TEST REPORT

Applicant Name :	AudioCodes Ltd.
Address :	1 Hayarden Street, Airport City, Lod. Israel
Report Number :	SZ6210924-49813E-RF-00B
FCC ID:	XAK455HDB

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	IP Phone 455HD
Model No.:	C455HD
Multiple Model(s) No.:	N/A
Trade Mark:	Audiocodes
Date Received:	2021/09/24
Date of Test:	2021/10/27~2021/12/06
Report Date:	2021/12/07

Test Result:	Pass*

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

Prepared and Checked By:

Ting Lv

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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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	BLE: 2402-2480MHz Wi-Fi: 2412-2462MHz
Maximum Conducted Peak Output Power	BLE: 0.71dBm Wi-Fi: 18.51dBm(802.11b), 19.09dBm(802.11g) 18.71dBm(802.11n20), 19.19dBm(802.11n40)
Modulation Technique	BLE: GFSK Wi-Fi: DSSS, OFDM
Antenna Specification*	BLE: 2.5dBi Wi-Fi: 2.5dBi (provided by the applicant)
Voltage Range	DC 12V from Adapter or DC48V from POE
Sample serial number	SZ6210924-49813E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter information	Model: RD1202000-C55-29MG Input: AC 100-240V, 50/60Hz, 0.6A Output: DC12.0V, 2.0A

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		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz – 30MHz	2.66dB
	30MHz – 1GHz	4.28dB
	1GHz – 18GHz	4.98dB
	18GHz – 26.5GHz	5.06dB
	26.5GHz – 40GHz	4.72dB
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 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. 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.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b, 802.11g, 802.11n-HT20 and 802.11n-HT40 mode, total 11 channels are provided to testing:

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

802.11b, 802.11g and 802.11n-HT20 mode was tested with Channel 1, 6 and 11.
802.11n-HT40 mode was tested with Channel 3, 6 and 9.

For BLE 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

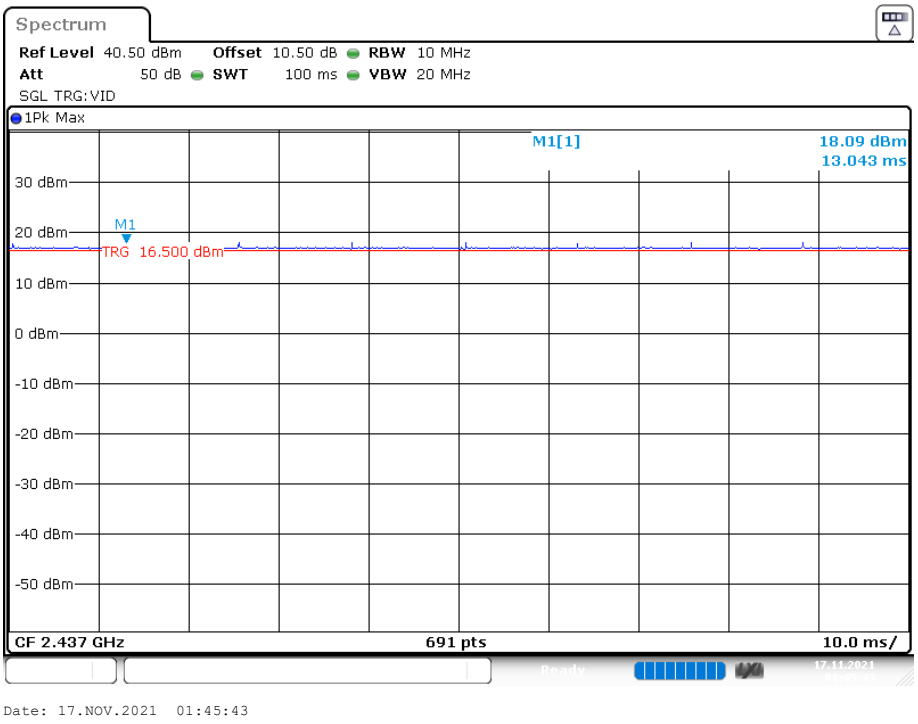
"secureCRT.EXE*" software was used to test, which provided by manufacturer and power level as below:

Mode	Date rate	Power Level*		
		Low Channel	Middle Channel	High Channel
802.11b	1Mbps	40	40	40
802.11g	6Mbps	40	40	40
802.11n-HT20	MCS0	40	40	40
802.11n-HT40	MCS0	40	40	40
BLE	1M	20	20	20

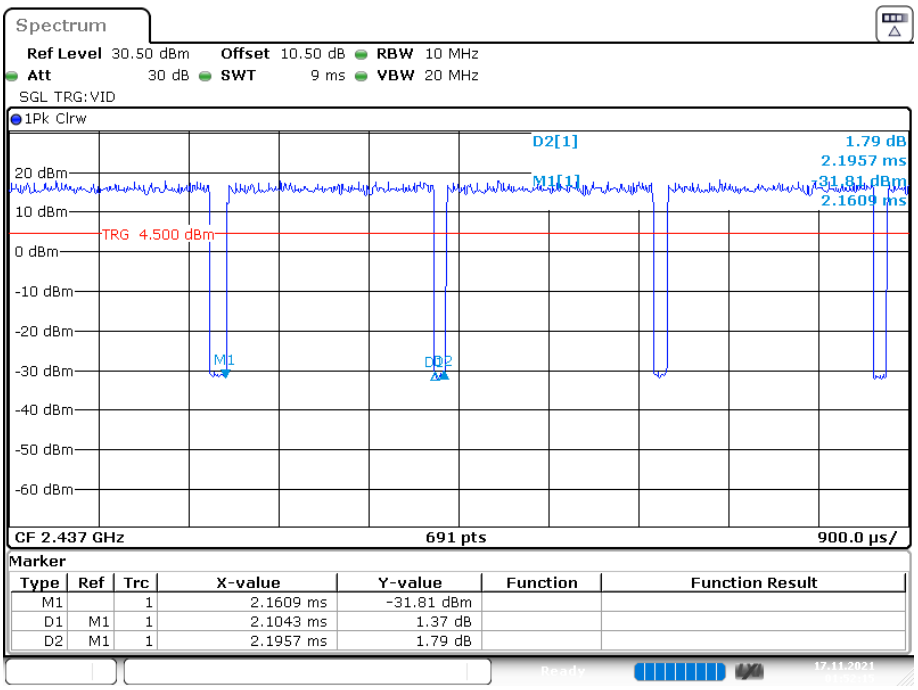
Duty cycle

Mode	Ton(ms)	Ton+Toff(ms)	Duty cycle(%)
802.11 b	-	-	100
802.11 g	2.1043	2.1957	95.84
802.11 n-HT20	1.9377	2.0696	93.63
802.11 n-HT40	0.9565	1.0565	90.53

802.11 b



802.11 g



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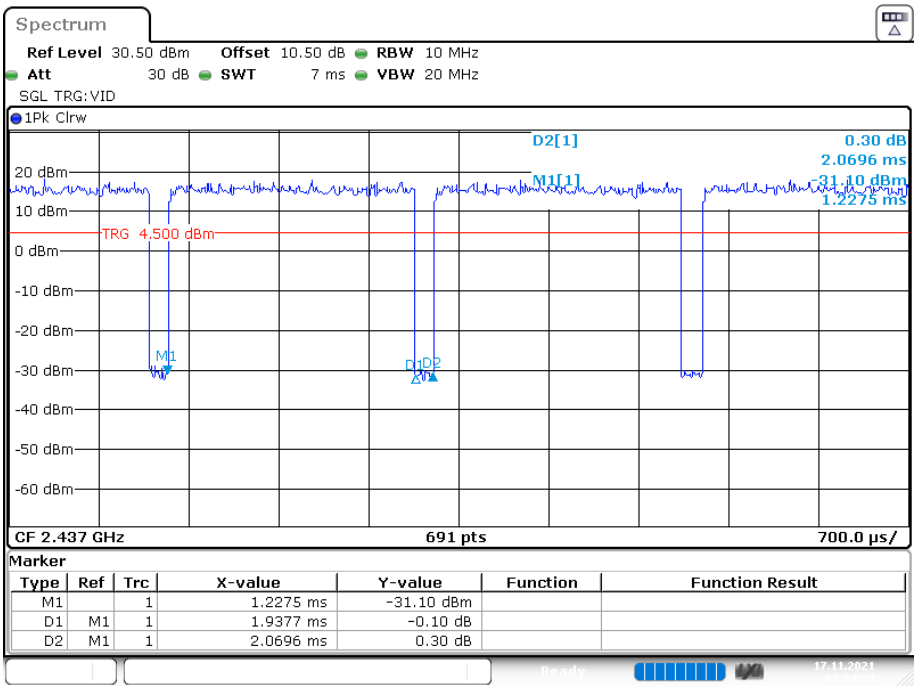
802.11 n-HT20



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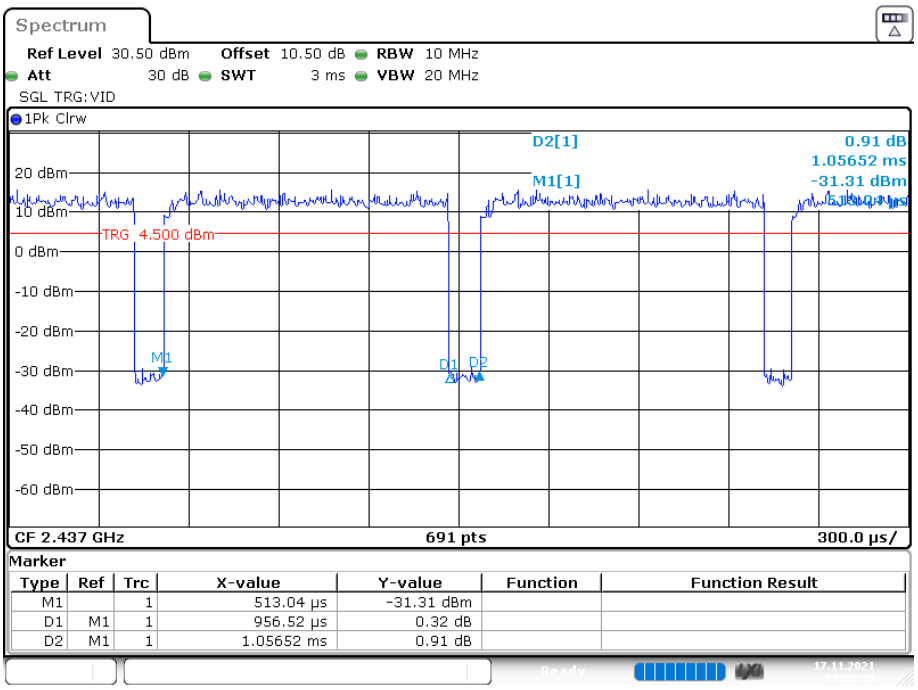
802.11 n-HT40



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For BLE mode, please refer to the Appendix BLE

Support Equipment List and Details

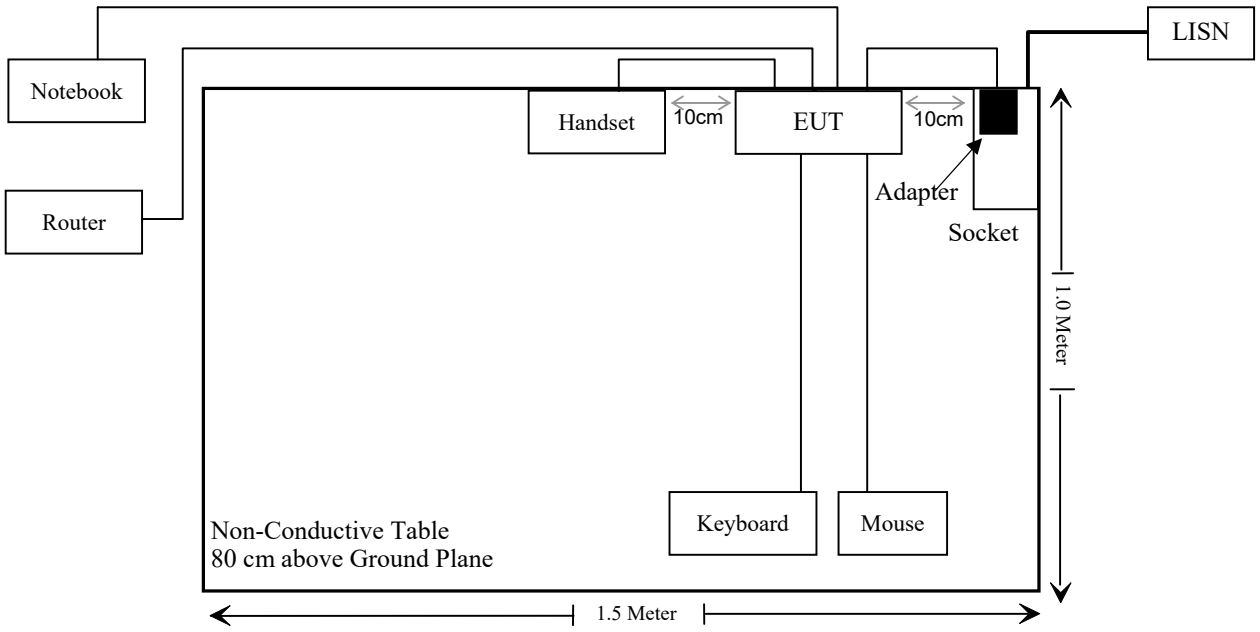
Manufacturer	Description	Model	Serial Number
DELL	NoteBook	Latitude E4710	PC201911252059
HUAWEI	Router	WS5100	A4933FEF1D01
LUOJI	mouse	MS111-L	CN-09RRC7-48729-38F-0H8S
DELL	Keyboard	KB212-B	0K6KPN
GOSPELL	POE	G0720-480-050	212701319

External I/O Cable

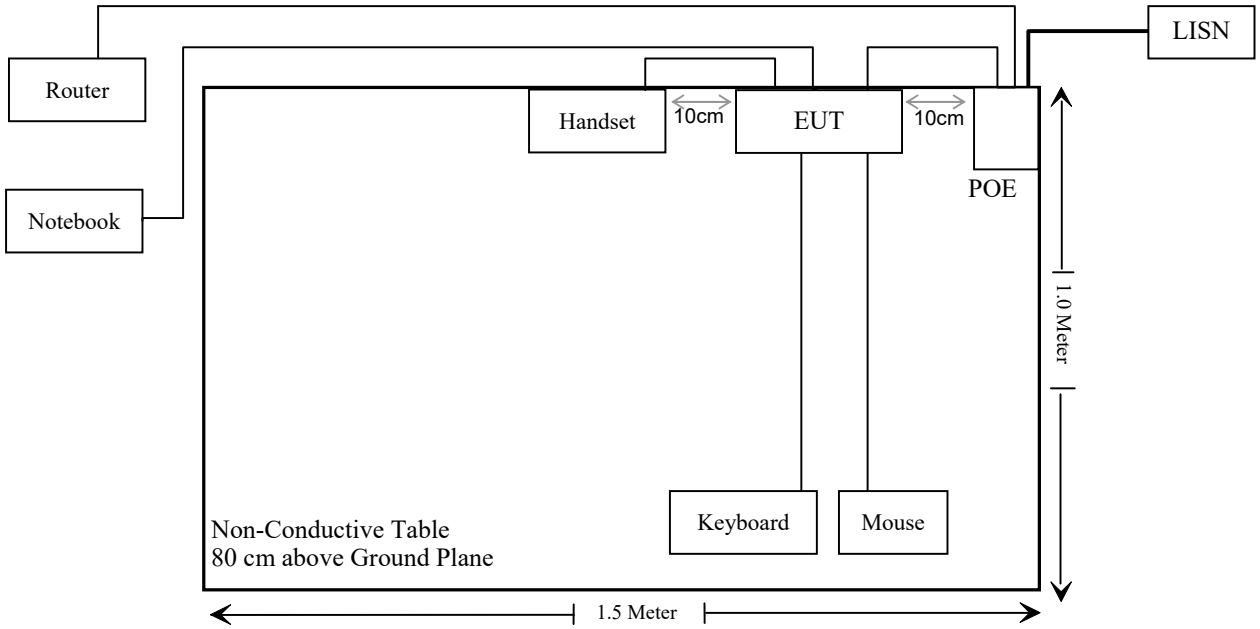
Cable Description	Length (m)	From/Port	To
Un-shielding Detachable DC Cable	1.2	EUT	Adapter
Un-shielded detachable RJ45 Cable	8.0	EUT	NoteBook
Un-shielded detachable RJ45 Cable	8.0	EUT	Router
Un-shielded detachable RJ45 Cable	8.0	Router	POE
Un-shielded detachable RJ45 Cable	0.8	EUT	POE
Un-shielded detachable USB Cable	1.5	EUT	Keyboard
Un-shielded detachable USB Cable	1.5	EUT	Mouse

Block Diagram of Test Setup

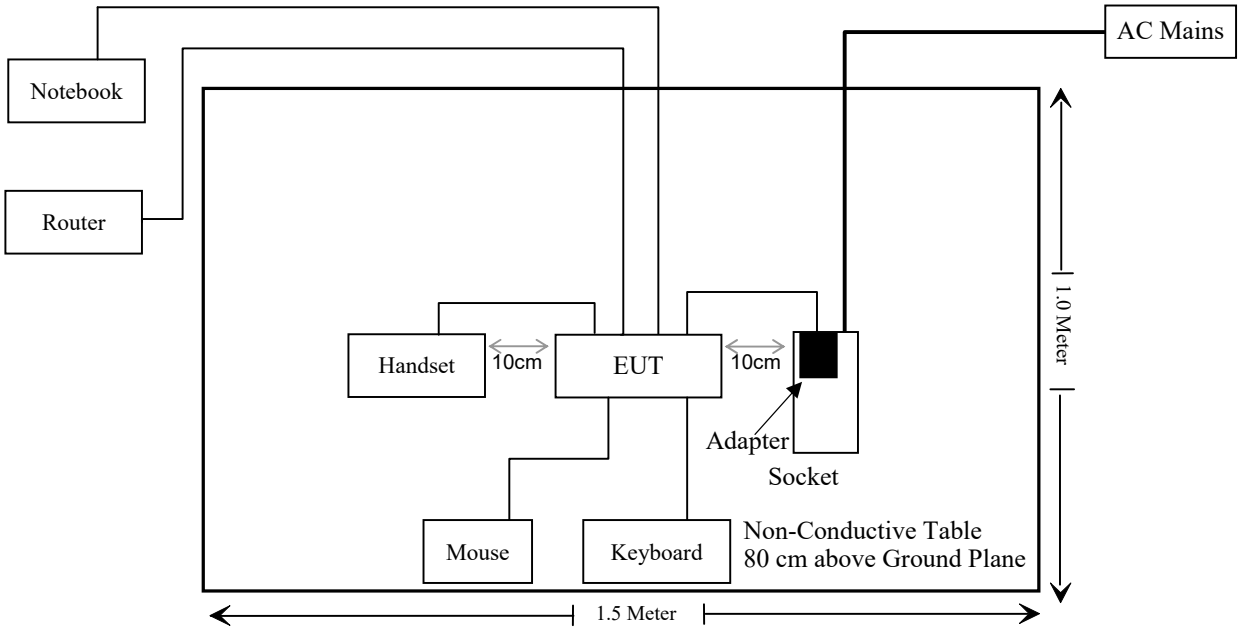
For conducted emission: (Adapter)



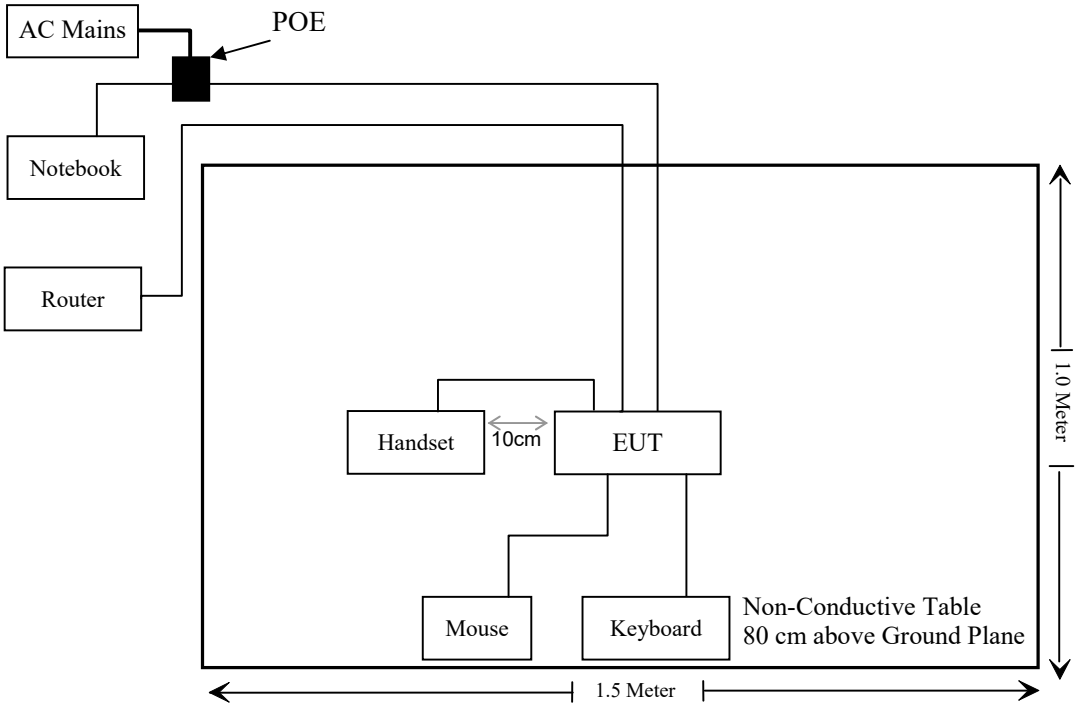
For conducted emission: (POE)



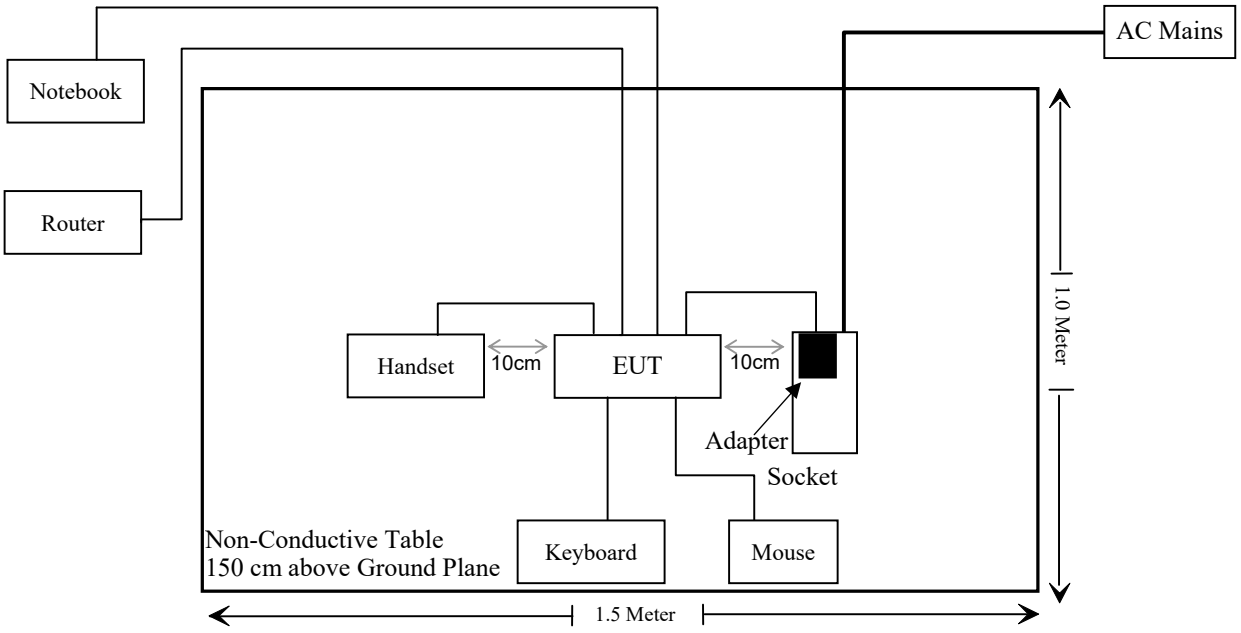
For radiated emission: (below 1GHz-Adapter)



For radiated emission: (below 1GHz-POE)



For radiated emission: (above 1GHz)



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §2.1091	Maximum Permissible Exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth & Occupied Bandwidth	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde& Schwarz	Test Receiver	ESPI3	100396	2020/12/24	2021/12/23
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50ΩCoaxial Switch	MP59B	6200506474	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
Rohde&Schwarz	Spectrum Analyzer	FSV40	101495	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2021/07/08	2022/07/07
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/28	2021/11/27
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Unknown	RF Coaxial Cable	N-5m	No.3	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-5m	No.4	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.6	2020/12/25	2021/12/24
Wainwright	High Pass Filter	WHKX3.6/18G-10SS	5	2020/12/25	2021/12/24
Radiated Emission Test Software: e3 19821b (V9)					

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2020/12/24	2021/12/23
WEINSCHEL	10dB Attenuator	5324	AU 3842	2020/12/25	2021/12/24
Agilent	USB Modular Simultaneous Sampling Multifunction Data Acquisition	U2531A	TW59113529	2021/07/06	2022/07/05
Tonscend	RF Control Unit	JS0806-2	19G8060182	2021/07/06	2022/07/05

*** 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) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) 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.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \le 1$$

Mode	Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
BT	2402-2480	2.5	1.78	8.5	7.08	20	0.0025	1
BLE	2402-2480	2.5	1.78	1.0	1.26	20	0.0004	1
2.4GHz Wi-Fi	2412-2462	2.5	1.78	19.5	89.13	20	0.0316	1
5GHz Wi-Fi	5150-5250	3.52	2.25	13.5	22.39	20	0.0100	1
	5250-5350	3.03	2.01	14.0	25.12	20	0.0101	1
	5470-5725	2.59	1.82	14.0	25.12	20	0.0091	1
	5725-5850	1.97	1.57	13.0	19.95	20	0.0062	1

Note: The 2.4G Wi-Fi/BT/BLE can't transmit with the 5G Wi-Fi at the same time, but 2.4G Wi-Fi can transmit with BT/BLE simultaneously.

Simultaneous transmitting consideration (worst case):

The ratio=$MPE_{2.4G\ Wi\text{-}Fi}$/limit+MPE_{BT}/limit=0.0316/1+0.0025/1=0.0341＜1.0

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

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.

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 for BLE and one internal Antenna arrangement for Wi-Fi, which were permanently attached and both the antenna gain is 2.5dBi, fulfill the requirement of this section. Please refer to the EUT photos.

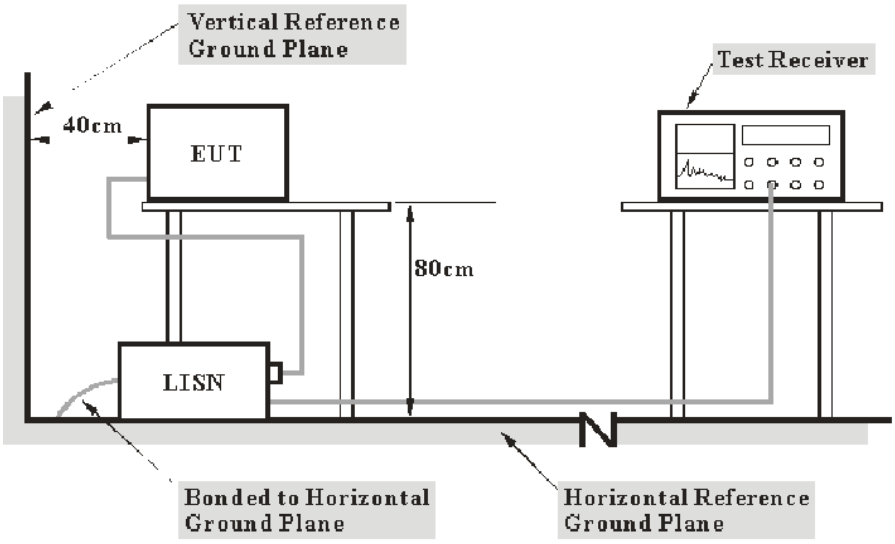
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

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), Cable Loss. 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 = Result – Limit
Result= reading level+ Transd Factor

Test Data

Environmental Conditions

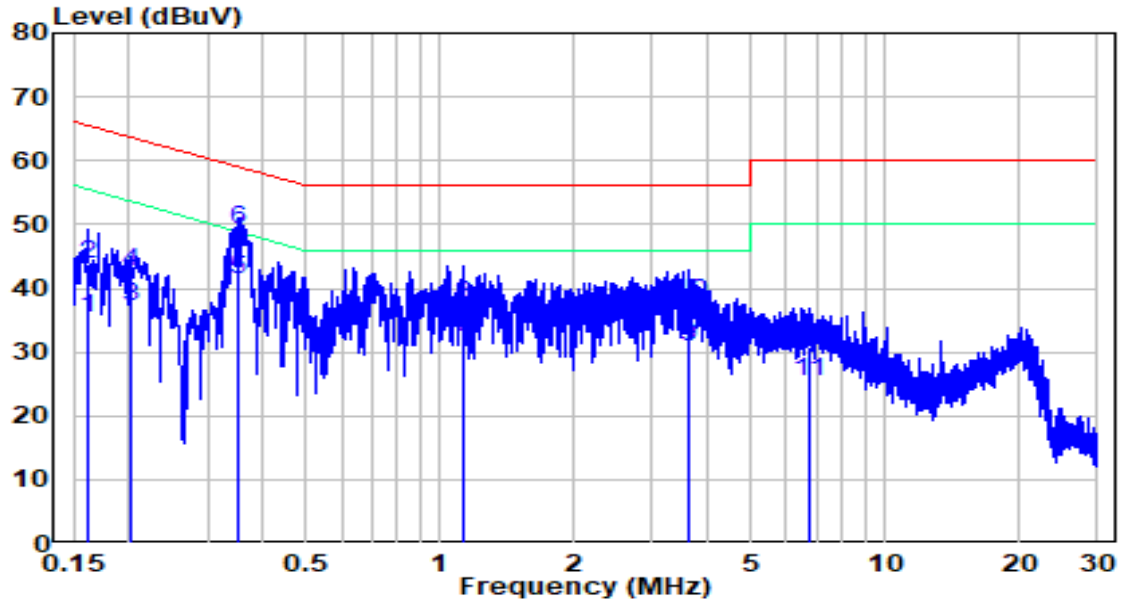
Temperature:	25℃
Relative Humidity:	48 %
ATM Pressure:	101.0 kPa

The testing was performed by Bin Deng on 2021-10-27.

EUT operation mode: Transmitting (the worst case is 802.11g mode, Middle channel)

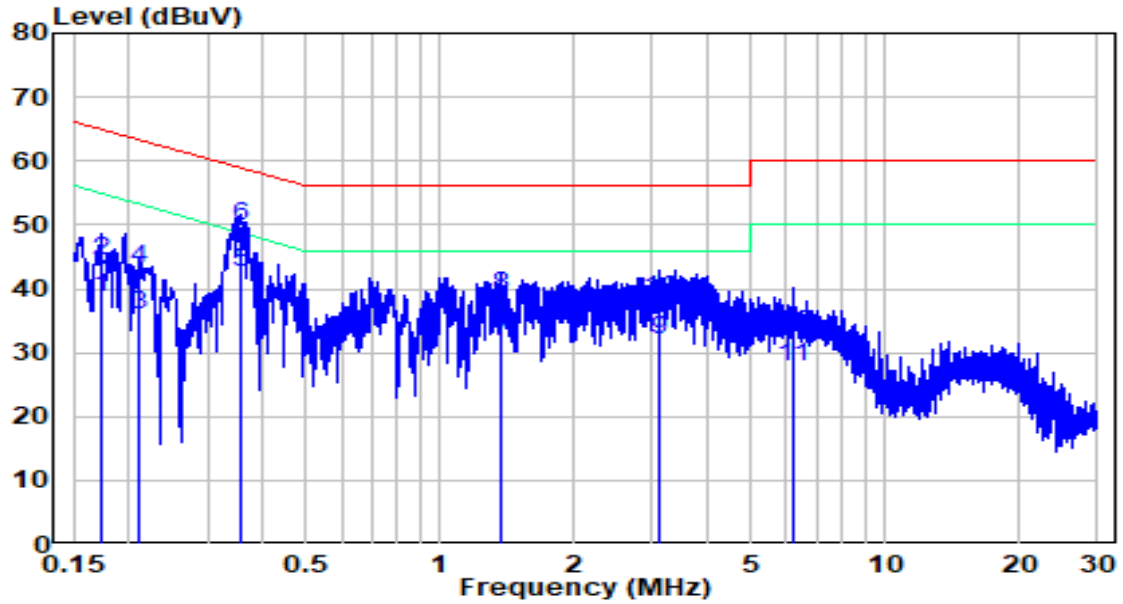
Powered by Adapter:

AC 120V/60 Hz, Line



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)		
1	0.161	25.56	9.88	35.44	55.42	-19.98	Average	Line
2	0.161	33.91	9.88	43.78	65.42	-21.64	QP	Line
3	0.201	27.24	9.80	37.04	53.57	-16.53	Average	Line
4	0.201	32.75	9.80	42.56	63.57	-21.01	QP	Line
5	0.353	31.68	9.80	41.49	48.88	-7.39	Average	Line
6	0.353	39.49	9.80	49.29	58.88	-9.59	QP	Line
7	1.123	22.37	9.83	32.20	46.00	-13.80	Average	Line
8	1.123	27.75	9.83	37.57	56.00	-18.43	QP	Line
9	3.606	21.00	9.94	30.94	46.00	-15.06	Average	Line
10	3.606	27.79	9.94	37.73	56.00	-18.27	QP	Line
11	6.760	15.40	10.06	25.46	50.00	-24.54	Average	Line
12	6.760	20.86	10.06	30.92	60.00	-29.08	QP	Line

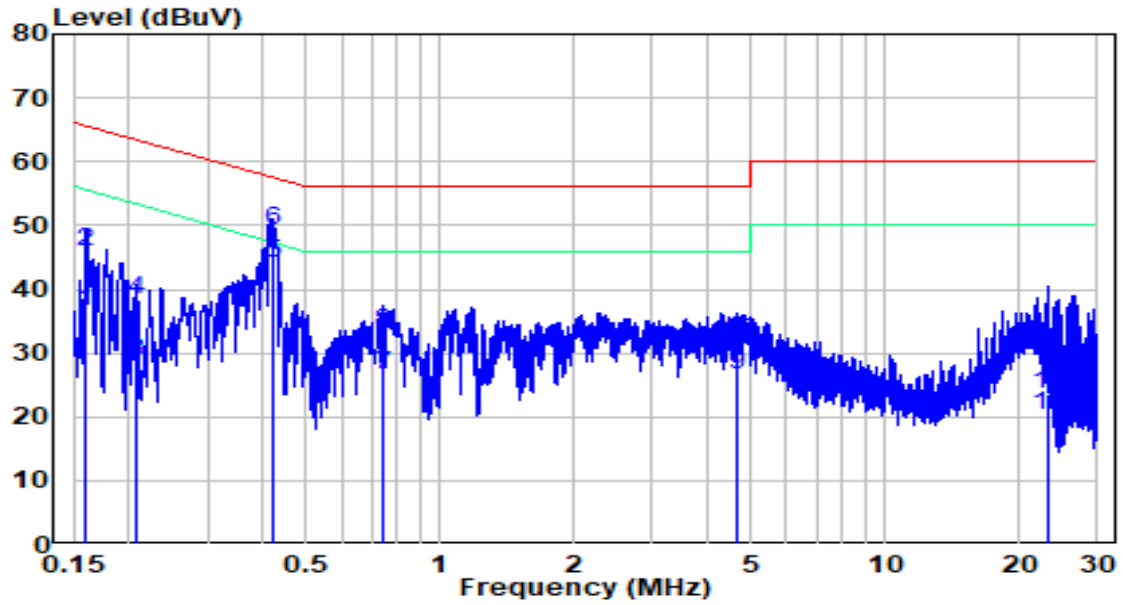
AC 120V/60 Hz, Neutral



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)		
1	0.174	28.58	9.95	38.53	54.78	-16.25	Average	Neutral
2	0.174	34.32	9.95	44.27	64.78	-20.51	QP	Neutral
3	0.210	26.05	10.00	36.05	53.21	-17.16	Average	Neutral
4	0.210	33.09	10.00	43.08	63.21	-20.13	QP	Neutral
5	0.357	32.63	9.94	42.57	48.80	-6.23	Average	Neutral
6	0.357	39.73	9.94	49.67	58.80	-9.13	QP	Neutral
7	1.370	21.65	9.91	31.56	46.00	-14.44	Average	Neutral
8	1.370	28.96	9.91	38.87	56.00	-17.13	QP	Neutral
9	3.111	21.89	9.99	31.89	46.00	-14.11	Average	Neutral
10	3.111	28.28	9.99	38.27	56.00	-17.73	QP	Neutral
11	6.198	17.75	10.06	27.81	50.00	-22.19	Average	Neutral
12	6.198	22.78	10.06	32.84	60.00	-27.16	QP	Neutral

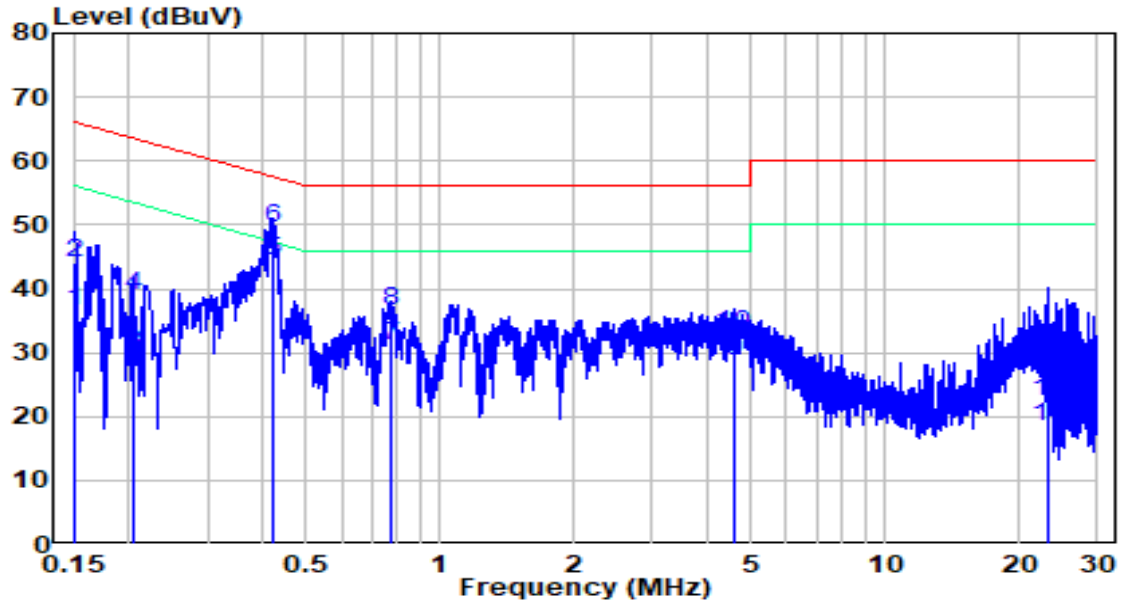
Powered by POE:

AC 120V/60 Hz, Line



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)		
1	0.160	26.77	9.88	36.65	55.46	-18.81	Average	Line
2	0.160	36.00	9.88	45.88	65.46	-19.58	QP	Line
3	0.207	18.94	9.80	28.74	53.32	-24.58	Average	Line
4	0.207	28.48	9.80	38.28	63.32	-25.04	QP	Line
5	0.418	34.27	9.80	44.08	47.48	-3.40	Average	Line
6	0.418	39.35	9.80	49.15	57.48	-8.33	QP	Line
7	0.742	16.73	9.81	26.54	46.00	-19.46	Average	Line
8	0.742	23.35	9.81	33.16	56.00	-22.84	QP	Line
9	4.653	16.56	9.97	26.53	46.00	-19.47	Average	Line
10	4.653	21.76	9.97	31.73	56.00	-24.27	QP	Line
11	23.140	9.91	10.30	20.21	50.00	-29.79	Average	Line
12	23.140	13.39	10.30	23.69	60.00	-36.31	QP	Line

AC 120V/60 Hz, Neutral



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)		
1	0.151	26.54	9.90	36.45	55.94	-19.49	Average	Neutral
2	0.151	34.20	9.90	44.11	65.94	-21.83	QP	Neutral
3	0.204	19.91	10.00	29.91	53.44	-23.53	Average	Neutral
4	0.204	28.82	10.00	38.82	63.44	-24.62	QP	Neutral
5	0.420	34.56	9.92	44.48	47.45	-2.97	Average	Neutral
6	0.420	39.66	9.92	49.58	57.45	-7.87	QP	Neutral
7	0.777	21.22	9.91	31.13	46.00	-14.87	Average	Neutral
8	0.777	26.68	9.91	36.58	56.00	-19.42	QP	Neutral
9	4.555	18.50	10.05	28.54	46.00	-17.46	Average	Neutral
10	4.555	22.94	10.05	32.98	56.00	-23.02	QP	Neutral
11	23.140	8.21	10.27	18.48	50.00	-31.52	Average	Neutral
12	23.140	12.08	10.27	22.34	60.00	-37.66	QP	Neutral

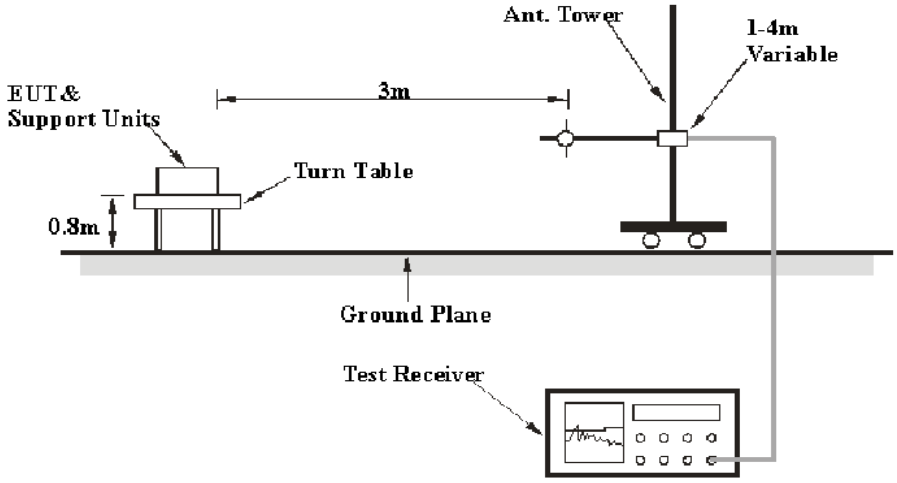
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

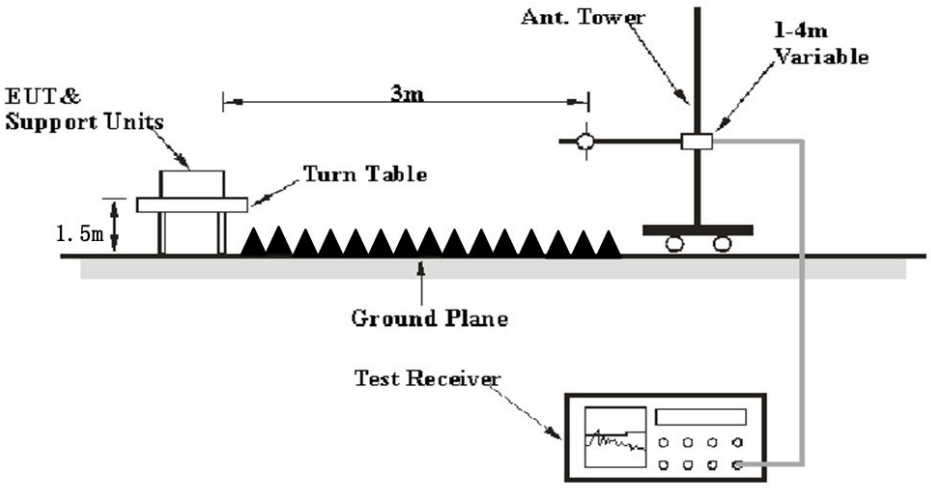
FCC §15.247 (d); §15.209; §15.205;

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.

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 over limit or margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Over limit/Margin = Result/Corrected Amplitude-Limit
Result/Corrected Amplitude = Reading + Corrected Factor

Test Data

Environmental Conditions

Temperature:	25~28.6℃
Relative Humidity:	48~54%
ATM Pressure:	100.9~101.0 kPa

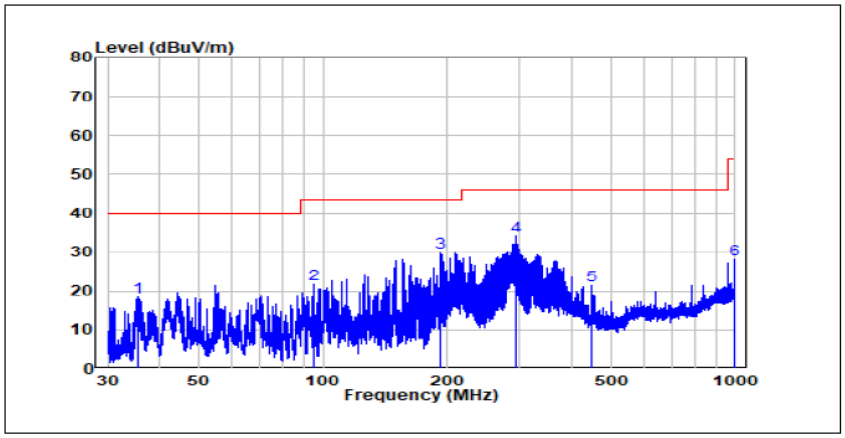
The testing was performed by Chao Mo on 2021-10-27 for below 1GHz and Caro Hu on 2021-11-14 for above 1GHz.

EUT operation mode: Transmitting

30MHz-1GHz: *(the worst case is 802.11b mode, Middle channel)*

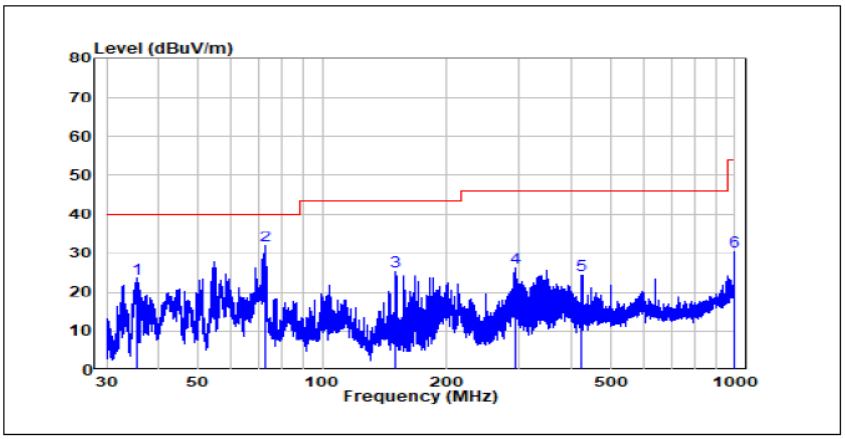
Powered by Adapter

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	35.577	37.87	-19.35	18.52	40.00	-21.48	Peak	HORIZONTAL
2	94.885	42.04	-20.23	21.81	43.50	-21.69	Peak	HORIZONTAL
3	192.672	49.69	-19.87	29.82	43.50	-13.68	Peak	HORIZONTAL
4	293.985	50.97	-16.94	34.03	46.00	-11.97	Peak	HORIZONTAL
5	450.147	35.75	-14.28	21.47	46.00	-24.53	Peak	HORIZONTAL
6	999.562	35.36	-7.35	28.01	54.00	-25.99	Peak	HORIZONTAL

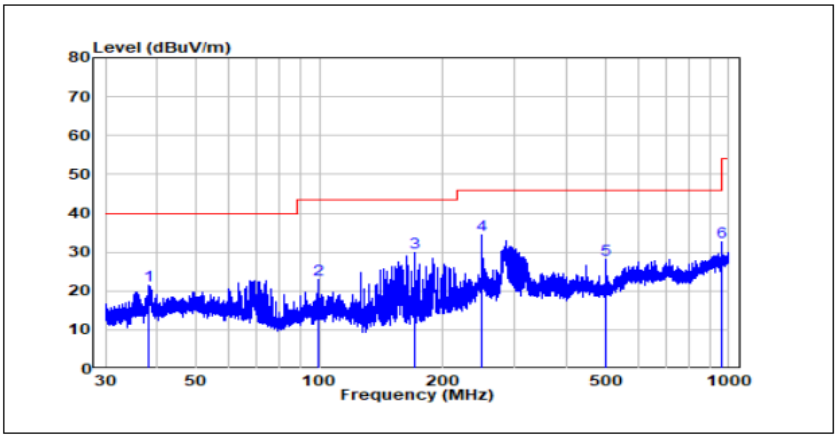
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	35.468	42.81	-19.37	23.44	40.00	-16.56	Peak	VERTICAL
2	72.751	53.99	-21.84	32.15	40.00	-7.85	Peak	VERTICAL
3	150.011	46.94	-21.58	25.36	43.50	-18.14	Peak	VERTICAL
4	293.856	43.11	-16.95	26.16	46.00	-19.84	Peak	VERTICAL
5	425.961	38.97	-14.40	24.57	46.00	-21.43	Peak	VERTICAL
6	997.811	37.96	-7.39	30.57	54.00	-23.43	Peak	VERTICAL

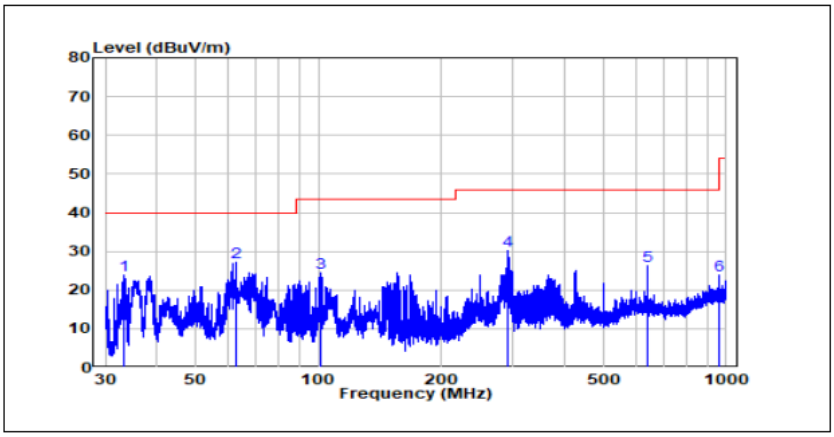
Powered by POE

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	38.380	40.36	-18.91	21.45	40.00	-18.55	Peak	HORIZONTAL
2	99.354	42.36	-19.30	23.06	43.50	-20.44	Peak	HORIZONTAL
3	170.643	50.97	-21.00	29.97	43.50	-13.53	Peak	HORIZONTAL
4	249.972	52.93	-18.53	34.40	46.00	-11.60	Peak	HORIZONTAL
5	500.082	42.40	-14.18	28.22	46.00	-17.78	Peak	HORIZONTAL
6	960.056	40.51	-7.99	32.52	54.00	-21.48	Peak	HORIZONTAL

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Remark	Phase
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	33.313	43.63	-19.82	23.81	40.00	-16.19	Peak	VERTICAL
2	62.871	47.14	-20.03	27.11	40.00	-12.89	Peak	VERTICAL
3	101.466	43.62	-19.17	24.46	43.50	-19.04	Peak	VERTICAL
4	291.291	47.30	-17.10	30.20	46.00	-15.80	Peak	VERTICAL
5	639.209	37.58	-11.23	26.35	46.00	-19.65	Peak	VERTICAL
6	960.056	31.91	-7.99	23.92	54.00	-30.08	Peak	VERTICAL

1-25 GHz:

BLE:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
BLE 1M, Low Channel									
2310	68.41	PK	32	1.6	V	-7.24	61.17	74	-12.83
2310	56.23	Ave.	32	1.6	V	-7.24	48.99	54	-5.01
2310	56.80	PK	94	1.8	H	-7.24	49.56	74	-24.44
2310	51.90	Ave.	94	1.8	H	-7.24	44.66	54	-9.34
2390	71.19	PK	238	1.5	V	-7.22	63.97	74	-10.03
2390	57.20	Ave.	238	1.5	V	-7.22	49.98	54	-4.02
2390	67.58	PK	295	1.6	H	-7.22	60.36	74	-13.64
2390	52.69	Ave.	295	1.6	H	-7.22	45.47	54	-8.53
4804	55.20	PK	184	1.5	V	-3.51	51.69	74	-22.31
4804	50.73	PK	308	1.9	H	-3.51	47.22	74	-26.78
BLE 1M, Middle Channel									
4880	55.40	PK	24	1.7	V	-3.38	52.02	74	-21.98
4880	51.38	PK	199	1.9	H	-3.38	48.00	74	-26.00
BLE 1M, High Channel									
2483.5	68.45	PK	40	2.0	V	-7.20	61.25	74	-12.75
2483.5	56.10	Ave.	40	2.0	V	-7.20	48.90	54	-5.10
2483.5	67.07	PK	201	1.9	H	-7.20	59.87	74	-14.13
2483.5	53.57	Ave.	201	1.9	H	-7.20	46.37	54	-7.63
2500	66.12	PK	145	1.6	V	-7.18	58.94	74	-15.06
2500	49.84	Ave.	145	1.6	V	-7.18	42.66	54	-11.34
2500	64.80	PK	328	2.0	H	-7.18	57.62	74	-16.38
2500	50.95	Ave.	328	2.0	H	-7.18	43.77	54	-10.23
4960	55.87	PK	344	1.7	V	-3.01	52.86	74	-21.14
4960	51.22	PK	337	1.5	H	-3.01	48.21	74	-25.79

Wi-Fi:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11B, Low Channel									
2310	67.62	PK	340	2.0	H	-7.24	60.38	74	-13.62
2310	53.42	Ave.	340	2.0	H	-7.24	46.18	54	-7.82
2310	65.43	PK	202	1.5	V	-7.24	58.19	74	-15.81
2310	51.90	Ave.	202	1.5	V	-7.24	44.66	54	-9.34
2390	71.21	PK	227	1.7	H	-7.22	63.99	74	-10.01
2390	57.34	Ave.	227	1.7	H	-7.22	50.12	54	-3.88
2390	66.45	PK	8	1.6	V	-7.22	59.23	74	-14.77
2390	52.13	Ave.	8	1.6	V	-7.22	44.91	54	-9.09
4824	56.09	PK	295	1.8	H	-3.52	52.57	74	-21.43
4824	52.04	PK	254	2.0	V	-3.52	48.52	74	-25.48
802.11B, Middle Channel									
4874	55.74	PK	346	1.7	H	-3.42	52.32	74	-21.68
4874	50.96	PK	338	1.7	V	-3.42	47.54	74	-26.46
802.11B, High Channel									
2483.5	70.32	PK	81	1.8	H	-7.2	63.12	74	-10.88
2483.5	58.42	Ave.	81	1.8	H	-7.2	51.22	54	-2.78
2483.5	69.96	PK	338	1.6	V	-7.2	62.76	74	-11.24
2483.5	57.03	Ave.	338	1.6	V	-7.2	49.83	54	-4.17
2500	68.99	PK	312	1.6	H	-7.18	61.81	74	-12.19
2500	54.58	Ave.	312	1.6	H	-7.18	47.4	54	-6.60
2500	69.35	PK	359	1.5	V	-7.18	62.17	74	-11.83
2500	54.32	Ave.	359	1.5	V	-7.18	47.14	54	-6.86
4924	56.66	PK	46	1.9	H	-3.16	53.5	74	-20.50
4924	47.35	Ave.	46	1.9	H	-3.16	44.19	54	-9.81
4924	57.88	PK	166	1.6	V	-3.16	54.72	74	-19.28
4924	49.71	Ave.	166	1.6	V	-3.16	46.55	54	-7.45

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11G, Low Channel									
2310	70.39	PK	287	2.0	H	-7.24	63.15	74	-10.85
2310	57.75	Ave.	287	2.0	H	-7.24	50.51	54	-3.49
2310	67.40	PK	79	2.0	V	-7.24	60.16	74	-13.84
2310	55.16	Ave.	79	2.0	V	-7.24	47.92	54	-6.08
2390	68.83	PK	125	1.6	H	-7.22	61.61	74	-12.39
2390	56.90	Ave.	125	1.6	H	-7.22	49.68	54	-4.32
2390	65.99	PK	126	1.9	V	-7.22	58.77	74	-15.23
2390	54.21	Ave.	126	1.9	V	-7.22	46.99	54	-7.01
4824	55.75	PK	359	1.8	H	-3.52	52.23	74	-21.77
4824	53.17	PK	100	1.6	V	-3.52	49.65	74	-24.35
802.11G, Middle Channel									
4874	56.19	PK	183	2.1	H	-3.42	52.77	74	-21.23
4874	53.47	PK	107	1.8	V	-3.42	50.05	74	-23.95
802.11G, High Channel (2462MHz)									
2483.5	70.99	PK	13	1.6	H	-7.2	63.79	74	-10.21
2483.5	56.02	Ave.	13	1.6	H	-7.2	48.82	54	-5.18
2483.5	69.37	PK	195	1.9	V	-7.2	62.17	74	-11.83
2483.5	55.64	Ave.	195	1.9	V	-7.2	48.44	54	-5.56
2500	69.19	PK	112	2.0	H	-7.18	62.01	74	-11.99
2500	54.84	Ave.	112	2.0	H	-7.18	47.66	54	-6.34
2500	68.96	PK	50	1.7	V	-7.18	61.78	74	-12.22
2500	54.79	Ave.	50	1.7	V	-7.18	47.61	54	-6.39
4924	55.17	PK	315	2.0	H	-3.16	52.01	74	-21.99
4924	54.32	PK	80	1.6	V	-3.16	51.16	74	-22.84

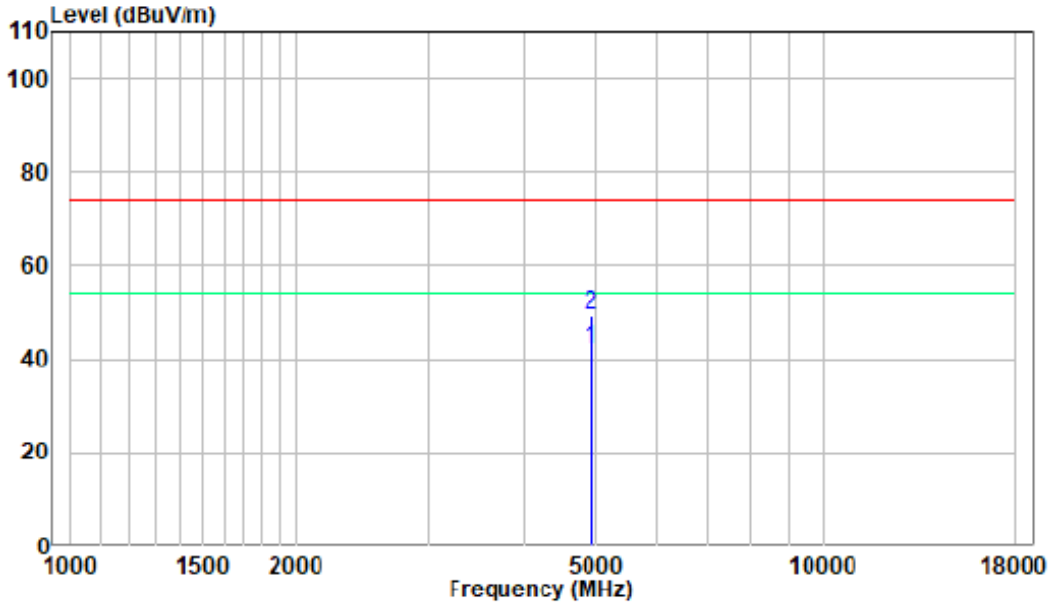
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11N20, Low Channel									
2310	71.45	PK	74	2.1	H	-7.24	64.21	74	-9.79
2310	57.58	Ave.	74	2.1	H	-7.24	50.34	54	-3.66
2310	68.71	PK	242	1.6	V	-7.24	61.47	74	-12.53
2310	54.85	Ave.	242	1.6	V	-7.24	47.61	54	-6.39
2390	69.19	PK	149	2.1	H	-7.22	61.97	74	-12.03
2390	57.57	Ave.	149	2.1	H	-7.22	50.35	54	-3.65
2390	66.45	PK	238	1.5	V	-7.22	59.23	74	-14.77
2390	54.74	Ave.	238	1.5	V	-7.22	47.52	54	-6.48
4824	56.17	PK	314	1.5	H	-3.52	52.65	74	-21.35
4824	54.37	PK	82	1.7	V	-3.52	50.85	74	-23.15
802.11N20, Middle Channel									
4874	56.03	PK	113	1.9	H	-3.42	52.61	74	-21.39
4874	53.44	PK	214	2.0	V	-3.42	50.02	74	-23.98
802.11N20, High Channel									
2483.5	72.96	PK	270	1.6	H	-7.2	65.76	74	-8.24
2483.5	56.83	Ave.	270	1.6	H	-7.2	49.63	54	-4.37
2483.5	69.36	PK	70	1.7	V	-7.2	62.16	74	-11.84
2483.5	55.37	Ave.	70	1.7	V	-7.2	48.17	54	-5.83
2500	68.62	PK	168	1.6	H	-7.18	61.44	74	-12.56
2500	55.25	Ave.	168	1.6	H	-7.18	48.07	54	-5.93
2500	68.83	PK	263	1.5	V	-7.18	61.65	74	-12.35
2500	55.13	Ave.	263	1.5	V	-7.18	47.95	54	-6.05
4924	54.82	PK	232	1.7	H	-3.16	51.66	74	-22.34
4924	54.22	PK	174	1.6	V	-3.16	51.06	74	-22.94

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11N40, Low Channel									
2310	68.83	PK	166	1.7	H	-7.24	61.59	74	-12.41
2310	57.74	Ave.	166	1.7	H	-7.24	50.5	54	-3.50
2310	66.19	PK	47	1.8	V	-7.24	58.95	74	-15.05
2310	55.11	Ave.	47	1.8	V	-7.24	47.87	54	-6.13
2390	69.36	PK	55	1.6	H	-7.22	62.14	74	-11.86
2390	58.06	Ave.	55	1.6	H	-7.22	50.84	54	-3.16
2390	66.64	PK	355	1.7	V	-7.22	59.42	74	-14.58
2390	55.32	Ave.	355	1.7	V	-7.22	48.10	54	-5.90
4844	53.83	PK	181	1.6	H	-3.54	50.29	74	-23.71
4844	51.85	PK	77	2.0	V	-3.54	48.31	74	-25.69
802.11N40, Middle Channel									
4874	55.73	PK	232	1.8	H	-3.42	52.31	74	-21.69
4874	53.53	PK	232	1.5	V	-3.42	50.11	74	-23.89
802.11N40, High Channel									
2483.5	74.13	PK	178	2.0	H	-7.2	66.93	74	-7.07
2483.5	57.95	Ave.	178	2.0	H	-7.2	50.75	54	-3.25
2483.5	70.62	PK	321	1.9	V	-7.2	63.42	74	-10.58
2483.5	56.41	Ave.	321	1.9	V	-7.2	49.21	54	-4.79
2500	69.58	PK	23	1.5	H	-7.18	62.4	74	-11.60
2500	56.23	Ave.	23	1.5	H	-7.18	49.05	54	-4.95
2500	68.91	PK	173	1.6	V	-7.18	61.73	74	-12.27
2500	55.71	Ave.	173	1.6	V	-7.18	48.53	54	-5.47
4904	55.25	PK	342	1.8	H	-3.26	51.99	74	-22.01
4904	54.79	PK	342	1.7	V	-3.26	51.53	74	-22.47

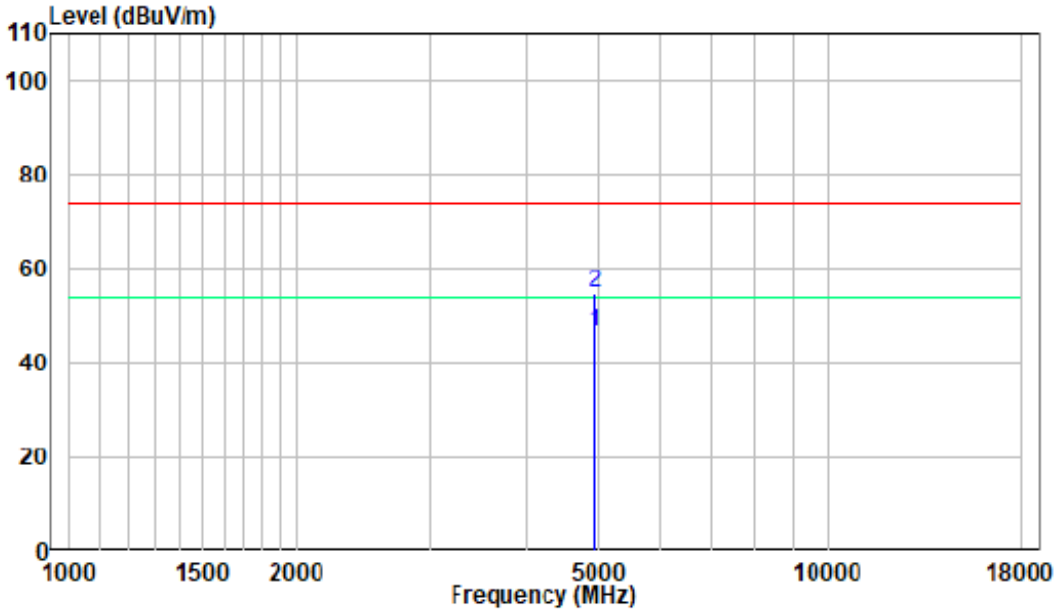
Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin =Corrected. Amplitude - Limit
The other spurious emission which is 20dB to the limit was not recorded.
The test result of peak was less than the limit of average, so just peak values were recorded.

1-18 GHz:

Pre-scan for
802.11 b High Channel
Horizontal

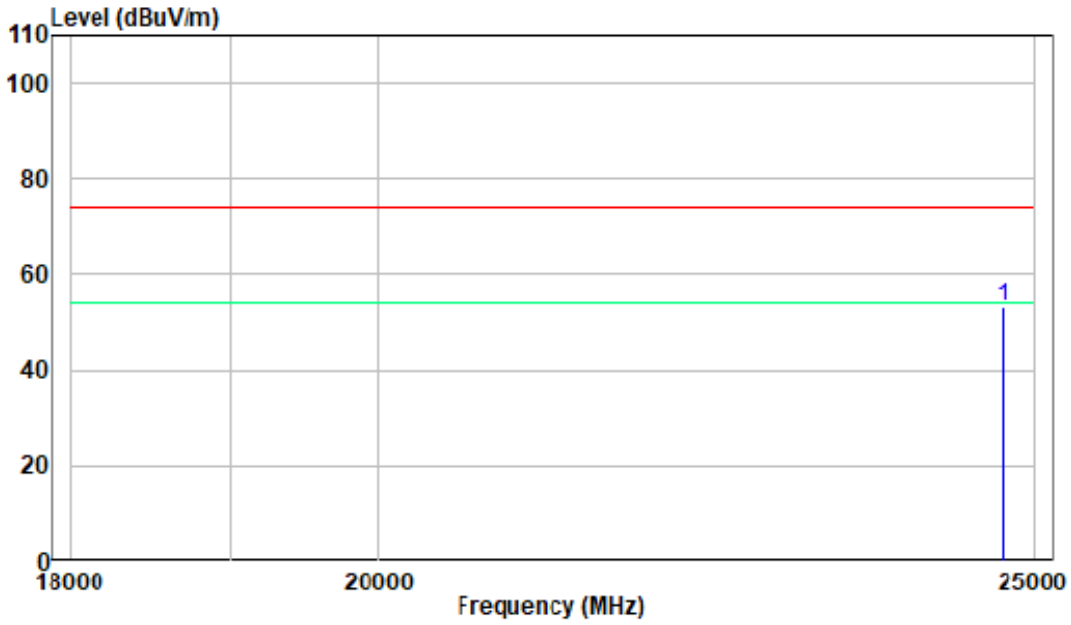


Vertical

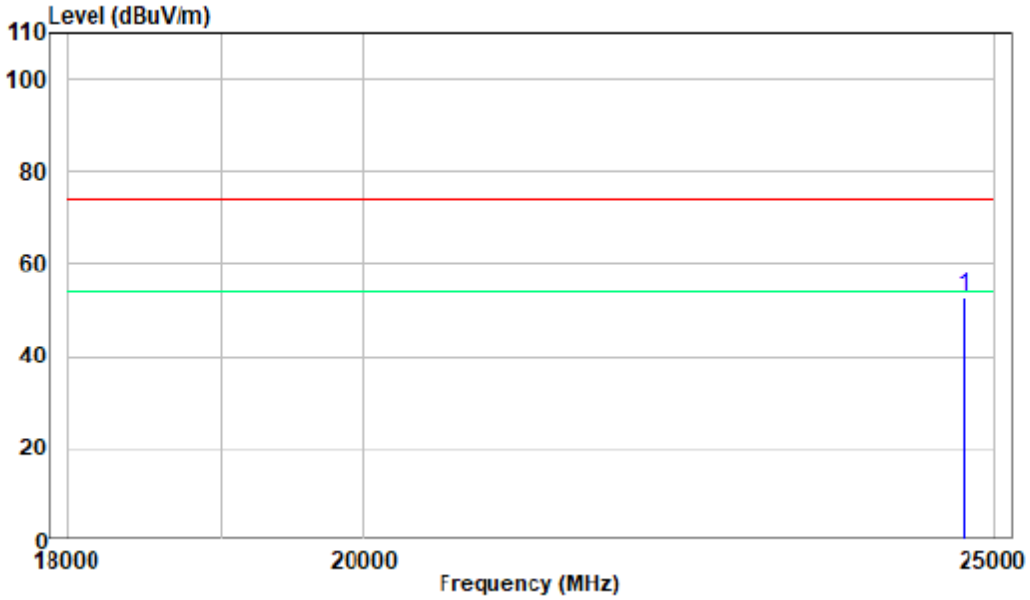


18 -25GHz:

Pre-scan for
802.11 b High Channel
Horizontal



Vertical



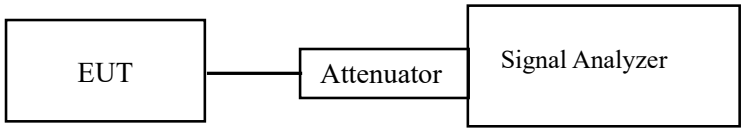
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH & OCCUPIED BANDWIDTH

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

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:	24~27.9 ℃
Relative Humidity:	42~55%
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-11-26 for BLE and 2021-11-17 and 2021-12-06 for Wi-Fi.

EUT operation mode: Transmitting

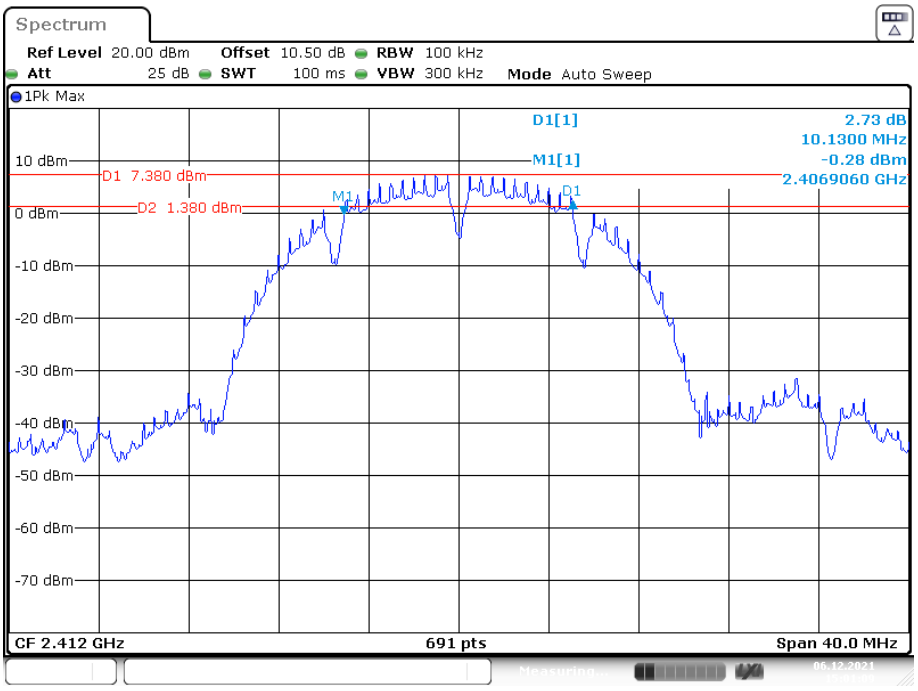
Test Result: Compliant.

For BLE mode please refer to the Appendix BLE.

Wi-Fi:

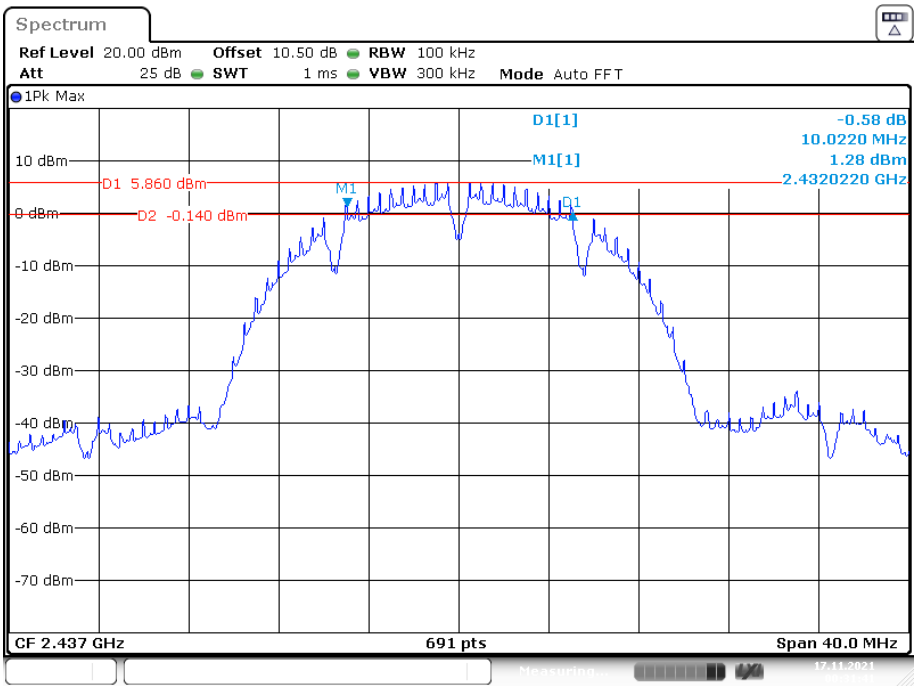
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)
802.11b mode			
Low	2412	10.13	≥500
Middle	2437	10.02	≥500
High	2462	10.09	≥500
802.11g mode			
Low	2412	16.38	≥500
Middle	2437	16.27	≥500
High	2462	16.34	≥500
802.11n-HT20 mode			
Low	2412	17.37	≥500
Middle	2437	17.31	≥500
High	2462	17.32	≥500
802.11n-HT40 mode			
Low	2422	35.96	≥500
Middle	2437	36.13	≥500
High	2452	36.07	≥500

6dB Bandwidth, 802.11b Low Channel



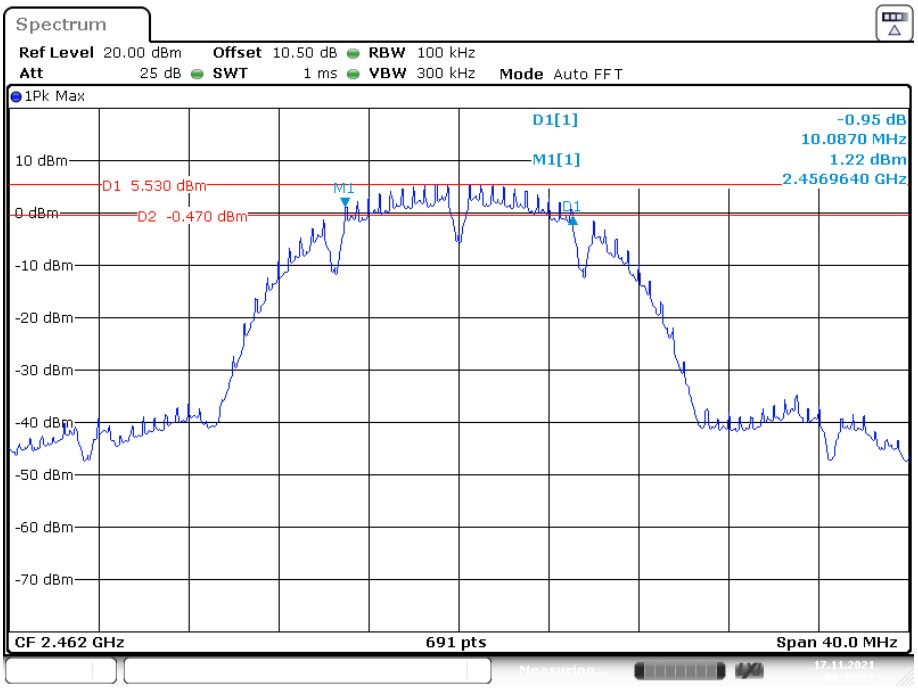
Date: 6.DEC.2021 15:01:09

6dB Bandwidth, 802.11b Middle Channel



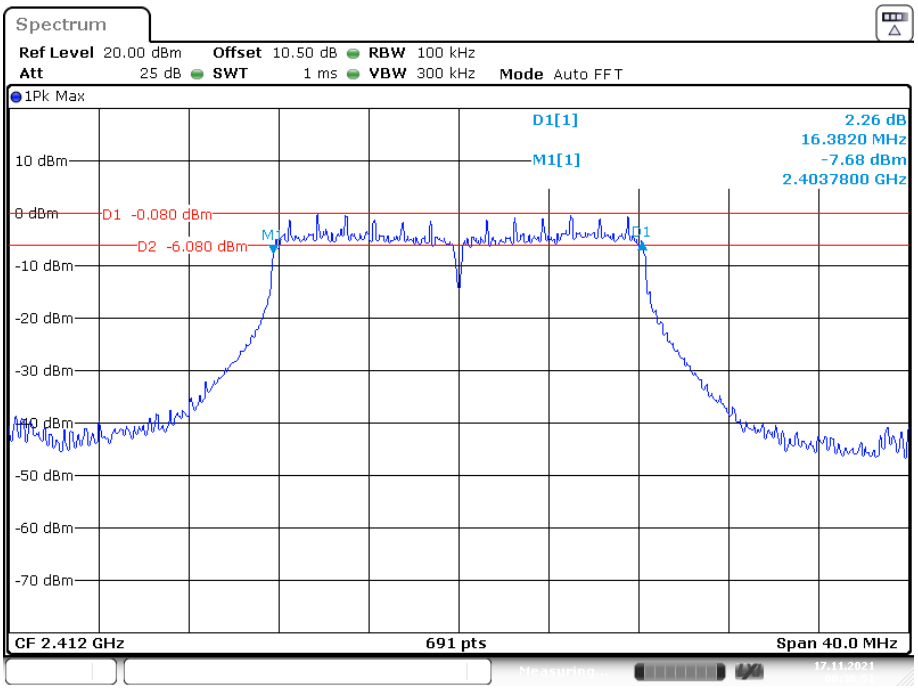
Date: 17.NOV.2021 00:31:41

6dB Bandwidth, 802.11b High Channel



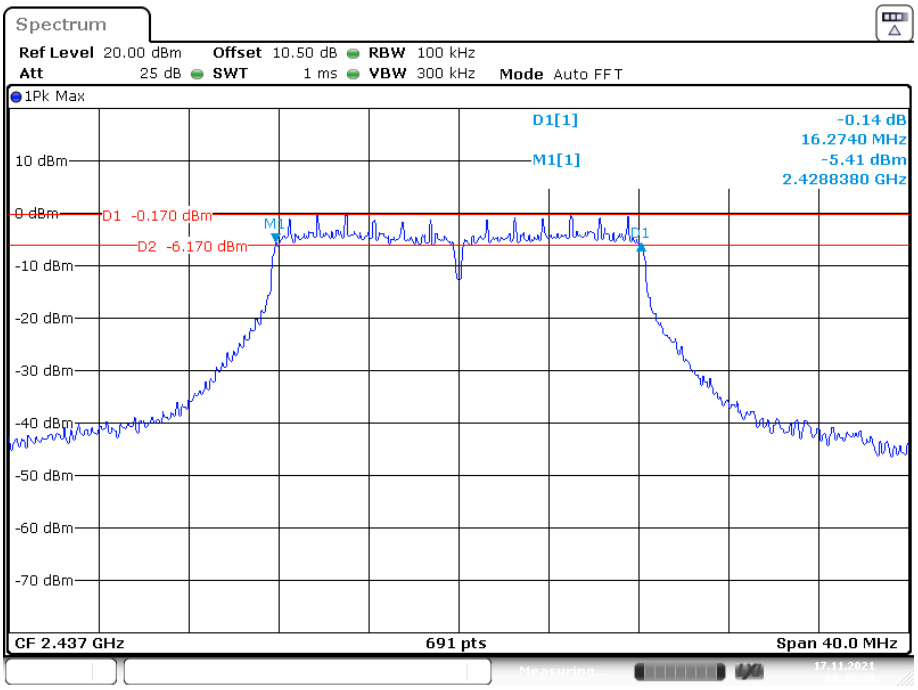
Date: 17.NOV.2021 00:33:31

6dB Bandwidth, 802.11g Low Channel



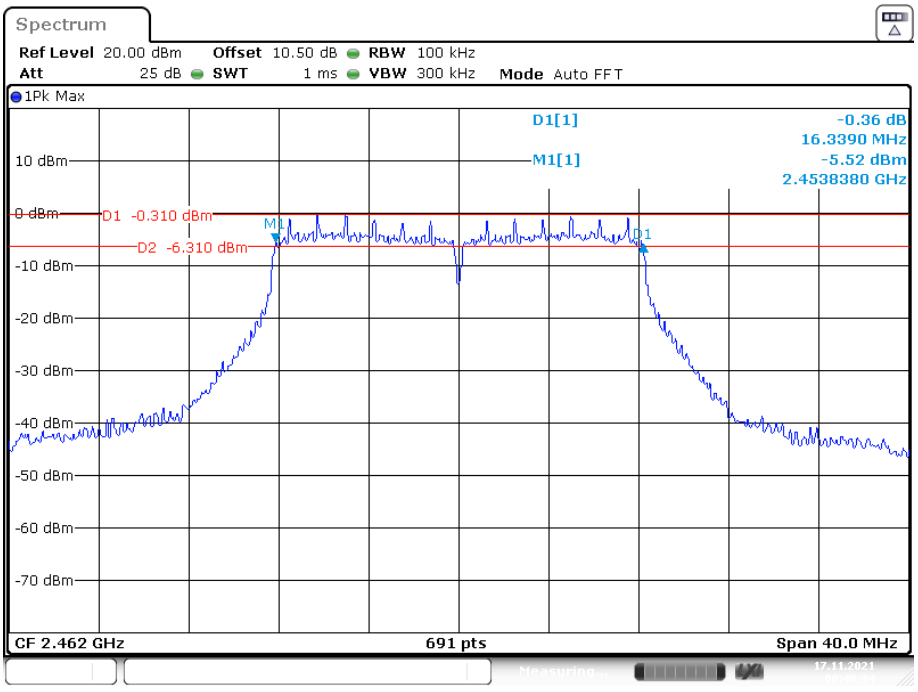
Date: 17.NOV.2021 00:36:52

6dB Bandwidth, 802.11g Middle Channel



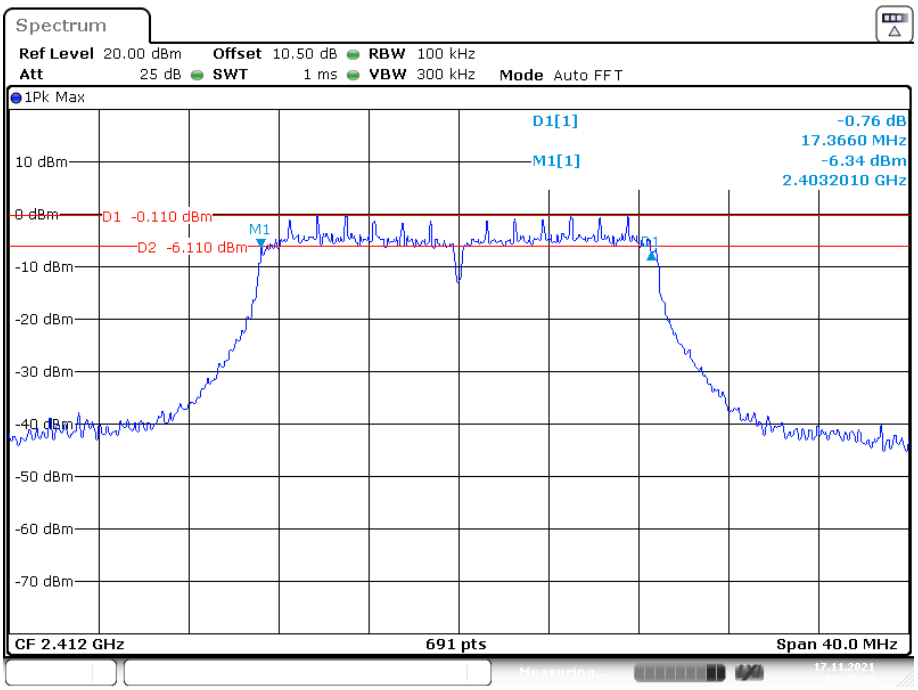
Date: 17.NOV.2021 00:38:38

6dB Bandwidth, 802.11g High Channel



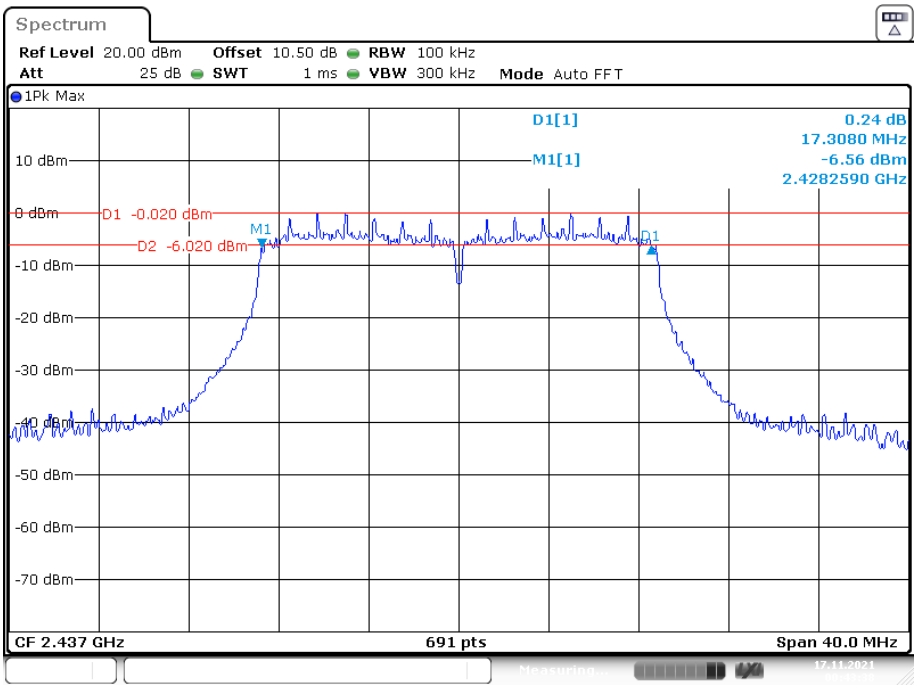
Date: 17.NOV.2021 00:40:34

6dB Bandwidth, 802.11n-HT20 Low Channel



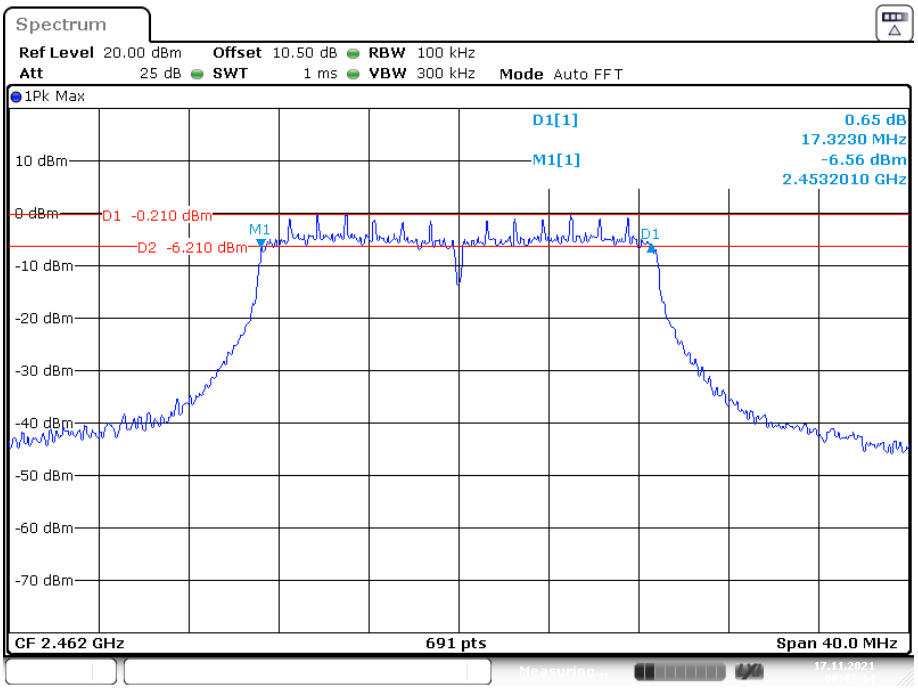
Date: 17.NOV.2021 00:45:39

6dB Bandwidth, 802.11n-HT20 Middle Channel



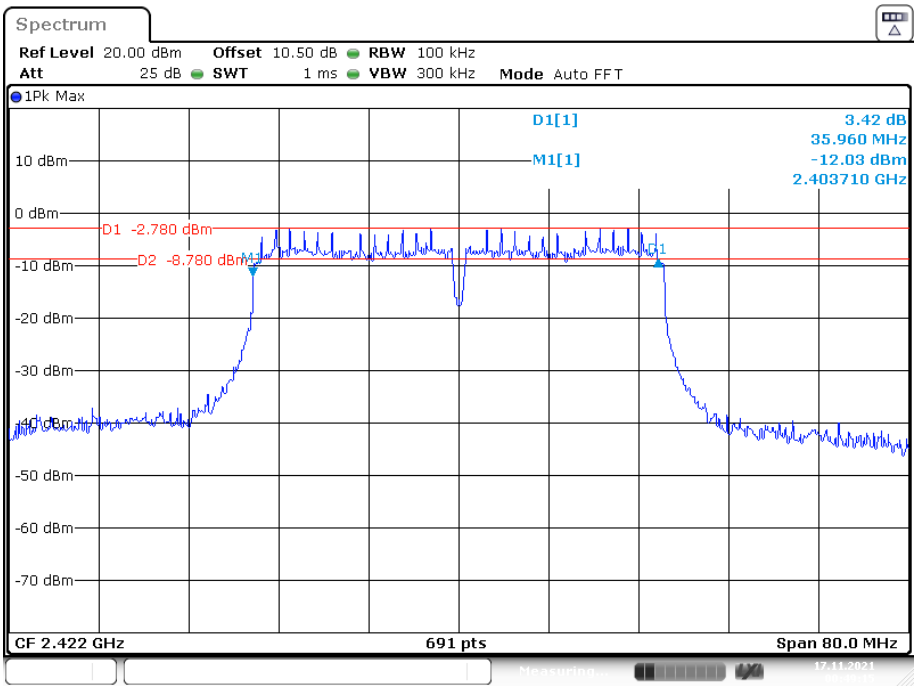
Date: 17.NOV.2021 00:43:38

6dB Bandwidth, 802.11n-HT20 High Channel



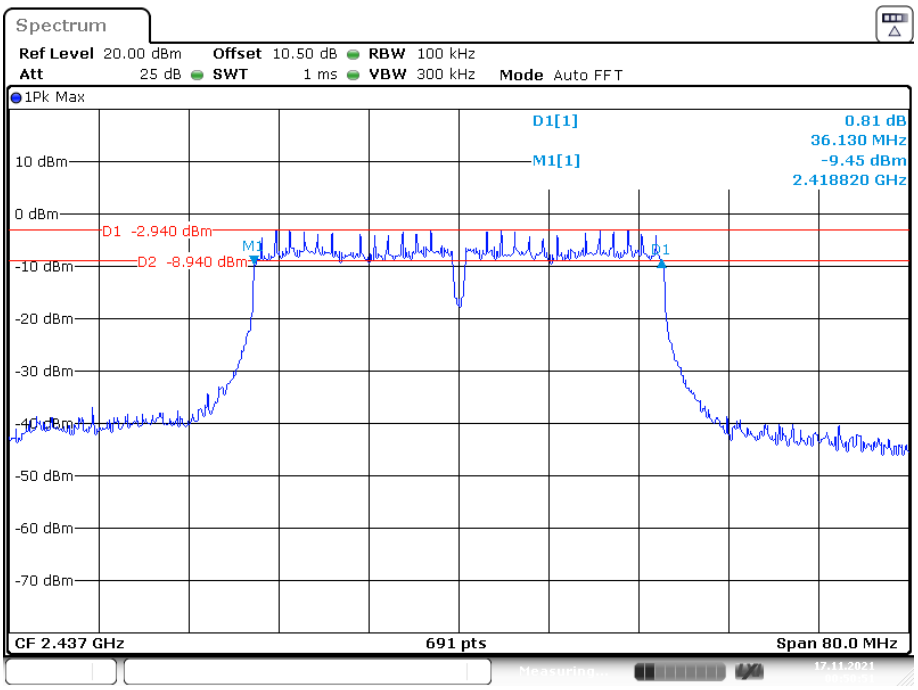
Date: 17.NOV.2021 00:42:14

6dB Bandwidth, 802.11n-HT40 Low Channel



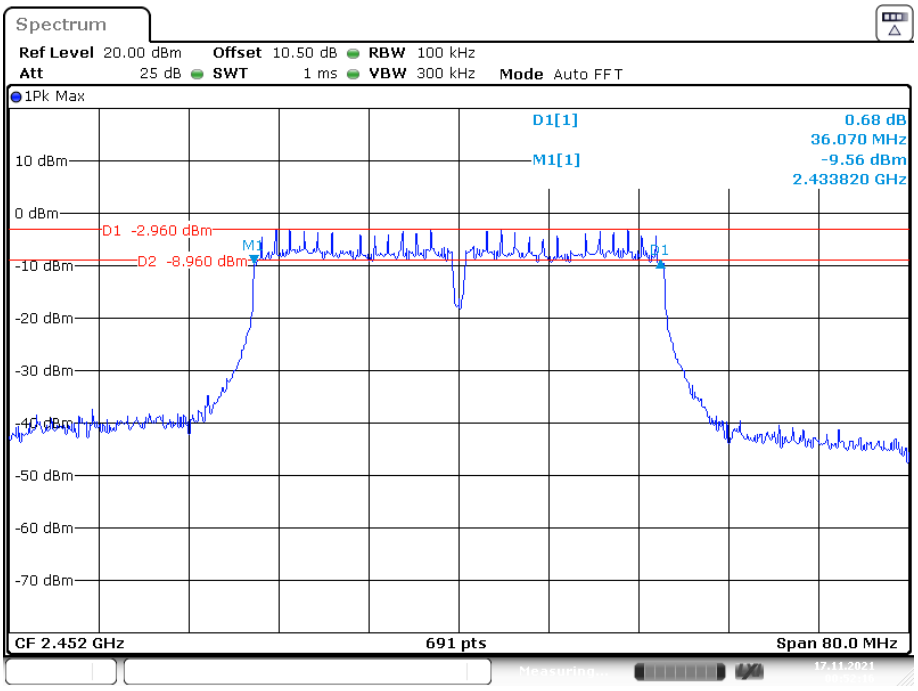
Date: 17.NOV.2021 00:49:15

6dB Bandwidth, 802.11n-HT40 Middle Channel



Date: 17.NOV.2021 00:50:51

6dB Bandwidth, 802.11n-HT40 High Channel



Date: 17.NOV.2021 00:52:16

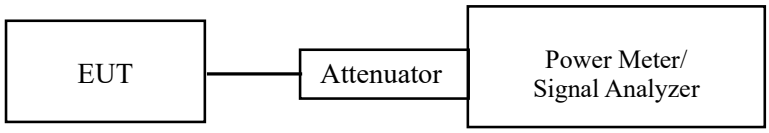
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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

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.



Test Data

Environmental Conditions

Temperature:	24~27.9 ℃
Relative Humidity:	42~55%
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-11-26 for BLE and 2021-11-17 for Wi-Fi.

EUT operation mode: Transmitting

Test Result: Compliant.

For BLE mode please refer to the Appendix BLE.

Wi-Fi:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)
802.11b mode			
Low	2412	18.51	30
Middle	2437	18.50	30
High	2462	18.24	30
802.11g mode			
Low	2412	19.09	30
Middle	2437	18.72	30
High	2462	18.83	30
802.11n HT20 mode			
Low	2412	18.62	30
Middle	2437	18.59	30
High	2462	18.71	30
802.11n HT40 mode			
Low	2422	19.19	30
Middle	2437	19.18	30
High	2452	19.06	30

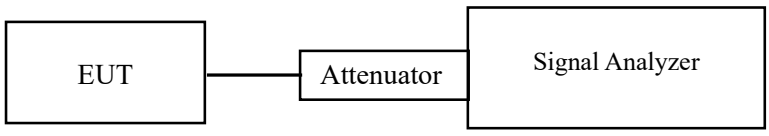
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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

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:	24~27.9 ℃
Relative Humidity:	42~55%
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-11-26 for BLE and 2021-11-17 for Wi-Fi.

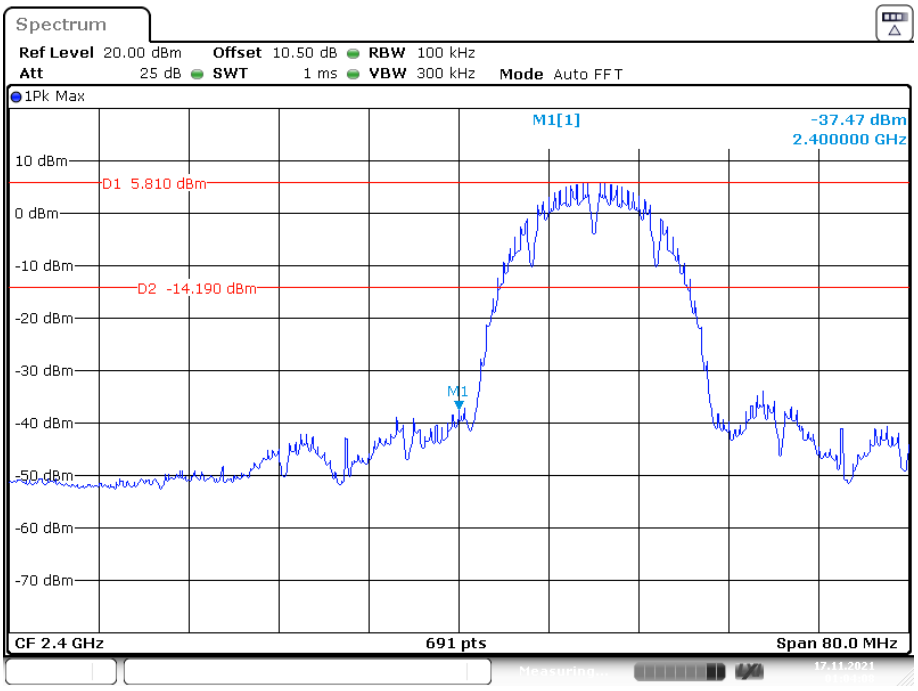
EUT operation mode: Transmitting

Test Result: Compliant.

For BLE mode please refer to the Appendix BLE.

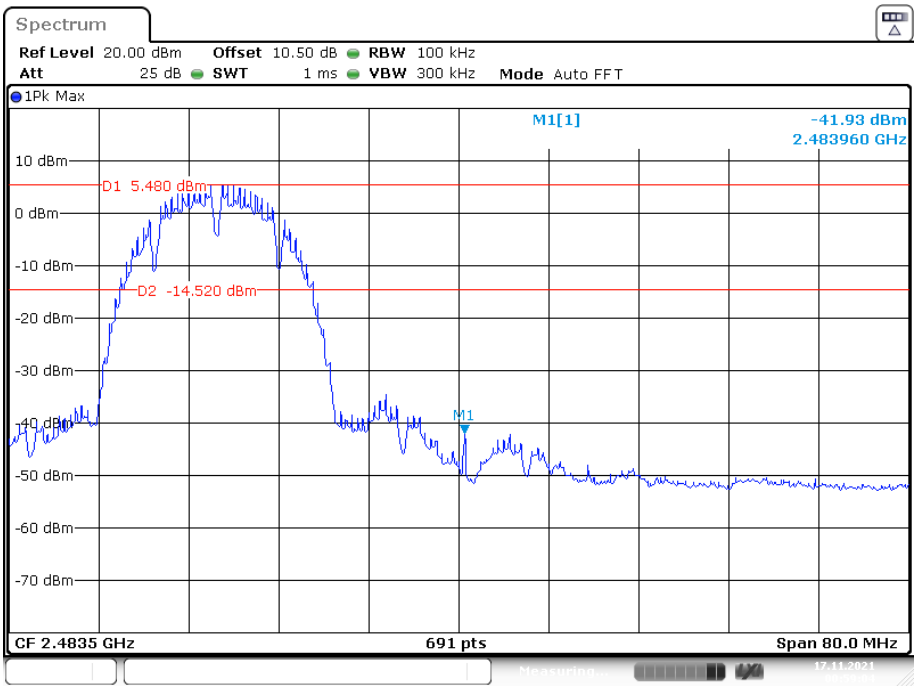
Wi-Fi:

802.11b: Band Edge, Left Side



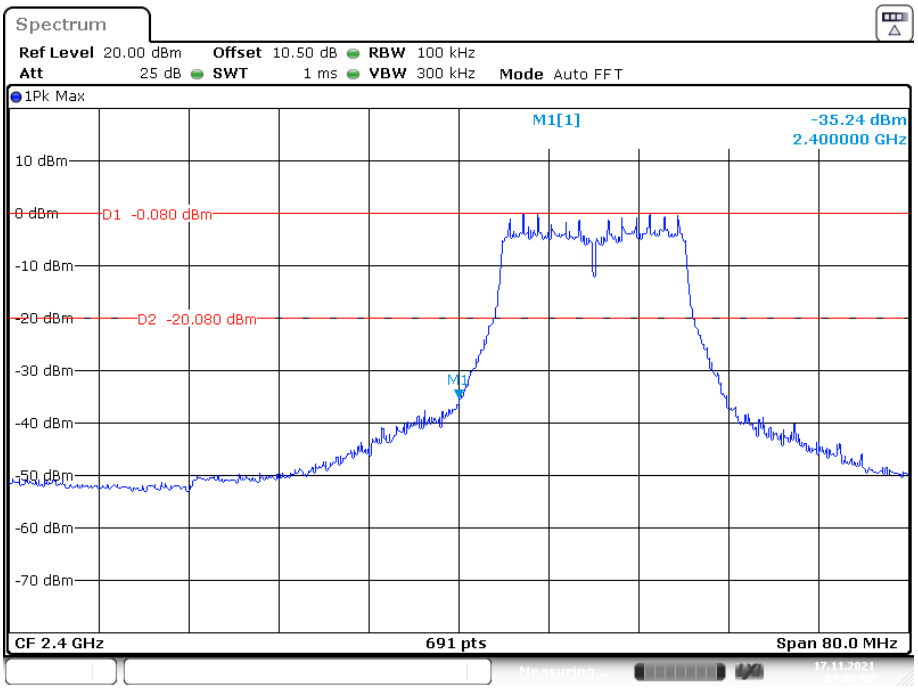
Date: 17.NOV.2021 01:04:08

802.11b: Band Edge, Right Side



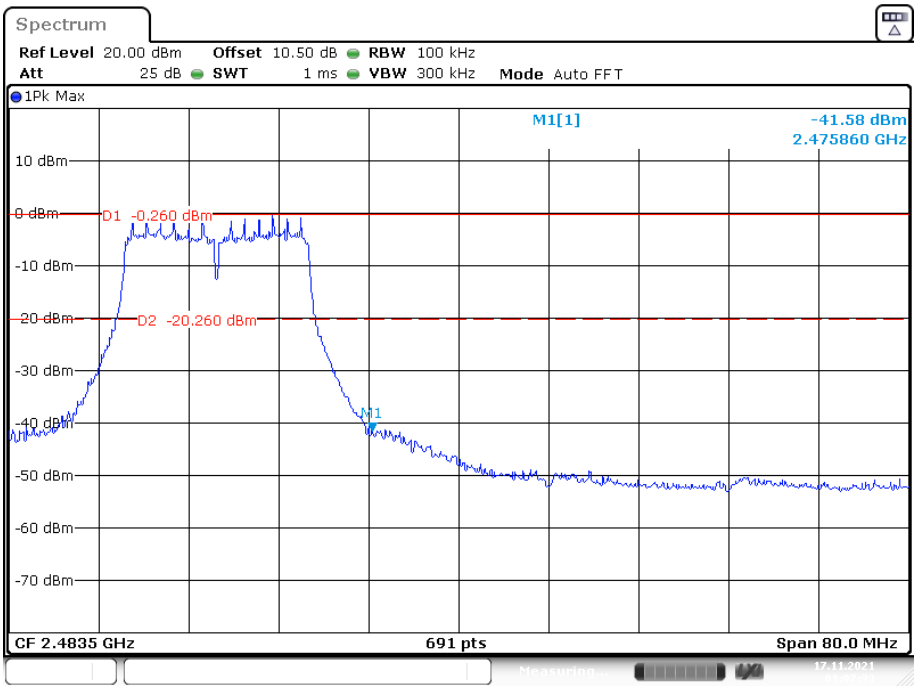
Date: 17.NOV.2021 00:59:04

802.11g: Band Edge, Left Side



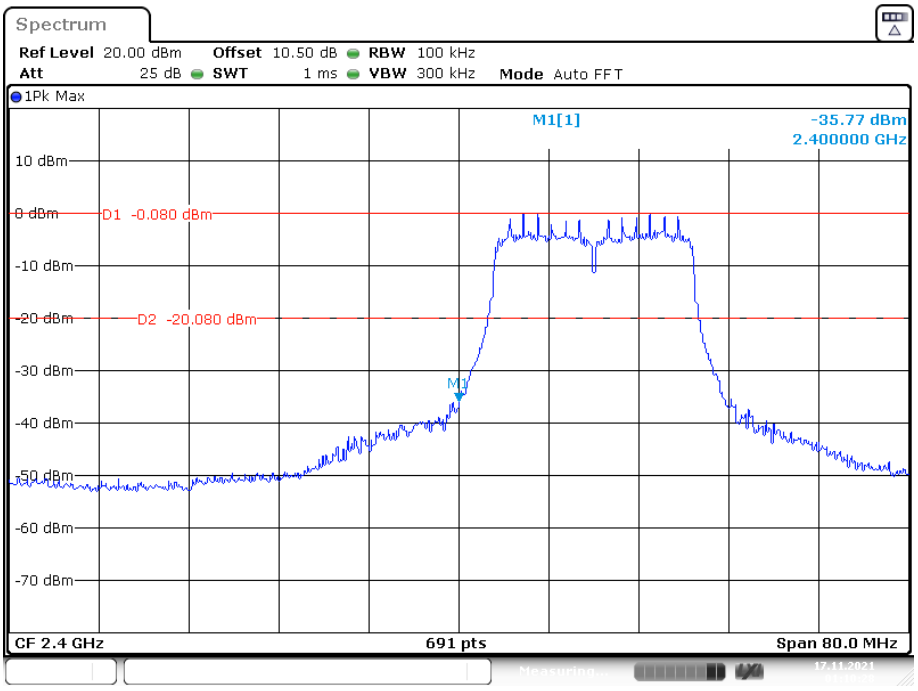
Date: 17.NOV.2021 01:05:57

802.11g: Band Edge, Right Side



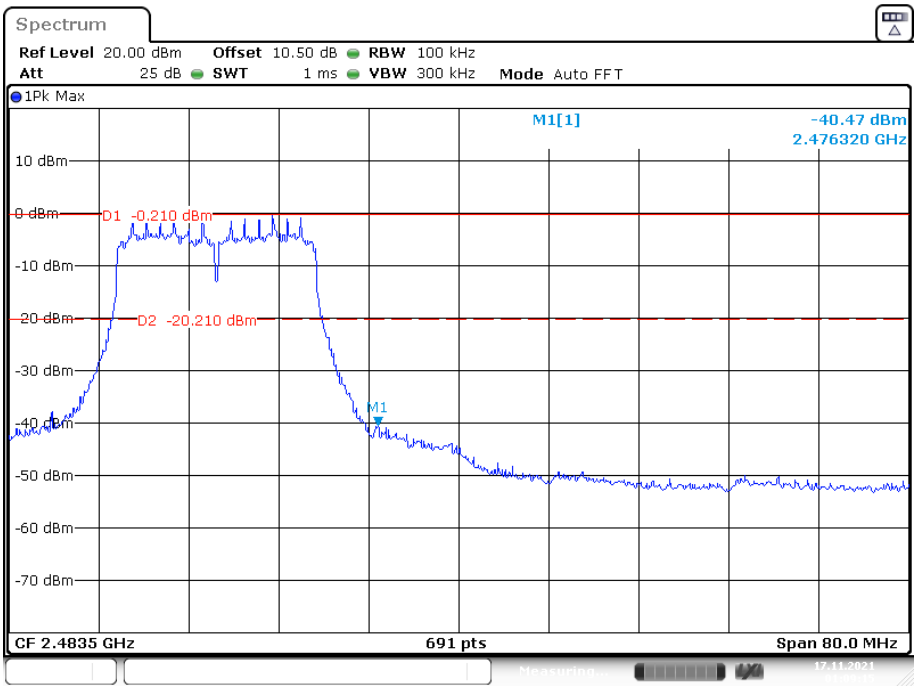
Date: 17.NOV.2021 01:07:33

802.11n-HT20: Band Edge, Left Side



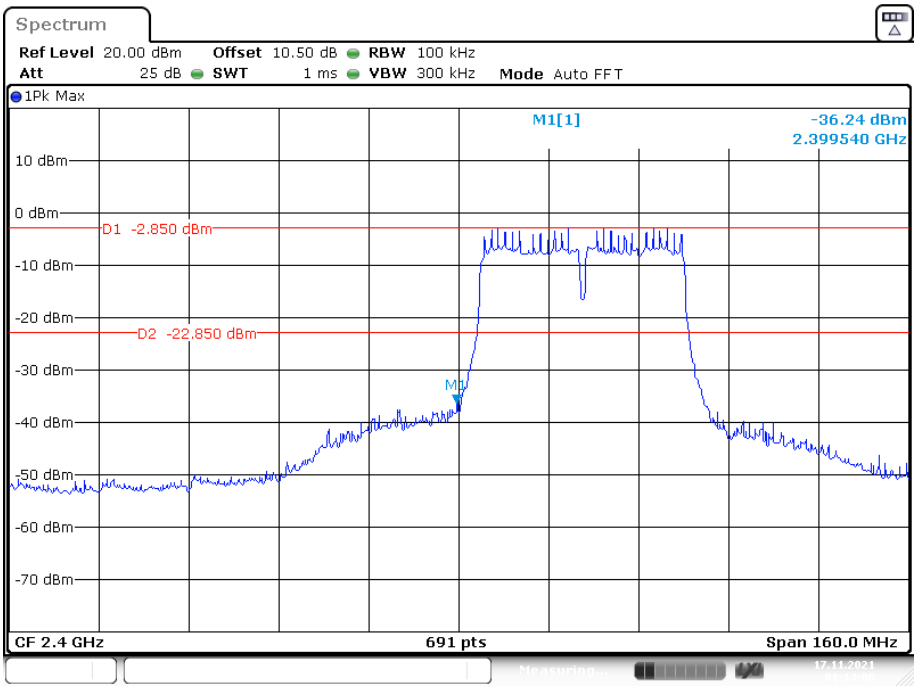
Date: 17.NOV.2021 01:10:28

802.11n-HT20: Band Edge, Right Side



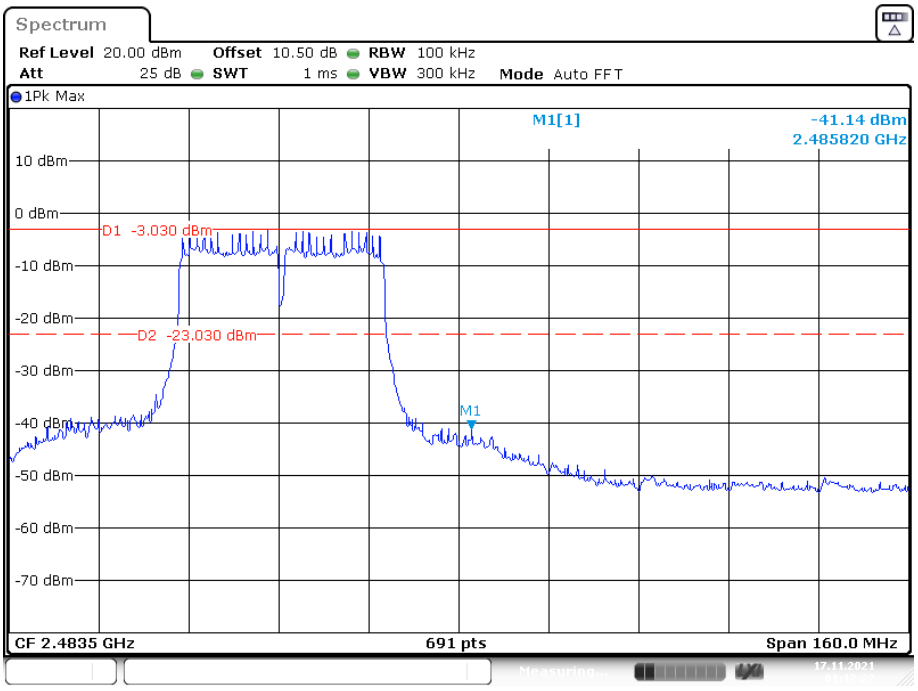
Date: 17.NOV.2021 01:09:15

802.11n-HT40: Band Edge, Left Side



Date: 17.NOV.2021 01:14:08

802.11n-HT40: Band Edge, Right Side



Date: 17.NOV.2021 01:12:22

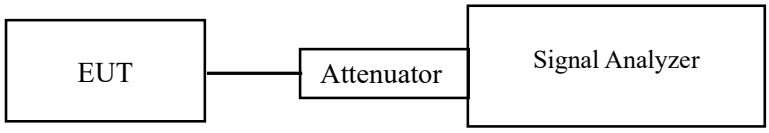
FCC §15.247(e) - POWER SPECTRAL DENSITY

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

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



Test Data

Environmental Conditions

Temperature:	24~27.9 ℃
Relative Humidity:	42~55%
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-11-26 for BLE and 2021-11-17 for Wi-Fi.

EUT operation mode: Transmitting

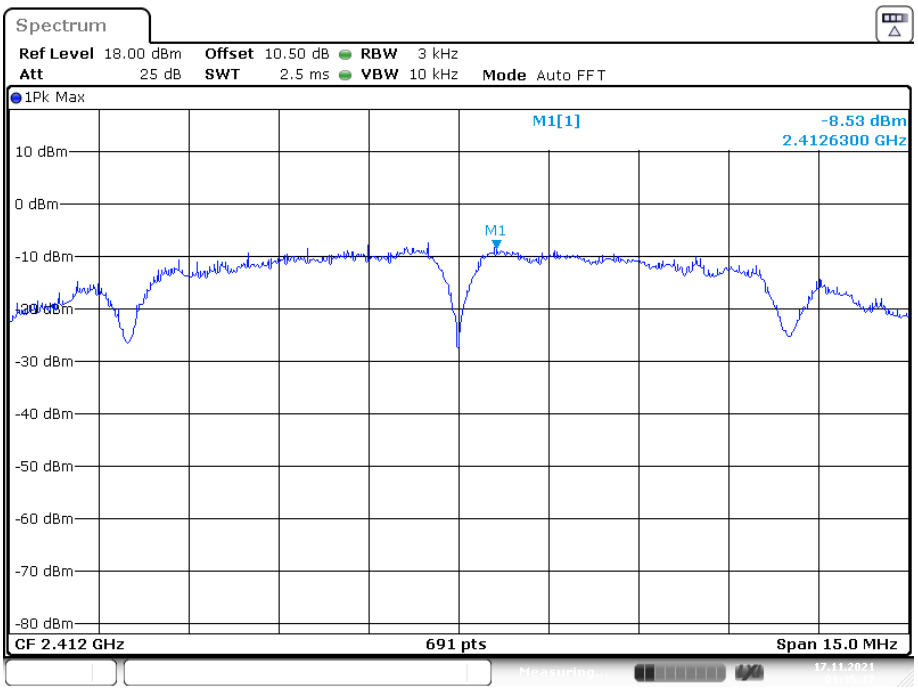
Test Result: Compliant.

For BLE mode please refer to the Appendix BLE.

Wi-Fi:

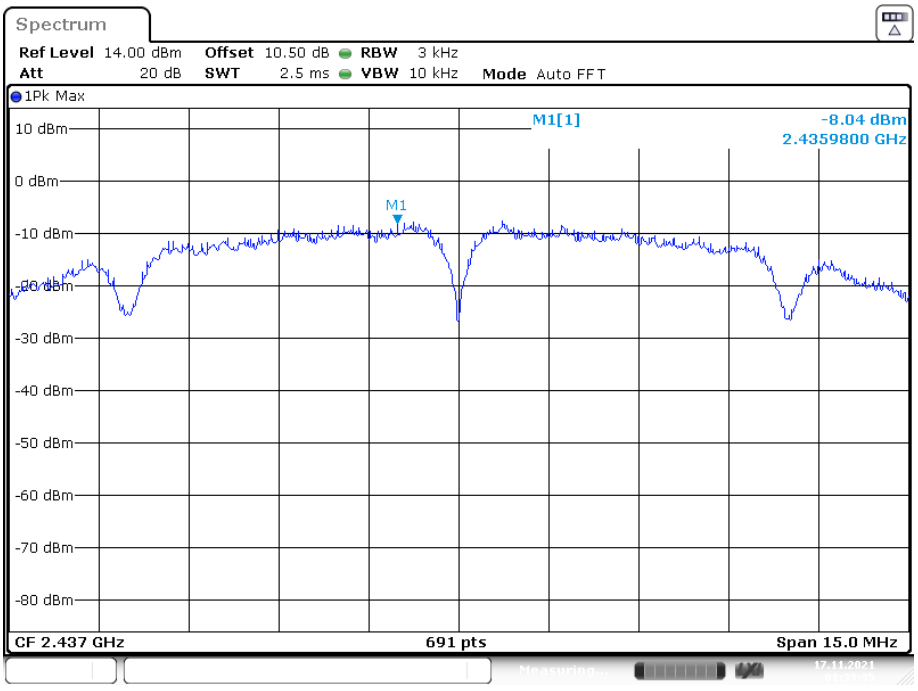
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode			
Low	2412	-8.53	≤8
Middle	2437	-8.04	≤8
High	2462	-9.10	≤8
802.11g mode			
Low	2412	-16.10	≤8
Middle	2437	-15.44	≤8
High	2462	-13.94	≤8
802.11n-HT20 mode			
Low	2412	-14.50	≤8
Middle	2437	-14.83	≤8
High	2462	-14.55	≤8
802.11n-HT40 mode			
Low	2422	-17.07	≤8
Middle	2437	-18.99	≤8
High	2452	-16.29	≤8

Power Spectral Density, 802.11b Low Channel



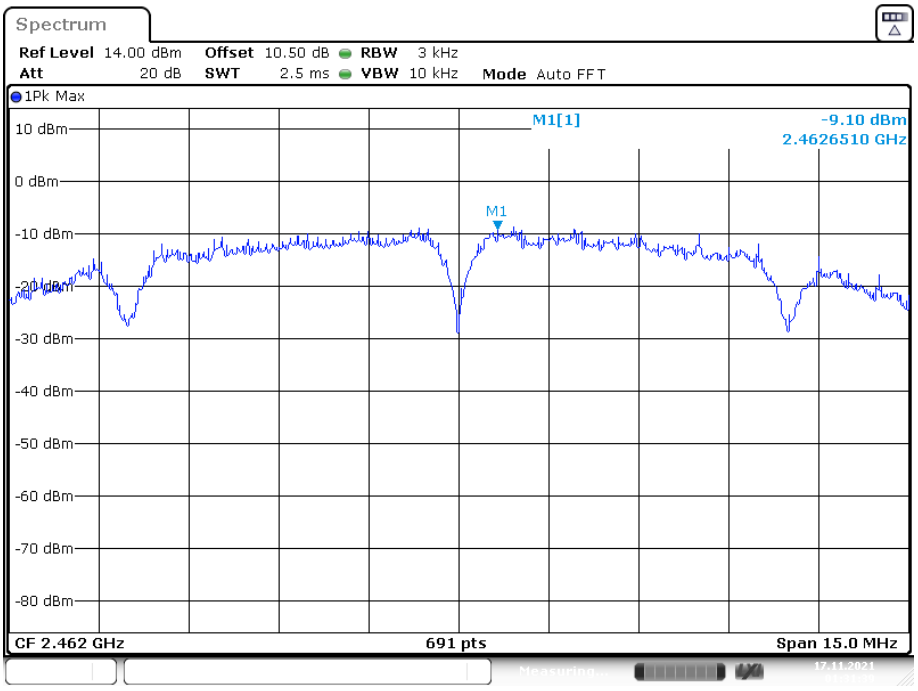
Date: 17.NOV.2021 01:35:17

Power Spectral Density, 802.11b Middle Channel



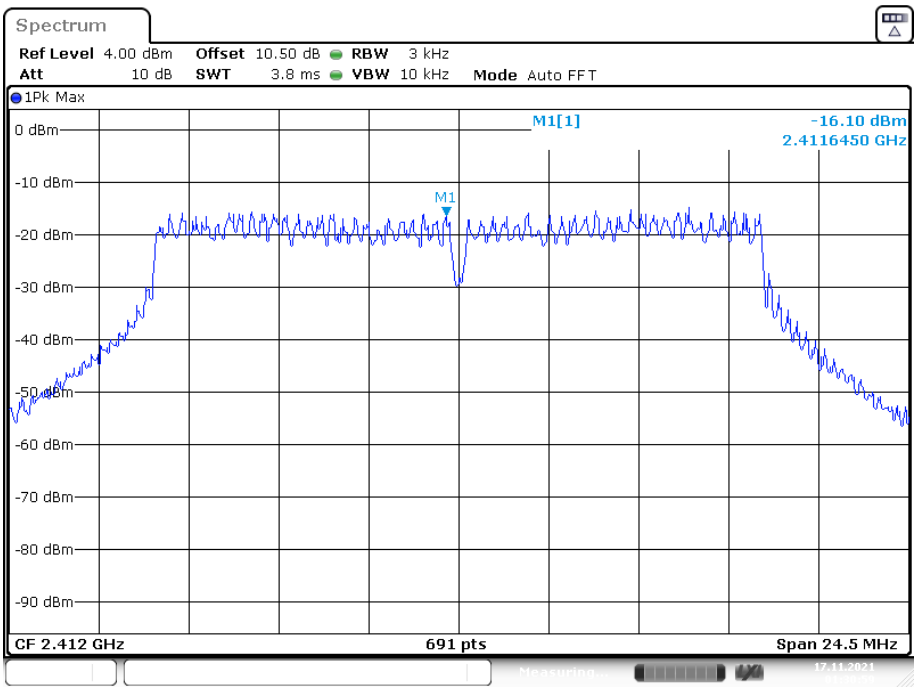
Date: 17.NOV.2021 01:33:35

Power Spectral Density, 802.11b High Channel



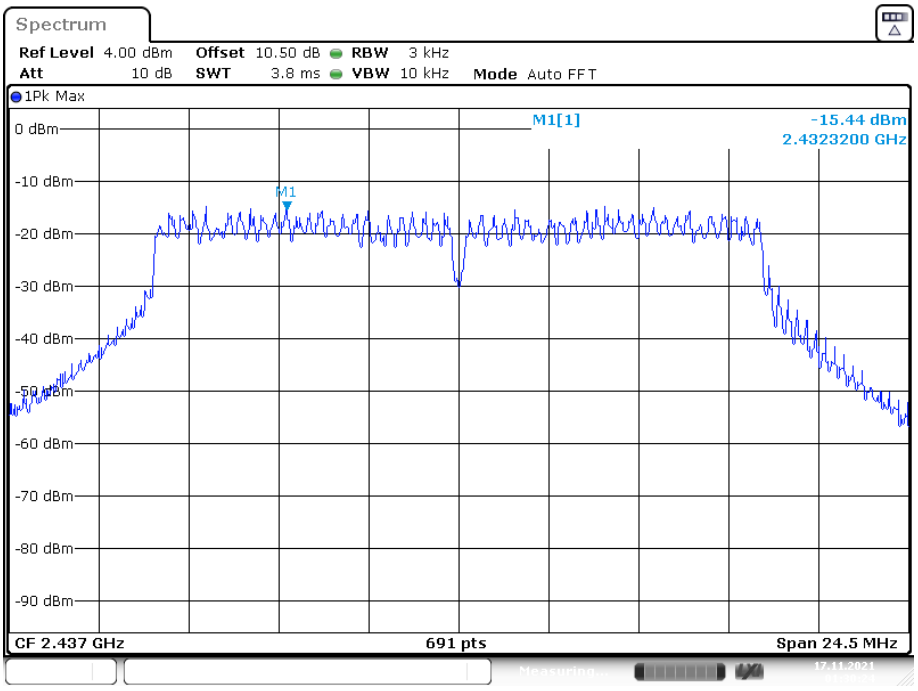
Date: 17.NOV.2021 01:31:40

Power Spectral Density, 802.11g Low Channel



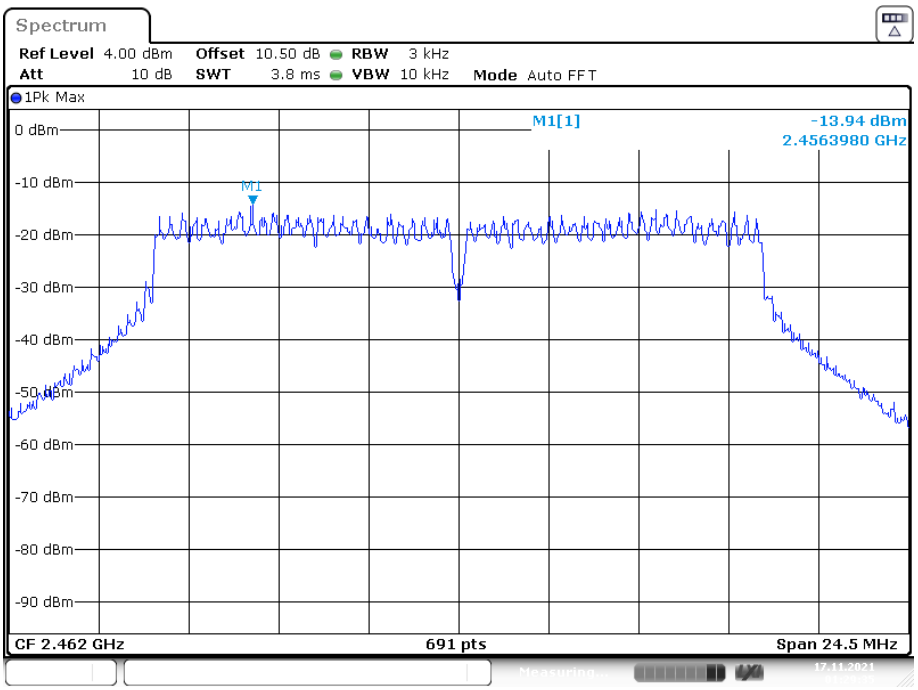
Date: 17.NOV.2021 01:30:59

Power Spectral Density, 802.11g Middle Channel



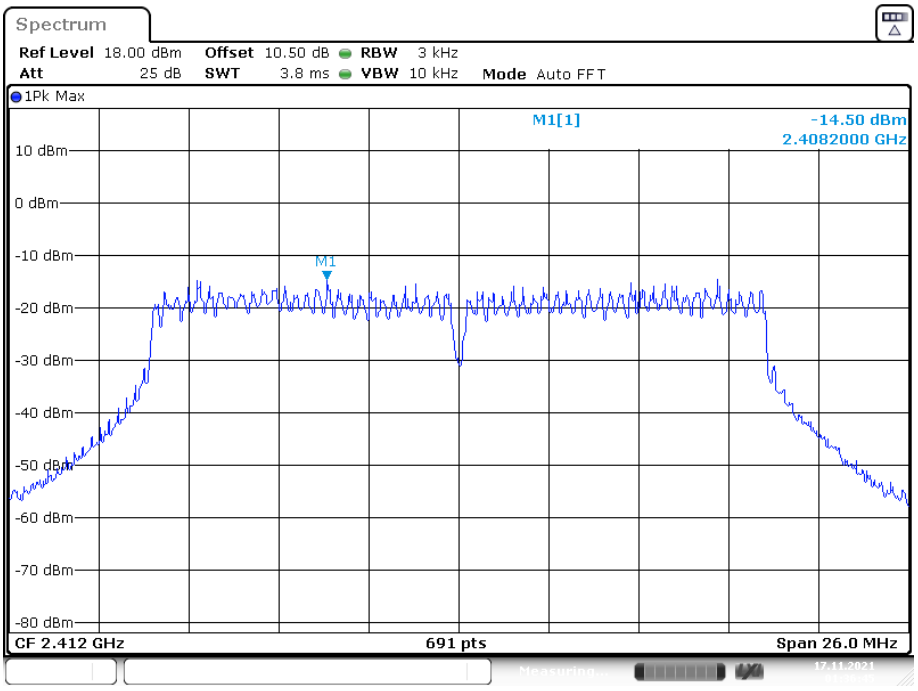
Date: 17.NOV.2021 01:30:24

Power Spectral Density, 802.11g High Channel



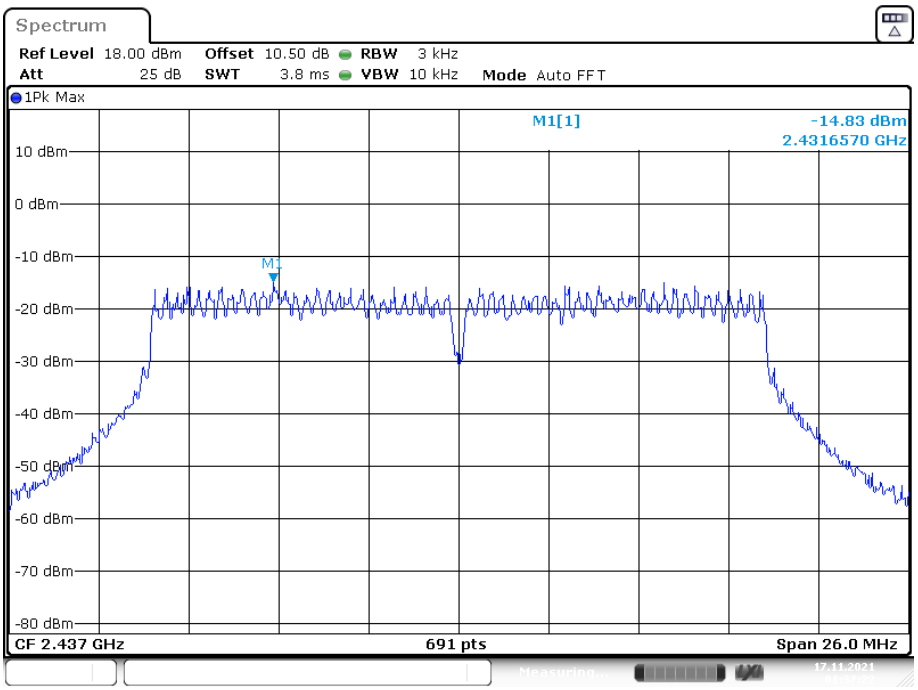
Date: 17.NOV.2021 01:29:35

Power Spectral Density, 802.11n-HT20 Low Channel



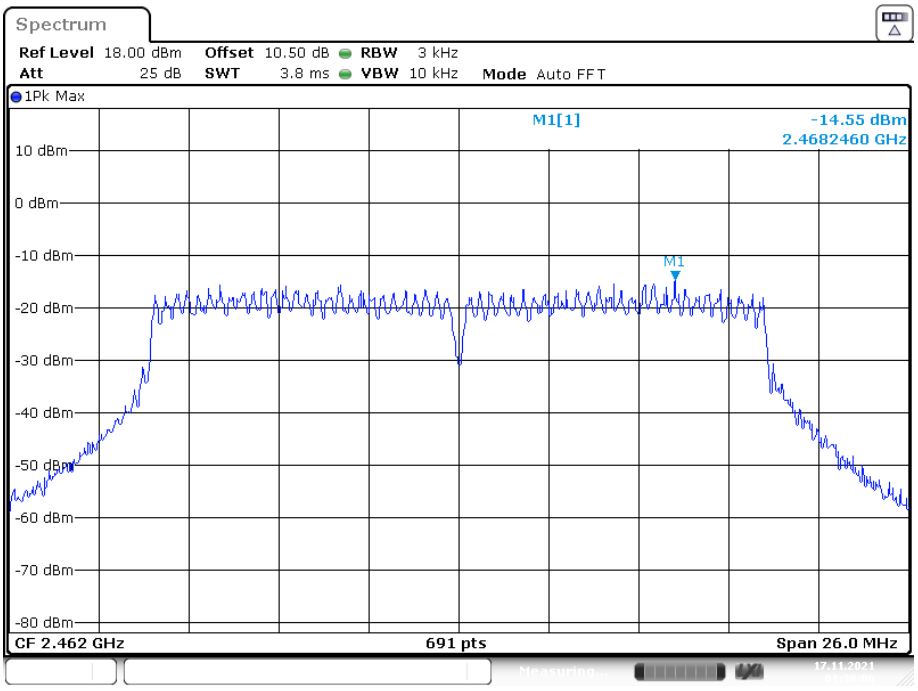
Date: 17.NOV.2021 01:36:45

Power Spectral Density, 802.11n-HT20 Middle Channel



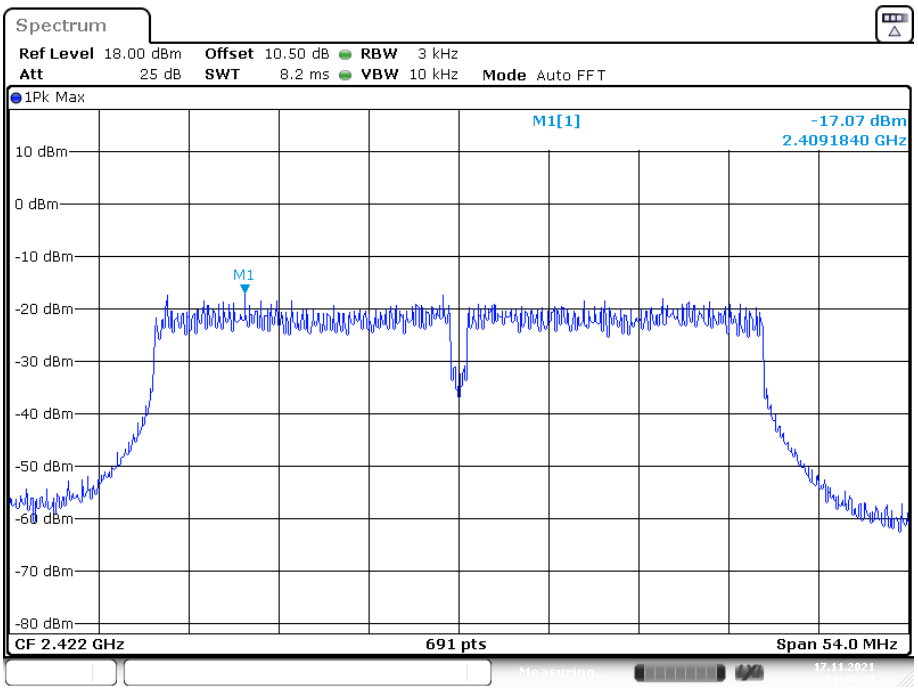
Date: 17.NOV.2021 01:37:22

Power Spectral Density, 802.11n-HT20 High Channel



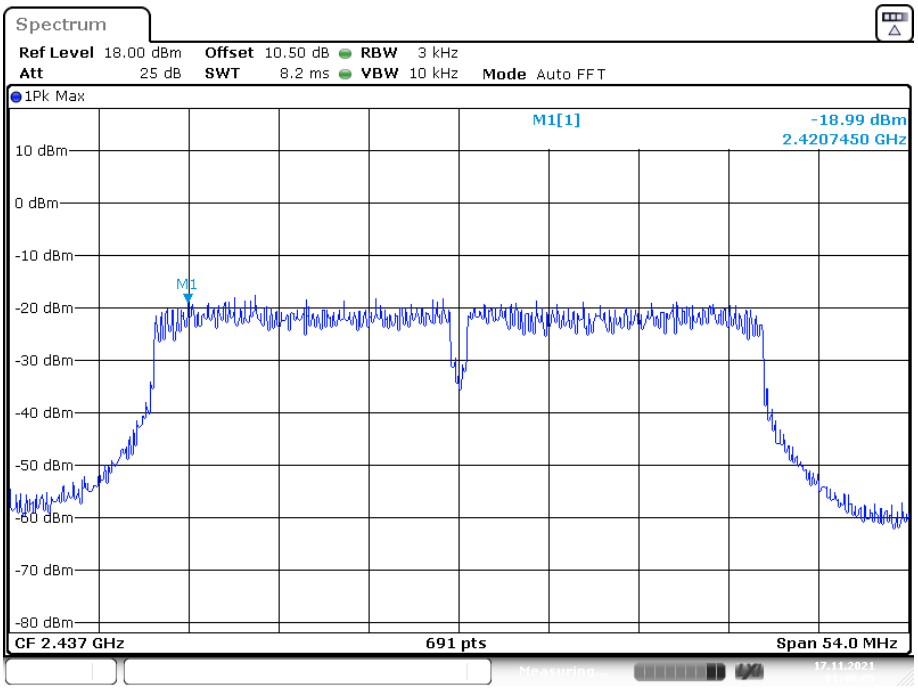
Date: 17.NOV.2021 01:38:06

Power Spectral Density, 802.11n-HT40 Low Channel



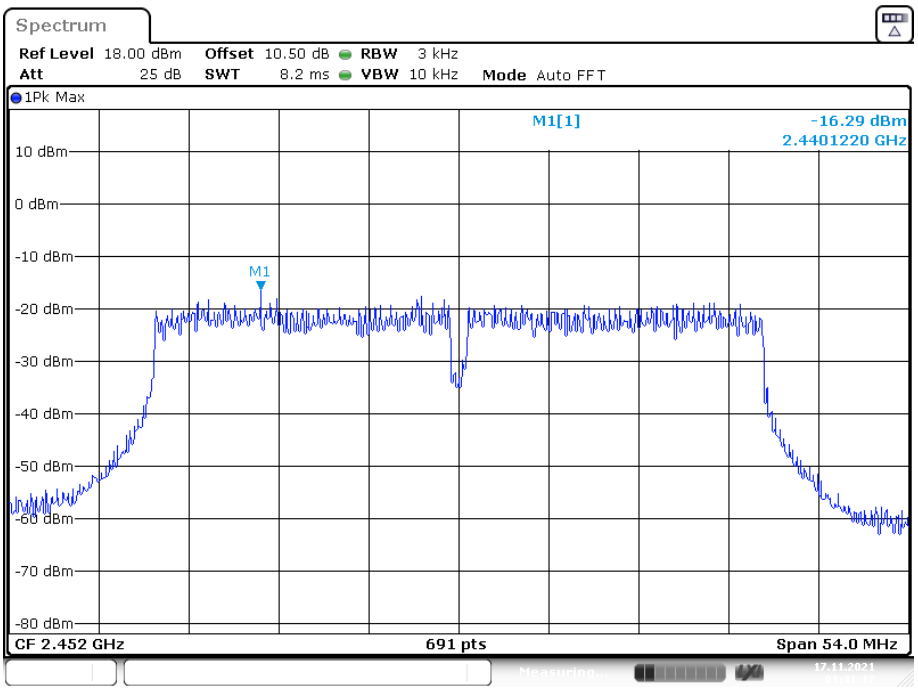
Date: 17.NOV.2021 01:40:40

Power Spectral Density, 802.11n-HT20 Middle Channel



Date: 17.NOV.2021 01:40:06

Power Spectral Density, 802.11n-HT20 High Channel



Date: 17.NOV.2021 01:41:17

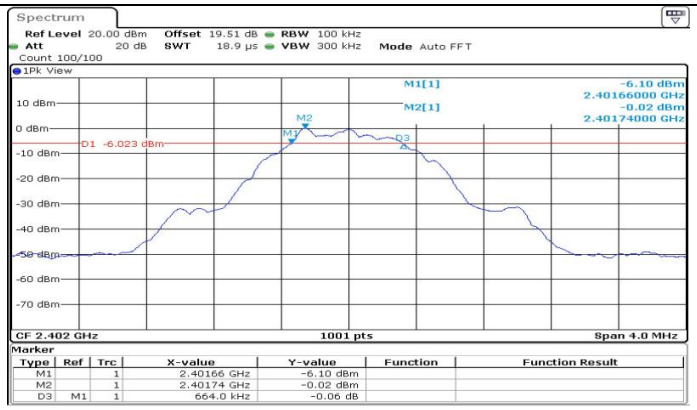
APPENDIX BLE

Appendix A: DTS Bandwidth

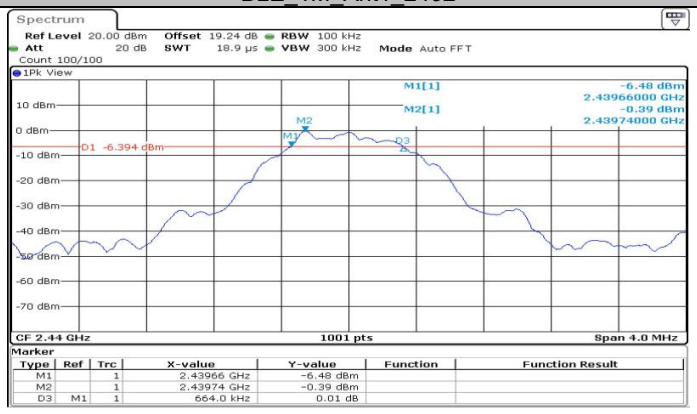
Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.664	0.5	PASS
		2440	0.664	0.5	PASS
		2480	0.664	0.5	PASS

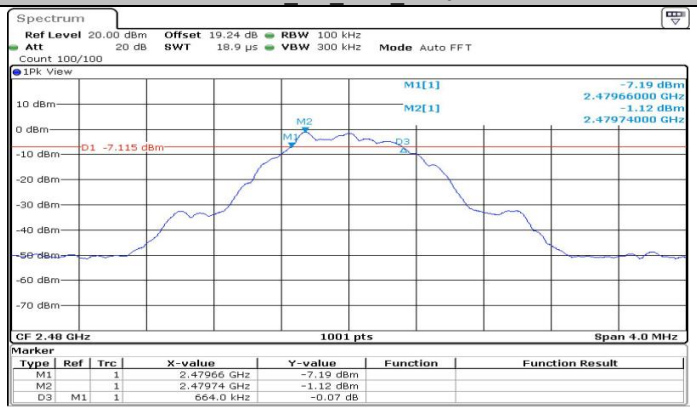
Test Graphs



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

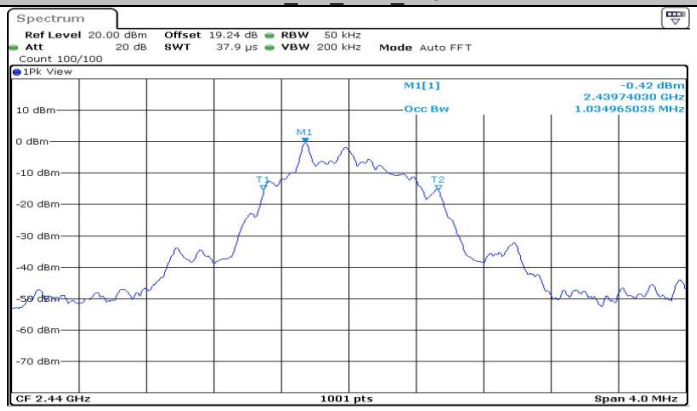
Appendix B: Occupied Channel Bandwidth

Test Result

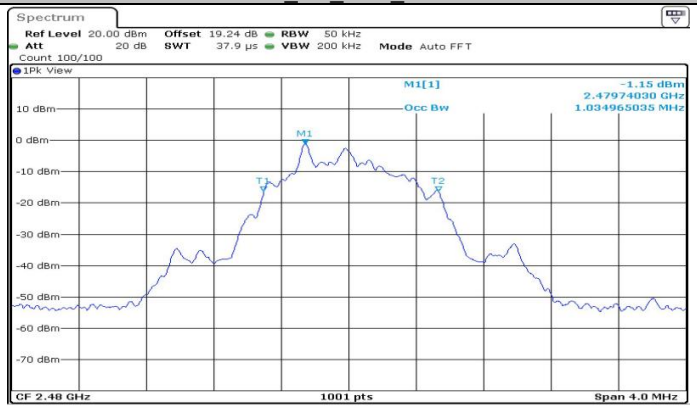
Test Mode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.035	---	PASS
		2440	1.035	---	PASS
		2480	1.035	---	PASS

Test Graphs

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

Appendix C: Maximum conducted Peak output power

Test Result

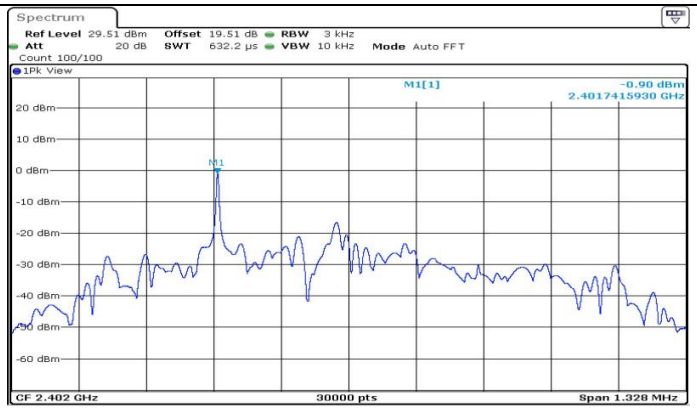
Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.71	≤30	PASS
		2440	0.56	≤30	PASS
		2480	0.00	≤30	PASS

Appendix D: Maximum power spectral density

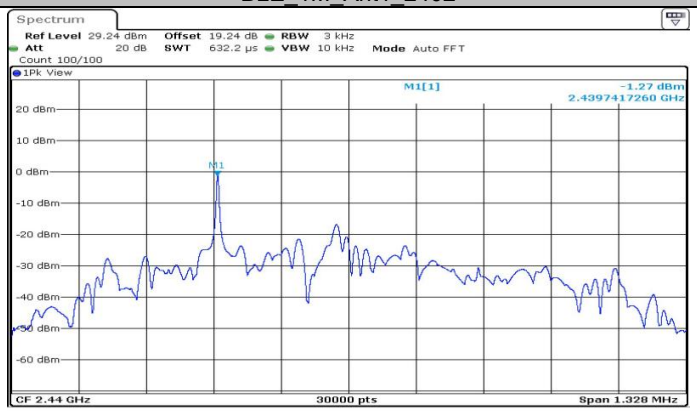
Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-0.90	≤8	PASS
		2440	-1.27	≤8	PASS
		2480	-1.99	≤8	PASS

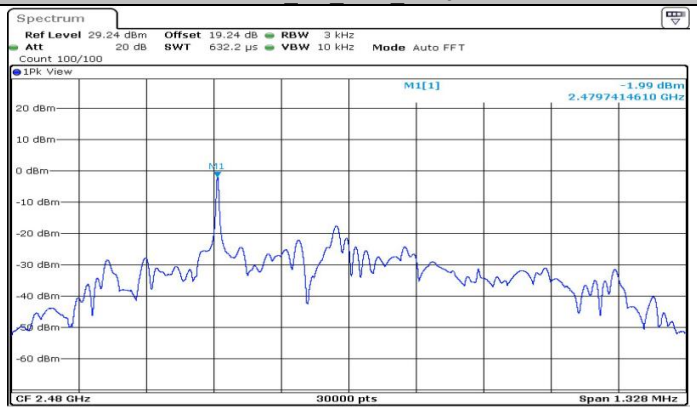
Test Graphs



BLE_1M_Ant1_2402



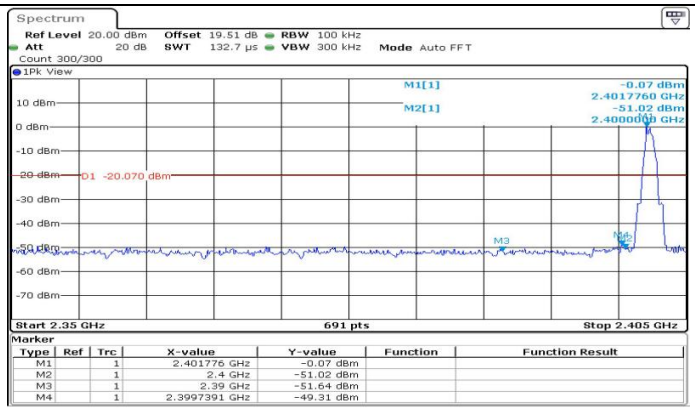
BLE_1M_Ant1_2440



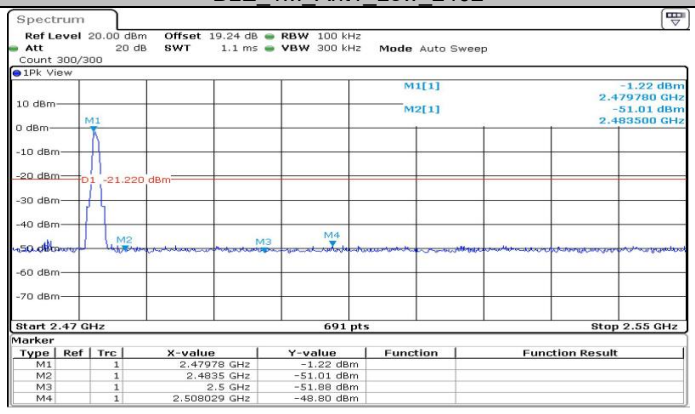
BLE_1M_Ant1_2480

Appendix E: Band edge measurements

Test Graphs



BLE_1M_Ant1_Low_2402



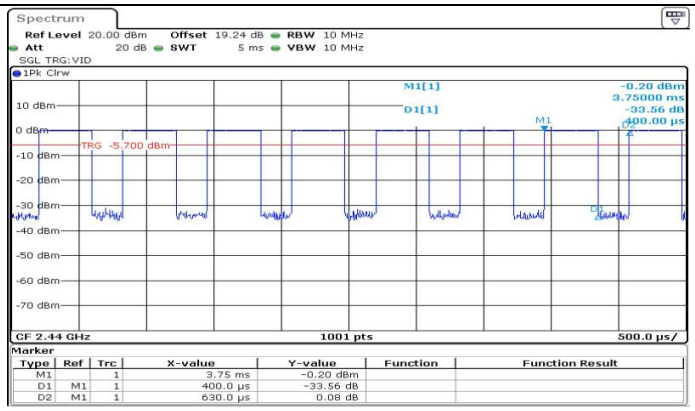
BLE_1M_Ant1_High_2480

Appendix F: Duty Cycle

Test Result

Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
BLE_1M	Ant1	2440	0.40	0.63	63.49

Test Graphs



BLE_1M_Ant1_2440

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