TEST REPORT

Applicant Name :	Inrico Technologies Co., Ltd
Address :	3/F, Building No.118, High Tech Industrial Park, 72 Guowei Road, Luohu District, Shenzhen,China
Report Number :	SZGMA210719-29778E-RF-00BA1
FCC ID:	2AIV6-2-TM-9

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	PoC mobile radio
Model No.:	TM-9
Trade Mark:	Inrico
Date Received:	2021/07/19
Date of Test:	2021/08/05~2021/10/22
Report Date:	2021/12/16

Test Result:	Pass*

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

Prepared and Checked By:

Fan Yang

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: 2412-2472MHz
Maximum Conducted Peak Output Power	BLE: 5.95dBm Wi-Fi: 11.36dBm
Modulation Technique	BLE: GFSK Wi-Fi: DSSS, OFDM
Antenna Specification*	1.5dBi(provided by the applicant)
Voltage Range	DC 12V or DC 24V From Car Battery
Sample number	SZGMA210719-29778E-RFA1-S1 (RE) SZGMA210719-29778E-RFA1-S2 (RF Conducted Test) (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, 15.209 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.
Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
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 13 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	12	2467
6	2437	13	2472
7	2442	/	/

802.11b, 802.11g and 802.11n-HT20 mode was tested with Channel 1, 7 and 13.

802.11n-HT40 mode was tested with Channel 3, 7 and 11.

For BLE mode:

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

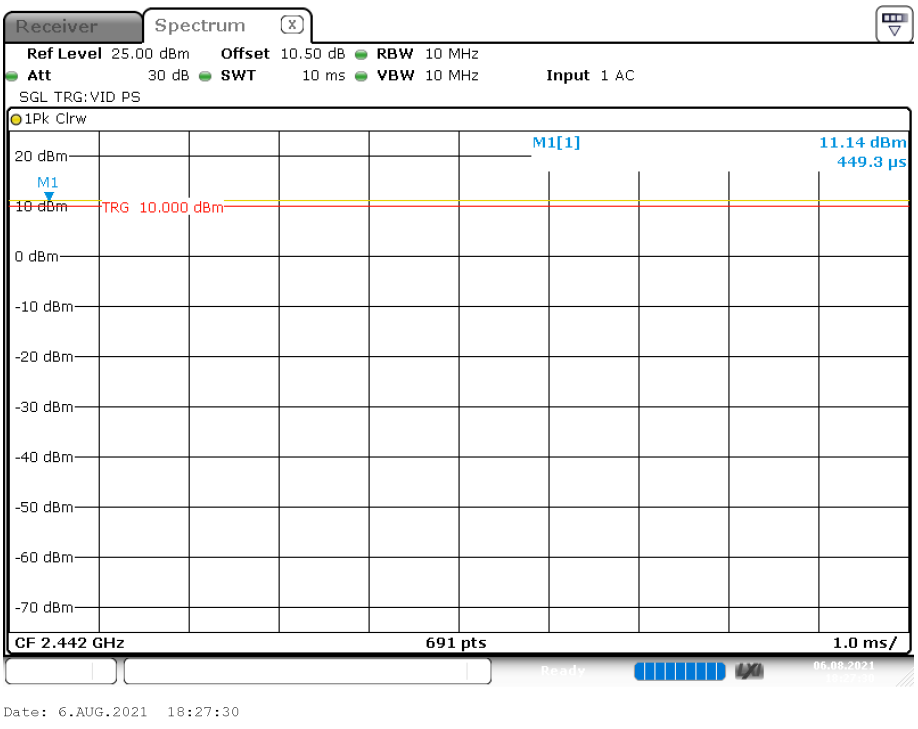
EUT is tested in engineering mode and the power level was provided by the manufacturer.

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

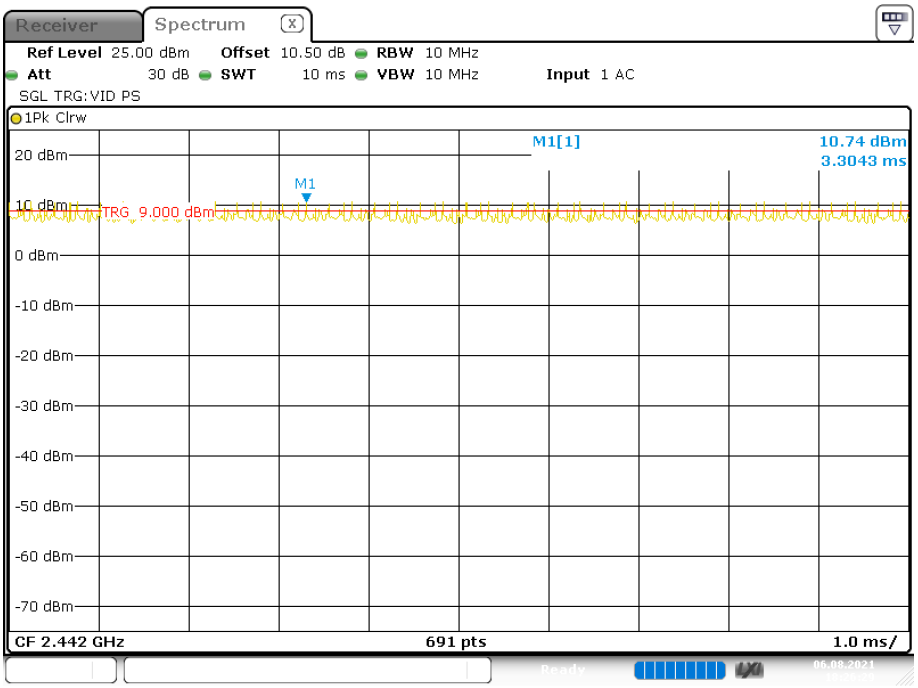
Mode	Data rate	Power level*		
		Low channel	Middle channel	High channel
802.11b	1Mbps	9	9	9
802.11g	6Mbps	5	5	5
802.11n-HT20	MCS0	5	5	5
802.11n-HT40	MCS0	5	5	5
BLE	1Mbps	Default		

Duty cycle

802.11b mode



802.11g mode



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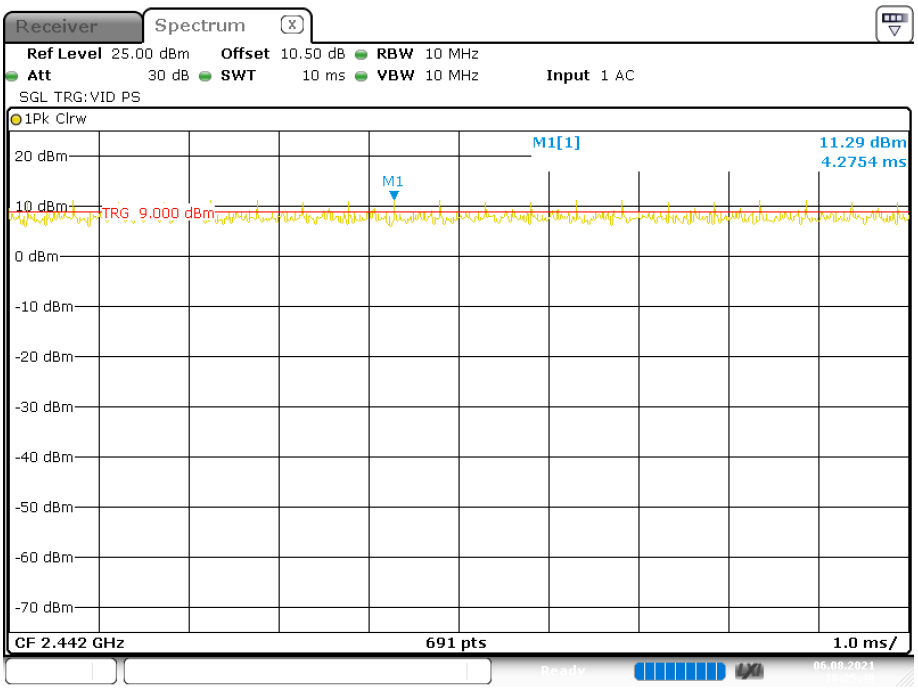
802.11n-HT20 Mode



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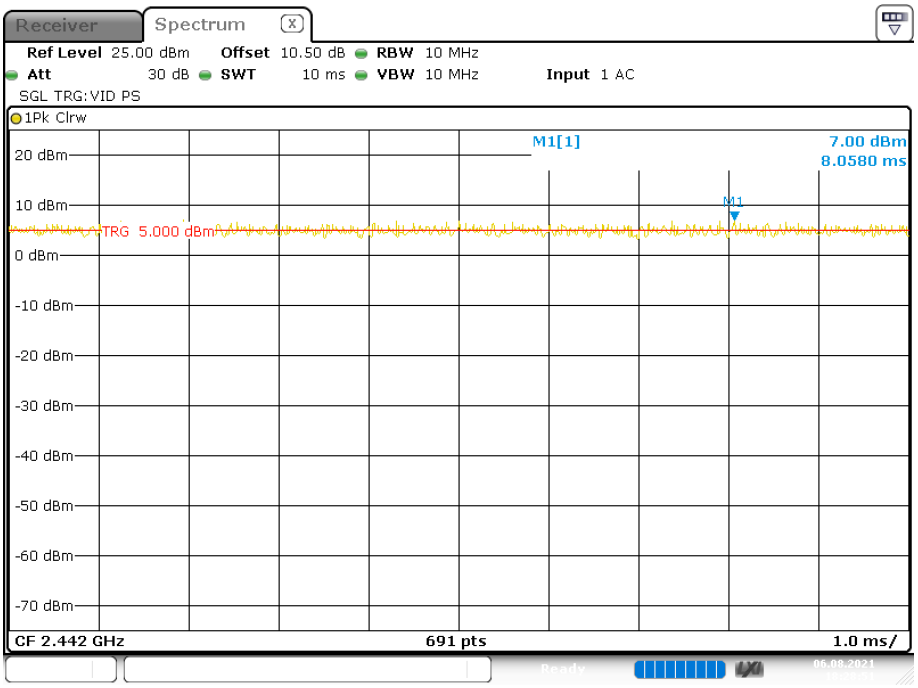
802.11n-HT40 Mode



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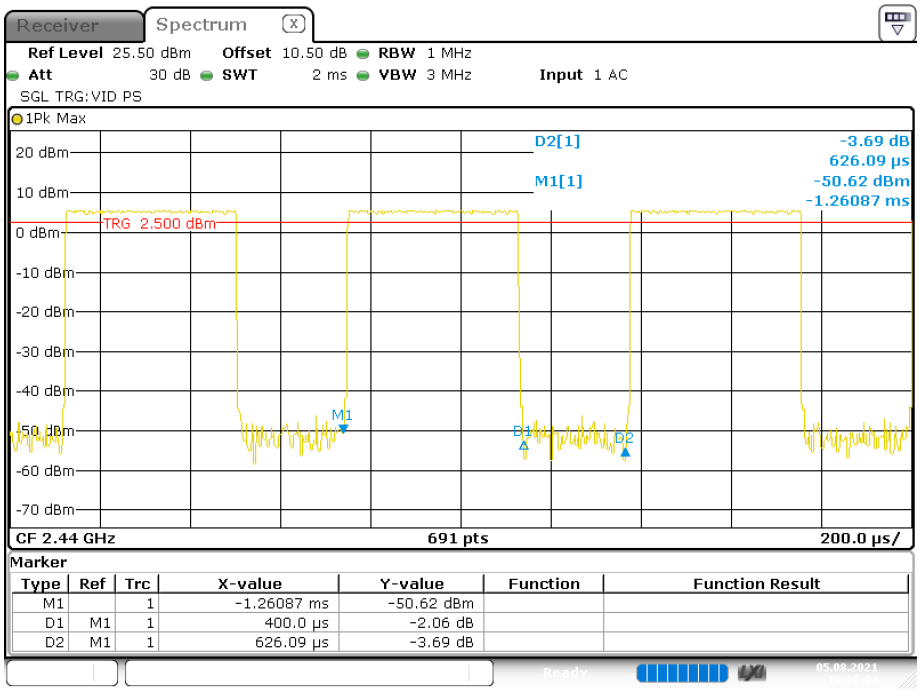
BLE



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Mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
802.11b	/	/	100
802.11g	/	/	100
802.11n-HT20	/	/	100
802.11n-HT40	/	/	100
BLE 1M	0.4	0.626	63.90

Support Equipment List and Details

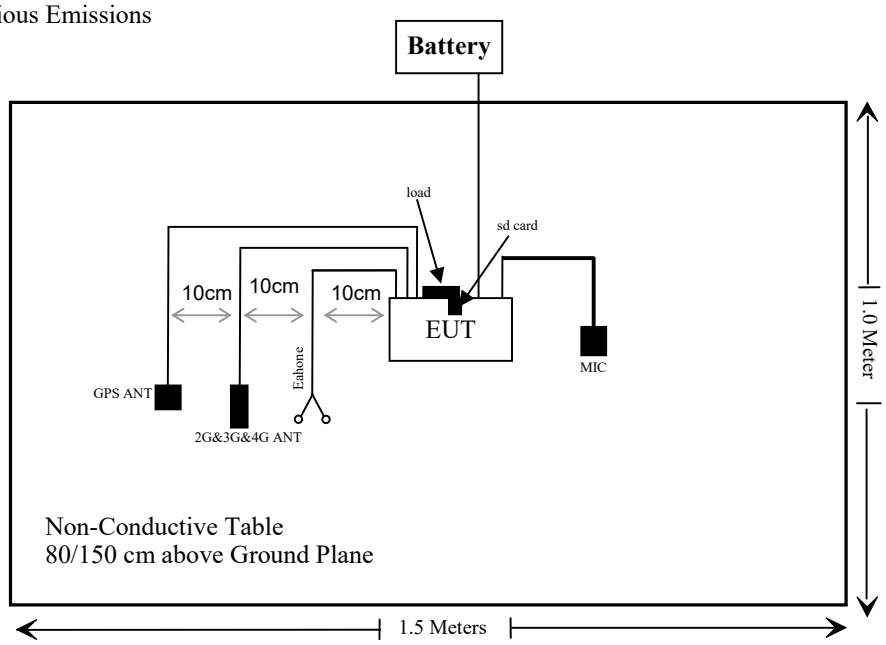
Manufacturer	Description	Model	Serial Number
CHUANXI	Battery	6-QW-120	45H885718
Unknown	load	Unknown	Unknown
Unknown	Earphone	Unknown	Unknown
Kingston	sd card	SDG3	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable DC Cable	2.7	Battery	EUT
Un-shielding Detachable MIC Cable	0.6	EUT	MIC
Un-shielding Detachable Earphone Cable	1.0	EUT	Earphone
Un-shielding Detachable ANT Cable	1.2	EUT	2G&3G&4G ANT
Un-shielding Detachable ANT Cable	2.5	EUT	GPS ANT

Block Diagram of Test Setup

For Spurious Emissions



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Not Applicable
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission 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

Not Applicable: The device is powered by Car battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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	2020/11/09	2021/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/28	2021/11/27
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
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-1m	No.5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-10m	No.7	2020/11/09	2021/11/08
Unknown	RF Coaxial Cable	N-2m	No.8	2020/11/09	2021/11/08
Wainwright	High Pass Filter	WHKX3.6/18G-10SS	5	2020/12/25	2021/12/24
Radiated Emission Test Software: EZ_EMC V 1.1.4.2 for below 1GHz					
Radiated Emission Test Software: e3 19821b (V9) for above 1GHz					

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	Open Switch and Control Unit	OSP120 + OSP-B157	101244 + 100866	2020/12/24	2021/12/23
WEINSCHEL	10dB Attenuator	5324	AU 3842	2020/12/25	2021/12/24

*** 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) & §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:

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

For worst:

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)			
BDR/EDR	2402-2480	1.5	1.41	6.0	3.98	20	0.001	1.0
BLE	2402-2480	1.5	1.41	6.0	3.98	20	0.001	1.0
2.4G Wi-Fi	2412-2472	1.5	1.41	11.5	14.13	20	0.004	1.0
GPRS/EDGE 850	824-849	0.5	1.12	32.1	1621.81	20	0.362	0.55
GPRS/EDGE 1900	1850-1910	0.5	1.12	29.5	891.25	20	0.199	1.0
WCDNA B2	1850-1910	0.5	1.12	23	199.53	20	0.045	1.0
WCDNA B5	824-849	0.5	1.12	22.5	177.83	20	0.040	0.55
LTE B2	1850-1910	0.5	1.12	23	199.53	20	0.045	1.0
LTE B4	1710-1755	0.5	1.12	22.5	177.83	20	0.040	1.0
LTE B5	824-849	0.5	1.12	23	199.53	20	0.045	0.55
LTE B7	2500-2570	0.5	1.12	23	199.53	20	0.045	1.0
LTE B12	699-716	0.5	1.12	23	199.53	20	0.045	0.47
LTE B17	704-716	0.5	1.12	23	199.53	20	0.045	0.47
LTE B38	2570-2620	0.5	1.12	23	199.53	20	0.045	1.0
LTE B66	1710-1780	0.5	1.12	22.5	177.83	20	0.040	1.0

Note: 1. The tune up conducted power was declared by the applicant.
2. The BT or Wi-Fi can transmit at the same time with the WWAN.

Simultaneous transmitting consideration (worst case):

The ratio=$MPE_{2.4G\ Wi\text{-}Fi}$/limit+$MPE_{GPRS/EDGE850}$/limit=0.004/1+0.362/0.55=0.662＜1.0, so simultaneous exposure is compliant.

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.

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 and the antenna gain is 1.5dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

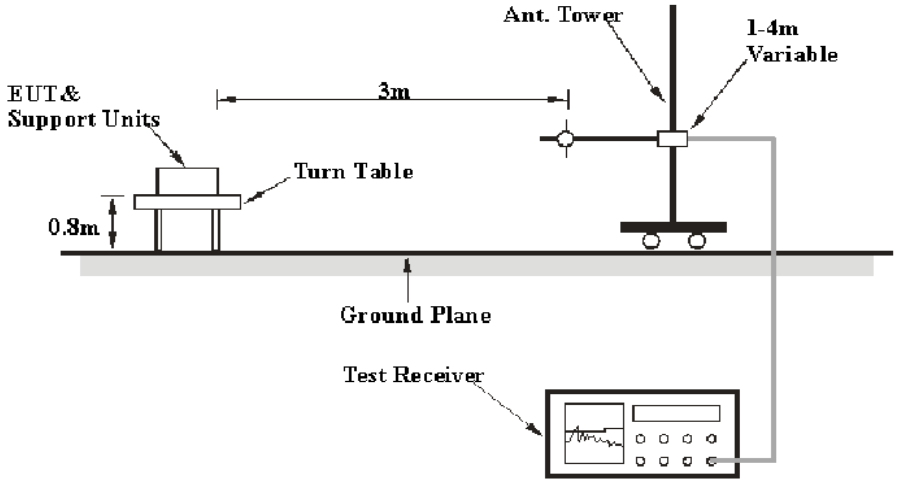
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

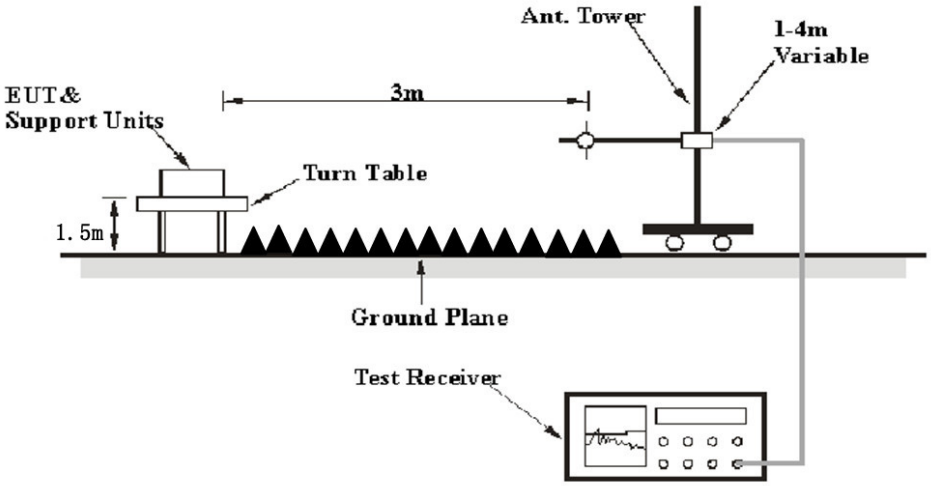
FCC §15.247 (d); §15.209; §15.205;

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

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

Test Data

Environmental Conditions

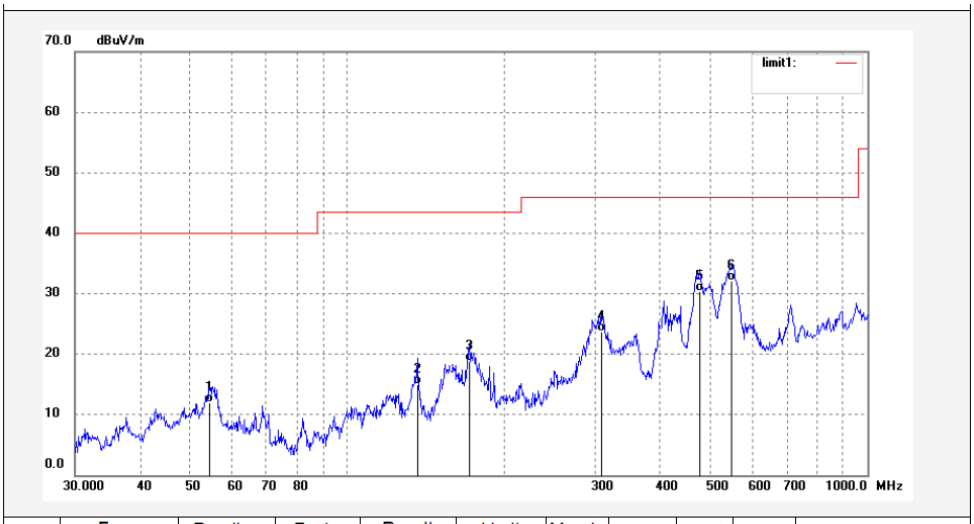
Temperature:	23~25 ℃
Relative Humidity:	48~64 %
ATM Pressure:	101.0~103.0 kPa

The testing was performed by Joe on 2021-10-22 for below 1GHz and Chao Mo on 2021-10-16 for above 1GHz.

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

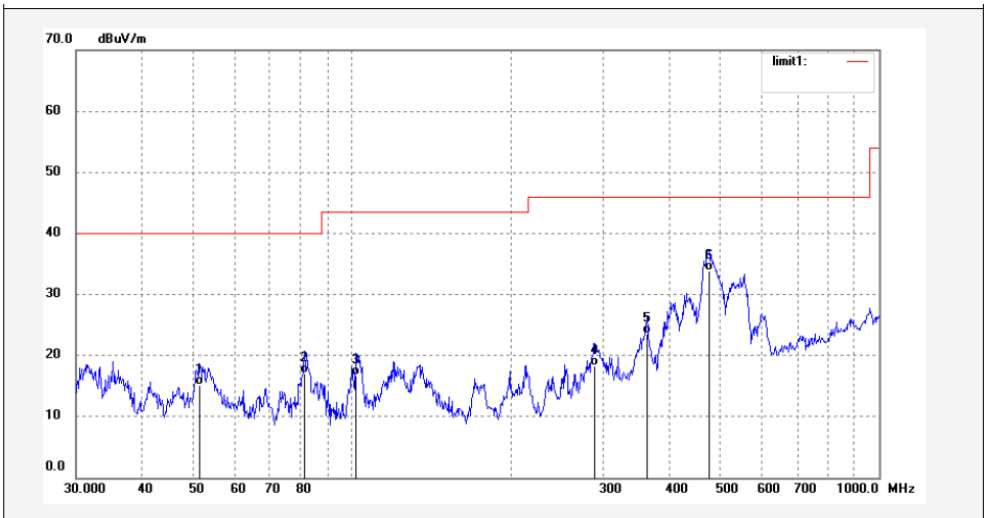
30MHz-1GHz: *(Worst case is 802.11n40 low channel)*

Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	54.4516	29.41	-17.37	12.04	40.00	-27.96	QP			
2	136.4598	34.23	-19.33	14.90	43.50	-28.60	QP			
3	171.9946	37.46	-18.69	18.77	43.50	-24.73	QP			
4	307.8313	38.07	-14.38	23.69	46.00	-22.31	QP			
5	475.4991	41.08	-10.71	30.37	46.00	-15.63	QP			
6	549.0195	41.23	-9.09	32.14	46.00	-13.86	QP			

Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	51.4807	32.49	-17.39	15.10	40.00	-24.90	QP			
2	81.4970	38.11	-21.05	17.06	40.00	-22.94	QP			
3	102.0014	35.09	-18.43	16.66	43.50	-26.84	QP			
4	289.0021	33.28	-14.94	18.34	46.00	-27.66	QP			
5	362.9844	36.74	-13.15	23.59	46.00	-22.41	QP			
6	475.4991	44.52	-10.71	33.81	46.00	-12.19	QP			

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/Ave.		Height (m)	Polar (H/V)				
BLE 1M, Low Channel									
2310	51.57	PK	235	1.9	H	-7.24	44.33	74	-29.67
2310	52.78	PK	197	1.5	V	-7.24	45.54	74	-28.46
2390	54.09	PK	117	1.2	H	-7.22	46.87	74	-27.13
2390	53.88	PK	83	1.6	V	-7.22	46.66	74	-27.34
4804	46.66	PK	2	1.6	H	-3.51	43.15	74	-30.85
4804	46.43	PK	57	1.1	V	-3.51	42.92	74	-31.08
BLE 1M, Middle Channel									
4880	46.74	PK	28	1.8	H	-3.38	43.36	74	-30.64
4880	46.7	PK	63	1.2	V	-3.38	43.32	74	-30.68
BLE 1M, High Channel									
2483.5	52.76	PK	55	1.2	H	-7.2	45.56	74	-28.44
2483.5	52.53	PK	342	1.4	V	-7.2	45.33	74	-28.67
2500	50.85	PK	204	1.6	H	-7.18	43.67	74	-30.33
2500	51.35	PK	5	2.1	V	-7.18	44.17	74	-29.83
4960	46.78	PK	189	1.7	H	-3.01	43.77	74	-30.23
4960	47.22	PK	125	2.1	V	-3.01	44.21	74	-29.79

Wi-Fi:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/Ave.		Height (m)	Polar (H/V)				
802.11B, Low Channel									
2310	50.66	PK	104	1.8	H	-7.24	43.42	74	-30.58
2310	51.13	PK	309	2.0	V	-7.24	43.89	74	-30.11
2390	51.58	PK	195	2.1	H	-7.22	44.36	74	-29.64
2390	53.03	PK	271	1.6	V	-7.22	45.81	74	-28.19
4824	45.67	PK	300	2.1	H	-3.52	42.15	74	-31.85
4824	47.03	PK	85	2.0	V	-3.52	43.51	74	-30.49
802.11B, Middle Channel									
4884	45.92	PK	149	1.2	H	-3.36	42.56	74	-31.44
4884	47.57	PK	135	1.5	V	-3.36	44.21	74	-29.79
802.11B, High Channel									
2483.5	51.41	PK	162	1.2	H	-7.2	44.21	74	-29.79
2483.5	50.41	PK	358	1.1	V	-7.2	43.21	74	-30.79
2500	49.42	PK	166	1.4	H	-7.18	42.24	74	-31.76
2500	49.52	PK	310	1.1	V	-7.18	42.34	74	-31.66
4944	45.98	PK	1	2.0	H	-3.07	42.91	74	-31.09
4944	47.61	PK	187	2.0	V	-3.07	44.54	74	-29.46
802.11G, Low Channel									
2310	50.15	PK	288	1.8	H	-7.24	42.91	74	-31.09
2310	50.48	PK	106	1.1	V	-7.24	43.24	74	-30.76
2390	51.68	PK	262	1.0	H	-7.22	44.46	74	-29.54
2390	51.55	PK	350	1.3	V	-7.22	44.33	74	-29.67
4824	47.46	PK	146	2.0	H	-3.52	43.94	74	-30.06
4824	48.21	PK	170	1.7	V	-3.52	44.69	74	-29.31
802.11G, Middle Channel									
4884	47.48	PK	356	1.3	H	-3.36	44.12	74	-29.88
4884	47.23	PK	25	2.2	V	-3.36	43.87	74	-30.13
802.11G, High Channel									
2483.5	51.49	PK	73	1.9	H	-7.2	44.29	74	-29.71
2483.5	52.89	PK	190	2.0	V	-7.2	45.69	74	-28.31
2500	51.72	PK	46	1.3	H	-7.18	44.54	74	-29.46
2500	51.69	PK	323	1.5	V	-7.18	44.51	74	-29.49
4944	47.58	PK	249	1.1	H	-3.07	44.51	74	-29.49
4944	46.98	PK	68	1.9	V	-3.07	43.91	74	-30.09

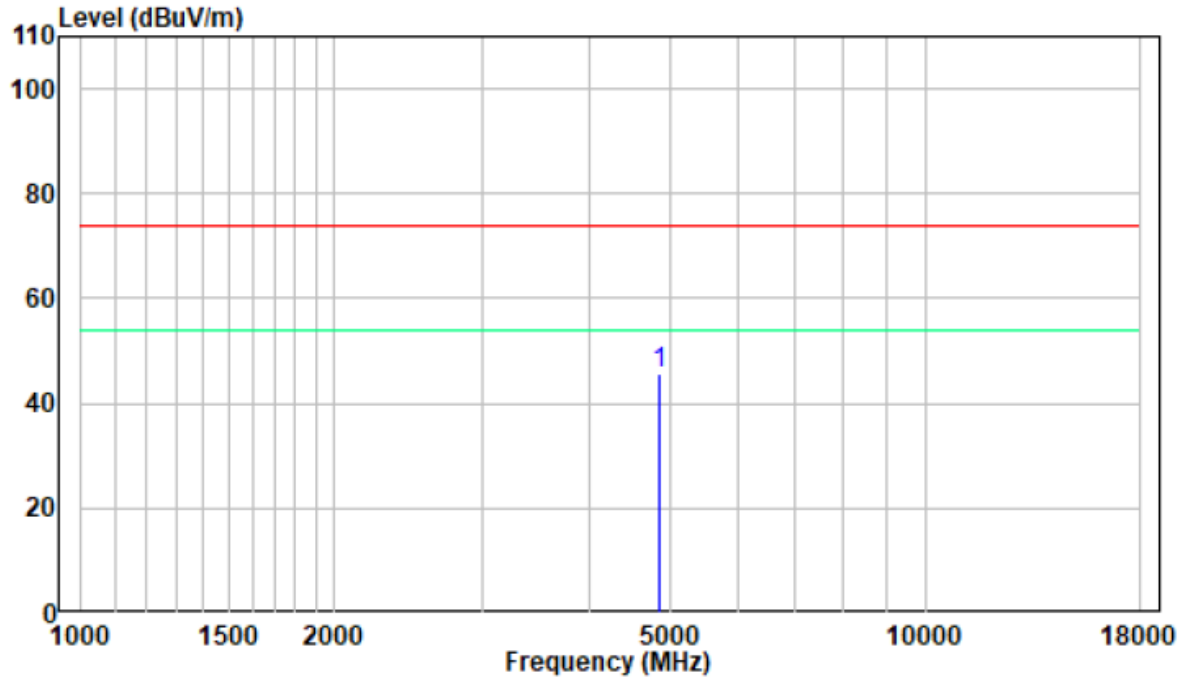
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/Ave		Height (m)	Polar (H/V)				
802.11N20, Low Channel									
2310	50.78	PK	294	1.7	H	-7.24	43.54	74	-30.46
2310	50.16	PK	20	1.5	V	-7.24	42.92	74	-31.08
2390	52.09	PK	275	2.2	H	-7.22	44.87	74	-29.13
2390	52.15	PK	301	2.2	V	-7.22	44.93	74	-29.07
4824	47.24	PK	37	1.1	H	-3.52	43.72	74	-30.28
4824	47.43	PK	184	1.9	V	-3.52	43.91	74	-30.09
802.11N20, Middle Channel									
4884	45.75	PK	273	1.7	H	-3.36	42.39	74	-31.61
4884	47.13	PK	200	1.7	V	-3.36	43.77	74	-30.23
802.11N20, High Channel									
2483.5	51.84	PK	274	1.1	H	-7.2	44.64	74	-29.36
2483.5	51.66	PK	215	1.4	V	-7.2	44.46	74	-29.54
2500	51.9	PK	2	1.5	H	-7.18	44.72	74	-29.28
2500	51.44	PK	324	1.6	V	-7.18	44.26	74	-29.74
4944	47.56	PK	174	1.4	H	-3.07	44.49	74	-29.51
4944	47.96	PK	168	2.2	V	-3.07	44.89	74	-29.11
802.11N40, Low Channel									
2310	50.87	PK	153	1.7	H	-7.24	43.63	74	-30.37
2310	51.03	PK	91	1.3	V	-7.24	43.79	74	-30.21
2390	53.53	PK	133	1.1	H	-7.22	46.31	74	-27.69
2390	52.76	PK	151	1.8	V	-7.22	45.54	74	-28.46
4844	49.25	PK	16	1.4	H	-3.54	45.71	74	-28.29
4844	50.18	PK	137	1.9	V	-3.54	46.64	74	-27.36
802.11N40, Middle Channel									
4884	46.69	PK	231	1.6	H	-3.36	43.33	74	-30.67
4884	46.28	PK	256	2.0	V	-3.36	42.92	74	-31.08
802.11N40, High Channel									
2483.5	52.51	PK	98	1.6	H	-7.2	45.31	74	-28.69
2483.5	53.8	PK	104	1	V	-7.2	46.6	74	-27.4
2500	51.34	PK	260	1.1	H	-7.18	44.16	74	-29.84
2500	52.12	PK	53	1.1	V	-7.18	44.94	74	-29.06
4924	47	PK	75	2.2	H	-3.16	43.84	74	-30.16
4924	47.39	PK	250	2	V	-3.16	44.23	74	-29.77

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 in the noise floor level was not recorded.
The test result of peak was less than the limit of average, so just peak value were recorded.

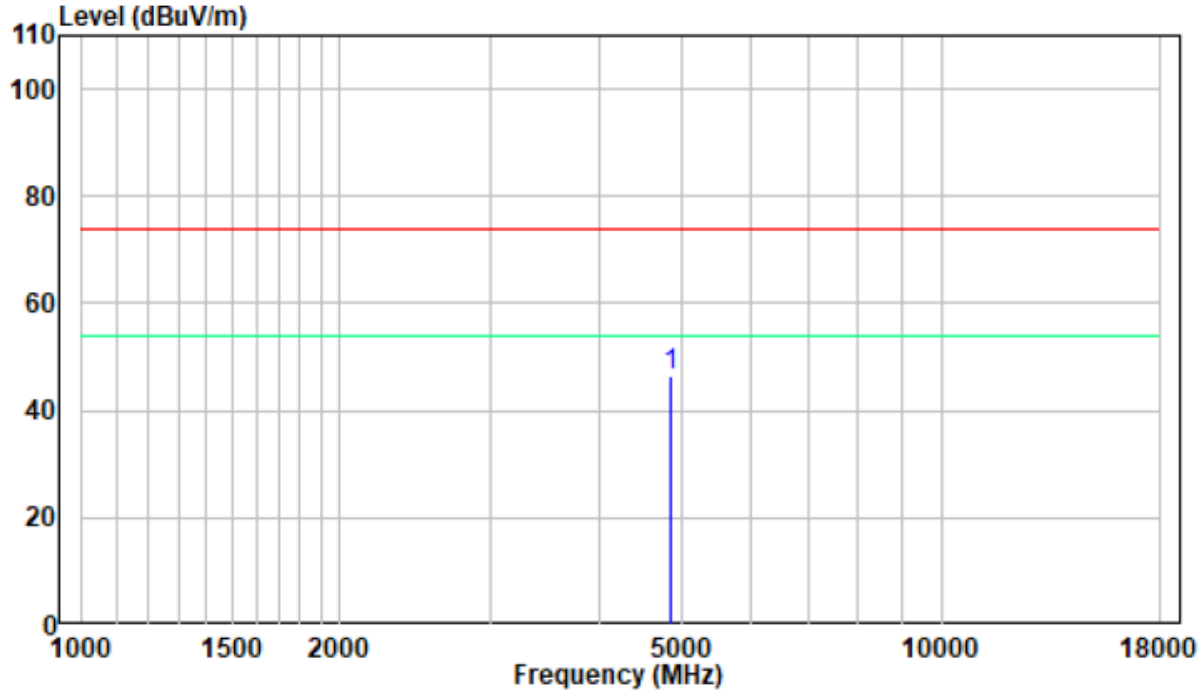
1-18 GHz:

Pre-scan Plots:

802.11B Middle Channel
Horizontal



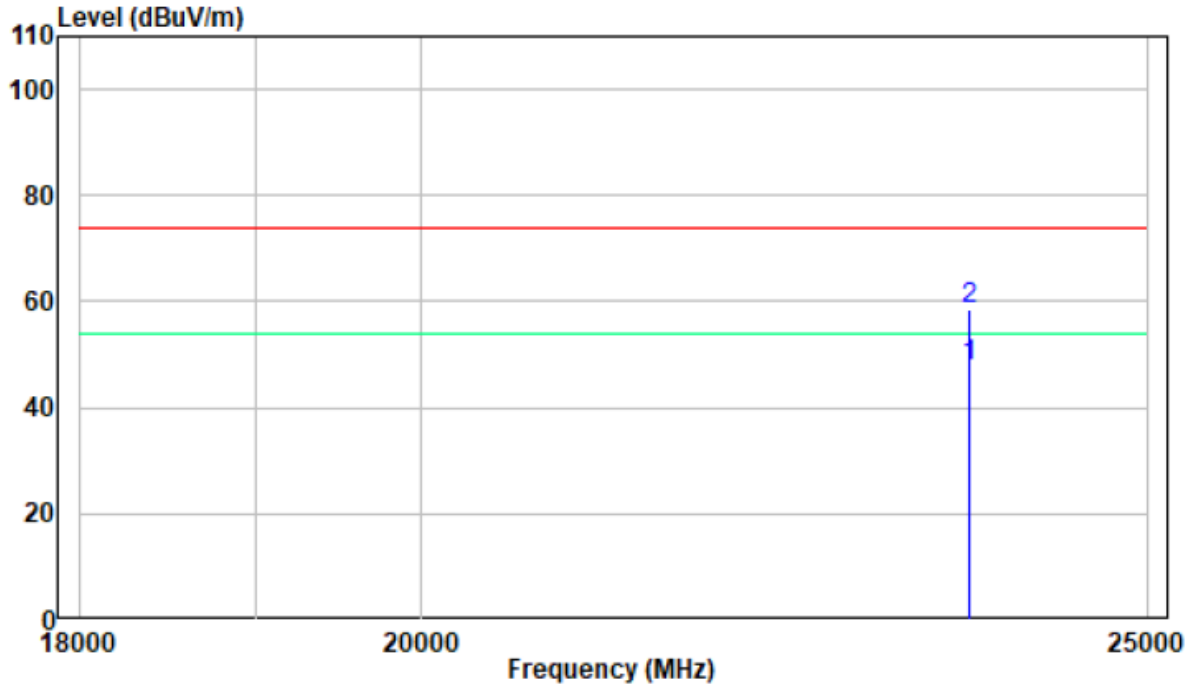
Vertical



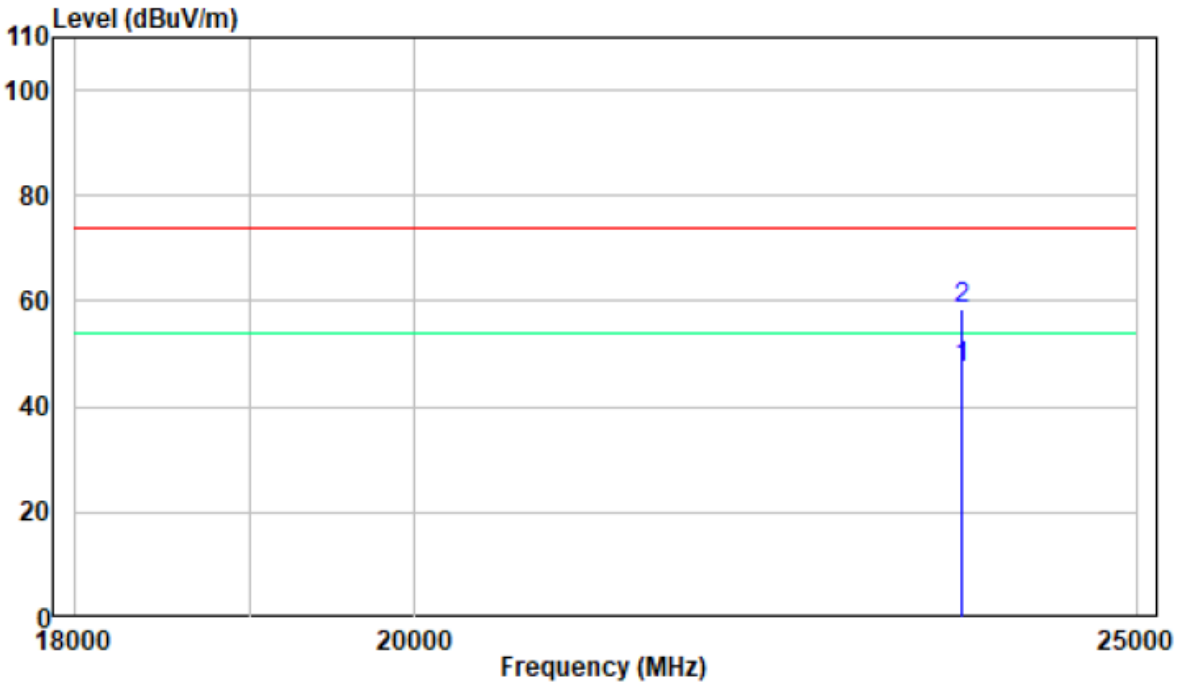
18 - 25GHz:

Pre-scan Plots:

802.11B Middle Channel
Horizontal



Vertical



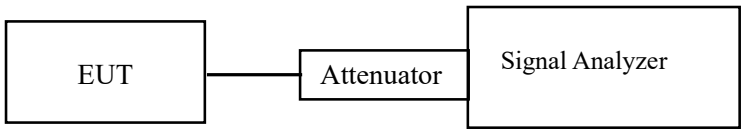
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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:	25~26 ℃
Relative Humidity:	56 ℃
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-08-05 to 2021-08-06.

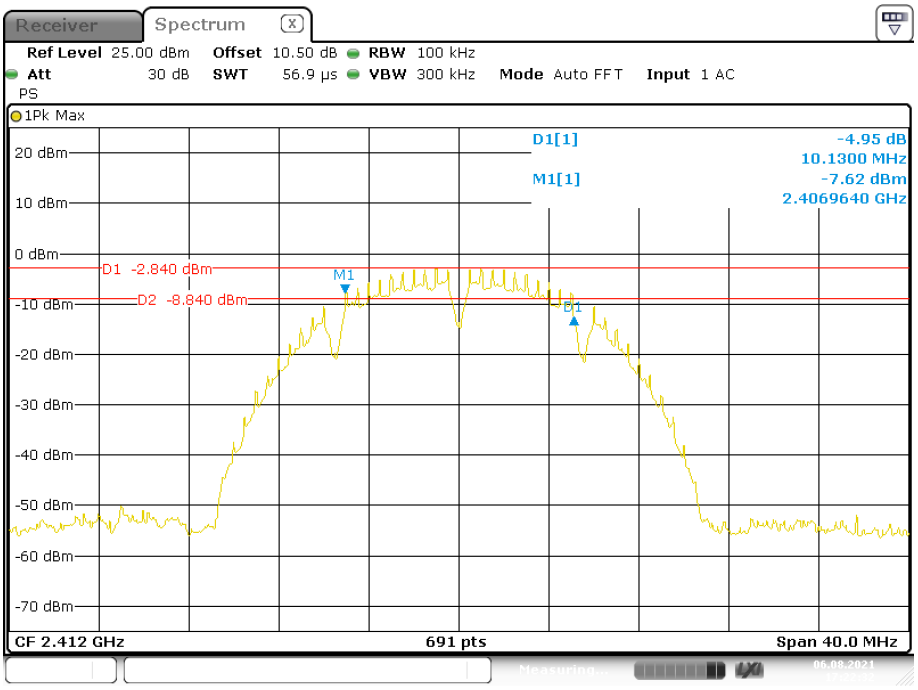
Test Result: Pass.

Please refer to the following table and plots.

EUT operation mode: Transmitting

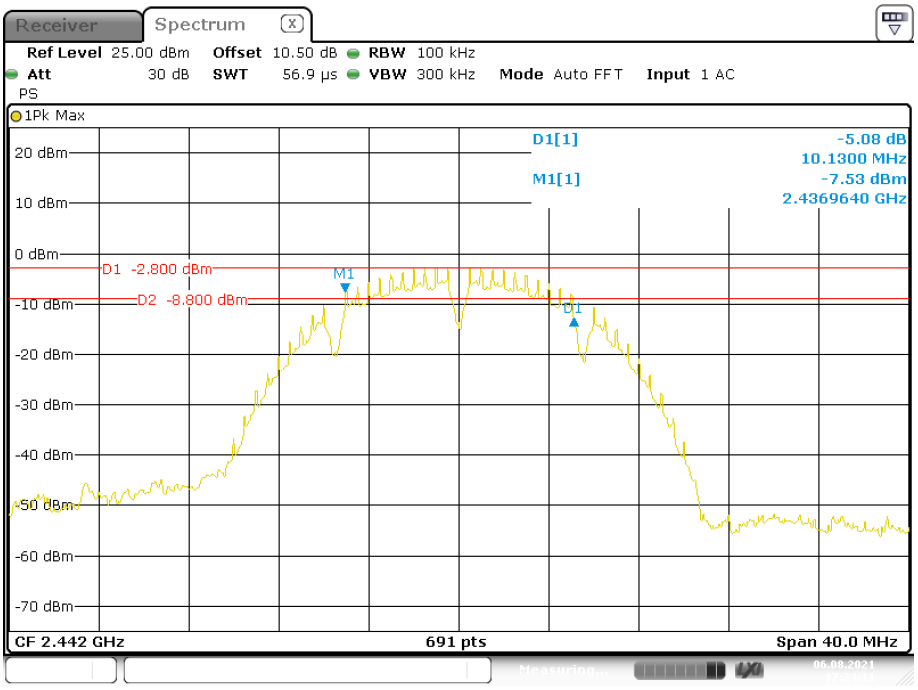
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)
802.11b mode			
Low	2412	10.13	≥500
Middle	2442	10.13	≥500
High	2472	10.13	≥500
802.11g mode			
Low	2412	16.44	≥500
Middle	2442	16.44	≥500
High	2472	16.44	≥500
802.11n-HT20 mode			
Low	2412	17.48	≥500
Middle	2442	17.60	≥500
High	2472	17.66	≥500
802.11n-HT40 mode			
Low	2422	35.98	≥500
Middle	2442	36.12	≥500
High	2462	36.15	≥500
BLE mode			
Low	2402	0.729	≥500
Middle	2440	0.729	≥500
High	2480	0.729	≥500

6dB Bandwidth, 802.11b Low Channel



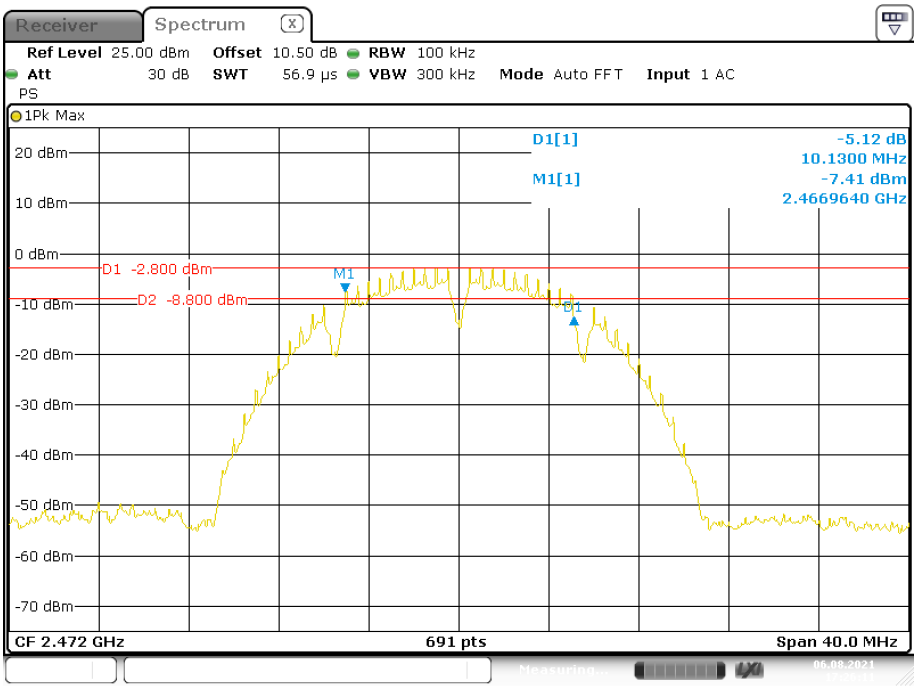
Date: 6.AUG.2021 17:22:32

6dB Bandwidth, 802.11b Middle Channel



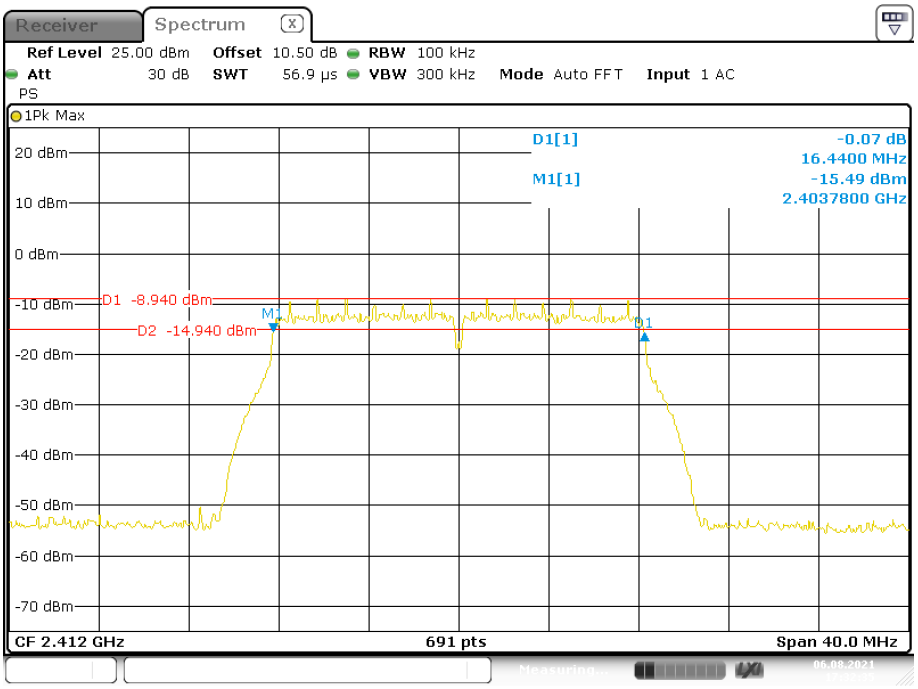
Date: 6.AUG.2021 17:24:12

6dB Bandwidth, 802.11b High Channel



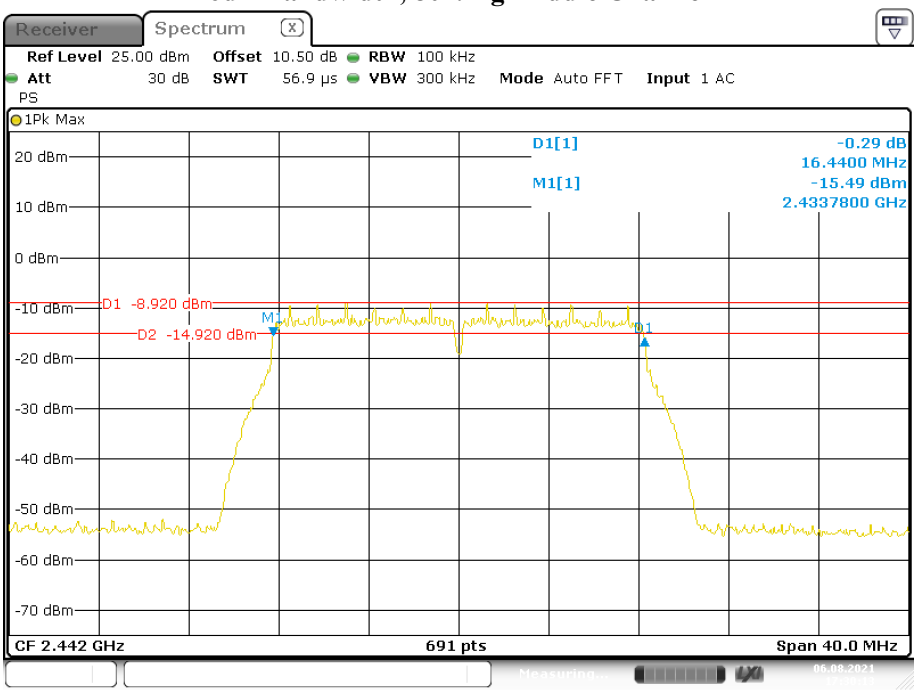
Date: 6.AUG.2021 17:26:11

6dB Bandwidth, 802.11g Low Channel



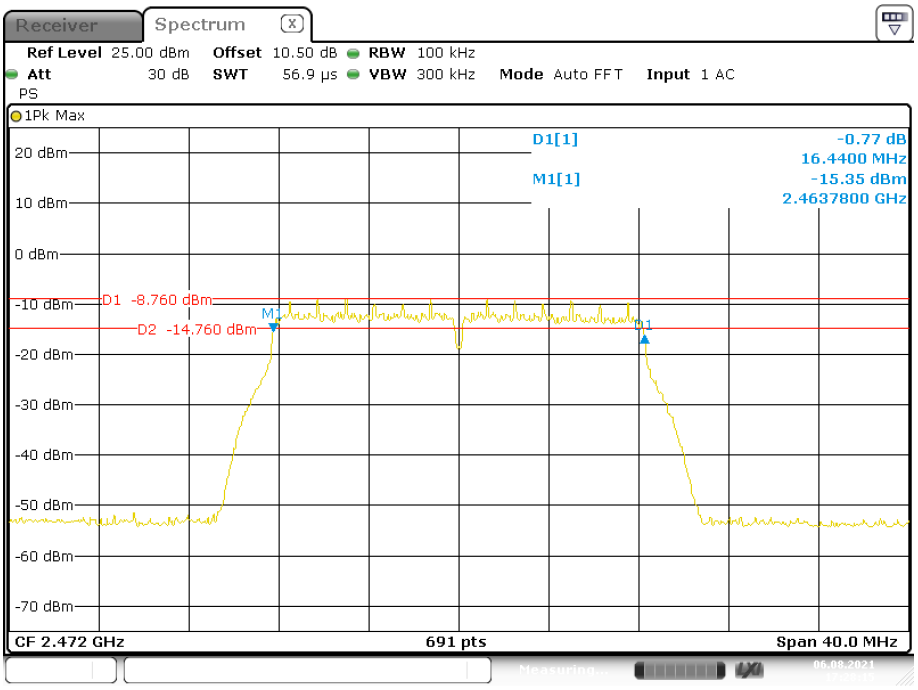
Date: 6.AUG.2021 17:32:35

6dB Bandwidth, 802.11g Middle Channel



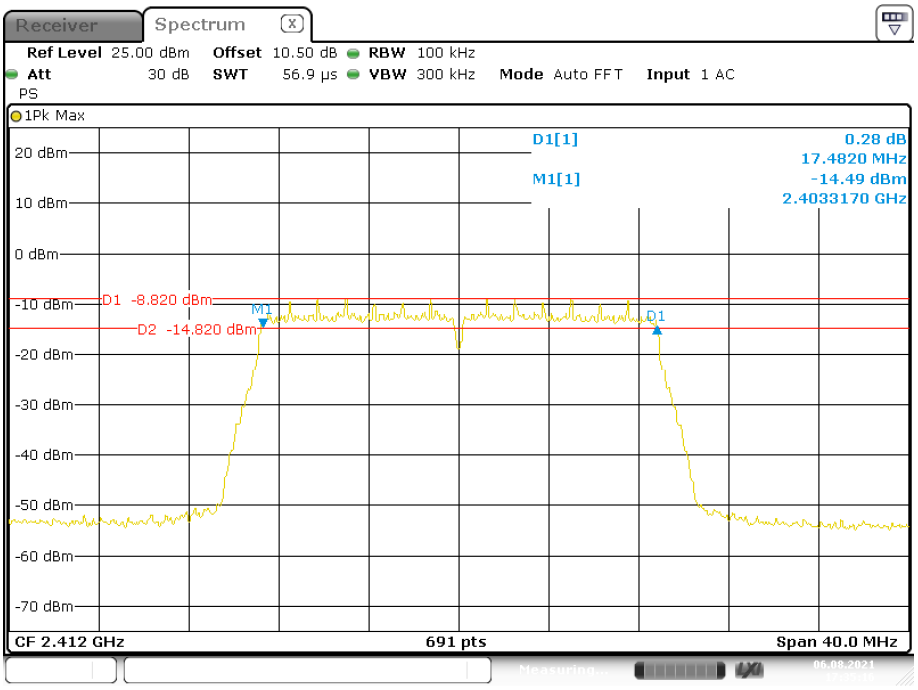
Date: 6.AUG.2021 17:30:14

6dB Bandwidth, 802.11g High Channel



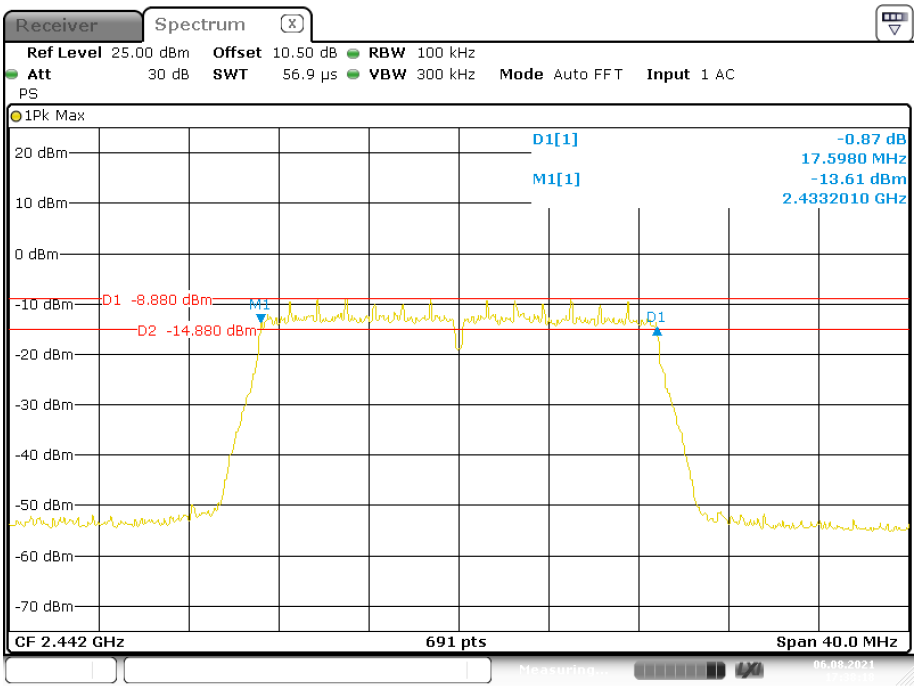
Date: 6.AUG.2021 17:28:16

6dB Bandwidth, 802.11n-HT20 Low Channel



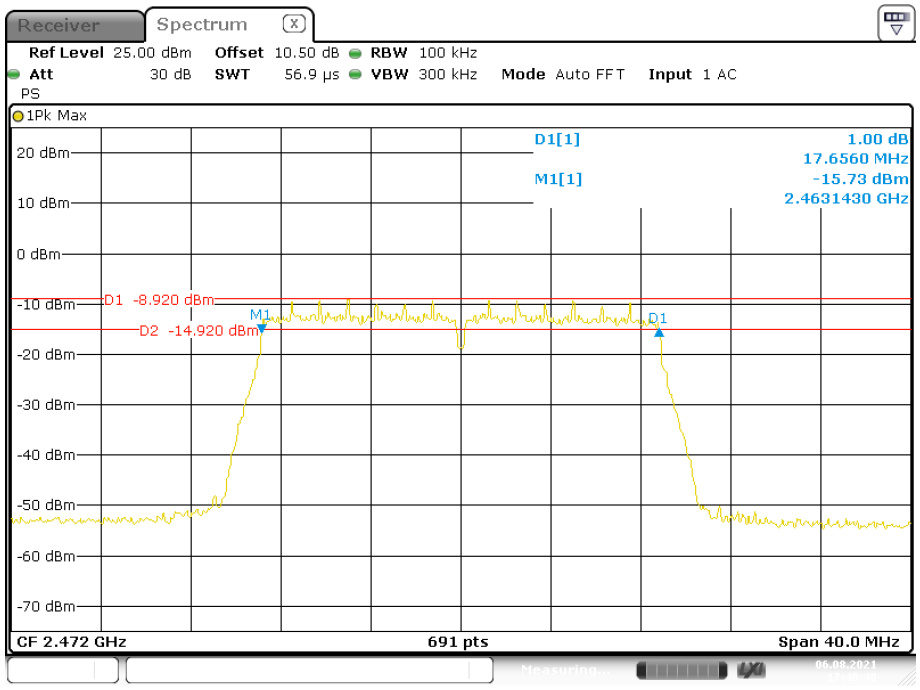
Date: 6.AUG.2021 17:35:17

6dB Bandwidth, 802.11n-HT20 Middle Channel



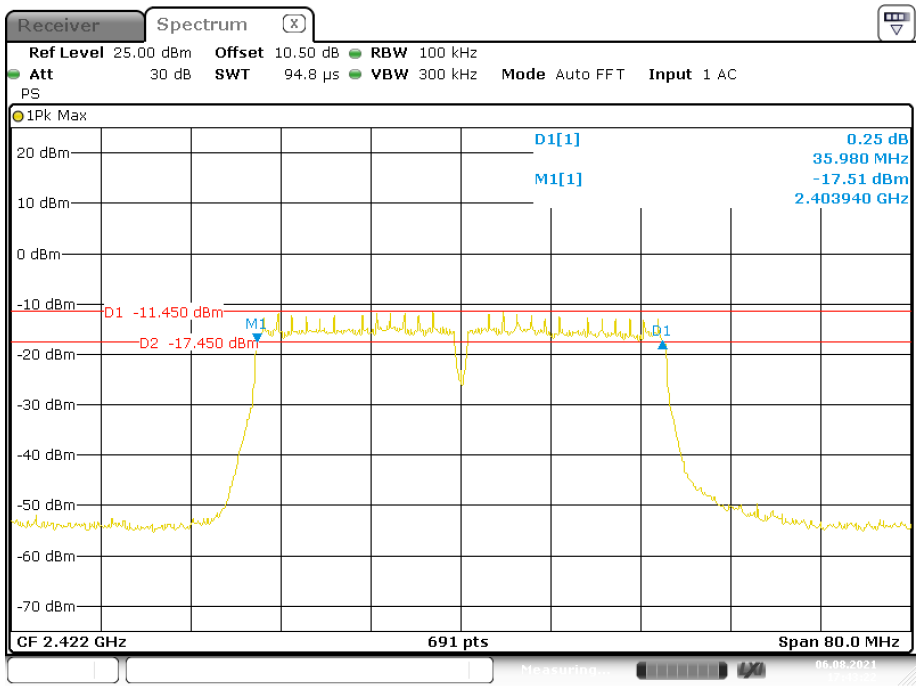
Date: 6.AUG.2021 17:38:19

6dB Bandwidth, 802.11n-HT20 High Channel



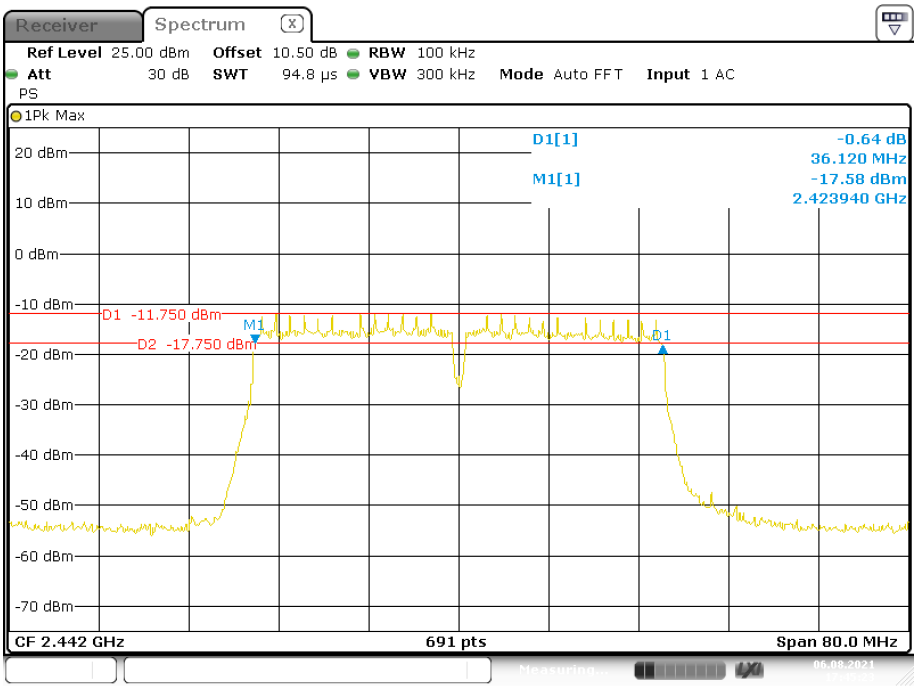
Date: 6.AUG.2021 17:40:40

6dB Bandwidth, 802.11n-HT40 Low Channel



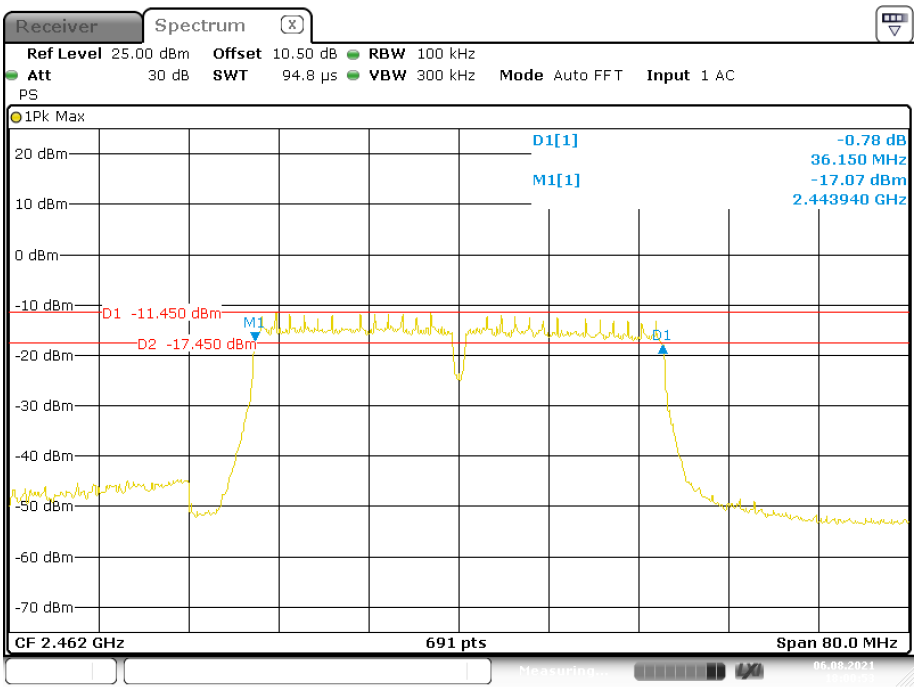
Date: 6.AUG.2021 17:43:22

6dB Bandwidth, 802.11n-HT40 Middle Channel



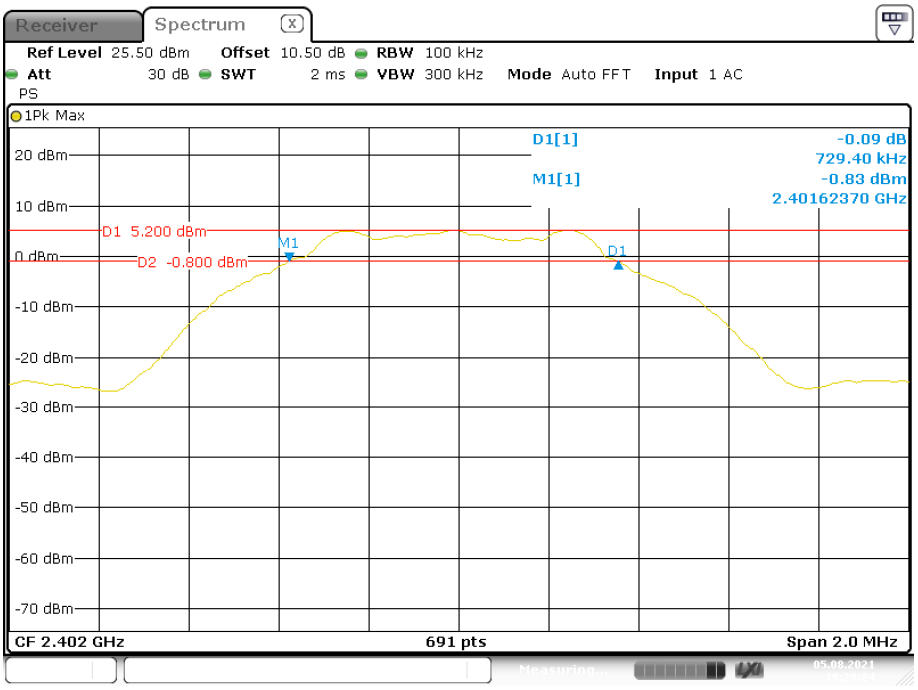
Date: 6.AUG.2021 17:45:23

6dB Bandwidth, 802.11n-HT40 High Channel



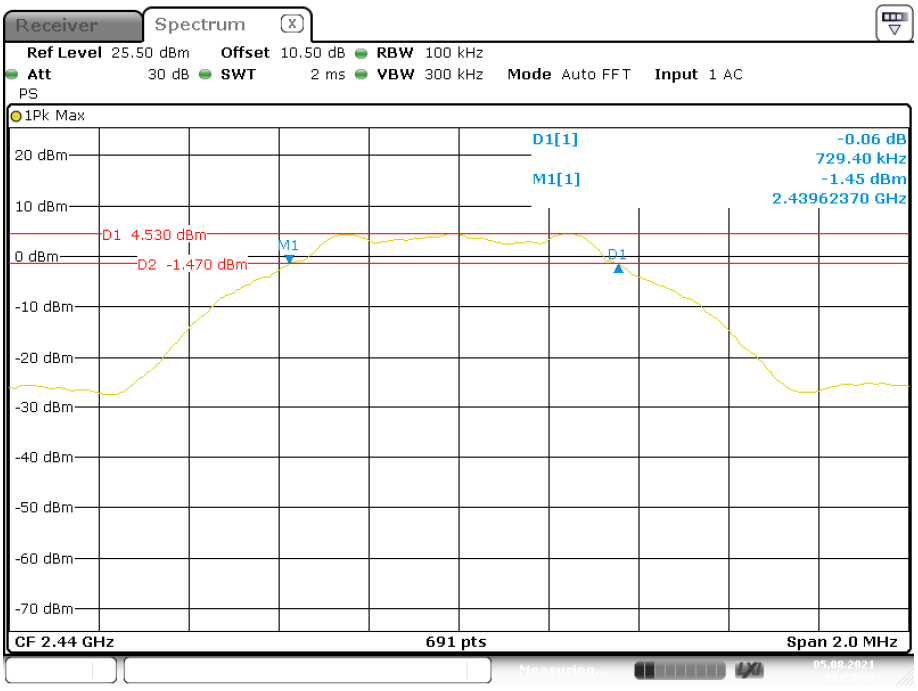
Date: 6.AUG.2021 18:00:53

6dB Bandwidth, BLE Low Channel



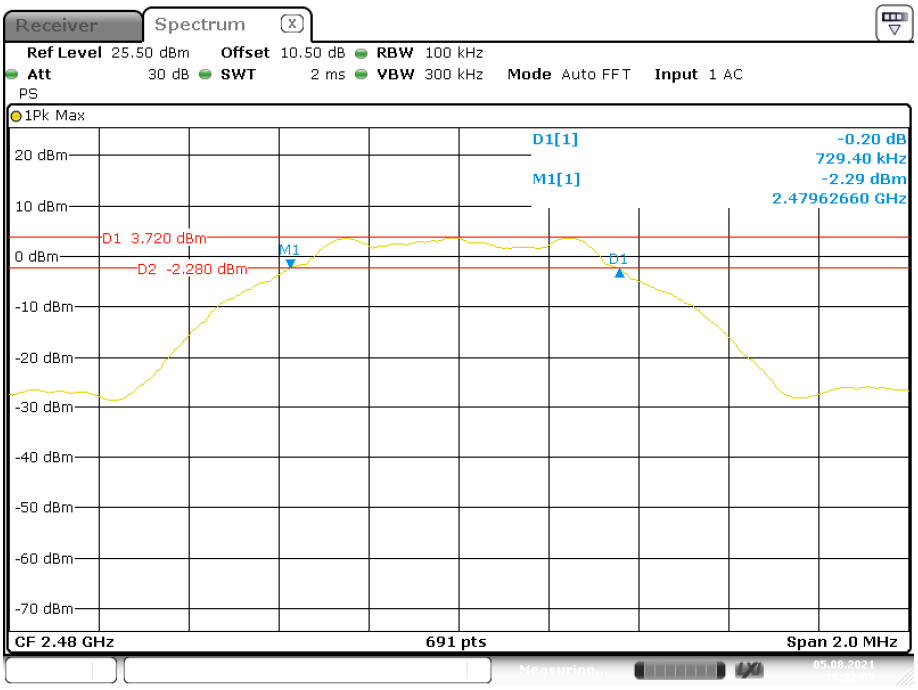
Date: 5.AUG.2021 19:29:24

6dB Bandwidth, BLE Middle Channel



Date: 5.AUG.2021 19:27:43

6dB Bandwidth, BLE High Channel



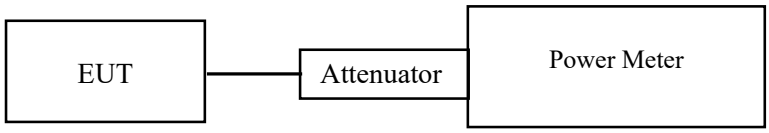
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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:	25~26 ℃
Relative Humidity:	56 ℃
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-08-05 to 2021-08-06.

EUT operation mode: Transmitting

Wi-Fi mode

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Max Conducted Average Output Power (dBm)	Limit (dBm)
802.11b mode				
Low	2412	9.24	7.30	30
Middle	2442	9.23	7.18	30
High	2472	9.17	7.08	30
802.11g mode				
Low	2412	10.88	7.64	30
Middle	2442	10.86	7.82	30
High	2472	10.75	7.38	30
802.11n HT20 mode				
Low	2412	10.85	7.58	30
Middle	2442	10.70	7.49	30
High	2472	11.07	7.63	30
802.11n HT40 mode				
Low	2422	11.36	7.69	30
Middle	2442	11.19	7.78	30
High	2462	11.07	7.57	30

BLE mode

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)
BLE 1M			
Low	2402	5.95	30
Middle	2440	5.30	30
High	2480	4.51	30

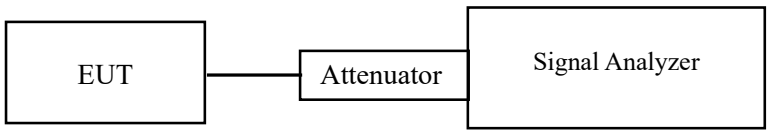
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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:	25~26 ℃
Relative Humidity:	56 ℃
ATM Pressure:	101.0 kPa

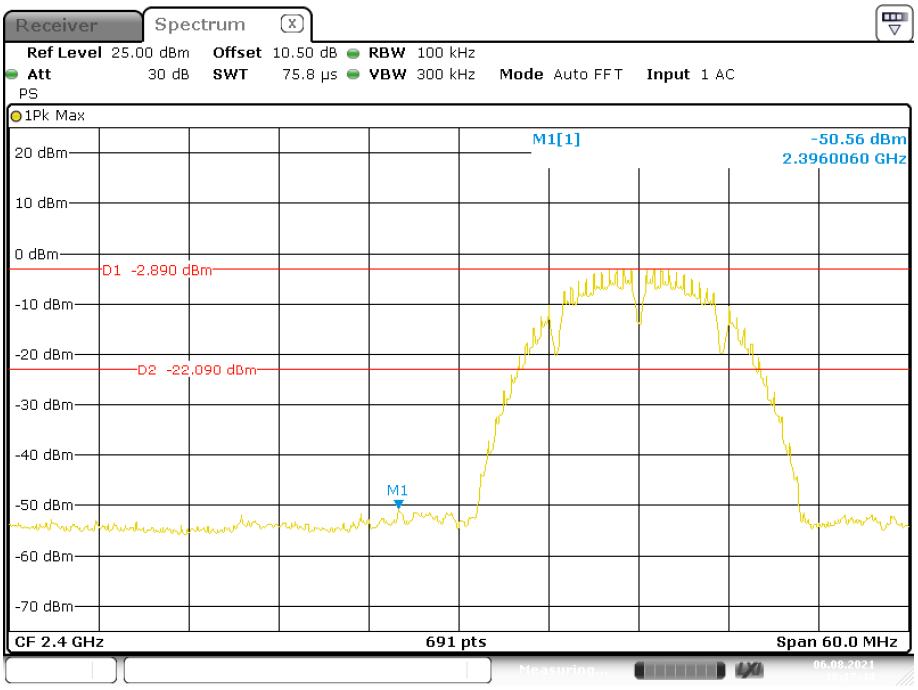
The testing was performed by Paul liu from 2021-08-05 to 2021-08-06.

EUT operation mode: Transmitting

Test Result: Compliant

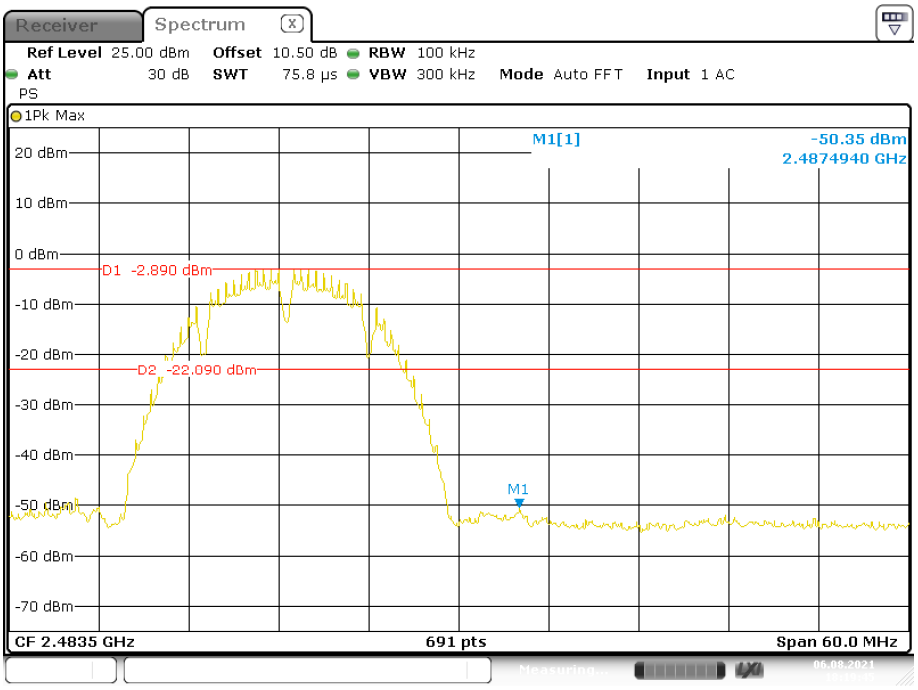
Please refer to the following plots.

802.11b: Band Edge, Left Side



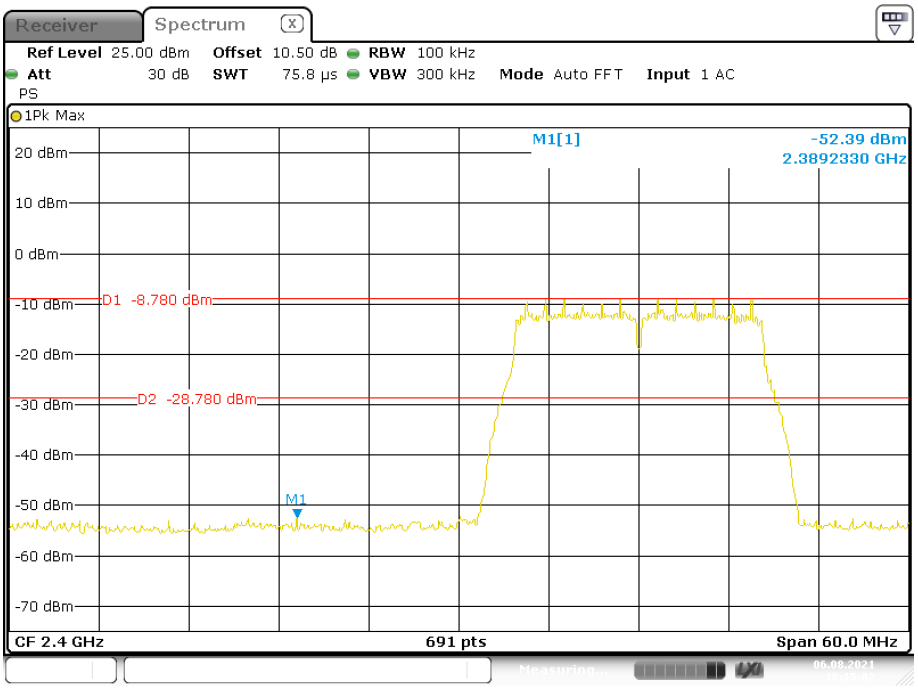
Date: 6.AUG.2021 18:17:44

802.11b: Band Edge, Right Side



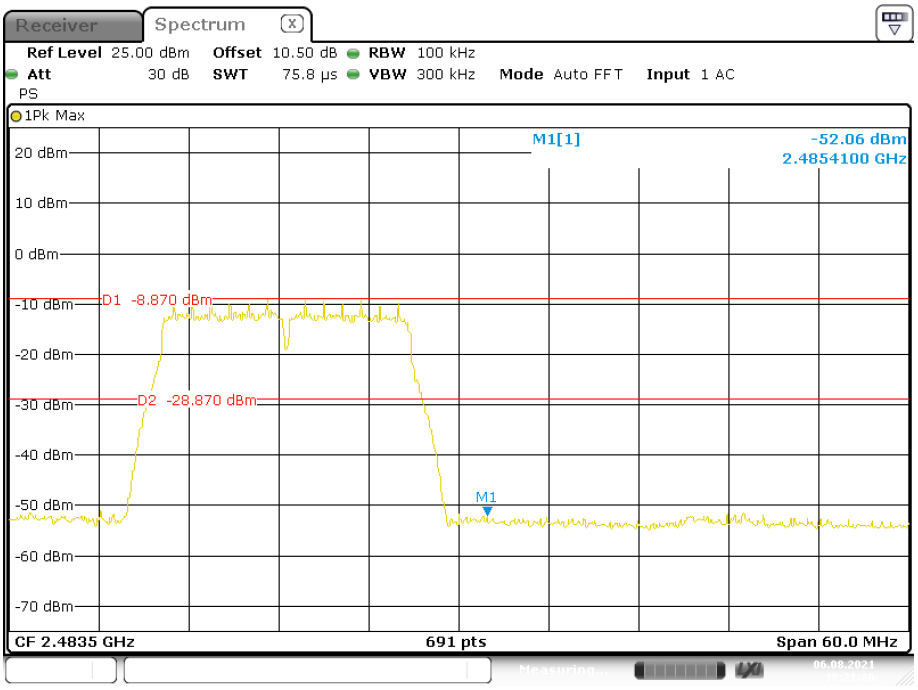
Date: 6.AUG.2021 18:19:45

802.11g: Band Edge, Left Side



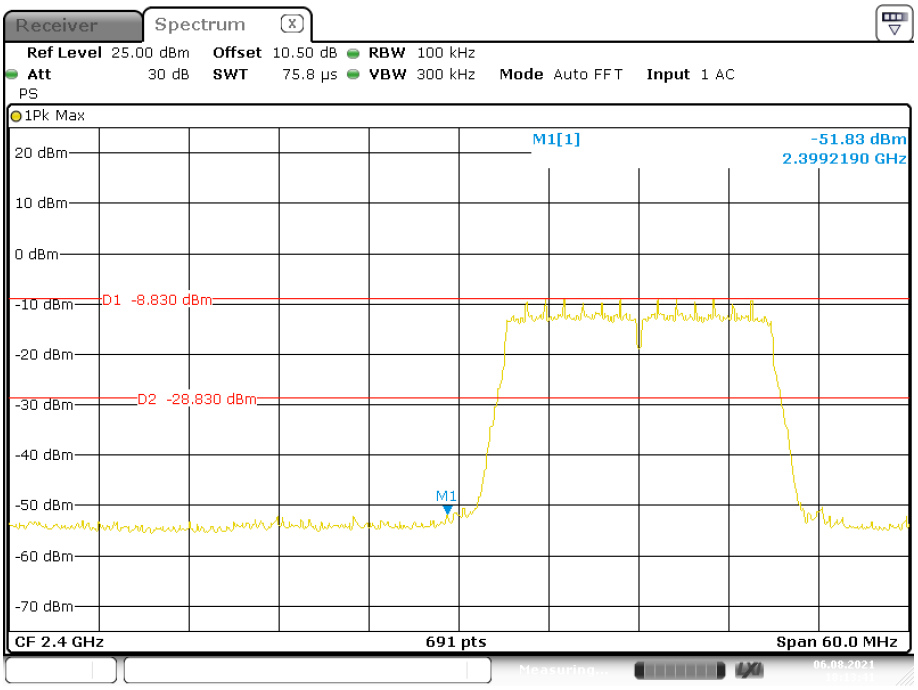
Date: 6.AUG.2021 18:15:02

802.11g: Band Edge, Right Side



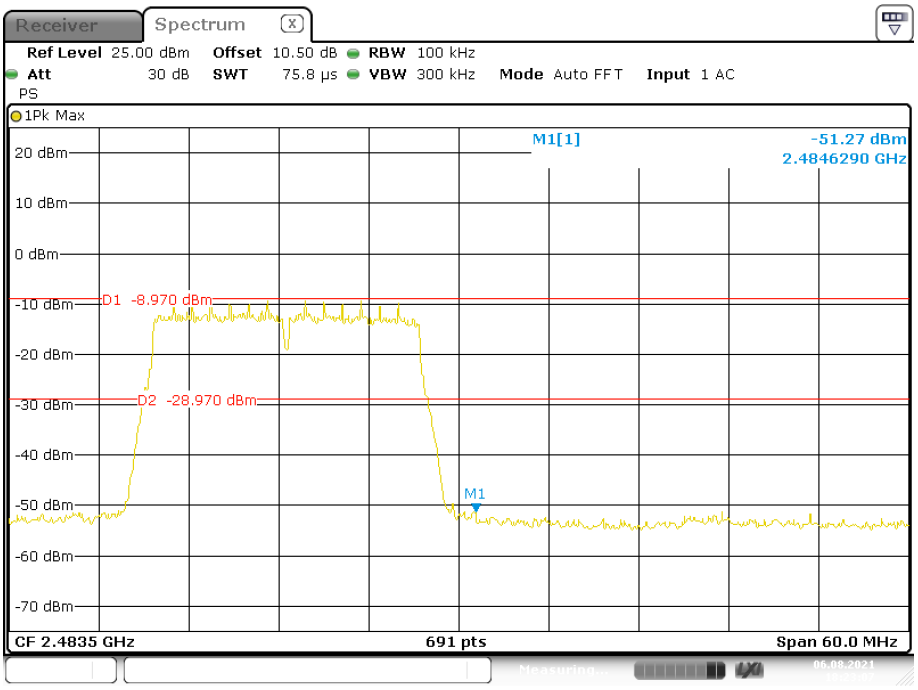
Date: 6.AUG.2021 18:21:26

802.11n-HT20: Band Edge, Left Side



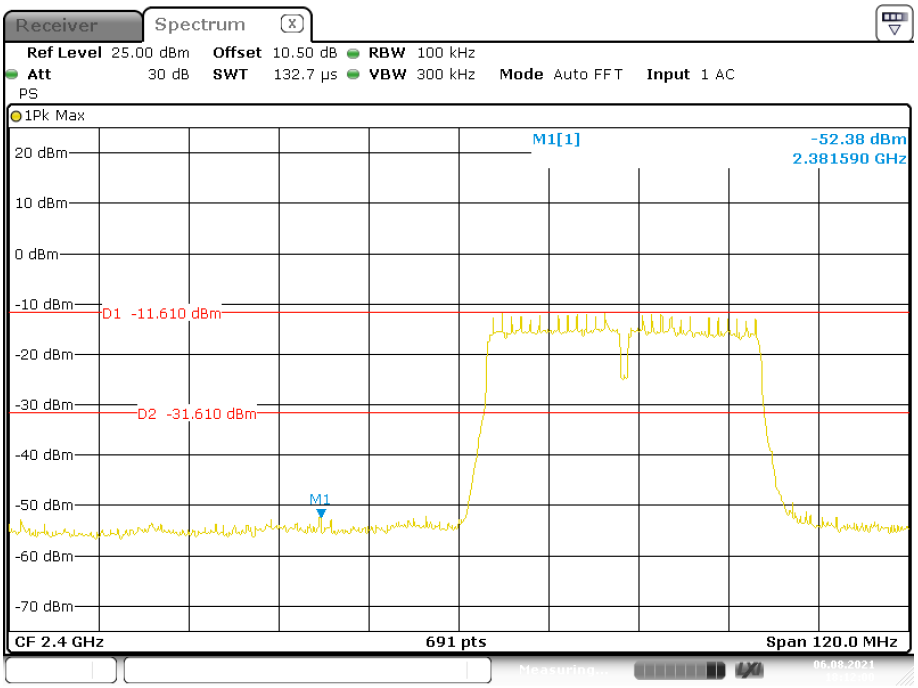
Date: 6.AUG.2021 18:13:41

802.11n-HT20: Band Edge, Right Side



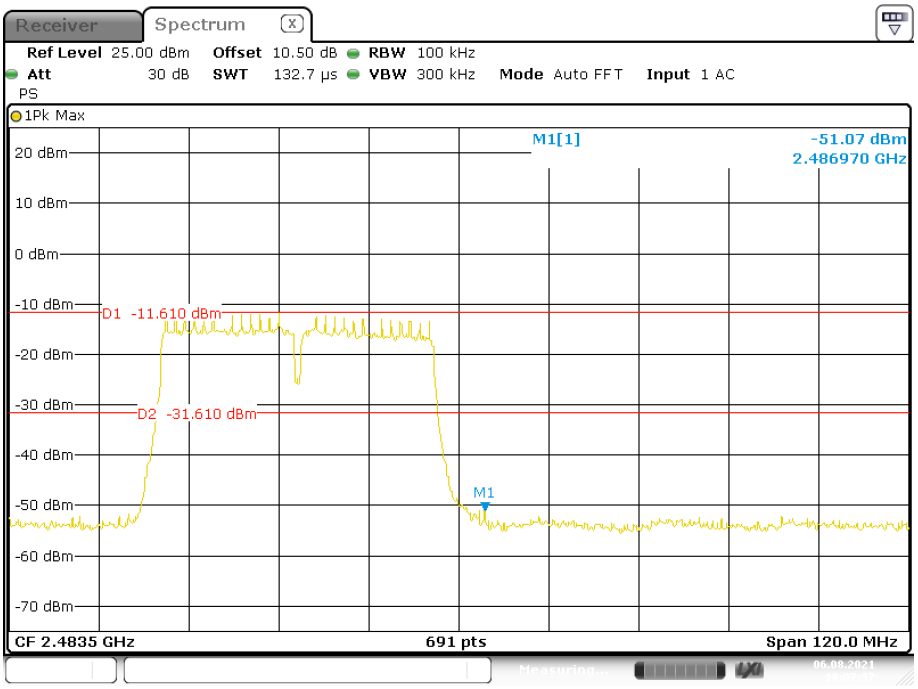
Date: 6.AUG.2021 18:23:07

802.11n-HT40: Band Edge, Left Side



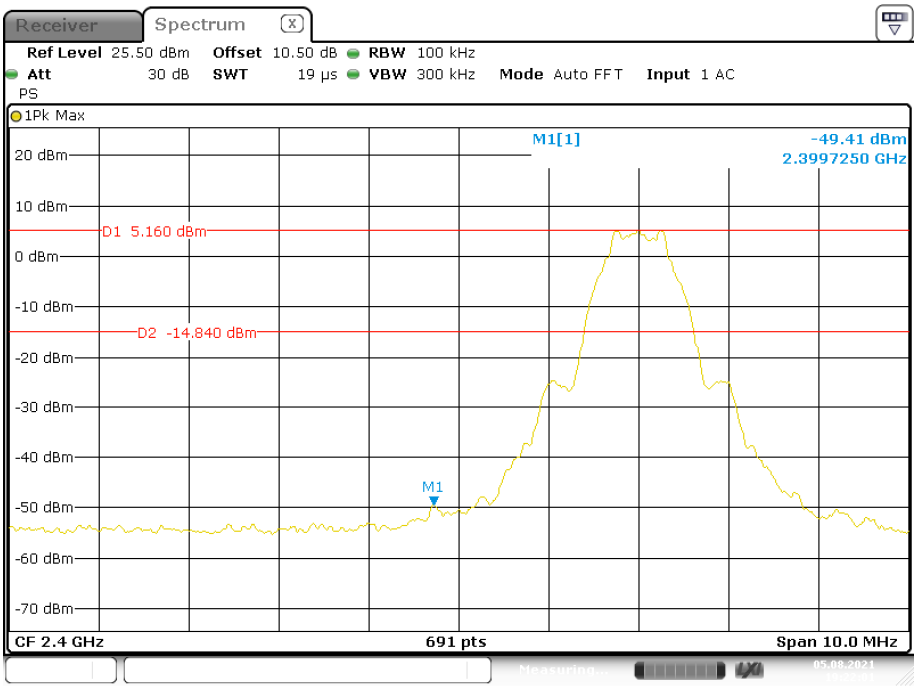
Date: 6.AUG.2021 18:12:00

802.11n-HT40: Band Edge, Right Side



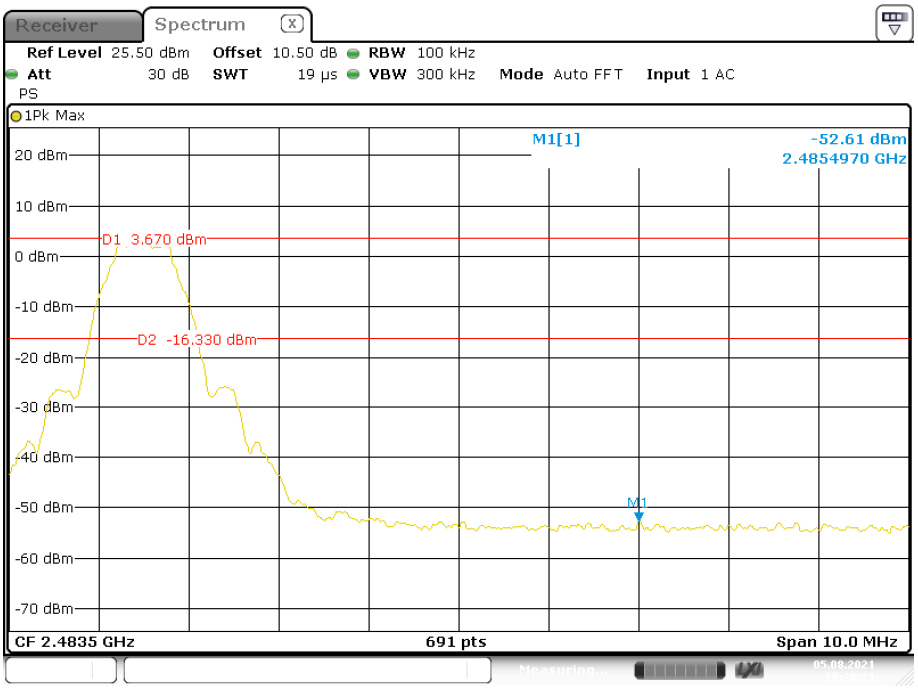
Date: 6.AUG.2021 18:07:37

BLE: Band Edge, Left Side



Date: 5.AUG.2021 19:22:01

BLE: Band Edge, Right Side



Date: 5.AUG.2021 19:20:21

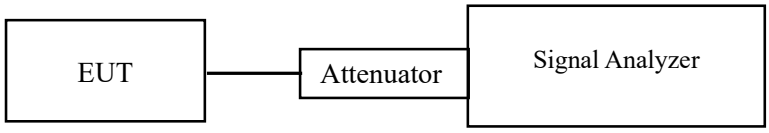
FCC §15.247(e) - POWER SPECTRAL DENSITY

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:	25~26 ℃
Relative Humidity:	56 ℃
ATM Pressure:	101.0 kPa

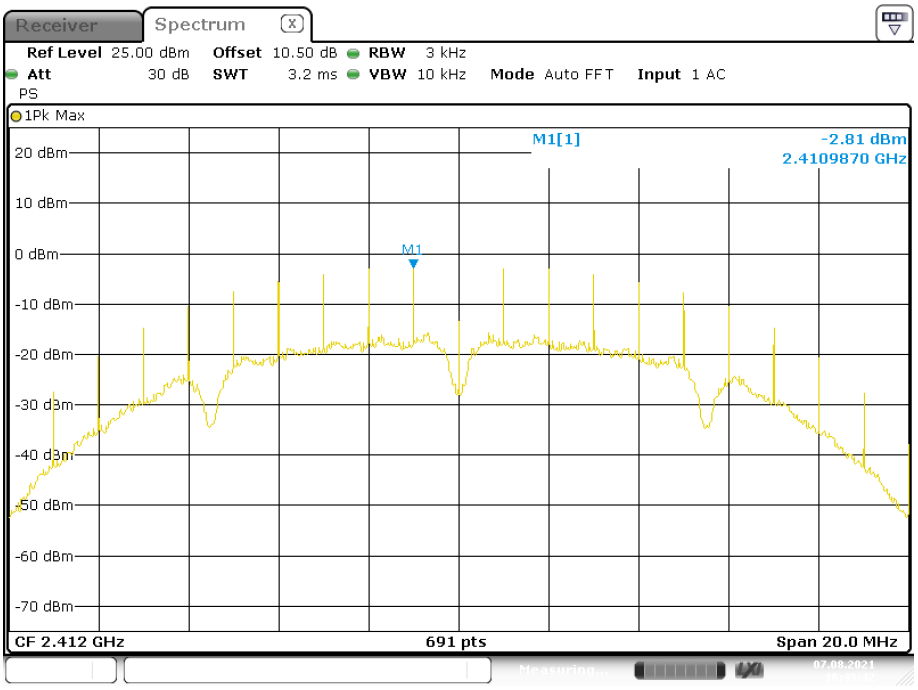
The testing was performed by Paul liu from 2021-08-05 to 2021-08-07.

EUT operation mode: Transmitting

Test Result: Pass

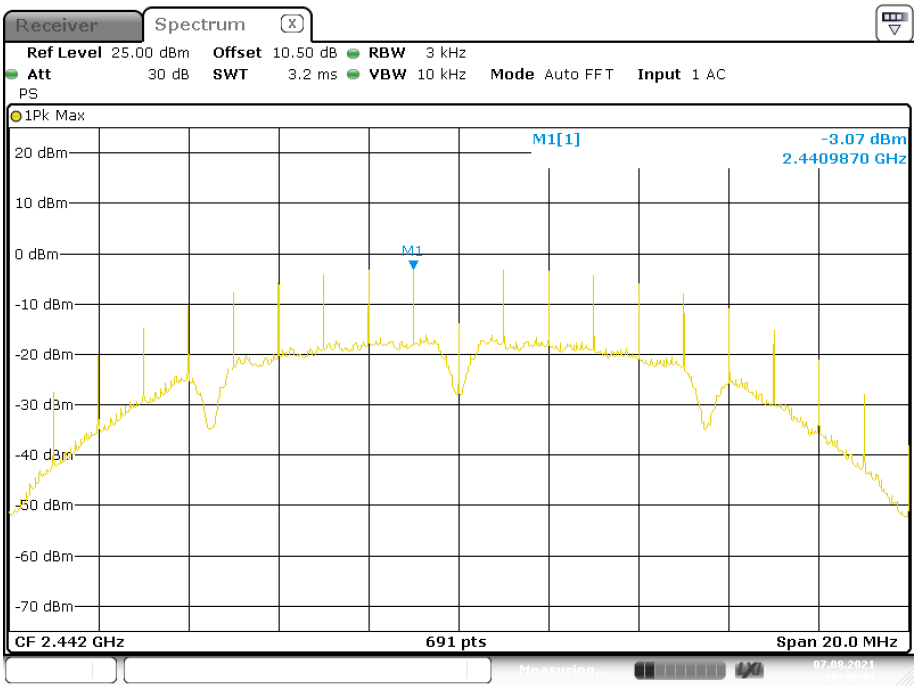
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode			
Low	2412	-2.81	≤8
Middle	2442	-3.07	≤8
High	2472	-2.98	≤8
802.11g mode			
Low	2412	-21.57	≤8
Middle	2442	-20.63	≤8
High	2472	-20.50	≤8
802.11n-HT20 mode			
Low	2412	-21.71	≤8
Middle	2442	-20.52	≤8
High	2472	-21.91	≤8
802.11n-HT40 mode			
Low	2422	-25.04	≤8
Middle	2442	-23.49	≤8
High	2462	-24.89	≤8
BLE mode			
Low	2402	-9.81	≤8
Middle	2440	-10.33	≤8
High	2480	-11.16	≤8

Power Spectral Density, 802.11b Low Channel



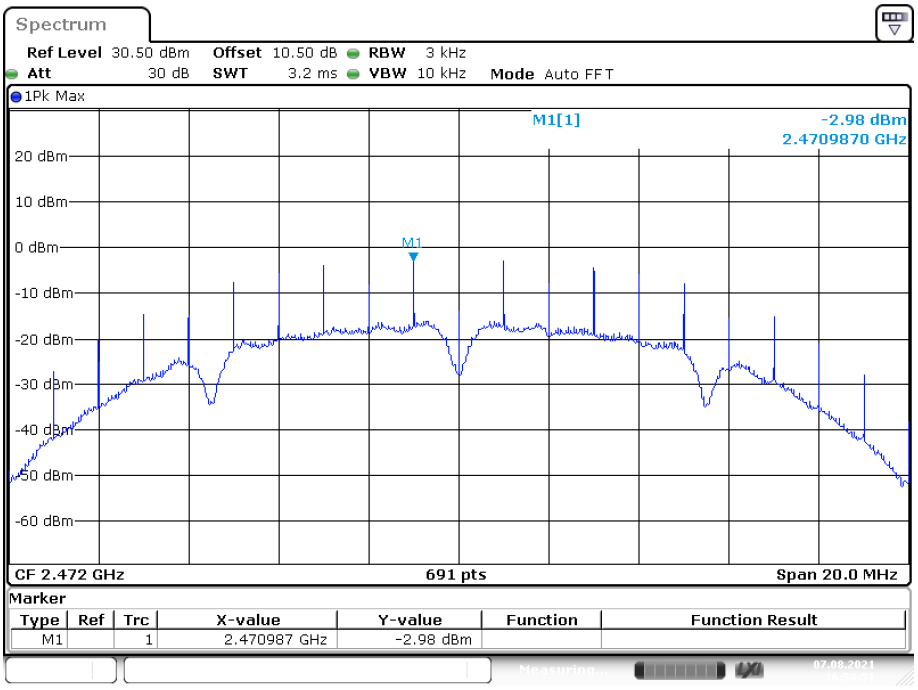
Date: 7.AUG.2021 16:43:43

Power Spectral Density, 802.11b Middle Channel



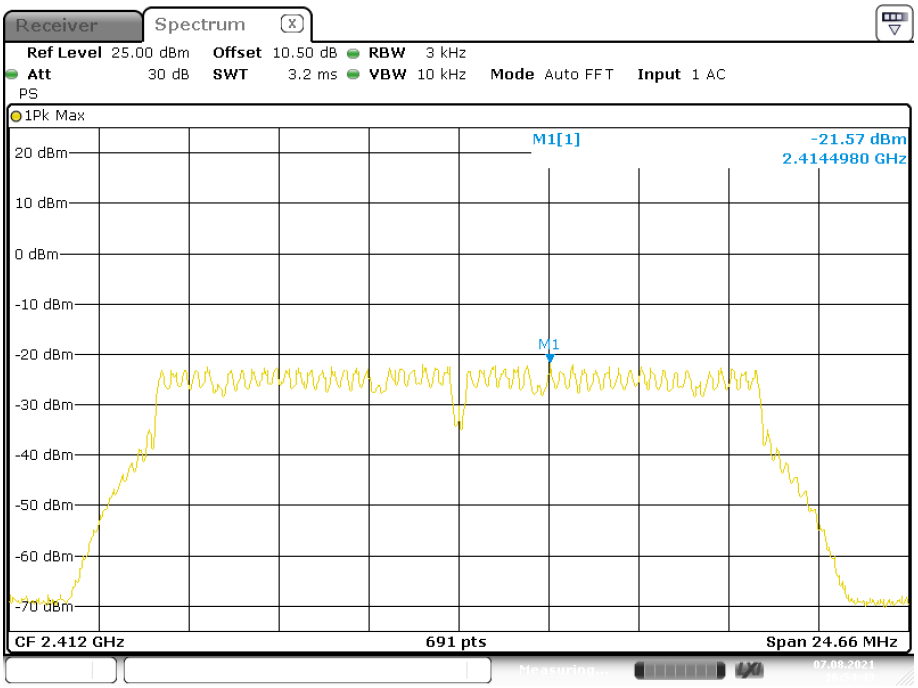
Date: 7.AUG.2021 16:46:45

Power Spectral Density, 802.11b High Channel



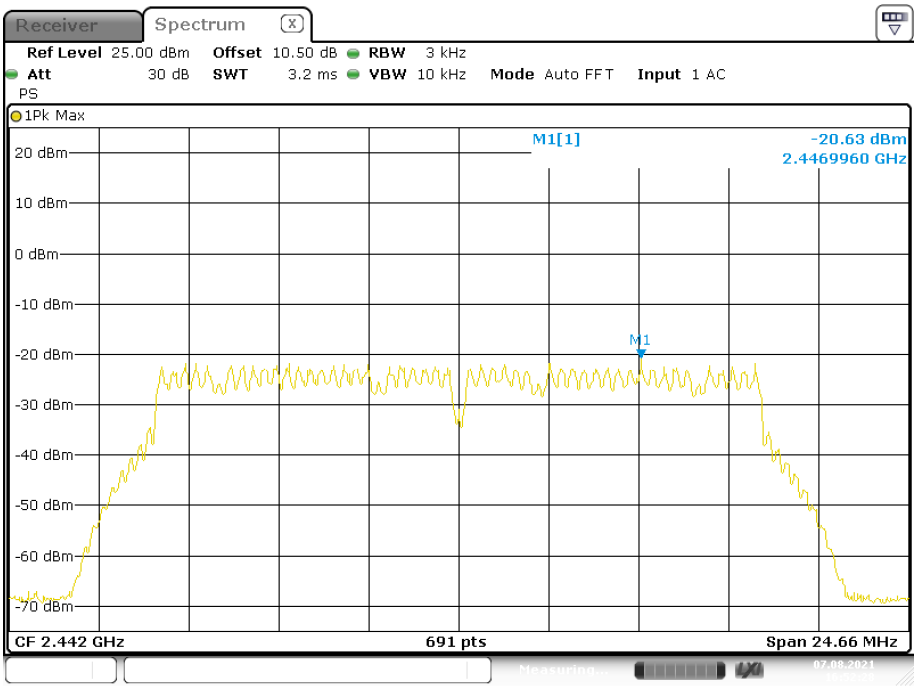
Date: 7.AUG.2021 16:50:52

Power Spectral Density, 802.11g Low Channel



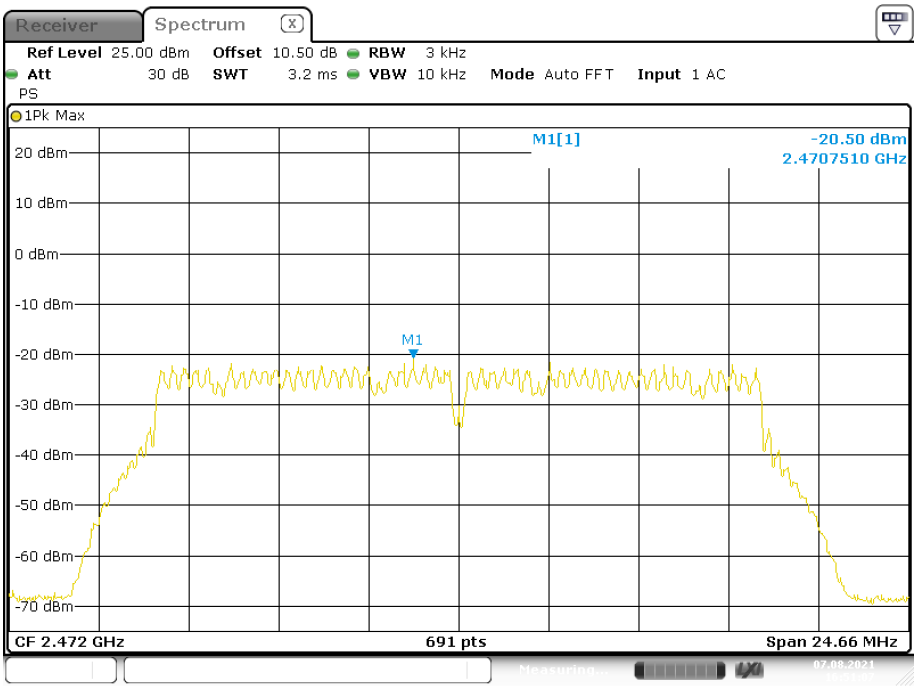
Date: 7.AUG.2021 16:54:50

Power Spectral Density, 802.11g Middle Channel



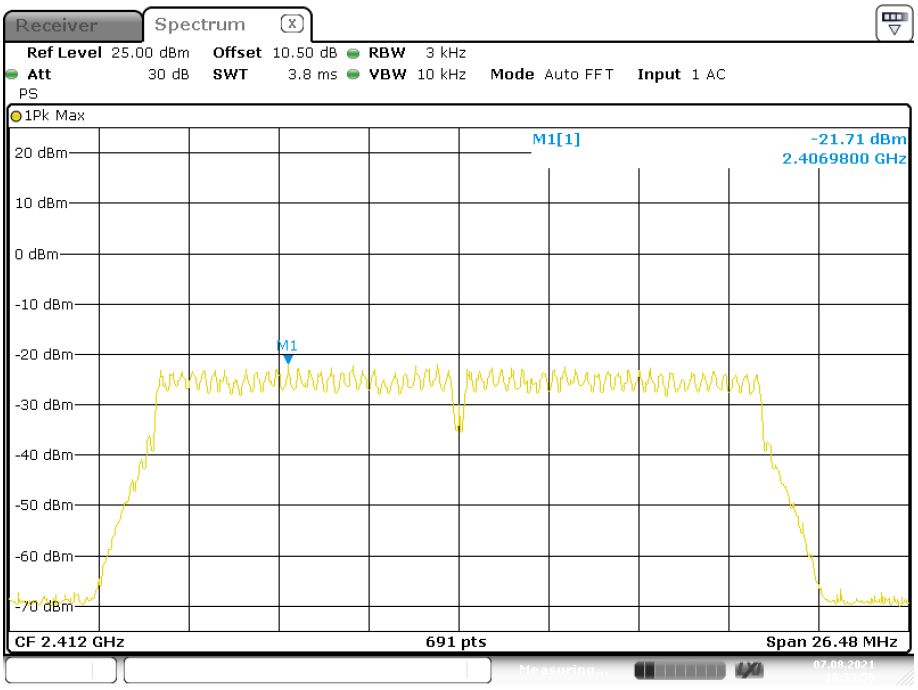
Date: 7.AUG.2021 16:52:28

Power Spectral Density, 802.11g High Channel



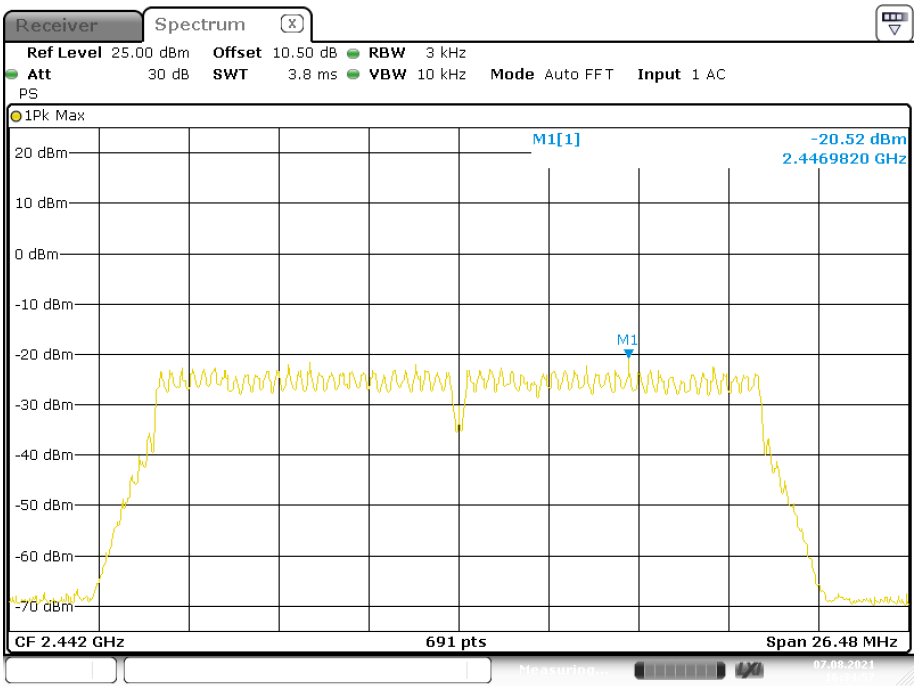
Date: 7.AUG.2021 16:51:07

Power Spectral Density, 802.11n-HT20 Low Channel



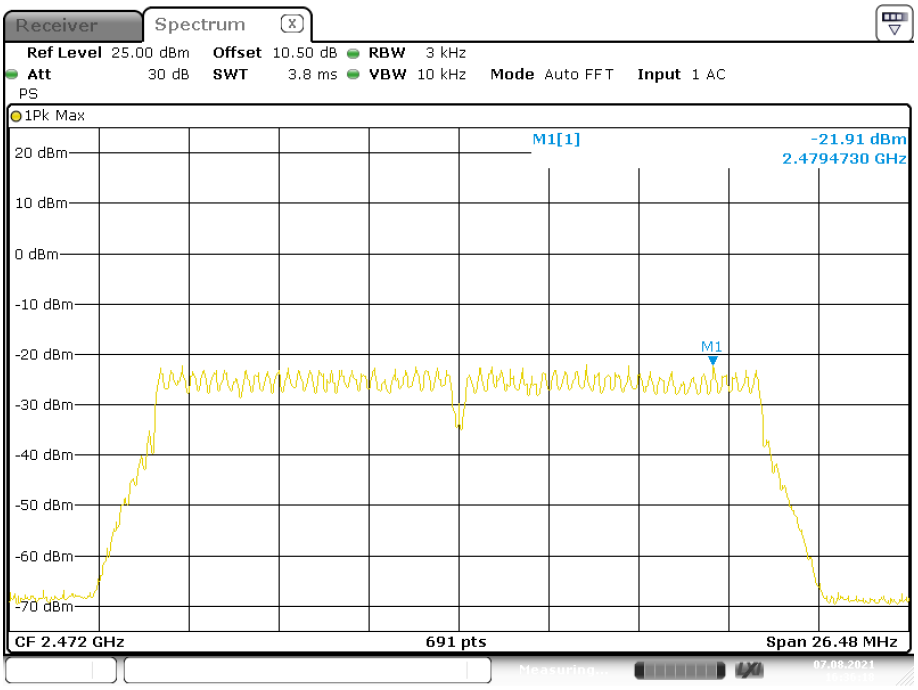
Date: 7.AUG.2021 16:33:57

Power Spectral Density, 802.11n-HT20 Middle Channel



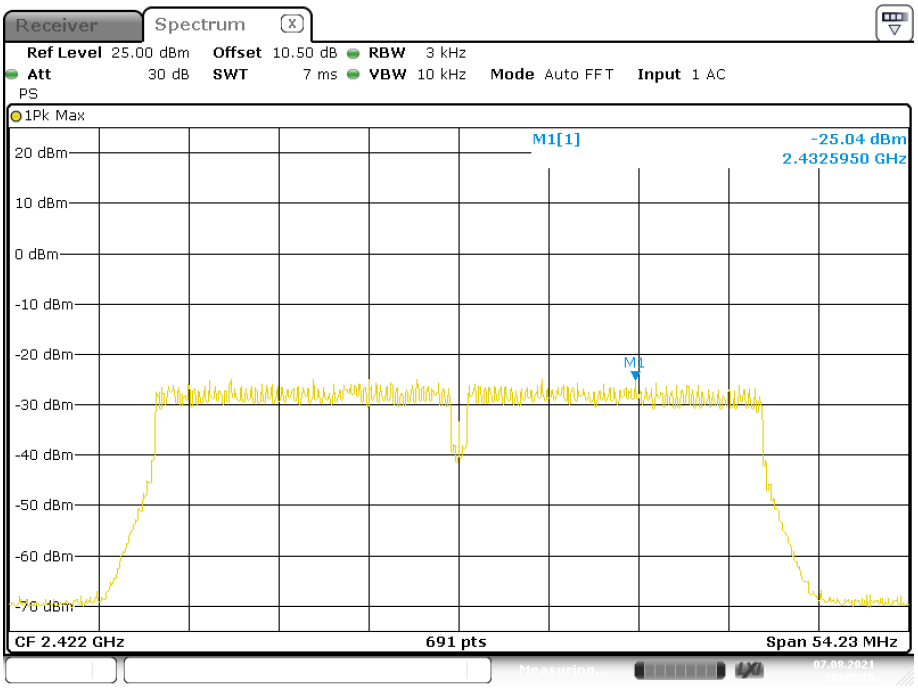
Date: 7.AUG.2021 16:34:57

Power Spectral Density, 802.11n-HT20 High Channel



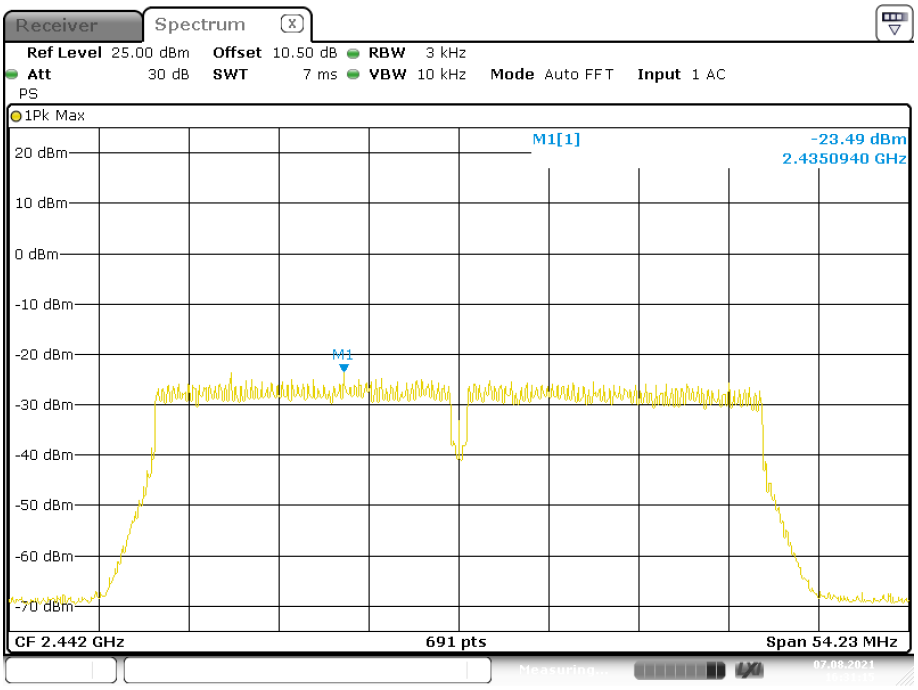
Date: 7.AUG.2021 16:36:18

Power Spectral Density, 802.11n-HT40 Low Channel



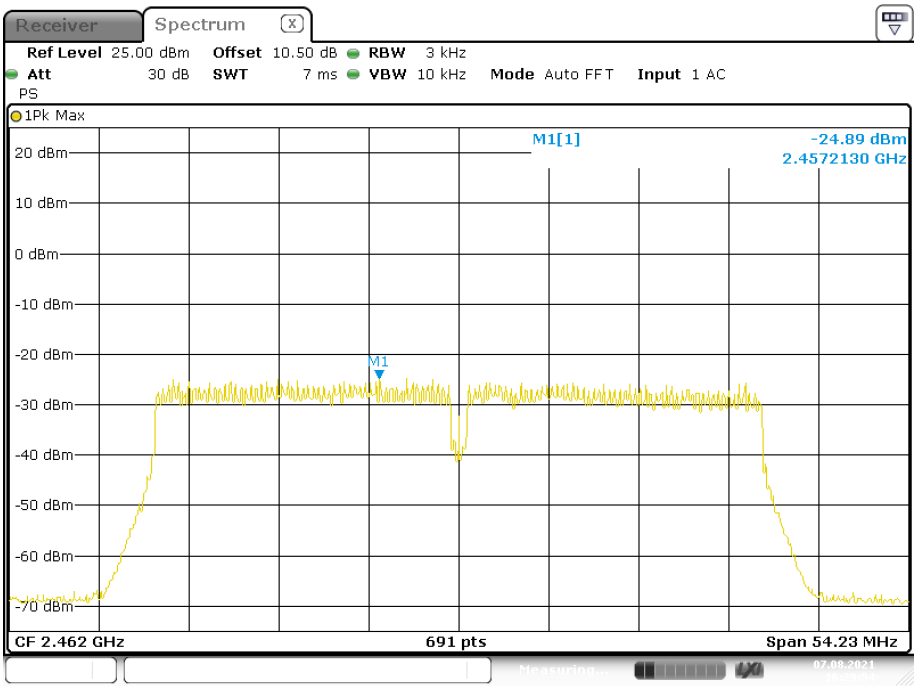
Date: 7.AUG.2021 16:32:16

Power Spectral Density, 802.11n-HT40 Middle Channel



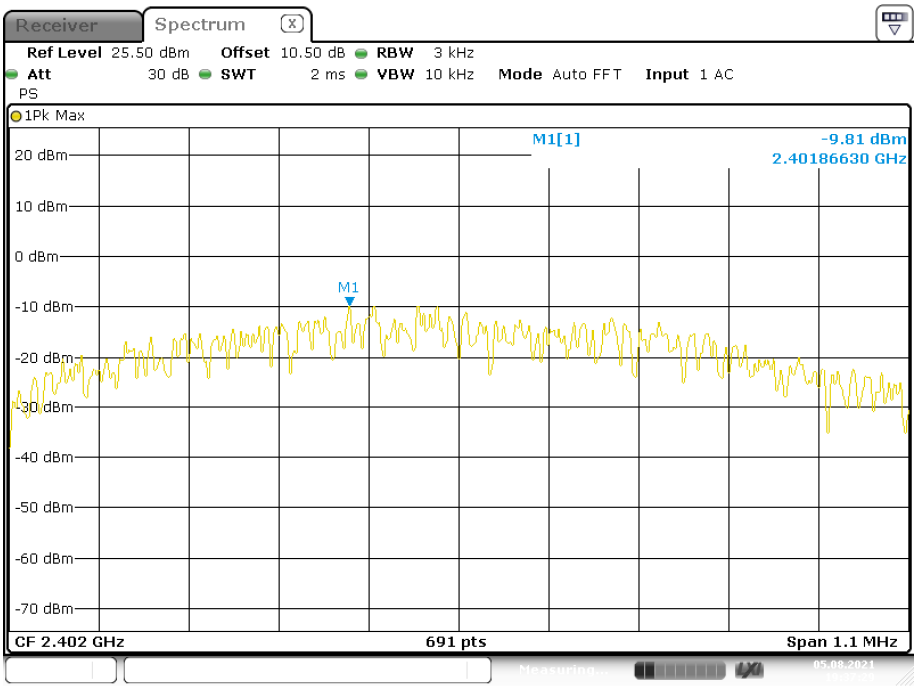
Date: 7.AUG.2021 16:31:15

Power Spectral Density, 802.11n-HT40 High Channel



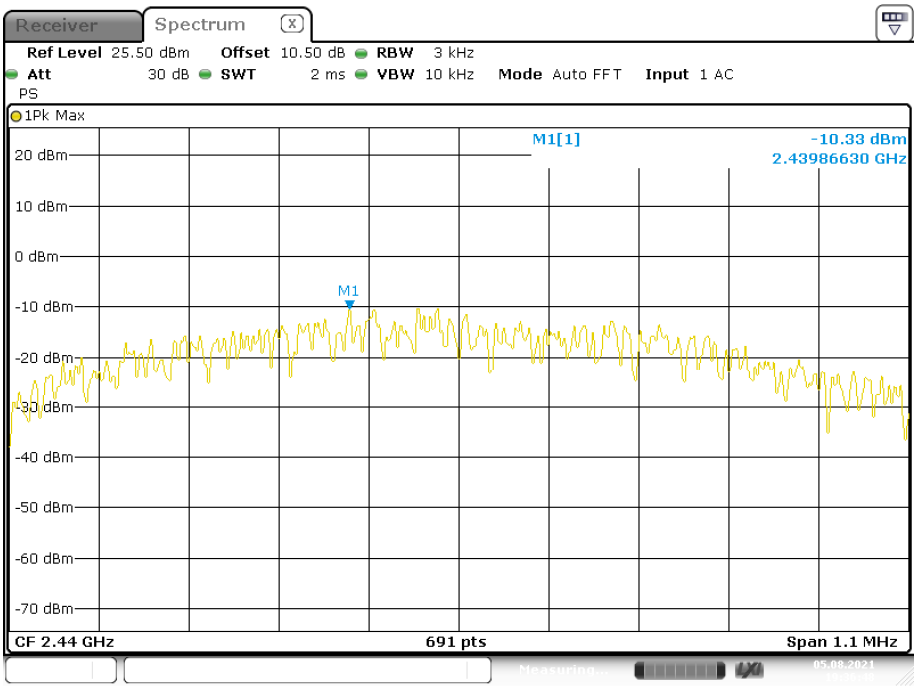
Date: 7.AUG.2021 16:29:54

Power Spectral Density, BLE Low Channel



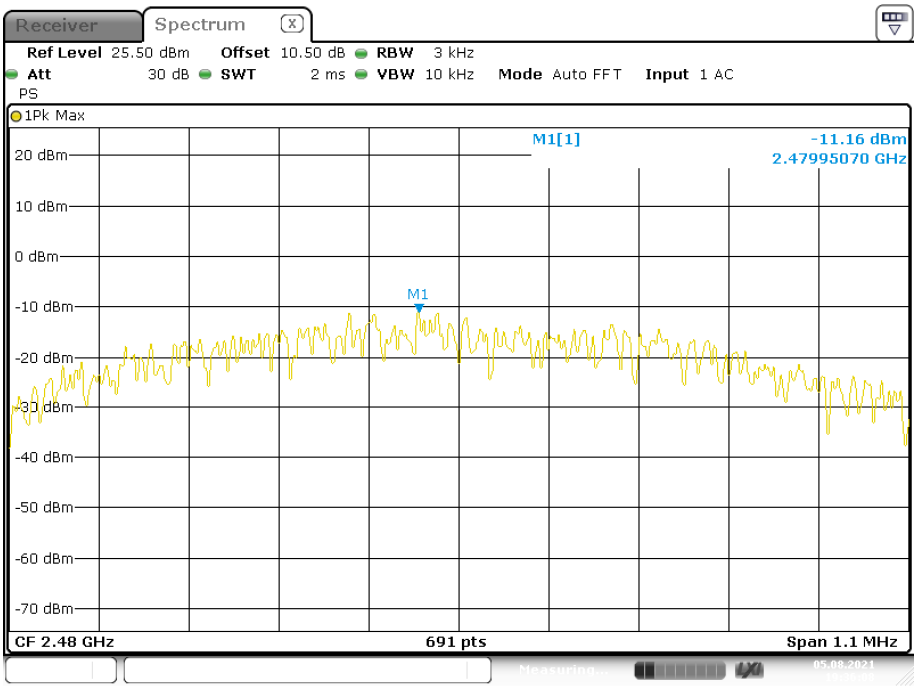
Date: 5.AUG.2021 19:37:29

Power Spectral Density, BLE Middle Channel



Date: 5.AUG.2021 19:36:49

Power Spectral Density, BLE High Channel



Date: 5.AUG.2021 19:36:08

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