LTA
Laboratory for Test & Approval Co.,Ltd.

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http://www.ltalab.com

Dates of Tests: May 23, 2023 ~ June 28, 2023
Test Report S/N: LR500112306B
Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID. **2BBRCHN-SSC**

APPLICANT **Honeynaps Co., Ltd**

Equipment Class	**:**	**Digital Transmission System (DTS) _LE,802.11**
Manufacturing Description	**:**	**Sleep Sensing Device**
Manufacturer	**:**	**Honeynaps Co., Ltd**
Model name	**:**	**HN-SSC**
Test Device Serial No.:	**:**	**Identical prototype**
Rule Part(s)	**:**	**FCC Part 15.247 Subpart C ; ANSI C63.10 - 2013**
Frequency Range	**:**	**BLE 2402 ~ 2480 MHz**
		802.11 b,g,n20 2412 ~ 2462 MHz
		n40 2422 ~ 2452 MHz
Max. Output Power	**:**	**Max 8.35 dBm - Conducted**
Data of issue	**:**	**June 28, 2023**

This test report is issued under the authority of:

Ja-Beom Koo, Manager

The test was supervised by:

Eun-Hwan Jung, Test Engineer

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1. General information

1-1 Test Performed

Company name : LTA Co., Ltd.

Address : 243, Jubug-ri,Yangji-Myeon,Youngin-Si, Kyunggi-Do, Korea. 17159

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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2023-09-28	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	649054	2024-04-08	FCC CAB
VCCI	JAPAN	C-4948,	2023-09-10	VCCI registration
VCCI	JAPAN	T-2416,	2023-09-10	VCCI registration
VCCI	JAPAN	R-4483(10 m),	2023-10-15	VCCI registration
VCCI	JAPAN	G-847	2024-12-13	VCCI registration
IC	CANADA	5799A-1	2024-08-15	IC filing

2. Information about test item

2-1 Client & Manufacturer

Client Company name	:	Honeynaps Co., Ltd
Address	:	4F, 529, Nonhyeon-ro, Gangnam-gu, Seoul, Republic of Korea
Tel / Fax	:	+82 10-6795-8804 / +82 2-567-0134
Manufacturer		Honeynaps Co., Ltd
Address		4F, 529, Nonhyeon-ro, Gangnam-gu, Seoul, Republic of Korea
Tel / Fax		+82 10-6795-8804 / +82 2-567-0134

2-2 Equipment Under Test (EUT)

Model name	:	HN-SSC
Serial number	:	Identical prototype
Date of receipt	:	May 23, 2023
EUT condition	:	Pre-production, not damaged
Antenna type	:	FPCB Antenna (Max Gain : 5 dBi)
Frequency Range	:	BLE 2402 ~ 2480 MHz 802.11 b,g,n20 2412 ~ 2462 MHz n40 2422 ~ 2452 MHz
RF output power	:	Max 8.35 dBm – Conducted
Type of Modulation	:	Pi/4 DQPSK, 8DPSK, OFDMA
Power Source	:	DC 5 V

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz) 802.11 b,g,n20	2412	2442	2462
Frequency (MHz) 802.11 n40	2422	2442	2452
Frequency (MHz) BLE	2402	2442	2480

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
Notebook	-	MS-1736	MSI

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	Conducted	C
15.247(b)	Transmitter Peak Output Power		C
15.247(e)	Transmitter Power Spectral Density		C
15.247(d)	Band Edge & Conducted Spurious emission		C
15.209	Transmitter emission	Radiated	C
15.207	AC Conducted Emissions	Conducted	N/A
15.203	Antenna requirement	-	C

N/A : This product is battery-enabled and excludes the test.

The above equipment was tested by LTA Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.247 The test results of this report relate only to the tested sample identified in this report.
The tests were performed according to the method of measurements prescribed in KDB No.558074.

→ Antenna Requirement
Honeynaps Co., Ltd FCC ID: 2BBRCHN-SSC unit complies with the requirement of §15.203.
The antenna type is FPCB Antenna

3.2 Technical Characteristics Test

3.2.1 6 dB Bandwidth

Procedure:

The bandwidth at 6 dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 3 X RBW

VBW = 3 X RBW

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data : Complies

BLE Mode

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2402	0.745	Complies
2442	0.745	Complies
2480	0.745	Complies

(802.11 b)

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2412	10.767	Complies
2442	10.767	Complies
2462	10.767	Complies

(802.11 g)

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2412	16.903	Complies
2442	16.845	Complies
2462	16.903	Complies

(802.11 n)

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2412	**18.003**	Complies
2442	**18.003**	Complies
2462	**18.061**	Complies

(802.11 n40)

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2422	**37.771**	Complies
2442	**37.627**	Complies
2452	**37.844**	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth ≥ 500 kHz

Measurement Setup

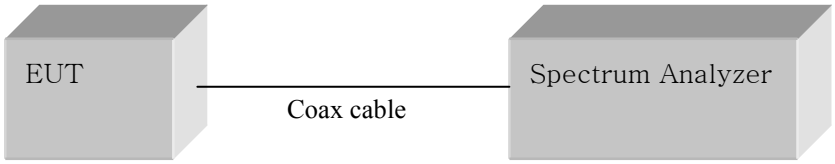
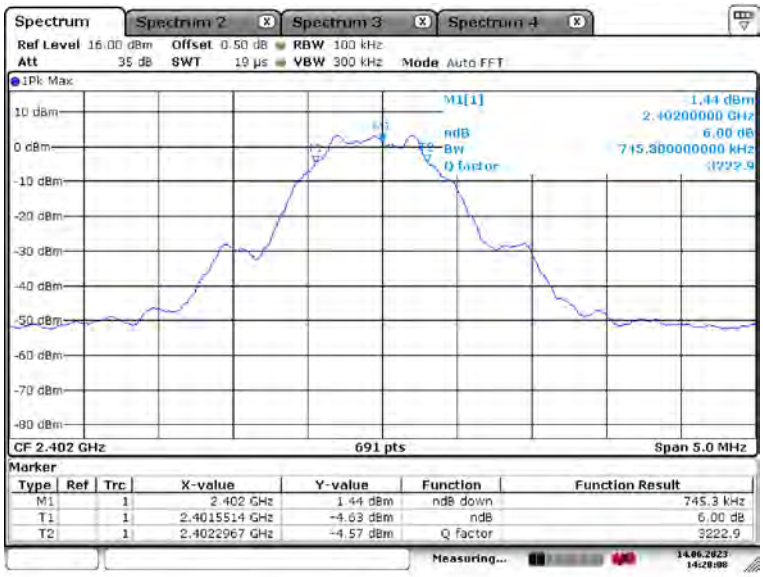
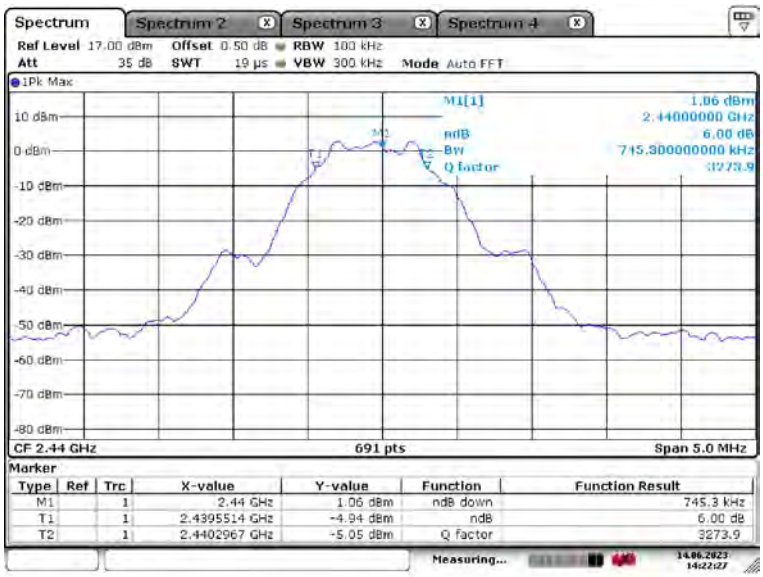
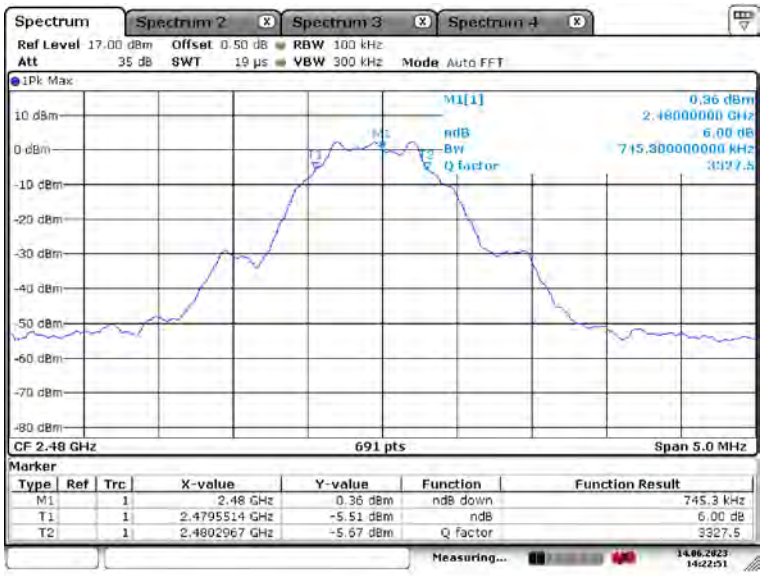


Figure 1: Measurement setup for the carrier frequency separation

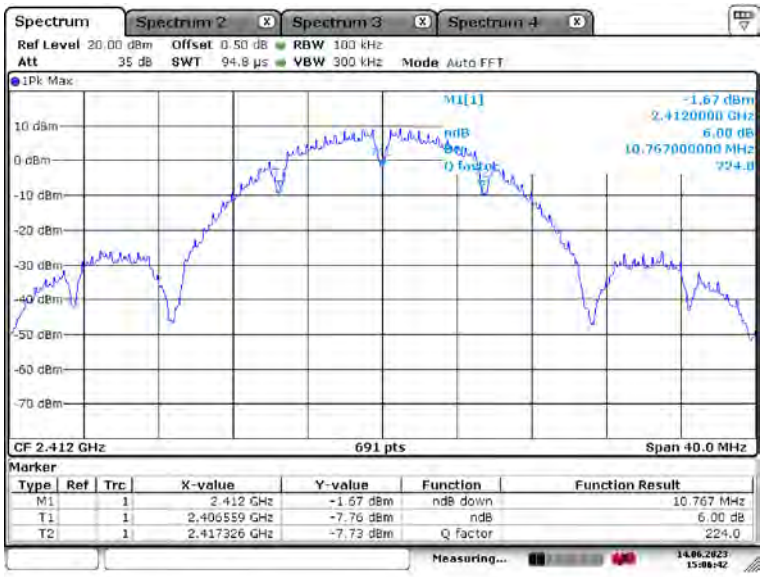
BLE

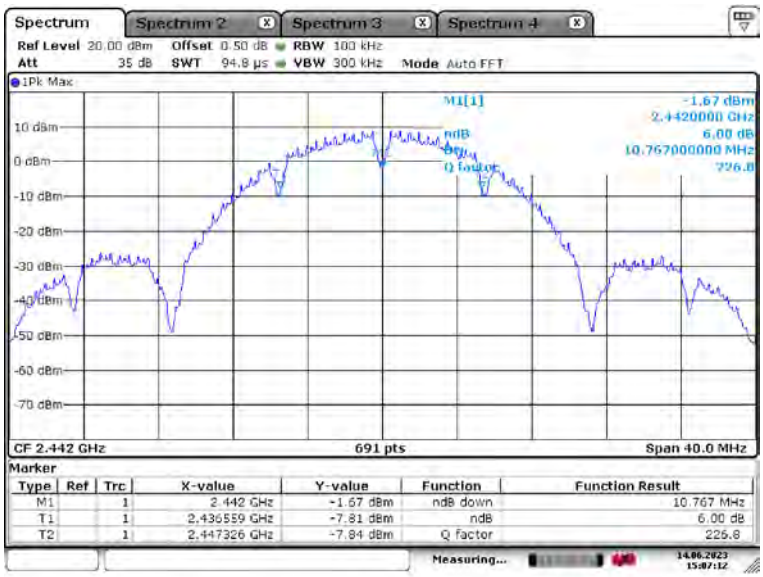


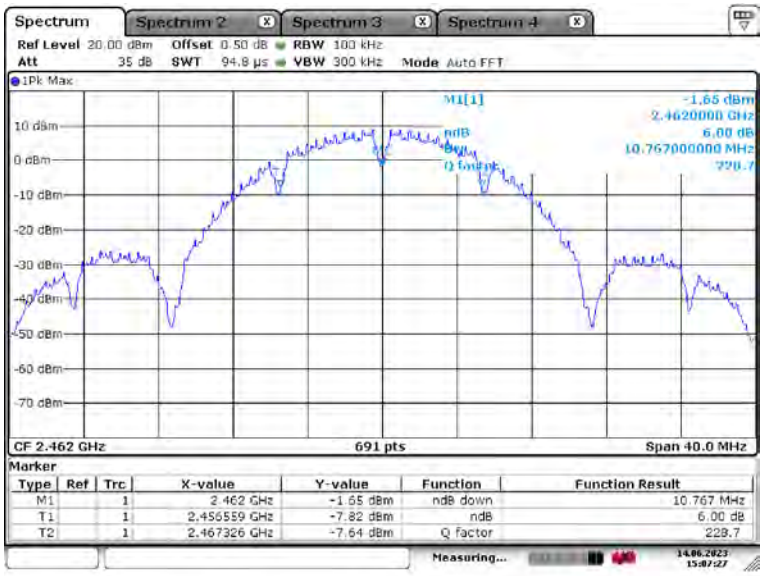




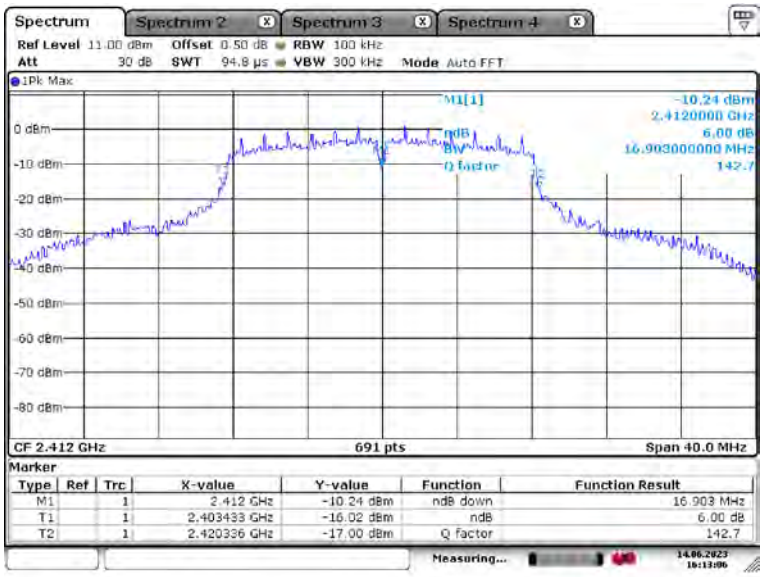
802.11 b

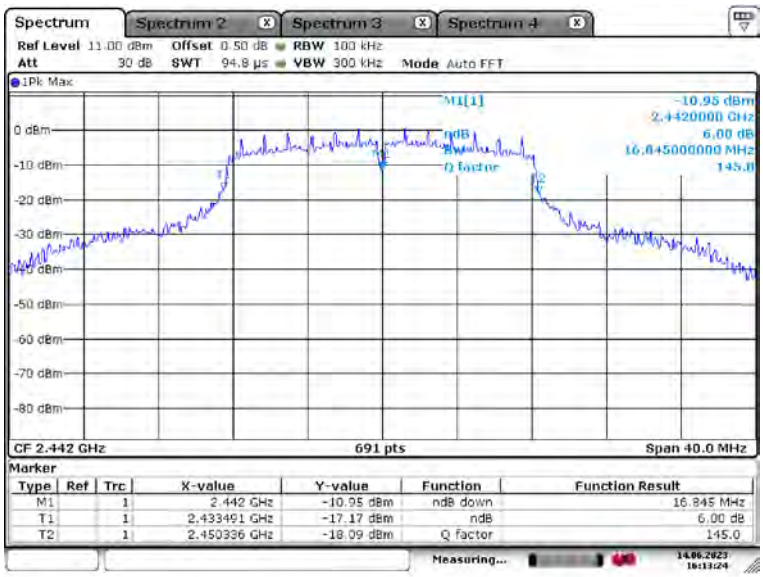


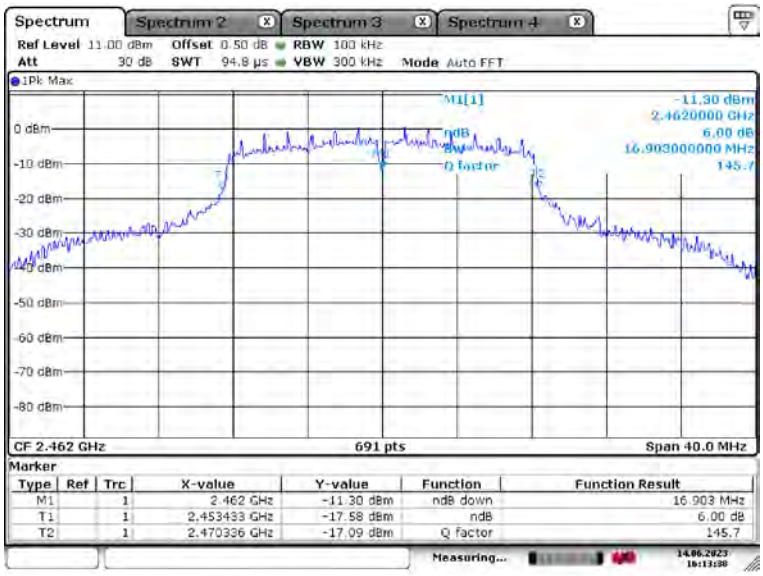




802.11 g







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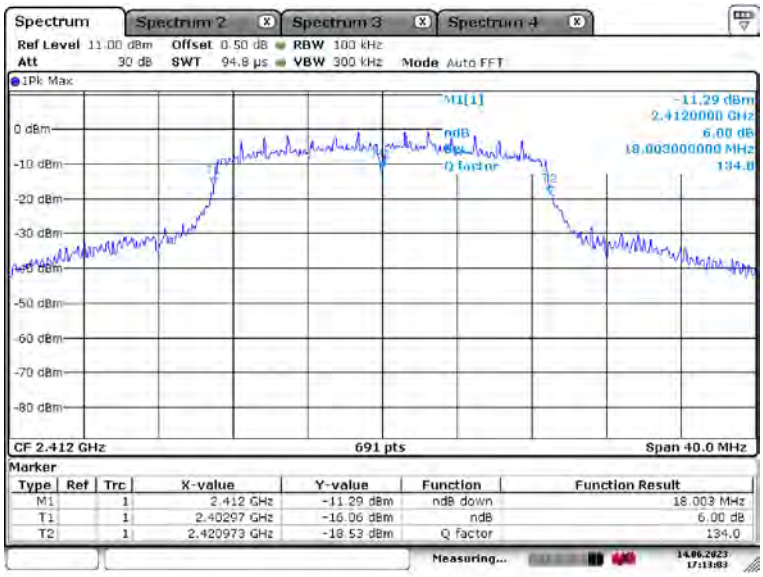
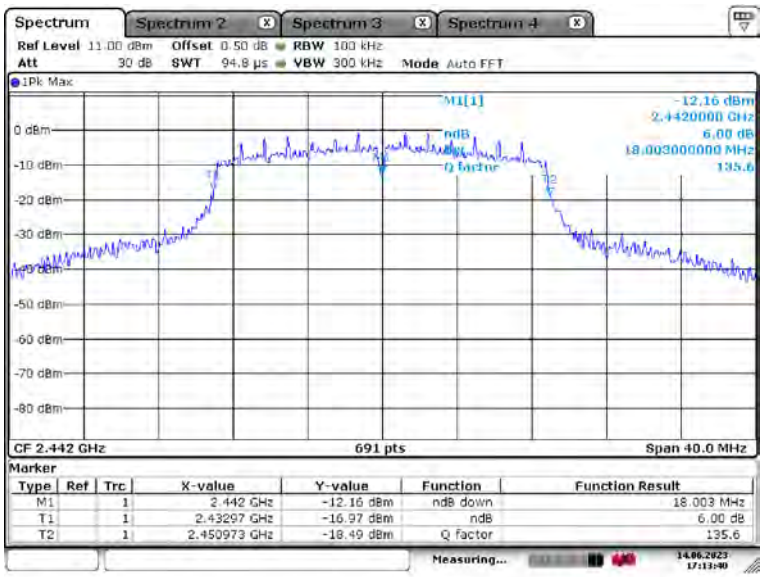
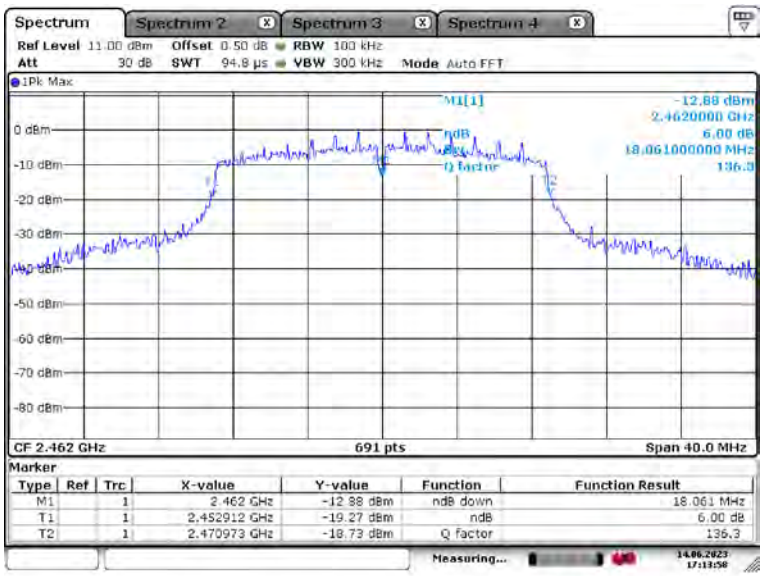
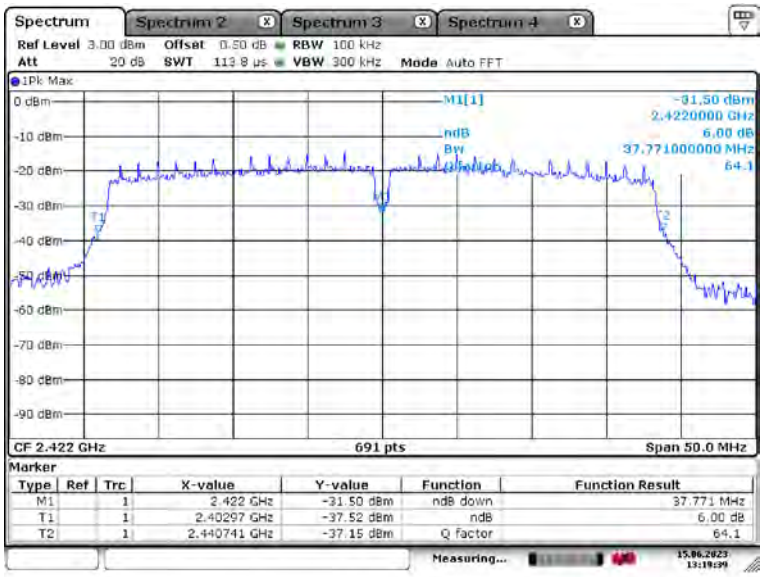
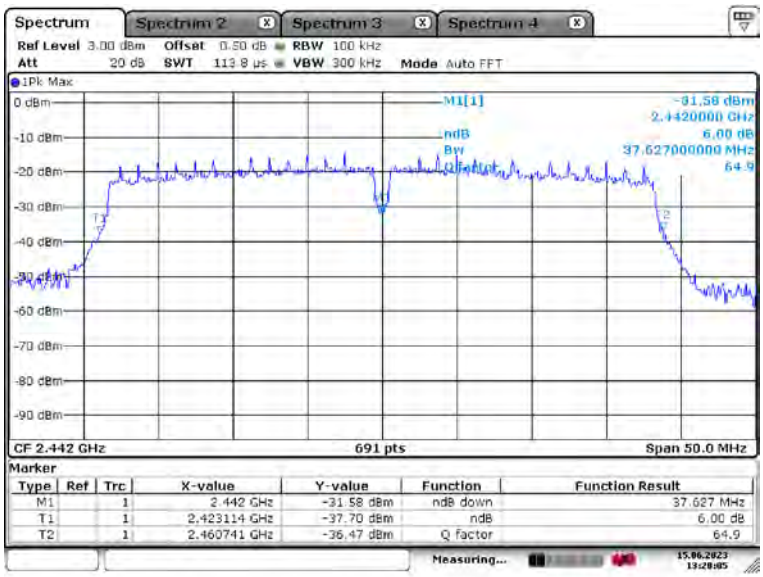


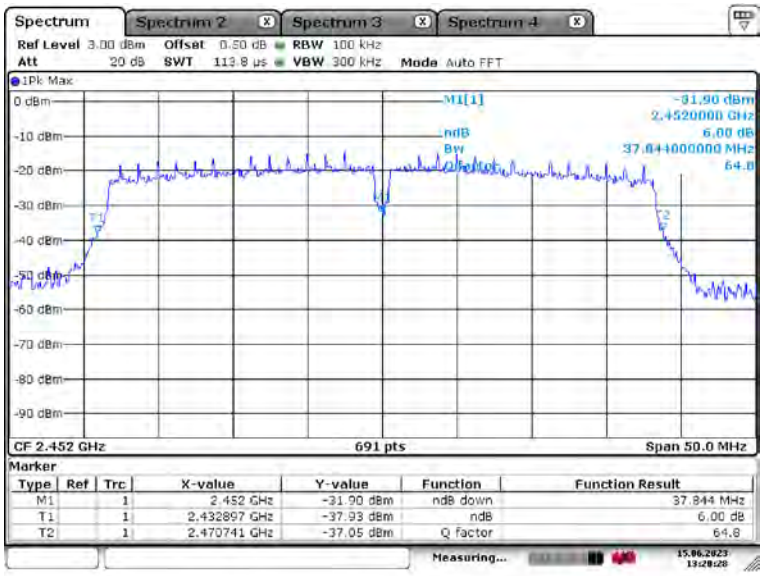




802.11 n40







3.2.2 Peak Output Power Measurement

Procedure:

The following procedure can be used when the maximum available RBW of the instrument is less than the DTS bandwidth :

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW ≥ DTS Bandwidth

Span ≥ 3 X RBW

VBW = 3 X RBW

Sweep = auto

Detector function = peak

Measurement Data : Complies

BLE Mode

Frequency (MHz)	Test Results	
	Measured data (dBm)	Result
2402	3.55	Complies
2442	3.25	Complies
2480	2.63	Complies

802.11 b Mode

Frequency (MHz)	Test Results	
	Measured data (dBm)	Result
2412	7.58	Complies
2442	7.57	Complies
2462	7.60	Complies

802.11 g Mode

Frequency (MHz)	Test Results	
	Measured data (dBm)	Result
2412	8.35	Complies
2442	8.24	Complies
2462	8.18	Complies

802.11 n Mode

Frequency (MHz)	Test Results	
	Measured data (dBm)	Result
2412	**6.71**	Complies
2442	**6.85**	Complies
2462	**6.75**	Complies

802.11 n40 Mode

Frequency (MHz)	Test Results	
	Measured data (dBm)	Result
2422	**-7.35**	Complies
2442	**-7.38**	Complies
2452	**-7.24**	Complies

- See next pages for actual measured spectrum plots.

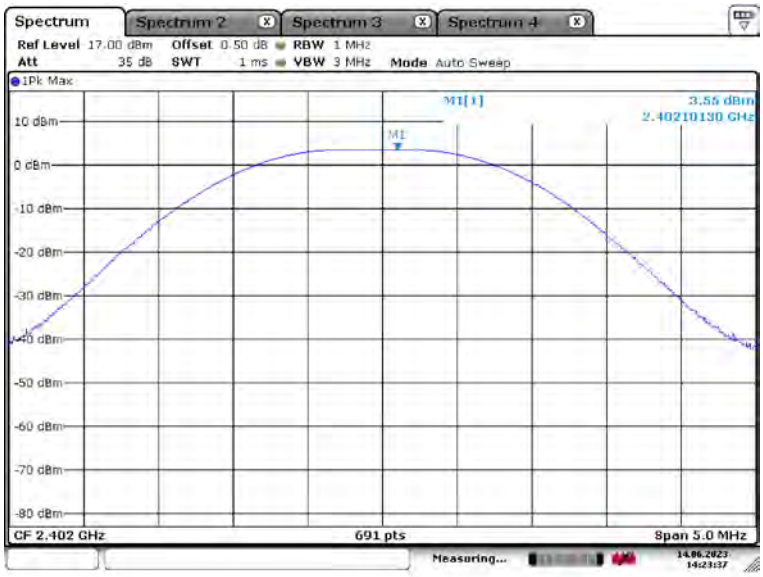
Minimum Standard:

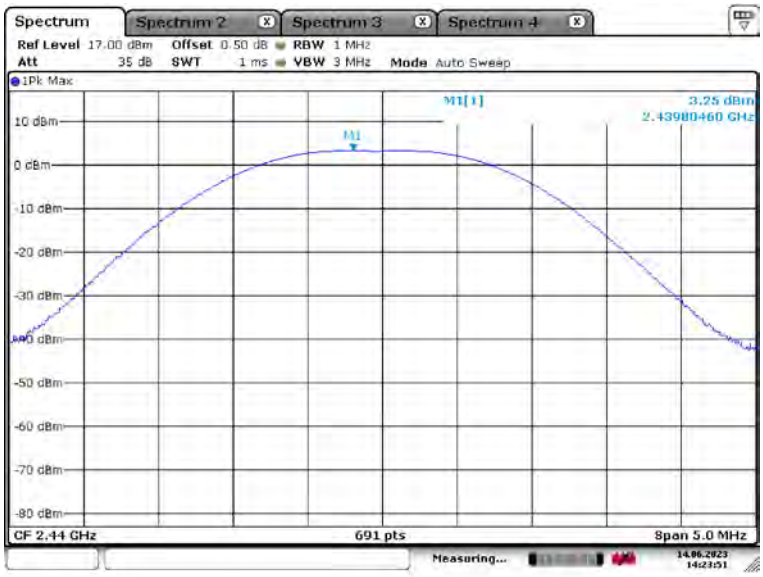
Peak output power	≤ 1 W(30 dBm)

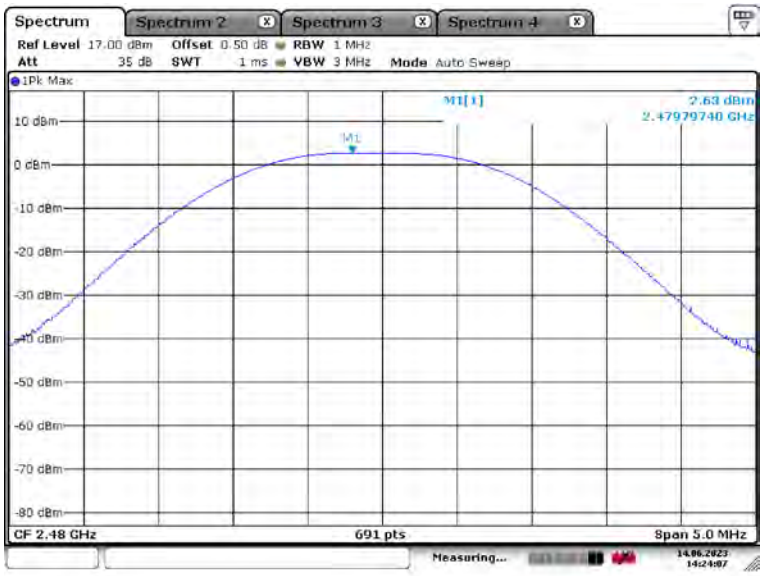
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

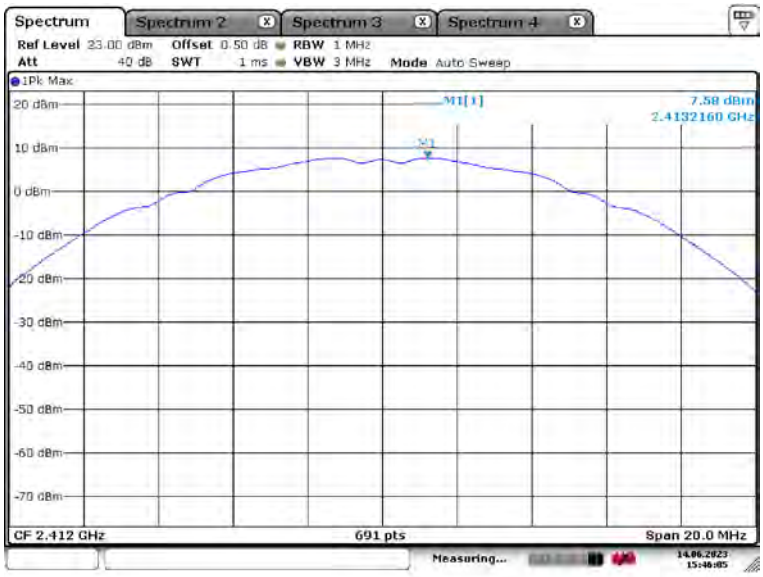
BLE

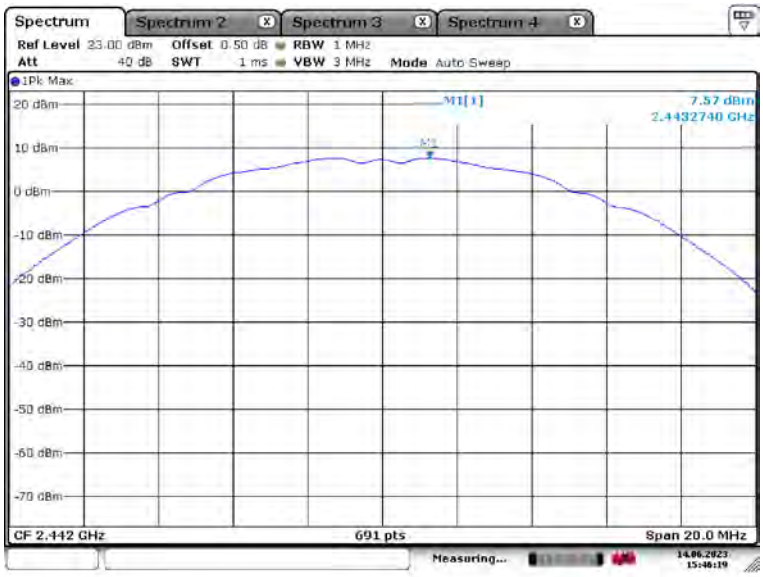


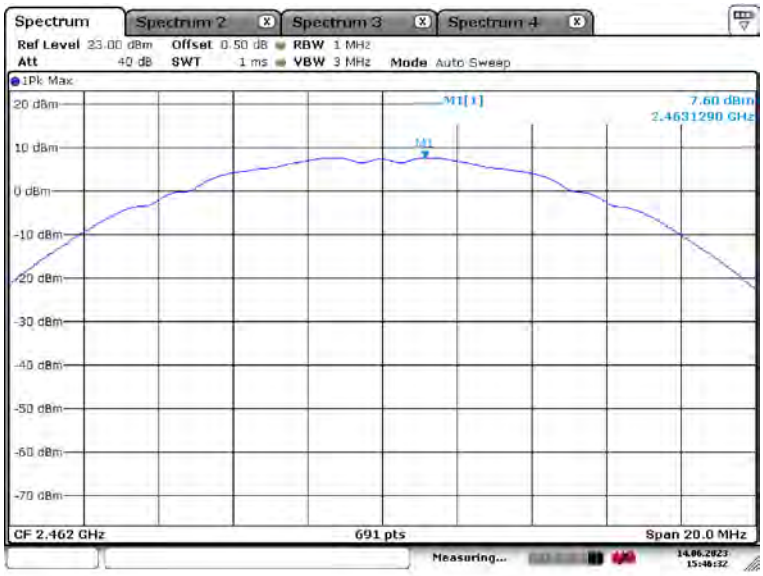




802.11 b







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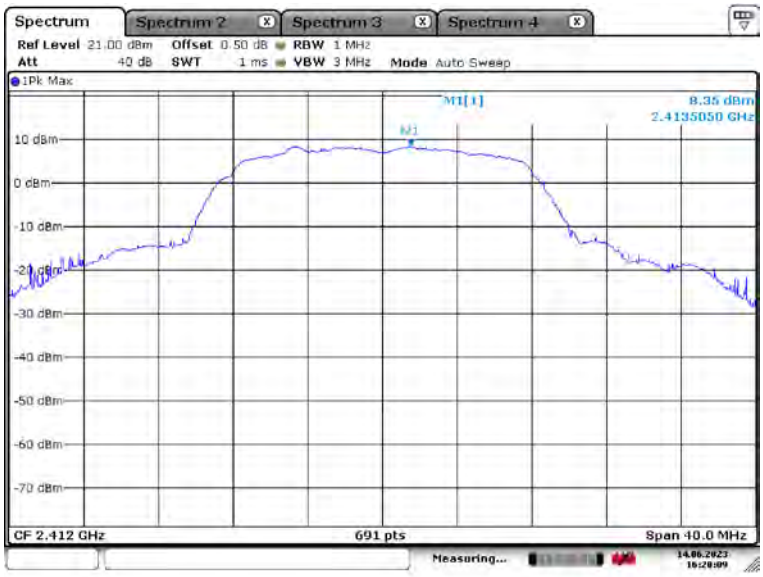
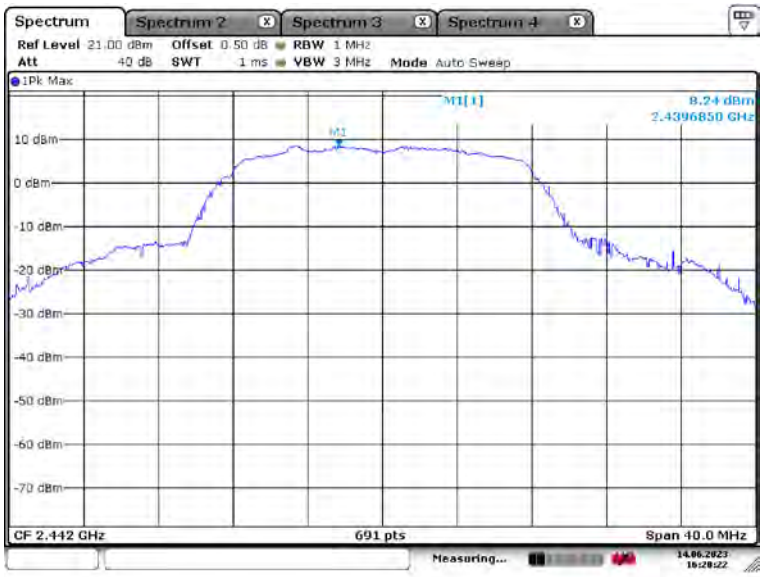
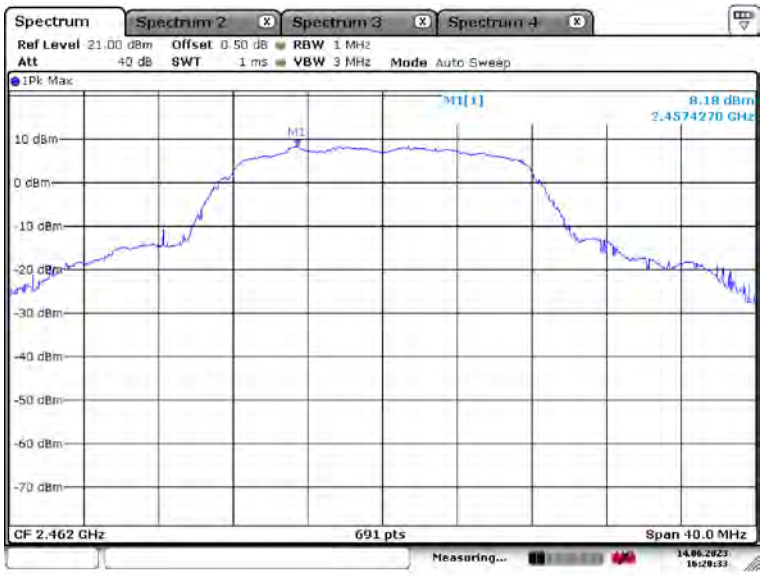
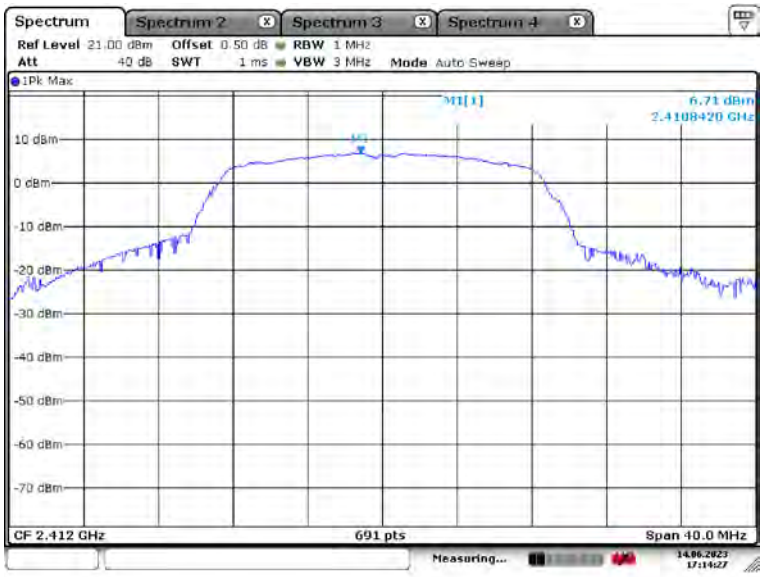
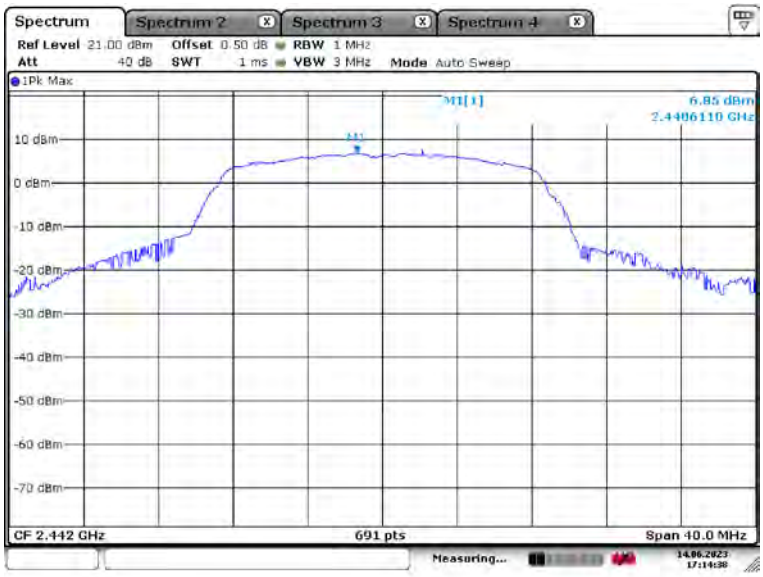


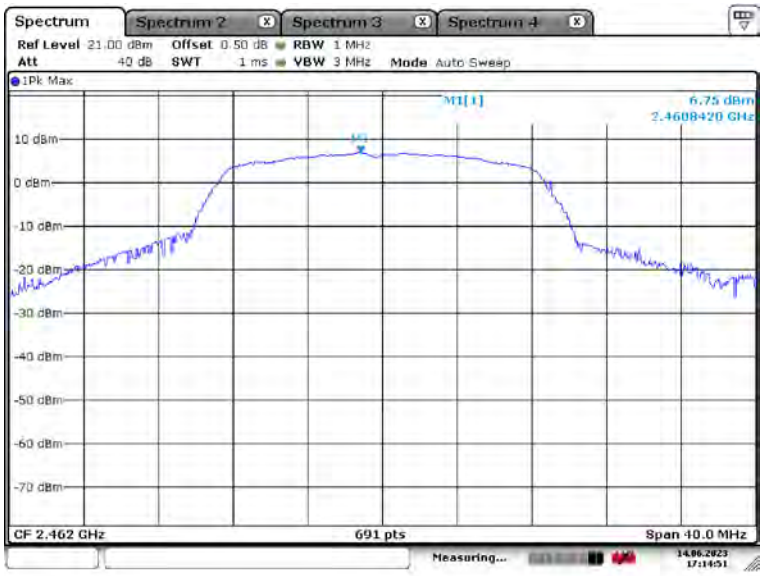




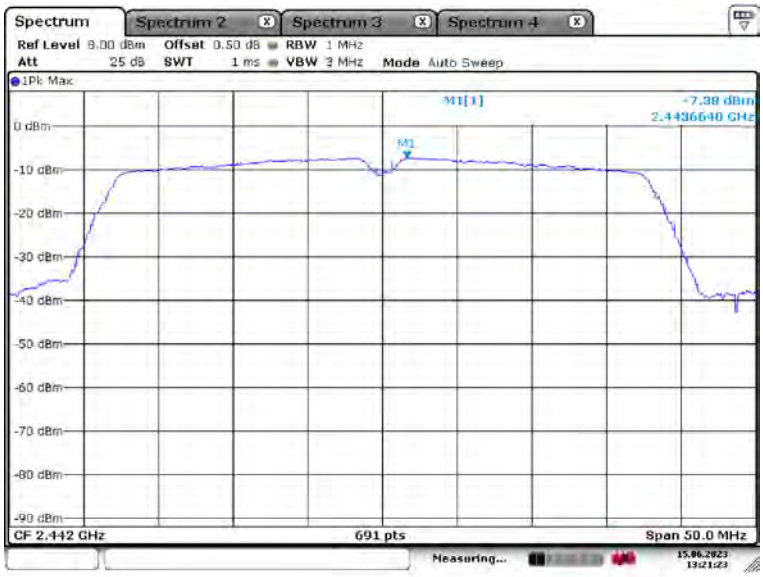
802.11 n

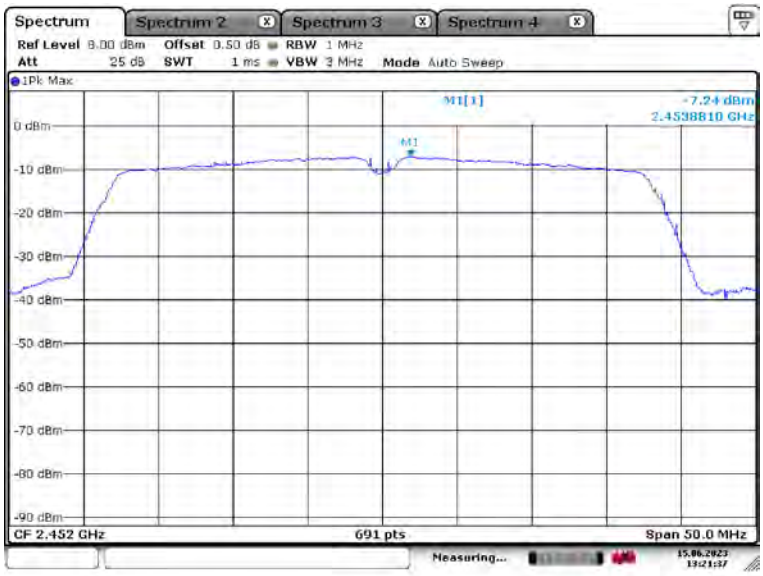






802.11 n





3.2.3 Power Spectral Density

Procedure:

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance.

The spectrum analyzer is set to:

RBW = 3 kHz (3 kHz≤RBW≤100 kHz) Span ≥ 1.5 times the DTS bandwidth

VBW = 3 X RBW Sweep = auto

Detector function = peak Trace = max hold

Measurement Data : Complies

BLE Mode

Frequency (MHz)	Test Results	
	dBm / 3 kHz BW	Result
2402	-6.94	Complies
2442	-7.22	Complies
2480	-7.79	Complies

802.11 b Mode

Frequency (MHz)	Test Results	
	dBm / 3 kHz BW	Result
2412	2.45	Complies
2442	2.31	Complies
2462	2.32	Complies

802.11 g Mode

Frequency (MHz)	Test Results	
	dBm / 3 kHz BW	Result
2412	-15.97	Complies
2442	-15.20	Complies
2462	-14.81	Complies

802.11 n Mode

Frequency (MHz)	Test Results	
	dBm / 3 kHz BW	Result
2412	**-14.87**	Complies
2442	**-16.92**	Complies
2462	**-14.04**	Complies

802.11 n40 Mode

Frequency (MHz)	Test Results	
	dBm / 3 kHz BW	Result
2422	**-30.63**	Complies
2442	**-30.81**	Complies
2452	**-30.28**	Complies

- See next pages for actual measured spectrum plots.

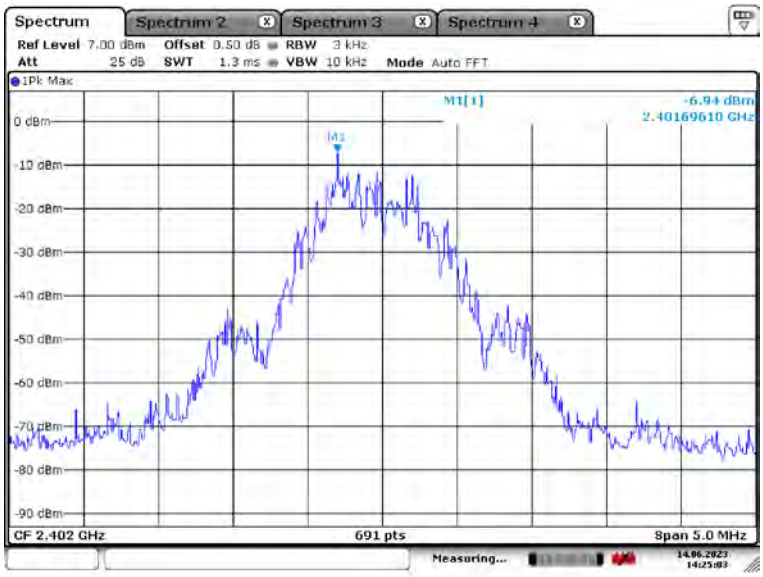
Minimum Standard:

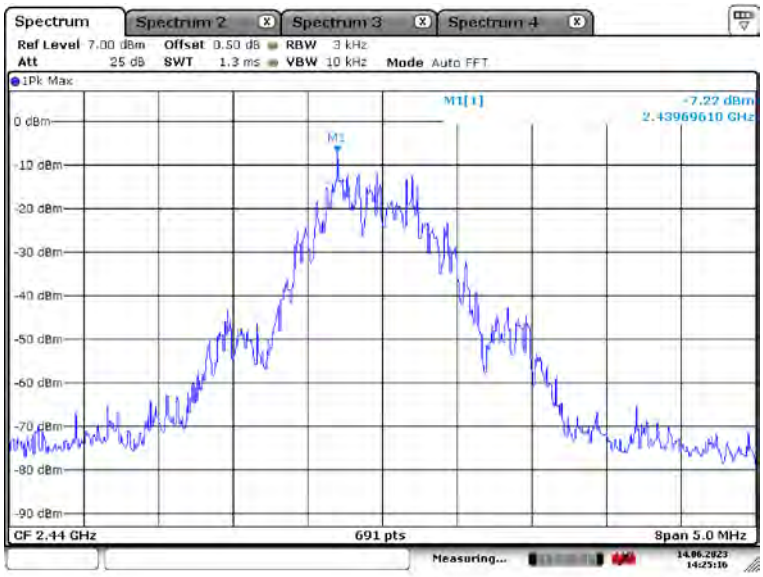
Power Spectral Density	≤ 8 dBm @ 3 kHz BW

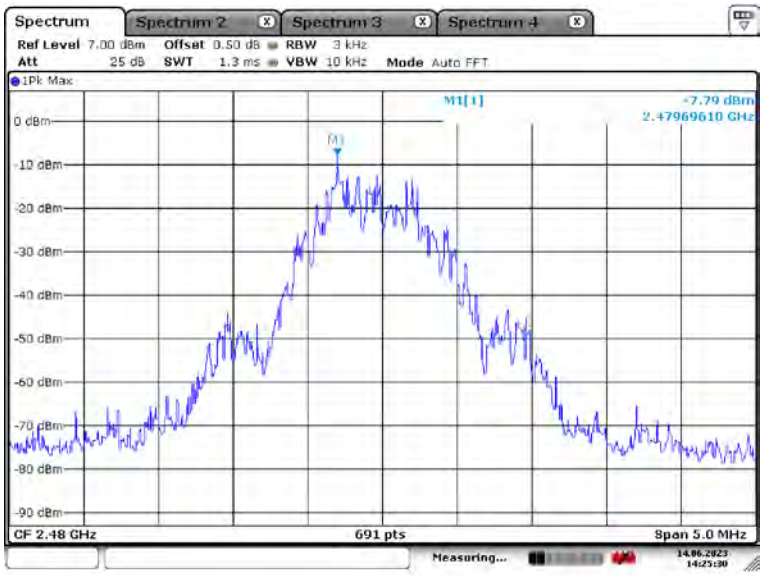
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

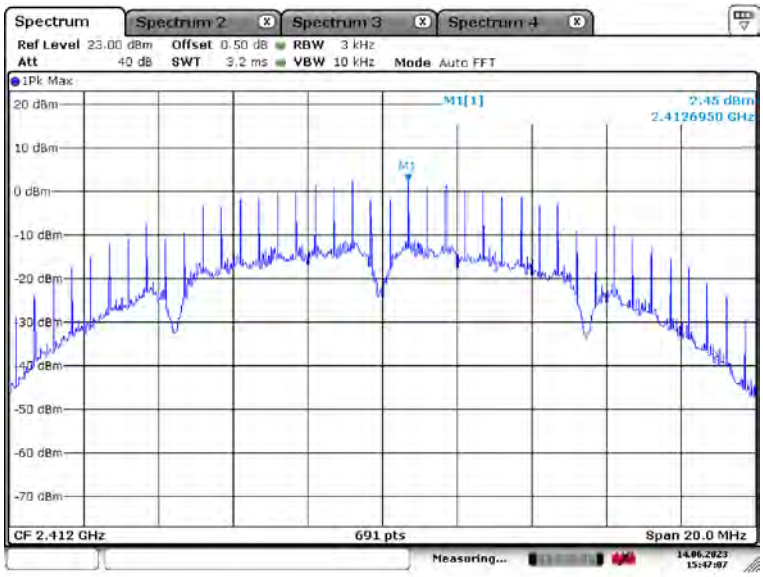
BLE

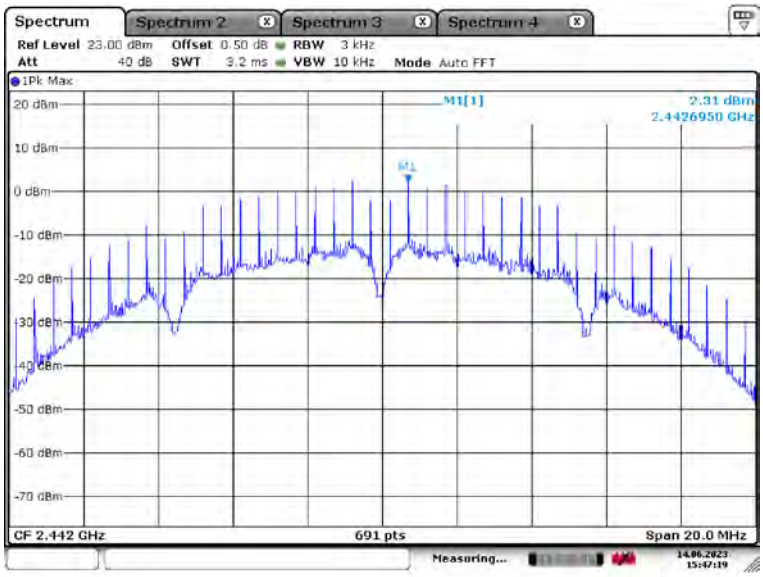


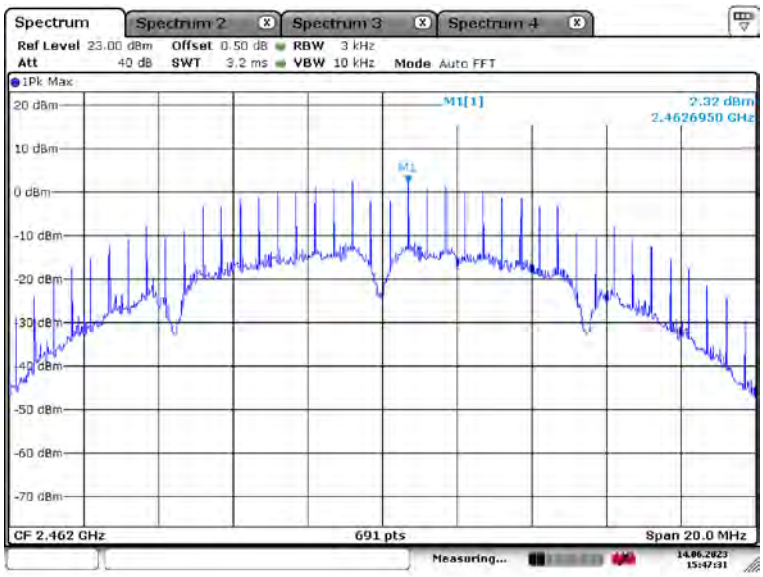




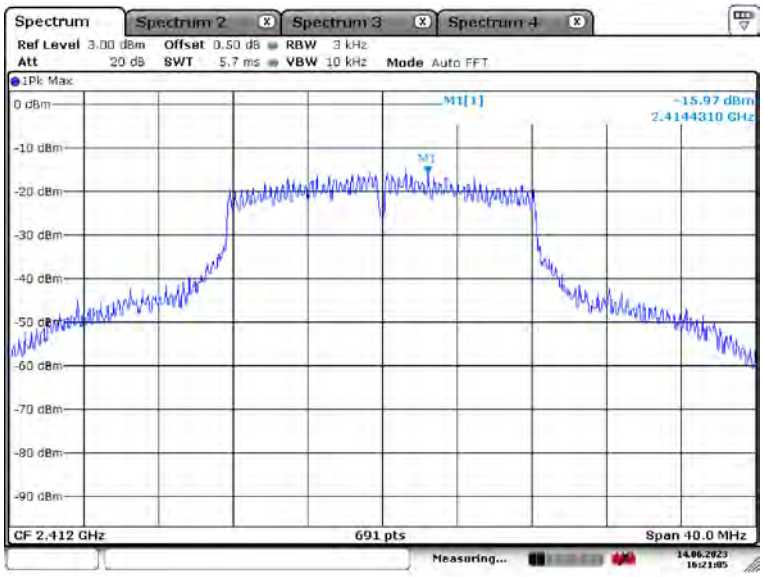
802.11 b

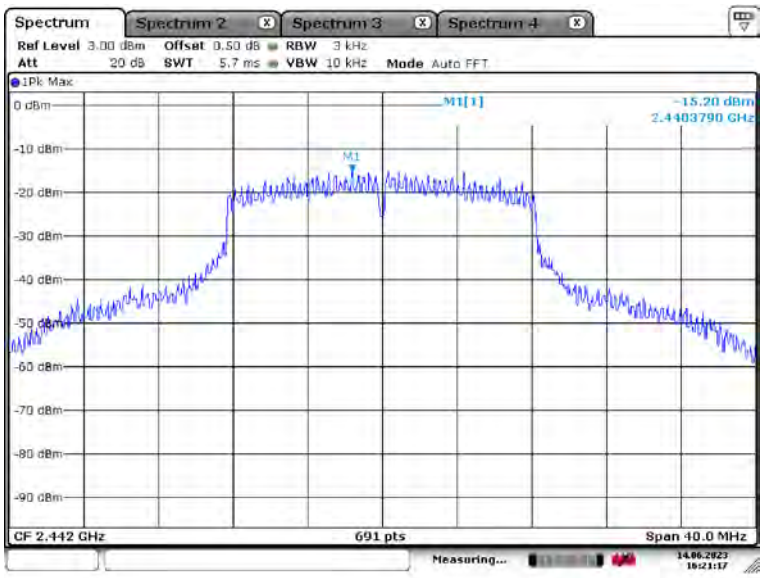


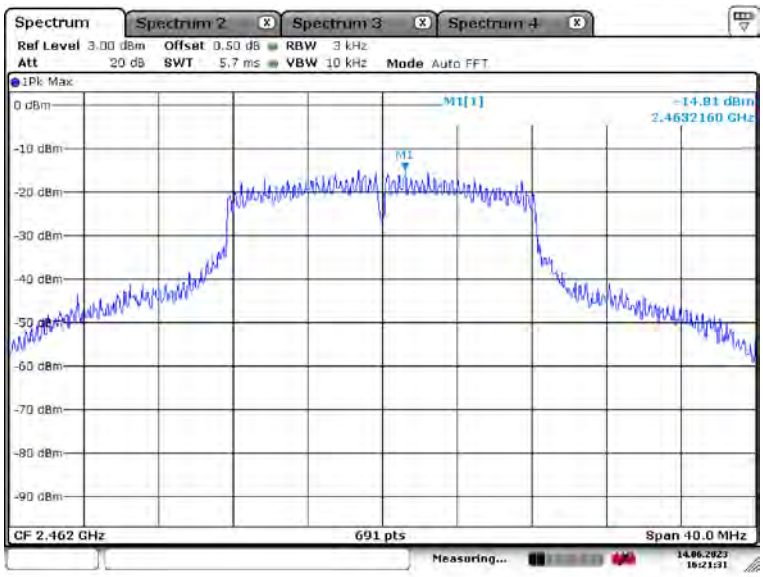




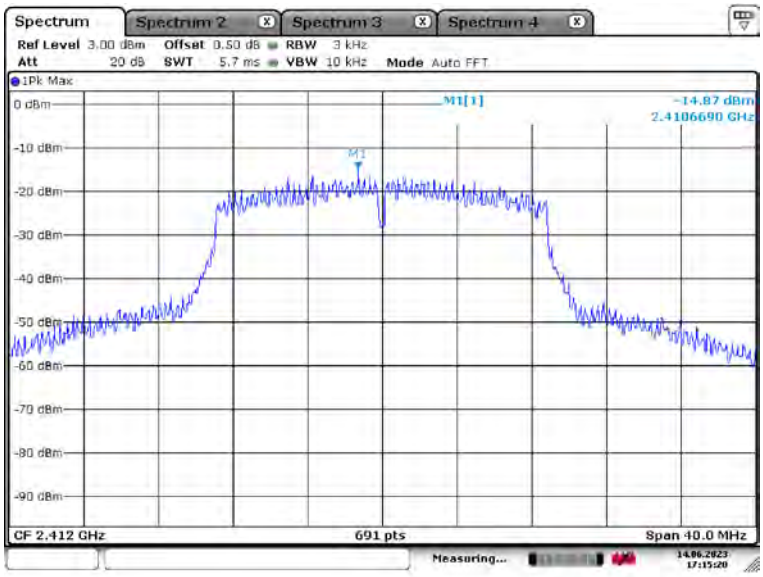
802.11 g

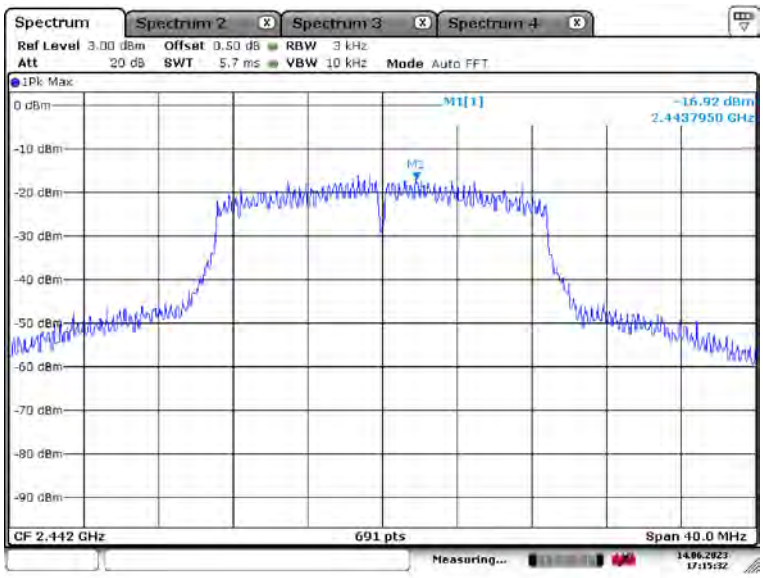


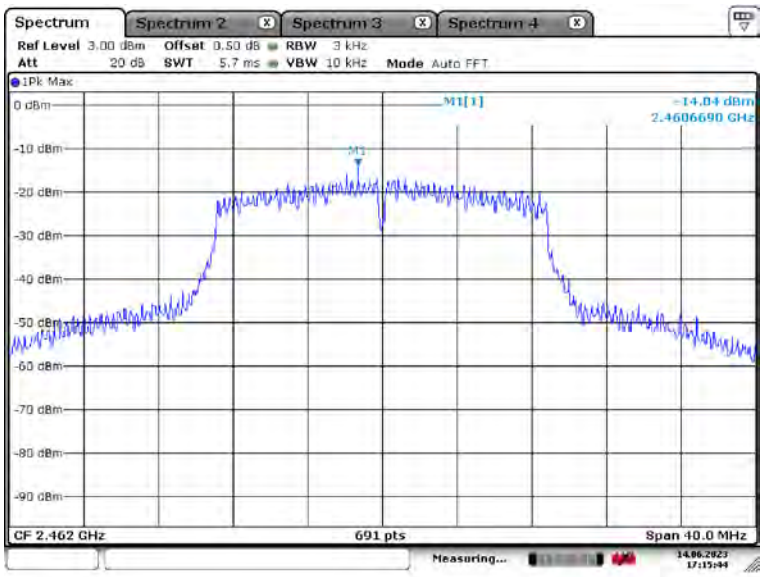




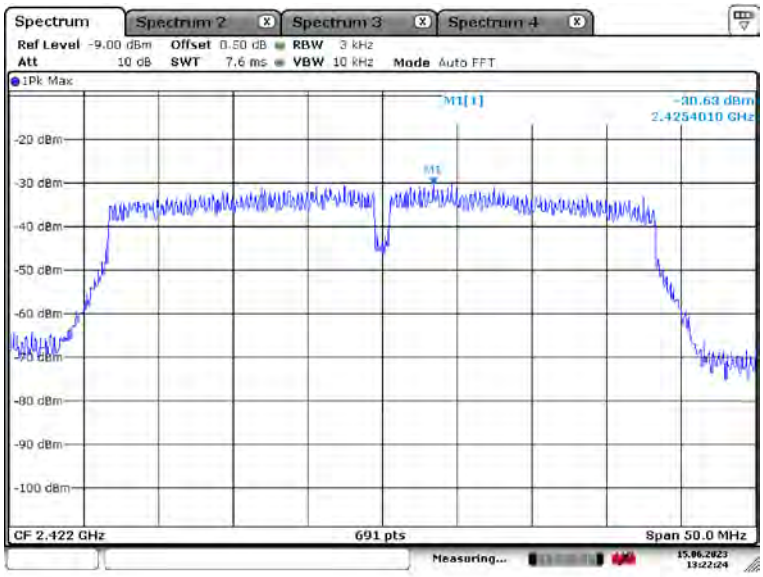
802.11 n

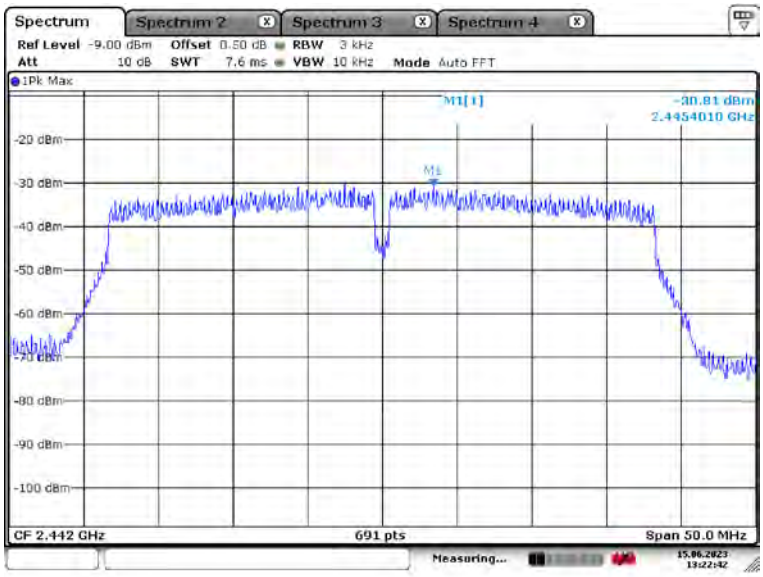


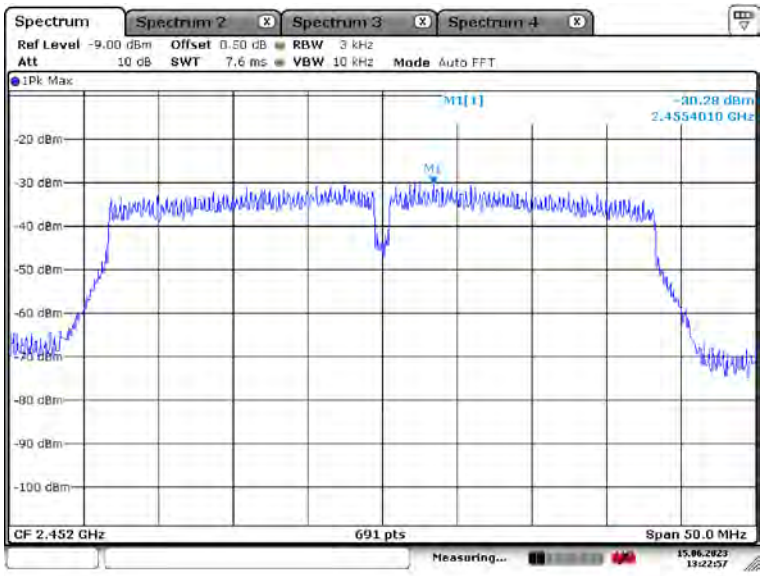




802.11 n40







3.2.4 Band Edge

Procedure:

The Unwanted emission from the EUT were measured according to the dictates PKPSD measurement procedure in section 11.11 of ANSI C63.10-2013.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB..

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1 MHz VBW ≥ 3 X RBW

Detector function = peak Trace = max hold

Sweep = auto

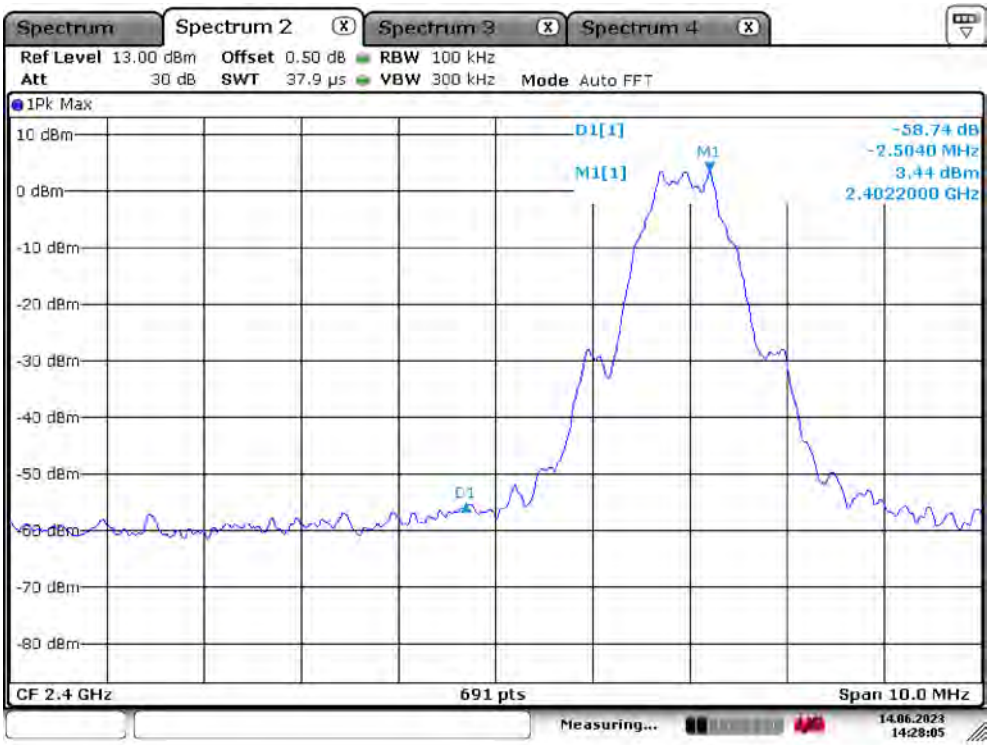
Measurement Data: Complies

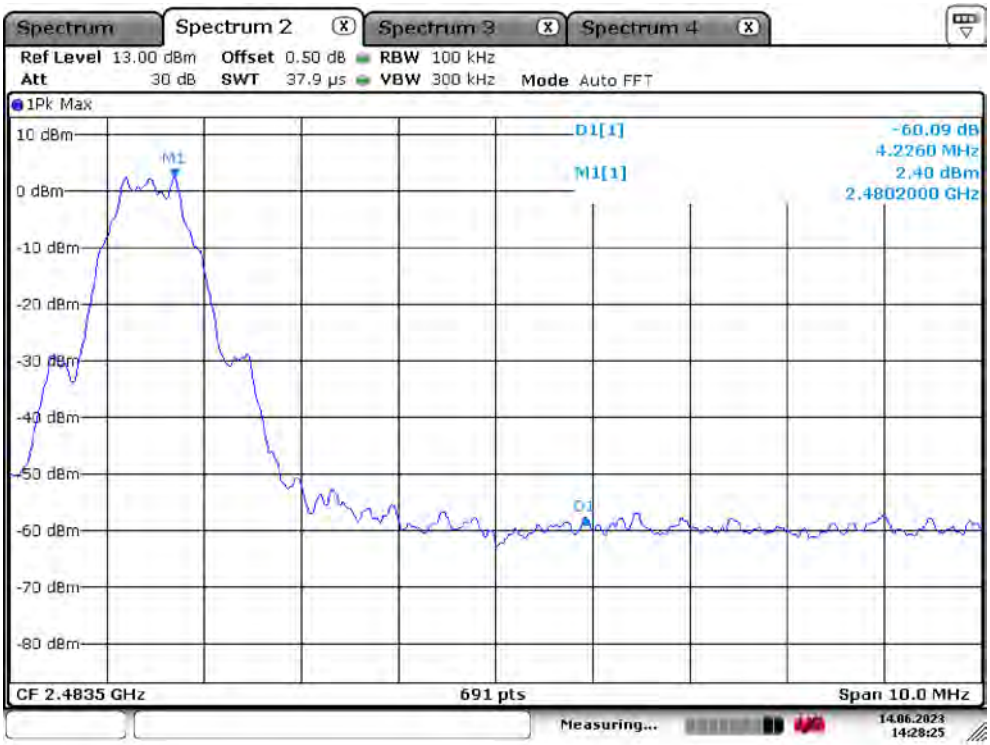
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20 dB lower than the highest inband spectral density. Therefore the applying equipment meets the require ment.

- See next pages for actual measured spectrum plots.

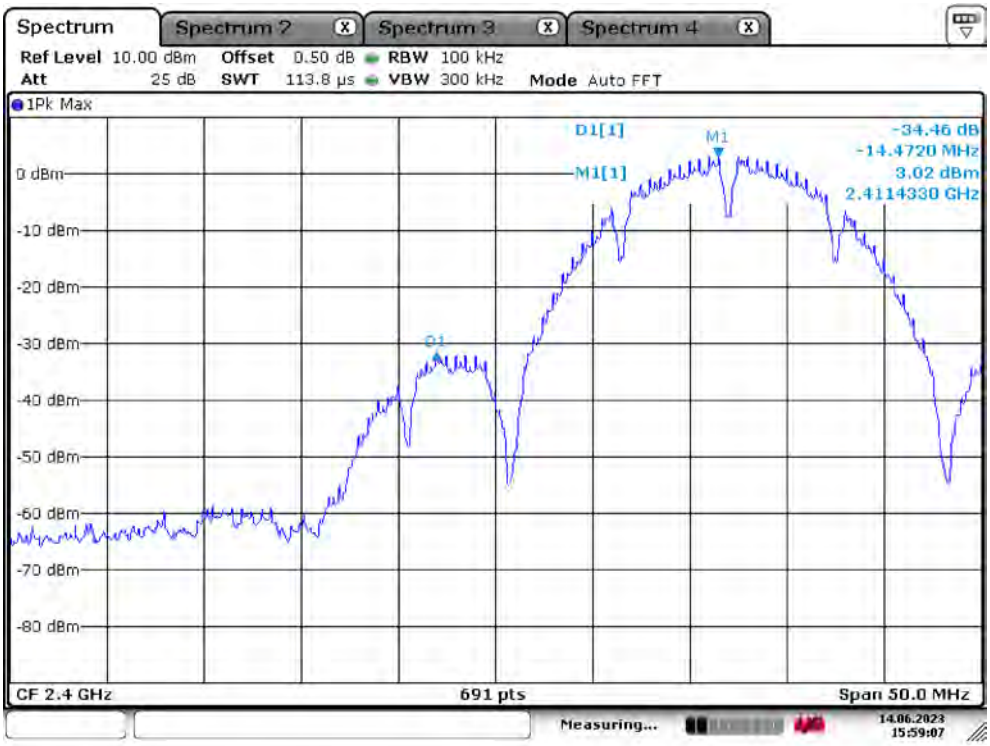
Minimum Standard:	≤ 20 dBc

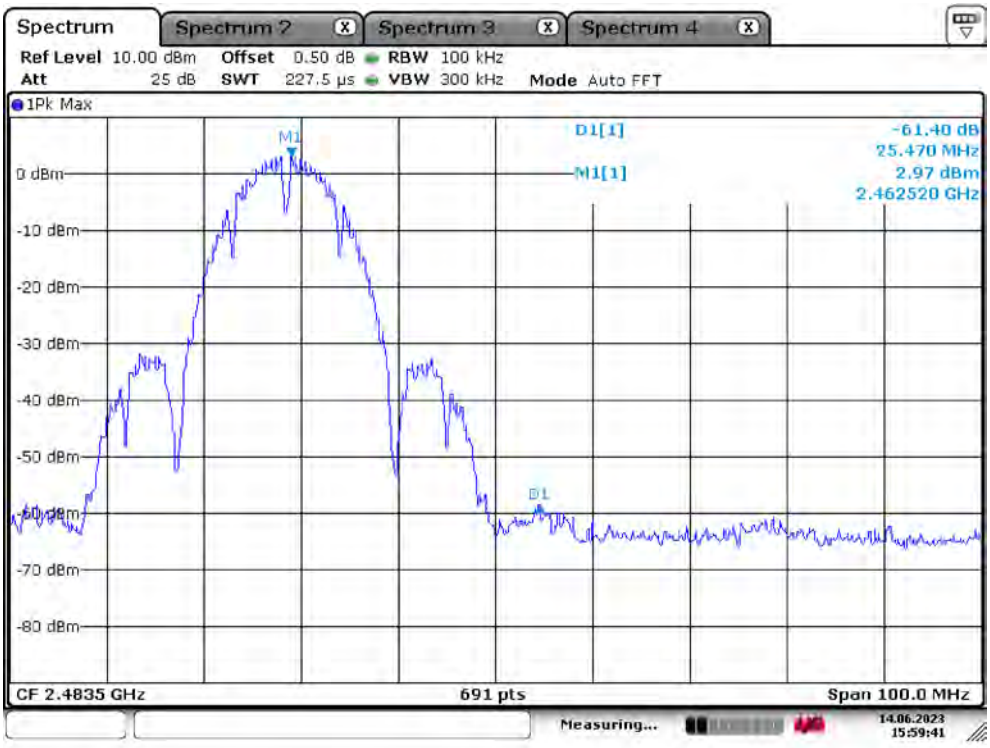
BLE



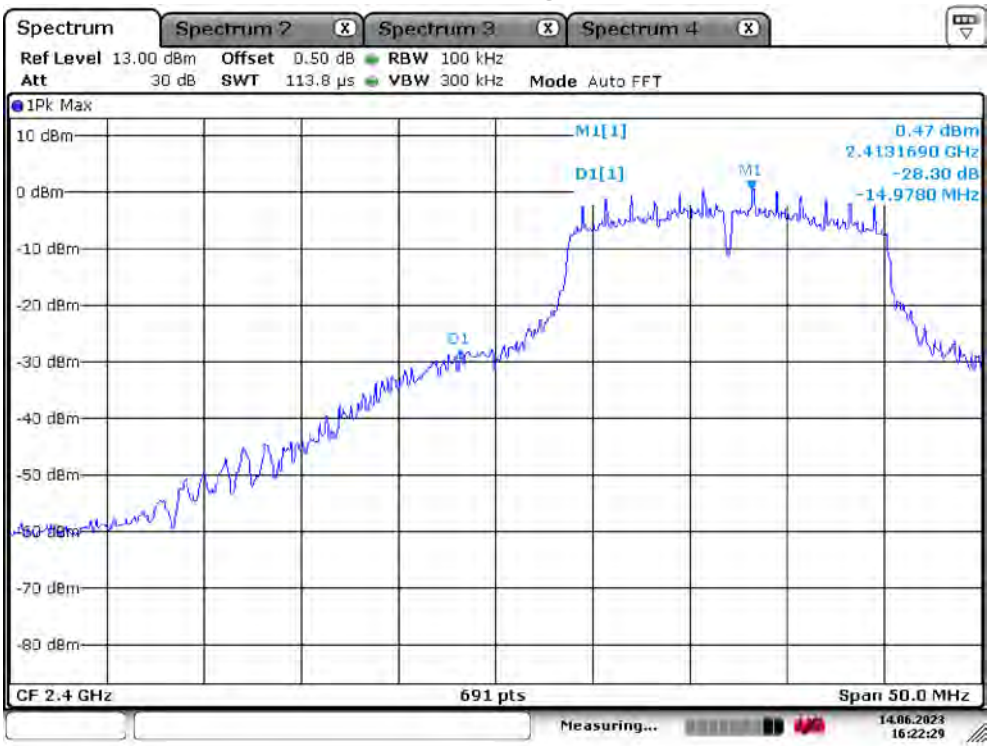


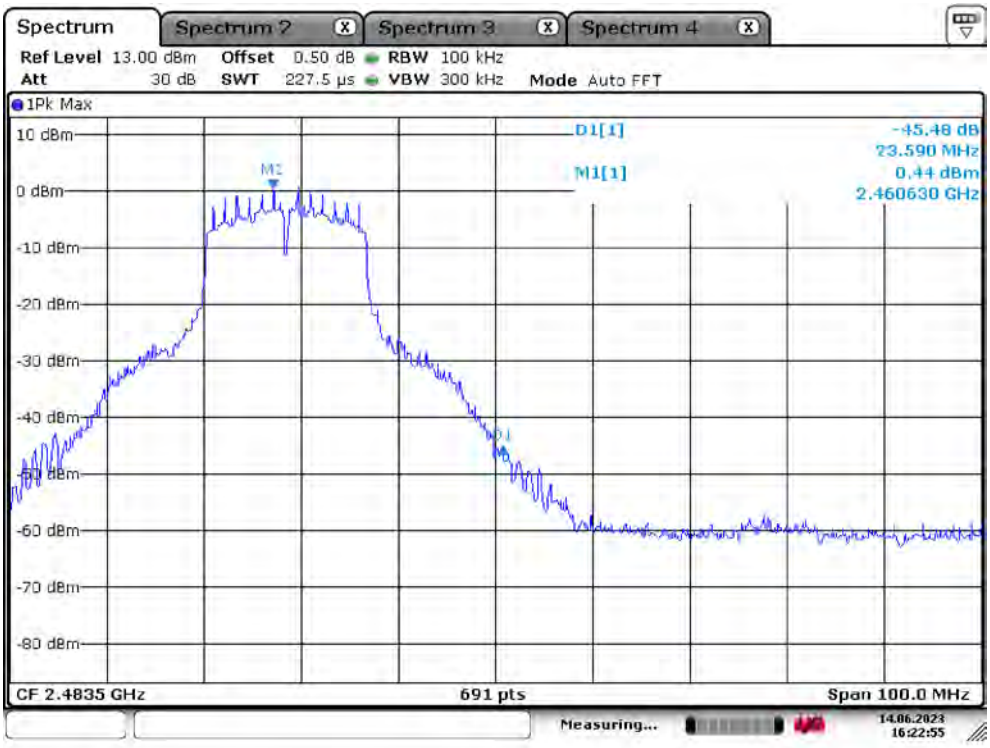
802.11 b



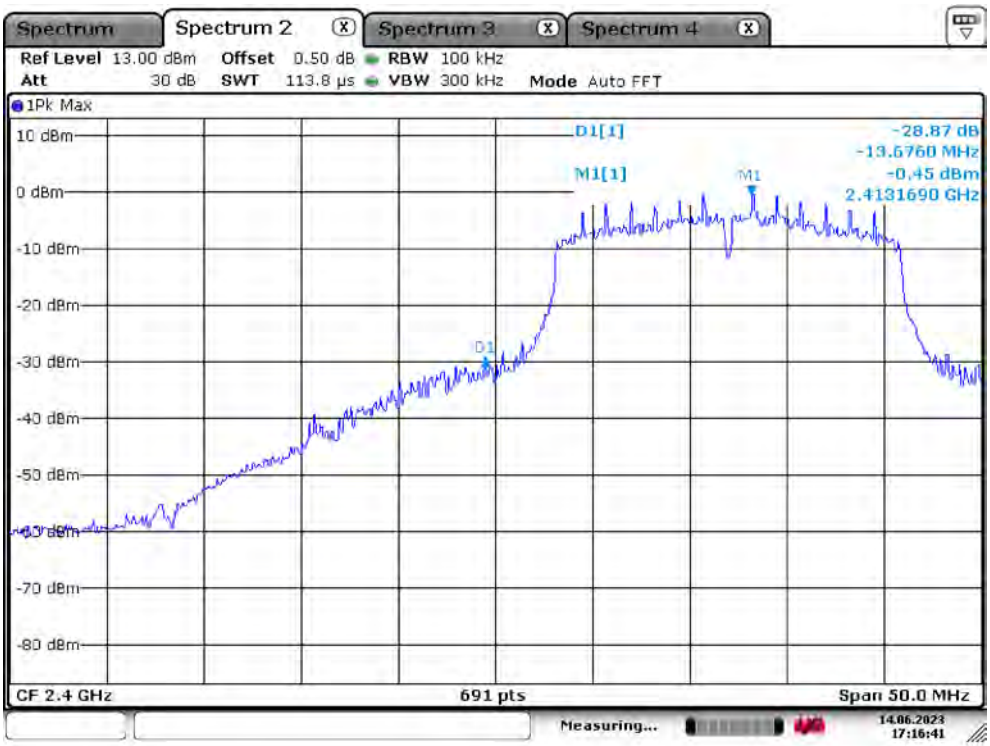


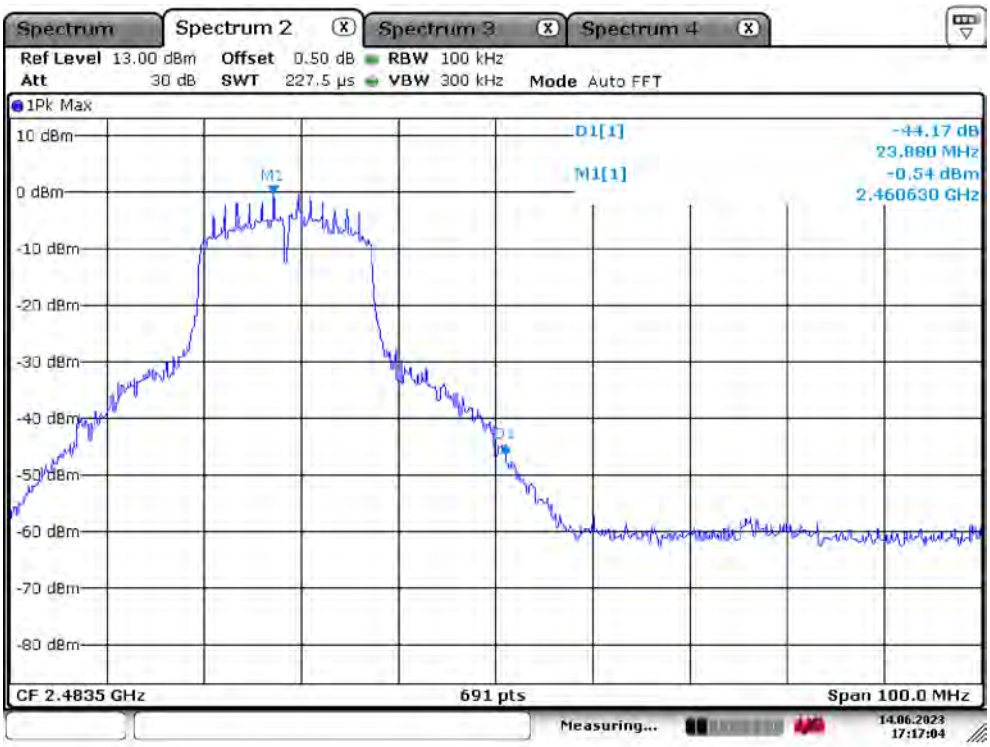
802.11 g



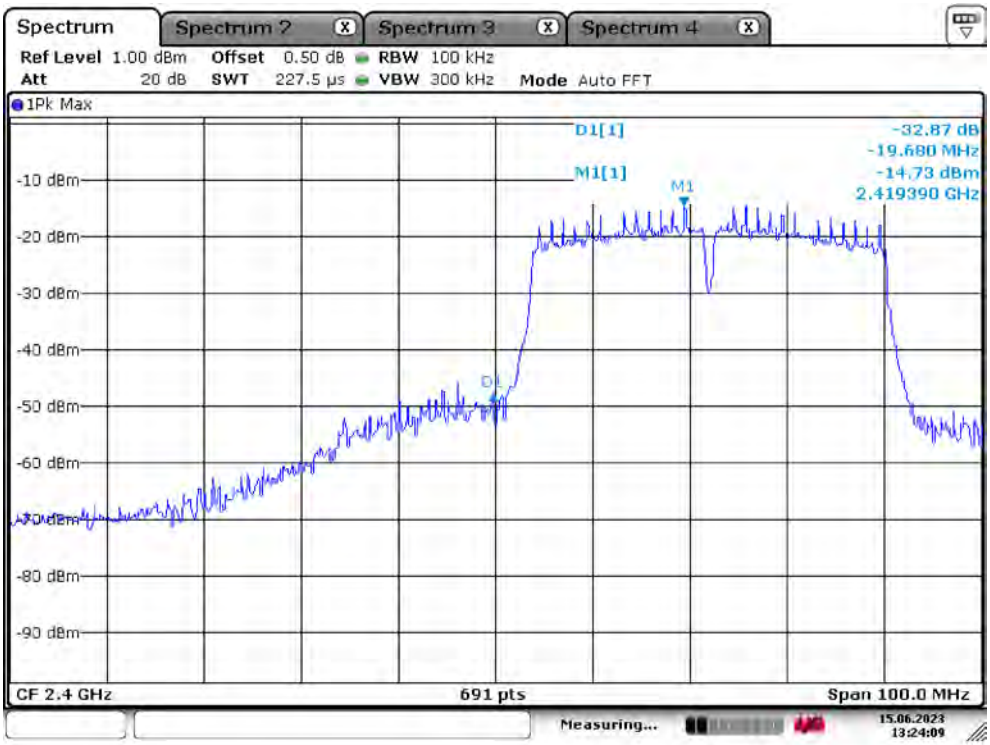


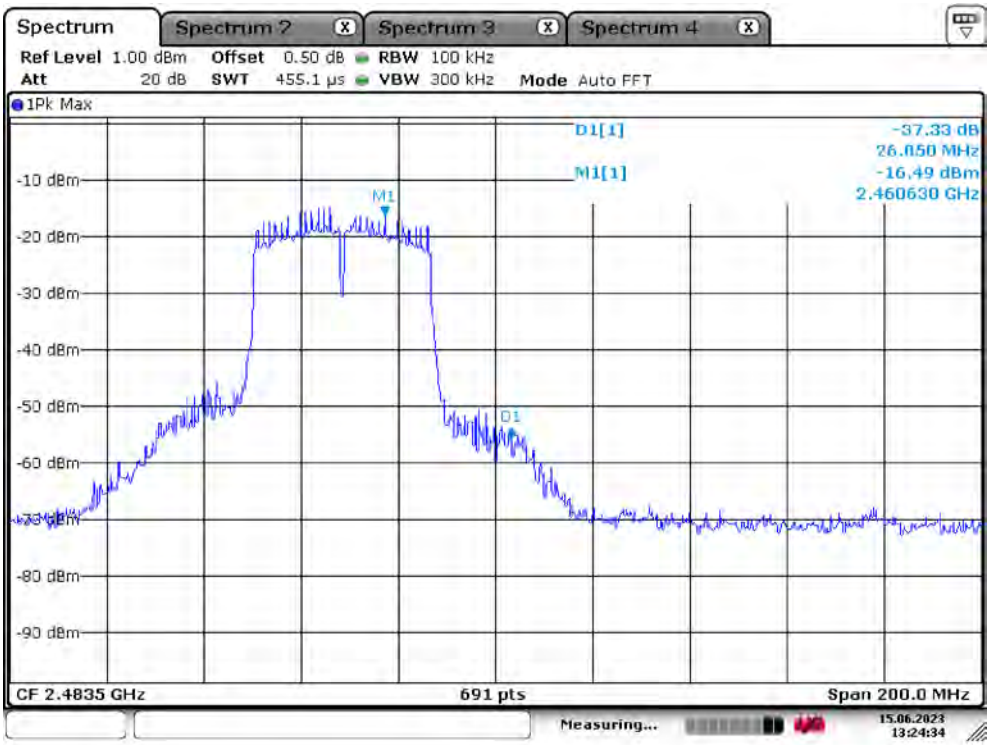
802.11 n





802.11 n40





3.2.5 Conducted Spurious Emissions

Procedure:

The test follows KDB558074. The conducted spurious emissions were measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, set the marker on the peak of any spurious emission recorded.

The spectrum analyzer is set to:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions

RBW = 100 kHz Sweep = auto

VBW = 100 kHz Detector function = peak

Trace = max hold

Measurement Data: **Complies**

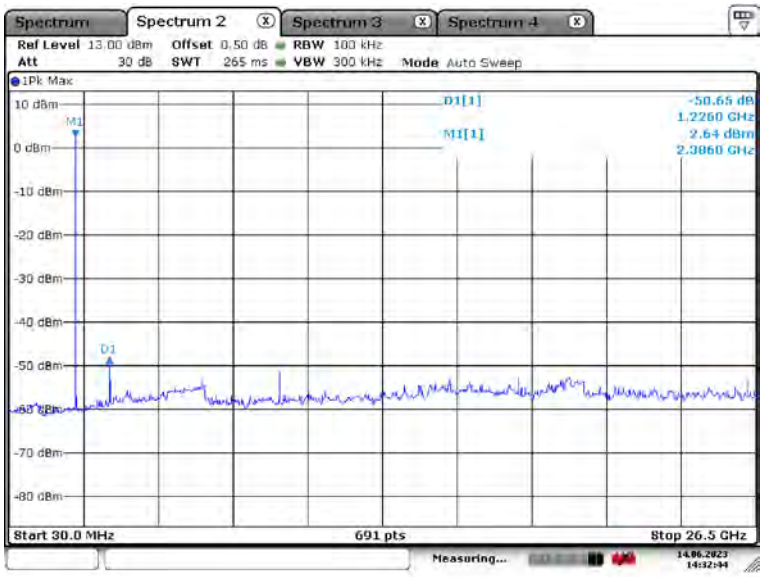
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20 dB lower than the highest inband spectral density. Therefore the applying equipment meets the require ment.
- See next pages for actual measured spectrum plots.

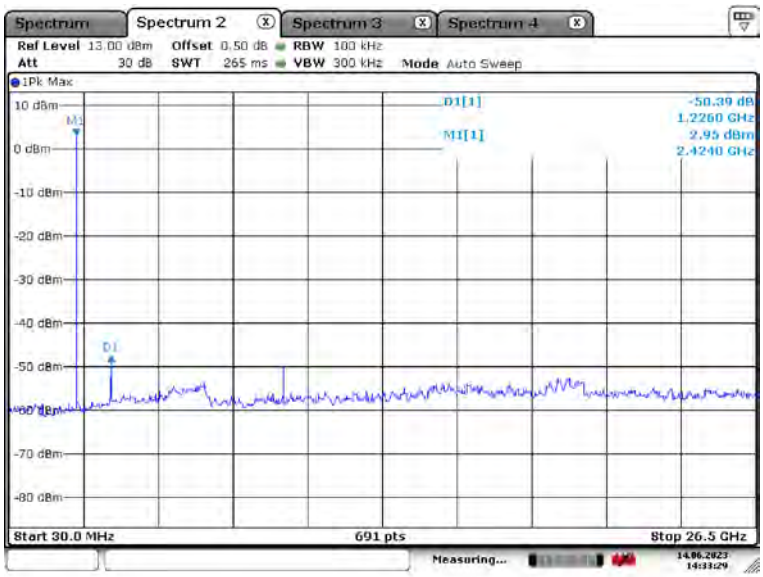
Minimum Standard:	≥ 20 dBc

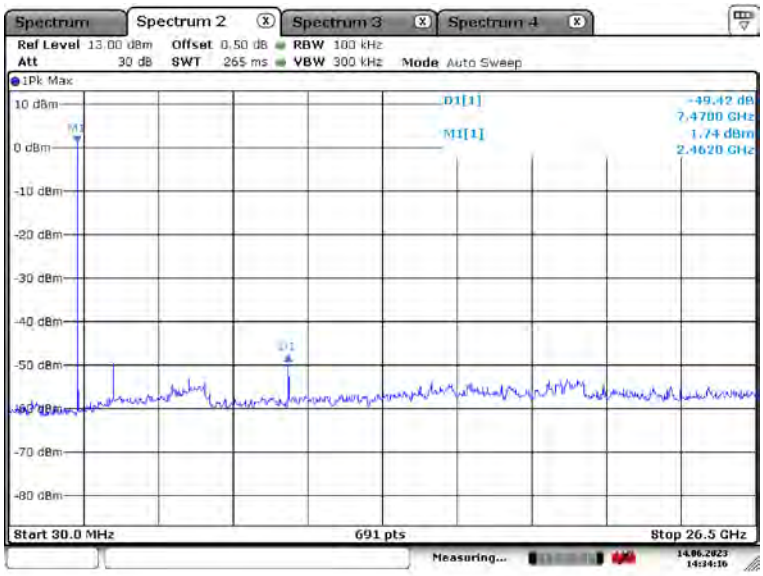
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

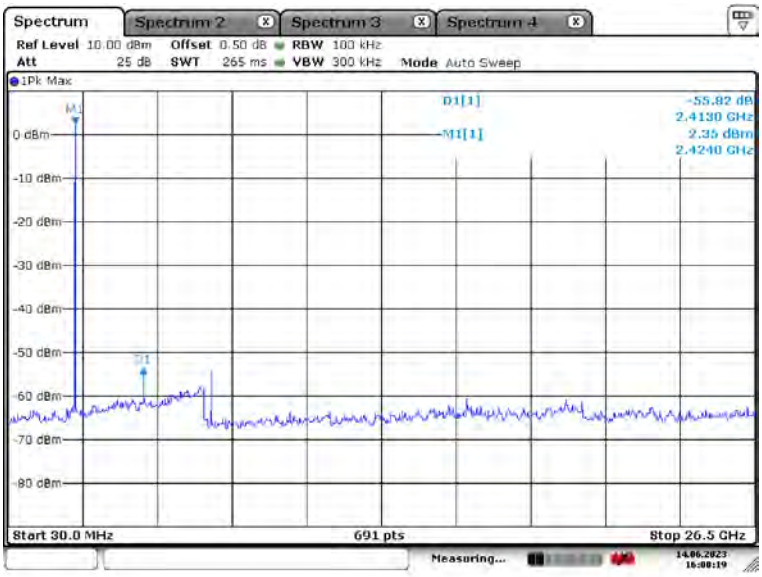
Unwanted Emission – BLE (Low,Middle,High)

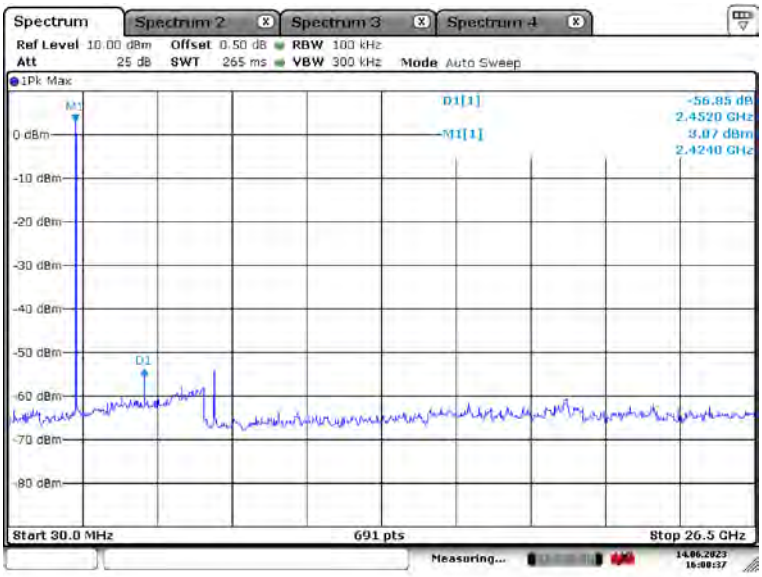


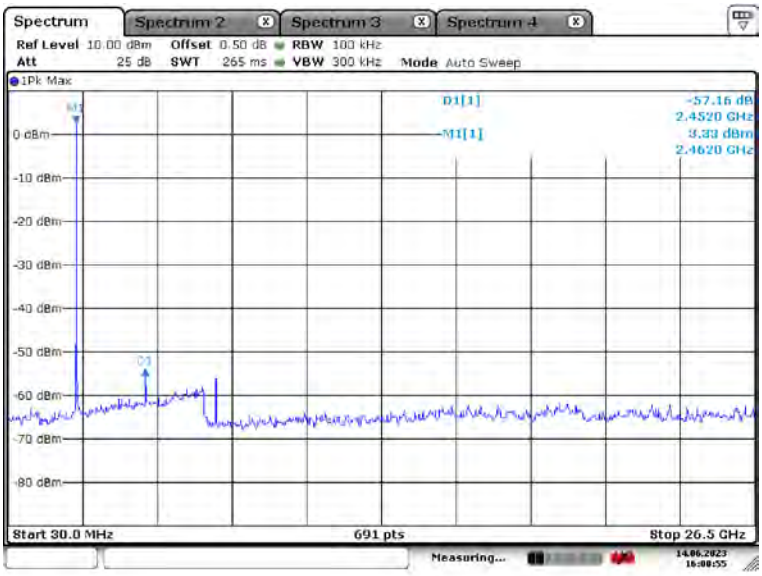




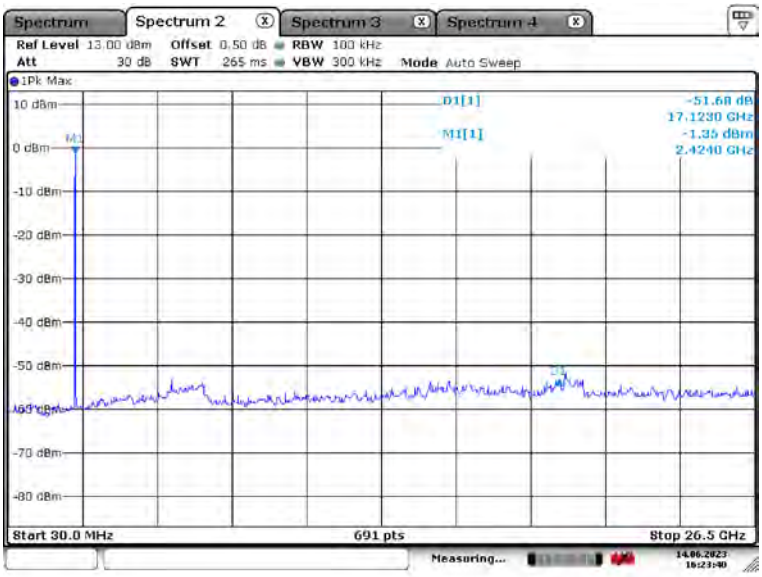
Unwanted Emission – 802.11 b (Low,Middle,High)

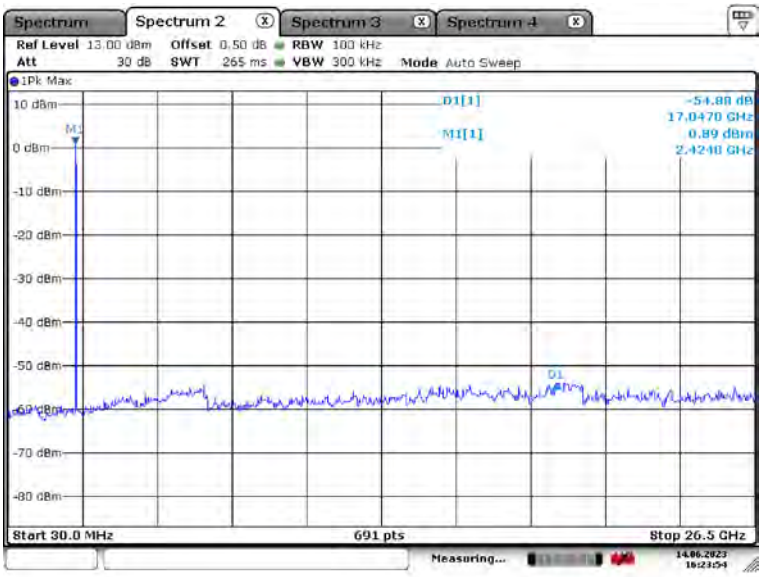


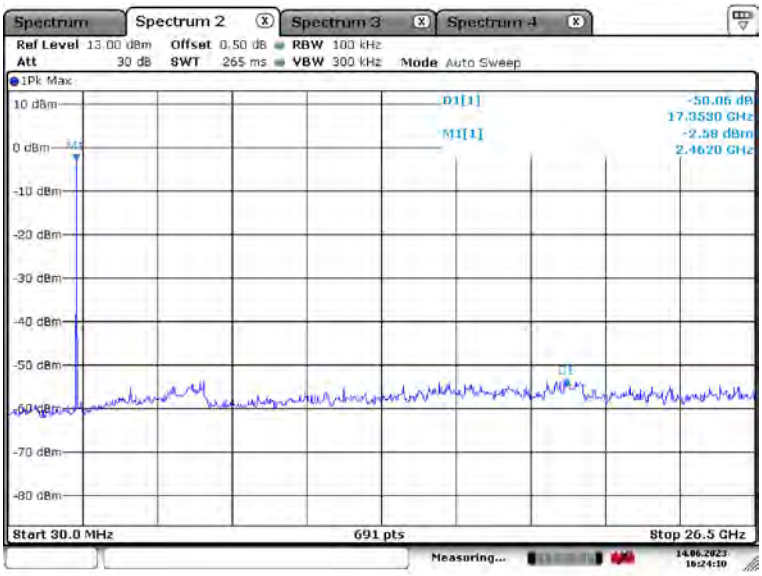




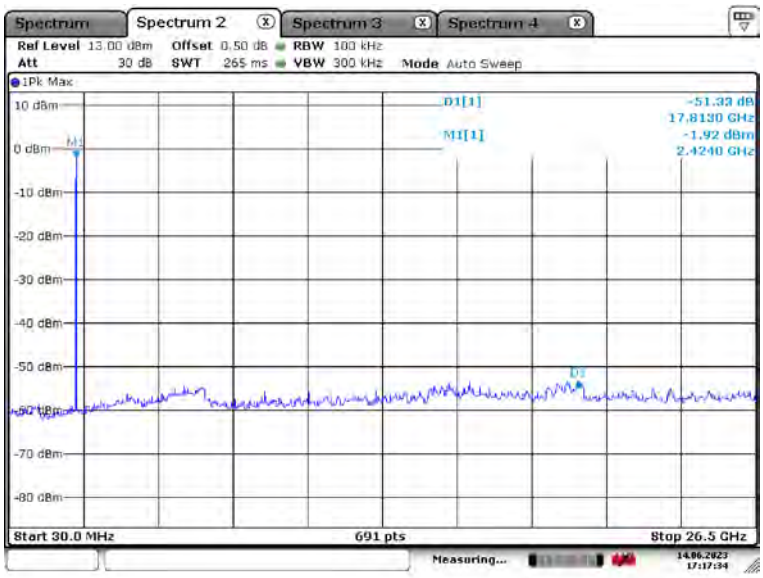
Unwanted Emission – 802.11 g (Low,Middle,High)

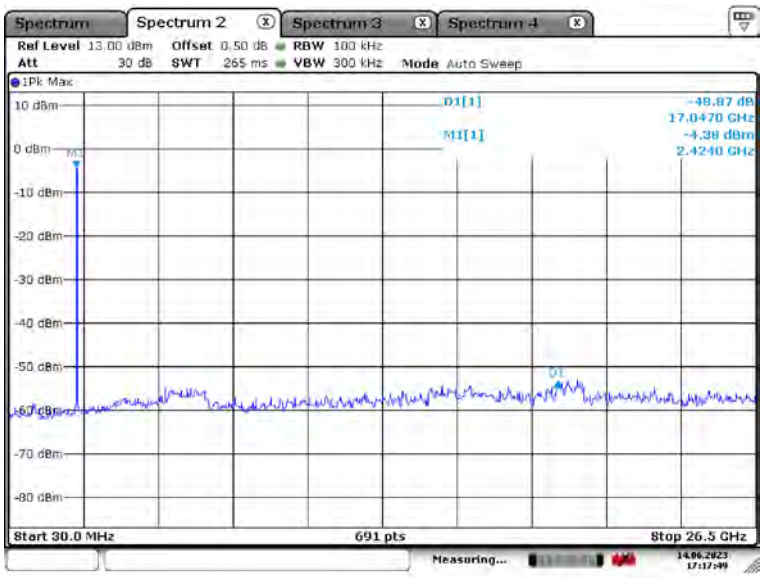


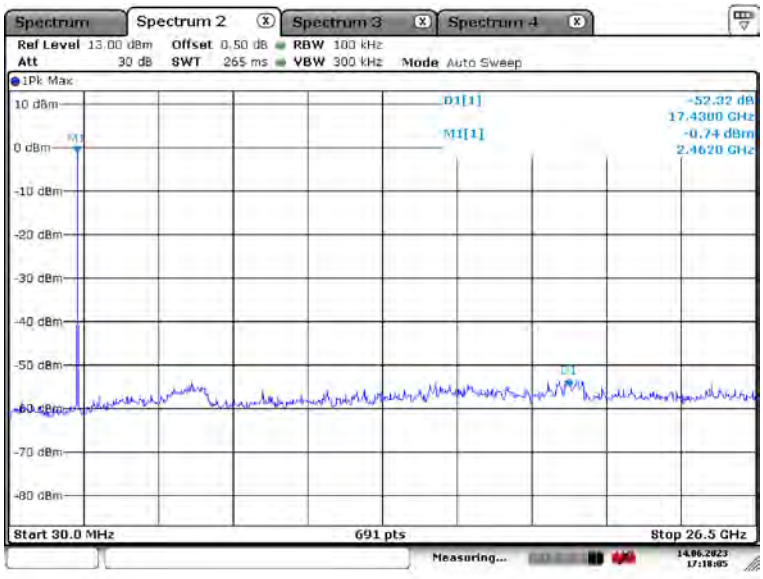




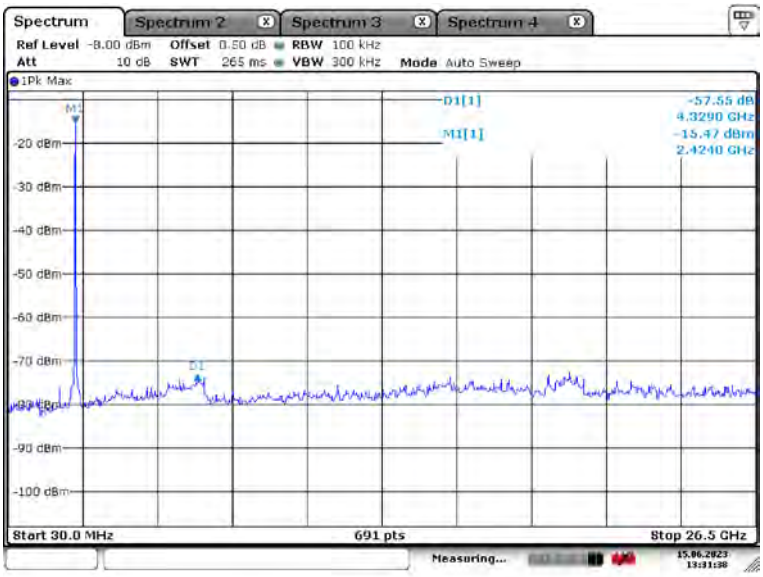
Unwanted Emission – 802.11 n (Low,Middle,High)

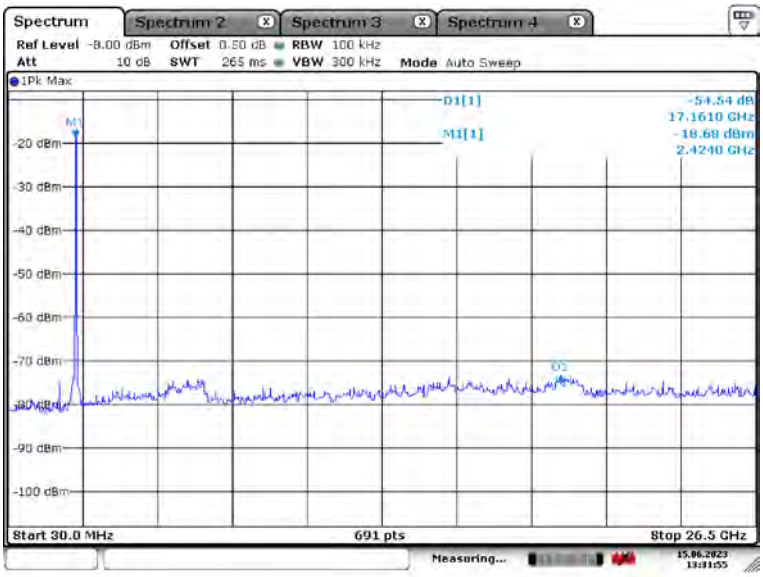


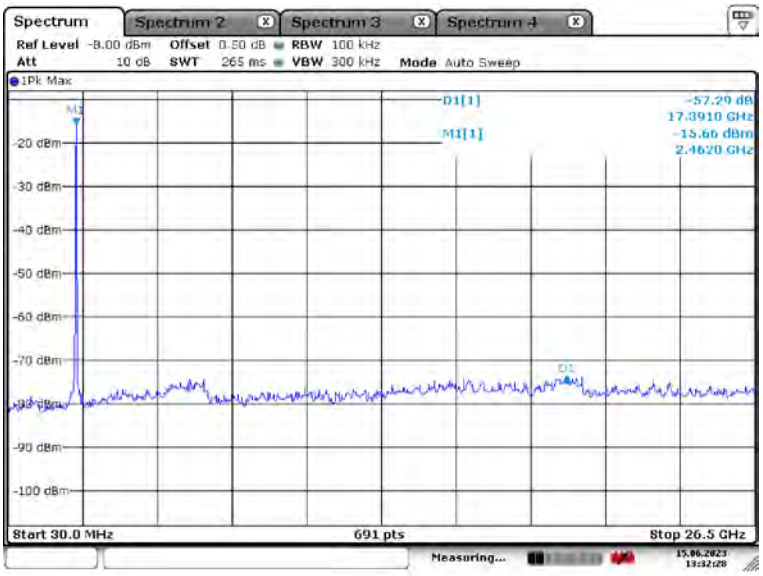




Unwanted Emission – 802.11 n40 (Low,Middle,High)







3.2.6 Radiated Spurious Emissions

Procedure:

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.10-2013. The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 9 kHz ~ 10^{th} harmonic.

RBW = 120 kHz (30 MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10^{th} harmonic)

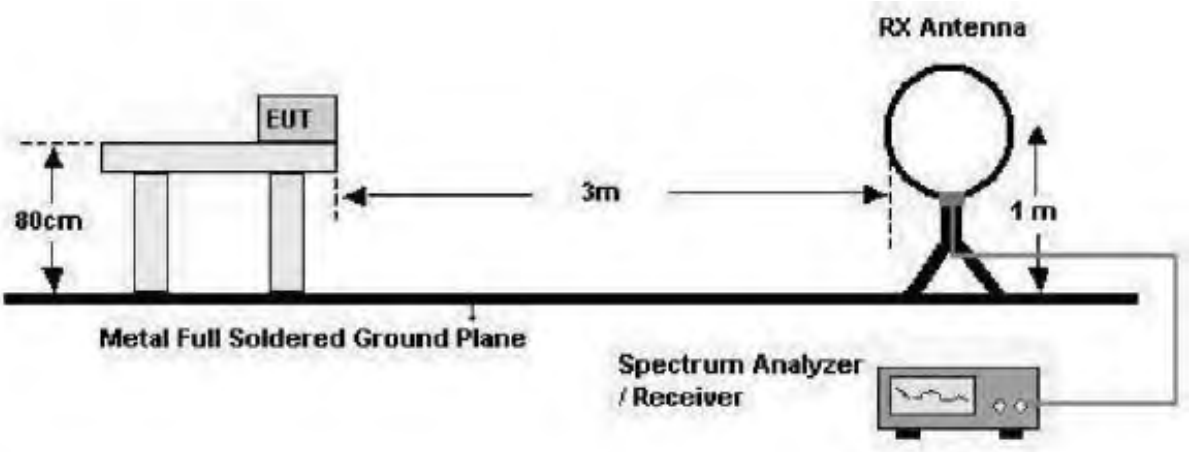
Trace = max hold Detector function = peak

Sweep = auto

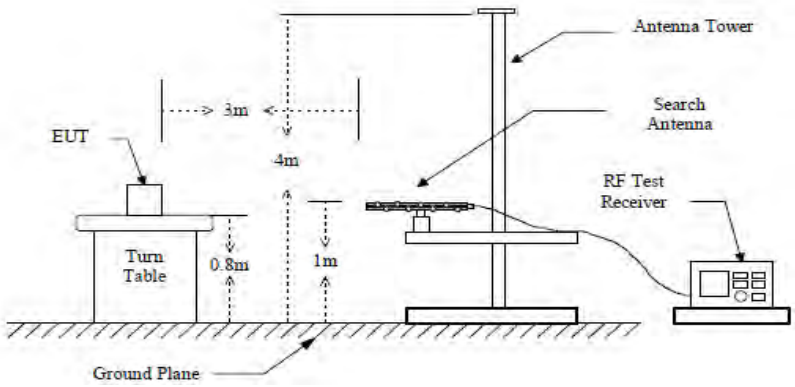
Duty cycle : 98.89 %

The EUT configureal to transmit continuously(D ≥ 98%)/ Duty Factor = 0

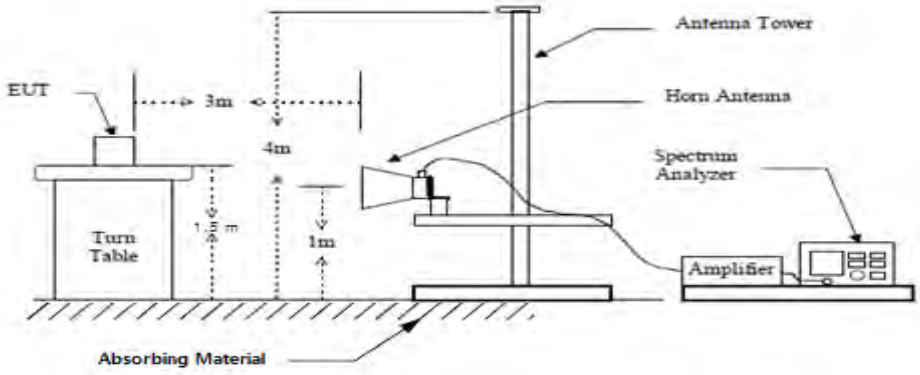
below 30 MHz



below 1 GHz (30 MHz to 1 GHz)



above 1 GHz



Measurement Data: Complies

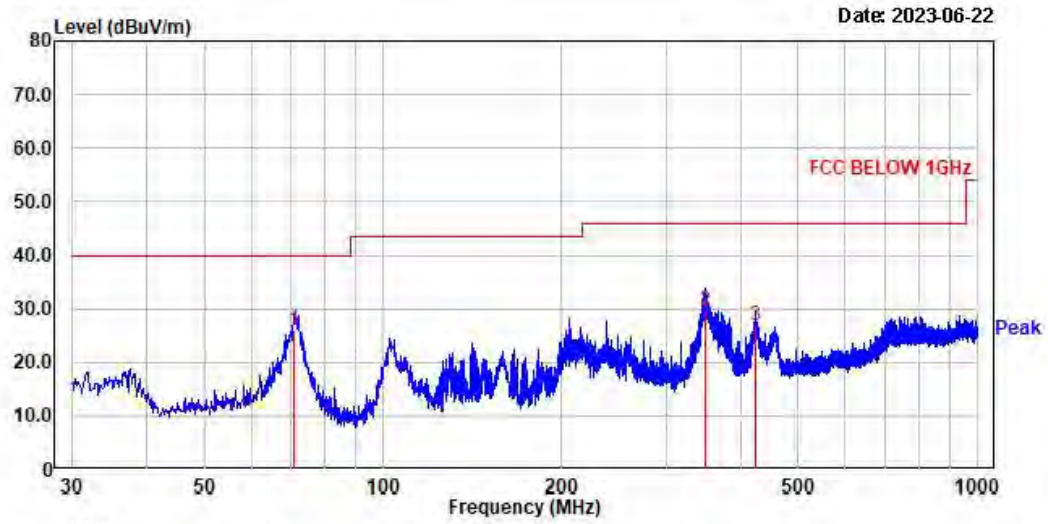
- See next pages for actual measured data.
- No other emissions were detected at a level greater than 20 dB below limit include from 9 kHz to 30MHz.
- The test results for the worst of the various operating modes are presented in accordance with 6.3.4 of ANSI C63.10.
- Checked with a red circle is the fundamental frequency.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3 m
0.009 ~ 0.490	2400/F(kHz) **(@ 300 m)**
0.490 ~ 1.705	24000/F(kHz) **(@ 30 m)**
1.705 ~ 30	30**(@ 30 m)**
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

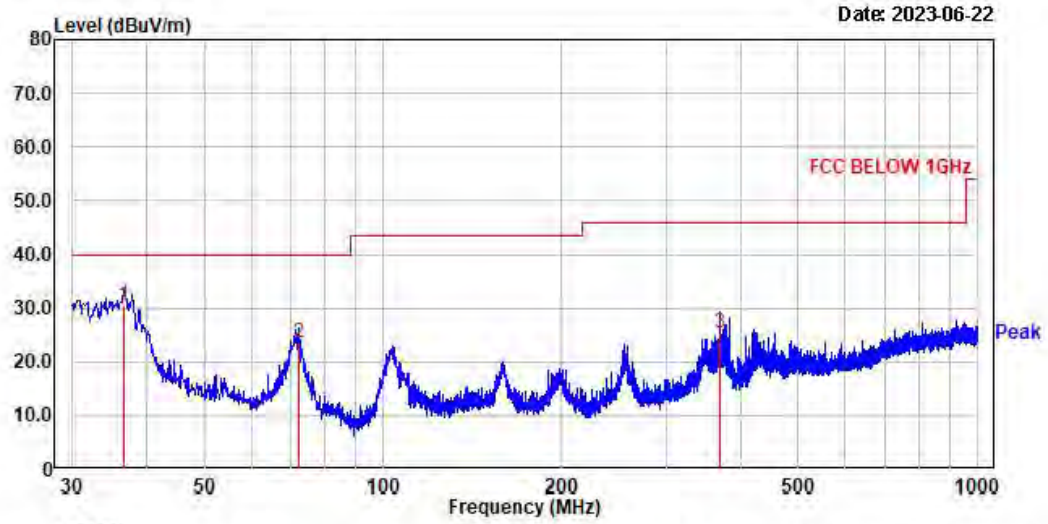
Radiated Emissions – BLE



Trace:

No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	70.86	40.70	-14.74	25.96	40.00	14.04	------	------	horizontal
2.	349.25	38.50	-8.77	29.73	46.00	16.27	------	------	horizontal
3.	423.94	33.70	-6.89	26.81	46.00	19.19	------	------	horizontal

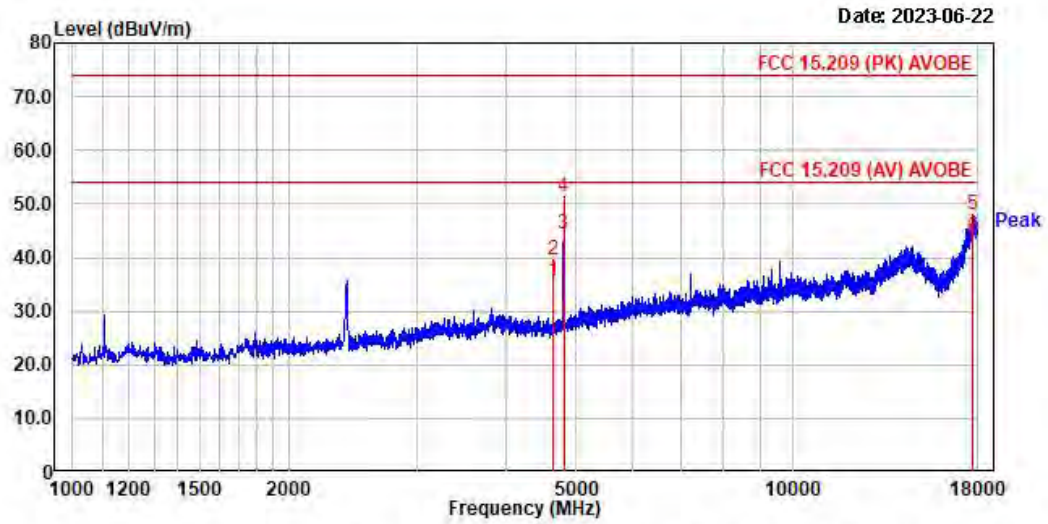
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



Trace:

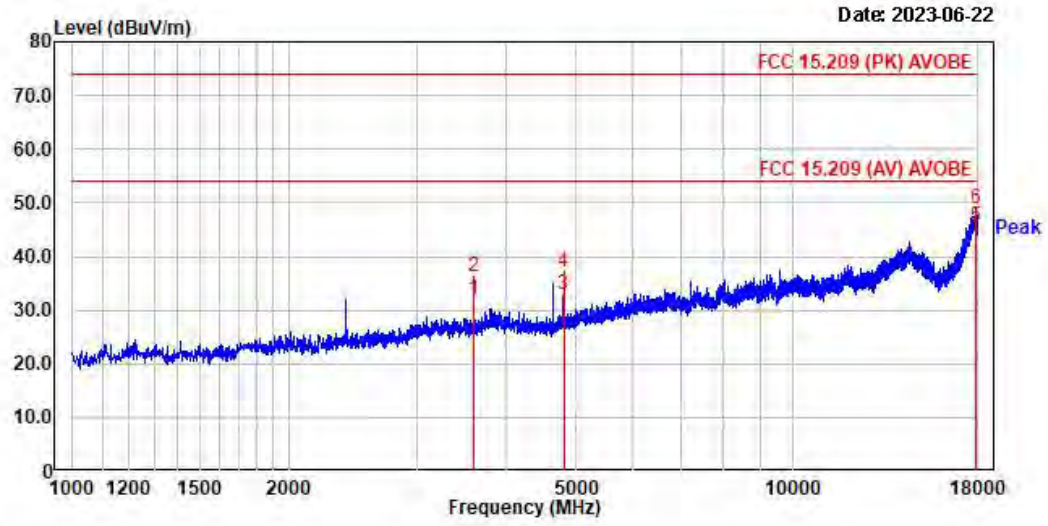
No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	36.55	44.10	-13.74	30.36	40.00	9.64	------	------	vertical
2.	71.95	38.60	-15.05	23.55	40.00	16.45	------	------	vertical
3.	369.62	33.61	-8.31	25.30	46.00	20.70	------	------	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



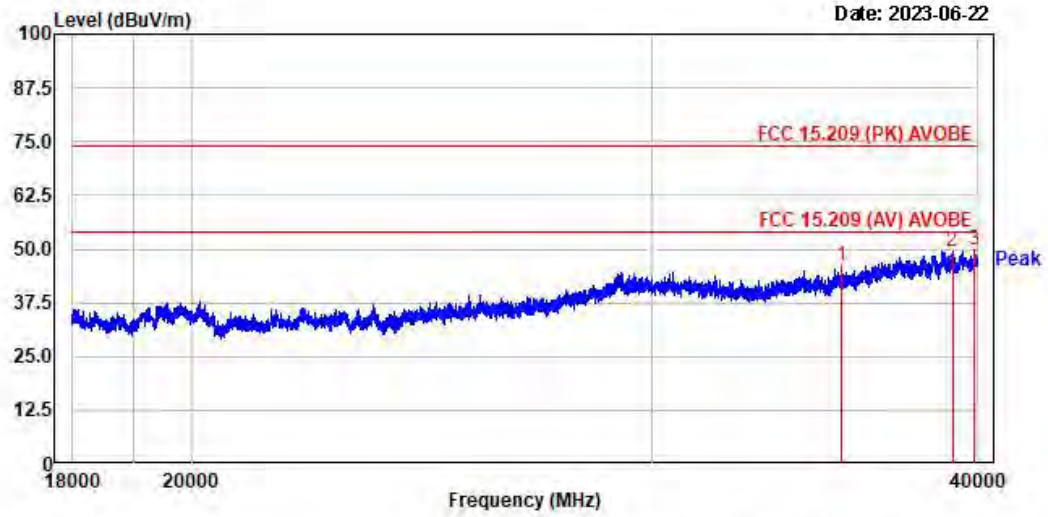
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4652.88	36.79	32.80	2.75	39.54	35.55	74.00	54.00	34.46	18.45	100	330	horizontal
4.	4803.75	47.83	40.90	3.47	51.30	44.37	74.00	54.00	22.70	9.63	100	63	horizontal
5.	17755.63	23.69	------	24.20	47.89	------	74.00	------	26.11	------	100	236	horizontal
6.	17755.63	------	19.70	24.20	------	43.90	------	54.00	------	10.10	100	236	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



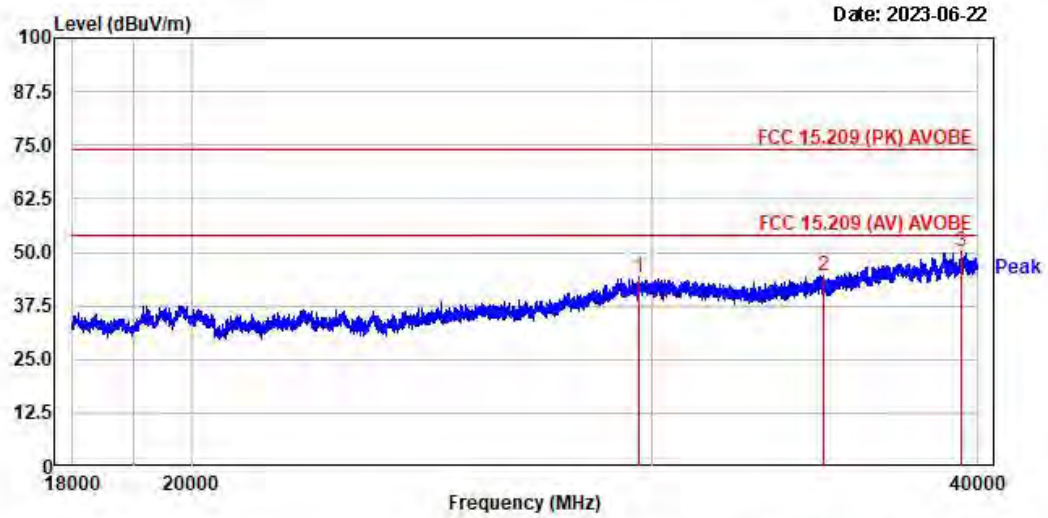
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	3601.00	35.29	31.21	0.84	36.13	32.05	74.00	54.00	37.87	21.95	100	187	vertical
4.	4803.75	33.60	29.40	3.47	37.07	32.87	74.00	54.00	36.93	21.13	100	360	vertical
6.	17889.50	24.22	20.89	24.60	48.82	45.49	74.00	54.00	25.18	8.51	100	28	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
1.	35470.75	22.21	------	23.69	45.90	------	74.00	------	28.10	------	100	12	horizontal
2.	39133.75	25.86	------	23.70	49.56	------	74.00	------	24.44	------	100	0	horizontal
3.	39920.25	25.39	------	24.52	49.91	------	74.00	------	24.09	------	100	0	horizontal

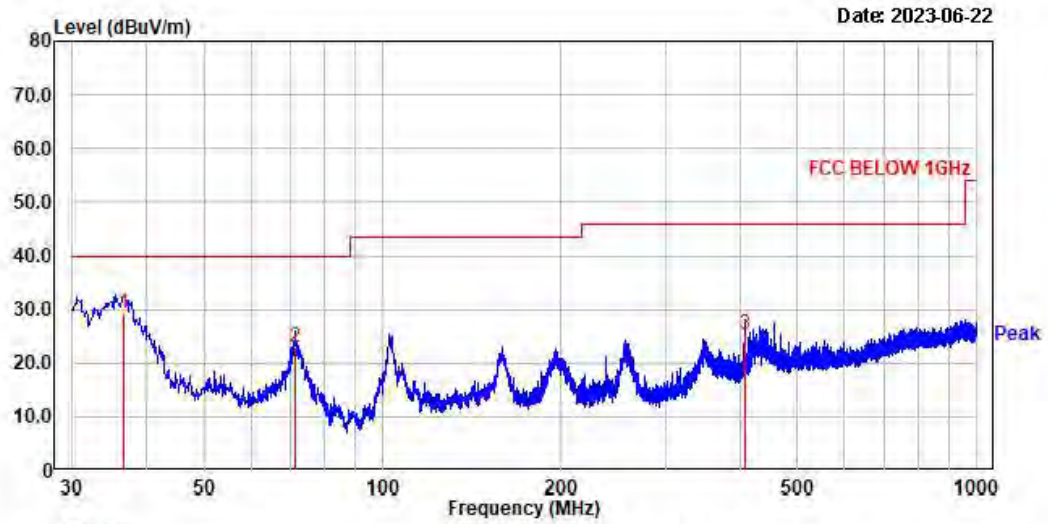
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
1.	29668.25	21.25	------	22.87	44.12	------	74.00	------	29.88	------	100	0	vertical
2.	34987.00	20.80	------	23.73	44.53	------	74.00	------	29.47	------	100	319	vertical
3.	39428.00	25.51	------	24.63	50.14	------	74.00	------	23.86	------	100	356	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

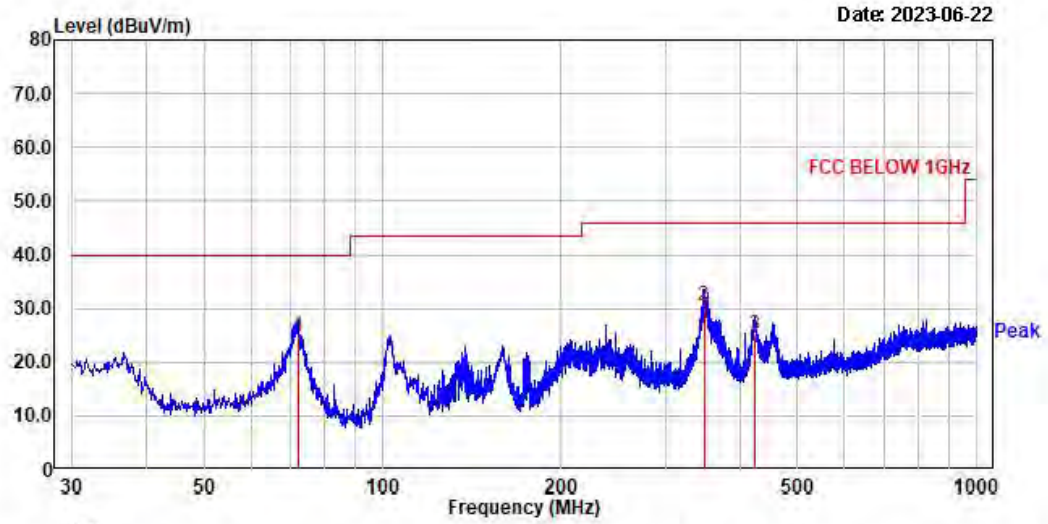
Radiated Emissions –802.11 b mode



Trace:

No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	36.67	43.30	-13.87	29.43	40.00	10.57	------	------	horizontal
2.	71.35	37.80	-14.83	22.97	40.00	17.03	------	------	horizontal
3.	408.06	32.85	-7.41	25.44	46.00	20.56	------	------	horizontal

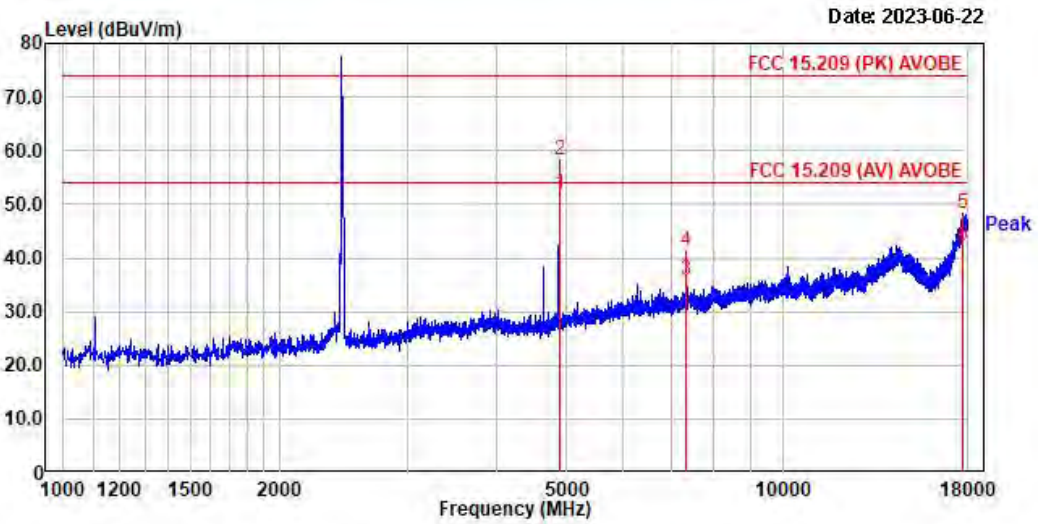
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



Trace:

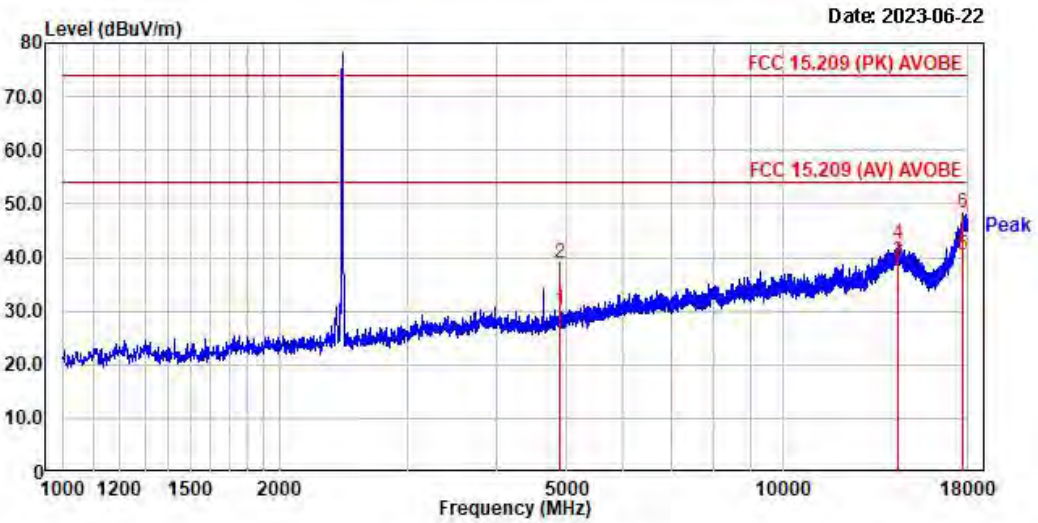
No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	71.95	39.90	-15.05	24.85	40.00	15.15	------	------	vertical
2.	347.68	39.60	-9.02	30.58	46.00	15.42	------	------	vertical
3.	423.09	32.19	-7.15	25.04	46.00	20.96	------	------	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



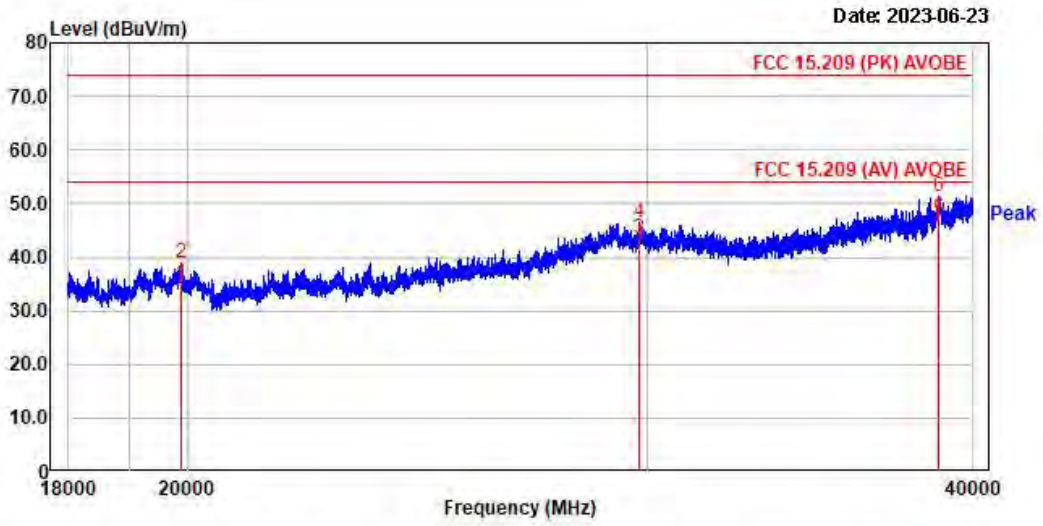
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4882.38	54.62	48.01	3.78	58.40	51.79	74.00	54.00	15.60	2.21	100	287	horizontal
4.	7324.00	32.83	27.30	8.62	41.45	35.92	74.00	54.00	32.55	18.08	100	287	horizontal
5.	17700.38	24.36	------	23.87	48.23	------	74.00	------	25.77	------	100	124	horizontal
6.	17700.38	------	18.40	23.87	------	42.27	------	54.00	------	11.73	100	124	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



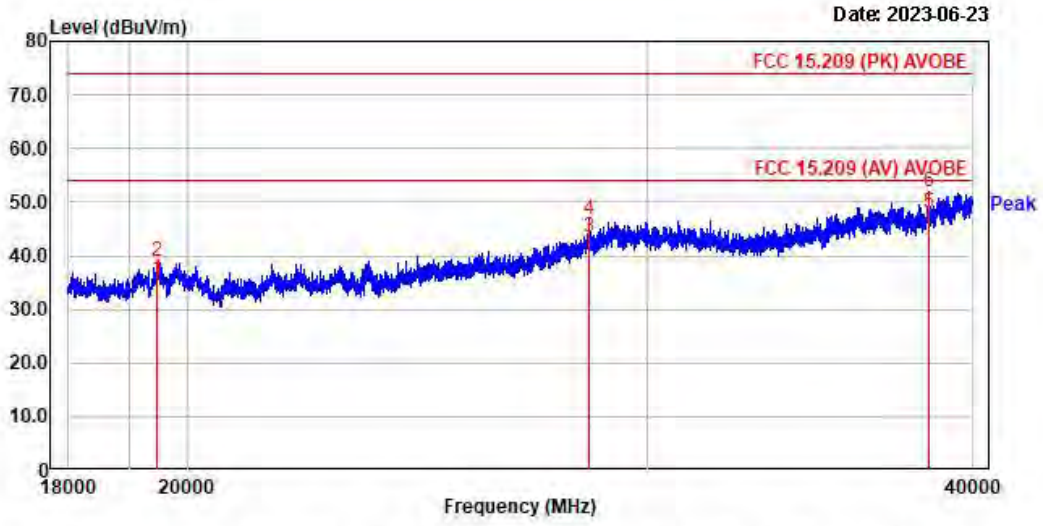
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4882.38	35.85	26.41	3.78	38.83	30.19	74.00	54.00	35.17	23.81	100	360	vertical
4.	14451.25	23.53	20.31	18.90	42.43	39.21	74.00	54.00	31.57	14.79	100	47	vertical
6.	17728.00	24.26	16.30	24.04	48.30	40.34	74.00	54.00	25.70	13.66	100	47	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	19881.00	24.11	20.29	14.75	38.86	35.04	74.00	54.00	35.14	18.96	100	360	horizontal
4.	29822.25	22.56	19.40	24.01	46.57	43.41	74.00	54.00	27.43	10.59	100	360	horizontal
6.	38850.50	26.78	22.70	24.51	51.29	47.21	74.00	54.00	22.71	6.79	100	300	horizontal

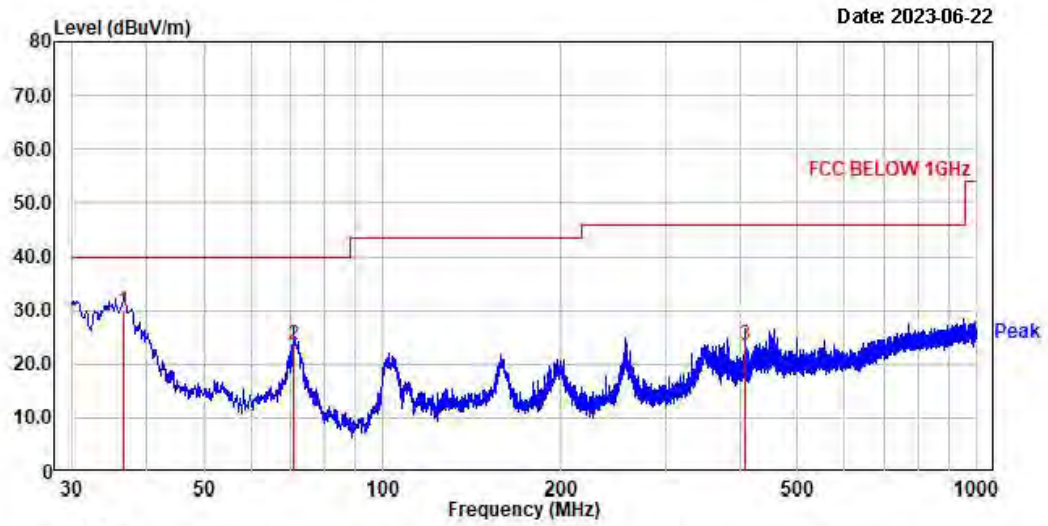
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	19465.75	23.90	20.60	14.91	38.81	35.51	74.00	54.00	35.19	18.49	100	248	vertical
4.	28510.50	23.14	20.10	23.51	46.65	43.61	74.00	54.00	27.35	10.39	100	0	vertical
6.	38490.25	27.62	23.70	24.29	51.91	47.99	74.00	54.00	22.09	6.01	100	105	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

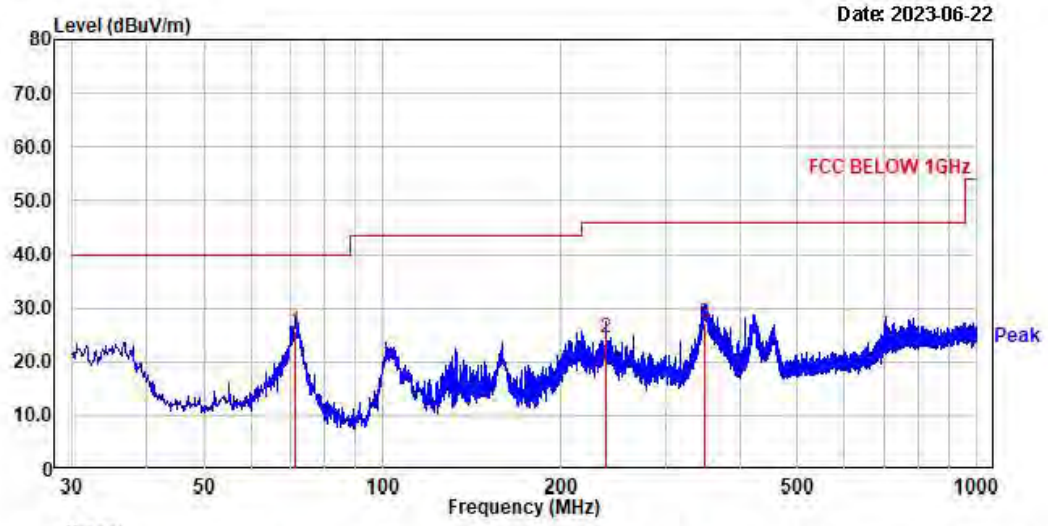
Radiated Emissions –802.11 g mode



Trace:

No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	36.67	43.90	-13.87	30.03	40.00	9.97	------	------	horizontal
2.	70.86	38.40	-14.74	23.66	40.00	16.34	------	------	horizontal
3.	408.06	31.00	-7.41	23.59	46.00	22.41	------	------	horizontal

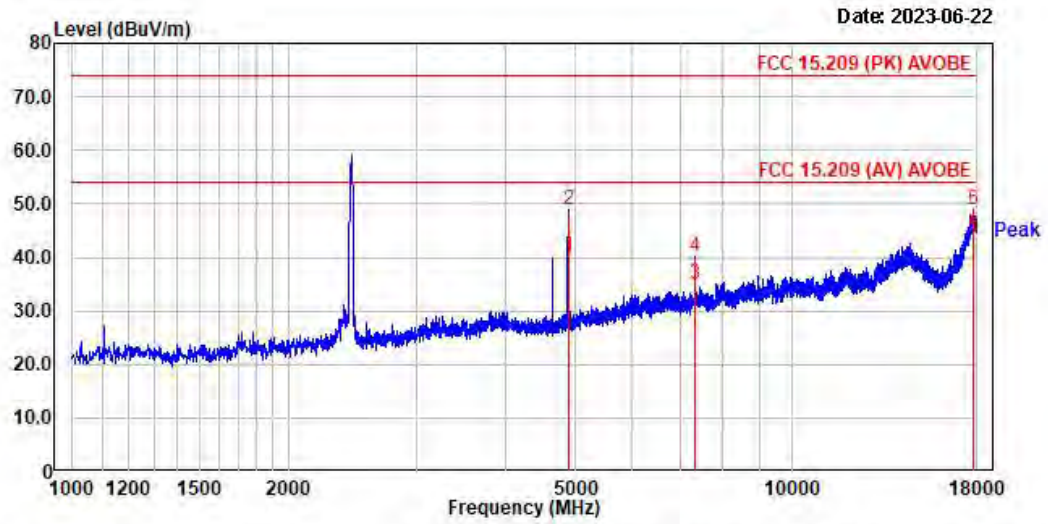
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



Trace:

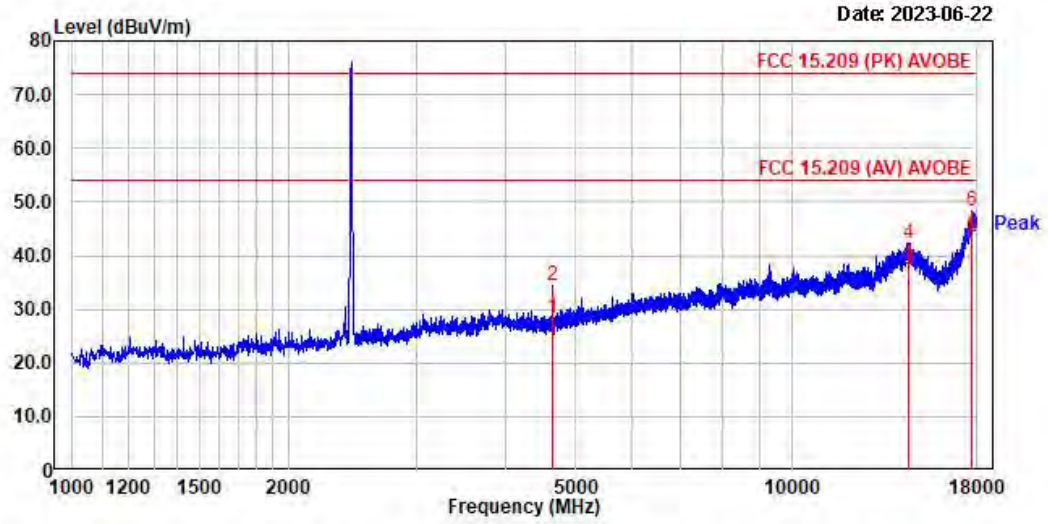
No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	71.35	40.59	-14.99	25.60	40.00	14.40	------	------	vertical
2.	237.94	37.21	-12.80	24.41	46.00	21.59	------	------	vertical
3.	348.65	36.20	-9.03	27.17	46.00	18.83	------	------	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



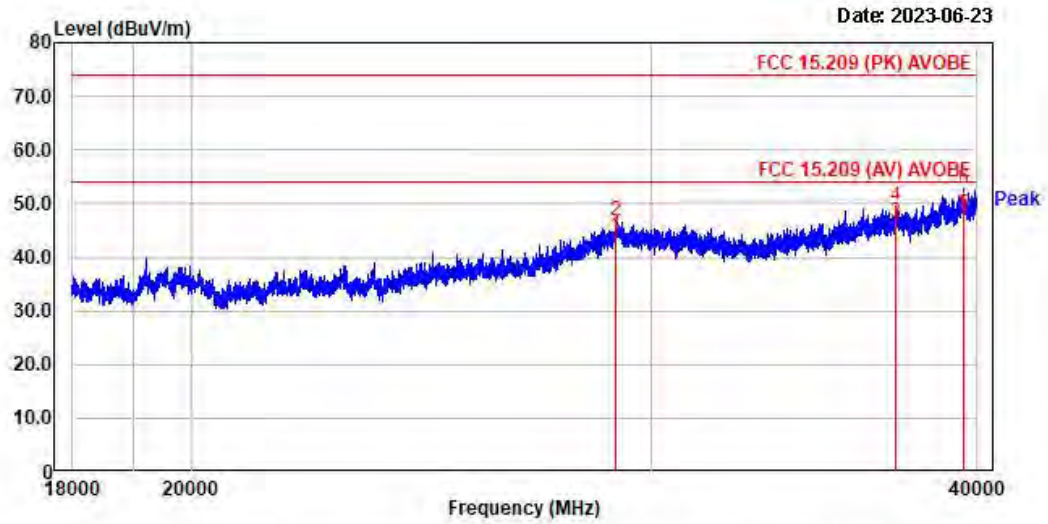
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4884.50	45.13	36.19	3.81	48.94	40.00	74.00	54.00	25.06	14.00	100	266	horizontal
4.	7332.50	31.52	26.39	8.68	40.20	35.07	74.00	54.00	33.80	18.93	100	266	horizontal
6.	17796.00	24.67	19.80	24.38	49.05	44.18	74.00	54.00	24.95	9.82	100	360	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



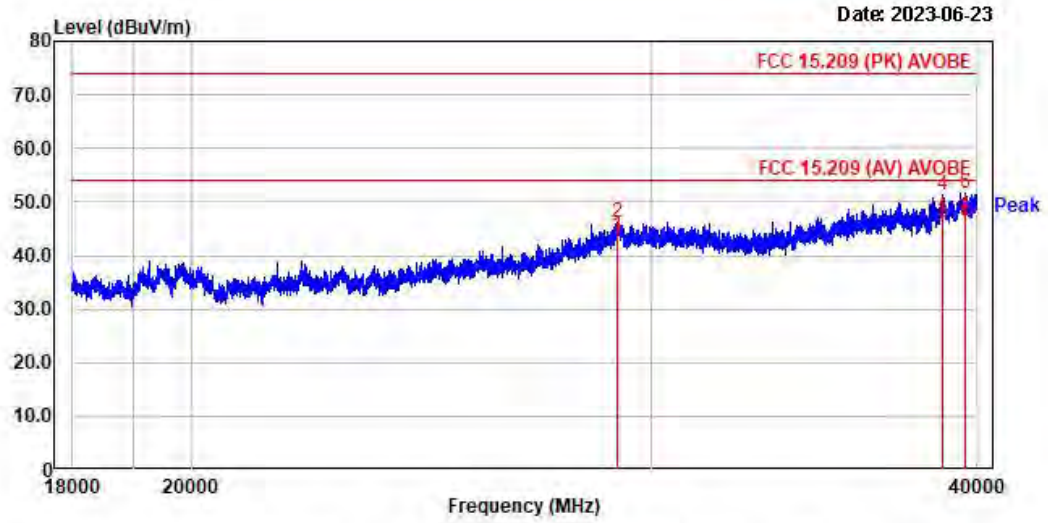
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4652.88	31.56	25.68	2.75	34.31	28.35	74.00	54.00	39.69	25.65	100	102	vertical
4.	14510.75	23.40	18.40	18.95	42.35	37.35	74.00	54.00	31.65	16.65	100	70	vertical
6.	17736.50	24.87	19.51	24.09	48.16	43.60	74.00	54.00	25.84	10.40	100	185	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	29090.75	22.11	19.40	24.67	46.78	44.07	74.00	54.00	27.22	9.93	100	30	horizontal
4.	37263.75	24.78	21.80	24.80	49.58	46.60	74.00	54.00	24.42	7.40	100	286	horizontal
5.	39571.00	26.54	21.90	26.22	52.76	48.12	74.00	54.00	21.24	5.88	100	126	horizontal

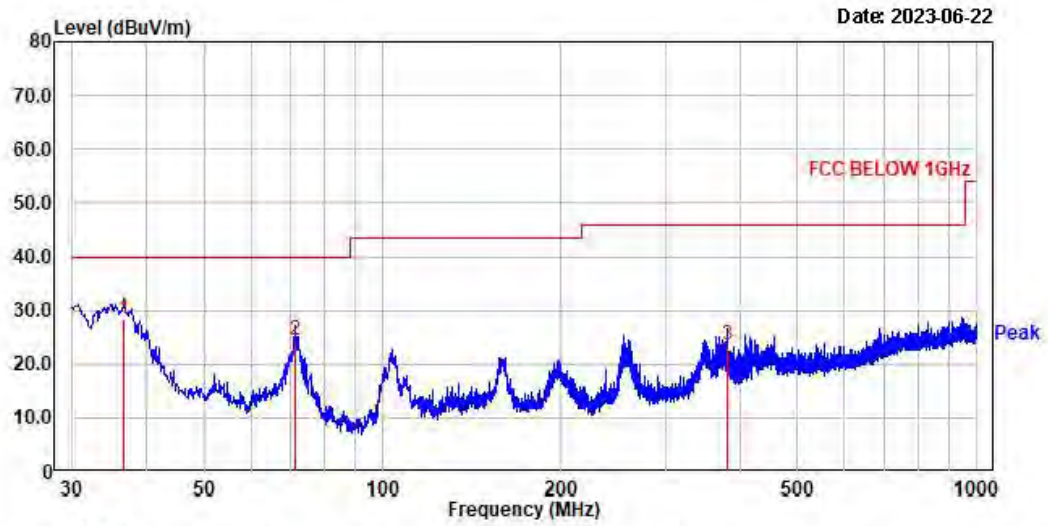
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	29148.50	21.89	19.50	24.24	46.13	43.74	74.00	54.00	27.87	10.26	100	360	vertical
4.	38836.75	26.78	21.48	24.64	51.42	46.04	74.00	54.00	22.58	7.96	100	283	vertical
5.	39637.00	25.20	20.00	26.41	51.61	46.41	74.00	54.00	22.39	7.59	100	266	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

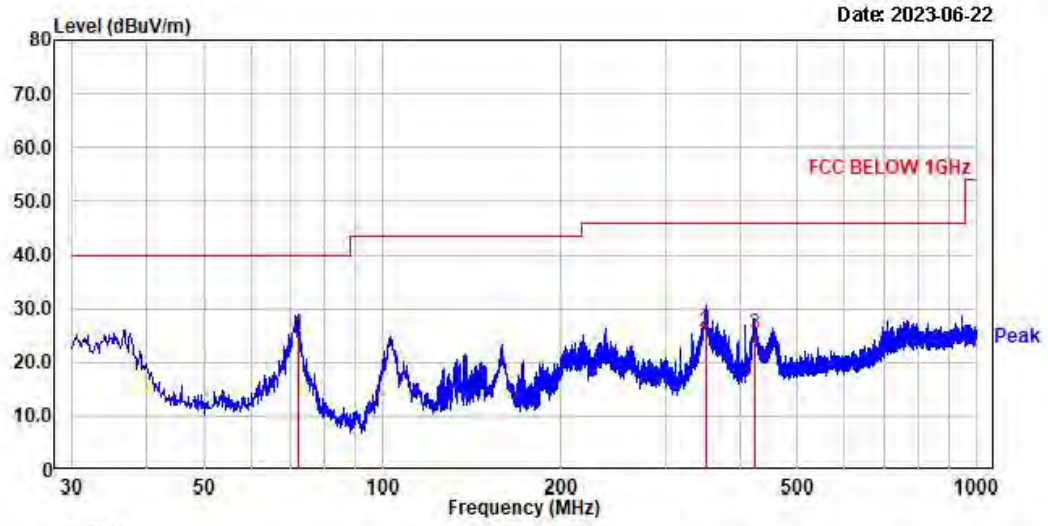
Radiated Emissions –802.11 n20 mode



Trace:

No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	36.67	42.10	-13.87	28.23	40.00	11.77	------	------	horizontal
2.	71.35	39.20	-14.83	24.37	40.00	15.63	------	------	horizontal
3.	379.93	31.40	-7.80	23.60	46.00	22.40	------	------	horizontal

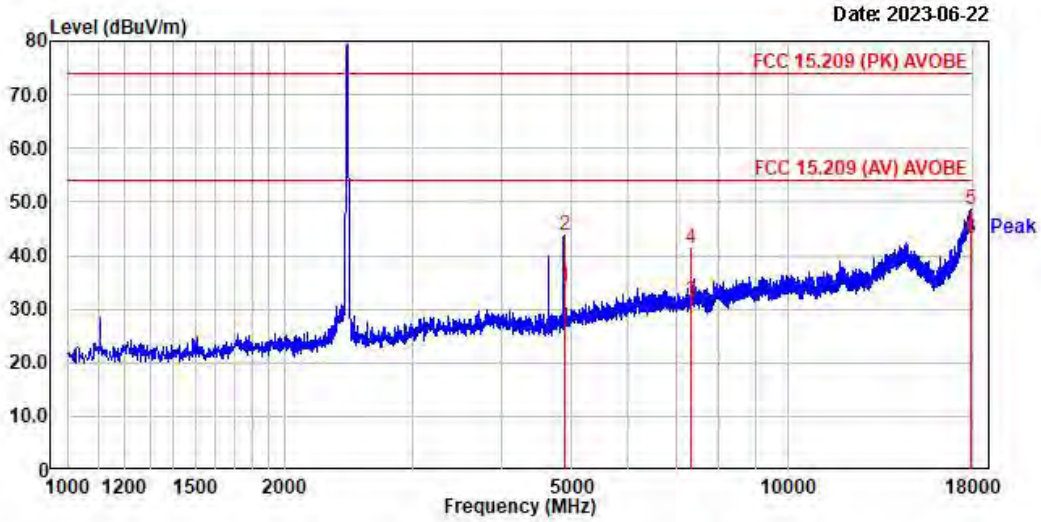
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



Trace:

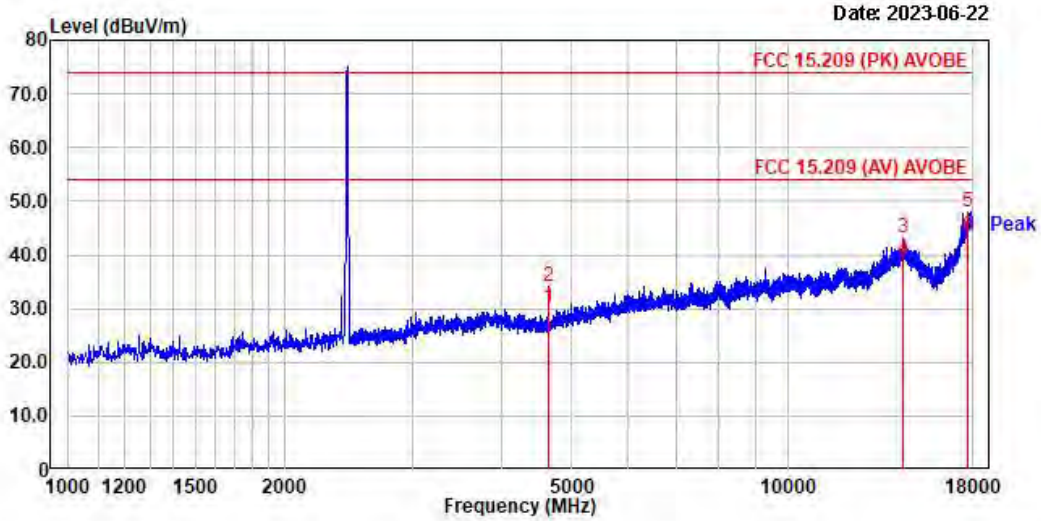
No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	71.95	40.20	-15.05	25.15	40.00	14.85	------	------	vertical
2.	349.86	34.81	-9.06	25.75	46.00	20.25	------	------	vertical
3.	424.06	32.61	-7.11	25.50	46.00	20.50	------	------	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



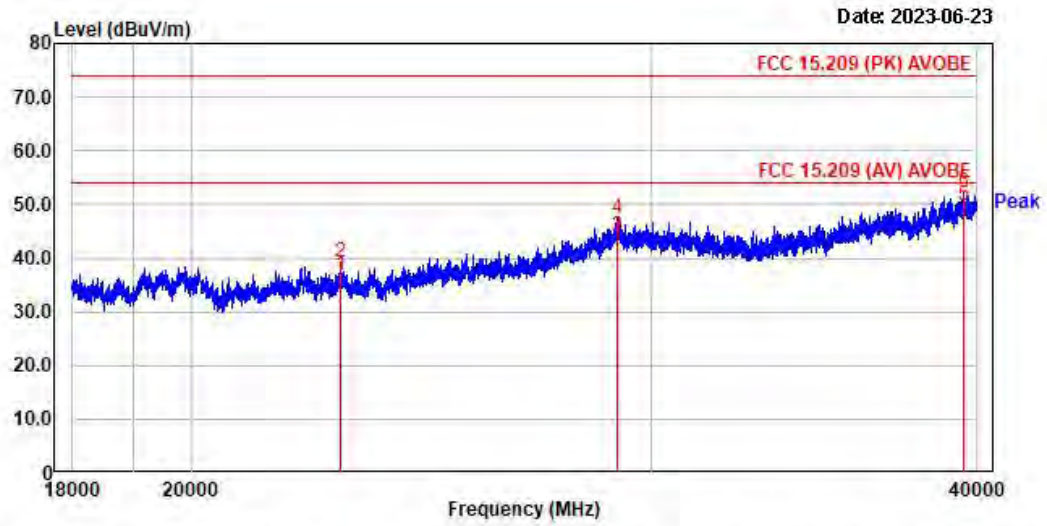
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4882.38	39.94	30.41	3.78	43.72	34.19	74.00	54.00	30.28	19.81	100	263	horizontal
4.	7326.13	32.78	22.88	8.63	41.33	31.43	74.00	54.00	32.67	22.57	100	263	horizontal
5.	17908.63	23.97	------	24.60	48.57	------	74.00	------	25.43	------	100	155	horizontal
6.	17908.63	------	18.70	24.60	------	43.30	------	54.00	------	10.70	100	155	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



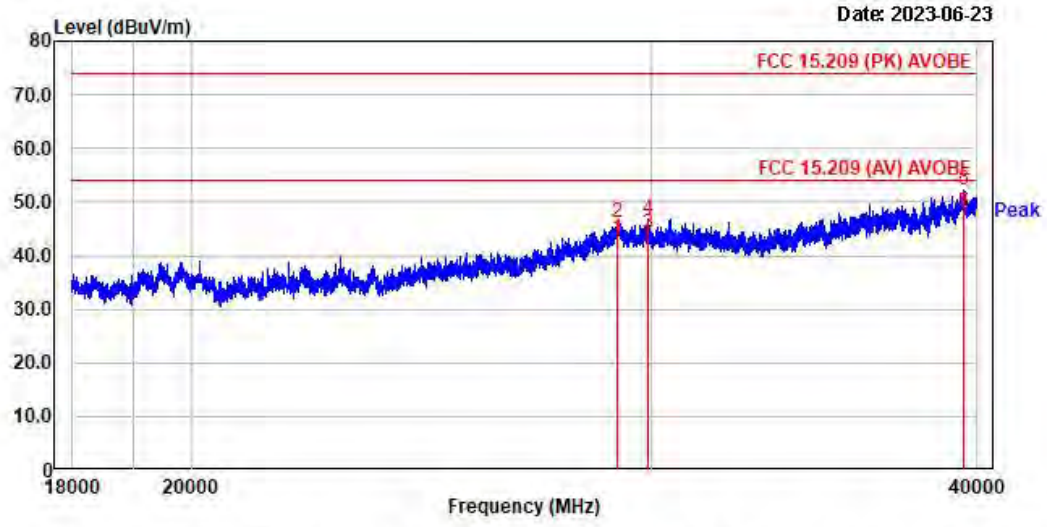
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4652.88	31.43	27.30	2.75	34.18	30.05	74.00	54.00	39.82	23.95	100	108	vertical
3.	14393.88	24.42	------	18.78	43.20	------	74.00	------	30.80	------	100	331	vertical
4.	14393.88	------	20.60	18.78	------	39.38	------	54.00	------	14.62	100	331	vertical
5.	17713.13	23.97	------	23.95	47.92	------	74.00	------	26.08	------	100	173	vertical
6.	17713.13	------	19.50	23.95	------	43.45	------	54.00	------	10.55	100	173	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	22815.25	22.81	20.59	16.33	39.14	36.92	74.00	54.00	34.86	17.08	100	360	horizontal
4.	29137.50	22.84	19.41	24.64	47.48	44.05	74.00	54.00	26.52	9.95	100	224	horizontal
6.	39573.75	26.11	23.50	26.22	52.33	49.72	74.00	54.00	21.67	4.28	100	360	horizontal

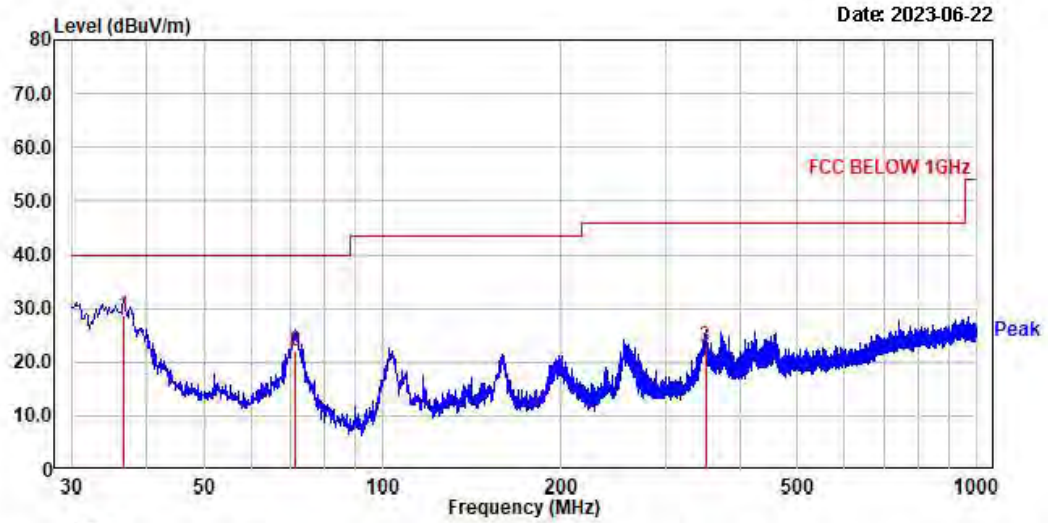
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	29134.75	22.89	19.00	24.25	46.34	43.25	74.00	54.00	27.66	10.75	100	347	vertical
4.	29929.50	22.91	20.10	23.87	46.78	43.97	74.00	54.00	27.22	10.03	100	2	vertical
6.	39562.75	25.87	21.60	26.45	52.32	48.05	74.00	54.00	21.68	5.95	100	9	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

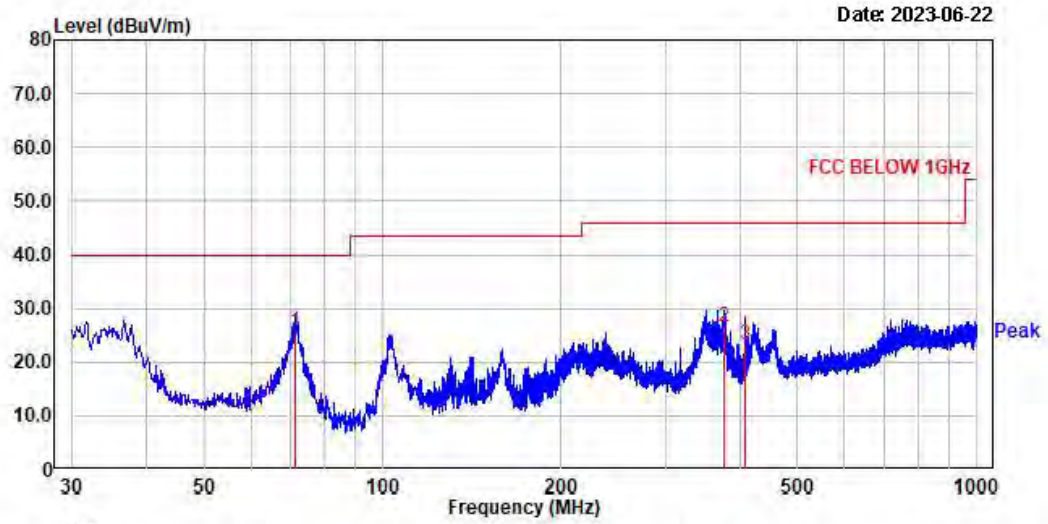
Radiated Emissions –802.11 n40 mode



Trace:

No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	36.55	42.69	-13.89	28.80	40.00	11.20	------	------	horizontal
2.	71.35	37.00	-14.83	22.17	40.00	17.83	------	------	horizontal
3.	349.86	31.80	-8.76	23.04	46.00	22.96	------	------	horizontal

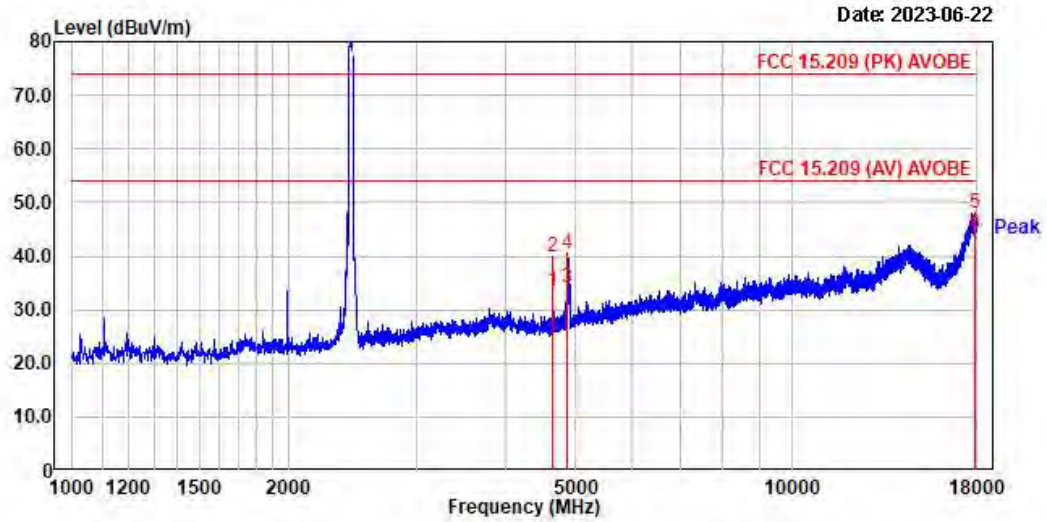
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



Trace:

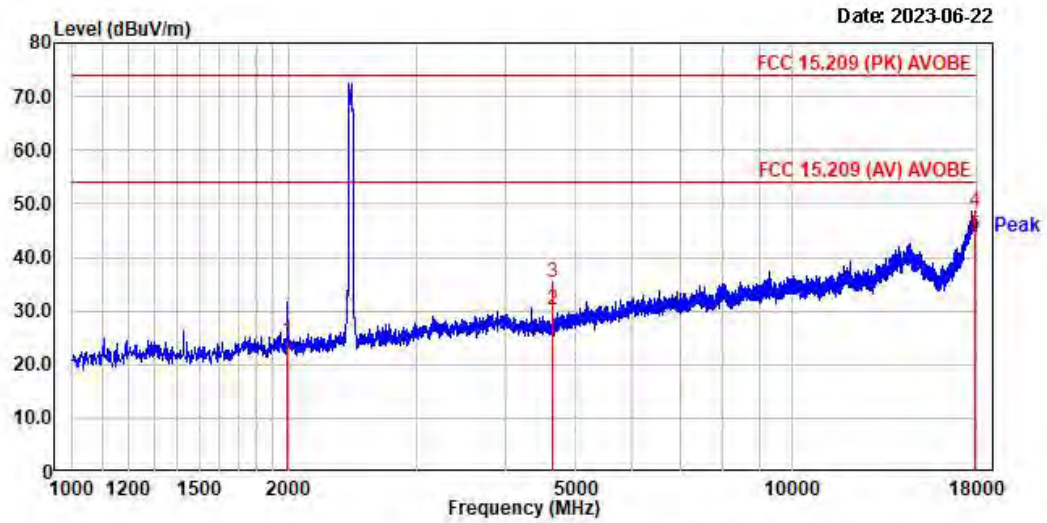
No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	71.35	40.59	-14.99	25.60	40.00	14.40	------	------	vertical
2.	375.32	34.69	-8.08	26.61	46.00	19.39	------	------	vertical
3.	408.06	31.00	-7.61	23.39	46.00	22.61	------	------	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



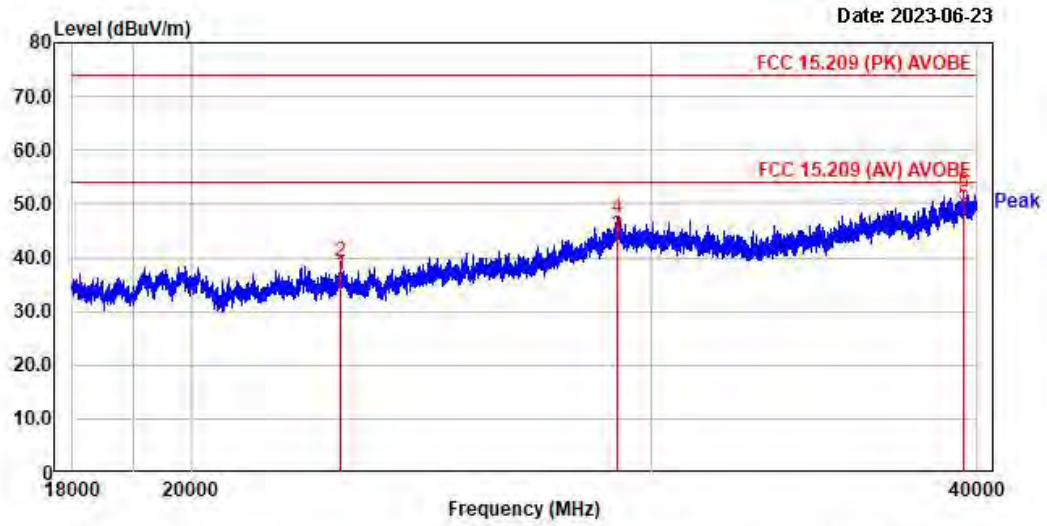
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	4652.88	36.97	30.70	2.75	39.72	33.45	74.00	54.00	34.28	20.55	100	330	horizontal
4.	4871.75	36.70	30.40	3.75	40.45	34.15	74.00	54.00	33.55	19.85	100	264	horizontal
5.	17900.13	23.40	------	24.62	48.02	------	74.00	------	25.98	------	100	170	horizontal
6.	17900.13	------	19.40	24.62	------	44.02	------	54.00	------	9.98	100	170	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



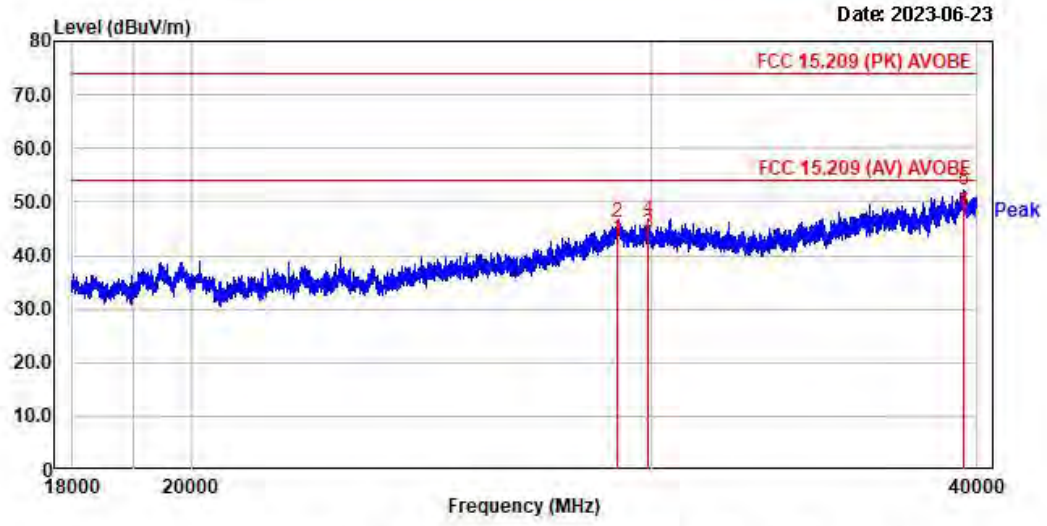
No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
1.	1992.38	------	30.41	-5.97	------	24.44	------	54.00	------	29.56	100	104	vertical
3.	4652.88	32.65	27.40	2.75	35.40	30.15	74.00	54.00	38.60	23.85	100	183	vertical
4.	17895.88	24.13	------	24.60	48.73	------	74.00	------	25.27	------	100	59	vertical
5.	17895.88	------	19.61	24.60	------	44.21	------	54.00	------	9.79	100	59	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	22815.25	22.81	20.59	16.33	39.14	36.92	74.00	54.00	34.86	17.08	100	360	horizontal
4.	29137.50	22.84	19.41	24.64	47.48	44.05	74.00	54.00	26.52	9.95	100	224	horizontal
6.	39573.75	26.11	23.50	26.22	52.33	49.72	74.00	54.00	21.67	4.28	100	360	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



No.	Freq	RD PK	RD AV	C.F	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Polarity
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	cm	deg	
2.	29134.75	22.09	19.00	24.25	46.34	43.25	74.00	54.00	27.66	10.75	100	347	vertical
4.	29929.50	22.91	20.18	23.87	46.78	43.97	74.00	54.00	27.22	10.03	100	2	vertical
6.	39562.75	25.87	21.60	26.45	52.32	48.05	74.00	54.00	21.68	5.95	100	0	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

3.2.7 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Minimum Standard: FCC Part 15.207(a) / EN 55022

Measurement Data: N/A

Class B

Frequency Range	quasi-peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Use	Description	Model No.	Serial No.	Manufacturer	Interval	Next Cal. Date
1		Signal Analyzer (9 kHz ~ 30 GHz)	FSV30	100757	R&S	1 year	2023-08-30
2	■	Signal Generator (~3.2 GHz)	8648C	3623A02597	HP	1 year	2024-03-14
3		SYNTHESIZED CW GENERATOR	83711B	US34490456	HP	1 year	2024-03-14
4	■	Double Ridge Horn Antenna	3116B	133350	ETS	1 year	2024-04-03
5	■	AMPLIFIER	PAM-840A	461314	COM-POWER CORPORATION	2 year	2024-03-15
6	■	EMI Test Receiver (~7 GHz)	ESCI7	100722	R&S	1 year	2023-08-30
7		RF Amplifier (~1.3 GHz)	8447D OPT 010	2944A07684	HP	1 year	2023-08-30
8		RF Amplifier (1~26.5 GHz)	8449B	3008A02126	HP	1 year	2024-03-14
9	■	Horn Antenna (1~18 GHz)	3115	00114105	ETS	2 year	2023-08-30
10		DRG Horn (Small)	3116B	81109	ETS-Lindgren	2 year	2024-03-18
11		DRG Horn (Small)	3116B	133350	ETS-Lindgren	2 year	2024-03-18
12	■	TRILOG Antenna	VULB 9160	9160-3237	SCHWARZBECK	2 year	2024-03-14
13		Temp.Humidity Data Logger	SK-L200TH II A	00801	SATO	1 year	2024-03-14
14		Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
15	■	DC Power Supply	6674A	3637A01657	Agilent	-	-
17	■	Power Meter	EPM-441A	GB32481702	HP	1 year	2024-03-14
18	■	Power Sensor	8481A	3318A94972	HP	1 year	2023-08-30
19		Audio Analyzer	8903B	3729A18901	HP	1 year	2023-08-30
20		Moduleation Analyzer	8901B	3749A05878	HP	1 year	2023-08-30
21		TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2023-08-30
22		Stop Watch	HS-3	812Q08R	CASIO	2 year	2026-03-14
23		LISN	KNW-407	8-1430-1	Kyoritsu	1 year	2024-03-14
24		Two-Lime V-Network	ESH3-Z5	893045/017	R&S	1 year	2024-03-14
25		UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	1 year	2024-03-14
26		Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	1 year	2024-03-14
27		Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	1 year	2024-03-14
28		OSP120 BASE UNIT	OSP120	101230	R&S	1 year	2024-03-14
29		Signal Generator(100 kHz ~ 40 GHz)	SMB100A03	177621	R&S	1 year	2024-03-14
30	■	Signal Analyzer (10 Hz ~ 40 GHz)	FSV40	101367	R&S	1 year	2024-03-14
31	■	Active Loop Antenna	FMZB 1519	1519-031	SCHWARZBECK	2 year	2024-03-16