TEST REPORT

Applicant Name :	AudioCodes Ltd.
Address :	1 Hayarden Street, Airport City, Lod, Israel
Report Number :	RA230419-20411E-RF-00B
FCC ID:	XAK-RXPANEL

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	Touch panel control device
Model No.:	RX-PANEL
Multiple Model(s) No.:	N/A
Trade Mark:	audiocodes
Date Received:	2023/04/19
Report Date:	2023/05/18

Test Result:	Pass*

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

Prepared and Checked By:

Roger Ling
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".
Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230419-20411E-RF-00B	Original Report	2023/05/18

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	BLE_1M: 2402-2480MHz Wi-Fi: 2412-2462MHz
Maximum Conducted Peak Output Power	BLE: 1.87dBm Wi-Fi: 20.67dBm
Modulation Technique	BLE: GFSK Wi-Fi: DSSS, OFDM
Antenna Specification*	1.96dBi (provided by the applicant)
Voltage Range	DC12V from adapter or DC 48V from PoE
Test Sample serial number	24UE-1 (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

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

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and 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.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

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

For 2.4GHz Wi-Fi mode, total 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

802.11b, 802.11g and 802.11n-HT20 mode was tested with Channel 1, 6 and 11.

For BLE_1M mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

"SecureCRT *" Exercise Software was used.

The device was tested with the worst case was performed as below:

Mode	Data rate	Power Level*		
		Low Channel	Middle Channel	High Channel
802.11b	1Mbps	16	16	16
802.11g	6Mbps	13	13	13
802.11n-HT20	MCS0	13	13	13
BLE	1Mbps	Default	Default	Default

The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.

Note: the software and power level was provided by applicant.

Duty cycle

Test Result: Compliant. Please refer to the Appendix Wi-Fi and Appendix BLE.

Support Equipment List and Details

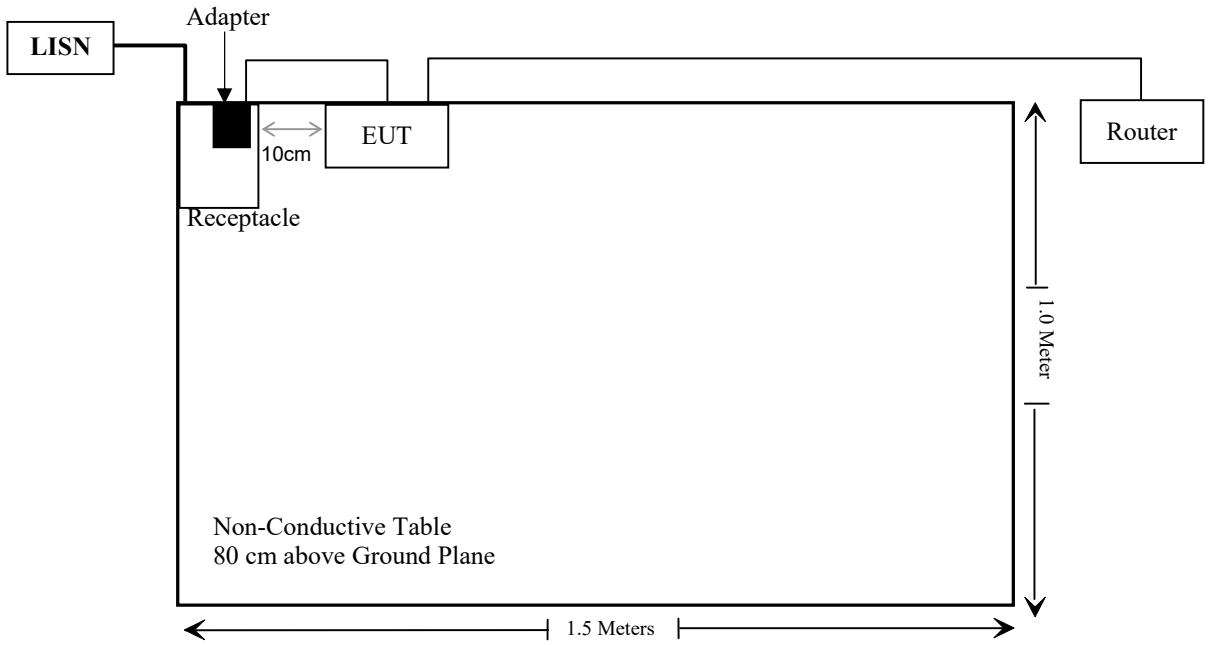
Manufacturer	Description	Model	Serial Number
Tenda	Router	F3	171263330120212106
Kuantech	Adapter	KSASB0241200200D5	KSASB0241200200D5NSK
NETGEAR	PoE	FS108P	Unknown

External I/O Cable

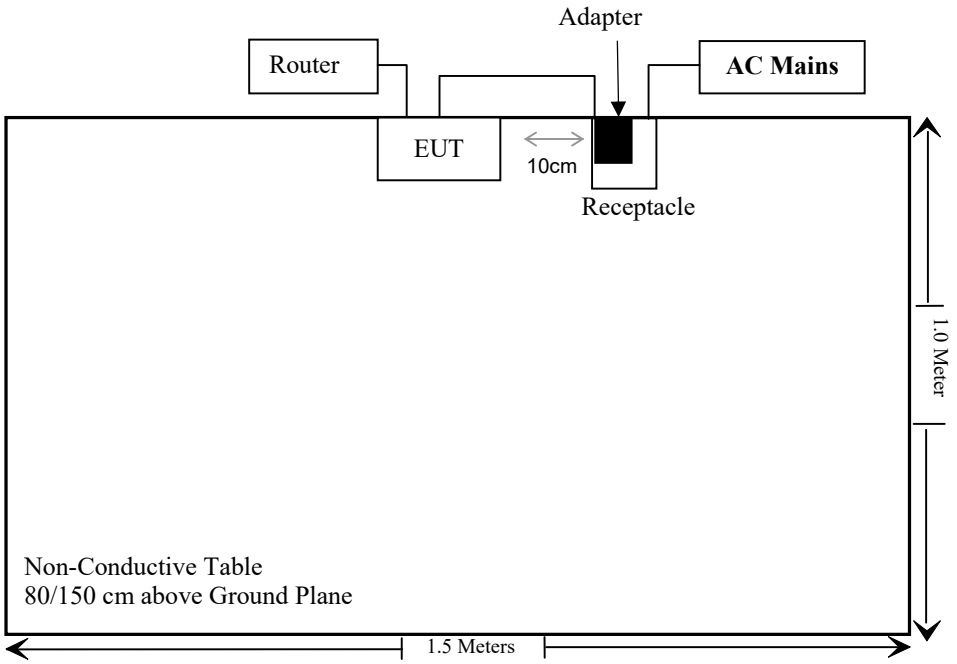
Cable Description	Length (m)	From Port	To
Un-shielding Undetachable DC Cable	1.0	EUT	Adapter
Un-shielding Detachable RJ45 Cable	1.0	EUT	PoE
Un-shielding Detachable AC Cable	1.0	PoE	LISN
Un-shielding Detachable RJ45 Cable	6.0	EUT	Router

Block Diagram of Test Setup

Powered by Adapter:
For conducted emission

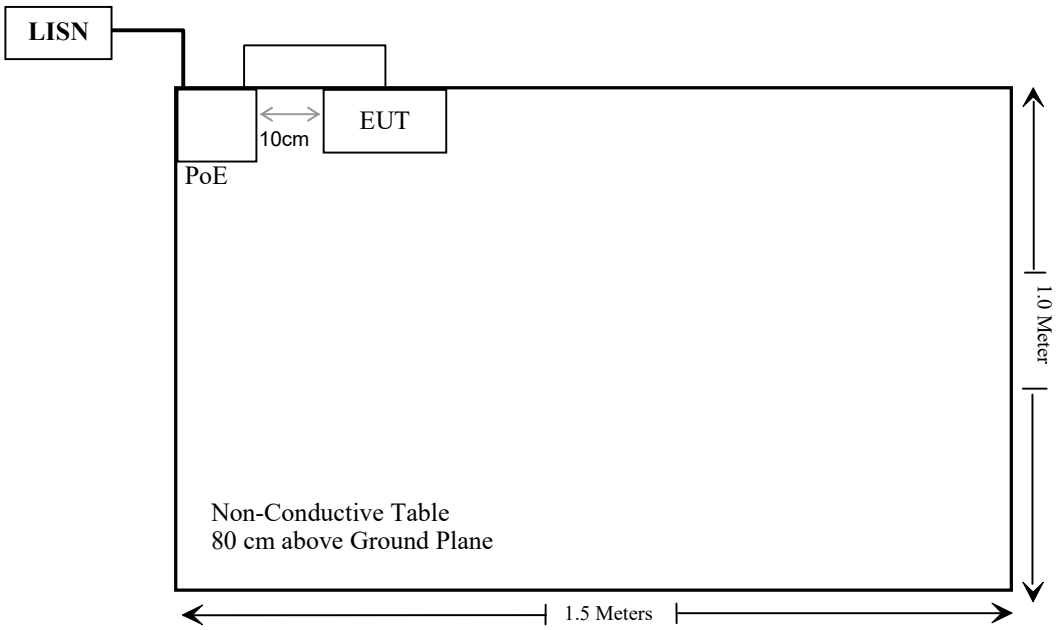


For Radiated Emissions:

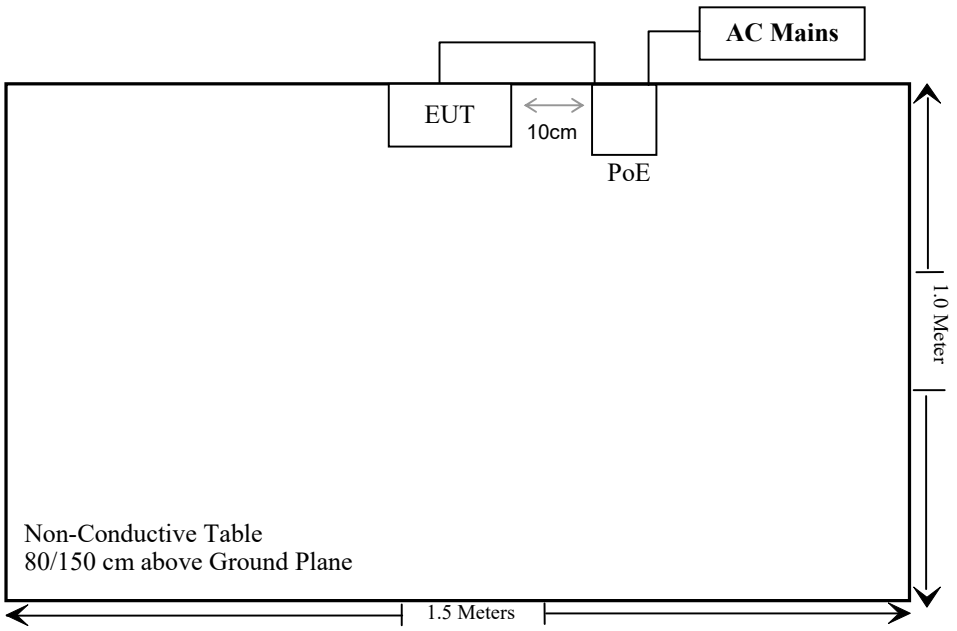


Note: the support table edge was flush with center of turntable

Powered by PoE:
For conducted emission



For Radiated Emissions:



Note: the support table edge was flush with center of turntable

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (3) & §2.1091	MPE-BASED EXEMPTION	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission Bandwidth & Occupied Bandwidth	Compliant
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	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.	ENV216	101314	2022/11/25	2023/11/24
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
Agilent	Power Sensor	U2021XA	MY5425003	2023/02/25	2024/02/24
Agilent	USB wideband power sensor	U2021XA	MY54250003	2022/06/27	2023/06/26
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24

*** 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 §15.247 (I) & §1.1307 (B) (3) & §2.1091- MPE-BASED EXEMPTION

Applicable Standard

According to subpart 1.1307 (b) (3) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemptionfrom further evaluation from 300 kHz through 100 GHz.

Table 1 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.

Ris the minimum separation distance in meters
f = frequency in MHz

Result

Mode	Frequency (MHz)	Tune up conducted power	Antenna Gain		ERP		Evaluation Distance (m)	ERP Limit (W)
		(dBm)	(dBi)	(dBd)	(dBm)	(W)		
Bluetooth	2402-2480	4.0	1.96	-0.19	3.81	0.002	0.2	0.768
BLE	2402-2480	2.0	1.96	-0.19	1.81	0.002	0.2	0.768
2.4G Wi-Fi	2412-2462	21.0	1.96	-0.19	20.81	0.121	0.2	0.768
5G Wi-Fi	5150-5250	16.0	5.66	3.51	19.51	0.089	0.2	0.768
	5250-5350	15.0	5.66	3.51	18.51	0.071	0.2	0.768
	5470-5725	15.0	5.66	3.51	18.51	0.071	0.2	0.768
	5725-5850	16.0	5.66	3.51	19.51	0.089	0.2	0.768

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
2. The Bluetooth/BLE/Wi-Fi can't Simultaneous transmitting
3. 0dBd=2.15dBi
To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the 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 6 dBi.

Antenna Connector Construction

The EUT has one internal antenna arrangement, which was permanently attached, the antenna gain for is 1.96dBi, fulfill the requirement of this section. Please refer to the EUT photos.

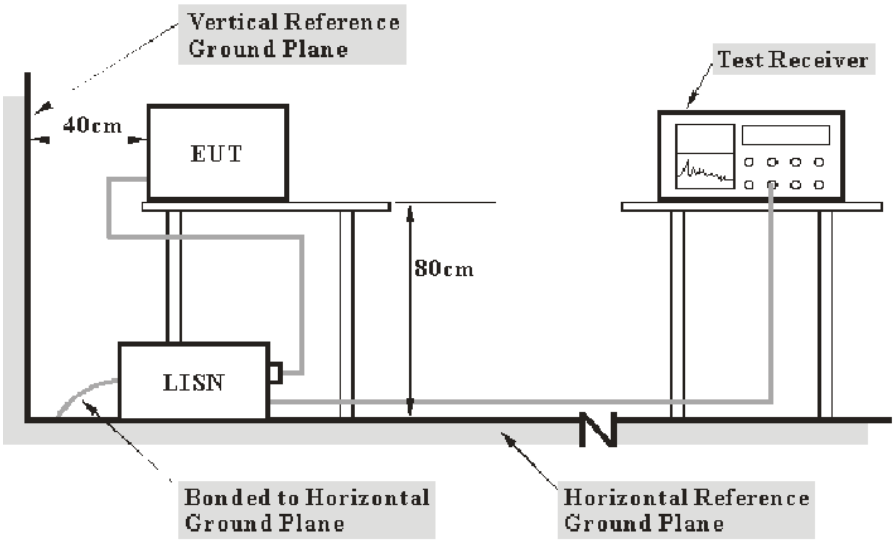
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

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

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) and Cable Loss. The basic equation is as follows:

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, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

Over Limit = Level – Limit
Level = Read Level + Factor

Test Data

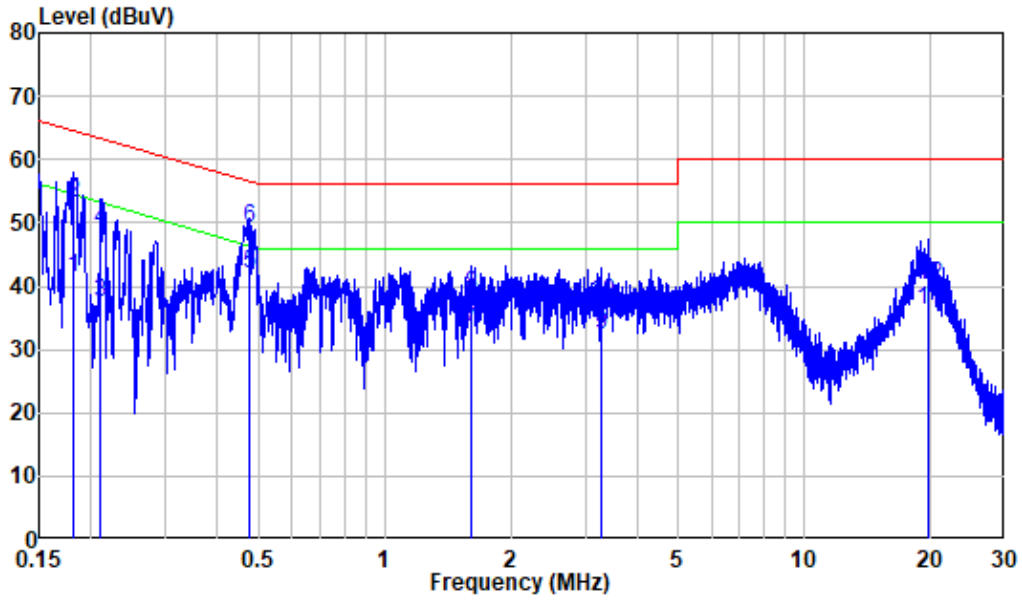
Environmental Conditions

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 (Worst case is 802.11b, middle channel)

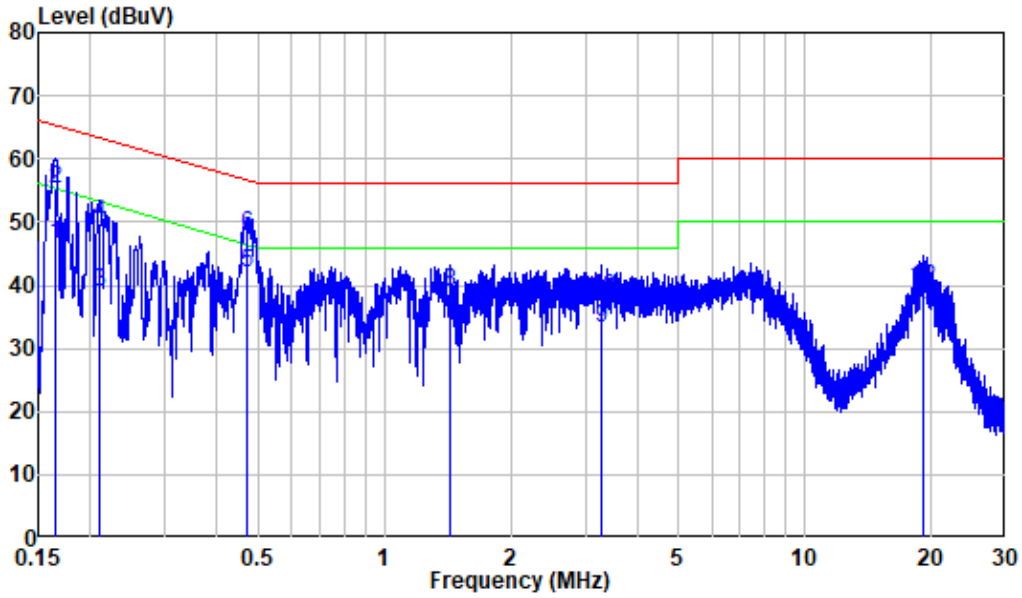
Powered by PoE:
AC 120V/60 Hz, Line



Site : Shielding Room
Condition: Line
Job No. : RA230419-20411E-RF
Mode : 2.4G WIFI Transmitting
Note : POE
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.182	10.28	31.06	41.34	54.41	-13.07	Average
2	0.182	10.28	42.77	53.05	64.41	-11.36	QP
3	0.211	10.29	27.22	37.51	53.18	-15.67	Average
4	0.211	10.29	38.68	48.97	63.18	-14.21	QP
5	0.474	10.36	31.53	41.89	46.44	-4.55	Average
6	0.474	10.36	38.83	49.19	56.44	-7.25	QP
7	1.608	10.38	23.01	33.39	46.00	-12.61	Average
8	1.608	10.38	28.26	38.64	56.00	-17.36	QP
9	3.265	10.50	21.82	32.32	46.00	-13.68	Average
10	3.265	10.50	26.90	37.40	56.00	-18.60	QP
11	19.714	10.31	25.86	36.17	50.00	-13.83	Average
12	19.714	10.31	29.87	40.18	60.00	-19.82	QP

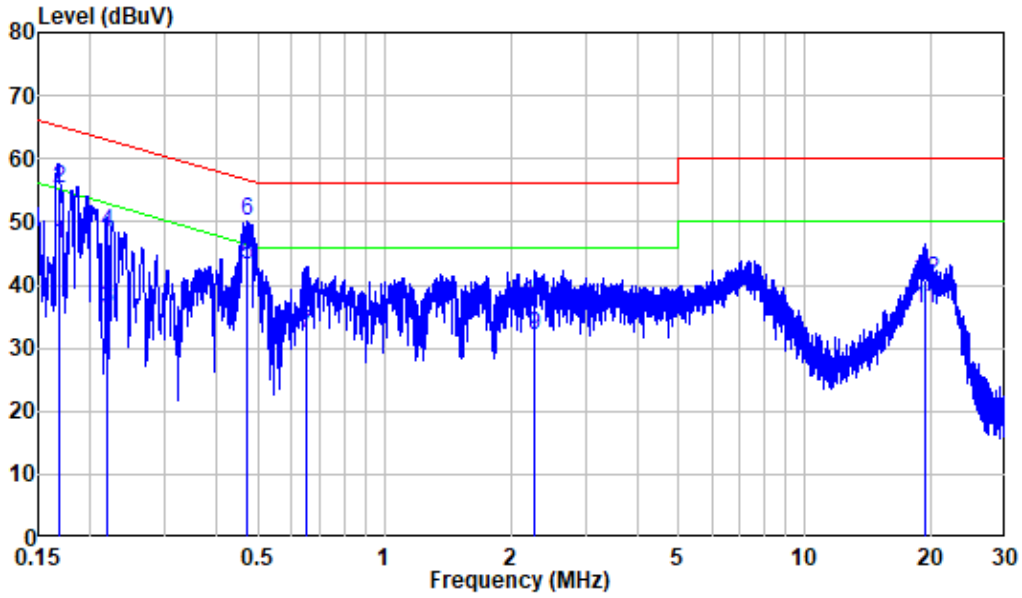
AC 120V/60 Hz, Neutral



Site : Shielding Room
Condition: Neutral
Job No. : RA230419-20411E-RF
Mode : 2.4G WIFI Transmitting
Note : POE
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.165	10.31	36.09	46.40	55.21	-8.81	Average
2	0.165	10.31	45.08	55.39	65.21	-9.82	QP
3	0.210	10.38	28.52	38.90	53.20	-14.30	Average
4	0.210	10.38	39.38	49.76	63.20	-13.44	QP
5	0.470	10.37	31.57	41.94	46.52	-4.58	Average
6	0.470	10.37	37.70	48.07	56.52	-8.45	QP
7	1.428	10.47	23.21	33.68	46.00	-12.32	Average
8	1.428	10.47	28.57	39.04	56.00	-16.96	QP
9	3.271	10.49	22.73	33.22	46.00	-12.78	Average
10	3.271	10.49	27.69	38.18	56.00	-17.82	QP
11	19.008	10.37	24.52	34.89	50.00	-15.11	Average
12	19.008	10.37	29.25	39.62	60.00	-20.38	QP

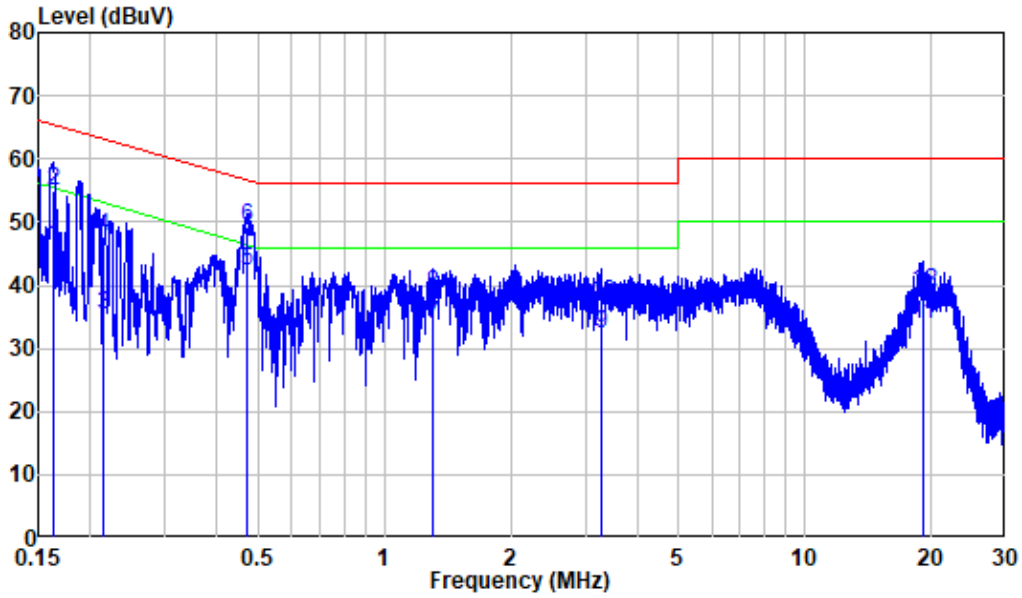
Powered by Adapter:
AC 120V/60 Hz, Line



Site : Shielding Room
Condition: Line
Job No. : RA230419-20411E-RF
Mode : 2.4G WIFI Transmitting
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.168	10.40	36.15	46.55	55.07	-8.52	Average
2	0.168	10.40	44.93	55.33	65.07	-9.74	QP
3	0.218	10.40	25.78	36.18	52.90	-16.72	Average
4	0.218	10.40	37.84	48.24	62.90	-14.66	QP
5	0.473	10.40	32.73	43.13	46.47	-3.34	Average
6	0.473	10.40	39.70	50.10	56.47	-6.37	QP
7	0.652	10.57	21.86	32.43	46.00	-13.57	Average
8	0.652	10.57	26.14	36.71	56.00	-19.29	QP
9	2.276	10.44	21.61	32.05	46.00	-13.95	Average
10	2.276	10.44	26.71	37.15	56.00	-18.85	QP
11	19.287	10.16	26.13	36.29	50.00	-13.71	Average
12	19.287	10.16	30.62	40.78	60.00	-19.22	QP

AC 120V/60 Hz, Neutral



Site : Shielding Room
Condition: Neutral
Job No. : RA230419-20411E-RF
Mode : 2.4G WIFI Transmitting
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.163	10.43	35.67	46.10	55.32	-9.22	Average
2	0.163	10.43	44.65	55.08	65.32	-10.24	QP
3	0.214	10.49	24.80	35.29	53.06	-17.77	Average
4	0.214	10.49	37.10	47.59	63.06	-15.47	QP
5	0.473	10.41	31.95	42.36	46.47	-4.11	Average
6	0.473	10.41	38.92	49.33	56.47	-7.14	QP
7	1.306	10.49	23.36	33.85	46.00	-12.15	Average
8	1.306	10.49	28.05	38.54	56.00	-17.46	QP
9	3.269	10.49	21.83	32.32	46.00	-13.68	Average
10	3.269	10.49	26.79	37.28	56.00	-18.72	QP
11	19.135	10.26	23.59	33.85	50.00	-16.15	Average
12	19.135	10.26	28.65	38.91	60.00	-21.09	QP

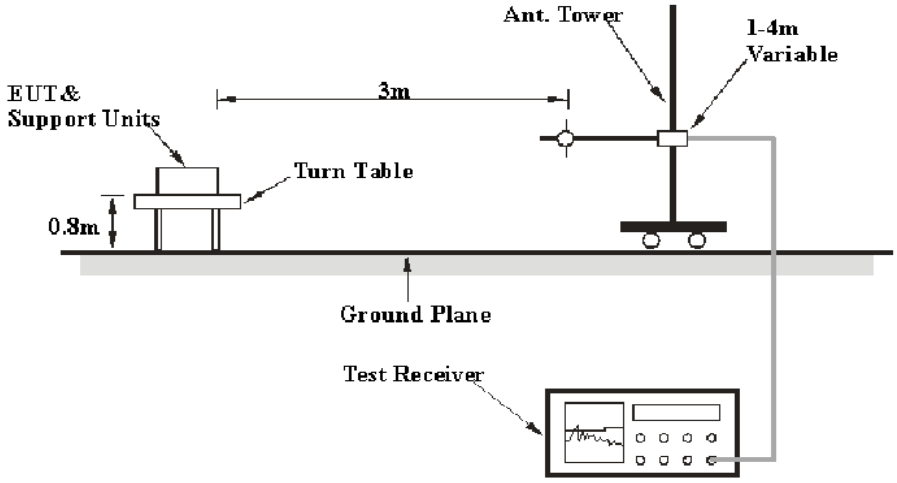
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

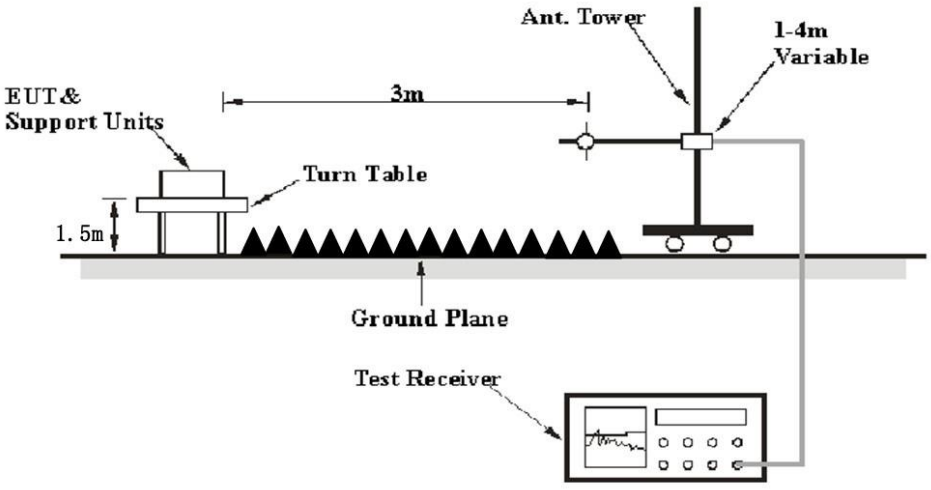
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, 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

During the radiated emission test, 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	1MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Average
	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

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

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

Factor & Margin Calculation

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

Factor = Antenna Factor + Cable Loss - Amplifier Gain

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

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	24 ~25.5℃
Relative Humidity:	52~56 %
ATM Pressure:	101 kPa

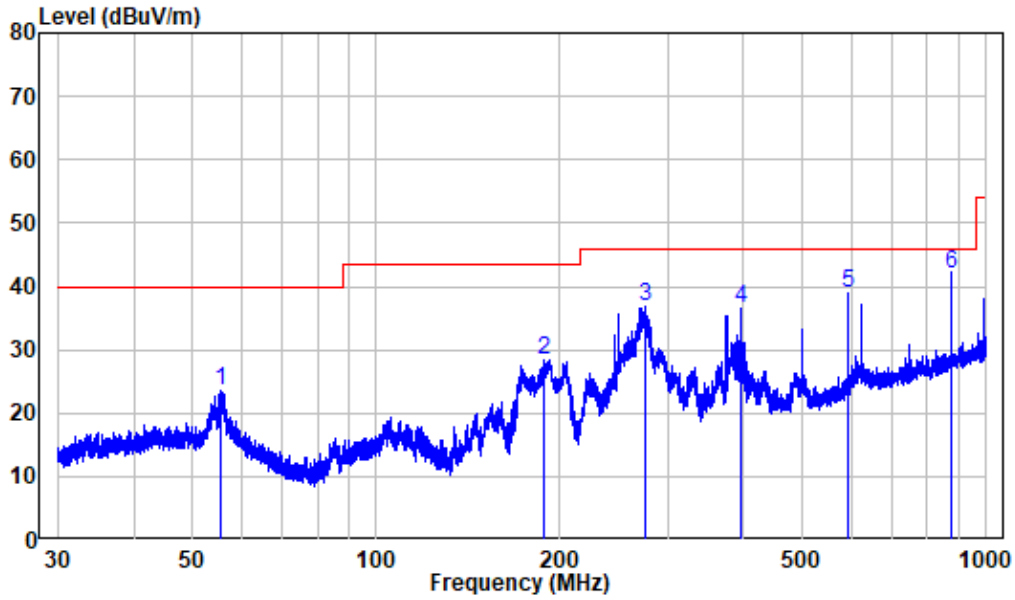
The testing was performed by Jason Liu on 2023-05-15 for below 1GHz Jason Liu on 2023-05-04 for above 1GHz.

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

30MHz-1GHz: *(Worst case is 802.11g, middle channel)*

Note: When the test result of peak was less than the limit of QP more than 6dB, just peak value were recorded.
Powered by PoE:

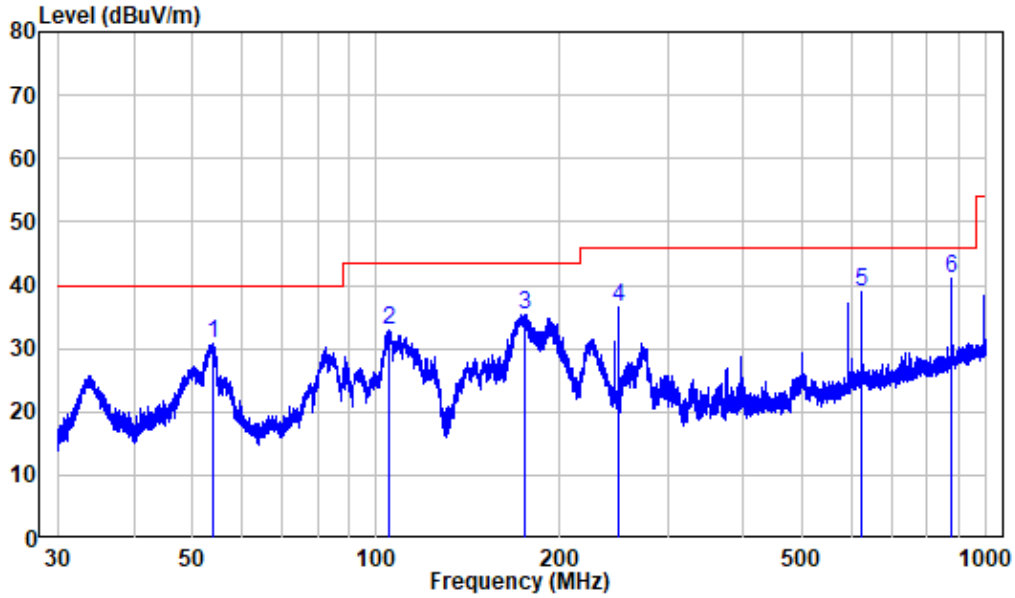
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230419-20411E-RF
Test Mode: 2.4G WIFI Transmitting
Note : POE

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	55.415	-10.25	33.76	23.51	40.00	-16.49	Peak
2	188.083	-11.81	40.14	28.33	43.50	-15.17	Peak
3	275.398	-9.88	46.64	36.76	46.00	-9.24	Peak
4	396.068	-6.79	43.38	36.59	46.00	-9.41	Peak
5	594.090	-2.70	41.52	38.82	46.00	-7.18	Peak
6	875.247	1.18	40.91	42.09	46.00	-3.91	QP

Vertical

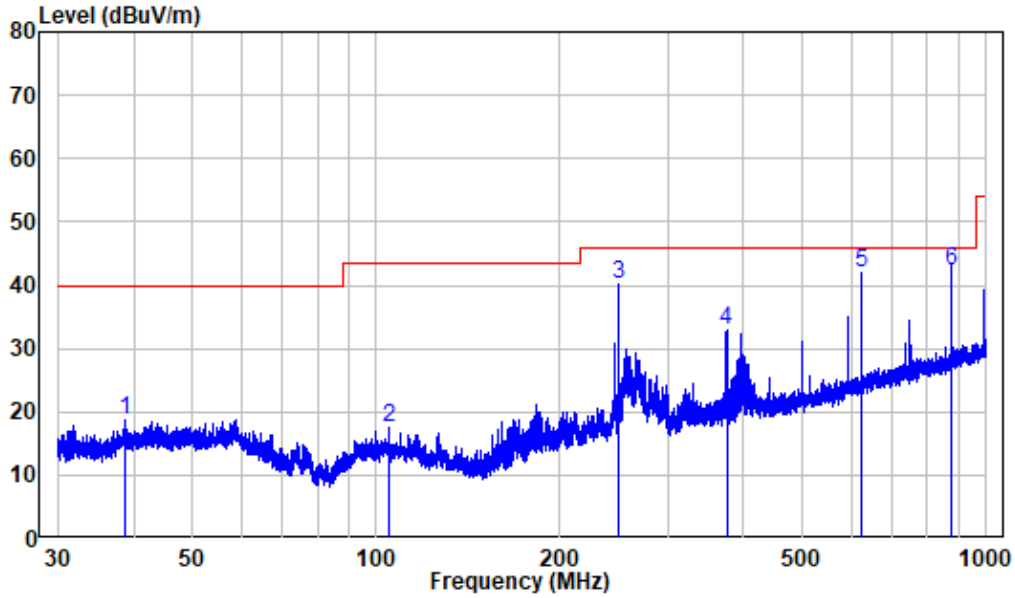


Site : chamber
Condition: 3m VERTICAL
Job No. : RA230419-20411E-RF
Test Mode: 2.4G WIFI Transmitting
Note : POE

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	53.787	-10.31	41.04	30.73	40.00	-9.27	Peak
2	104.628	-11.79	44.75	32.96	43.50	-10.54	Peak
3	175.037	-13.12	48.51	35.39	43.50	-8.11	Peak
4	249.972	-10.74	47.25	36.51	46.00	-9.49	Peak
5	625.078	-2.35	41.21	38.86	46.00	-7.14	Peak
6	875.247	1.18	40.00	41.18	46.00	-4.82	QP

Powered by Adapter:

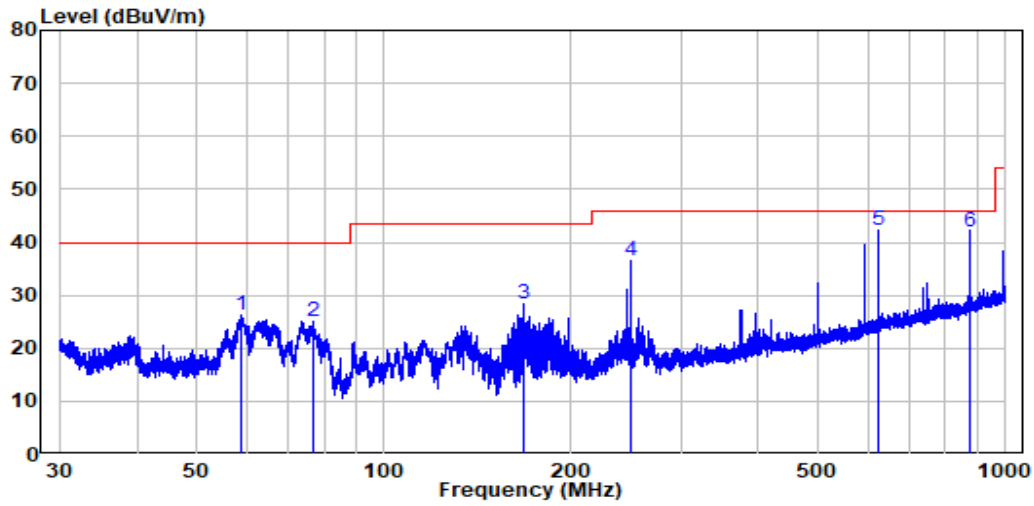
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230419-20411E-RF
Test Mode: 2.4G WIFI Transmitting
Note : Adapter

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	38.701	-10.65	29.38	18.73	40.00	-21.27	Peak
2	104.536	-11.78	29.34	17.56	43.50	-25.94	Peak
3	249.972	-10.74	50.80	40.06	46.00	-5.94	QP
4	375.116	-7.28	40.20	32.92	46.00	-13.08	Peak
5	625.078	-2.35	44.30	41.95	46.00	-4.05	QP
6	875.247	1.18	41.05	42.23	46.00	-3.77	QP

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA230419-20411E-RF
Test Mode: 2.4G WIFI Transmitting
Note : Adapter

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	58.922	-10.24	36.46	26.22	40.00	-13.78	Peak
2	76.646	-16.48	41.60	25.12	40.00	-14.88	Peak
3	167.971	-13.78	42.08	28.30	43.50	-15.20	Peak
4	249.972	-10.74	47.22	36.48	46.00	-9.52	Peak
5	625.078	-2.35	44.70	42.35	46.00	-3.65	QP
6	875.247	1.18	40.90	42.08	46.00	-3.92	QP

1-25 GHz: *(worst case powered by adapter)*

BLE_1M:

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									
2335.68	67.41	PK	127	2.5	H	-10.64	56.77	74	-17.23
2335.68	52.97	AV	127	2.5	H	-10.64	42.33	54	-11.67
2336.57	67.54	PK	45	1.3	V	-10.65	56.89	74	-17.11
2336.57	53.09	AV	45	1.3	V	-10.65	42.44	54	-11.56
2390	66.19	PK	110	1	H	-10.70	55.49	74	-18.51
2390	53.40	AV	110	1	H	-10.70	42.70	54	-11.30
2390	66.31	PK	251	1.8	V	-10.70	55.61	74	-18.39
2390	53.52	AV	251	1.8	V	-10.70	42.82	54	-11.18
4804	61.12	PK	346	1.5	H	-6.11	55.01	74	-18.99
4804	46.96	AV	346	1.5	H	-6.11	40.85	54	-13.15
4804	60.79	PK	194	2	V	-6.11	54.68	74	-19.32
4804	46.41	AV	194	2	V	-6.11	40.30	54	-13.70
Middle Channel 2440MHz									
4880	61.05	PK	3	2.4	H	-5.91	55.14	74	-18.86
4880	46.76	AV	3	2.4	H	-5.91	40.85	54	-13.15
4880	60.83	PK	281	2.4	V	-5.91	54.92	74	-19.08
4880	46.34	AV	281	2.4	V	-5.91	40.43	54	-13.57
High Channel 2480MHz									
2483.5	66.73	PK	4	2.5	H	-10.55	56.18	74	-17.82
2483.5	53.86	AV	4	2.5	H	-10.55	43.31	54	-10.69
2483.5	66.84	PK	237	1.2	V	-10.55	56.29	74	-17.71
2483.5	53.95	AV	237	1.2	V	-10.55	43.4	54	-10.60
2485.45	69.04	PK	183	1.7	H	-10.53	58.51	74	-15.49
2485.45	54.55	AV	183	1.7	H	-10.53	44.02	54	-9.98
2484.78	69.18	PK	219	2.4	V	-10.54	58.64	74	-15.36
2484.78	54.67	AV	219	2.4	V	-10.54	44.13	54	-9.87
4960	60.46	PK	129	2.1	H	-5.47	54.99	74	-19.01
4960	46.18	AV	129	2.1	H	-5.47	40.71	54	-13.29
4960	60.27	PK	356	1.7	V	-5.47	54.80	74	-19.20
4960	45.93	AV	356	1.7	V	-5.47	40.46	54	-13.54

Wi-Fi:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11b									
Low Channel 2412MHz									
2336.35	67.83	PK	328	1.8	H	-10.65	57.18	74	-16.82
2336.35	54.35	AV	328	1.8	H	-10.65	43.70	54	-10.30
2335.18	68.02	PK	31	1.2	V	-10.63	57.39	74	-16.61
2335.18	54.56	AV	31	1.2	V	-10.63	43.93	54	-10.07
2390	65.80	PK	109	2.2	H	-10.70	55.10	74	-18.90
2390	52.91	AV	109	2.2	H	-10.70	42.21	54	-11.79
2390	65.96	PK	194	1.3	V	-10.70	55.26	74	-18.74
2390	53.13	AV	194	1.3	V	-10.70	42.43	54	-11.57
4824	61.70	PK	342	2.4	H	-6.10	55.60	74	-18.40
4824	45.77	AV	342	2.4	H	-6.10	39.67	54	-14.33
4824	62.29	PK	183	1.2	V	-6.10	56.19	74	-17.81
4824	46.22	AV	183	1.2	V	-6.10	40.12	54	-13.88
Middle Channel 2437MHz									
4874	62.25	PK	339	1.4	H	-5.95	56.3	74	-17.70
4874	47.98	AV	339	1.4	H	-5.95	42.03	54	-11.97
4874	62.76	PK	68	1.5	V	-5.95	56.81	74	-17.19
4874	48.52	AV	68	1.5	V	-5.95	42.57	54	-11.43
High Channel 2462MHz									
2483.5	69.19	PK	14	2.3	H	-10.55	58.64	74	-15.36
2483.5	58.26	AV	14	2.3	H	-10.55	47.71	54	-6.29
2483.5	69.62	PK	284	2.3	V	-10.55	59.07	74	-14.93
2483.5	58.47	AV	284	2.3	V	-10.55	47.92	54	-6.08
2484.28	70.45	PK	151	1.4	H	-10.54	59.91	74	-14.09
2484.28	59.32	AV	151	1.4	H	-10.54	48.78	54	-5.22
2483.89	71.05	PK	355	2.4	V	-10.55	60.5	74	-13.50
2483.89	59.54	AV	355	2.4	V	-10.55	48.99	54	-5.01
4924	63.05	PK	170	2	H	-5.67	57.38	74	-16.62
4924	53.49	AV	170	2	H	-5.67	47.82	54	-6.18
4924	63.56	PK	142	2	V	-5.67	57.89	74	-16.11
4924	53.77	AV	142	2	V	-5.67	48.10	54	-5.90

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11g									
Low Channel 2412MHz									
2388.87	75.99	PK	319	2	H	-10.70	65.29	74	-8.71
2388.87	56.17	AV	319	2	H	-10.70	45.47	54	-8.53
2389.94	76.68	PK	261	2.4	V	-10.70	65.98	74	-8.02
2389.94	56.70	AV	261	2.4	V	-10.70	46.00	54	-8.00
2390	74.85	PK	109	2	H	-10.70	64.15	74	-9.85
2390	55.46	AV	109	2	H	-10.70	44.76	54	-9.24
2390	75.31	PK	328	1.8	V	-10.70	64.61	74	-9.39
2390	55.63	AV	328	1.8	V	-10.70	44.93	54	-9.07
4824	61.10	PK	333	1.8	H	-6.10	55.00	74	-19.00
4824	46.25	AV	333	1.8	H	-6.10	40.15	54	-13.85
4824	61.36	PK	324	1.2	V	-6.10	55.26	74	-18.74
4824	46.52	AV	324	1.2	V	-6.10	40.42	54	-13.58
Middle Channel 2437MHz									
4874	61.59	PK	73	1.6	H	-5.95	55.64	74	-18.36
4874	46.70	AV	73	1.6	H	-5.95	40.75	54	-13.25
4874	61.83	PK	55	2	V	-5.95	55.88	74	-18.12
4874	46.92	AV	55	2	V	-5.95	40.97	54	-13.03
High Channel 2462MHz									
2483.5	78.35	PK	79	1.8	H	-10.55	67.8	74	-6.20
2483.5	60.04	AV	79	1.8	H	-10.55	49.49	54	-4.51
2483.5	78.83	PK	144	1.9	V	-10.55	68.28	74	-5.72
2483.5	60.26	AV	144	1.9	V	-10.55	49.71	54	-4.29
2484.19	80.46	PK	312	2	H	-10.54	69.92	74	-4.08
2484.19	61.00	AV	312	2	H	-10.54	50.46	54	-3.54
2483.96	81.19	PK	57	2	V	-10.55	70.64	74	-3.36
2483.96	61.22	AV	57	2	V	-10.55	50.67	54	-3.33
4924	61.87	PK	93	2.3	H	-5.67	56.20	74	-17.80
4924	46.80	AV	93	2.3	H	-5.67	41.13	54	-12.87
4924	62.12	PK	213	1.3	V	-5.67	56.45	74	-17.55
4924	47.01	AV	213	1.3	V	-5.67	41.34	54	-12.66

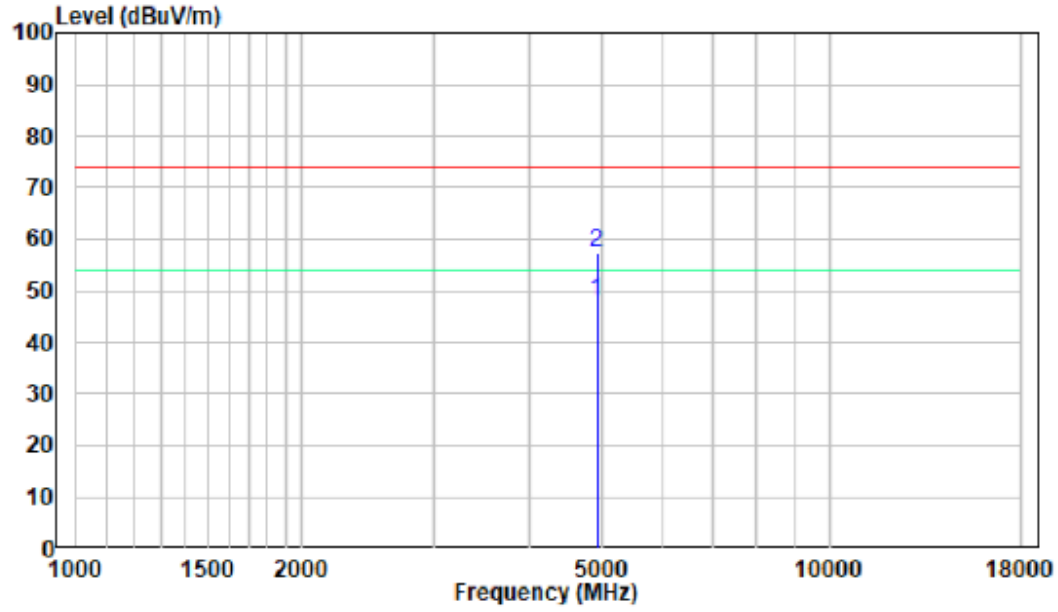
Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11n20									
Low Channel 2412MHz									
2388.69	76.61	PK	65	2	H	-10.70	65.91	74	-8.09
2388.69	56.79	AV	65	2	H	-10.70	46.09	54	-7.91
2389.38	77.10	PK	277	2.4	V	-10.70	66.40	74	-7.60
2389.38	57.28	AV	277	2.4	V	-10.70	46.58	54	-7.42
2390	75.52	PK	215	2	H	-10.70	64.82	74	-9.18
2390	55.86	AV	215	2	H	-10.70	45.16	54	-8.84
2390	75.98	PK	297	2.2	V	-10.70	65.28	74	-8.72
2390	56.13	AV	297	2.2	V	-10.70	45.43	54	-8.57
4824	61.32	PK	113	1.1	H	-6.10	55.22	74	-18.78
4824	46.41	AV	113	1.1	H	-6.10	40.31	54	-13.69
4824	61.53	PK	317	2.2	V	-6.10	55.43	74	-18.57
4824	46.65	AV	317	2.2	V	-6.10	40.55	54	-13.45
Middle Channel 2437MHz									
4874	61.85	PK	45	1.9	H	-5.95	55.9	74	-18.10
4874	46.79	AV	45	1.9	H	-5.95	40.84	54	-13.16
4874	62.06	PK	96	2.4	V	-5.95	56.11	74	-17.89
4874	47.00	AV	96	2.4	V	-5.95	41.05	54	-12.95
High Channel 2462MHz									
2483.5	79.29	PK	168	1.1	H	-10.55	68.74	74	-5.26
2483.5	60.35	AV	168	1.1	H	-10.55	49.8	54	-4.20
2483.5	79.76	PK	184	2	V	-10.55	69.21	74	-4.79
2483.5	60.68	AV	184	2	V	-10.55	50.13	54	-3.87
2484.15	80.96	PK	275	1.9	H	-10.54	70.42	74	-3.58
2484.15	61.12	AV	275	1.9	H	-10.54	50.58	54	-3.42
2483.78	81.48	PK	161	1.7	V	-10.55	70.93	74	-3.07
2483.78	61.54	AV	161	1.7	V	-10.55	50.99	54	-3.01
4924	62.08	PK	118	1.1	H	-5.67	56.41	74	-17.59
4924	46.97	AV	118	1.1	H	-5.67	41.30	54	-12.70
4924	62.31	PK	301	1.3	V	-5.67	56.64	74	-17.36
4924	47.20	AV	301	1.3	V	-5.67	41.53	54	-12.47

Note:
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.

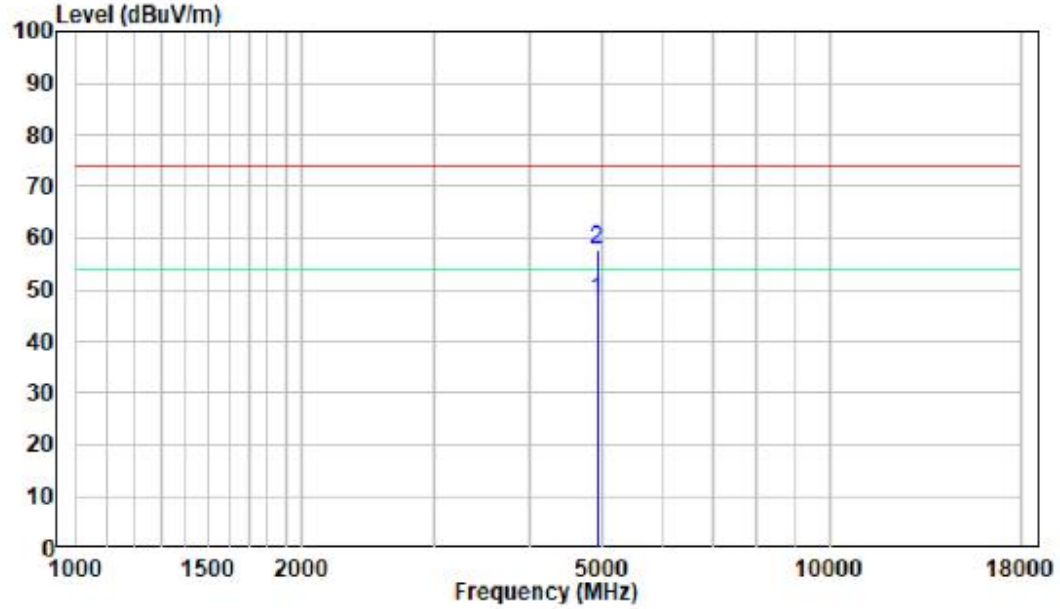
1-18 GHz:

Pre-scan for 802.11b, High Channel

Horizontal



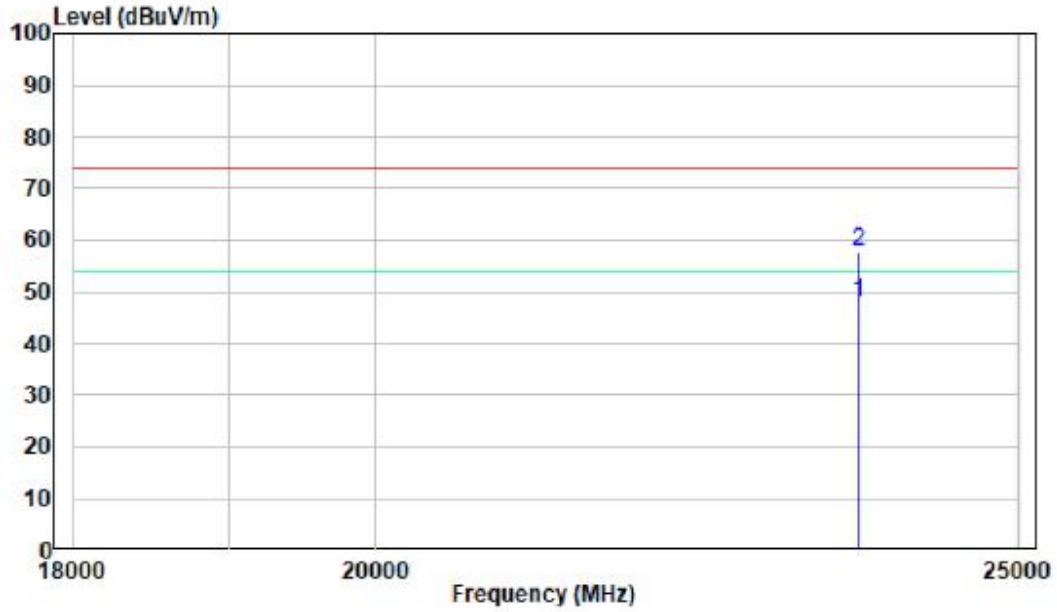
Vertical



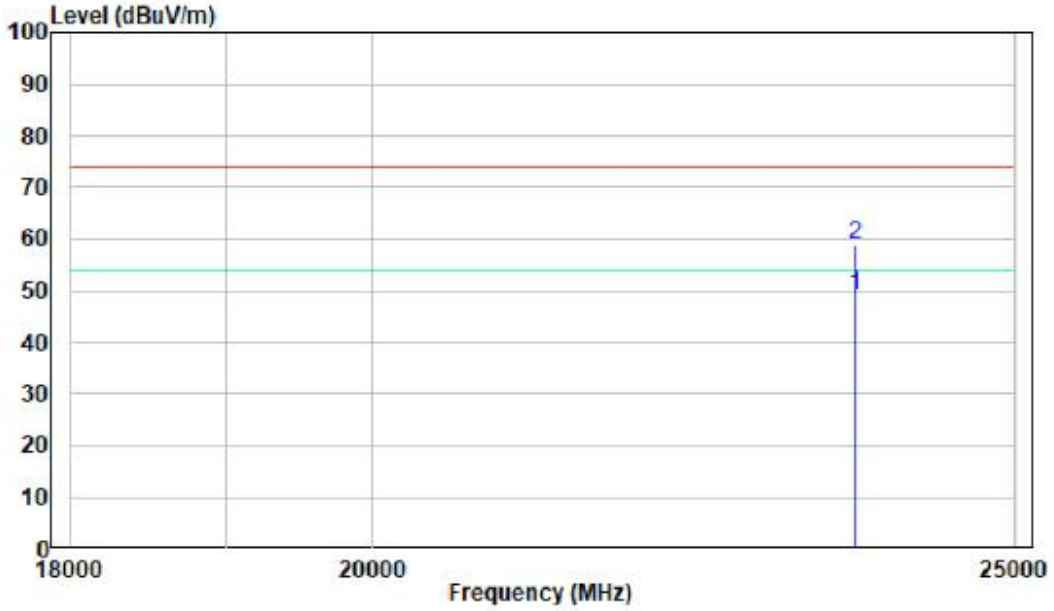
18 -25GHz:

Pre-scan for 802.11b, High Channel

Horizontal



Vertical



FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH & OCCUPIED BANDWIDTH

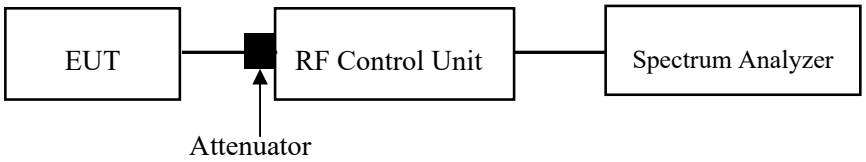
Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 11.8.1 & Clause 6.9.3

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-10.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix Wi-Fi and Appendix BLE.

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

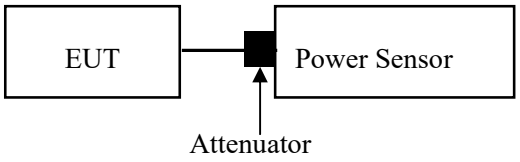
According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

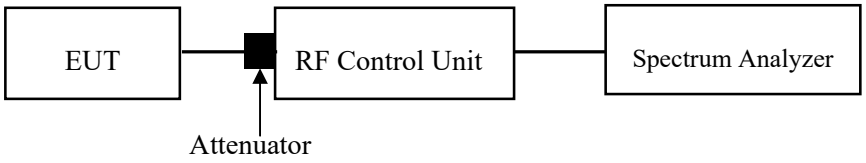
Test Method: ANSI C63.10-2013 Clause 11.9.1.1 for BLE & Clause 11.9.1.3 for Wi-Fi

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

For Wi-Fi mode:



For BLE mode:



Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-10.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix Wi-Fi and Appendix BLE.

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

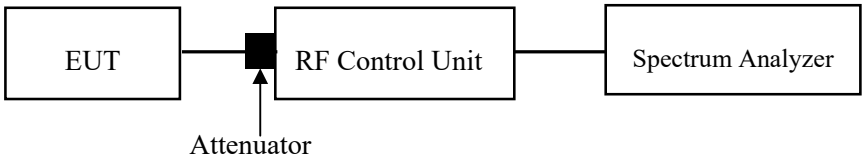
Applicable Standard

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 11.11

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 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:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-10.

EUT operation mode: Transmitting

Test Result: Compliant.

Conducted Band Edge Result:

Please refer to the Appendix Wi-Fi and Appendix BLE.

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

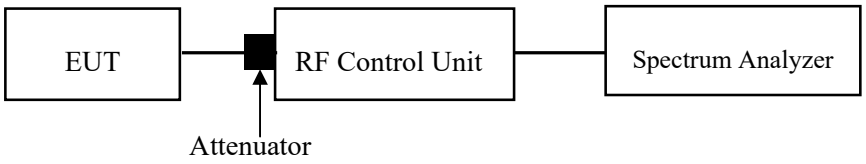
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 11.10.2

Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.

1. Set the RBW to: 3kHz≤ RBW≤100 kHz.
2. Set the VBW ≥ 3×RBW.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level within the RBW.
9. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-10.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix Wi-Fi and Appendix BLE.

APPENDIX Wi-Fi

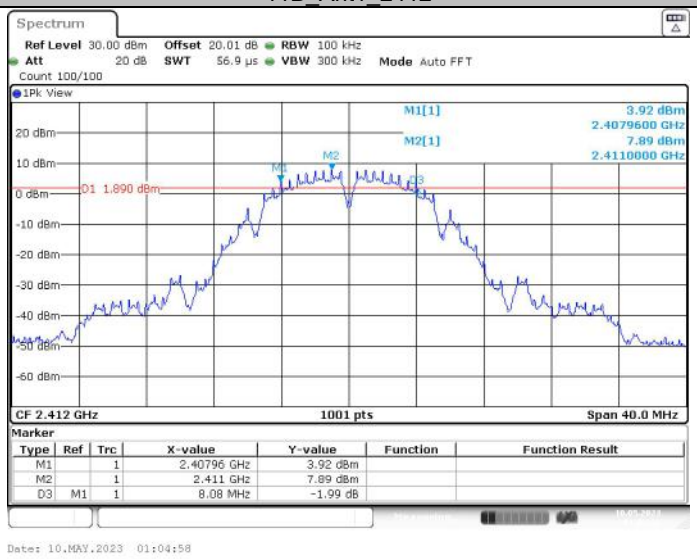
Appendix A: DTS Bandwidth

Test Result

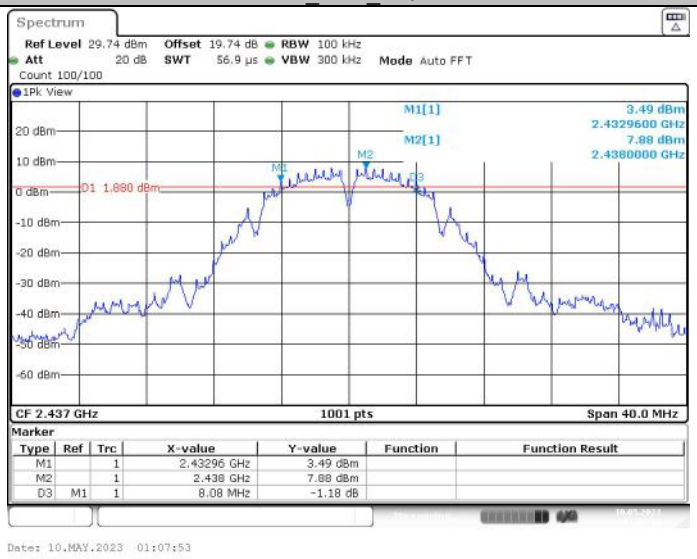
Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.08	2407.96	2416.04	0.5	PASS
		2437	8.08	2432.96	2441.04	0.5	PASS
		2462	8.08	2457.96	2466.04	0.5	PASS
11G	Ant1	2412	16.32	2403.80	2420.12	0.5	PASS
		2437	16.28	2428.84	2445.12	0.5	PASS
		2462	16.28	2453.84	2470.12	0.5	PASS
11N20SISO	Ant1	2412	15.72	2403.84	2419.56	0.5	PASS
		2437	15.16	2429.40	2444.56	0.5	PASS
		2462	15.16	2454.40	2469.56	0.5	PASS

Test Graphs

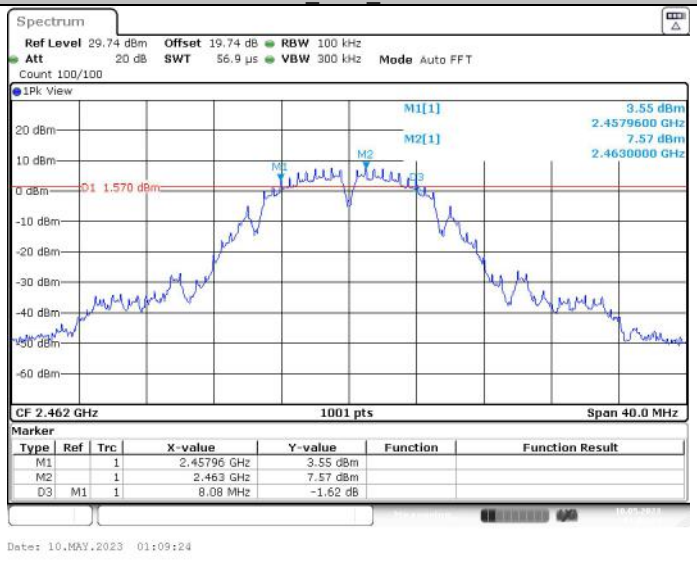
11B_Ant1_2412



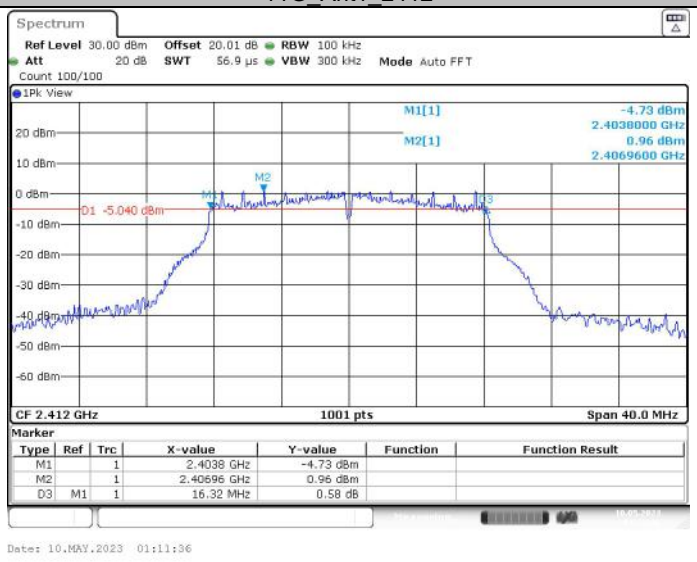
11B_Ant1_2437



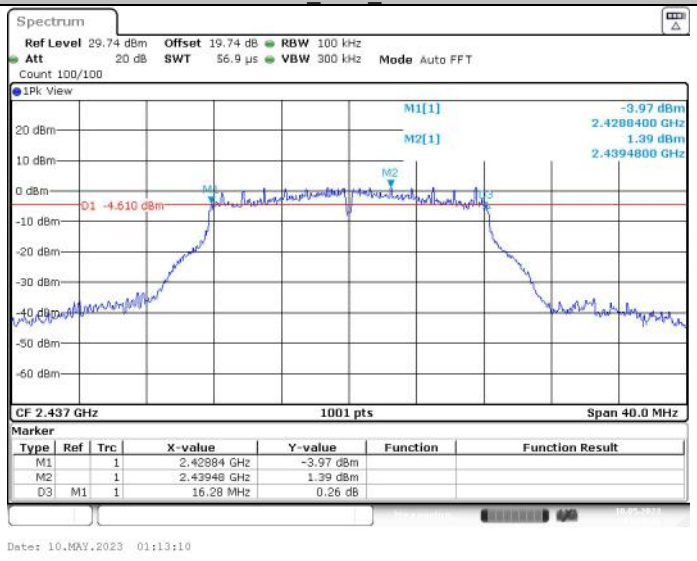
11B_Ant1_2462



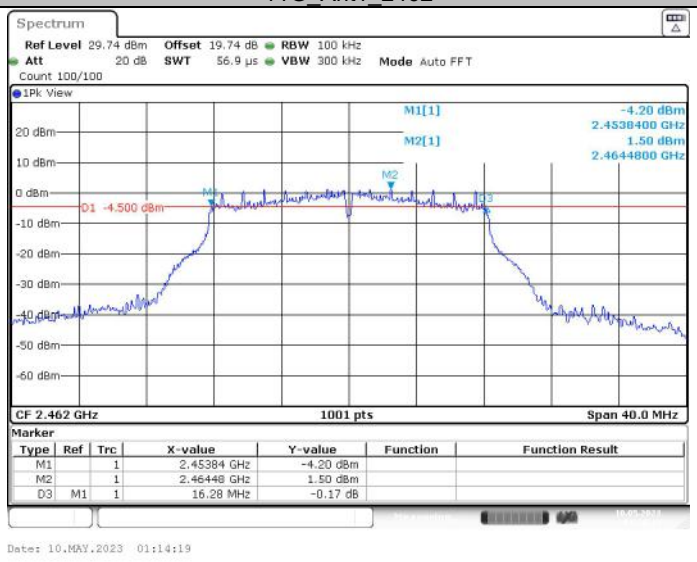
11G_Ant1_2412



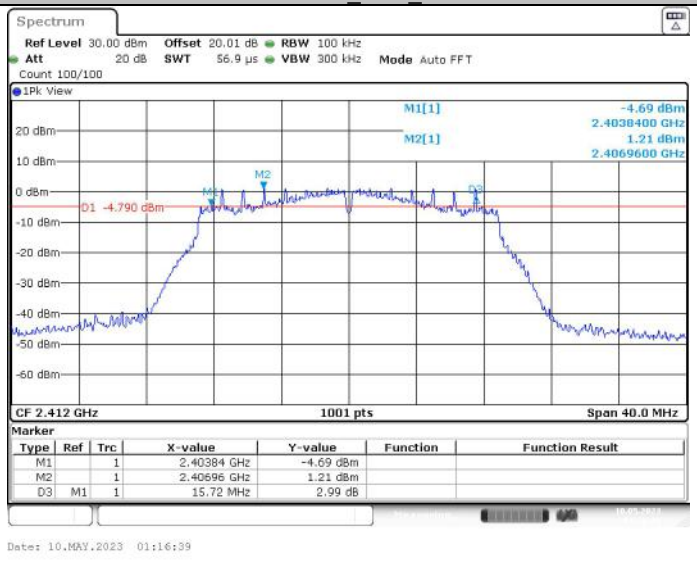
11G_Ant1_2437



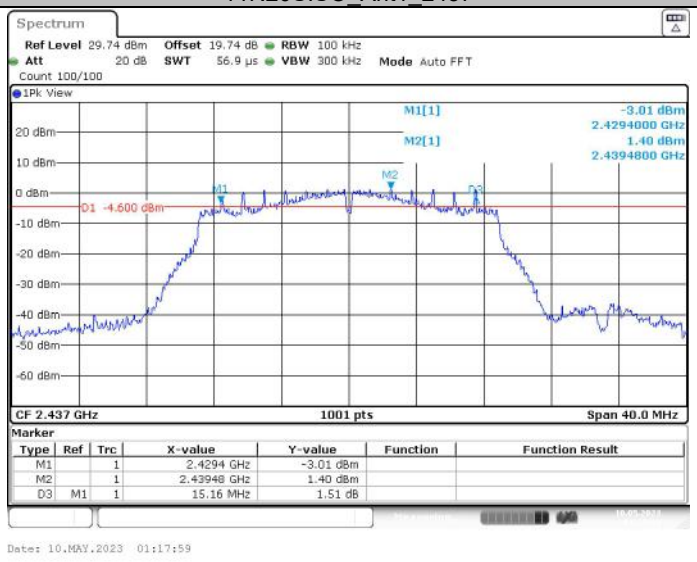
11G_Ant1_2462



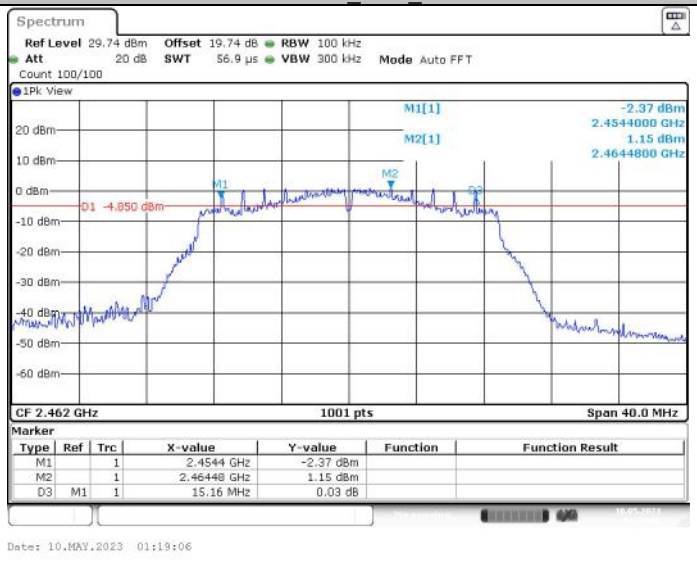
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



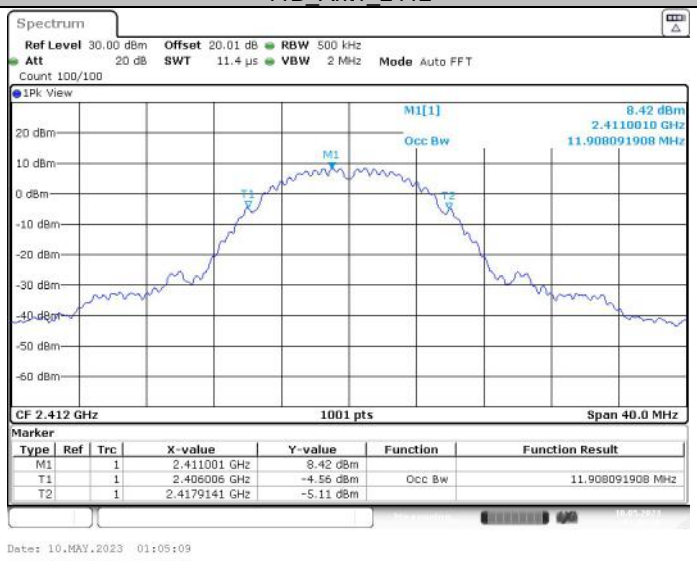
Appendix B: Occupied Channel Bandwidth

Test Result

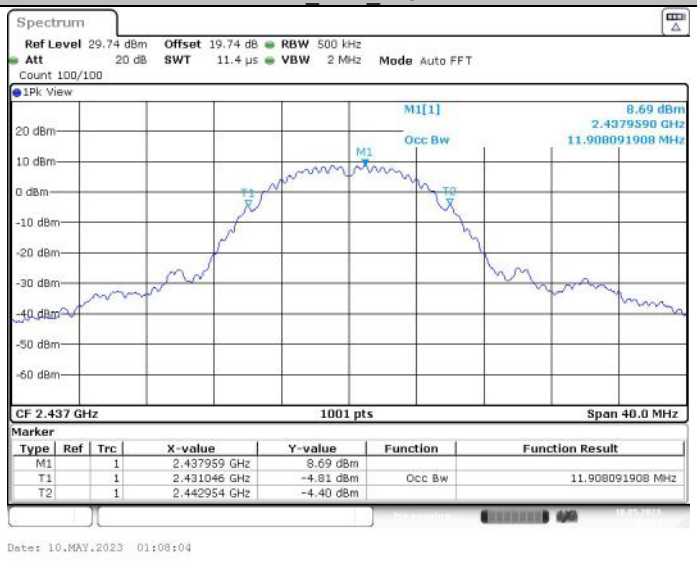
Test Mode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	11.908	2406.006	2417.914	---	---
		2437	11.908	2431.046	2442.954	---	---
		2462	12.028	2455.966	2467.994	---	---
11G	Ant1	2412	17.582	2403.009	2420.591	---	---
		2437	17.383	2428.329	2445.711	---	---
		2462	17.542	2453.129	2470.671	---	---
11N20SISO	Ant1	2412	18.182	2402.849	2421.031	---	---
		2437	17.982	2428.089	2446.071	---	---
		2462	18.142	2452.769	2470.911	---	---

Test Graphs

11B_Ant1_2412

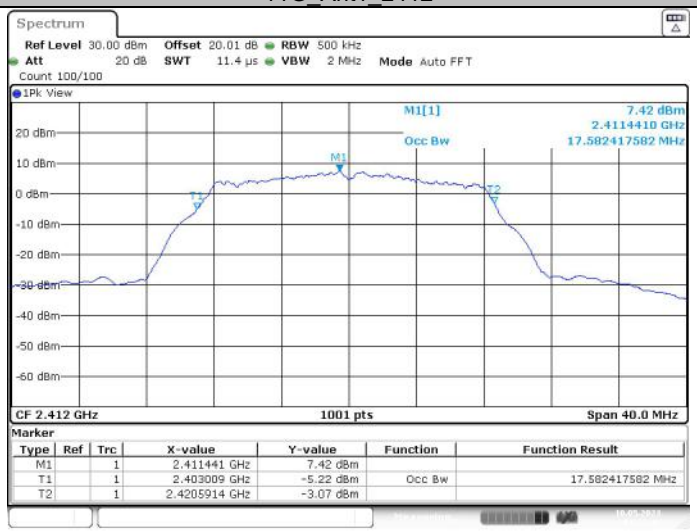


11B_Ant1_2437

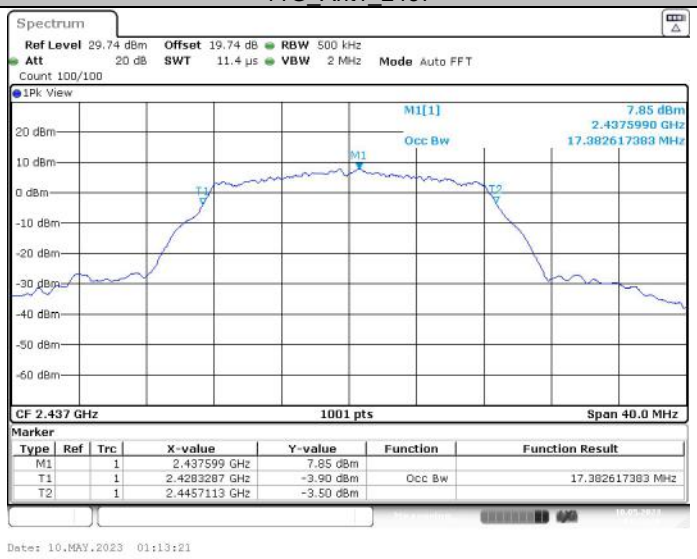


11B_Ant1_2462

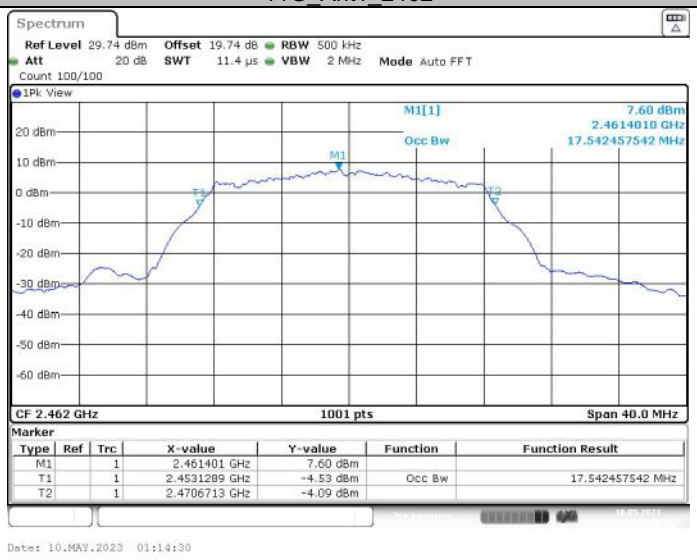
11G_Ant1_2412



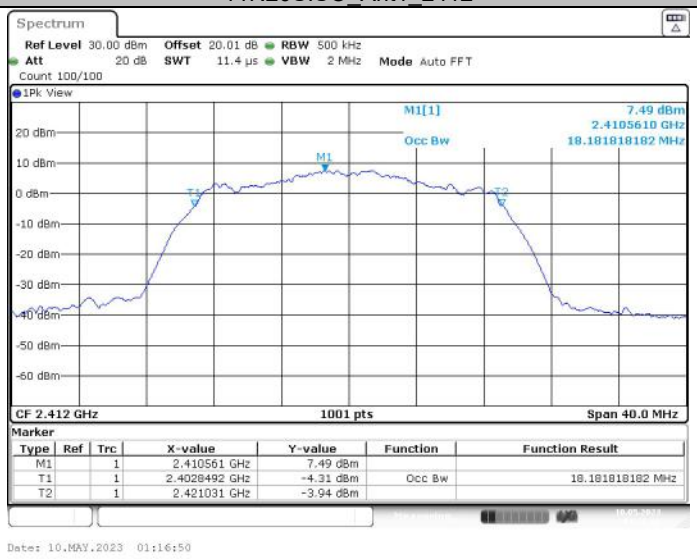
11G_Ant1_2437



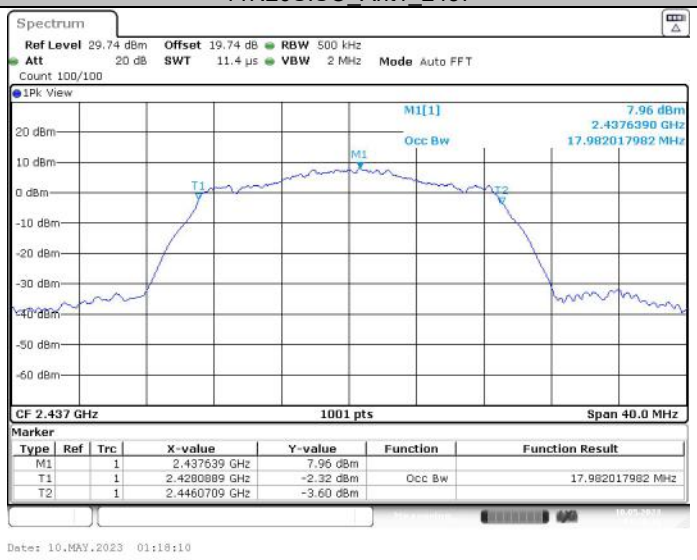
11G_Ant1_2462



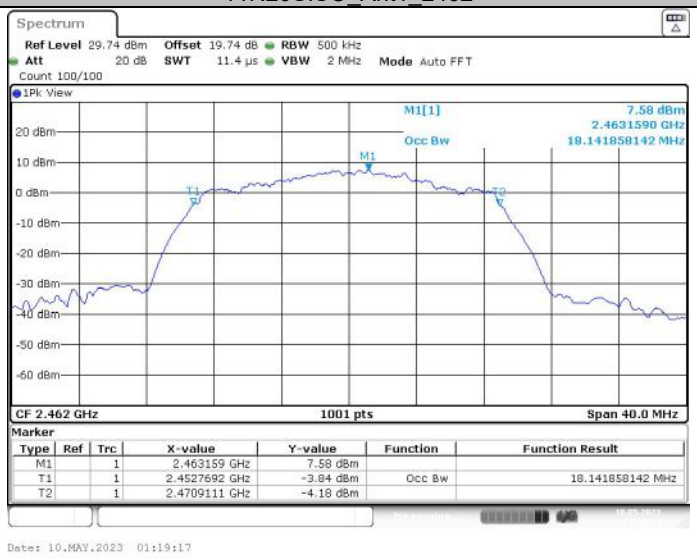
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



Appendix C: Maximum conducted output power

Test Result

Test Mode	Antenna	Frequency[MHz]	Peak Power[dBm]	Conducted Limit [dBm]	Verdict
11B	Ant1	2412	19.39	≤30.00	PASS
		2437	19.64	≤30.00	PASS
		2462	19.19	≤30.00	PASS
11G	Ant1	2412	20.50	≤30.00	PASS
		2437	**20.67**	≤30.00	PASS
		2462	20.55	≤30.00	PASS
11N20SISO	Ant1	2412	20.11	≤30.00	PASS
		2437	20.07	≤30.00	PASS
		2462	19.84	≤30.00	PASS

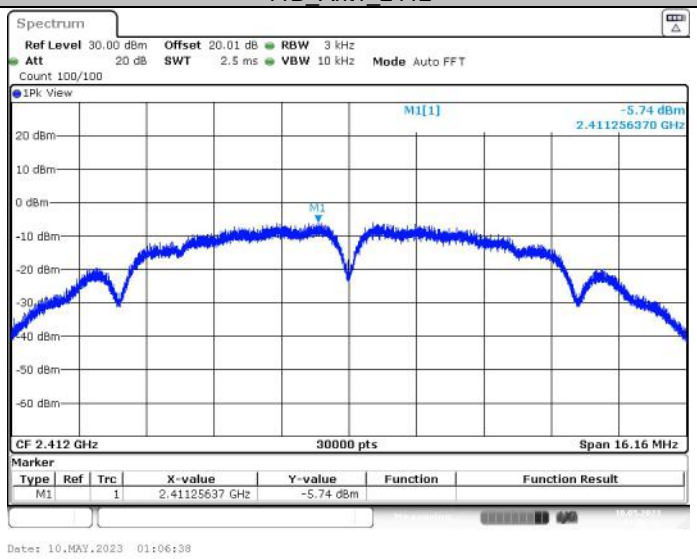
Appendix D: Maximum power spectral density

Test Result

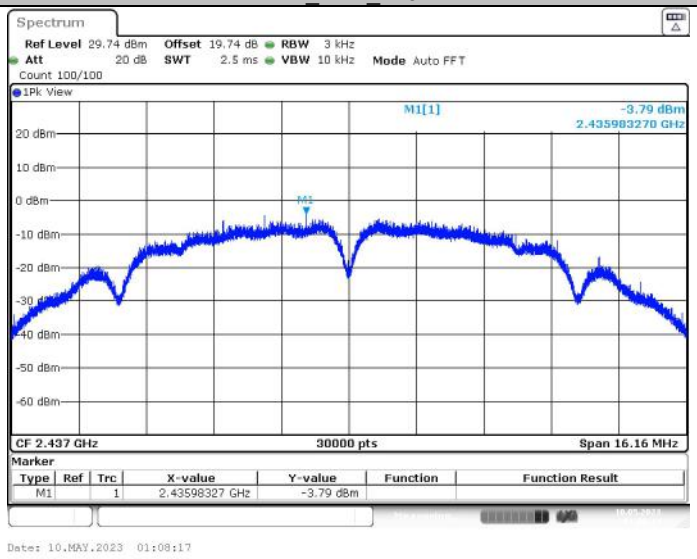
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-5.74	≤8.00	PASS
		2437	-3.79	≤8.00	PASS
		2462	-5.70	≤8.00	PASS
11G	Ant1	2412	-10.07	≤8.00	PASS
		2437	-9.84	≤8.00	PASS
		2462	-9.91	≤8.00	PASS
11N20SISO	Ant1	2412	-9.00	≤8.00	PASS
		2437	-9.72	≤8.00	PASS
		2462	-9.59	≤8.00	PASS

Test Graphs

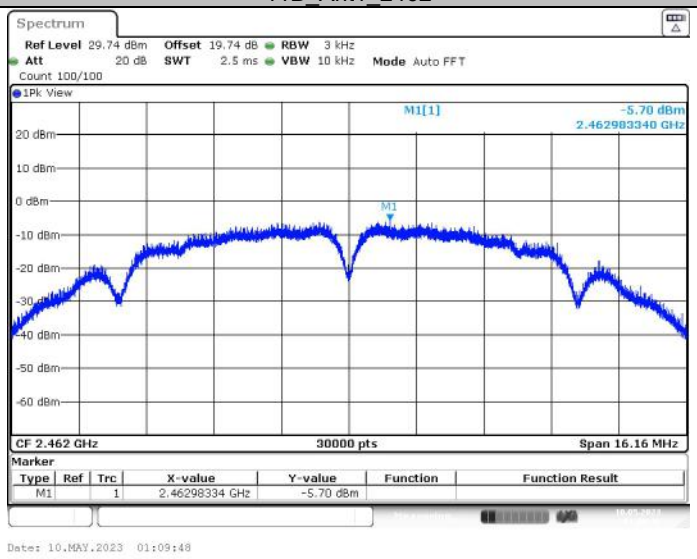
11B_Ant1_2412



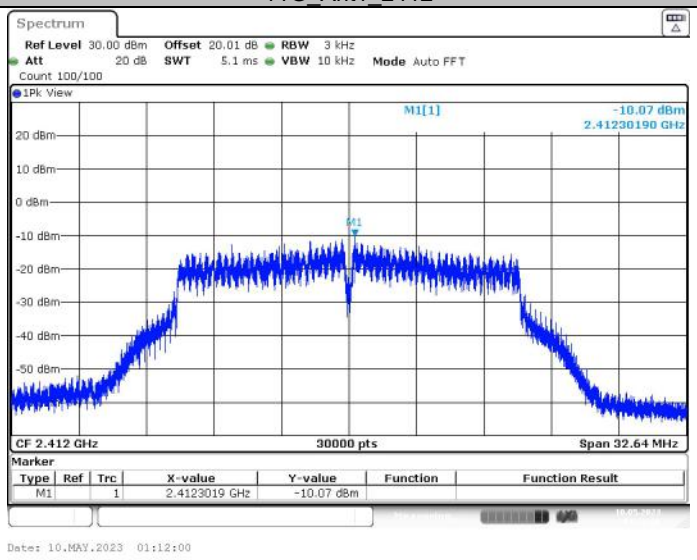
11B_Ant1_2437



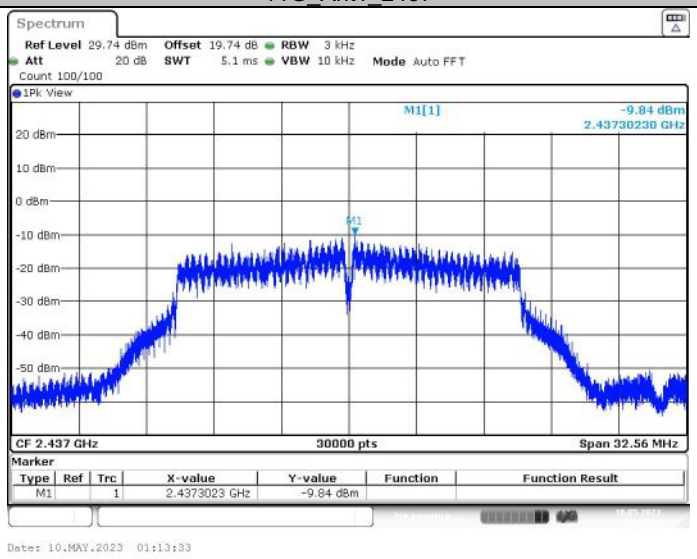
11B_Ant1_2462



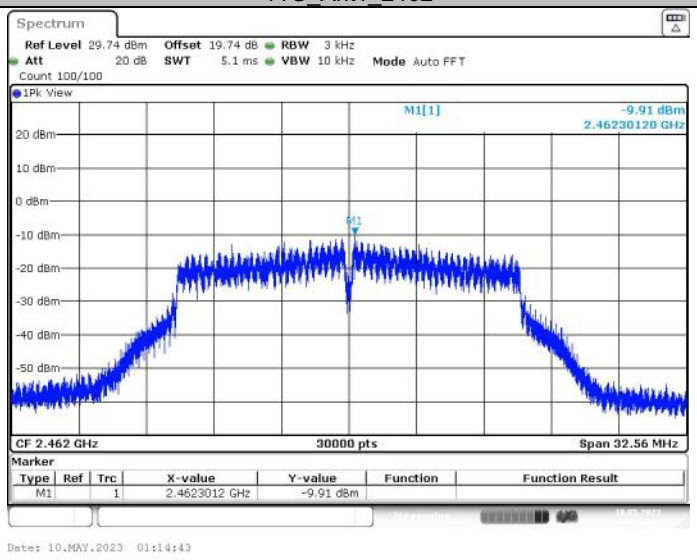
11G_Ant1_2412



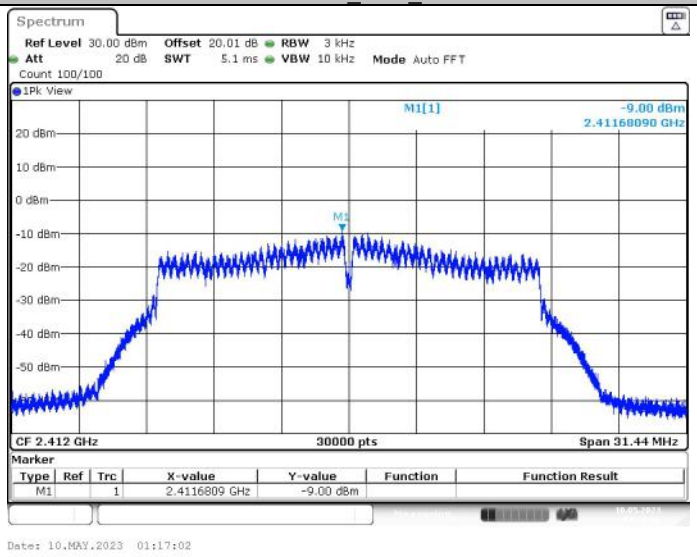
11G_Ant1_2437



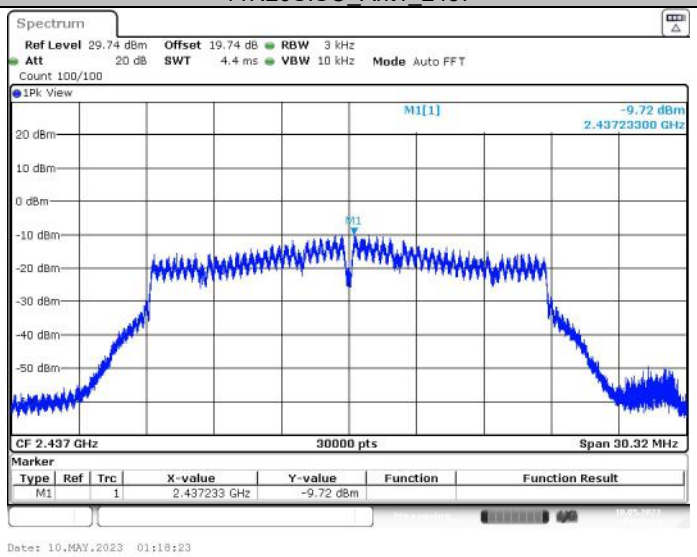
11G_Ant1_2462



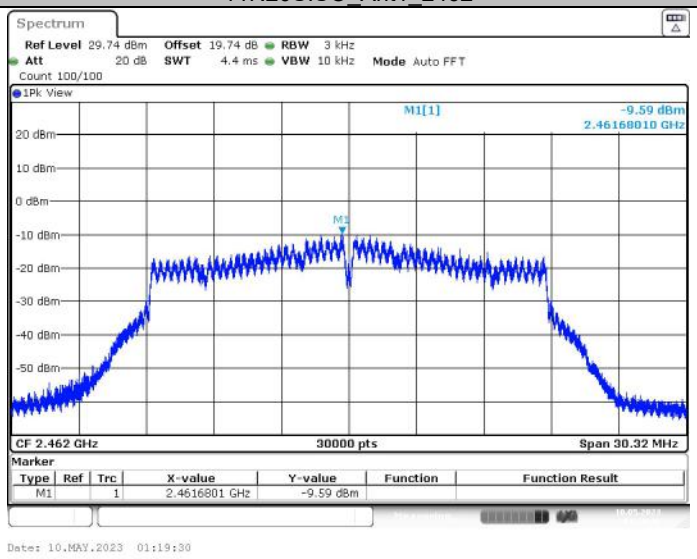
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



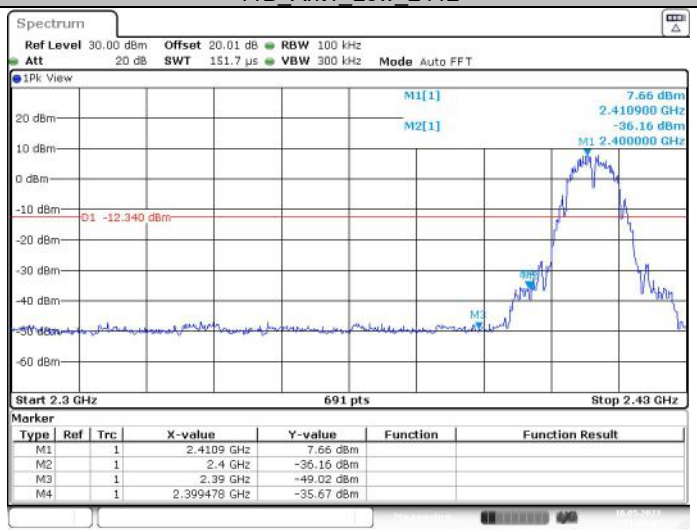
11N20SISO_Ant1_2462



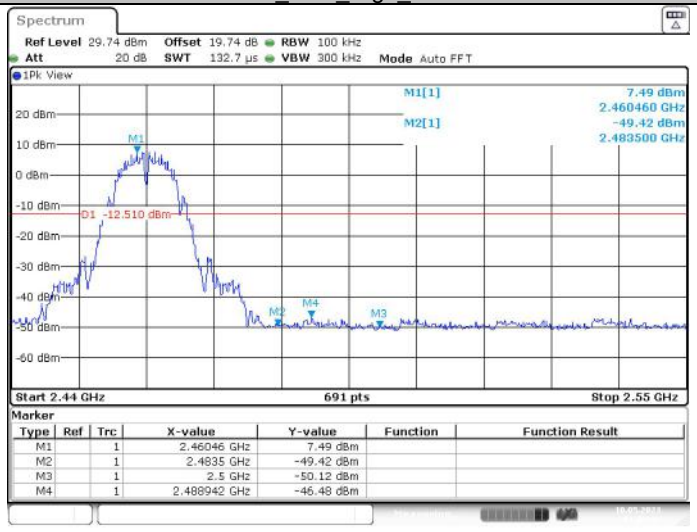
Appendix E: Band edge measurements

Test Graphs

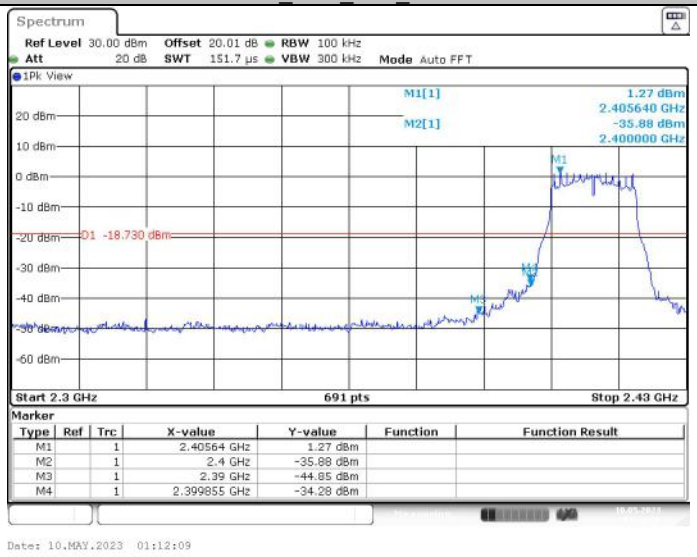
11B_Ant1_Low_2412



11B_Ant1_High_2462



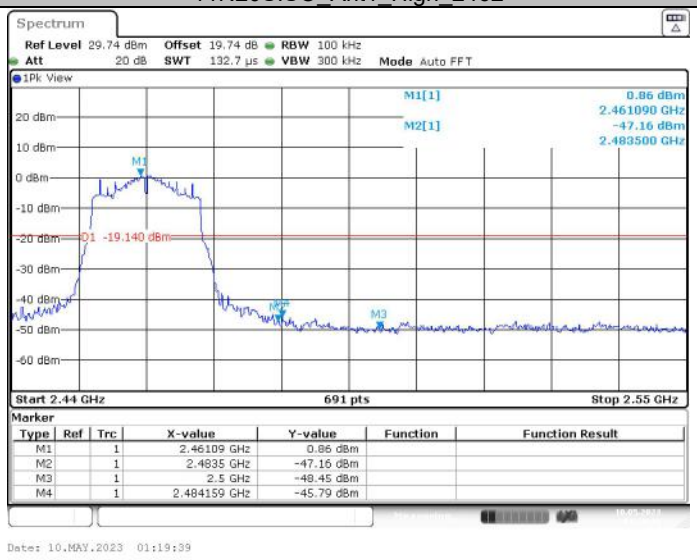
11G_Ant1_Low_2412



11G_Ant1_High_2462

11N20SISO_Ant1_Low_2412

11N20SISO_Ant1_High_2462



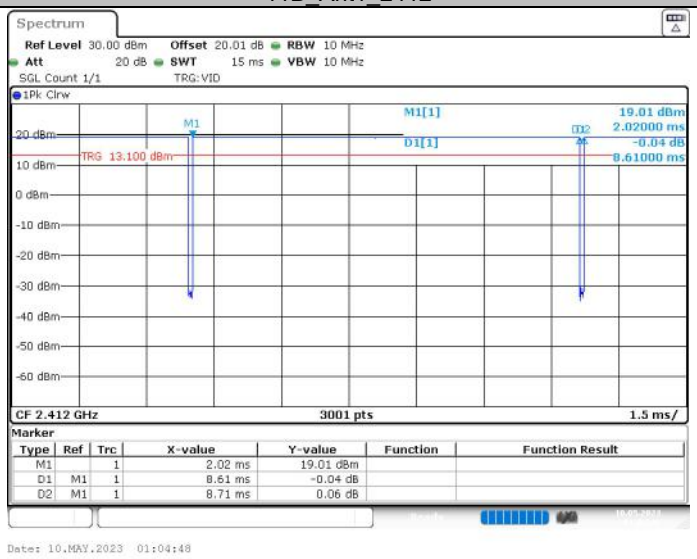
Appendix F: Duty Cycle

Test Result

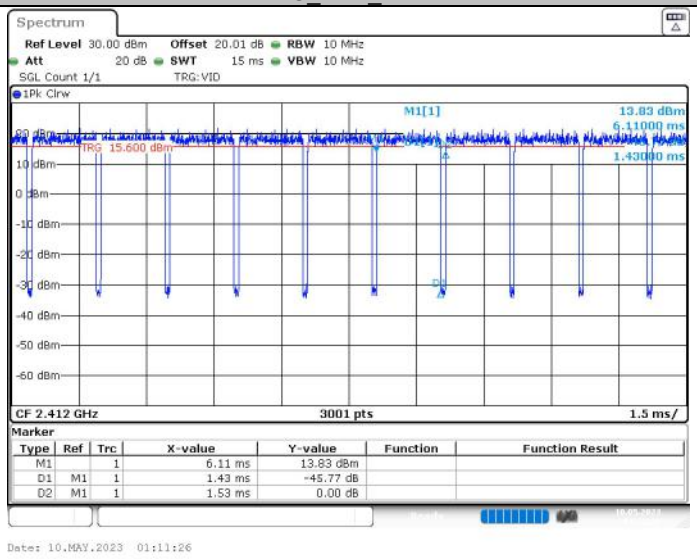
Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T [kHz]
11B	Ant1	2412	8.61	8.71	98.85	0.116
11G	Ant1	2412	1.43	1.53	93.46	0.699
11N20SISO	Ant1	2412	1.33	1.44	92.36	0.752

Test Graphs

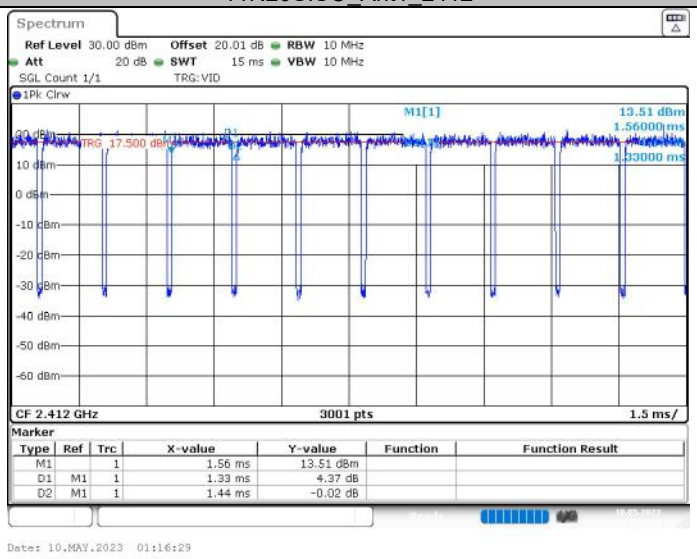
11B_Ant1_2412



11G_Ant1_2412



11N20SISO_Ant1_2412



APPENDIX BLE

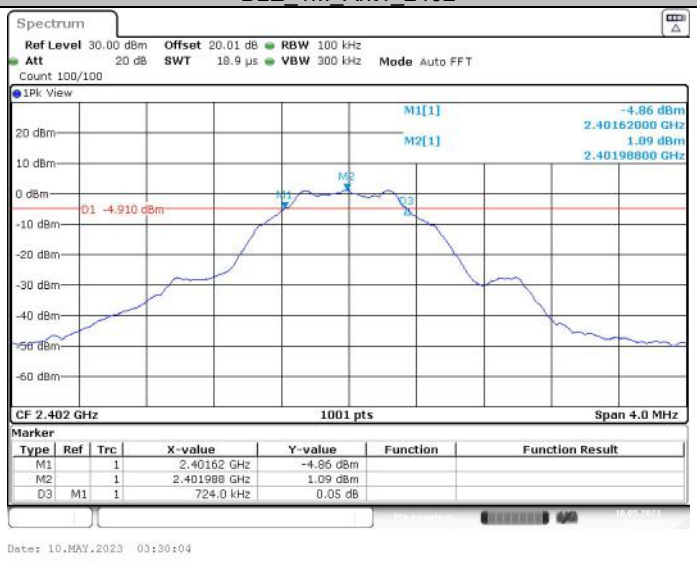
Appendix A: DTS Bandwidth

Test Result

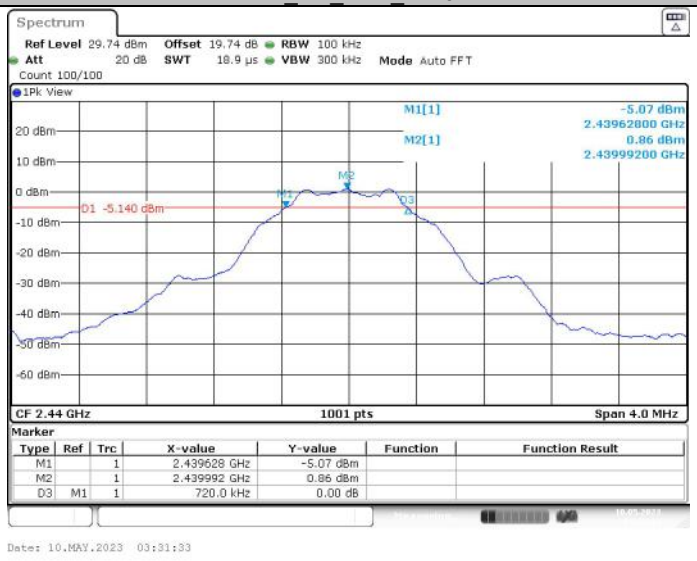
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.72	2401.62	2402.34	0.5	PASS
		2440	0.72	2439.63	2440.35	0.5	PASS
		2480	0.72	2479.63	2480.35	0.5	PASS

Test Graphs

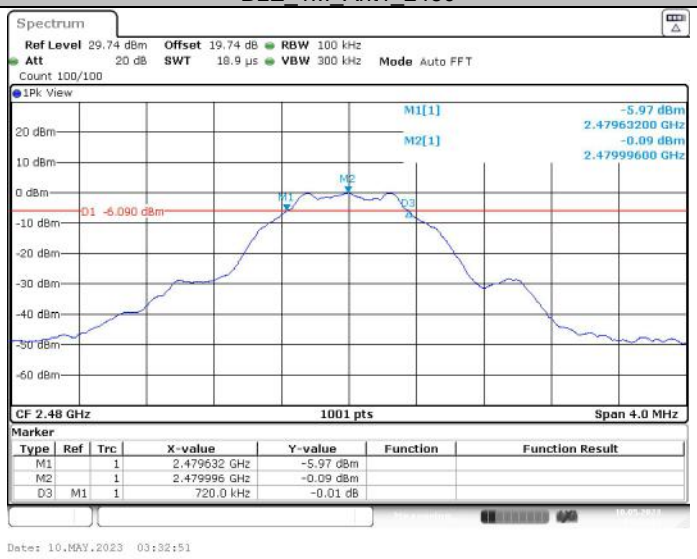
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



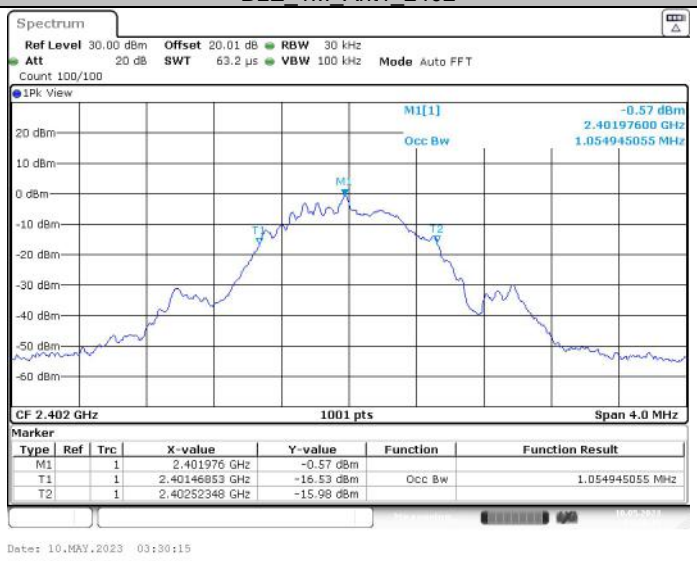
Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
BLE_1M	Ant1	2402	1.055	2401.469	2402.523
		2440	1.055	2439.473	2440.527
		2480	1.055	2479.477	2480.531

Test Graphs

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

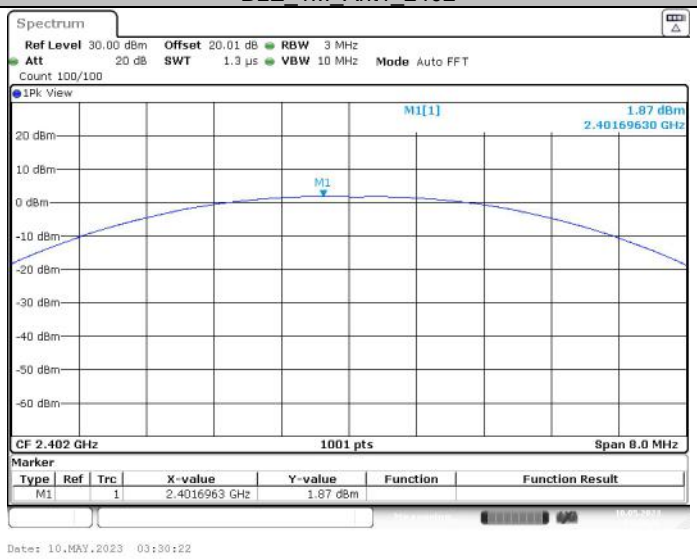
Appendix C: Maximum conducted output power

Test Result

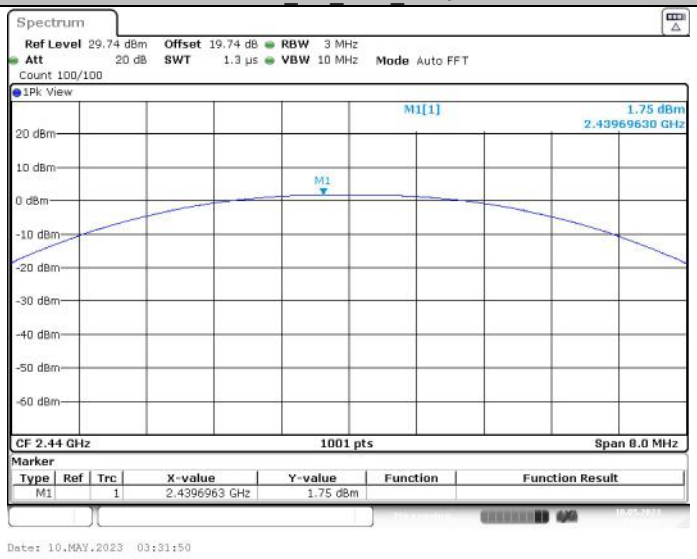
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit [dBm]	Verdict
BLE_1M	Ant1	2402	**1.87**	≤30	PASS
		2440	1.75	≤30	PASS
		2480	0.94	≤30	PASS

Test Graphs Peak

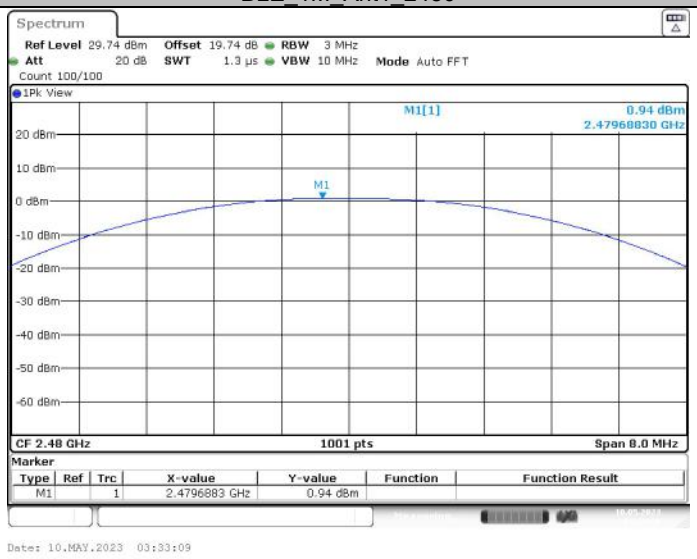
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



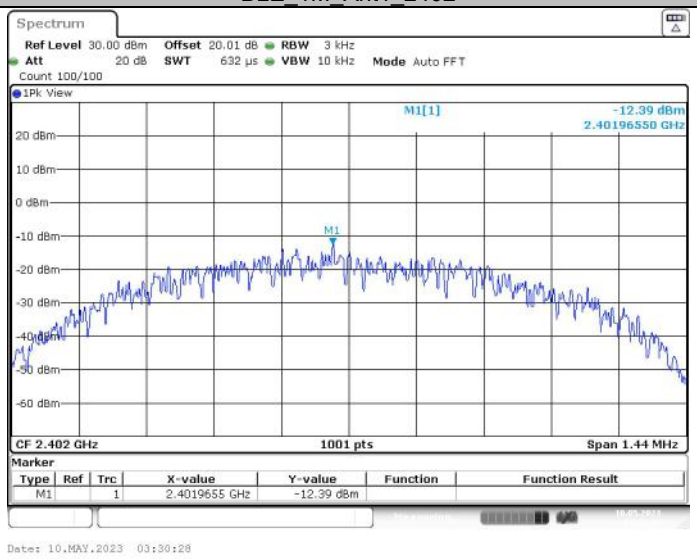
Appendix D: Maximum power spectral density

Test Result

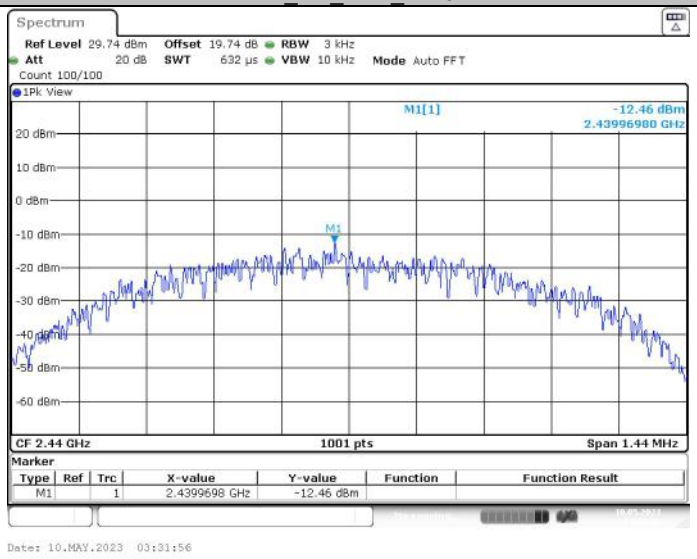
Test Mode	Antenna	Frequency [MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-12.39	≤8.00	PASS
		2440	-12.46	≤8.00	PASS
		2480	-13.51	≤8.00	PASS

Test Graphs

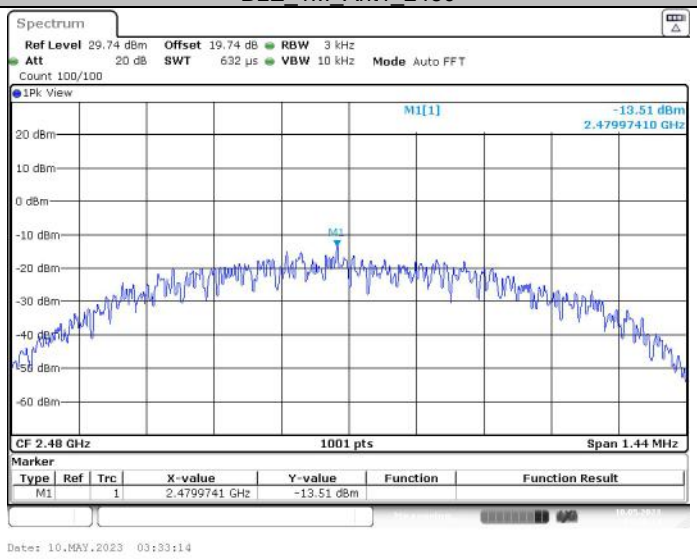
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



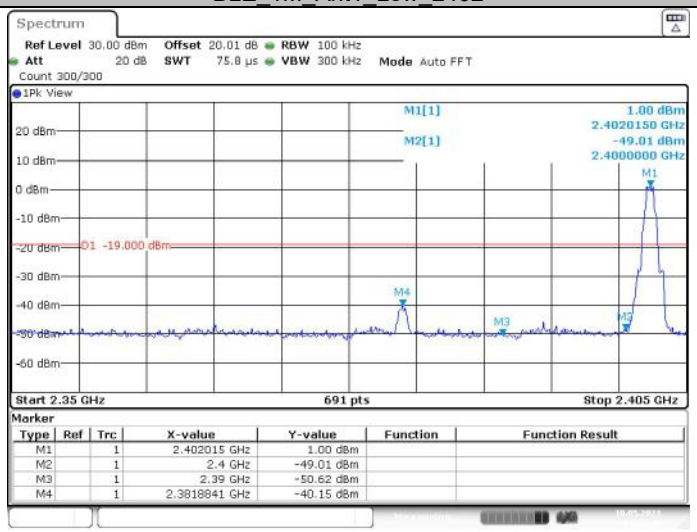
BLE_1M_Ant1_2480



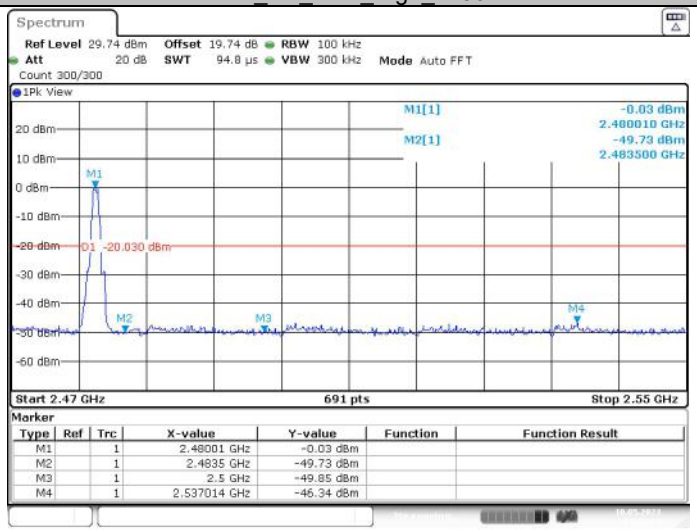
Appendix E: Band edge measurements

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



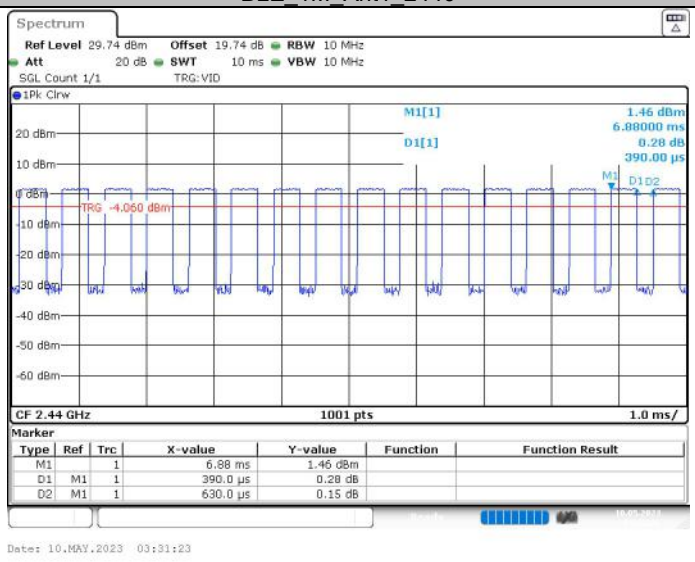
Appendix F: Duty Cycle

Test Result

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	1/T[kHz]
BLE_1M	Ant1	2440	0.39	0.63	61.90	2.564

Test Graphs

BLE_1M_Ant1_2440



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