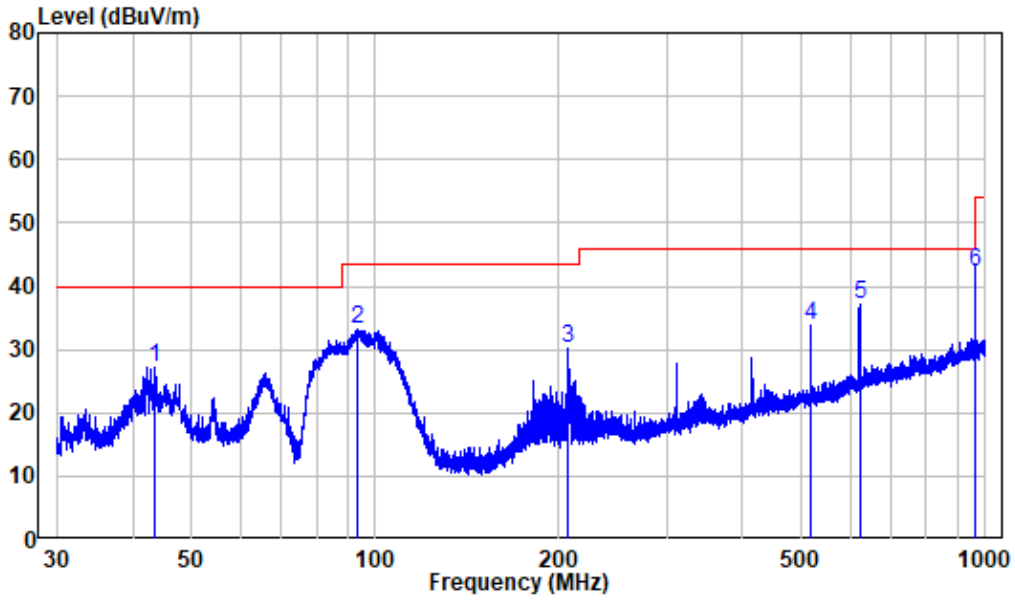
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 20204
Test Mode: BT Transmitting
Note : E004-1A060040VU

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	43.850	-9.91	29.01	19.10	40.00	-20.90	Peak
2	101.111	-11.67	30.45	18.78	43.50	-24.72	Peak
3	207.304	-11.85	35.67	23.82	43.50	-19.68	Peak
4	414.904	-6.23	37.19	30.96	46.00	-15.04	Peak
5	725.850	-1.22	38.47	37.25	46.00	-8.75	Peak
6	960.000	2.36	40.36	42.72	46.00	-3.28	QP

Vertical

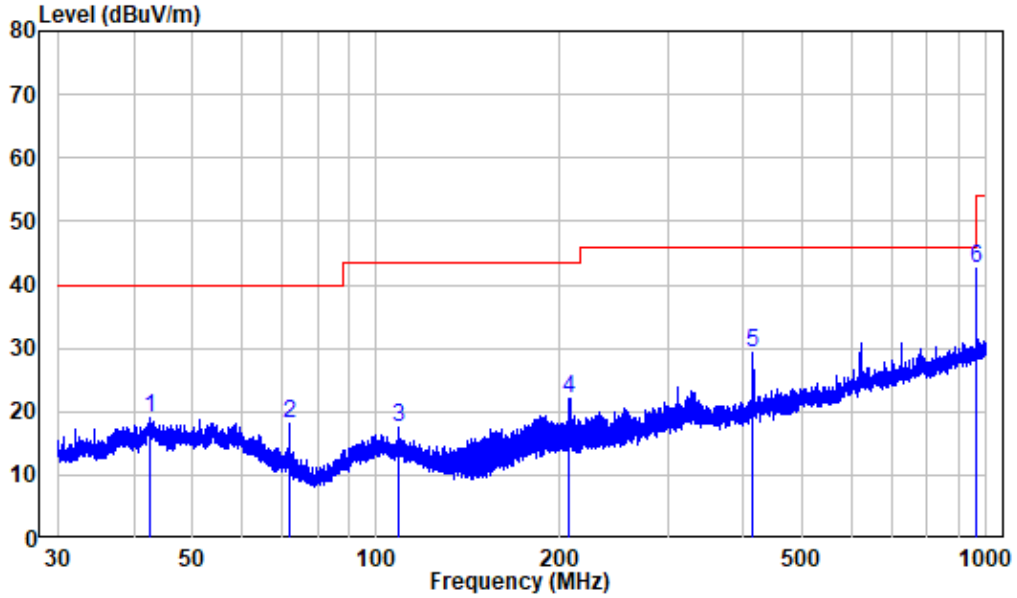


Site : chamber
Condition: 3m VERTICAL
Job No. : 20204
Test Mode: BT Transmitting
Note : E004-1A060040VU

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	43.506	-9.92	37.06	27.14	40.00	-12.86	Peak
2	93.358	-12.89	46.25	33.36	43.50	-10.14	Peak
3	207.395	-11.85	41.90	30.05	43.50	-13.45	Peak
4	518.383	-4.29	38.14	33.85	46.00	-12.15	Peak
5	622.072	-2.46	39.58	37.12	46.00	-8.88	Peak
6	960.000	2.36	39.91	42.27	46.00	-3.73	QP

For Adapter 2

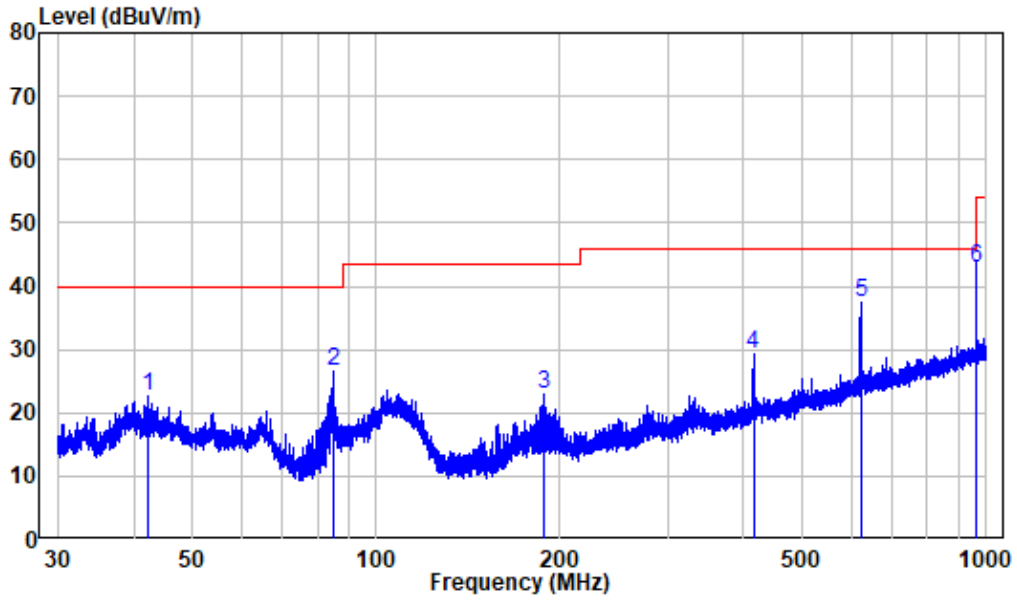
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 20204
Test Mode: BT Transmitting
Note : A318-060040W-US1

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	42.507	-9.98	28.95	18.97	40.00	-21.03	Peak
2	71.927	-15.59	33.66	18.07	40.00	-21.93	Peak
3	108.552	-11.99	29.47	17.48	43.50	-26.02	Peak
4	207.395	-11.85	33.98	22.13	43.50	-21.37	Peak
5	414.904	-6.23	35.37	29.14	46.00	-16.86	Peak
6	960.000	2.36	40.22	42.58	46.00	-3.42	QP

Vertical

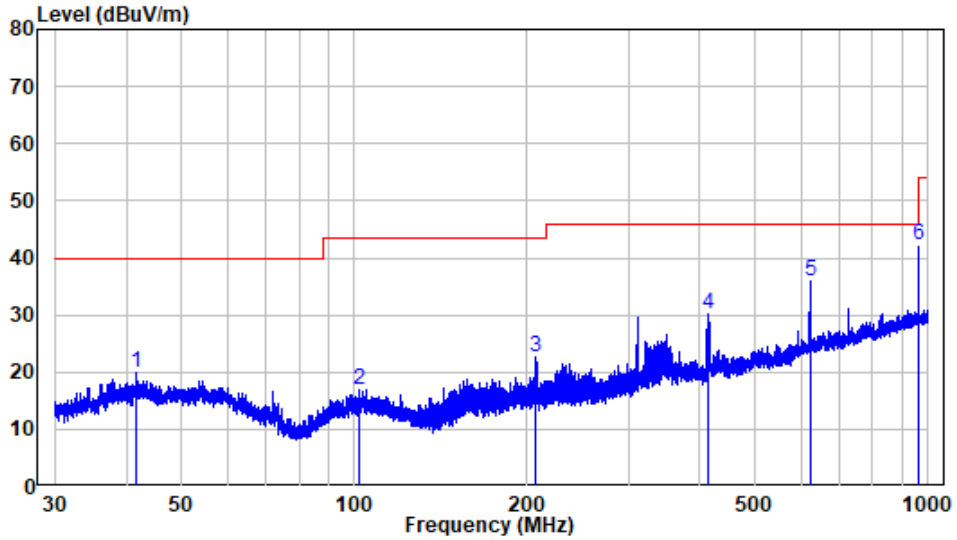


Site : chamber
Condition: 3m VERTICAL
Job No. : 20204
Test Mode: BT Transmitting
Note : A318-060040W-US1

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	42.117	-10.01	32.59	22.58	40.00	-17.42	Peak
2	84.962	-15.65	42.08	26.43	40.00	-13.57	Peak
3	188.495	-11.76	34.60	22.84	43.50	-20.66	Peak
4	415.086	-6.23	35.45	29.22	46.00	-16.78	Peak
5	622.072	-2.46	39.84	37.38	46.00	-8.62	Peak
6	960.000	2.36	40.50	42.86	46.00	-3.14	QP

For Adapter 3

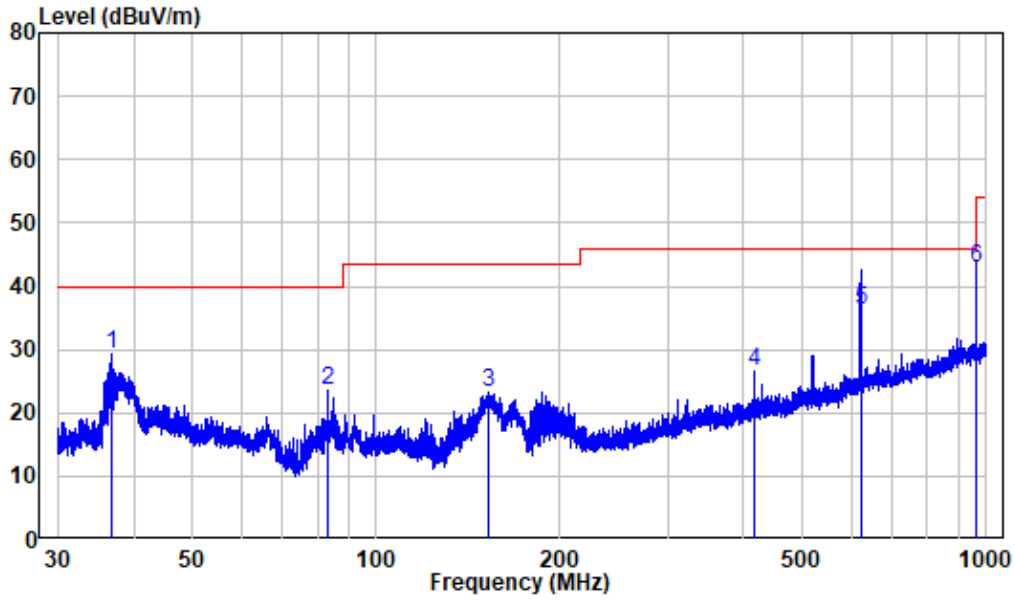
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 20204
Test Mode: BT Transmitting
Note : DSA-3PFM-05 BUS 060040

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	41.549	-10.10	29.98	19.88	40.00	-20.12	Peak
2	102.136	-11.58	28.47	16.89	43.50	-26.61	Peak
3	207.395	-11.85	34.34	22.49	43.50	-21.01	Peak
4	414.722	-6.24	36.34	30.10	46.00	-15.90	Peak
5	622.344	-2.44	38.35	35.91	46.00	-10.09	Peak
6	960.000	2.36	39.95	42.31	46.00	-3.69	QP

Vertical

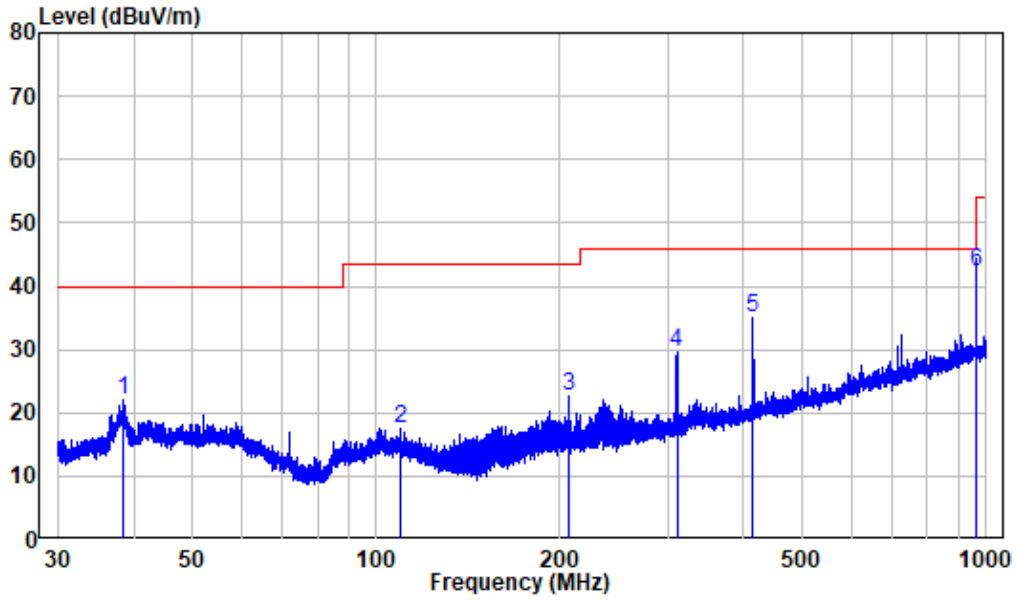


Site : chamber
Condition: 3m VERTICAL
Job No. : 20204
Test Mode: BT Transmitting
Note : DSA-3PFM-05 BUS 060040

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.831	-11.05	40.30	29.25	40.00	-10.75	Peak
2	83.376	-16.24	39.83	23.59	40.00	-16.41	Peak
3	152.597	-15.11	38.45	23.34	43.50	-20.16	Peak
4	415.997	-6.21	32.80	26.59	46.00	-19.41	Peak
5	622.344	-2.44	38.69	36.25	46.00	-9.75	QP
6	960.000	2.36	40.46	42.82	46.00	-3.18	QP

For Adapter 4

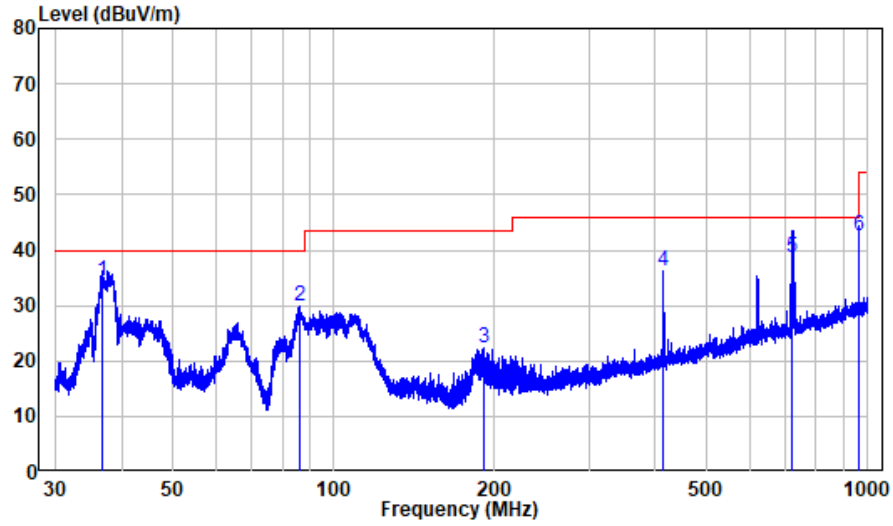
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 20204
Test Mode: BT Transmitting
Note : VT05UUS06040

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	38.363	-10.74	32.82	22.08	40.00	-17.92	Peak
2	109.844	-11.97	29.56	17.59	43.50	-25.91	Peak
3	207.395	-11.85	34.34	22.49	43.50	-21.01	Peak
4	310.950	-8.86	38.40	29.54	46.00	-16.46	Peak
5	414.722	-6.24	41.17	34.93	46.00	-11.07	Peak
6	960.000	2.36	39.81	42.17	46.00	-3.83	QP

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 20204
Test Mode: BT Transmitting
Note : VT05UUS06040

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.702	-11.06	45.38	34.32	40.00	-5.68	QP
2	86.276	-15.12	45.03	29.91	40.00	-10.09	Peak
3	190.489	-11.50	33.93	22.43	43.50	-21.07	Peak
4	414.722	-6.24	42.35	36.11	46.00	-9.89	Peak
5	723.627	-1.30	39.80	38.50	46.00	-7.50	QP
6	960.000	2.36	40.31	42.67	46.00	-3.33	QP

Above 1GHz: *(worst case is 8DPSK Mode)*

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
Low Channel 2402MHz									
2362.05	69.26	PK	168	1.3	H	-10.76	58.50	74	-15.50
2312.14	68.97	PK	96	2	V	-10.39	58.58	74	-15.42
2390	68.78	PK	268	1.9	H	-10.70	58.08	74	-15.92
2390	69.01	PK	226	2.4	V	-10.70	58.31	74	-15.69
4804	60.10	PK	154	1.9	H	-6.11	53.99	74	-20.01
4804	59.56	PK	196	1.9	V	-6.11	53.45	74	-20.55
Middle Channel 2441MHz									
4882	60.03	PK	302	1.8	H	-5.90	54.13	74	-19.87
4882	59.48	PK	145	1.8	V	-5.90	53.58	74	-20.42
High Channel 2480MHz									
2483.5	66.72	PK	228	1.4	H	-10.55	56.17	74	-17.83
2483.5	66.54	PK	146	2.4	V	-10.55	55.99	74	-18.01
2489.05	67.11	PK	104	1.4	H	-10.51	56.60	74	-17.40
2489.93	66.88	PK	186	1.6	V	-10.50	56.38	74	-17.62
4960	59.58	PK	191	1.8	H	-5.47	54.11	74	-19.89
4960	58.97	PK	297	1.8	V	-5.47	53.50	74	-20.50

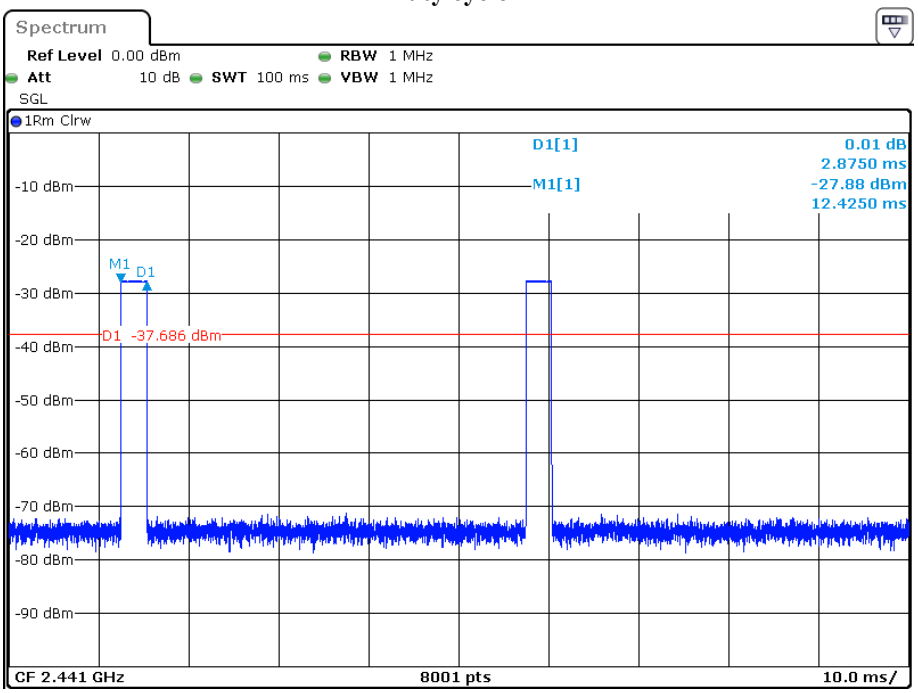
Field Strength of Average							
Frequency (MHz)	Peak Measurement @3m (dBμV/m)	Polar (H/V)	Duty Cycle Correction Factor (dB)	Corrected Ampitude (dBμV/m)	FCC Part 15.247		
					Limit (dBμV/m)	Margin (dB)	Comment
Low Channel(2402MHz)							
2362.05	58.50	H	-24.81	33.69	54	-20.31	Bandedge
2312.14	58.58	V	-24.81	33.77	54	-20.23	Bandedge
2390	58.08	H	-24.81	33.27	54	-20.73	Bandedge
2390	58.31	V	-24.81	33.50	54	-20.50	Bandedge
4804	53.99	H	-24.81	29.18	54	-24.82	Harmonic
4804	53.45	V	-24.81	28.64	54	-25.36	Harmonic
Middle Channel(2441MHz)							
4882	54.13	H	-24.81	29.32	54	-24.68	Harmonic
4882	53.58	V	-24.81	28.77	54	-25.23	Harmonic
High Channel(2480MHz)							
2483.5	56.17	H	-24.81	31.36	54	-22.64	Bandedge
2483.5	55.99	V	-24.81	31.18	54	-22.82	Bandedge
2489.05	56.60	H	-24.81	31.79	54	-22.21	Bandedge
2489.93	56.38	V	-24.81	31.57	54	-22.43	Bandedge
4960	54.11	H	-24.81	29.30	54	-24.70	Harmonic
4960	53.50	V	-24.81	28.69	54	-25.31	Harmonic

Note:

Absolute Level = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
Average level= Peak level+ Duty Cycle Corrected Factor
For fundamental, the peak value compliance with the limit of Average.

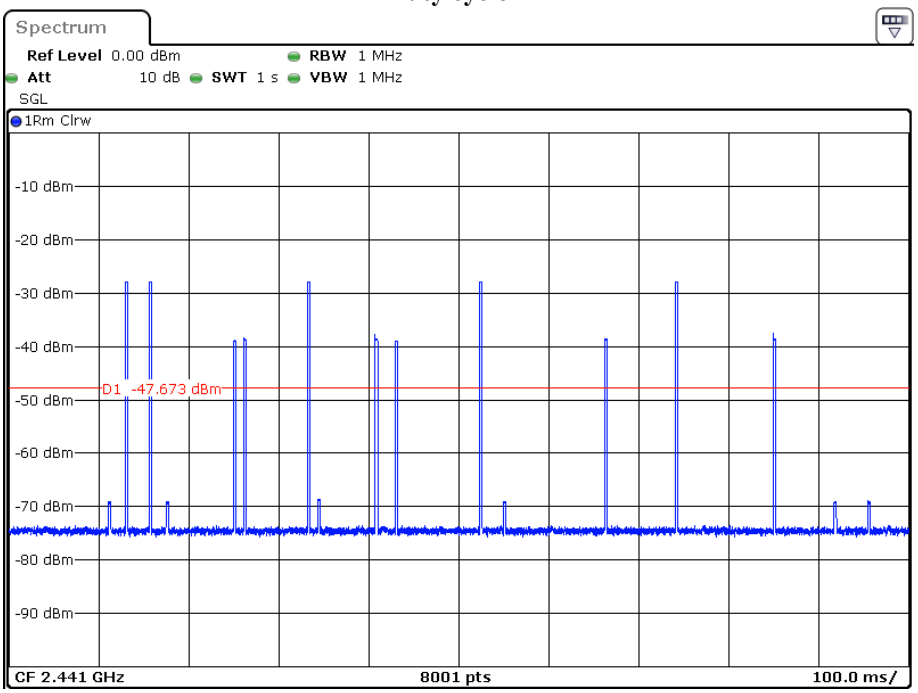
Duty cycle = Ton/100ms = 2.8750*2/100=0.0575
Duty Cycle Corrected Factor = 20lg (Duty cycle) = 20lg0.0575 = -24.81

Duty cycle 1



Date: 11.MAY.2023 18:01:33

Duty cycle 2

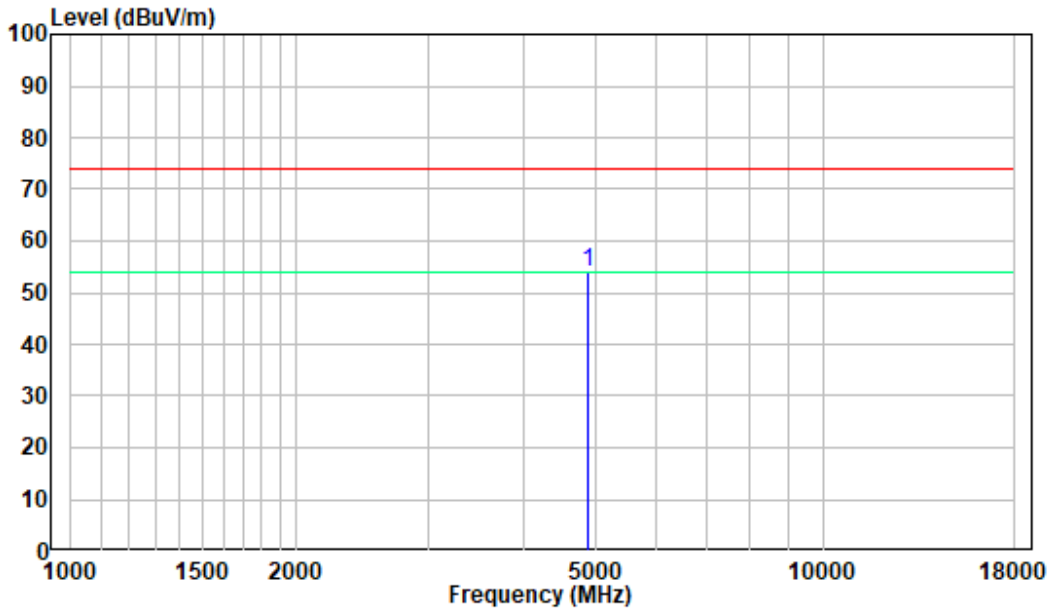


Date: 11.MAY.2023 19:01:17

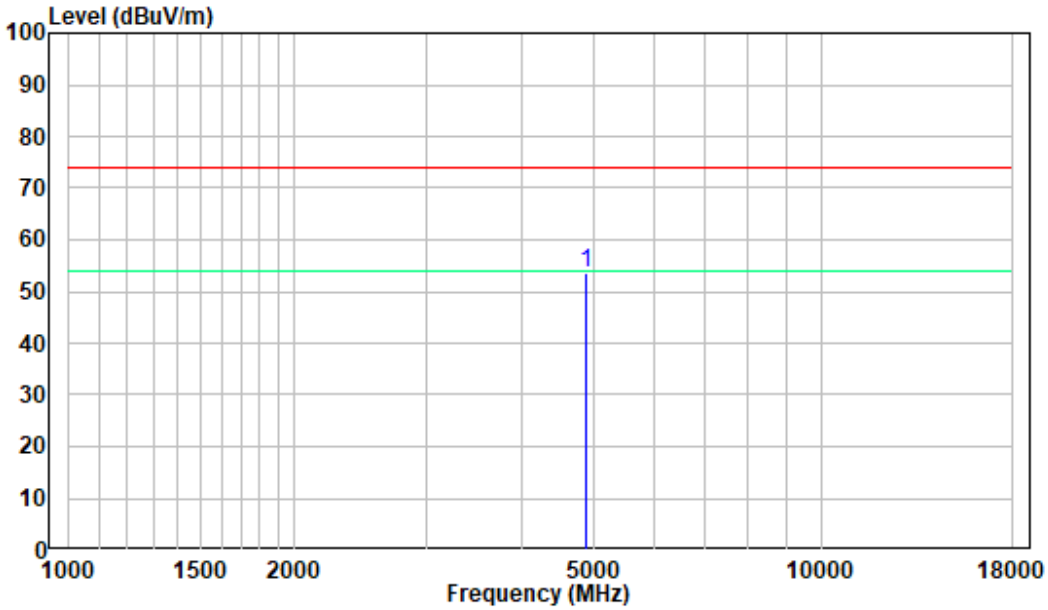
1-18GHz

Pre-scan, Middle Channel (worst case)

Horizontal:



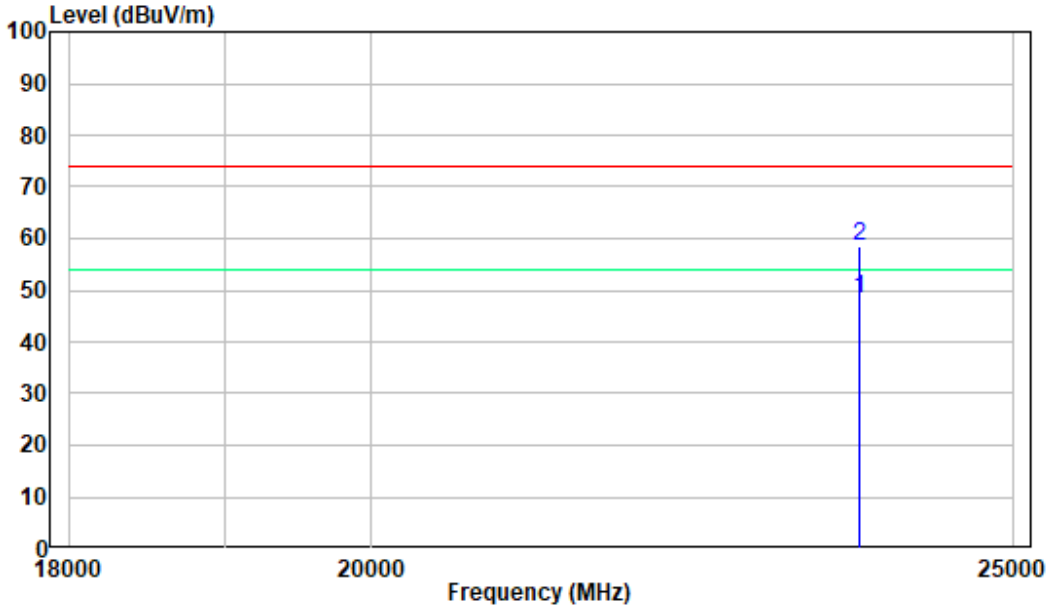
Vertical:



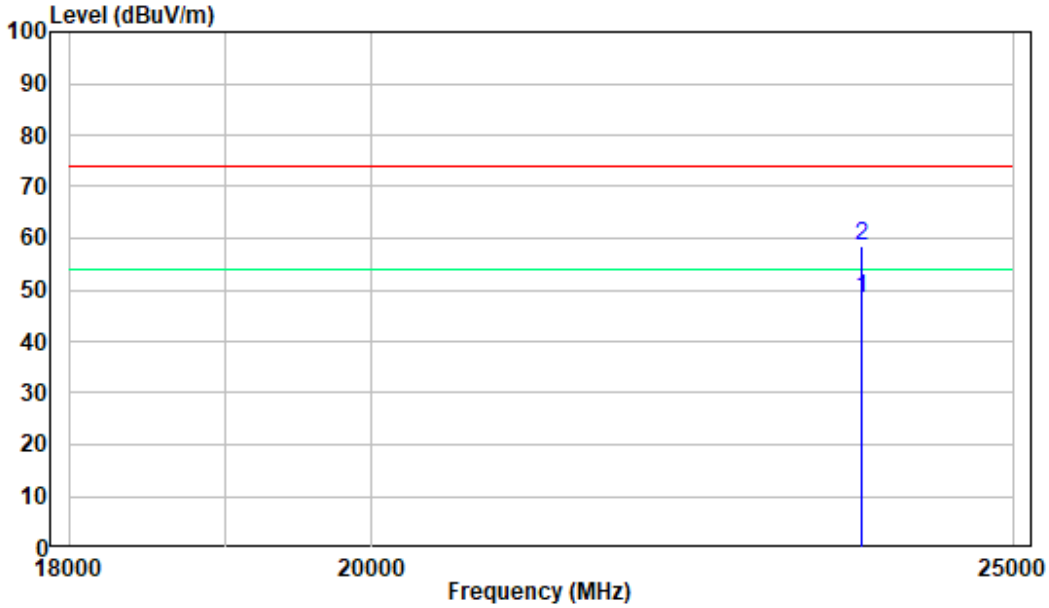
18-25GHz

Pre-scan , Middle Channel (worst case)

Horizontal:



Vertical:



FCC §15.247(a) (1)-CHANNEL SEPARATION TEST

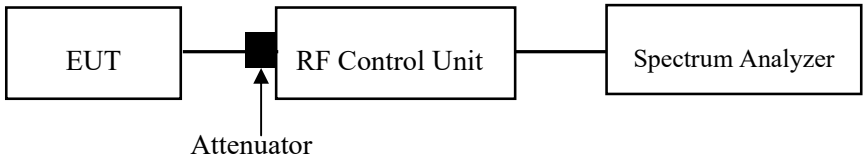
Applicable Standard

Frequency hopping systems shall have hoping 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.2

1. Set the EUT in transmitting mode, maxhold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace.
3. Measure the channel separation.



Test Data

Environmental Conditions

Temperature:	22.5 ℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH & 99% OCCUPIED BANDWIDTH

Applicable Standard

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.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.7 & Clause 6.9.2

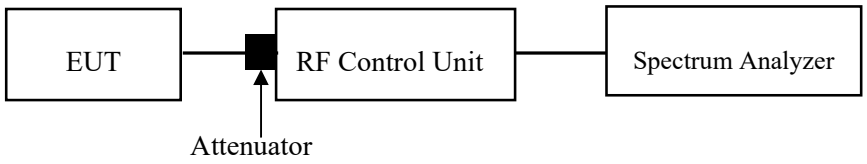
The following conditions shall be observed for measuring the occupied bandwidth and 20 dB bandwidth:
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / 20 dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / 20 dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).



Test Data

Environmental Conditions

Temperature:	22.5 ℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

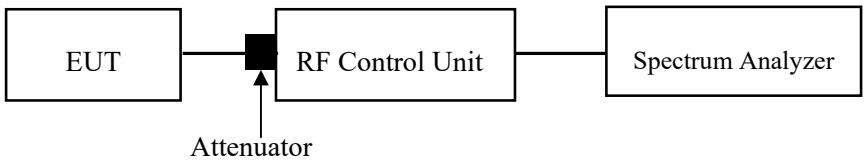
Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.3

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the max-hold function record the quantity of the channel.



Test Data

Environmental Conditions

Temperature:	22.5 ℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

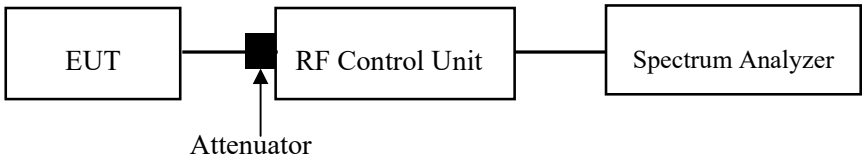
Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.4

1. The EUT was worked in channel hopping.
2. Set the RBW to: 1MHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 0Hz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Recorded the time of single pulses



Test Data

Environmental Conditions

Temperature:	22.5 ℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

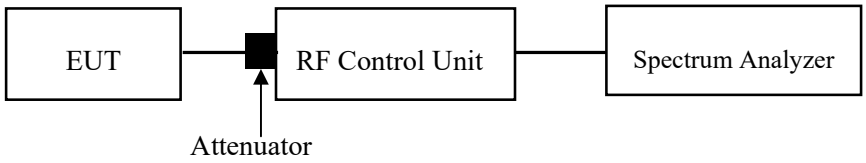
Applicable Standard

According to §15.247(b) (1), 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. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.5

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	22.5 ℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(d) & RSS-247 § 5.5 - BAND EDGES TESTING

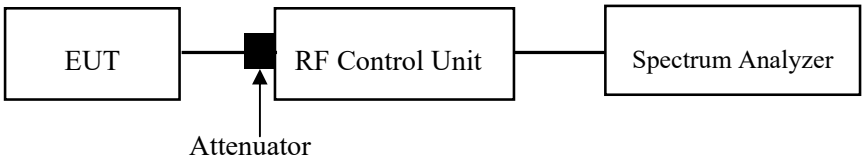
Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.6 & Clause 6.10

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Data

Environmental Conditions

Temperature:	22.5 ℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

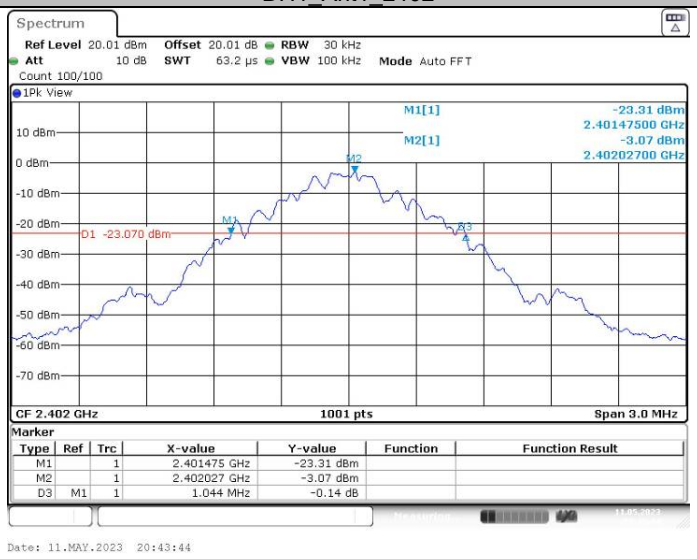
APPENDIX

Appendix A: 20dB Emission Bandwidth
Test Result

Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.04	2401.48	2402.52	---	---
		2441	1.05	2440.48	2441.52	---	---
		2480	1.04	2479.48	2480.52	---	---
2DH1	Ant1	2402	1.37	2401.31	2402.68	---	---
		2441	1.37	2440.30	2441.68	---	---
		2480	1.37	2479.30	2480.68	---	---
3DH1	Ant1	2402	1.33	2401.31	2402.64	---	---
		2441	1.31	2440.33	2441.63	---	---
		2480	1.31	2479.33	2480.64	---	---

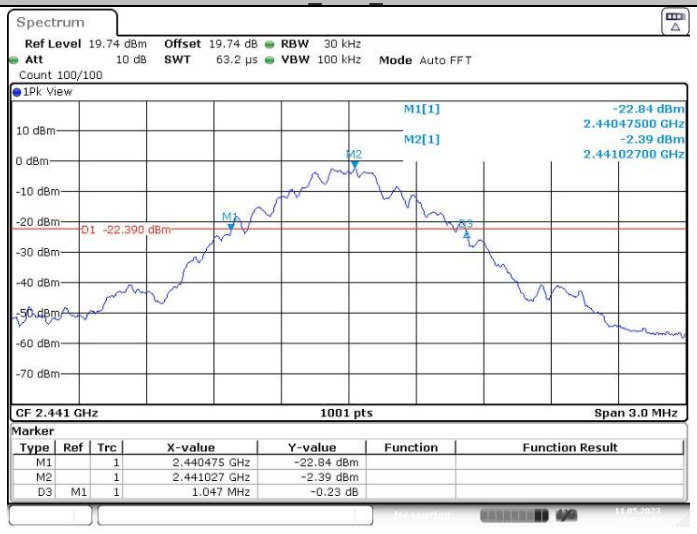
Test Graphs

DH1_Ant1_2402



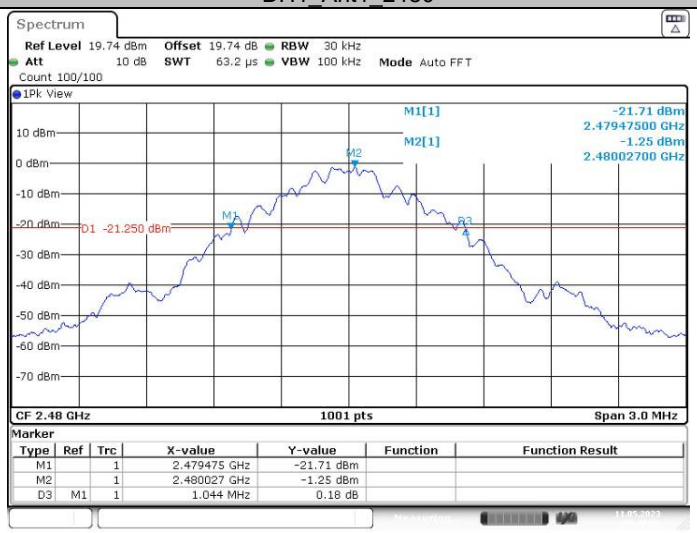
Date: 11.MAY.2023 20:43:44

DH1_Ant1_2441

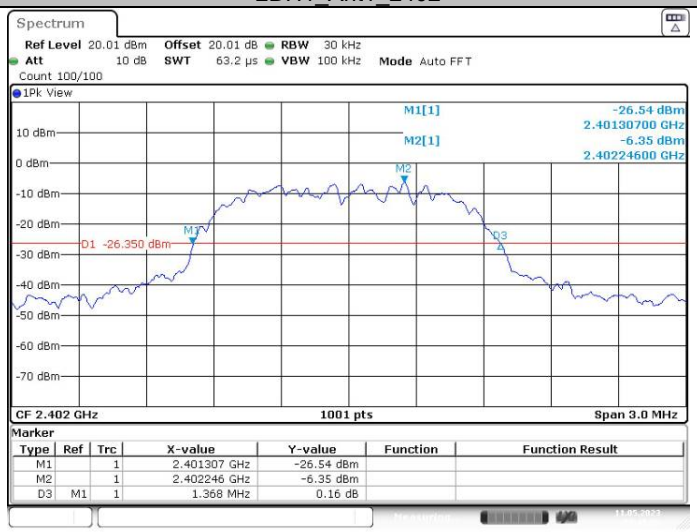


Date: 11.MAY.2023 20:45:24

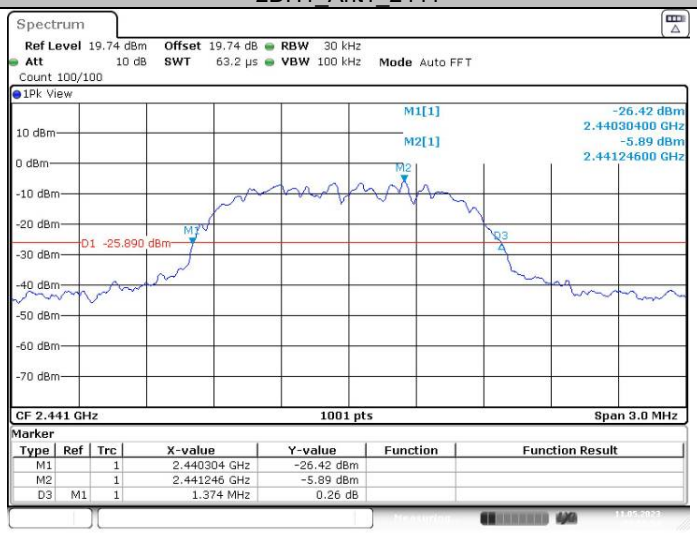
DH1_Ant1_2480



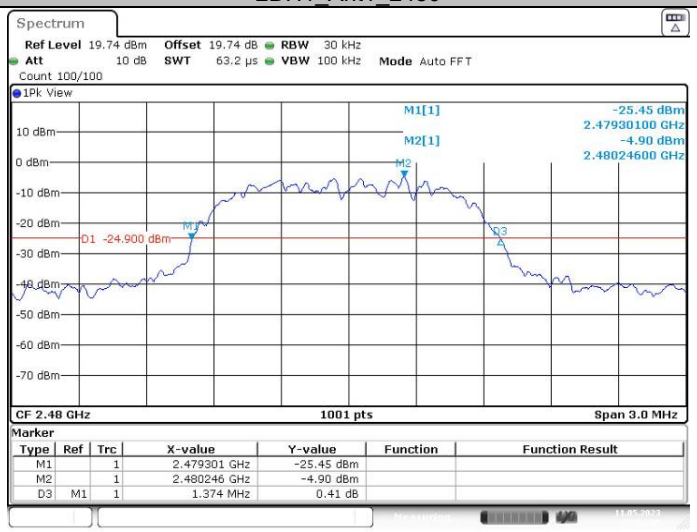
2DH1_Ant1_2402



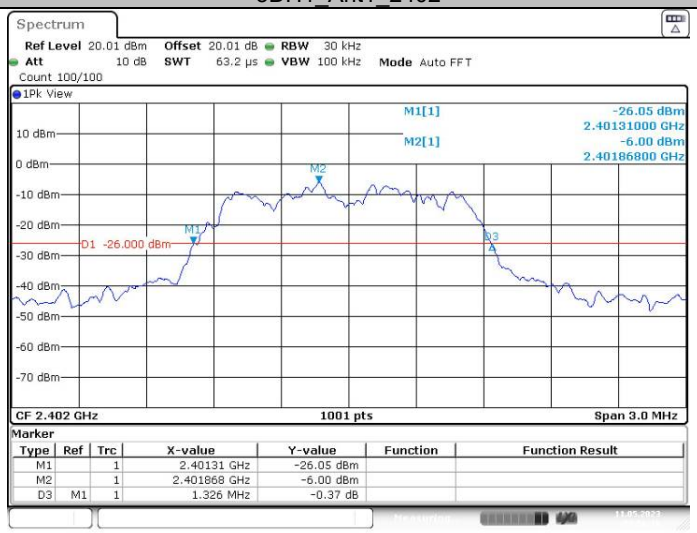
2DH1_Ant1_2441



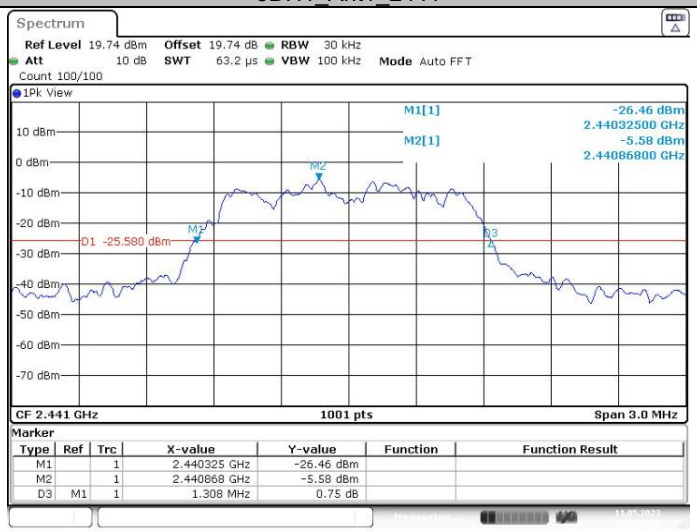
2DH1_Ant1_2480



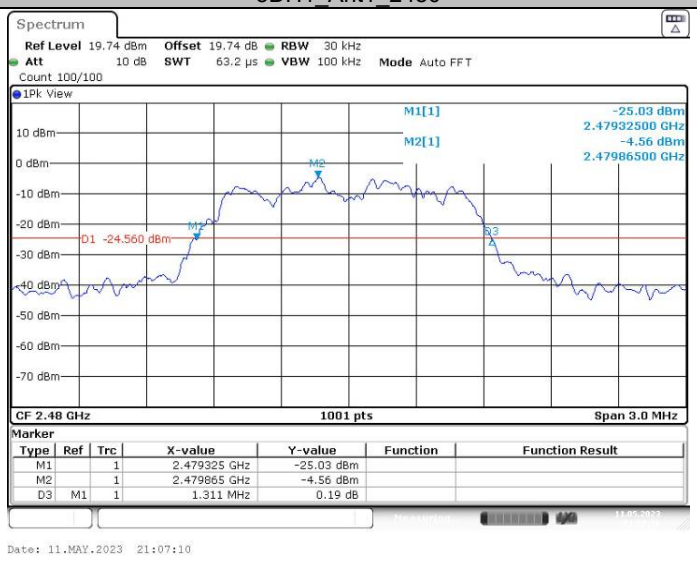
3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480



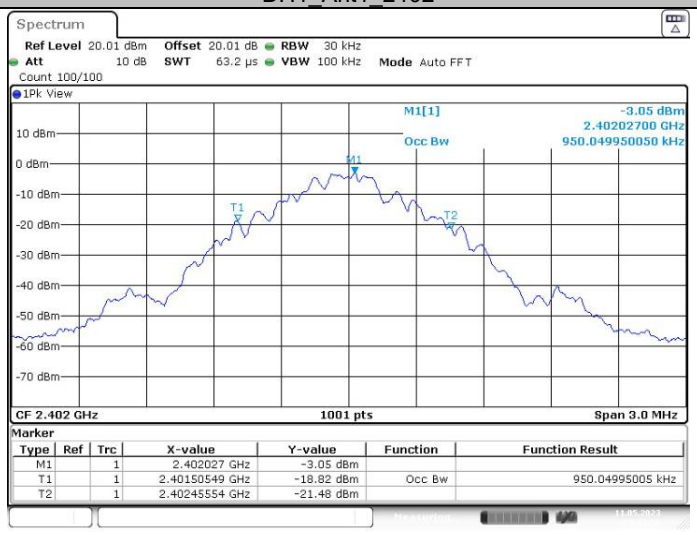
Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.950	2401.505	2402.456	---	---
		2441	0.950	2440.505	2441.456	---	---
		2480	0.944	2479.508	2480.453	---	---
2DH1	Ant1	2402	1.211	2401.383	2402.593	---	---
		2441	1.208	2440.383	2441.590	---	---
		2480	1.208	2479.383	2480.590	---	---
3DH1	Ant1	2402	1.193	2401.386	2402.578	---	---
		2441	1.196	2440.383	2441.578	---	---
		2480	1.196	2479.383	2480.578	---	---

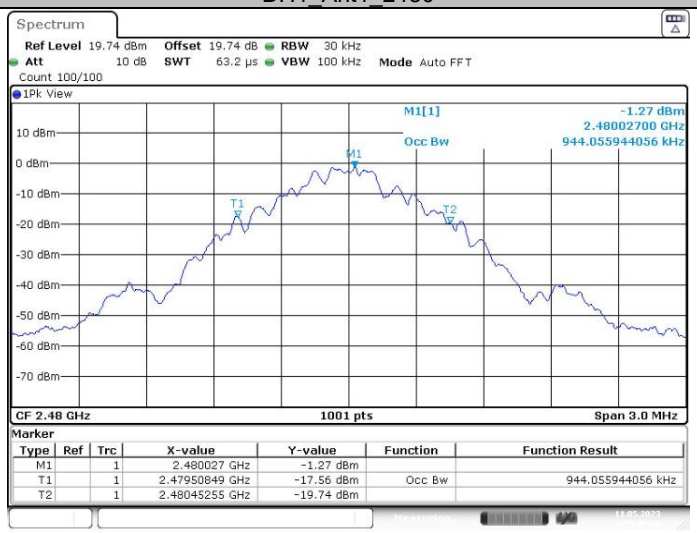
Test Graphs

DH1_Ant1_2402

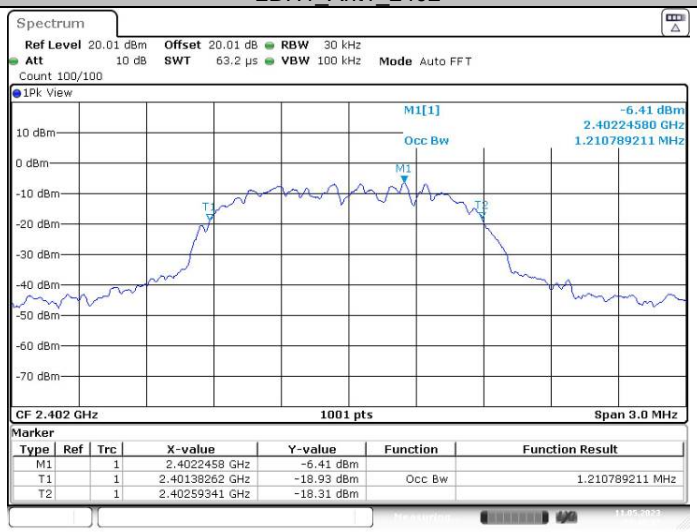


DH1_Ant1_2441

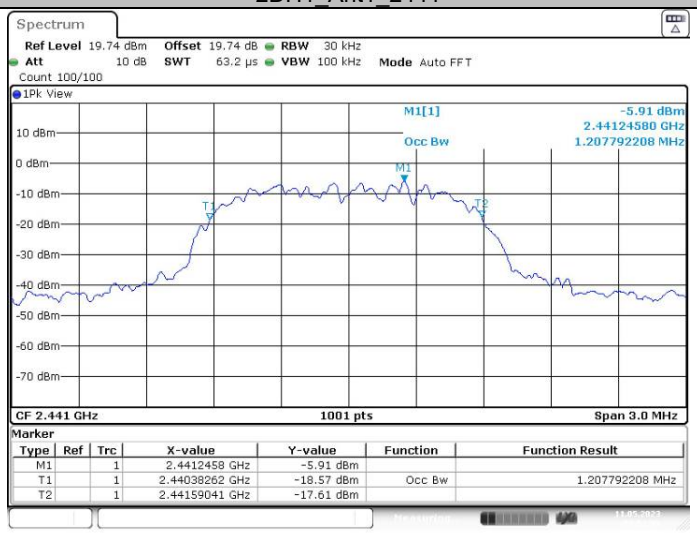
DH1_Ant1_2480



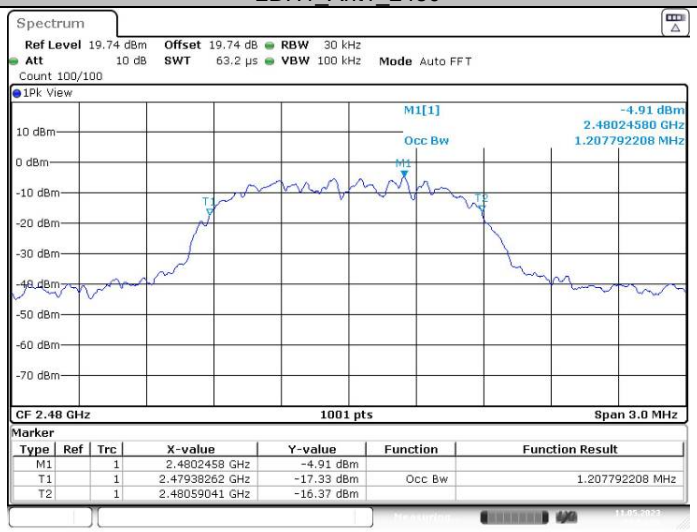
2DH1_Ant1_2402



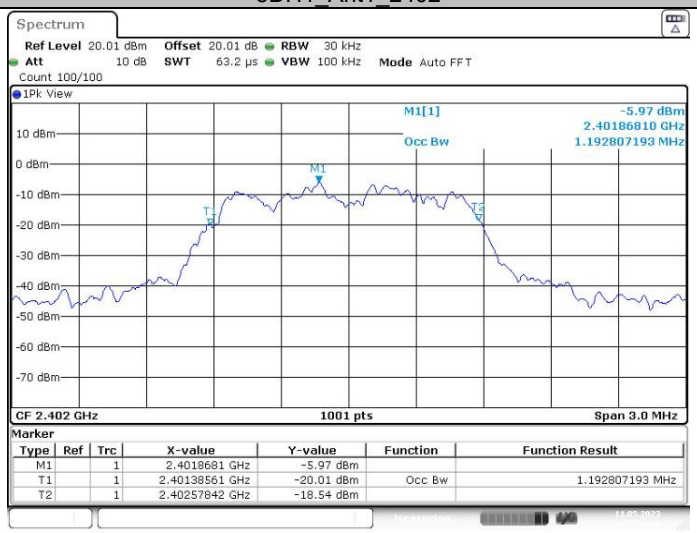
2DH1_Ant1_2441



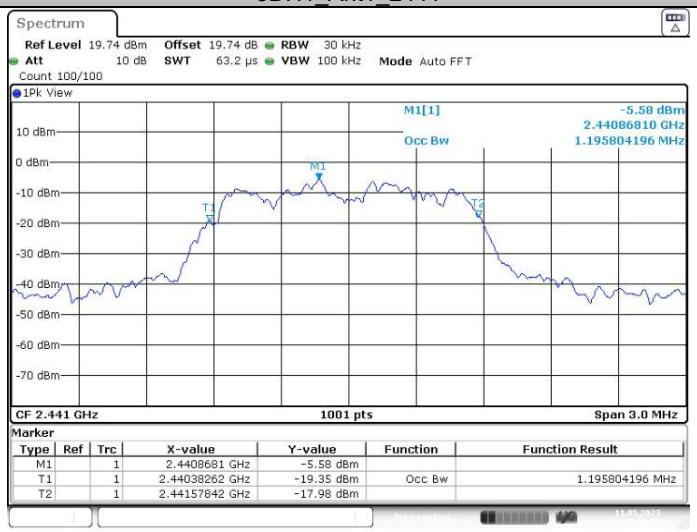
2DH1_Ant1_2480



3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480

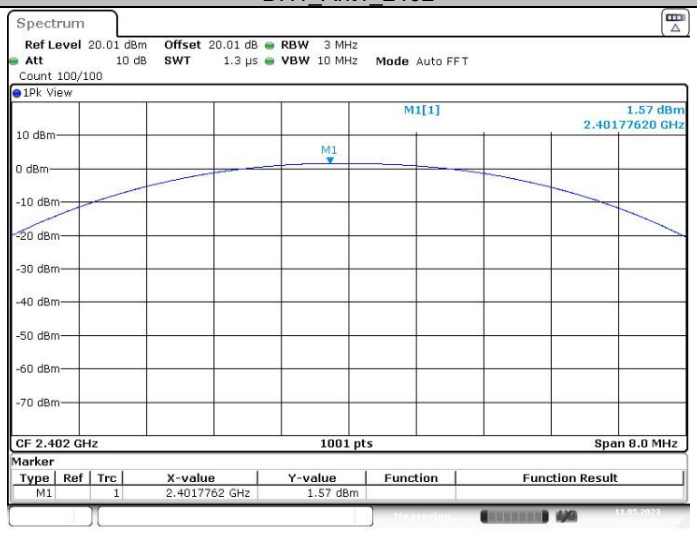
Appendix C: Maximum conducted output power

Test Result Peak

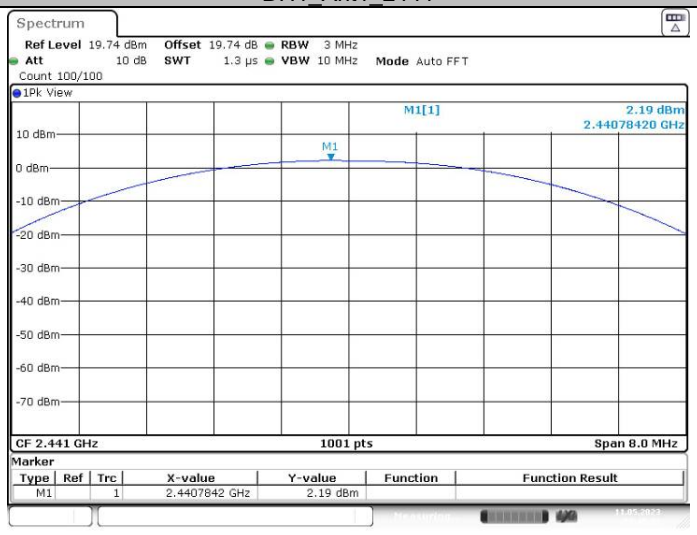
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit [dBm]	Verdict
DH1	Ant1	2402	1.57	≤20.97	PASS
		2441	2.19	≤20.97	PASS
		2480	3.32	≤20.97	PASS
2DH1	Ant1	2402	3.04	≤20.97	PASS
		2441	3.46	≤20.97	PASS
		2480	4.48	≤20.97	PASS
3DH1	Ant1	2402	2.99	≤20.97	PASS
		2441	3.43	≤20.97	PASS
		2480	4.5	≤20.97	PASS

Test Graphs

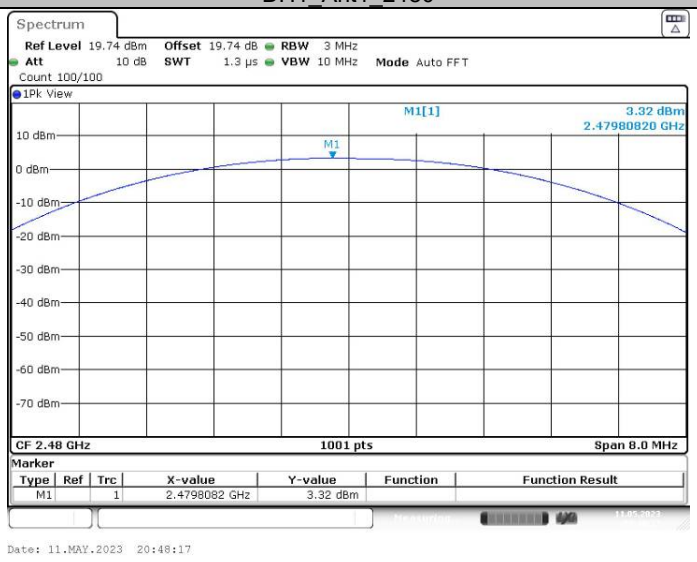
DH1_Ant1_2402



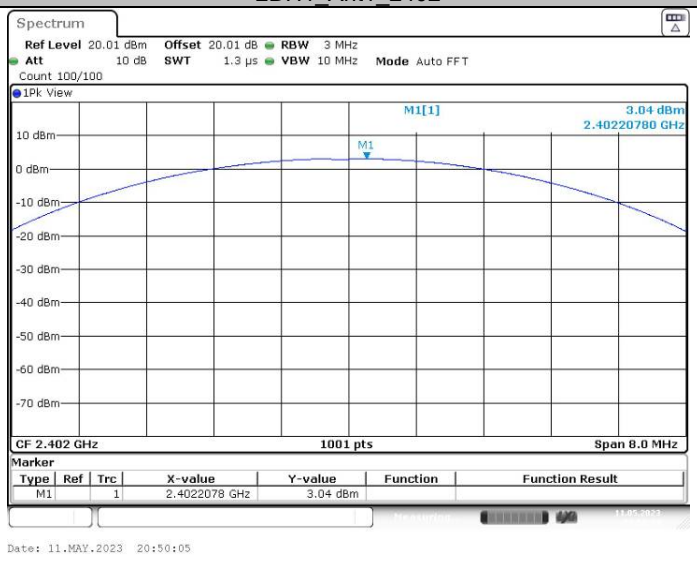
DH1_Ant1_2441



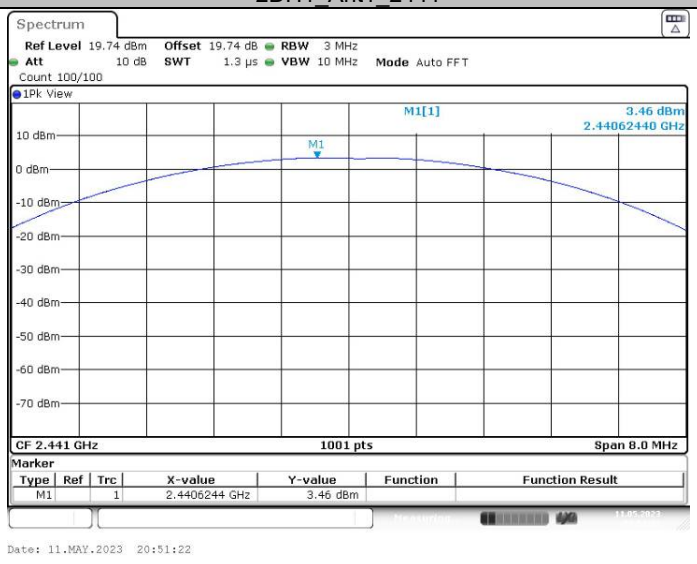
DH1_Ant1_2480



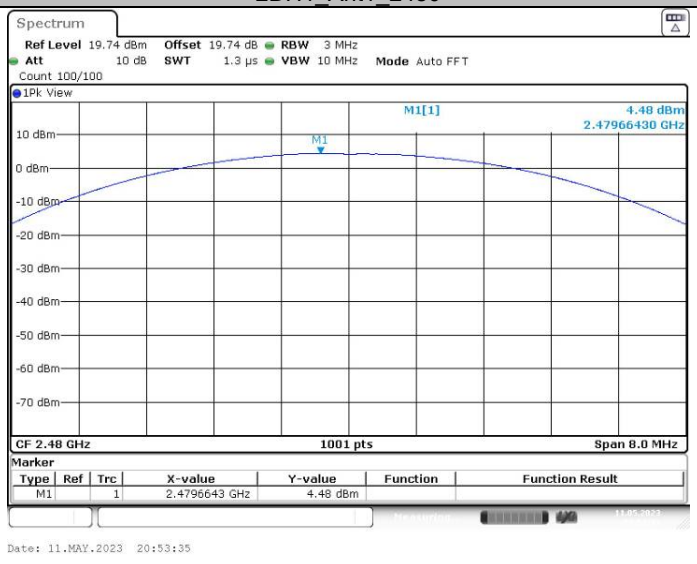
2DH1_Ant1_2402



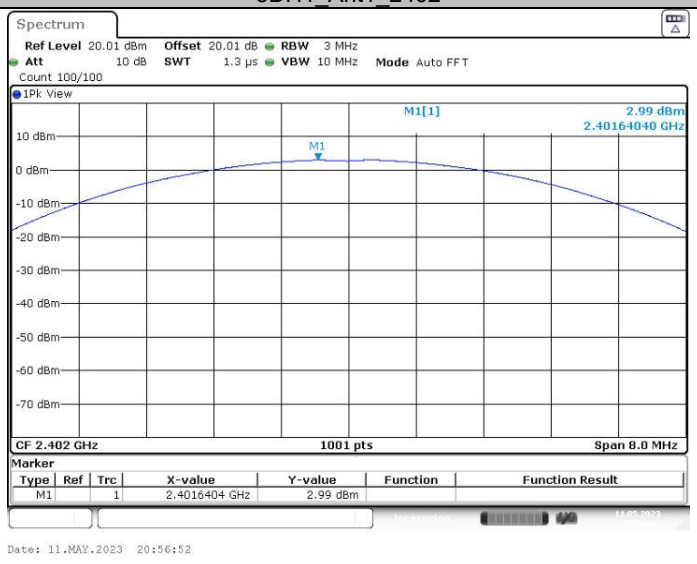
2DH1_Ant1_2441



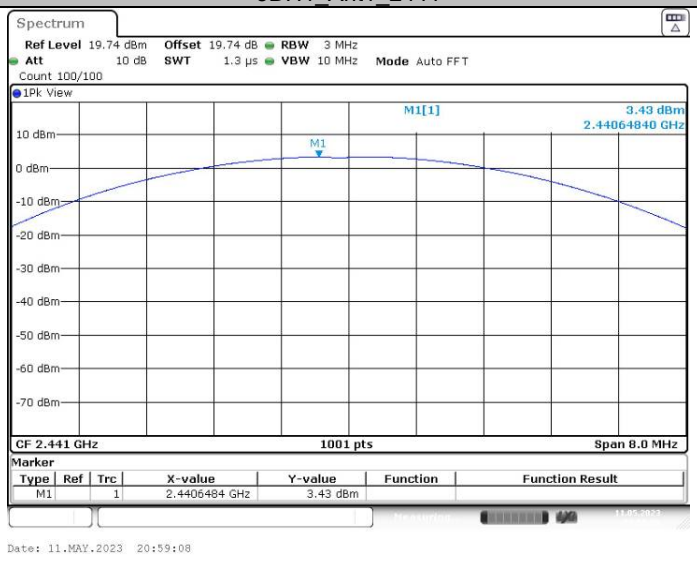
2DH1_Ant1_2480



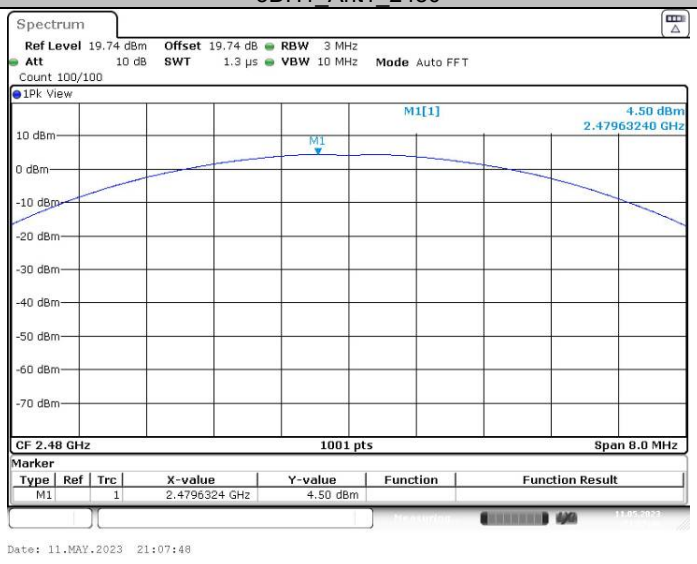
3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480



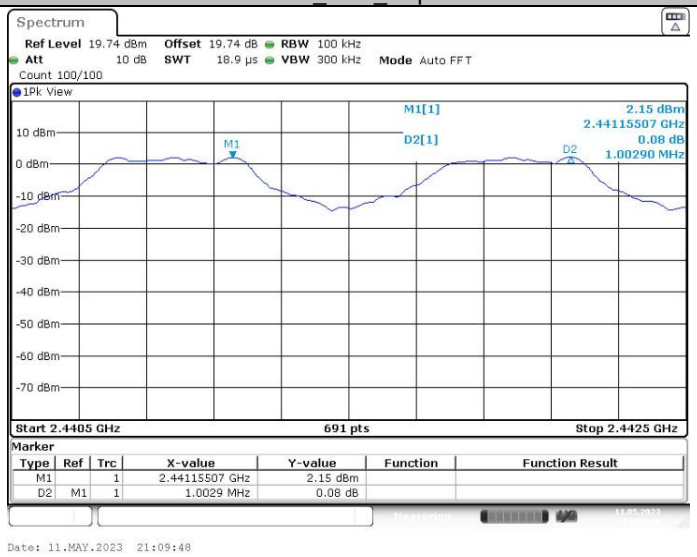
Appendix D: Carrier frequency separation

Test Result

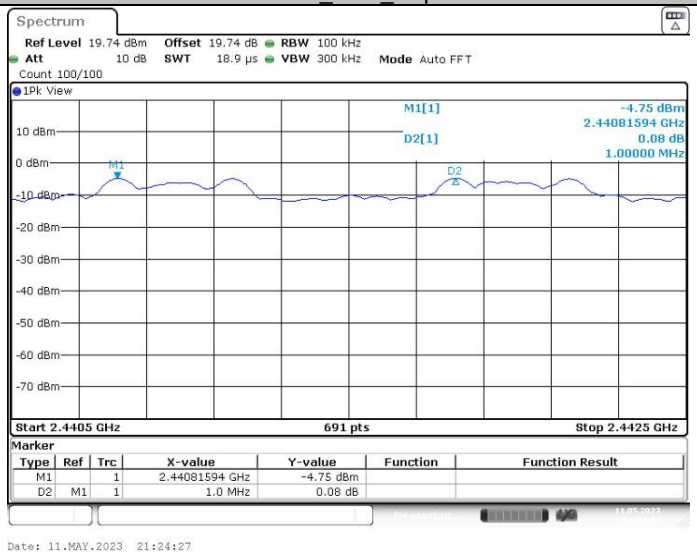
Test Mode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	1.003	≥0.700	PASS
2DH1	Ant1	Hop	1.000	≥0.913	PASS
3DH1	Ant1	Hop	1.003	≥0.887	PASS

Test Graphs

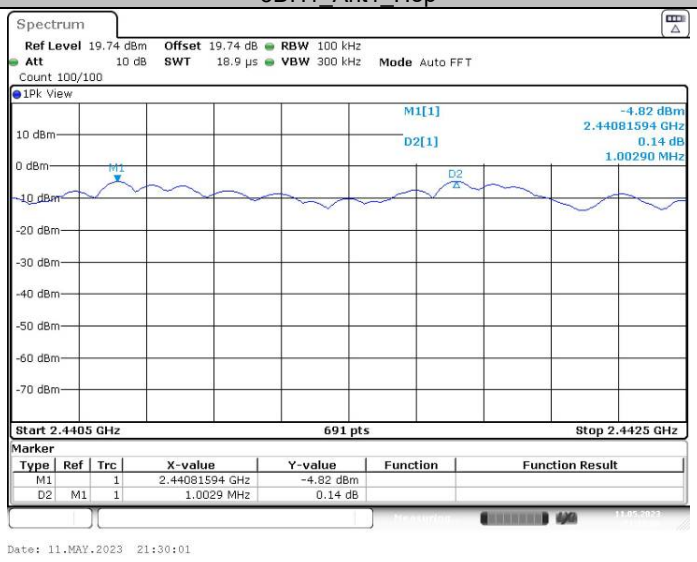
DH1_Ant1_Hop



2DH1_Ant1_Hop



3DH1_Ant1_Hop

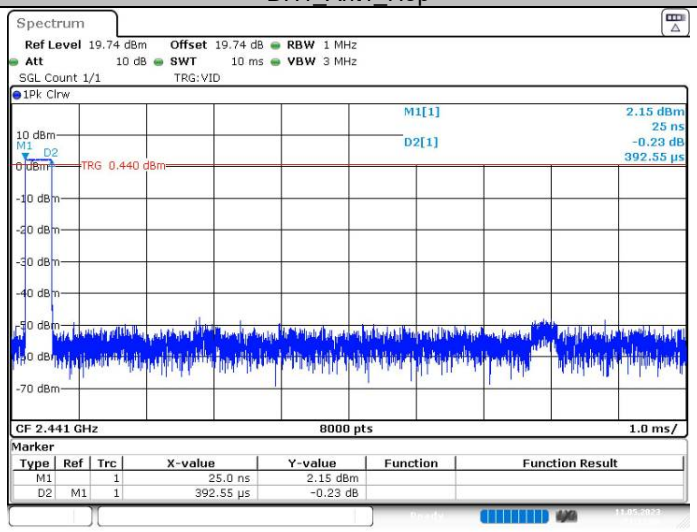
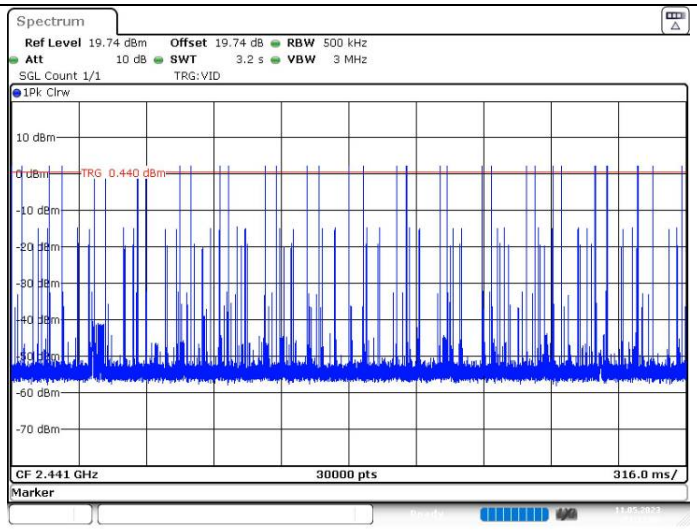


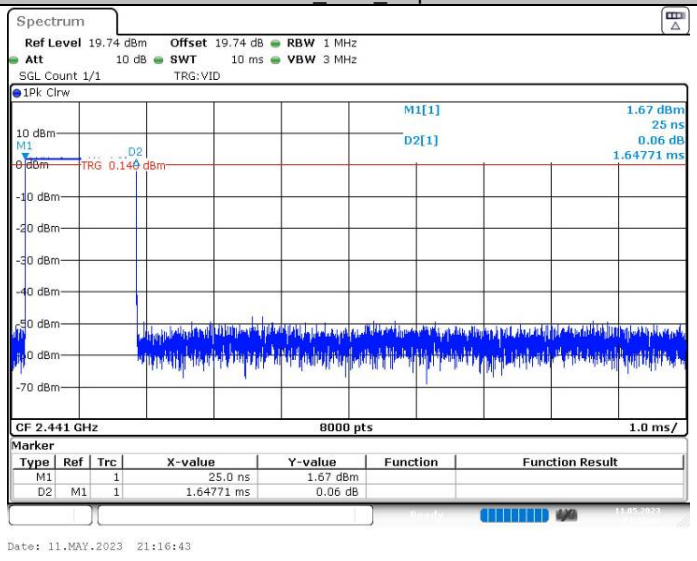
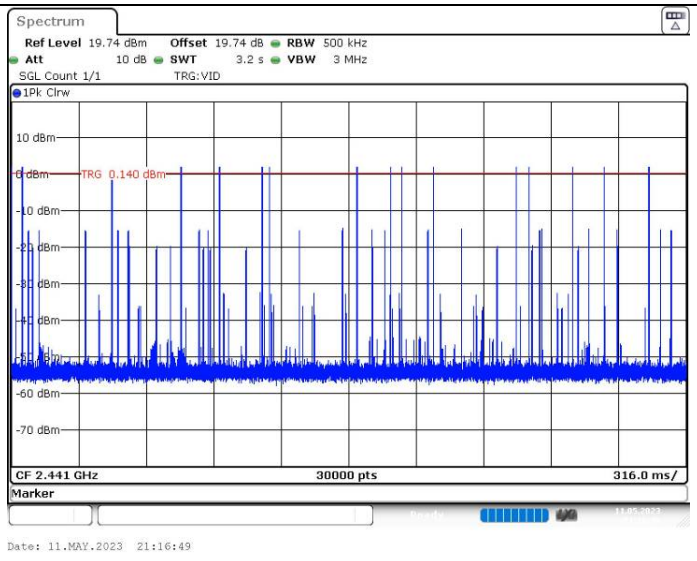
Appendix E: Time of occupancy
Test Result

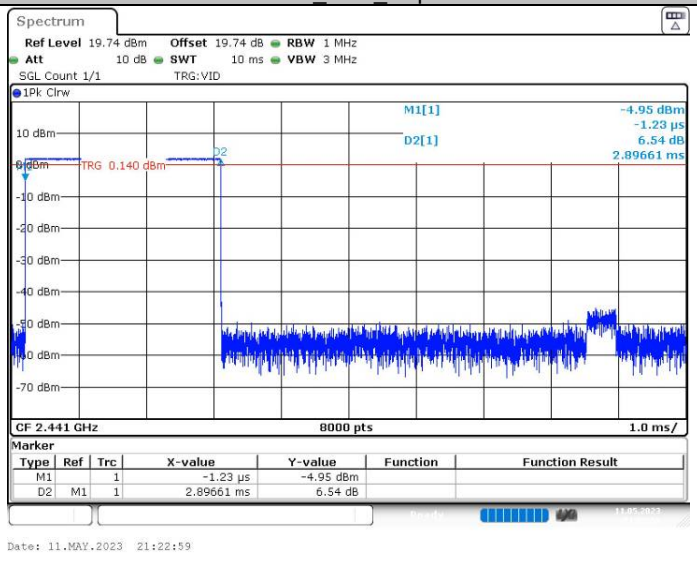
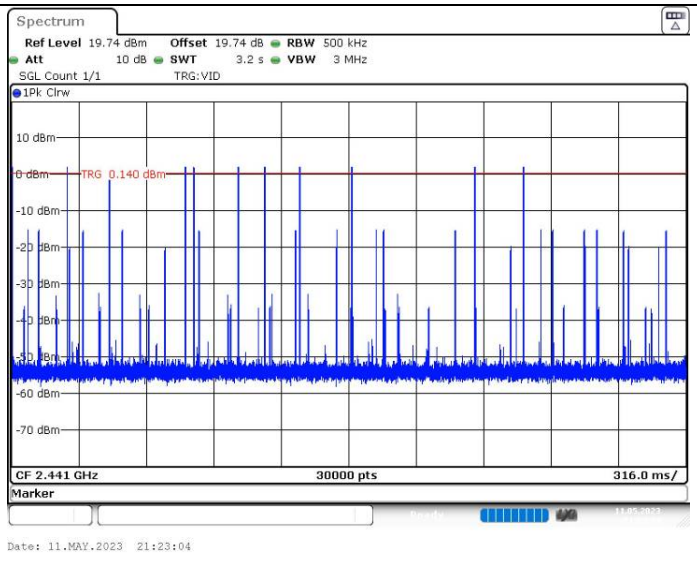
Test Mode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.39	330	0.129	≤0.4	PASS
DH3	Ant1	Hop	1.65	170	0.281	≤0.4	PASS
DH5	Ant1	Hop	2.90	110	0.319	≤0.4	PASS
2DH1	Ant1	Hop	0.40	320	0.128	≤0.4	PASS
2DH3	Ant1	Hop	1.66	170	0.282	≤0.4	PASS
2DH5	Ant1	Hop	2.90	130	0.377	≤0.4	PASS
3DH1	Ant1	Hop	0.40	330	0.132	≤0.4	PASS
3DH3	Ant1	Hop	1.65	160	0.264	≤0.4	PASS
3DH5	Ant1	Hop	2.91	110	0.320	≤0.4	PASS

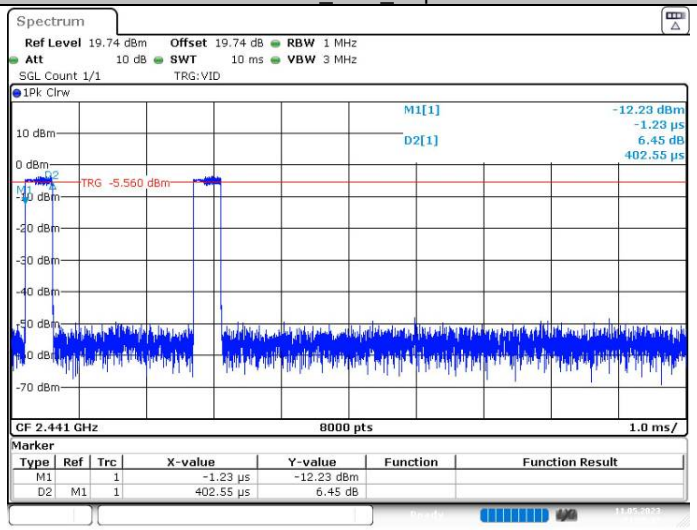
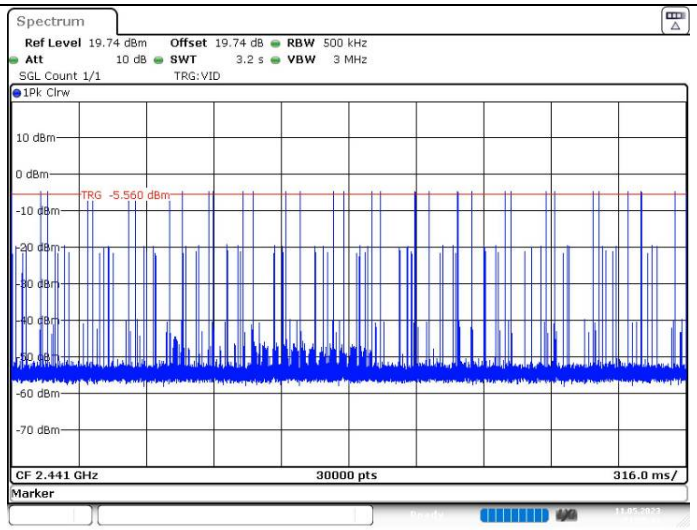
Note 1: A period time=0.4*79=31.6(S), Result=BurstWidth*Totalhops
Note 2: Totalhops=Hopping Number in 3.16s*10
Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s(Second high signals were other channel)

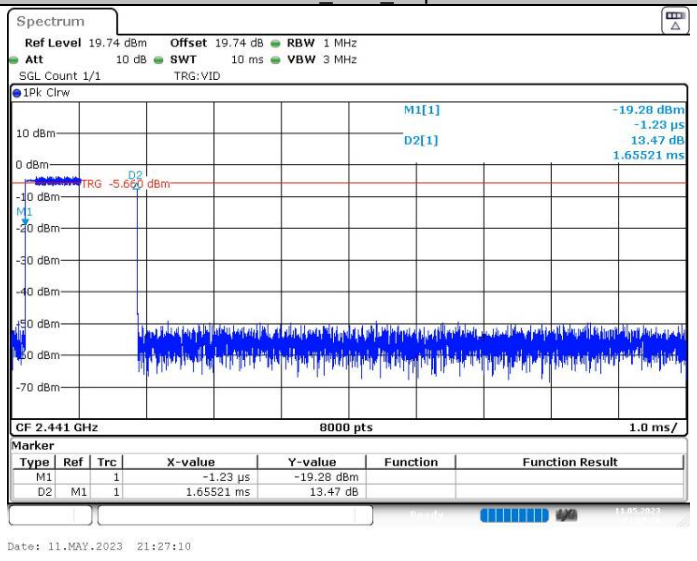
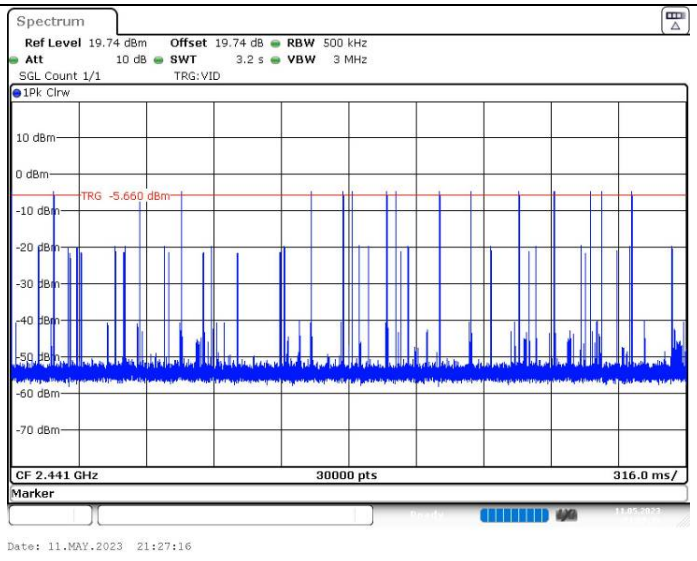
Test Graphs

DH1_Ant1_Hop



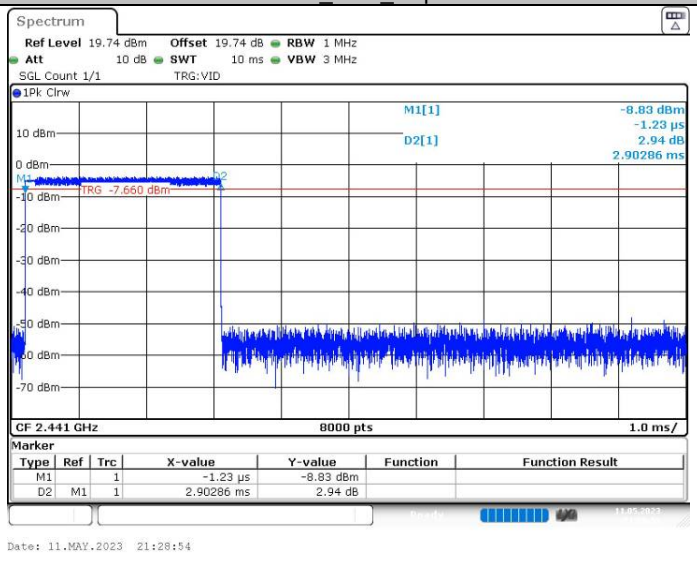
DH3_Ant1_Hop
 Spectrum Ref Level 19.74 dBm Offset 19.74 dB RBW 1 MHz Att 10 dB SWT 10 ms VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw M1[1] 1.67 dBm 25 ns D2[1] 0.06 dB 1.64771 ms TRG 0.140 dBm CF 2.441 GHz 8000 pts 1.0 ms/ Marker Type Ref Trc X-value Y-value Function Function Result M1 1 25.0 ns 1.67 dBm D2 M1 1 1.64771 ms 0.06 dB Date: 11.MAY.2023 21:16:43
 Spectrum Ref Level 19.74 dBm Offset 19.74 dB RBW 500 kHz Att 10 dB SWT 3.2 s VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw TRG 0.140 dBm CF 2.441 GHz 30000 pts 316.0 ms/ Marker Date: 11.MAY.2023 21:16:49

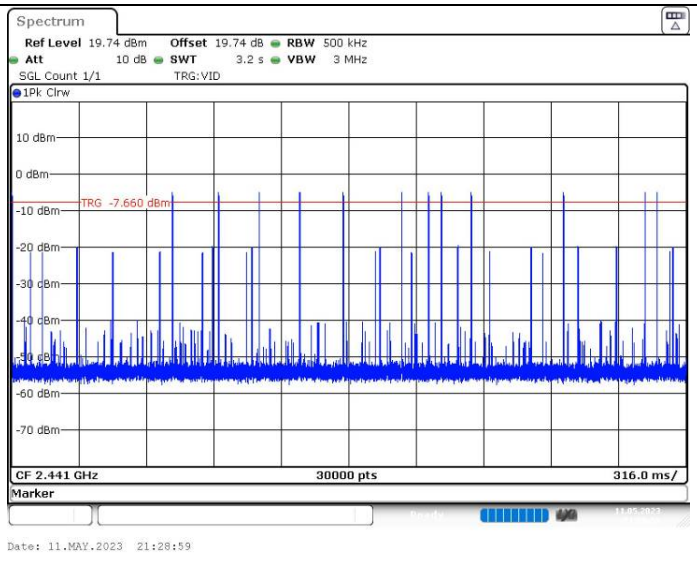
DH5_Ant1_Hop
 Spectrum Ref Level 19.74 dBm Offset 19.74 dB RBW 1 MHz Att 10 dB SWT 10 ms VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw M1[1] -4.95 dBm -1.23 µs D2[1] 6.54 dB 2.89661 ms TRG 0.140 dBm CF 2.441 GHz 8000 pts 1.0 ms/ Marker Type Ref Trc X-value Y-value Function Function Result M1 1 -1.23 µs -4.95 dBm D2 M1 1 2.89661 ms 6.54 dB Date: 11.MAY.2023 21:22:59
 Spectrum Ref Level 19.74 dBm Offset 19.74 dB RBW 500 kHz Att 10 dB SWT 3.2 s VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw TRG 0.140 dBm CF 2.441 GHz 30000 pts 316.0 ms/ Marker Date: 11.MAY.2023 21:23:04

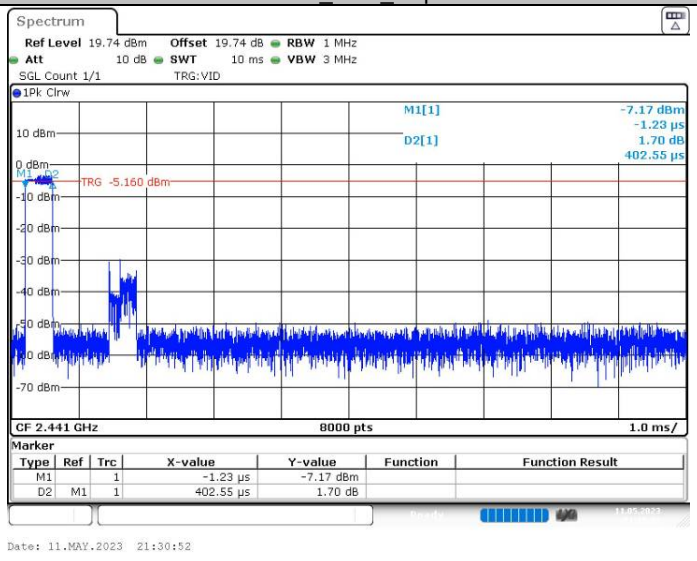
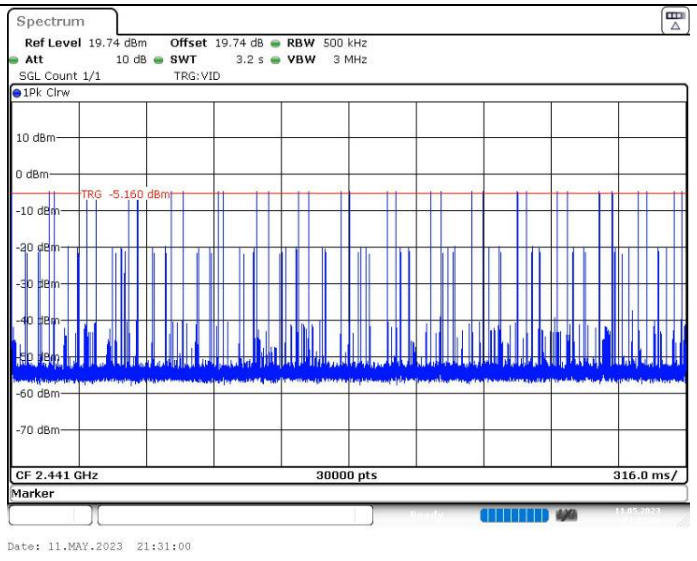
2DH1_Ant1_Hop



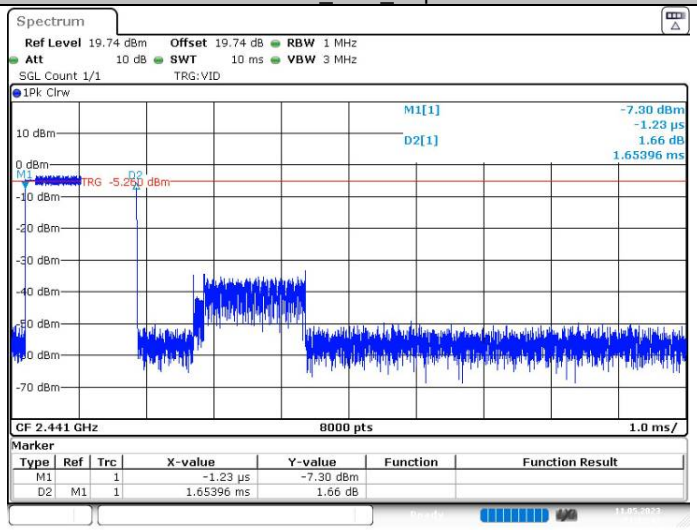
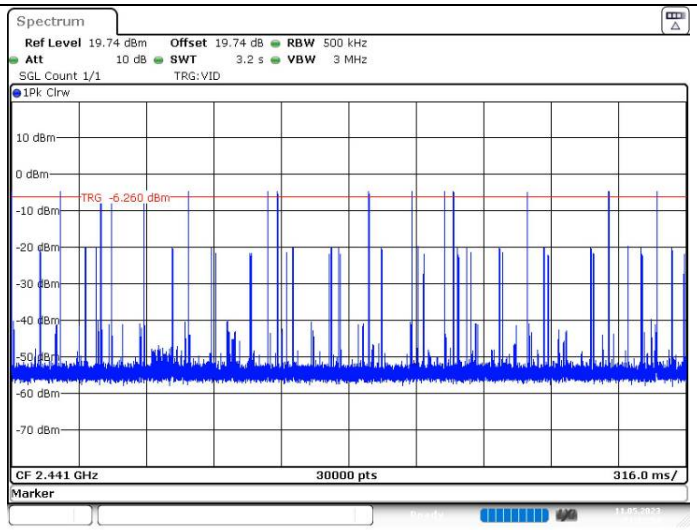
2DH3_Ant1_Hop



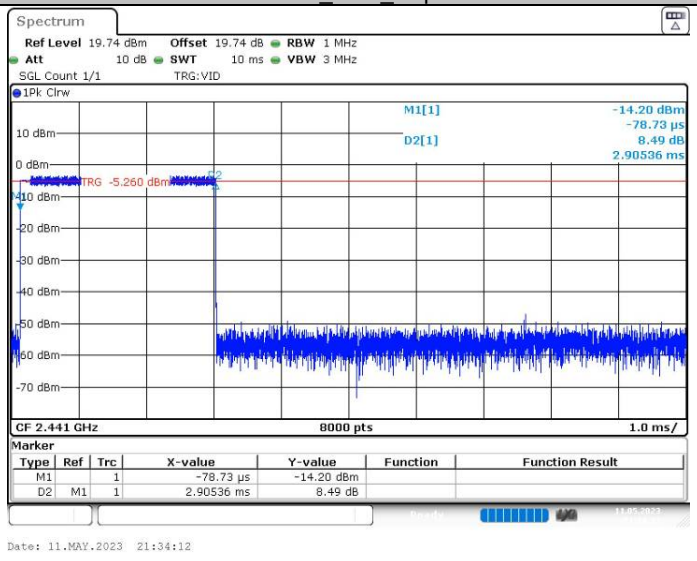
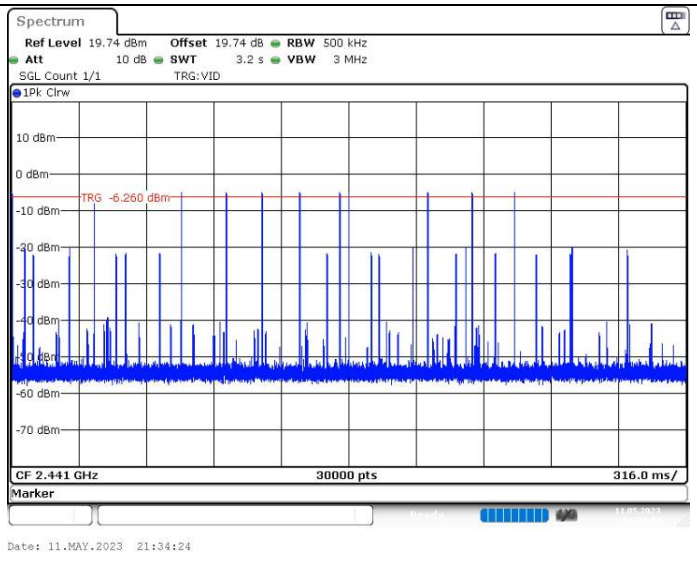
2DH5_Ant1_Hop





3DH1_Ant1_Hop



3DH3_Ant1_Hop



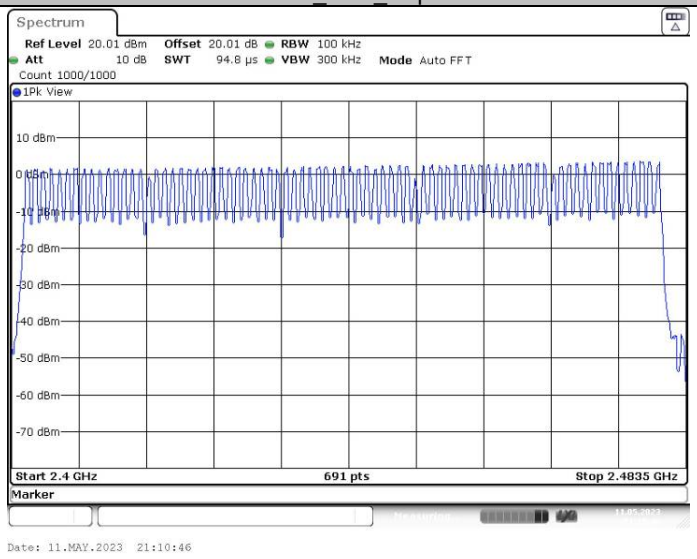
3DH5_Ant1_Hop



Appendix F: Number of hopping channels
Test Result

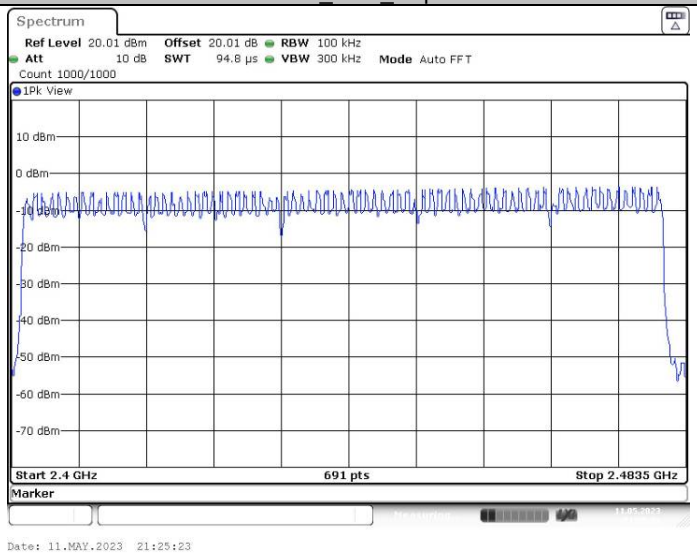
Test Mode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	≥15	PASS
2DH1	Ant1	Hop	79	≥15	PASS
3DH1	Ant1	Hop	79	≥15	PASS

Test Graphs

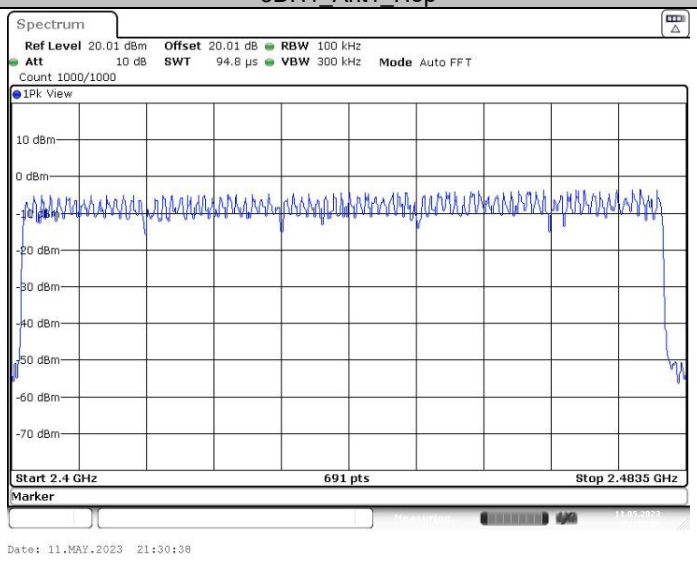
DH1_Ant1_Hop



2DH1_Ant1_Hop



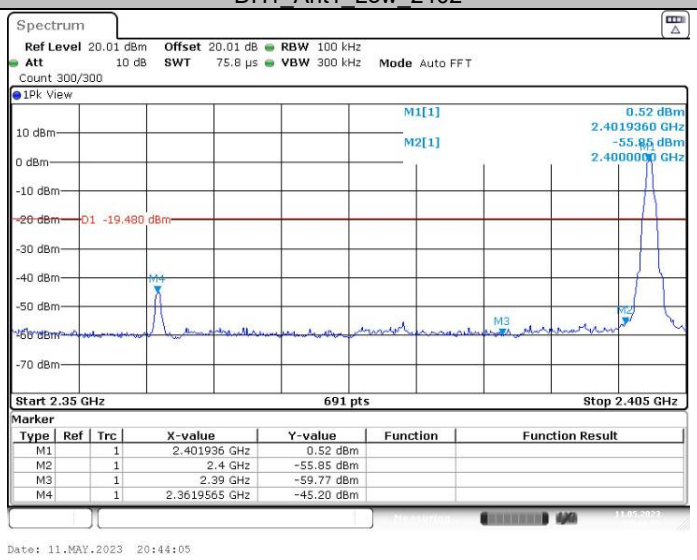
3DH1_Ant1_Hop



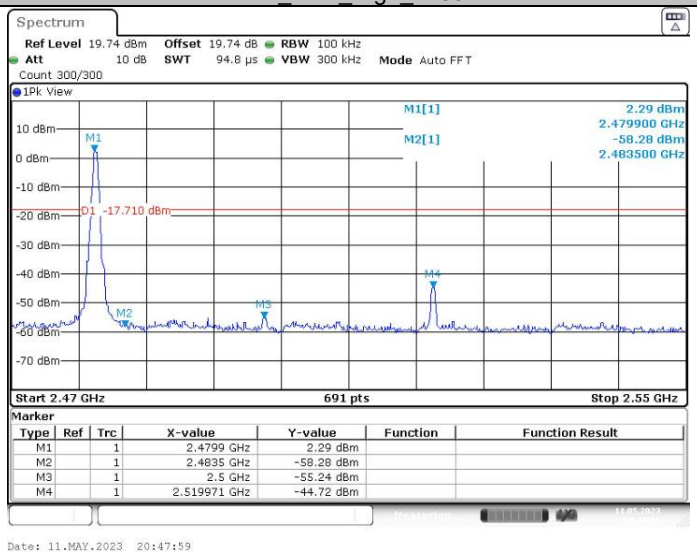
Appendix G: Band edge measurements

Test Graphs

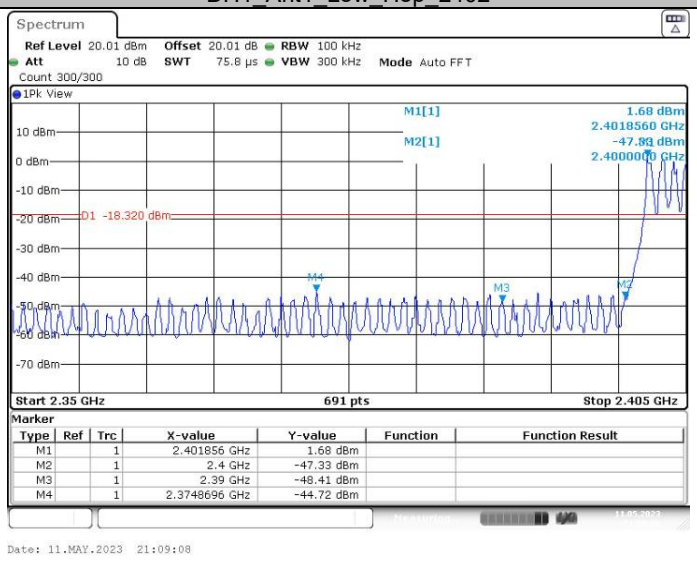
DH1_Ant1_Low_2402



DH1_Ant1_High_2480



DH1_Ant1_Low_Hop_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401856 GHz	1.68 dBm		
M2		1	2.4 GHz	-47.33 dBm		
M3		1	2.39 GHz	-48.41 dBm		
M4		1	2.3748696 GHz	-44.72 dBm		

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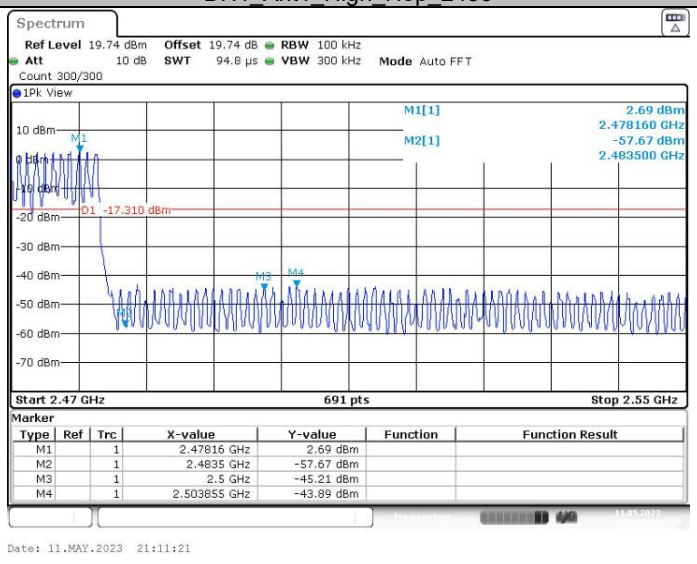
DH1_Ant1_High_Hop_2480

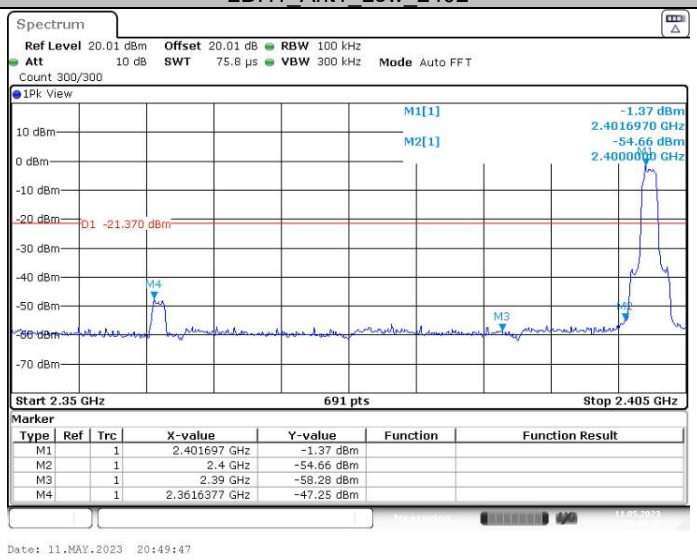


Marker

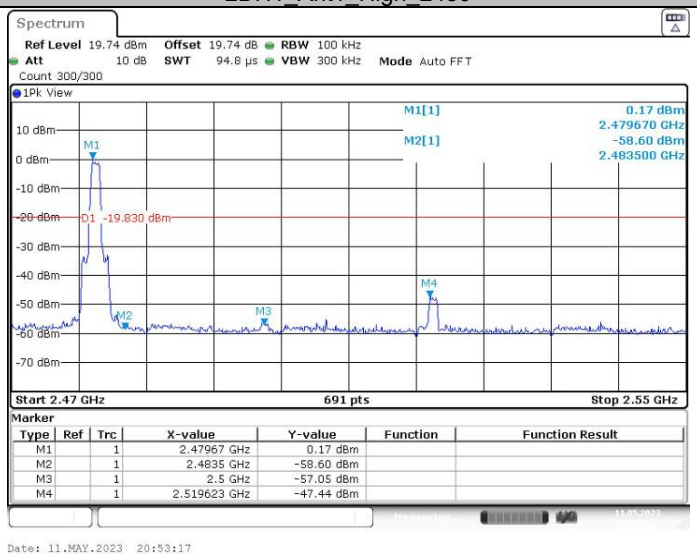
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47816 GHz	2.69 dBm		
M2		1	2.4835 GHz	-57.67 dBm		
M3		1	2.5 GHz	-45.21 dBm		
M4		1	2.503855 GHz	-43.89 dBm		

Date: 11.MAY.2023 21:11:21

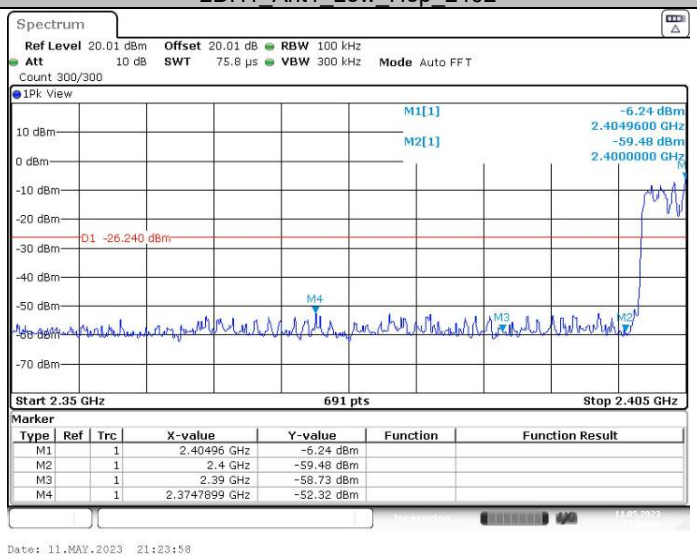
2DH1_Ant1_Low_2402



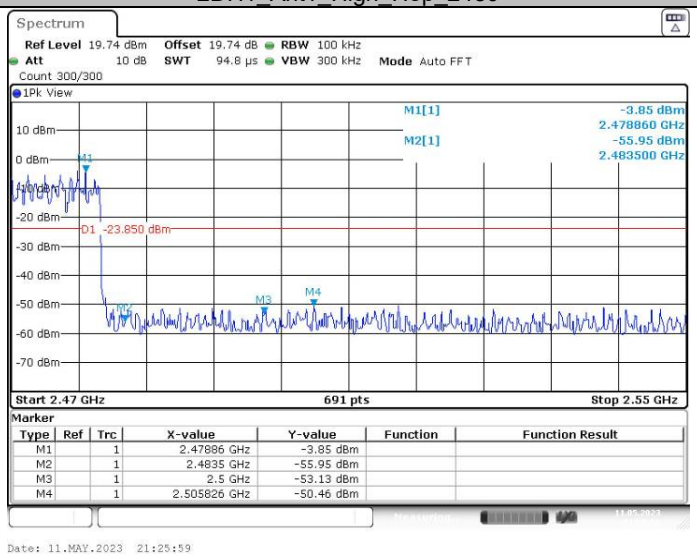
2DH1_Ant1_High_2480



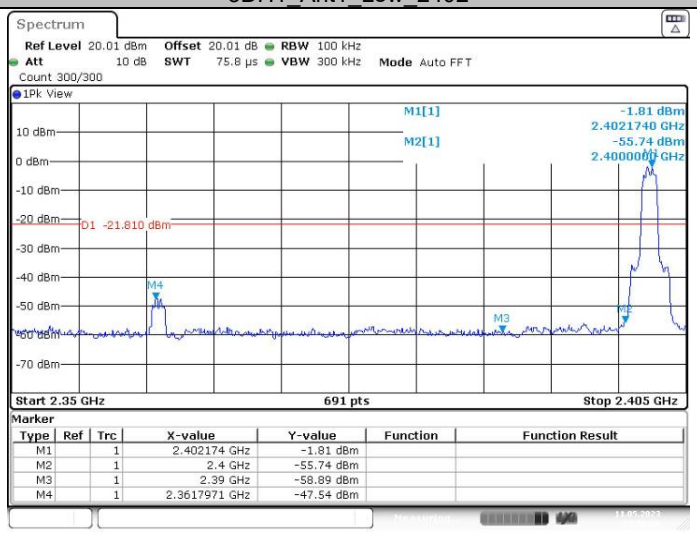
2DH1_Ant1_Low_Hop_2402



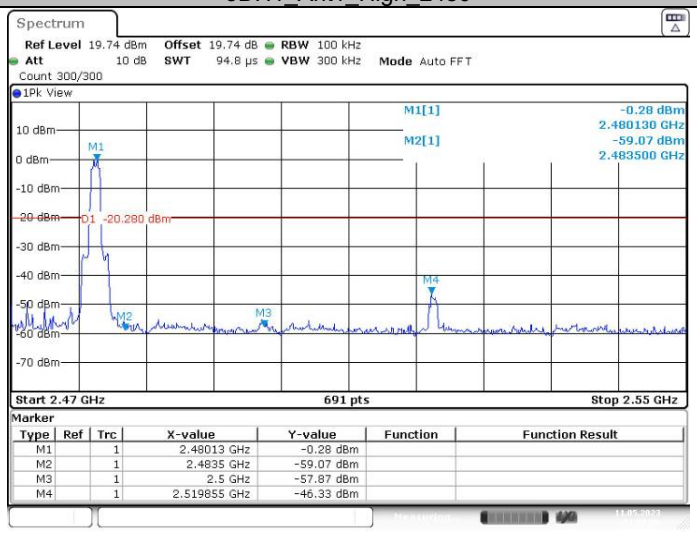
2DH1_Ant1_High_Hop_2480



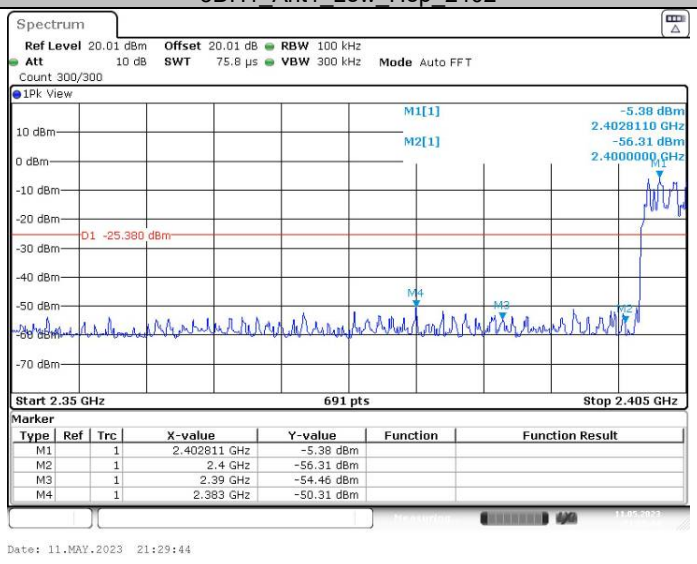
3DH1_Ant1_Low_2402



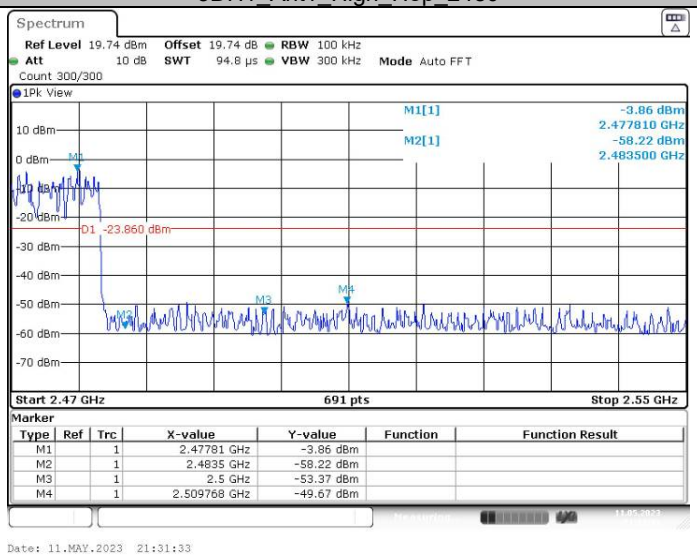
3DH1_Ant1_High_2480



3DH1_Ant1_Low_Hop_2402



3DH1_Ant1_High_Hop_2480



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