TEST REPORT
On behalf of

Savant Technologies LLC, dba GE Lighting, a Savant company

Product Name: Downlight

Model No.: CFIXRSCR6CRVD@

FCC ID: PUU-CFIXRSCR6CRVD

Prepared For: Savant Technologies LLC, dba GE Lighting, a Savant company
1975 Noble Road, Cleveland, OH 44112

Prepared By: Audix Technology (Shanghai) Co., Ltd.
3F, Building 34, No. 680 Guiping Rd.,
Caohejing, Hi-Tech Park,
Shanghai 200233, China

Tel: +86-21-64955500

TESTING
NVLAP LAB CODE 200371-0

File No. : C1D2304053
Report No. : ACI-F23123
Date of Test : 2023.04.28-05.17
Date of Report : 2023.05.19

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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TEST REPORT

Applicant	:	Savant Technologies LLC, dba GE Lighting, a Savant company
EUT Description	:	Downlight
(A) Model No.	:	Refer to Sec.2.1
(B) Power Supply	:	120V AC 60Hz
(C) Test Voltage	:	120V/60Hz

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C
AND ANSI C63.10-2013

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

The test results for EUT's BLE function are contained in No.ACI-F23121 report.

Date of Test : 2023.04.28-05.17 Date of Report : 2023.05.19

Producer : _____
JAREY LU / Deputy Assistant Manager

Review : _____
BYRON WU / Deputy Assistant Manager

AUDIX® For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : _____
Authorized Signature(s) KAMP CHEN / Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.207
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.209(a) 15.205(a)(c)
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(2)
Maximum Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(b)(3)
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(e)
Antenna Requirement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.203
N/A is an abbreviation for Not Applicable.			

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description	:	Downlight
Type of EUT	:	☑ Production ☐ Pre-product ☐ Pro-type
Model Number	:	CFIXRSCR6CRVD@
Note	:	@ Can be represented by any letters, numbers, or symbols, which means CRI, CCT, product color, packaging, or internal identification.
Test Model	:	CFIXRSCR6CRVD
Radio Tech	:	BLE 4.2; IEEE 802.11 b/g/n.
Channel Freq.	:	BLE: 2402MHz-2480MHz; 802.11b/g/n20: 2412MHz-2462MHz;
Modulation	:	BLE: GFSK; 802.11b: DSSS (CCK, DQPSK, DBPSK); 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK).
Antenna Info.	:	Antenna Type: PCB Antenna Antenna Gain: 0.5 dBi
Applicant	:	Savant Technologies LLC, dba GE Lighting, a Savant company 1975 Noble Road, Cleveland, OH 44112
Manufacturer	:	same as Applicant
Factory	:	Foshan Electrical and Lighting Co., Ltd. Gaoming Branch 19 Hengchang road, Fuwan Industrial Zone, Hecheng Street, Gaoming District, Foshan, China

2.2 EUT Specifications Assessed in Current Report

Mode	Modulation	Data Rate(Mbps)
802.11b	DS (DQPSK, DBPSK, CCK)	Up to 11
802.11g	OFDM (64-QAM, 16-QAM, QPSK, BPSK)	Up to 54
802.11n-HT 20	OFDM (64-QAM, 16-QAM, QPSK, BPSK)	Up to 72.2

Channel List			
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

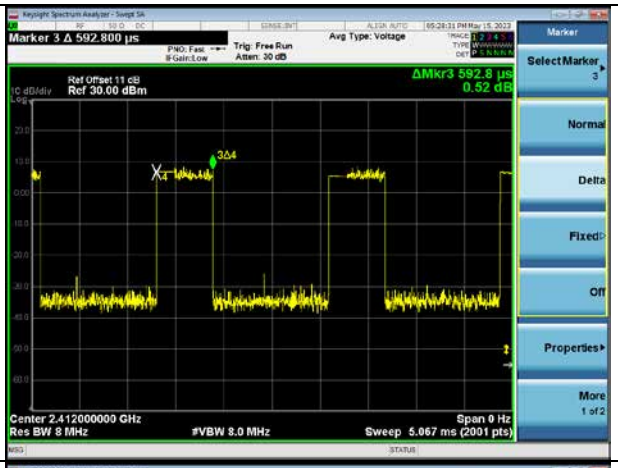
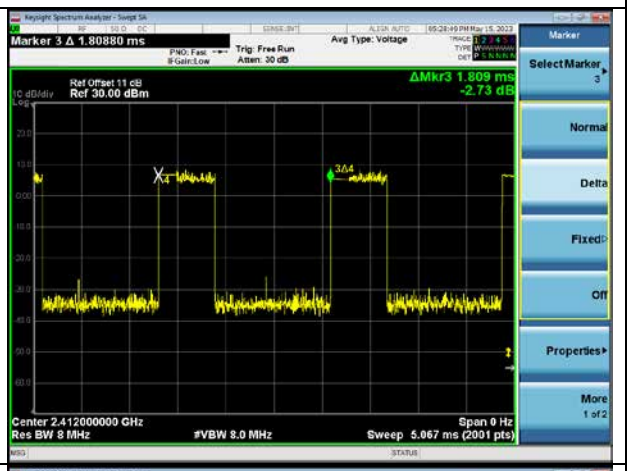
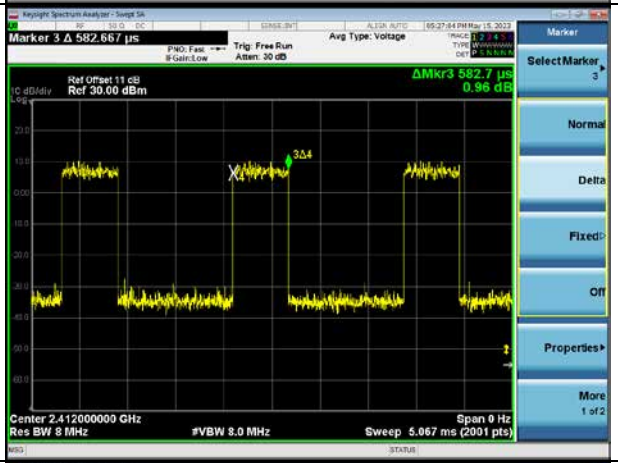
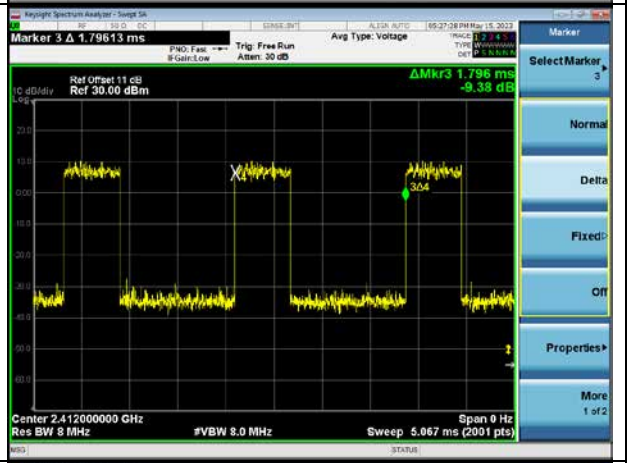
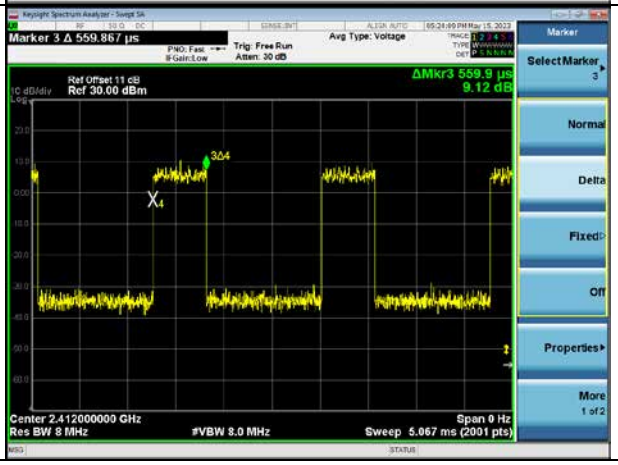
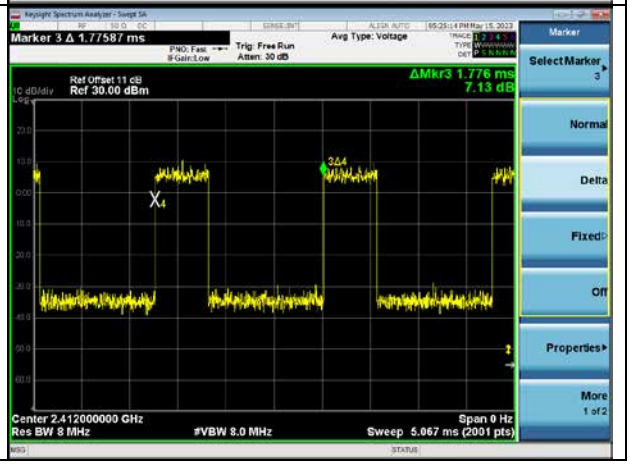
2.3 Test Information

The test software “sscom5.13.1.exe” was used to control EUT work in TX mode, Power Index and select test channel.

Mode	data rate (Mbps)	Attenuator Setting	Test Channel		Frequency (MHz)
802.11b	11	24	Low:	1	2412
		24	Middle:	6	2437
		24	High:	11	2462
802.11g	6	12	Low:	1	2412
		12	Middle:	6	2437
		12	High:	11	2462
802.11n20	MCS0	12	Low:	1	2412
		12	Middle:	6	2437
		12	High:	11	2462

2.4 Duty Cycle Check

Mode	Transmission Duration (ms)	Transmission Period (ms)	Duty Cycle (%)	Duty Cycle Correct Factor
802.11b	0.5928	1.809	32.77	4.85
802.11g	0.5827	1.796	32.44	4.89
802.11n20	0.5599	1.776	31.53	5.01

Mode	Ton	Ton+off
802.11b		
802.11g		
802.11n20		

2.5 Sample Description

Test Item	Model Number	Sample Number	Date of receipted
Conducted Emission	CFIXRSCR6CRVD	E2304369a-01/03	2023.04.20
Radiated Emission	CFIXRSCR6CRVD	E2304369a-02/03	2023.04.20
Conducted RF Test	CFIXRSCR6CRVD	E2304369a-03/03	2023.04.20

2.6 Supported equipment

Brand	:	Acer
Product Name:	:	Notebook PC
Model Name	:	TravelMate P238 series
Model Number	:	N15W8
Product Name	:	Test Fixture
Product Function	:	USB to TTL

2.7 Description of Test Facility

Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3F, Building 34, No. 680 Guiping Rd., Caohejing, Hi-Tech Park, Shanghai 200233, China
Accredited by NVLAP, Lab Code	:	200371-0
FCC Designation Number	:	CN5027
Test Firm Registration Number	:	954668

3 CONDUCTED EMISSION TEST

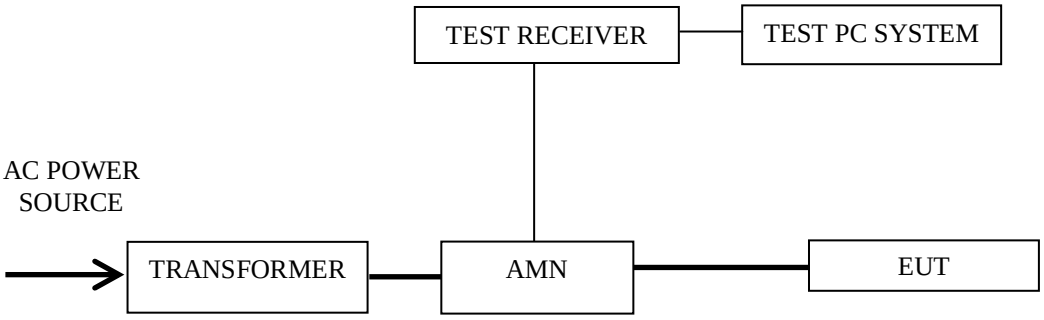
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101302	2023.02.22	1 Year
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	2022.09.23	1 Year
3.	Fixed Attenuator	SHYL	TTS-1	001	2023.02.22	1 Year
4.	50Ω Coaxial Switch	ANRITSU	MP59B	6200655086	2023.02.22	1 Year
5.	Coaxial Cable	HANWEI	RG223/U	KJ09052	2023.02.22	1 Year
6.	Software	Audix	e3	210616	--	--

3.2 Block Diagram of Test Setup

3.2.1 Conducted Disturbance Test Setup



—— : Signal Line
▬ : Power Line

3.3 Conducted Emission Limits (§15.207)

Frequency Range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50
NOTE 1 – The lower limit shall apply at the transition frequencies. NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz		

3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipment.

3.5.3 Turn the EUT on the test mode, and then test.

3.6 Test Procedures

The EUT was placed upon a non-metallic table, which is 0.8 m above the horizontal conducting ground plane and 0.4 m from a vertical reference plane. The EUT was connected to the power mains through an Artificial Mains Network (AMN) to provide a 50 Ω coupling impedance for the measuring equipment. Both sides of AC line (Line & Neutral) were checked to find out the maximum conducted emission according to FCC Part 15 Subpart C and ANSI C63.10: 2013 requirements during conducted disturbance test.

The I.F. bandwidth of Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

Test with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. (According to KDB 174176 D01 Line Conducted FAQ)

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Worst case emission:

No.	Operation	Mode	Channel	Frequency (MHz)	Data Page
1.	Transmitting	802.11b	1	2412	P13-14

NOTE 1 – Emission Level = Read Level + AMN Factor +Aux Factor + Cable Loss Margin = Limits - Emission Level

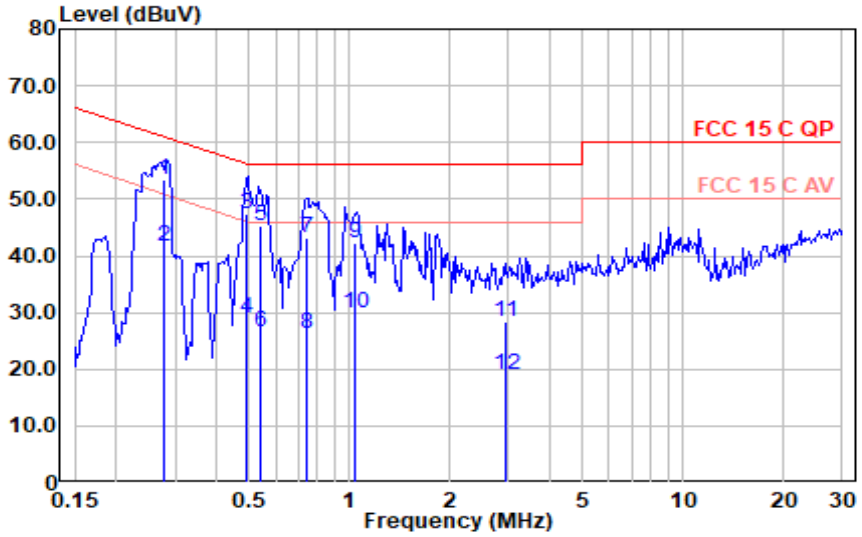
NOTE 2 – "QP" means "Quasi-Peak" values

NOTE 3 – The emission levels which not reported are too low against the official limit.

Worst case emission

Test Date:	2023.04.28	Temp./Hum.:	22℃/51%RH	Test By:	Jarey

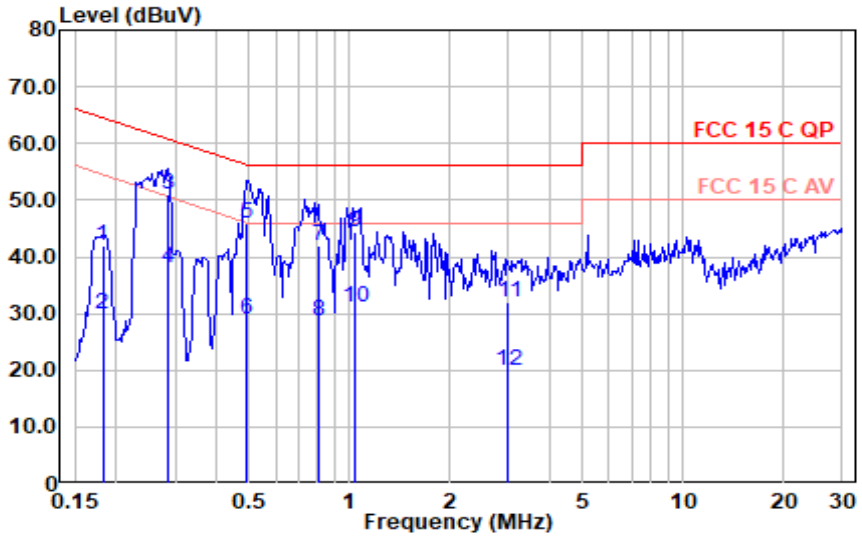
Mode: 802.11b CH2412



Polarization at Line

Frequency (MHz)	Meter Reading dB (μV)	AMN Factor (dB)	Aux Factor (dB)	Cable Loss (dB)	Emission Level dB (μV)	Limits dB (μV)	Margin (dB)	Remark
0.28	43.80	0.10	9.49	0.00	53.39	60.88	7.49	QP
0.28	32.16	0.10	9.49	0.00	41.75	50.88	9.12	Average
0.49	37.64	0.19	9.49	0.00	47.32	56.17	8.84	QP
0.49	19.35	0.19	9.49	0.00	29.03	46.17	17.14	Average
0.54	35.68	0.20	9.49	0.01	45.38	56.00	10.62	QP
0.54	16.78	0.20	9.49	0.01	26.48	46.00	19.52	Average
0.75	33.53	0.20	9.49	0.06	43.28	56.00	12.72	QP
0.75	16.38	0.20	9.49	0.06	26.13	46.00	19.87	Average
1.04	32.57	0.20	9.49	0.10	42.36	56.00	13.64	QP
1.04	20.15	0.20	9.49	0.10	29.94	46.00	16.06	Average
2.94	18.45	0.30	9.49	0.10	28.34	56.00	27.66	QP
2.94	9.01	0.30	9.49	0.10	18.90	46.00	27.10	Average

Mode: 802.11b CH2412



Polarization at Neutral

Frequency (MHz)	Meter Reading dB (μV)	AMN Factor (dB)	Aux Factor (dB)	Cable Loss (dB)	Emission Level dB (μV)	Limits dB (μV)	Margin (dB)	Remark
0.18	32.32	0.10	9.49	0.00	41.91	64.40	22.49	QP
0.18	20.34	0.10	9.49	0.00	29.93	54.40	24.47	Average
0.28	41.54	0.10	9.49	0.00	51.13	60.71	9.57	QP
0.28	28.32	0.10	9.49	0.00	37.91	50.71	12.80	Average
0.49	36.36	0.10	9.49	0.00	45.95	56.12	10.17	QP
0.49	19.33	0.10	9.49	0.00	28.92	46.12	17.20	Average
0.81	32.34	0.10	9.49	0.07	42.00	56.00	14.00	QP
0.81	18.97	0.10	9.49	0.07	28.63	46.00	17.37	Average
1.04	34.57	0.20	9.49	0.10	44.36	56.00	11.64	QP
1.04	21.39	0.20	9.49	0.10	31.18	46.00	14.82	Average
2.99	22.19	0.20	9.49	0.10	31.98	56.00	24.02	QP
2.99	10.07	0.20	9.49	0.10	19.86	46.00	26.14	Average

4 RADIATED EMISSION TEST

4.1 Test Equipment

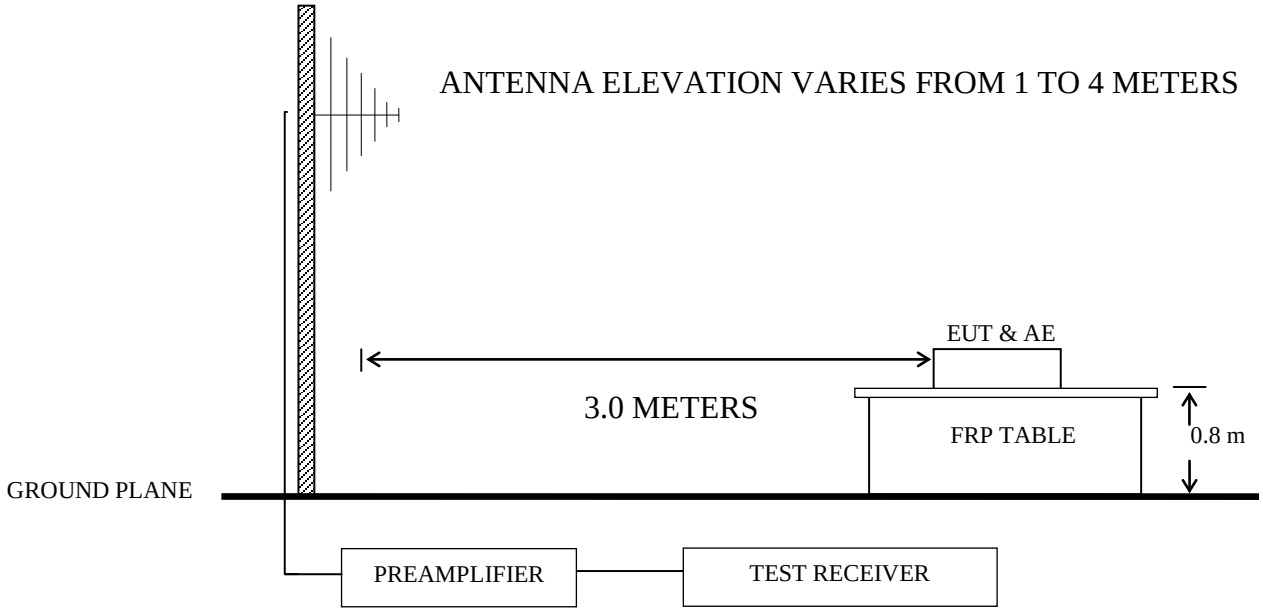
The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Preamplifier	Agilent	8447D	2944A10548	2023.02.22	1 Year
2.	Preamplifier	HP	8449B	3008A00864	2023.02.22	1 Year
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2022.09.15	1 Year
4.	Test Receiver	R&S	ESCI	101303	2023.02.22	1 Year
5.	Bilog Antenna+6dB Attenuator	Schwarz beck	VULB 9168+EMCI-N-6-06	707+AT-N0637	2022.07.25	1 Year
6.	Horn Antenna	EMCO	3115	96074878	2022.07.21	1 Year
7.	Horn Antenna	EMCO	3116	00062643	2023.01.30	2 Year
8.	Cavity Band Rejection Filter	Microwave	WT-A3882-R10	WT200312-1-1	2023.02.22	1 Year
9.	Coaxial Switch	Anritsu	MP59B	6200655086	2023.02.22	1 Year
10.	Coaxial Cable	SCHAFFNER	RG 212U-MIL C 17+N1K50-EW0630-N1K50-15m-1	RE-10m-001/ RE-15m-002	2023.02.22	1 Year
11.	Software	Audix	e3	210616	--	--

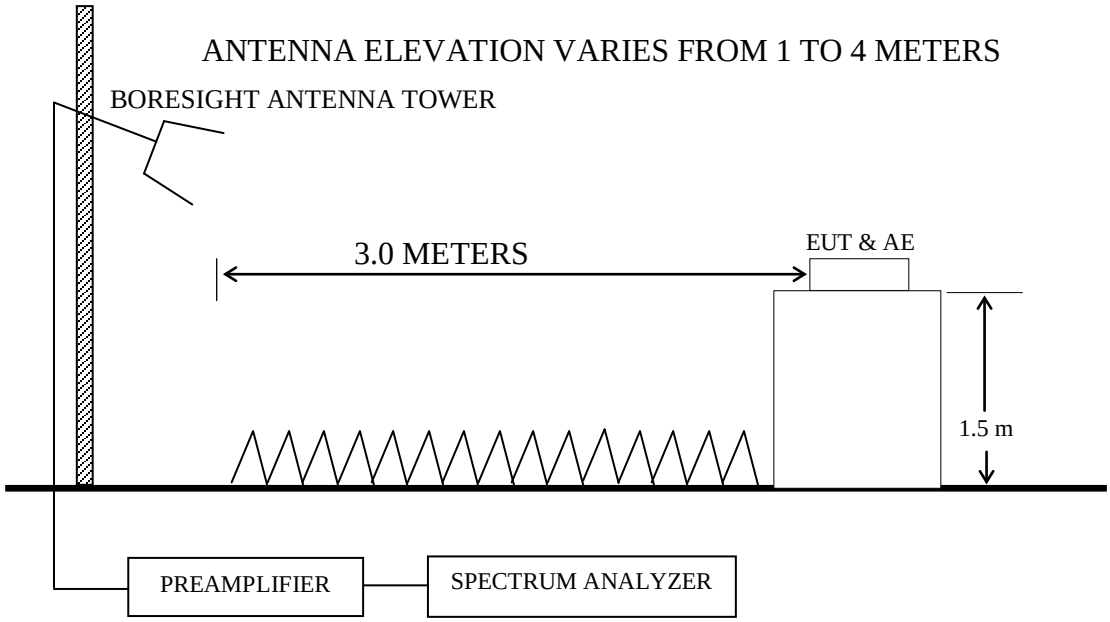
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals

4.2.2 Below 1GHz



4.2.3 Above 1GHz



4.3 Radiated Emission Limit (§15.209)

Frequency (MHz)	Distance (m)	Field strength limits (μV/m)	
		(μV/m)	(μV/m)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB (μV/m) = 20 log Emission Level (μV/m)
NOTE 2 - The tighter limit applies at the band edges.
NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.
NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

4.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

4.5 Operating Condition of EUT

4.5.1 Setup the EUT as shown in Sec. 4.2.

4.5.2 Turn the EUT on.

4.5.3 Connect the EUT and the TTL terminal of Test Fixture through three HCI cables of EUT, as follows (TX to RXD, RX to TXD, GND to GND). Plug the USB terminal of Test Fixture to the USB port of Notebook PC.

4.5.4 Use the software as section 2.3 to select the test mode, then disconnect the Test Fixture from EUT, remove the Test Fixture and Notebook PC, then test.

4.5.5 Repeat step 4.5.3 and 4.5.4, until the test of all modes finished.

4.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable. Below 1 GHz, the table height is 80 cm above the reference ground plane. Above 1 GHz, the table height is 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down

between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of Agilent N9010A was set at 1MHz for above 1GHz.

The frequency range from 30 MHz to 25 GHz (Up to 10^{th} harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.4.7.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Frequency range: below 1GHz (Worst case emission)

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	802.11b	1	2412 MHz	P20-21

Frequency range: above 1GHz

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	802.11b	1	2412 MHz	P22-23
2.			6	2437 MHz	P24-25
3.			11	2462 MHz	P26-27
4.		802.11g	1	2412 MHz	P28-29
5.		802.11n20	1	2412 MHz	P30-31

Band-Edge and Restricted bands:

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	802.11b	1	2412 MHz	P32-33
2.			11	2462 MHz	P34-35
3.		802.11g	1	2412 MHz	P36-37
4.			11	2462 MHz	P38-39
5.		802.11n20	1	2412 MHz	P40-41
6.			11	2462 MHz	P42-43

NOTE 1 – Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin = Limits - Emission Level.

NOTE 2 – "QP" means "Quasi-Peak" values

NOTE 3 – 0°was the table front facing the antenna. Degree is calculated from 0°clockwise facing the antenna.

NOTE 4 – The emission levels which not reported are too low against the official limit.

NOTE 5 – The emission levels recorded below is data of EUT configured in Standing direction, for this direction was the maximum emission direction during the test. The data of Side & Lying direction are too low against the official limit to be reported.

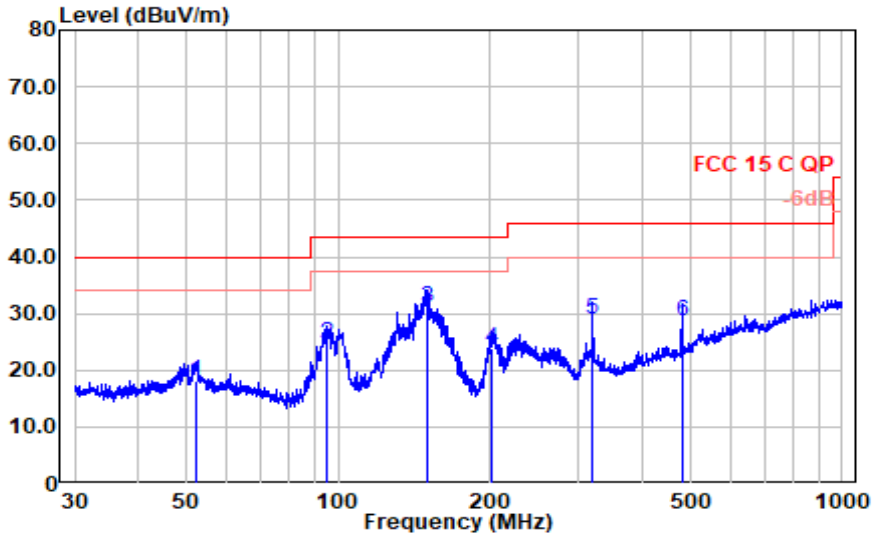
NOTE 6 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.
For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

NOTE 7 – The frequency range 2310-2390MHz & 2483.5-2500MHz were tested for Restricted bands.

Radiated emission < 1GHz

Test Date:	2023.05.14	Temp./Hum.:	22℃/51%RH	Test By:	Jarey

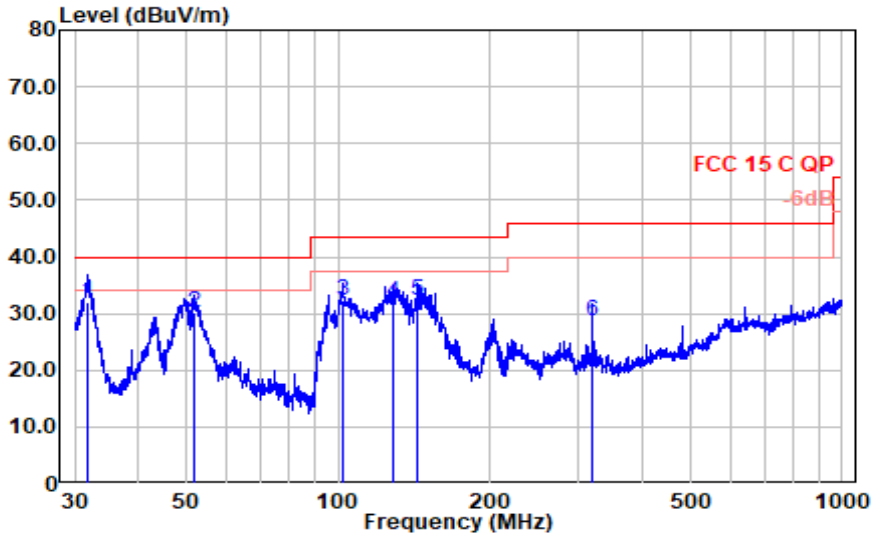
Mode: 802.11b CH2412



Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
52.116	27.70	19.60	0.78	29.89	18.19	40.00	21.81	QP
95.260	39.16	14.32	1.07	29.72	24.83	43.50	18.67	QP
150.802	40.04	19.20	1.30	29.40	31.14	43.50	12.36	QP
201.393	35.35	16.24	1.57	29.29	23.87	43.50	19.63	QP
319.937	35.81	19.90	1.94	28.78	28.87	46.00	17.13	QP
480.528	32.69	23.10	2.40	29.42	28.76	46.00	17.24	QP

Mode: 802.11b CH2412



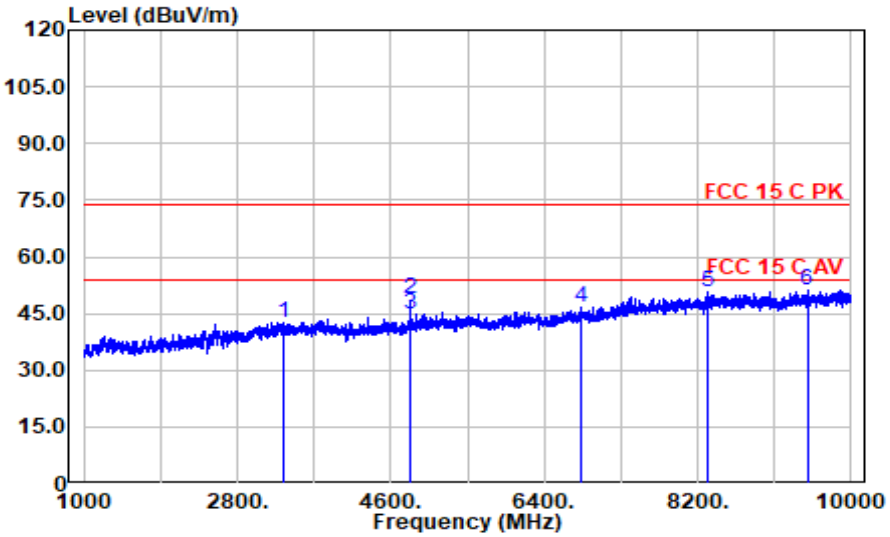
Polarization at Vertical

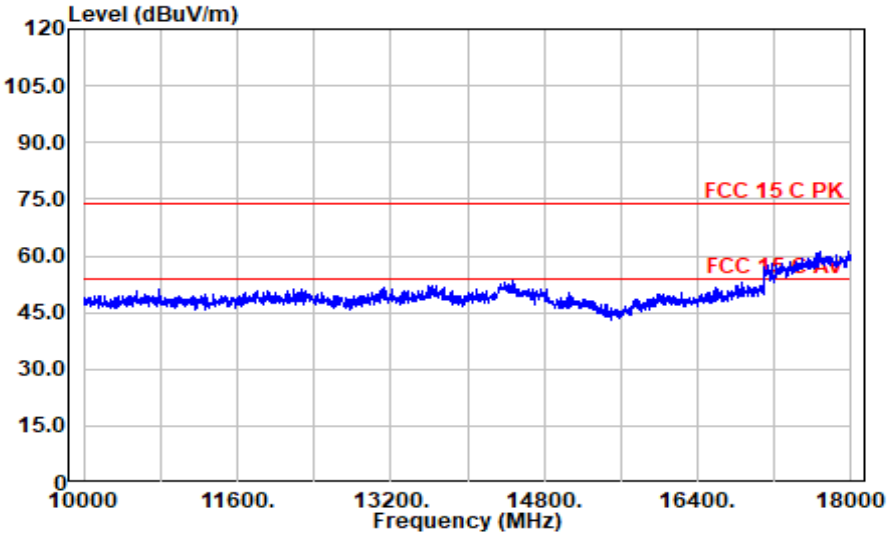
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
31.843	42.51	18.83	0.58	29.90	32.03	40.00	7.97	QP
51.571	39.67	19.60	0.77	29.89	30.15	40.00	9.85	QP
102.180	45.49	15.35	1.11	29.69	32.26	43.50	11.24	QP
128.563	42.52	17.75	1.22	29.54	31.95	43.50	11.55	QP
143.830	41.49	19.10	1.28	29.44	32.44	43.50	11.06	QP
319.937	35.62	19.90	1.94	28.78	28.68	46.00	17.32	QP

Radiated Emission > 1GHz

Test Date:	2023.05.14	Temp./Hum.:	22°C/51%RH	Test By:	Jarey

Mode: 802.11b CH2412

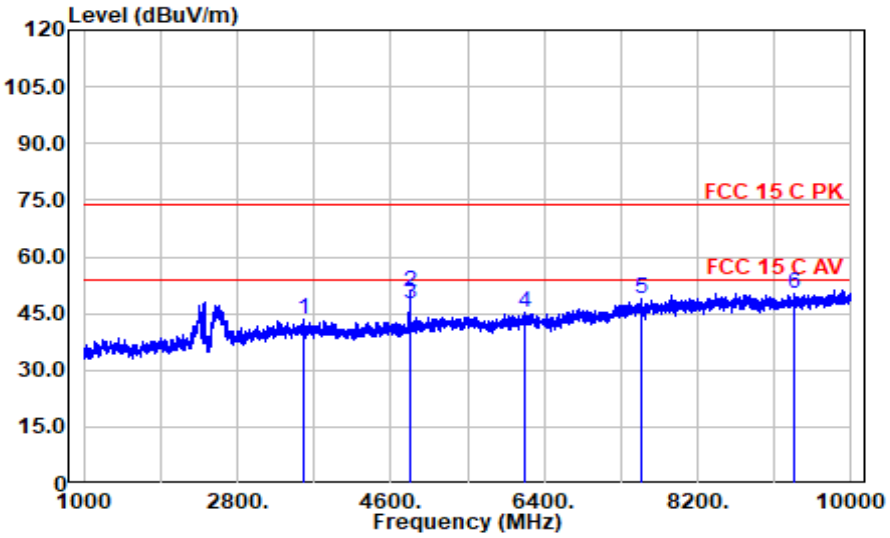


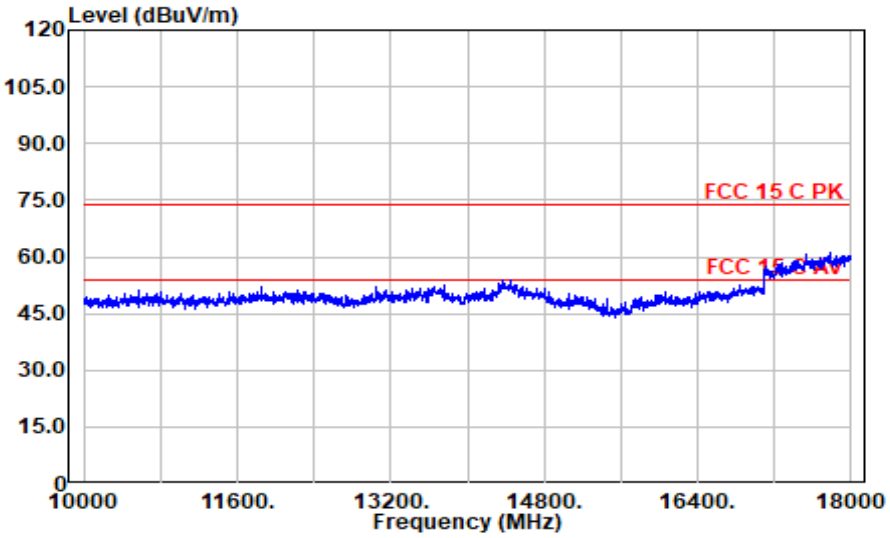


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3353.500	40.67	31.20	6.17	35.25	42.79	74.00	31.21	Peak
4825.000	43.29	32.95	7.55	34.66	49.12	74.00	24.88	Peak
4825.000	39.12	32.95	7.55	34.66	44.96	54.00	9.04	Average
6836.500	36.49	35.57	9.04	34.60	46.50	74.00	27.50	Peak
8312.500	37.24	38.13	10.35	34.83	50.89	74.00	23.11	Peak
9484.750	36.16	38.50	11.06	34.65	51.07	74.00	22.93	Peak

Mode: 802.11b CH2412

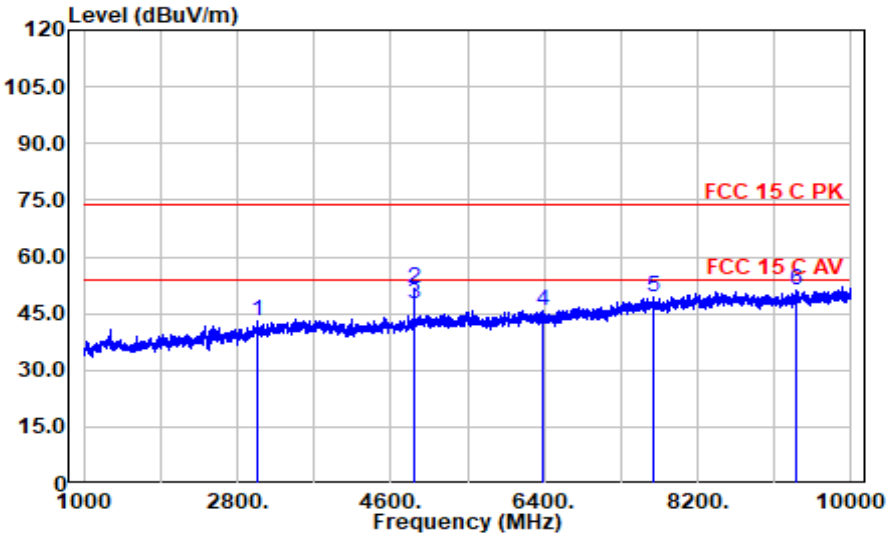


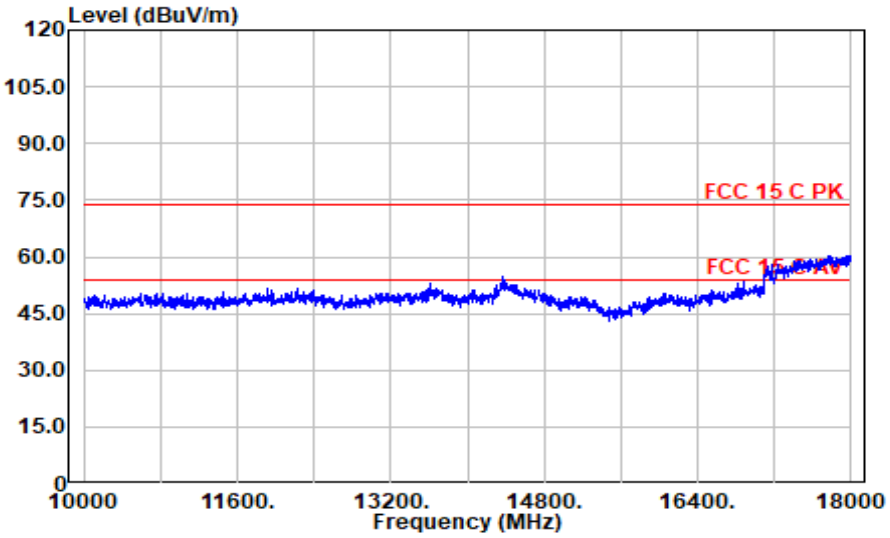


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3571.750	40.81	31.45	6.36	35.16	43.45	74.00	30.55	Peak
4825.000	45.09	32.95	7.55	34.66	50.92	74.00	23.08	Peak
4825.000	41.56	32.95	7.55	34.66	47.40	54.00	6.60	Average
6181.750	36.70	34.57	8.52	34.60	45.20	74.00	28.80	Peak
7545.250	36.69	37.00	9.76	34.77	48.69	74.00	25.31	Peak
9336.250	35.95	38.09	10.92	34.67	50.30	74.00	23.70	Peak

Mode: 802.11b CH2437

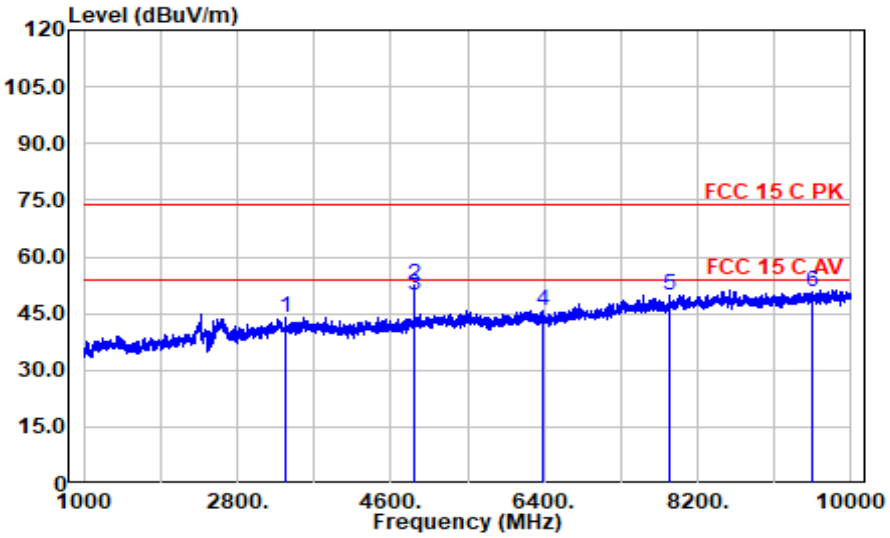


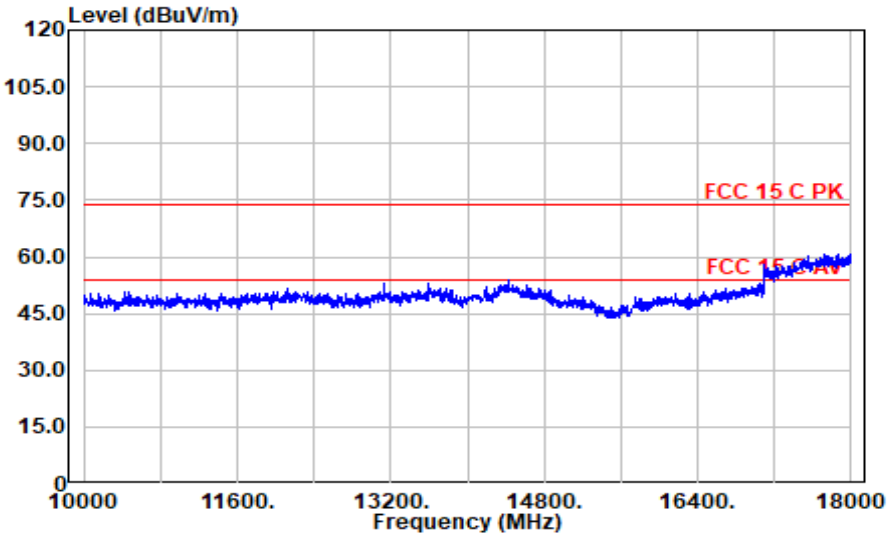


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3036.250	42.24	30.31	5.87	35.38	43.04	74.00	30.96	Peak
4874.500	45.45	33.10	7.60	34.65	51.50	74.00	22.50	Peak
4874.500	41.66	33.10	7.60	34.65	47.71	54.00	6.29	Average
6391.000	37.12	34.50	8.70	34.60	45.72	74.00	28.28	Peak
7673.500	37.32	37.05	9.90	34.81	49.46	74.00	24.54	Peak
9365.500	36.64	38.20	10.95	34.66	51.12	74.00	22.88	Peak

Mode: 802.11b CH2437

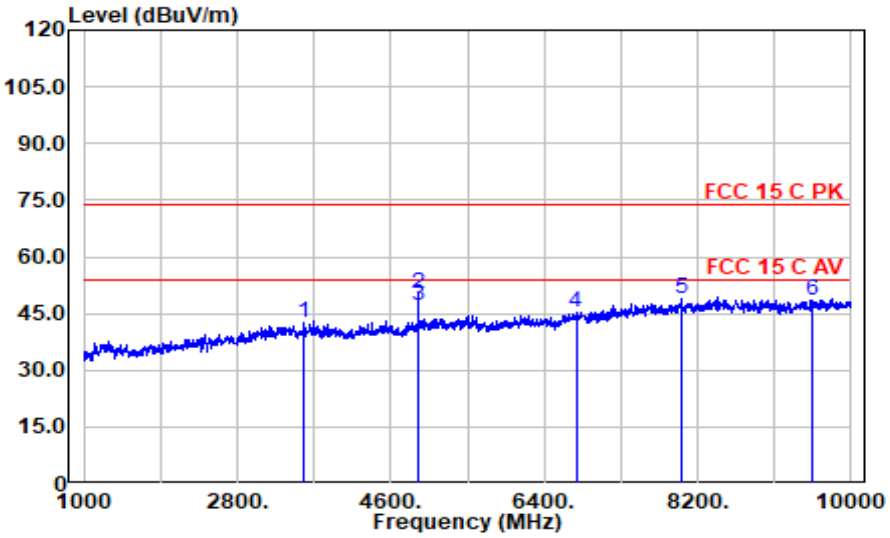


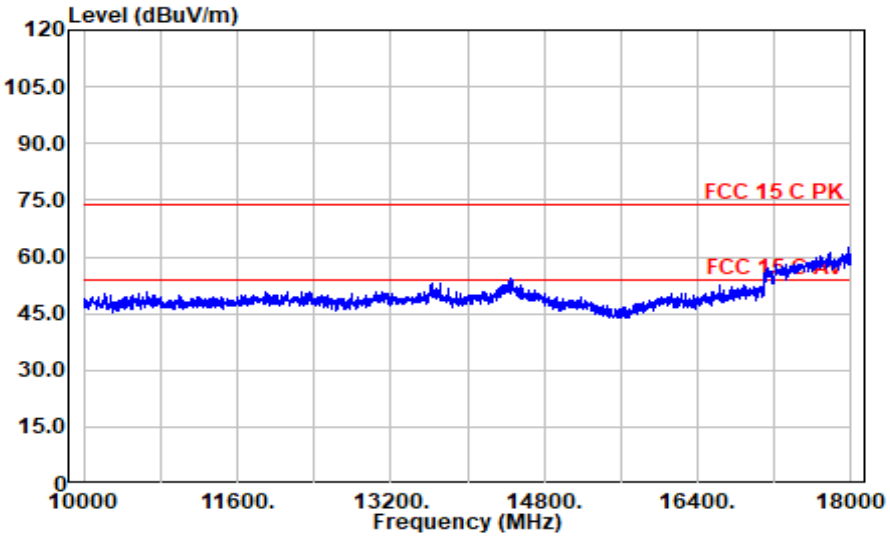


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3362.500	41.71	31.20	6.18	35.24	43.85	74.00	30.15	Peak
4874.500	46.37	33.10	7.60	34.65	52.42	74.00	21.58	Peak
4874.500	43.75	33.10	7.60	34.65	49.80	54.00	4.20	Average
6382.000	37.22	34.50	8.69	34.60	45.81	74.00	28.19	Peak
7876.000	36.99	37.45	10.11	34.86	49.68	74.00	24.32	Peak
9541.000	35.90	38.43	11.11	34.64	50.79	74.00	23.21	Peak

Mode: 802.11b CH2462

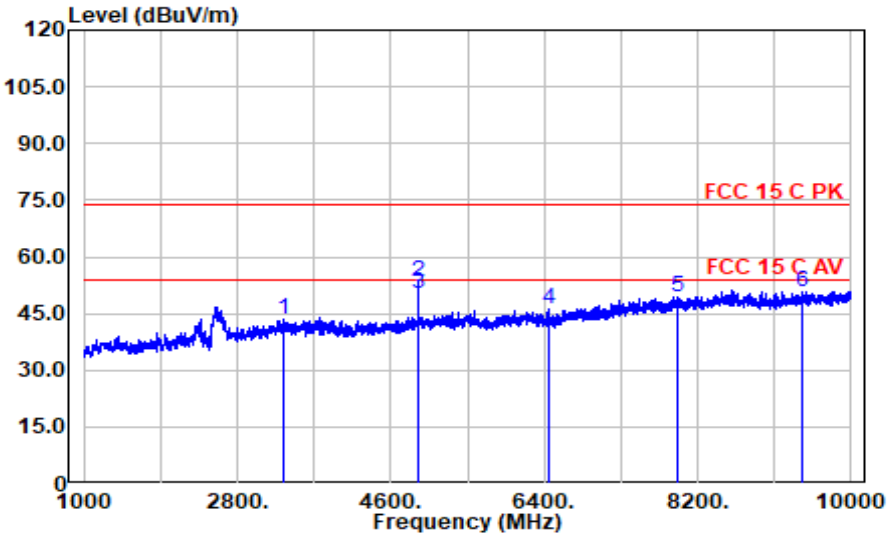


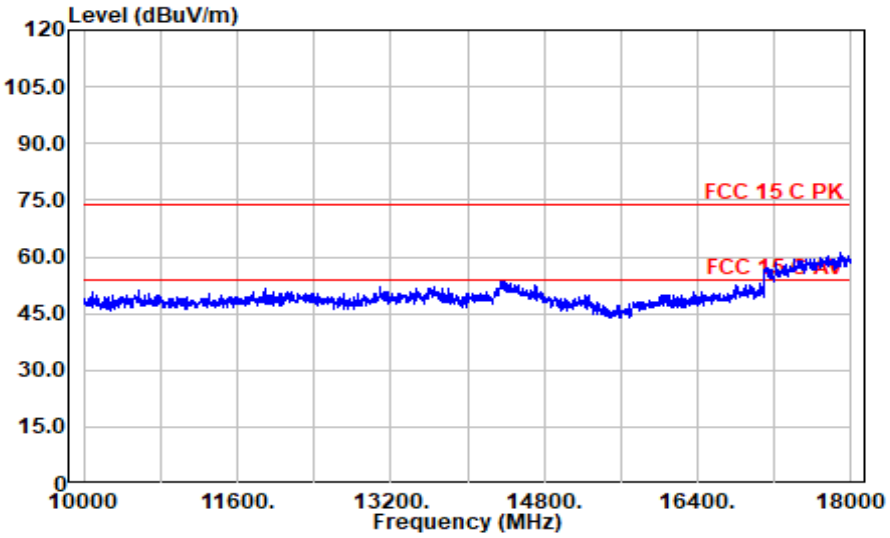


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3574.000	39.73	31.46	6.36	35.16	42.39	74.00	31.61	Peak
4924.000	43.99	33.25	7.64	34.63	50.25	74.00	23.75	Peak
4924.000	40.82	33.25	7.64	34.63	47.09	54.00	6.91	Average
6773.500	35.39	35.39	8.99	34.60	45.17	74.00	28.83	Peak
8015.500	35.91	37.66	10.23	34.90	48.91	74.00	25.09	Peak
9541.000	33.68	38.43	11.11	34.64	48.57	74.00	25.43	Peak

Mode: 802.11b CH2462

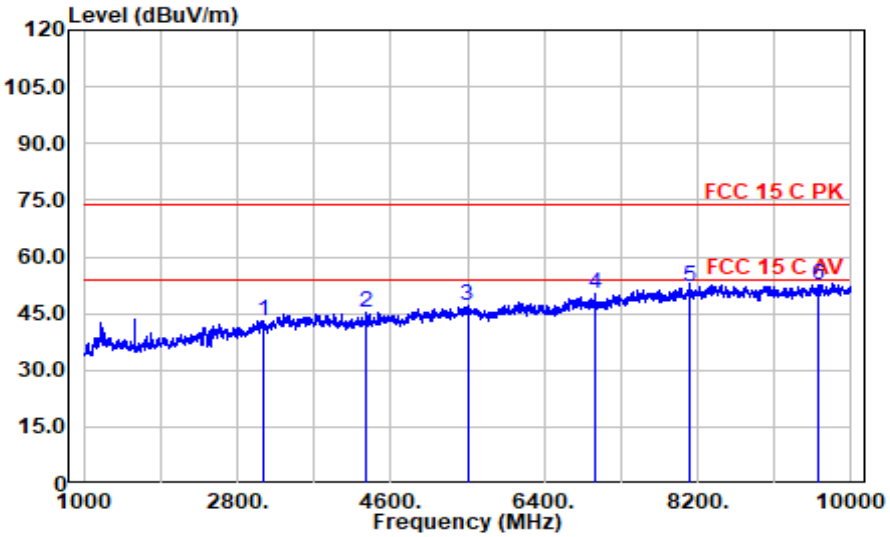


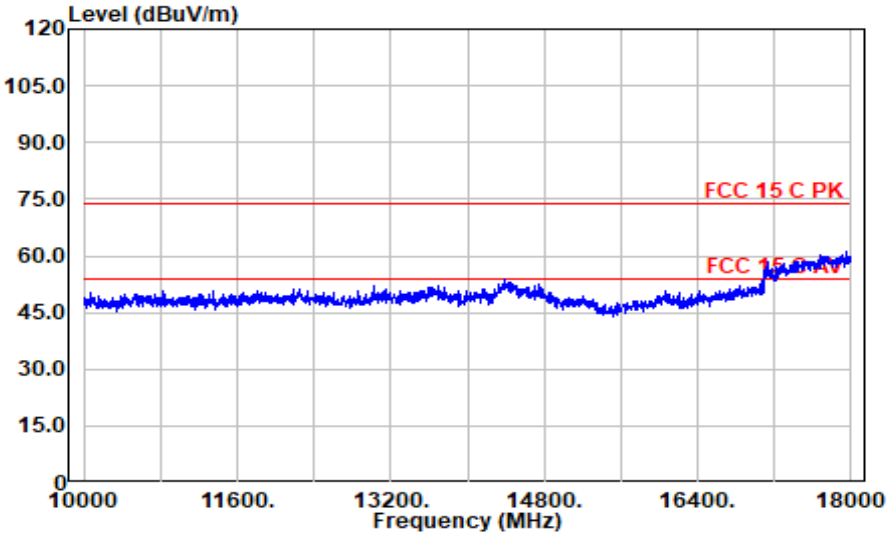


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3349.000	41.21	31.20	6.17	35.25	43.33	74.00	30.67	Peak
4924.000	47.32	33.25	7.64	34.63	53.59	74.00	20.41	Peak
4924.000	44.09	33.25	7.64	34.63	50.36	54.00	3.64	Average
6460.750	37.44	34.40	8.75	34.60	45.99	74.00	28.01	Peak
7972.750	36.38	37.70	10.21	34.89	49.39	74.00	24.61	Peak
9421.750	36.18	38.40	11.00	34.66	50.93	74.00	23.07	Peak

Mode: 802.11g CH2412

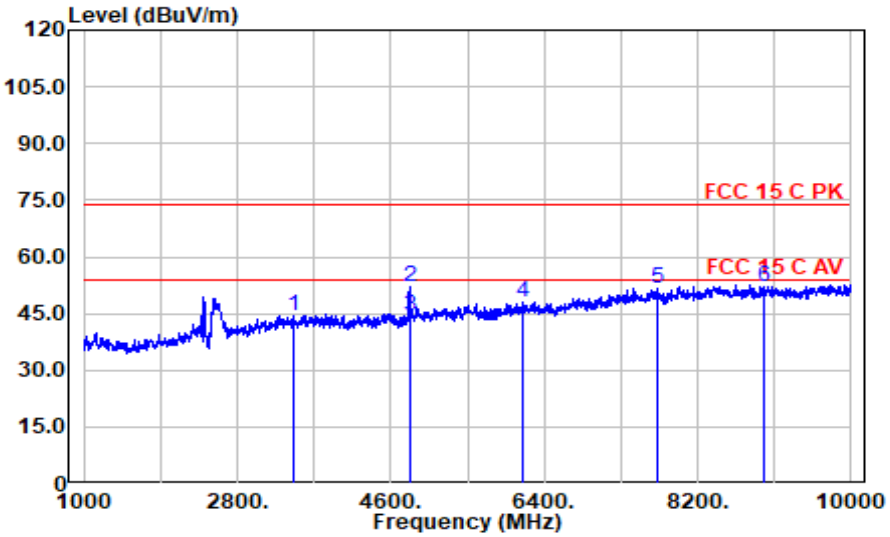


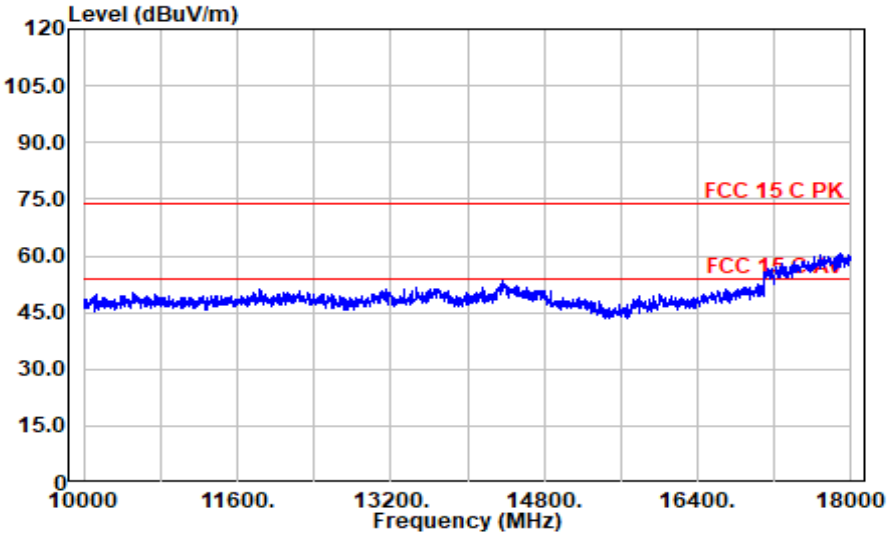


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3110.500	41.85	30.63	5.95	35.35	43.07	74.00	30.93	Peak
4316.500	40.73	32.30	7.05	34.86	45.21	74.00	28.79	Peak
5500.000	39.20	34.29	8.05	34.60	46.94	74.00	27.06	Peak
7007.500	40.09	35.42	9.17	34.60	50.08	74.00	23.92	Peak
8105.500	39.30	37.50	10.27	34.88	52.19	74.00	21.81	Peak
9613.000	37.75	38.40	11.17	34.64	52.69	74.00	21.31	Peak

Mode: 802.11g CH2412

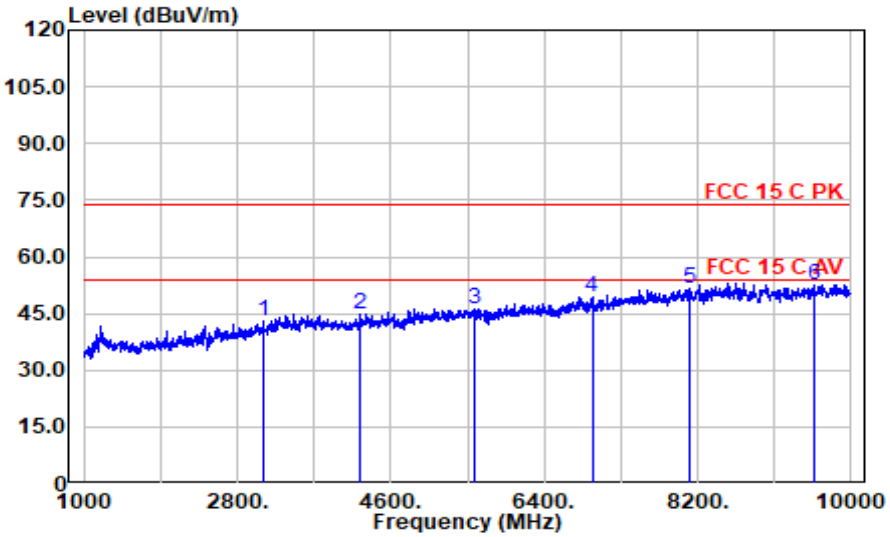


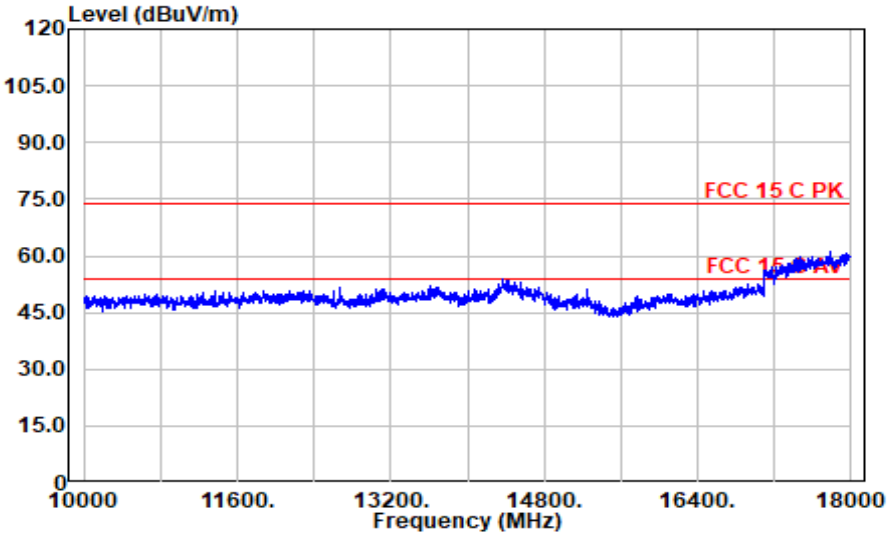


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3461.500	42.32	31.10	6.26	35.20	44.48	74.00	29.52	Peak
4825.000	46.29	32.95	7.55	34.66	52.12	74.00	21.88	Peak
4825.000	38.71	32.95	7.55	34.66	44.55	54.00	9.45	Average
6152.500	39.72	34.52	8.50	34.60	48.14	74.00	25.86	Peak
7718.500	39.65	37.05	9.94	34.82	51.83	74.00	22.17	Peak
8969.500	38.01	38.25	10.59	34.71	52.14	74.00	21.86	Peak

Mode: 802.11n20 CH2412

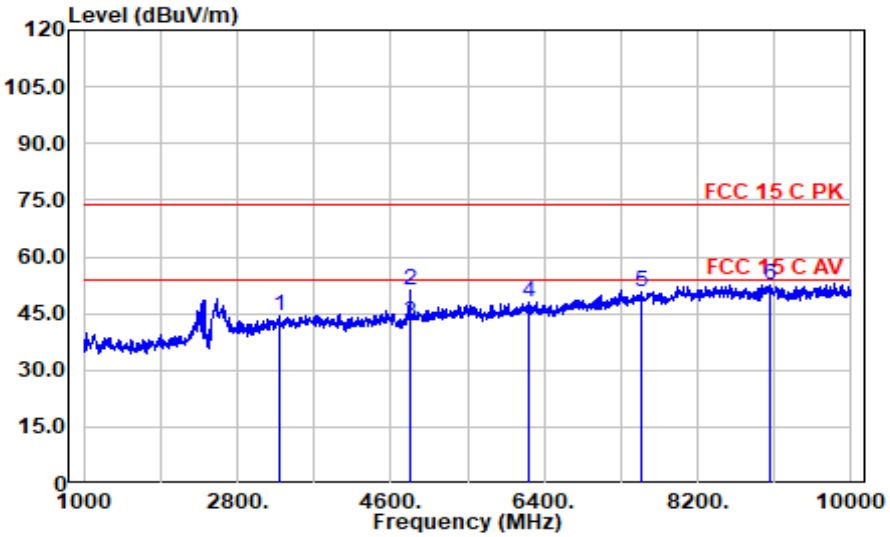


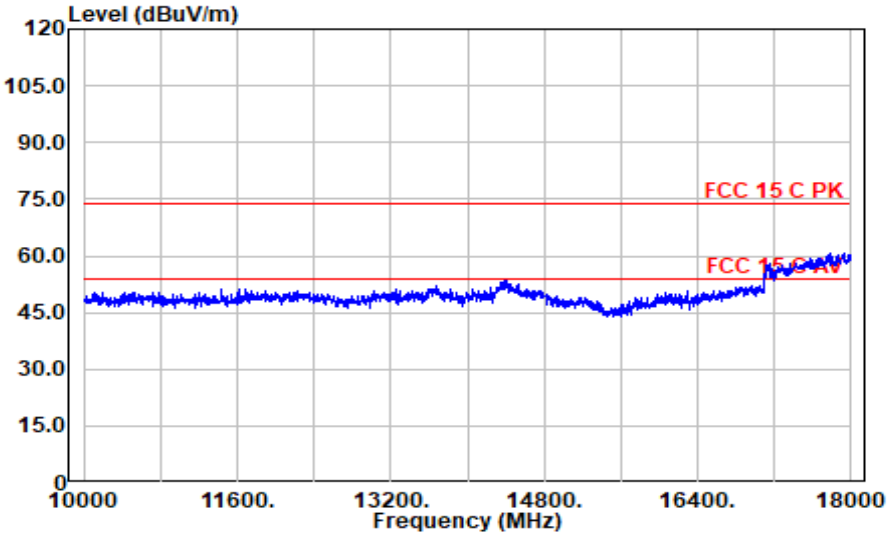


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3101.500	41.93	30.61	5.94	35.35	43.12	74.00	30.88	Peak
4240.000	40.39	32.33	6.97	34.90	44.79	74.00	29.21	Peak
5581.000	38.68	34.14	8.11	34.60	46.33	74.00	27.67	Peak
6962.500	39.47	35.40	9.14	34.60	49.40	74.00	24.60	Peak
8101.000	38.67	37.51	10.26	34.88	51.57	74.00	22.43	Peak
9559.000	37.65	38.40	11.12	34.64	52.53	74.00	21.47	Peak

Mode: 802.11n20 CH2412





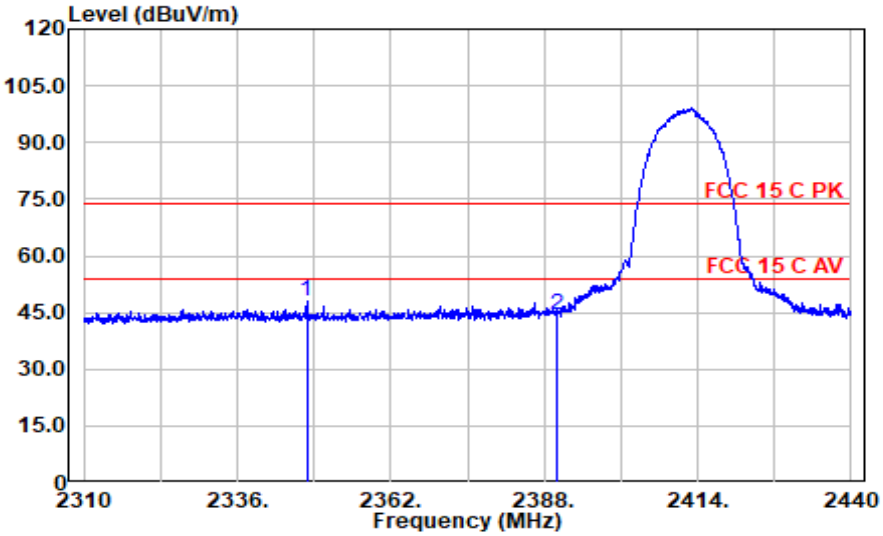
Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
3290.500	42.24	31.16	6.11	35.27	44.24	74.00	29.76	Peak
4825.000	45.20	32.95	7.55	34.66	51.04	74.00	22.96	Peak
4825.000	36.61	32.95	7.55	34.66	42.45	54.00	11.55	Average
6215.500	39.62	34.60	8.55	34.60	48.17	74.00	25.83	Peak
7538.500	38.76	37.00	9.75	34.77	50.75	74.00	23.25	Peak
9046.000	38.36	38.20	10.66	34.70	52.53	74.00	21.47	Peak

Band-Edge and Restricted bands:

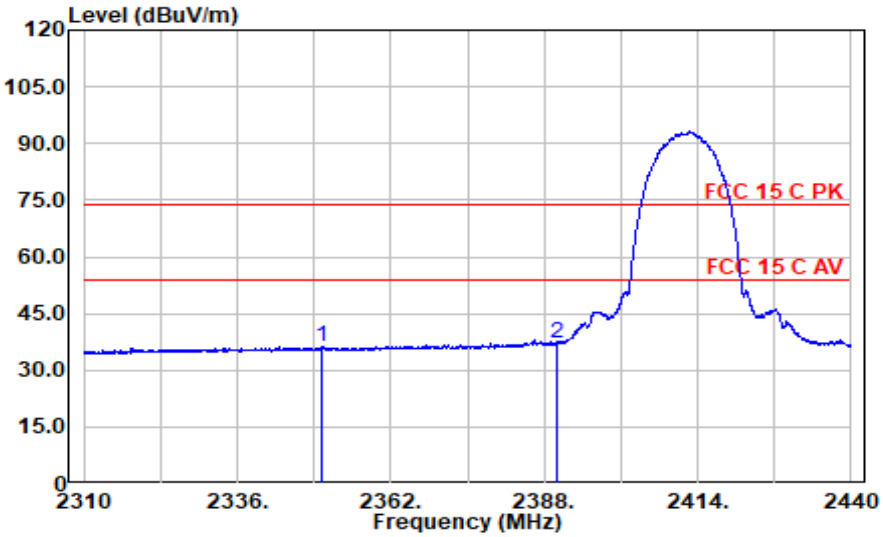
Test Date:	2023.05.14	Temp./Hum.:	22℃/51%RH	Test By:	Jarey

Mode: 802.11b CH2412



Polarization at Horizontal

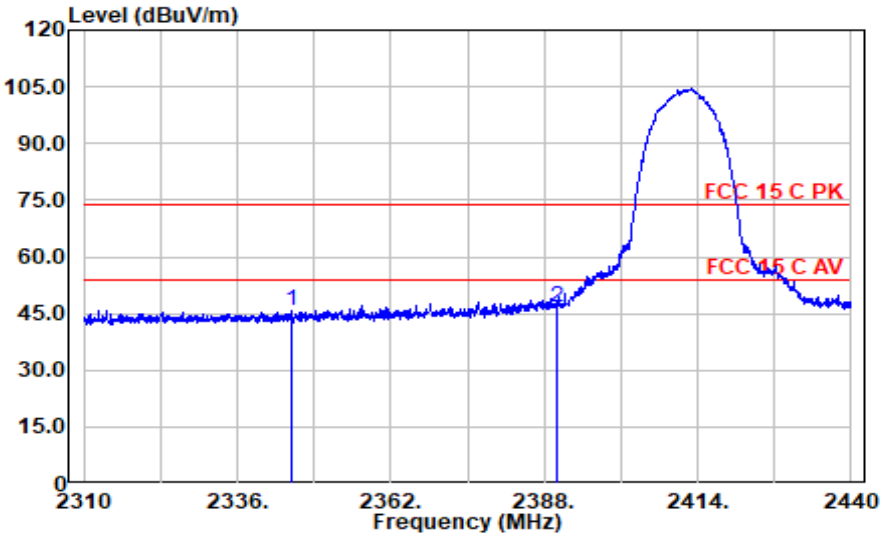
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2347.765	50.41	28.37	5.29	36.07	48.01	74.00	25.99	Peak
2390.000	46.49	28.40	5.33	36.02	44.21	74.00	29.79	Peak



Polarization at Horizontal

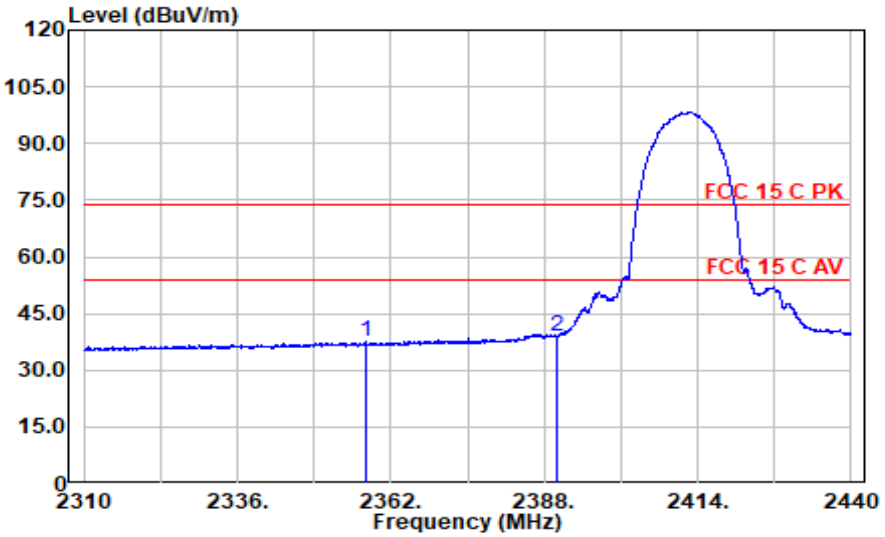
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2350.430	38.77	28.39	5.29	36.06	36.39	54.00	17.61	Average
2390.000	39.52	28.40	5.33	36.02	37.23	54.00	16.77	Average

Mode: 802.11b CH2412



Polarization at Vertical

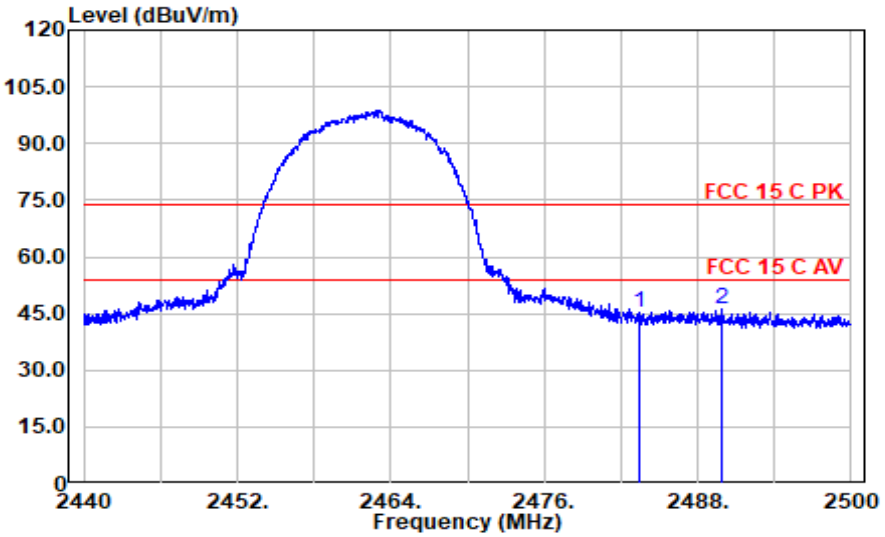
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2345.100	48.11	28.36	5.29	36.07	45.69	74.00	28.31	Peak
2390.000	49.02	28.40	5.33	36.02	46.73	74.00	27.27	Peak



Polarization at Vertical

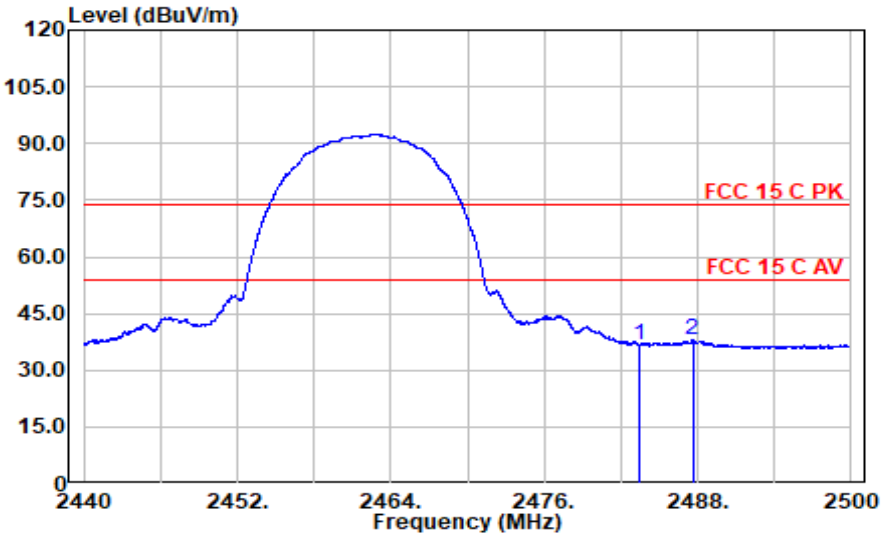
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2357.710	39.88	28.40	5.30	36.05	37.52	54.00	16.48	Average
2390.000	41.40	28.40	5.33	36.02	39.11	54.00	14.89	Average

Mode: 802.11b CH2462



Polarization at Horizontal

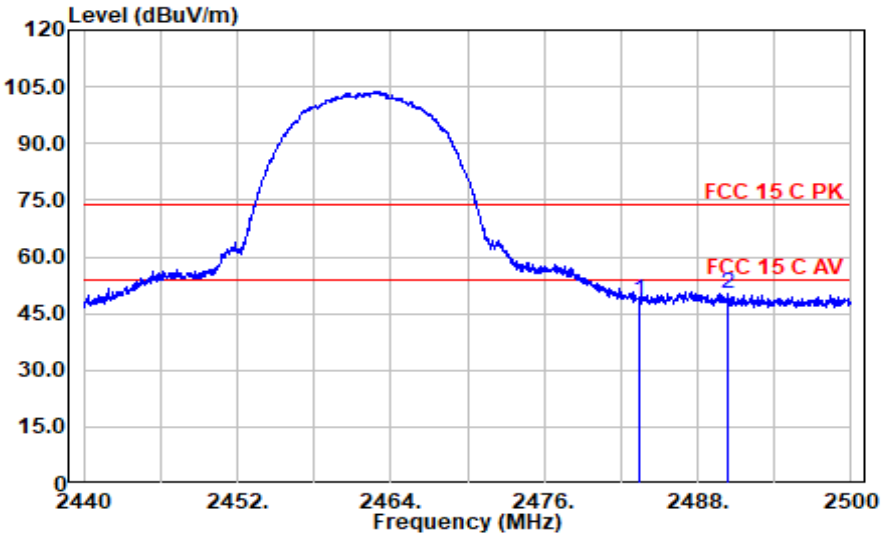
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	47.52	28.43	5.42	35.91	45.45	74.00	28.55	Peak
2489.950	48.03	28.46	5.42	35.91	46.01	74.00	27.99	Peak



Polarization at Horizontal

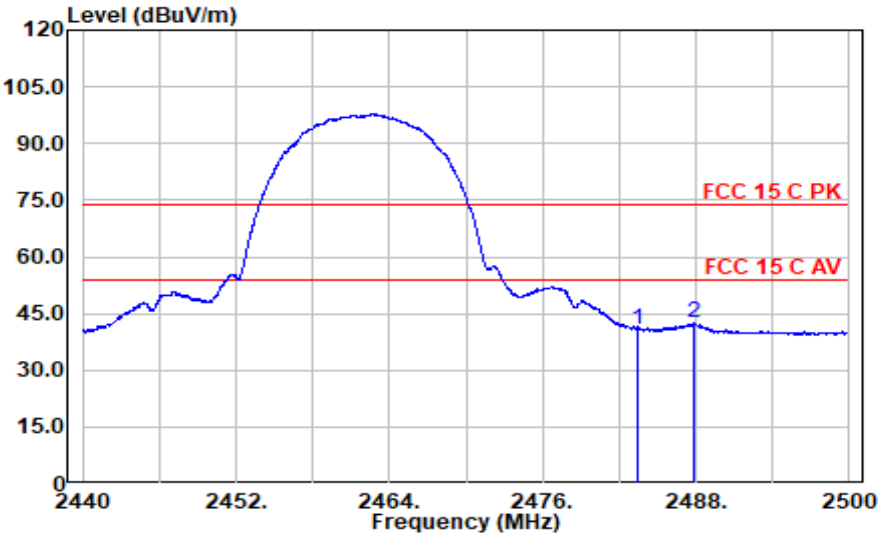
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	38.87	28.43	5.42	35.91	36.81	54.00	17.19	Average
2487.610	40.08	28.45	5.42	35.91	38.04	54.00	15.96	Average

Mode: 802.11b CH2462



Polarization at Vertical

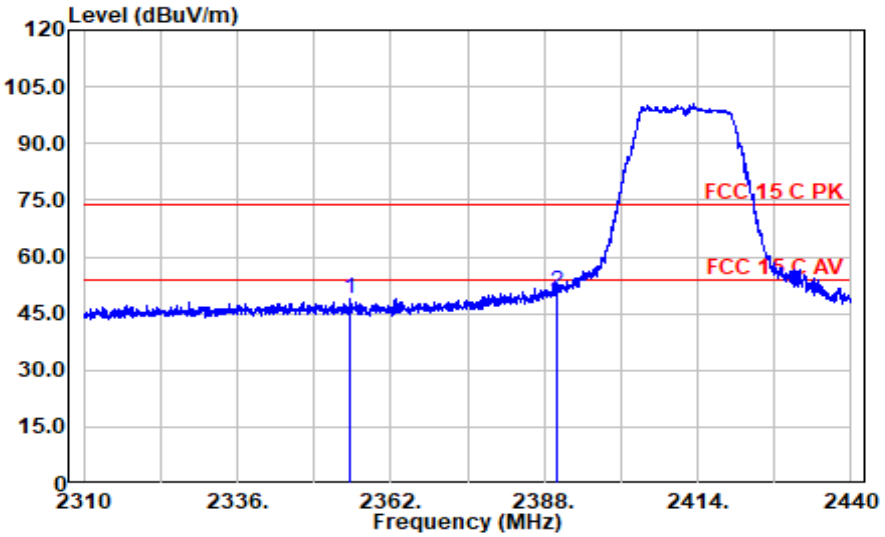
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	50.42	28.43	5.42	35.91	48.36	74.00	25.64	Peak
2490.400	52.38	28.46	5.42	35.91	50.36	74.00	23.64	Peak



Polarization at Vertical

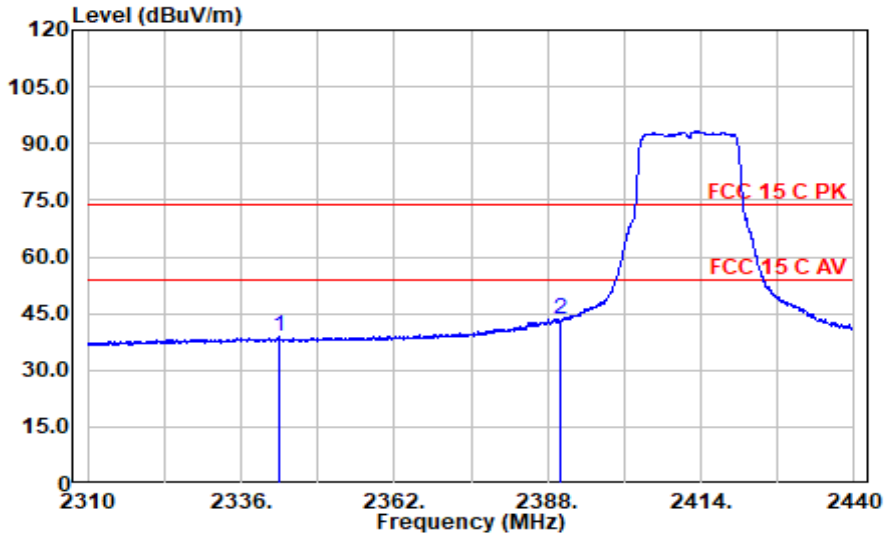
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	43.02	28.43	5.42	35.91	40.95	54.00	13.05	Average
2487.820	44.72	28.45	5.42	35.91	42.68	54.00	11.32	Average

Mode: 802.11g CH2412



Polarization at Horizontal

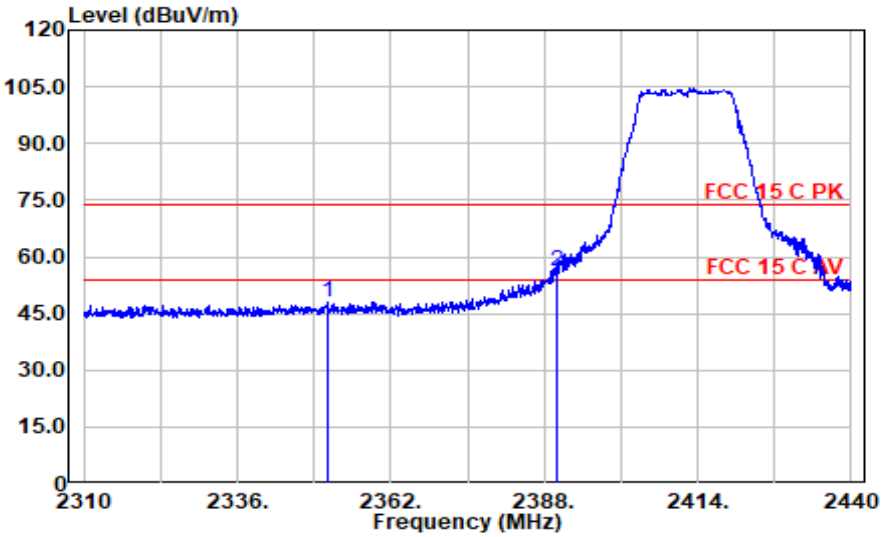
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2354.980	51.22	28.40	5.30	36.06	48.85	74.00	25.15	Peak
2390.000	52.90	28.40	5.33	36.02	50.62	74.00	23.38	Peak



Polarization at Horizontal

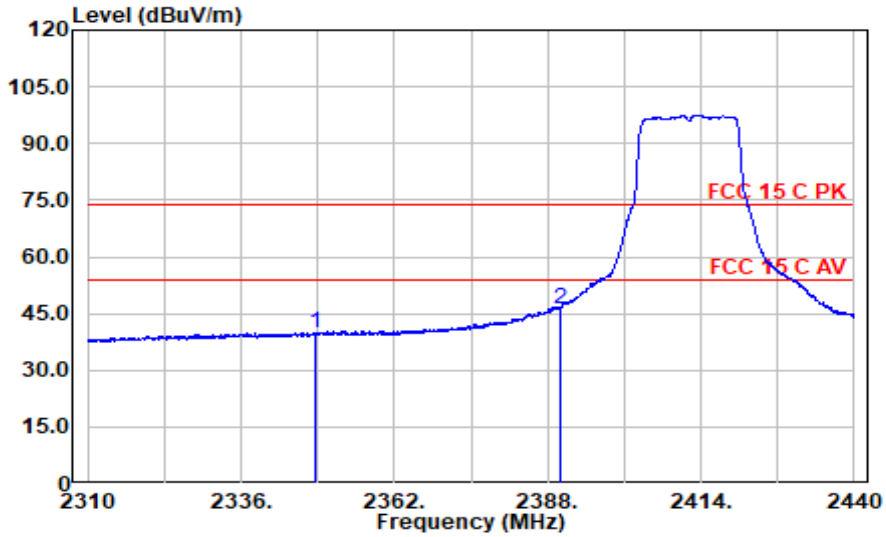
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2342.565	41.17	28.34	5.28	36.07	38.73	54.00	15.27	Average
2390.000	45.77	28.40	5.33	36.02	43.48	54.00	10.52	Average

Mode: 802.11g CH2412



Polarization at Vertical

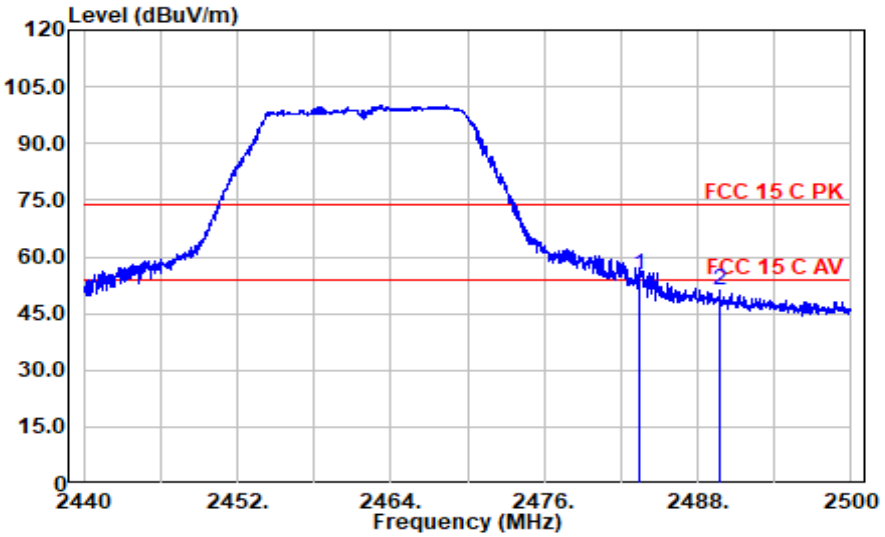
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2351.405	50.57	28.39	5.29	36.06	48.20	74.00	25.80	Peak
2390.000	58.61	28.40	5.33	36.02	56.33	74.00	17.67	Peak



Polarization at Vertical

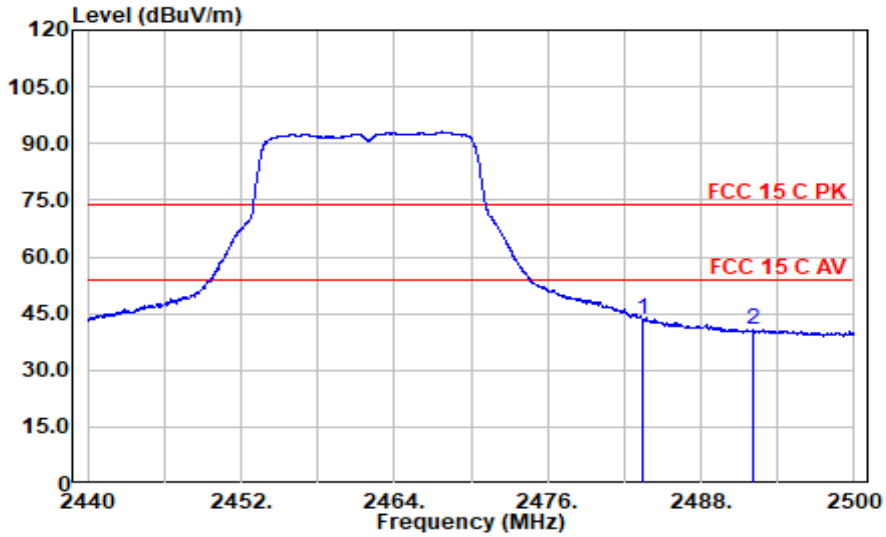
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2348.480	42.39	28.38	5.29	36.06	39.99	54.00	14.01	Average
2390.000	48.64	28.40	5.33	36.02	46.36	54.00	7.64	Average

Mode: 802.11g CH2462



Polarization at Horizontal

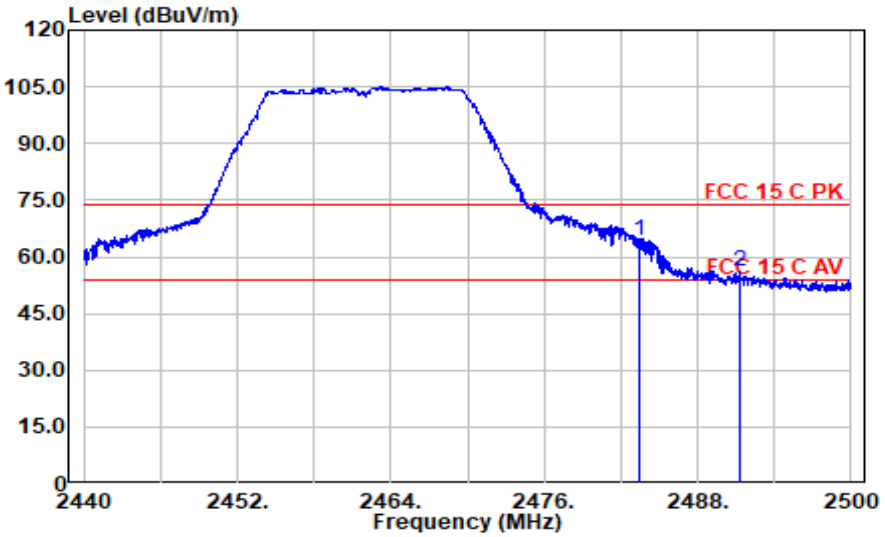
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	57.38	28.43	5.42	35.91	55.32	74.00	18.68	Peak
2489.740	53.28	28.46	5.42	35.91	51.25	74.00	22.75	Peak



Polarization at Horizontal

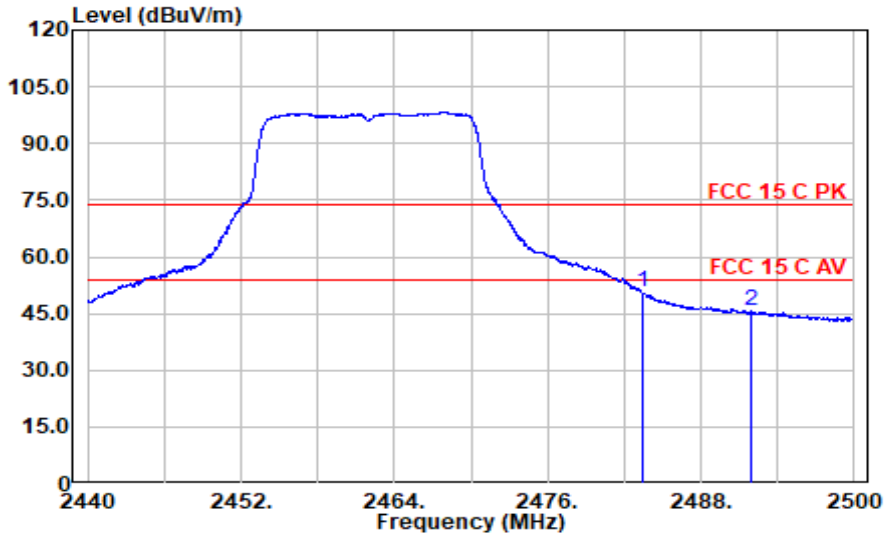
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	45.52	28.43	5.42	35.91	43.45	54.00	10.55	Average
2492.050	42.68	28.47	5.42	35.90	40.67	54.00	13.33	Average

Mode: 802.11g CH2462



Polarization at Vertical

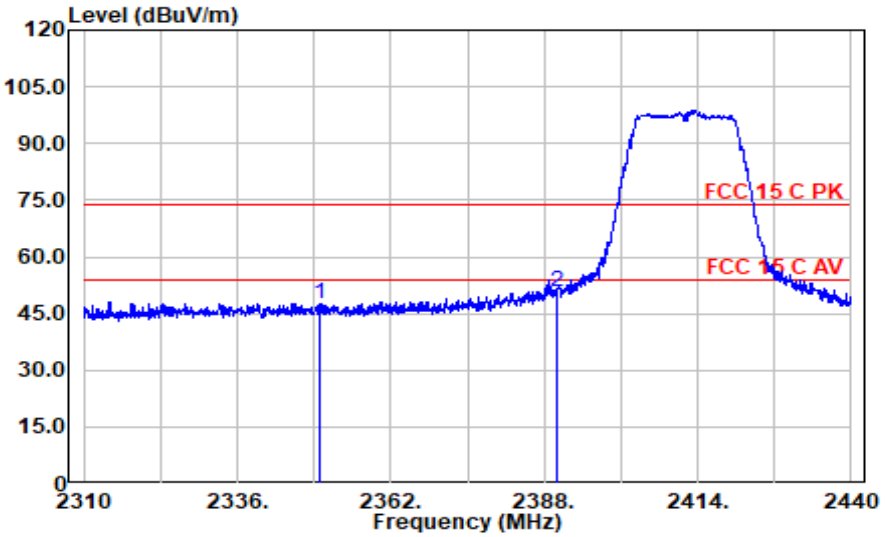
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	66.31	28.43	5.42	35.91	64.25	74.00	9.75	Peak
2491.330	58.08	28.47	5.42	35.90	56.07	74.00	17.93	Peak



Polarization at Vertical

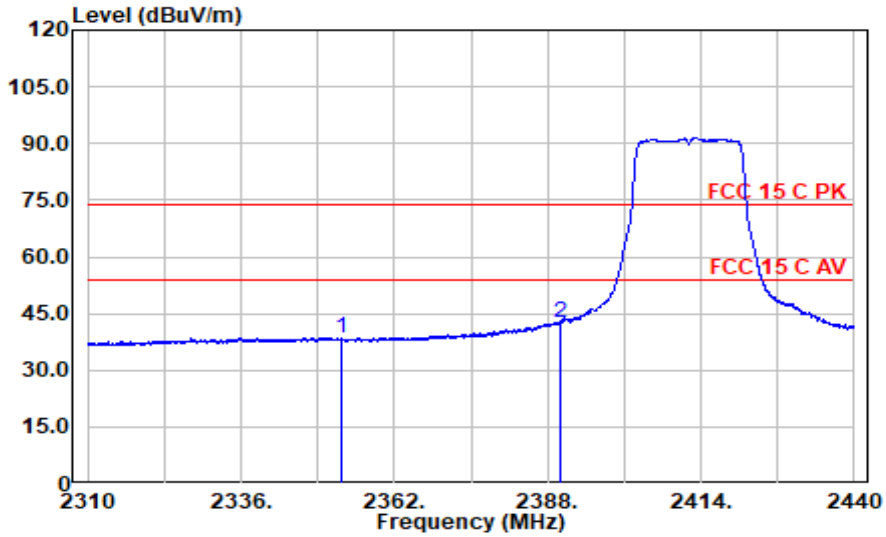
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	52.63	28.43	5.42	35.91	50.57	54.00	3.43	Average
2491.960	47.86	28.47	5.42	35.90	45.85	54.00	8.15	Average

Mode: 802.11n CH2462



Polarization at Horizontal

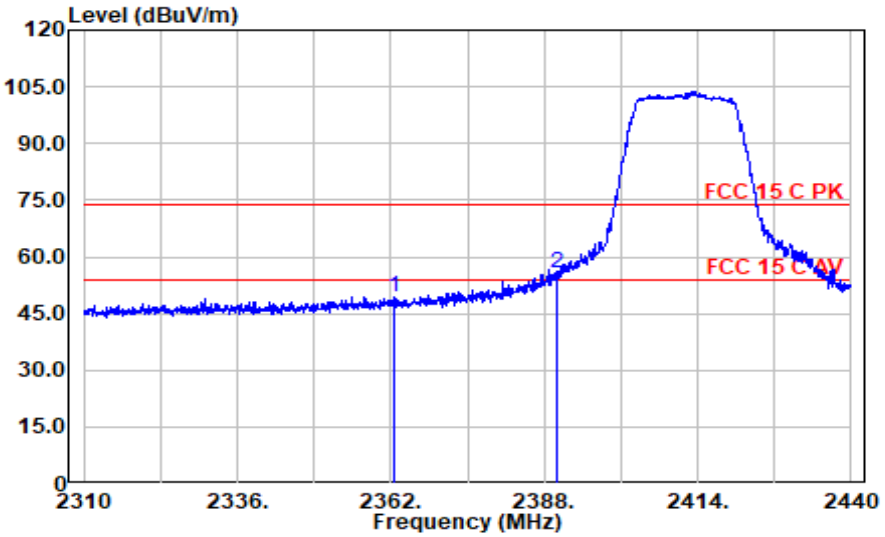
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2349.845	50.07	28.38	5.29	36.06	47.68	74.00	26.32	Peak
2390.000	52.82	28.40	5.33	36.02	50.54	74.00	23.46	Peak



Polarization at Horizontal

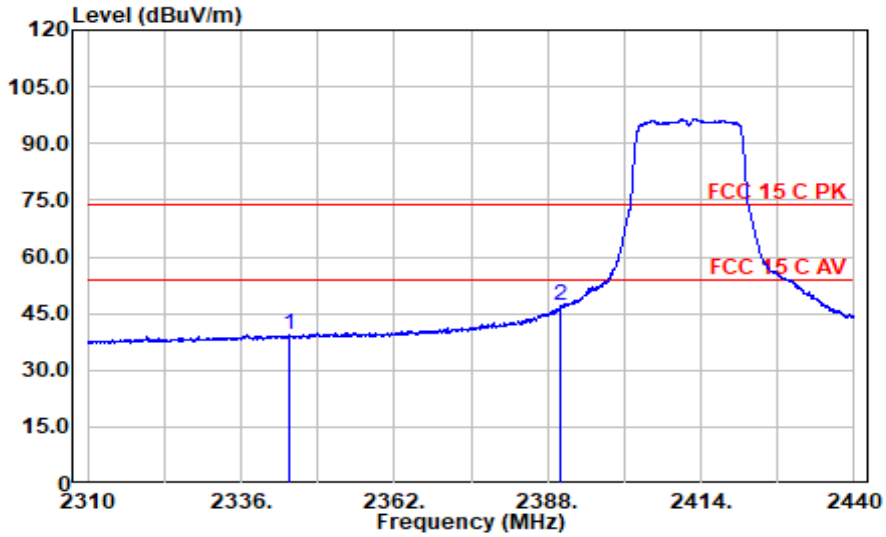
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2352.965	40.92	28.40	5.29	36.06	38.55	54.00	15.45	Average
2390.000	44.92	28.40	5.33	36.02	42.63	54.00	11.37	Average

Mode: 802.11n CH2412



Polarization at Vertical

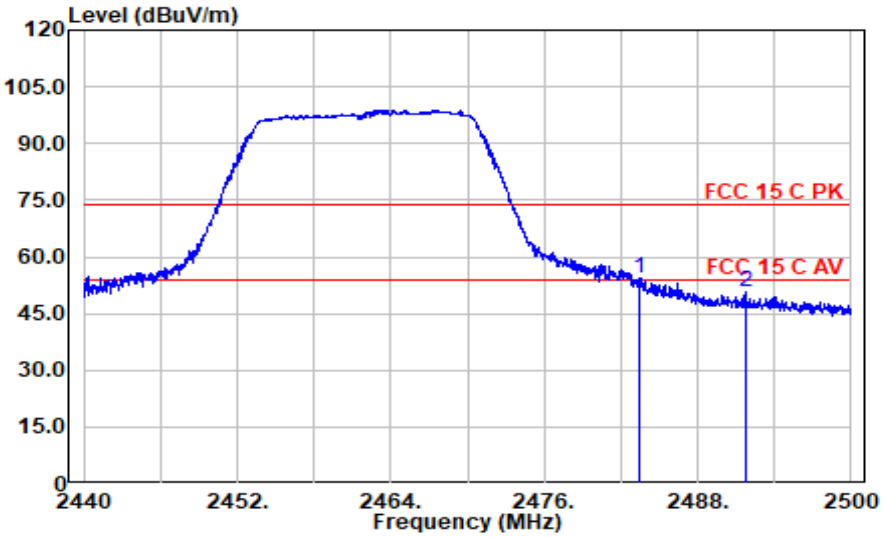
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2362.585	51.60	28.40	5.30	36.05	49.26	74.00	24.74	Peak
2390.000	57.98	28.40	5.33	36.02	55.69	74.00	18.31	Peak



Polarization at Vertical

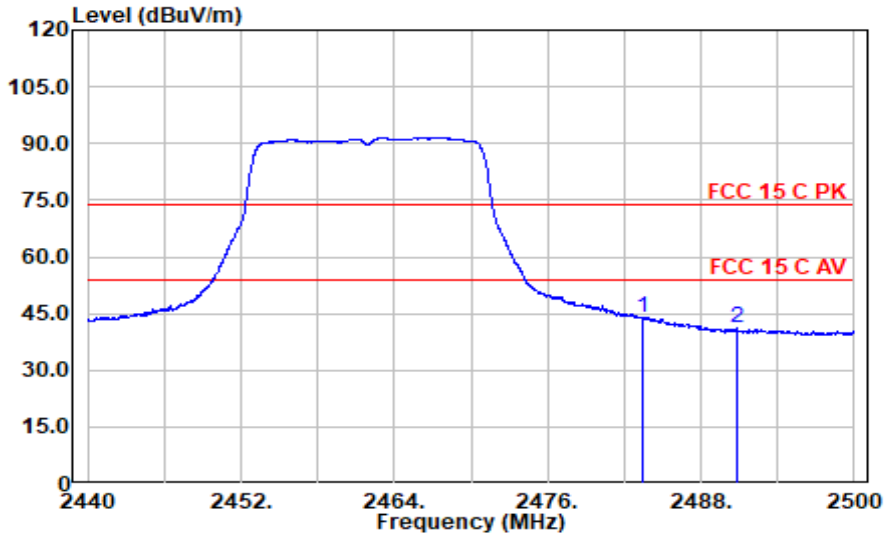
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2344.320	41.88	28.35	5.29	36.07	39.45	54.00	14.55	Average
2390.000	49.18	28.40	5.33	36.02	46.89	54.00	7.11	Average

Mode: 802.11n CH2462



Polarization at Horizontal

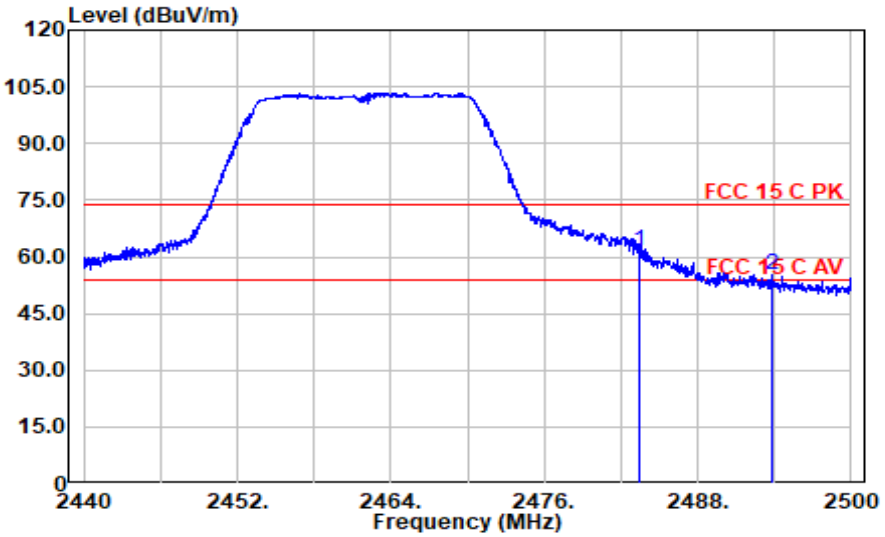
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	56.47	28.43	5.42	35.91	54.41	74.00	19.59	Peak
2491.810	52.52	28.47	5.42	35.90	50.51	74.00	23.49	Peak



Polarization at Horizontal

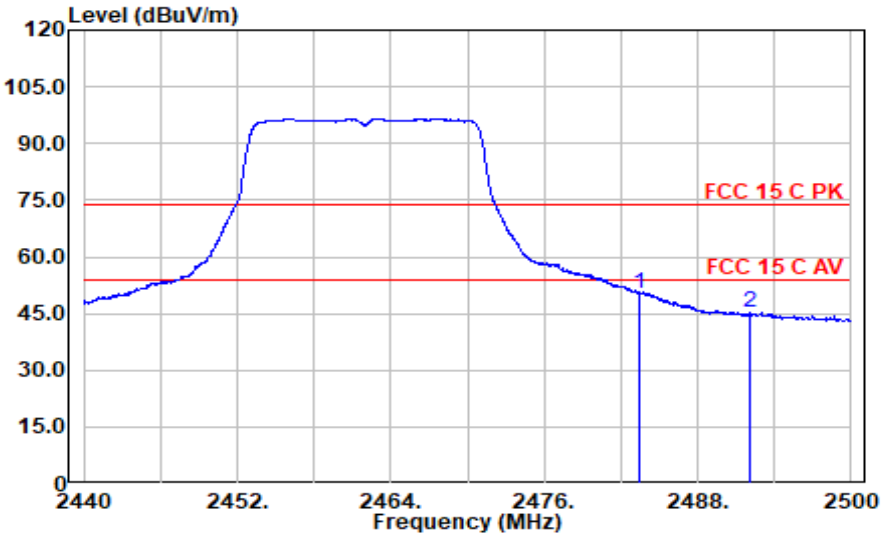
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	45.98	28.43	5.42	35.91	43.92	54.00	10.08	Average
2490.820	43.04	28.46	5.42	35.90	41.03	54.00	12.97	Average

Mode: 802.11n CH2462



Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	63.80	28.43	5.42	35.91	61.74	74.00	12.26	Peak
2493.790	57.15	28.48	5.43	35.90	55.15	74.00	18.85	Peak



Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
2483.500	52.47	28.43	5.42	35.91	50.40	54.00	3.60	Average
2492.140	47.22	28.47	5.42	35.90	45.21	54.00	8.79	Average

5 99% OCCUPIED BANDWIDTH MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2022.09.15	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2022.09.21	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2022.09.21	1 Year

5.2 Block Diagram of Test Setup

5.3 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

5.4 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of 99% power bandwidth was measure by spectrum analyzer with settings: Span = between 1.5 times and 5.0 times of the OBW, RBW = 1% to 5% of the OBW, VBW ≥ 3 × RBW, Detector = Peak, Trace = Max Hold.
Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

The test procedure is defined in ANSI C63.10-2013 (the 6.9.3 Measurement Procedure “Occupied bandwidth—power bandwidth (99%) measurement procedure” was used).

5.5 Test Results

PASSED.

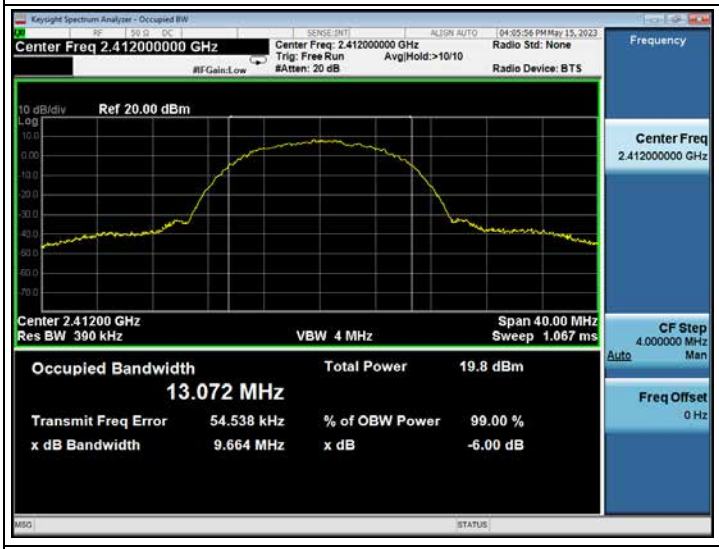
All the test results are attached in next pages.

(Test Date: 2023.05.15 Temperature: 23℃ Humidity: 51 %)

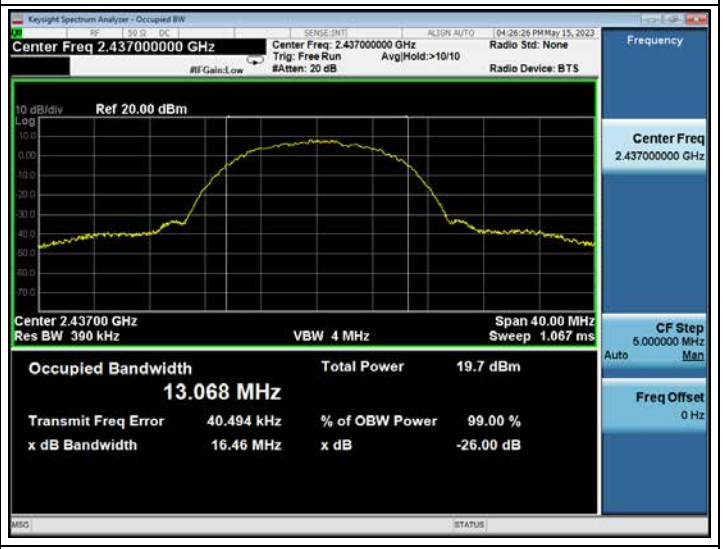
Mode	Channel	Frequency (MHz)	**99% Bandwidth (MHz)**
802.11b	1	2412	**13.072**
	6	2437	**13.068**
	11	2462	**13.071**
802.11g	1	2412	**17.591**
	6	2437	**17.597**
	11	2462	**17.627**
802.11n20	1	2412	**18.528**
	6	2437	**18.558**
	11	2462	**18.585**

802.11b

CH2412



CH2437

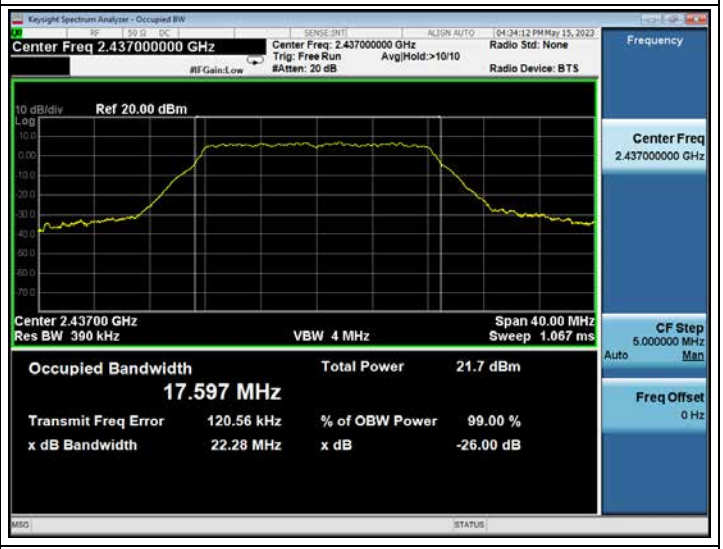


CH2462

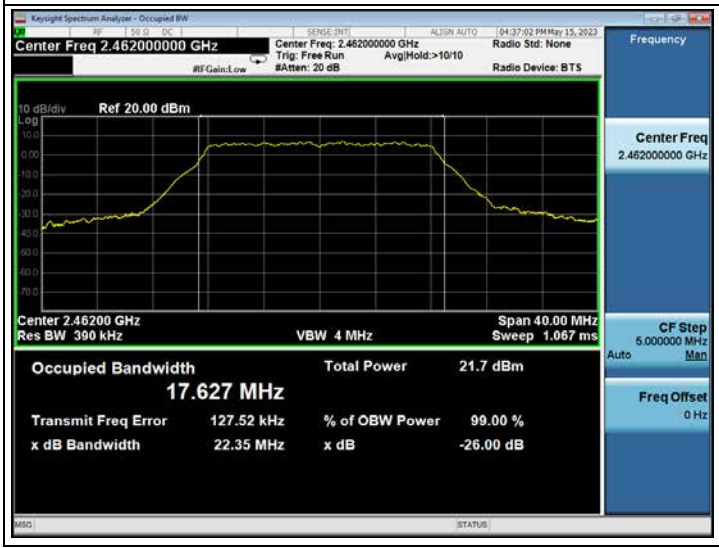
802.11g

CH2412

CH2437



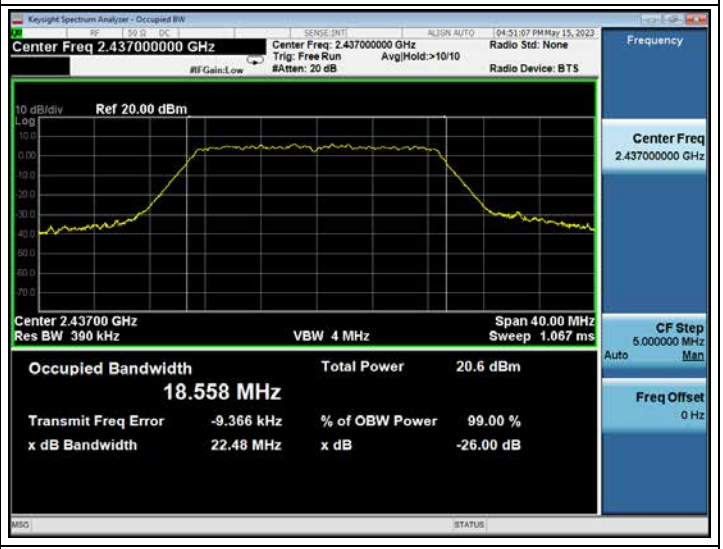
CH2462



802.11n20

CH2412

CH2437



CH2462

6 6 dB BANDWIDTH MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2022.09.15	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2022.09.21	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2022.09.21	1 Year

6.2 Block Diagram of Test Setup

The Same as Section. 5.2.

6.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

6.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with settings: RBW = 100kHz, VBW ≥ 3 × RBW.

The 6 dB bandwidth is defined as the total spectrum the power of which is lower than peak power minus 6 dB .

The test procedure is defined in ANSI C63.10-2013 (the 11.8.2 Measurement Procedure “Option 2” was used).

6.6 Test Results

PASSED.

All the test results are attached in next pages.

(Test Date: 2023.05.15-16 Temperature: 23℃ Humidity: 51 %)

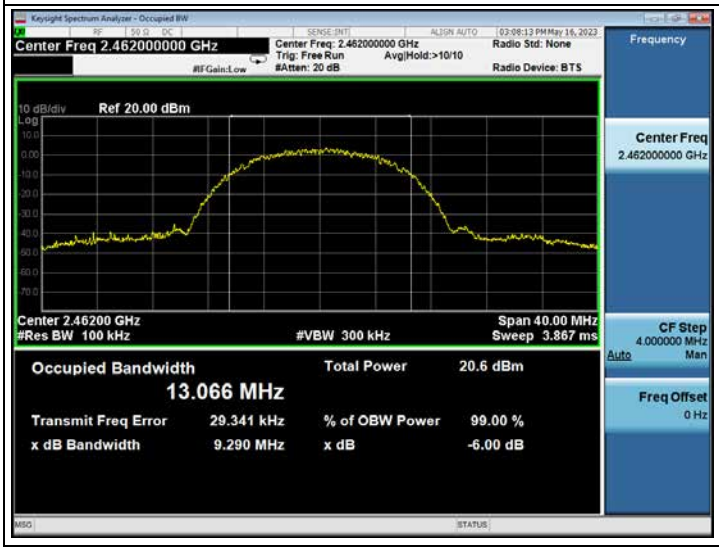
Mode	Channel	Frequency (MHz)	**6dB Bandwidth (MHz)**	Limit
802.11b	1	2412	**9.292**	500 kHz
	6	2437	**9.284**	500 kHz
	11	2462	**9.29**	500 kHz
802.11g	1	2412	**16.33**	500 kHz
	6	2437	**16.34**	500 kHz
	11	2462	**16.35**	500 kHz
802.11n20	1	2412	**17.57**	500 kHz
	6	2437	**17.57**	500 kHz
	11	2462	**17.58**	500 kHz

802.11b

CH2412

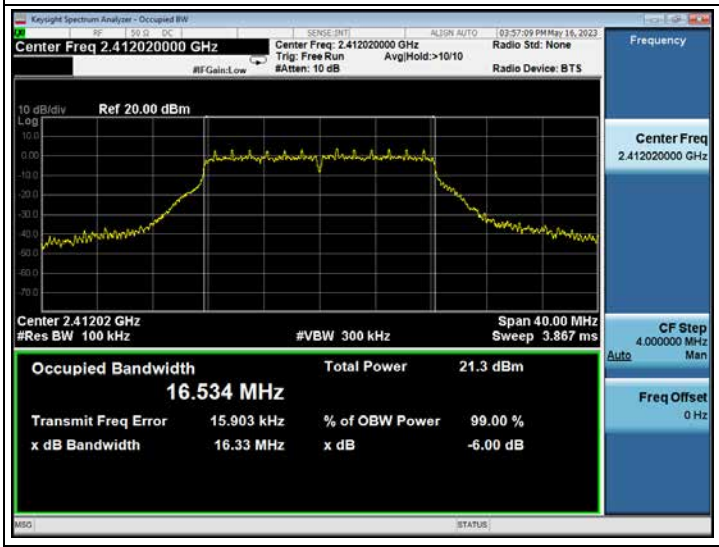
CH2437

CH2462

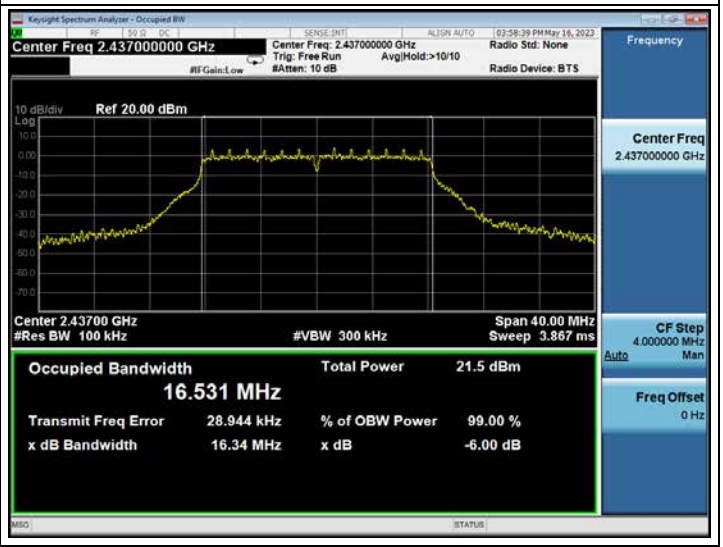


802.11g

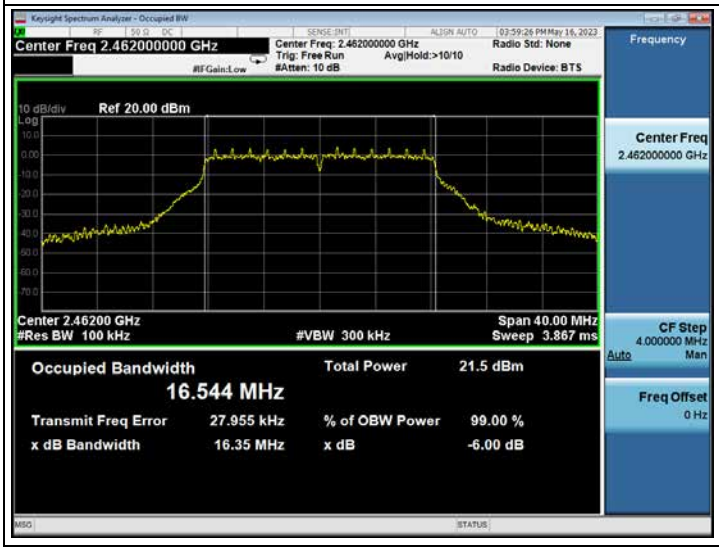
CH2412



CH2437

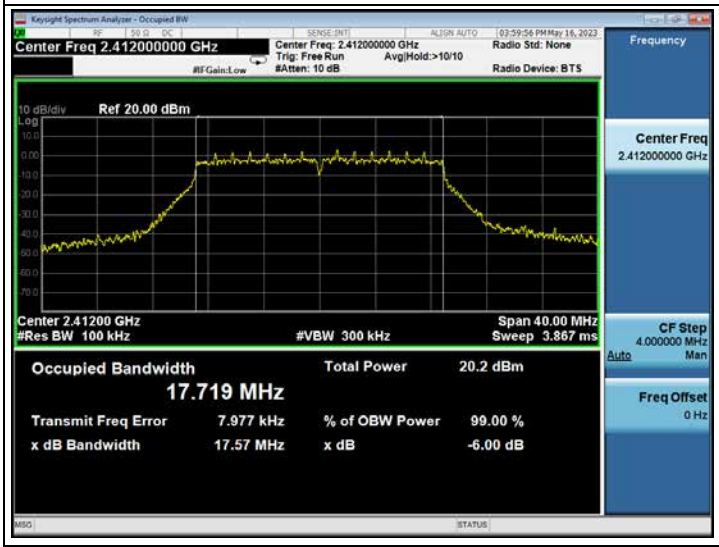


CH2462

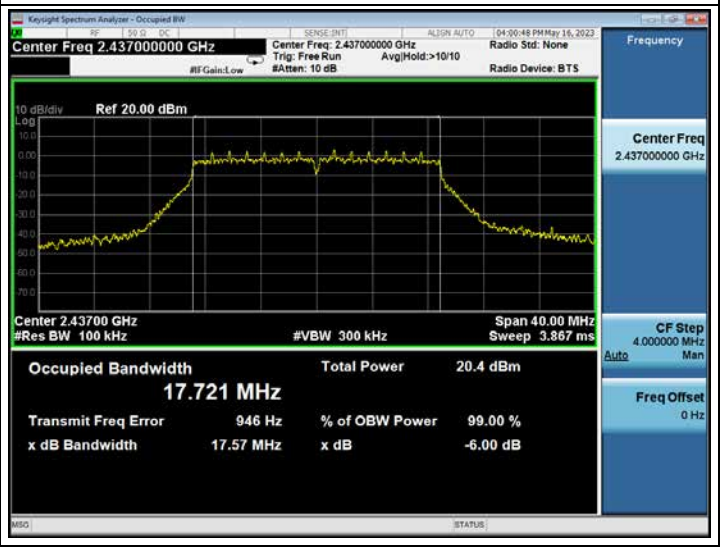


802.11n20

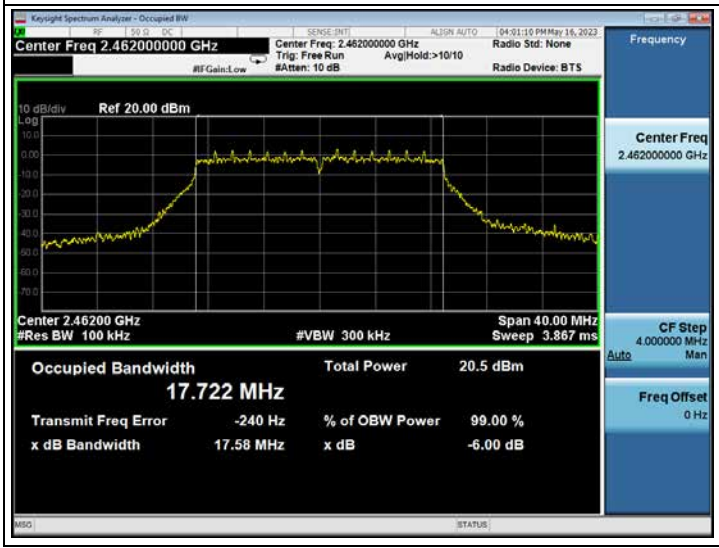
CH2412



CH2437



CH2462



7 MAXIMUM OUTPUT POWER MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2022.09.15	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2022.09.21	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2022.09.21	1 Year

7.2 Block Diagram of Test Setup

The Same as Section. 5.2.

7.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

7.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Method AVGSA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction.
The procedure for this method is as follows:
a) Measure the duty cycle D of the transmitter output signal.
b) Set span to at least 1.5 times the OBW.
c) Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
d) Set VBW ≥ [3 × RBW].
e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
f) Sweep time = auto.
g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
h) Do not use sweep triggering. Allow the sweep to “free run.”
i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
j) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW

extending across the entire OBW of the spectrum.
k) Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is 25%.

The test procedure is defined in ANSI C63.10-2013 (11.9.2.2.4 Measurement Procedure " Method AVGSA-2" was used).

7.6 Test Results

PASSED.

All the test results are listed below.

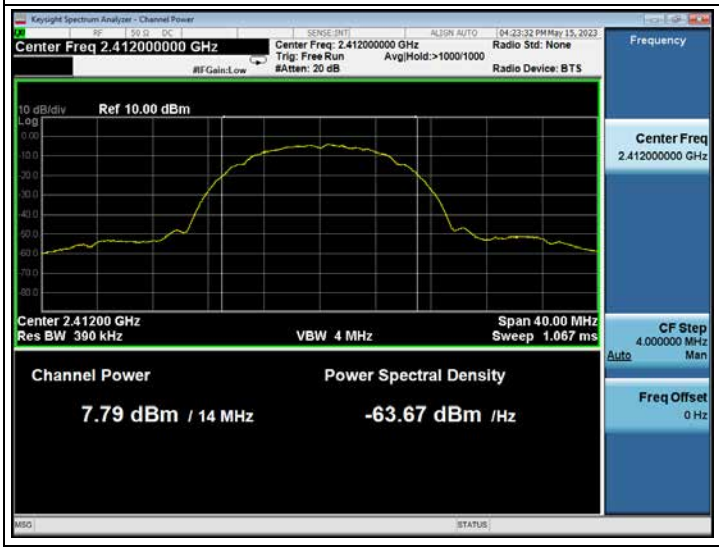
(Test Date: 2023.05.15 Temperature: 23℃ Humidity: 51 %)

Mode	Channel	Frequency (MHz)	**Average conducted (average) Output Power (dBm)**	**Maximum conducted (average) Output Power (dBm)**	Limit
802.11b	1	2412	**7.79**	**12.64**	30 dBm
	6	2437	**8.01**	**12.86**	30 dBm
	11	2462	**7.94**	**12.79**	30 dBm
802.11g	1	2412	**10.25**	**15.14**	30 dBm
	6	2437	**10.49**	**15.38**	30 dBm
	11	2462	**10.5**	**15.39**	30 dBm
802.11n20	1	2412	**9.13**	**14.14**	30 dBm
	6	2437	**9.31**	**14.32**	30 dBm
	11	2462	**9.17**	**14.18**	30 dBm

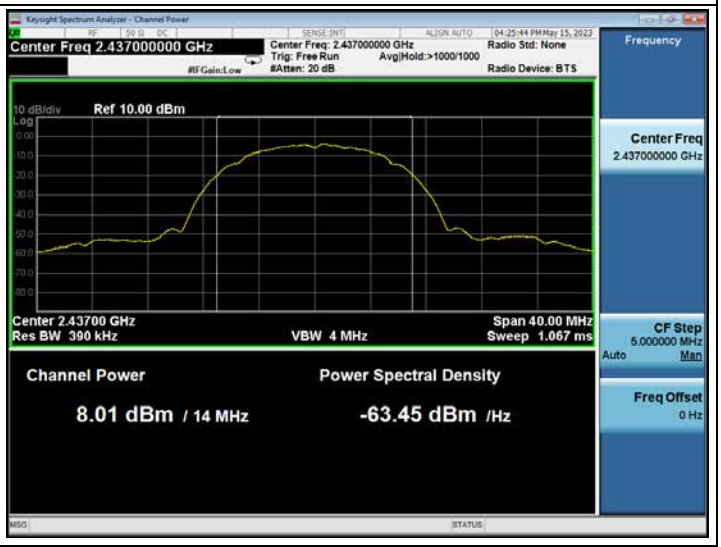
Note1: Maximum conducted (average) Output Power = Average conducted (average) Output Power + DCCF.
Note2: The DCCF(Duty Cycle Correct Factor) shows on section 2.4.

802.11b

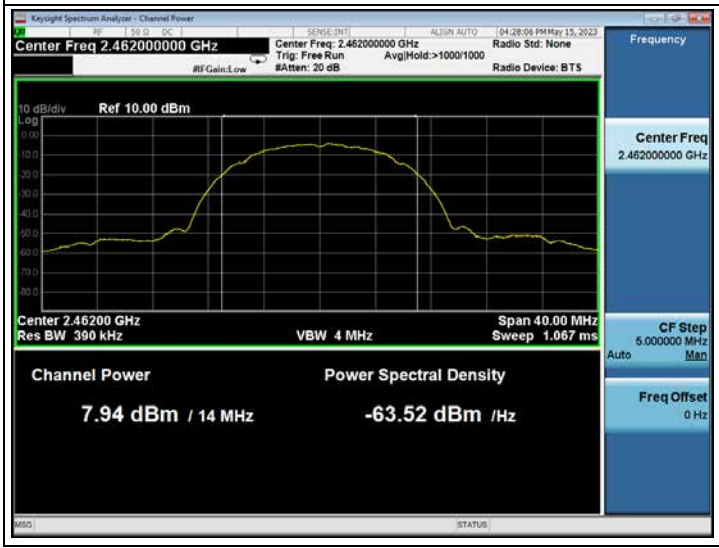
CH2412



CH2437

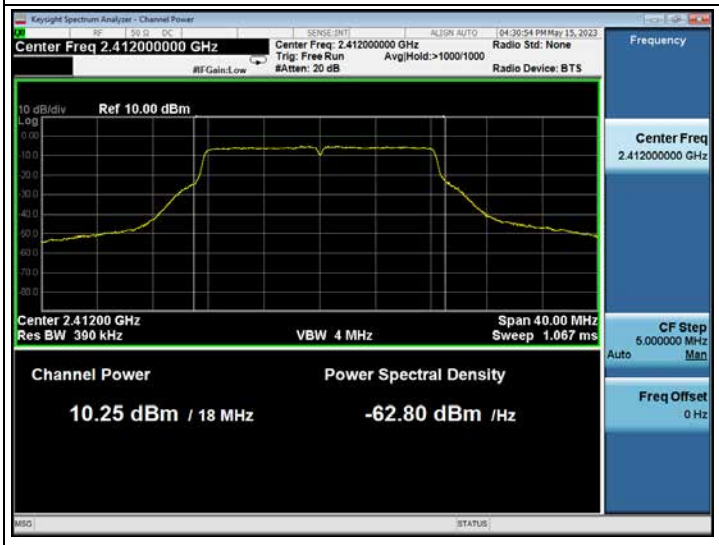


CH2462

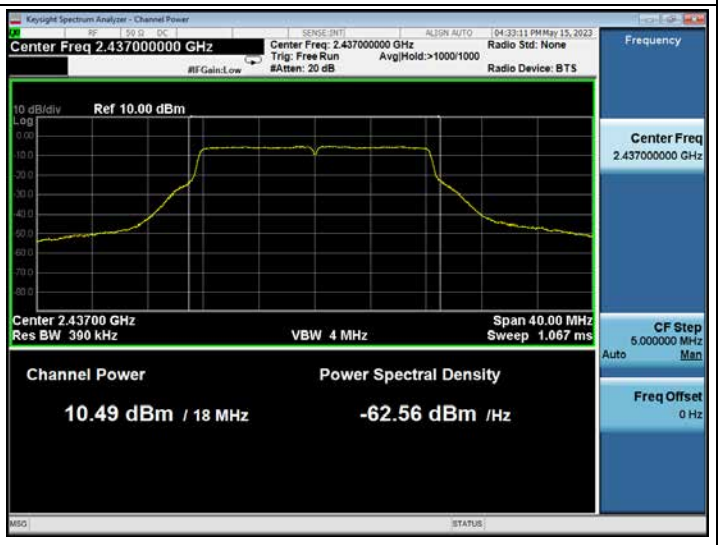


802.11g

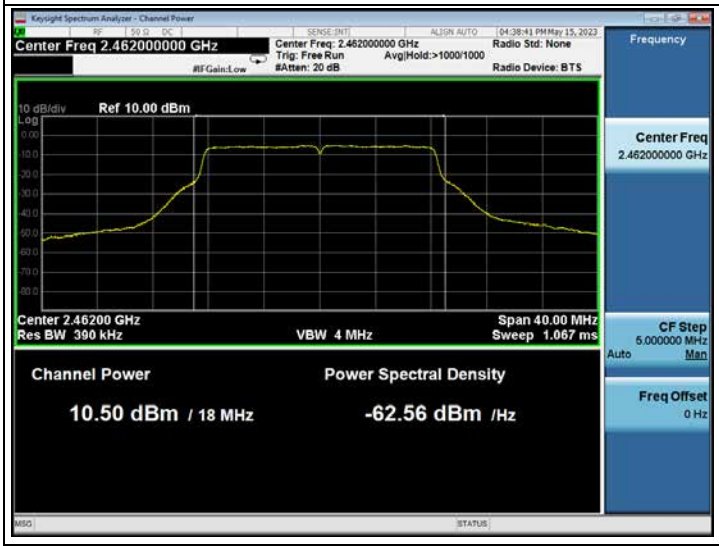
CH2412



CH2437

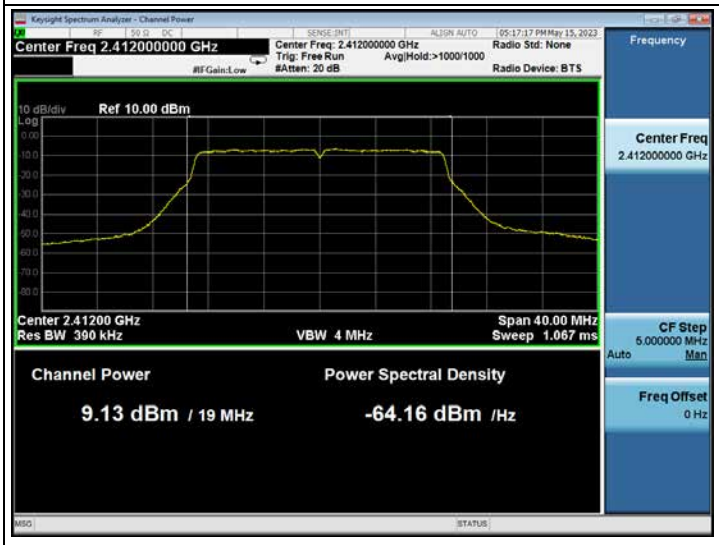


CH2462

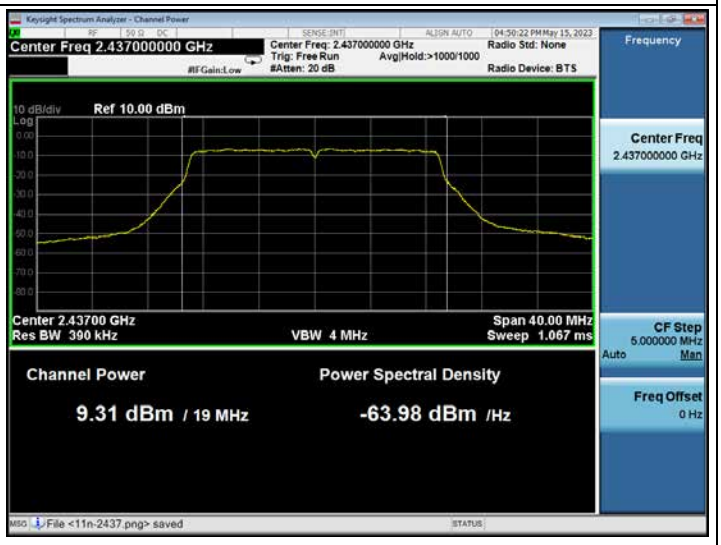


802.11n20

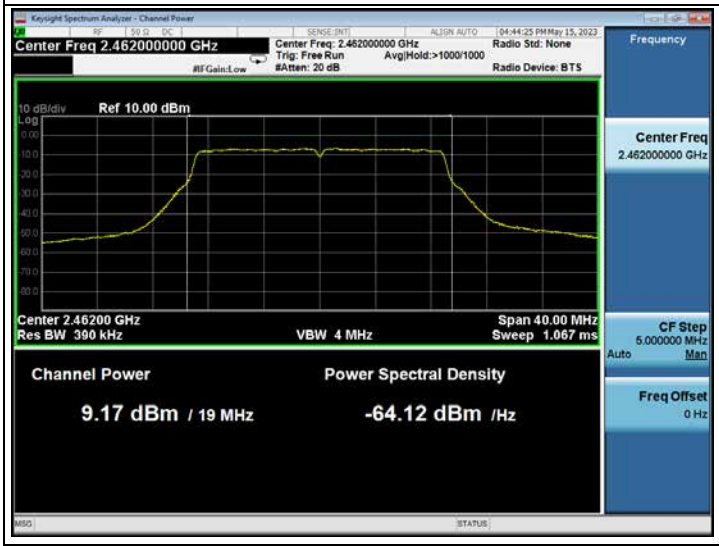
CH2412



CH2437



CH2462



8 EMISSION LIMITATIONS MEASUREMENT

8.1 Test Equipment

The following test equipment was used during the emission limitations test:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2022.09.15	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2022.09.21	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2022.09.21	1 Year

8.2 Block Diagram of Test Setup

The Same as Section. 5.2.

8.3 Specification Limits (§15.247(d))

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)). (※This test result attaching to Section. 3.7)

8.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

8.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:
a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.
Note that the channel found to contain the maximum PSD level can be used to

establish the reference level.

Establish an emission level by using the following procedure:
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Scan up through 10^{th} harmonic.

The test procedure is defined in ANSI C63.10-2013 (11.11.2 Reference level measurement and 11.11.3 Emission level measurement was used).

8.6 Test Results

PASSED.

The test data was attached in the next pages.

(Test Date: 2023.05.16-17 Temperature: 23℃ Humidity: 51 %)

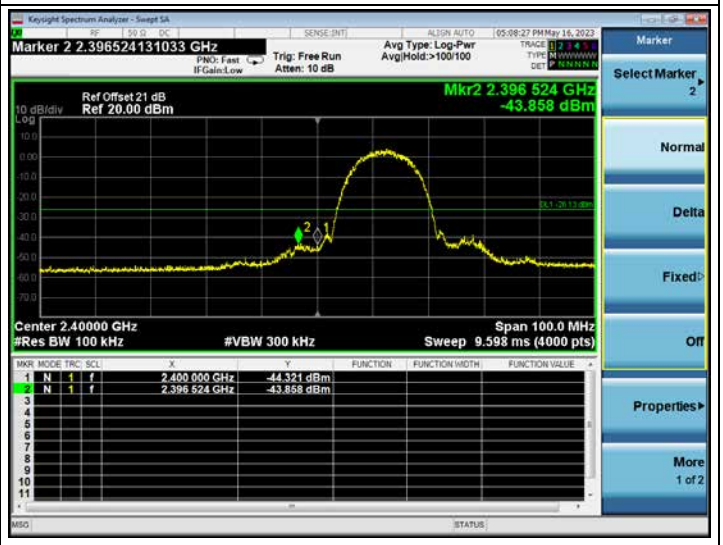
Mode	Channel	Frequency (MHz)	Data Page
802.11b	1	2412	P63
	6	2437	P64
	11	2462	P65
802.11g	1	2412	P66
	6	2437	P67
	11	2462	P68
802.11n20	1	2412	P69
	6	2437	P70
	11	2462	P71

802.11b

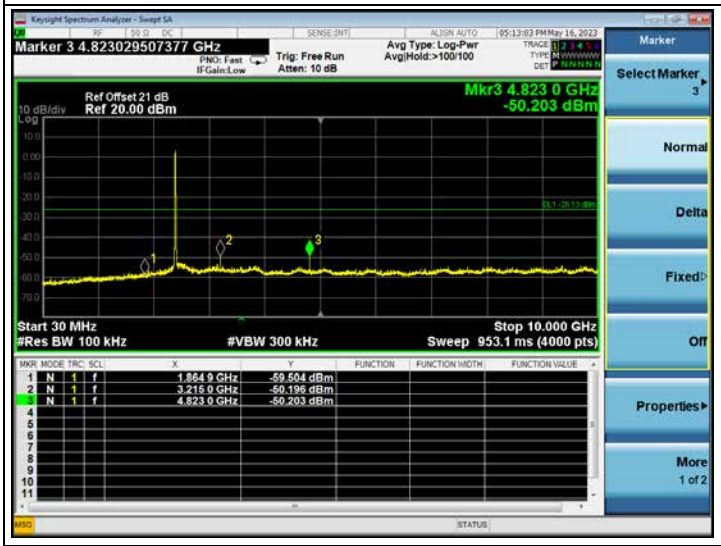
CH2412

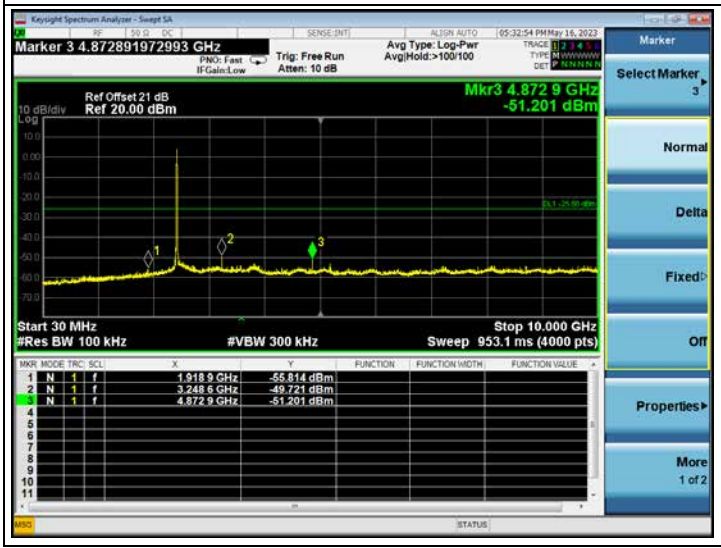
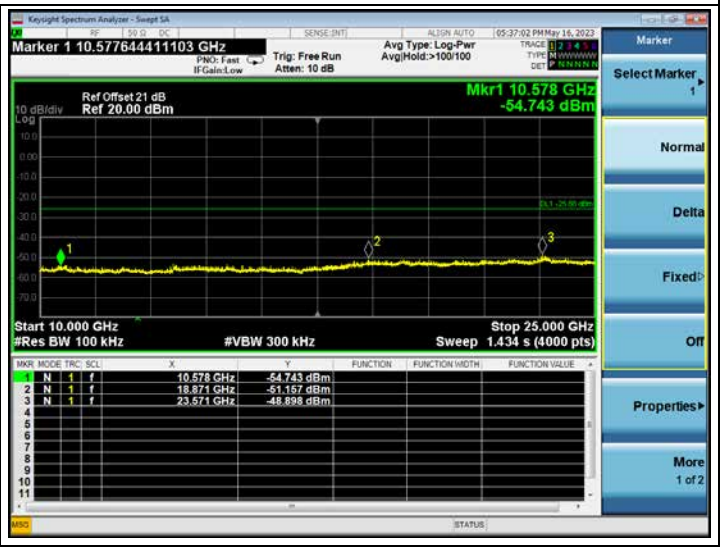
Reference Level

Lower Edge



Emission Level



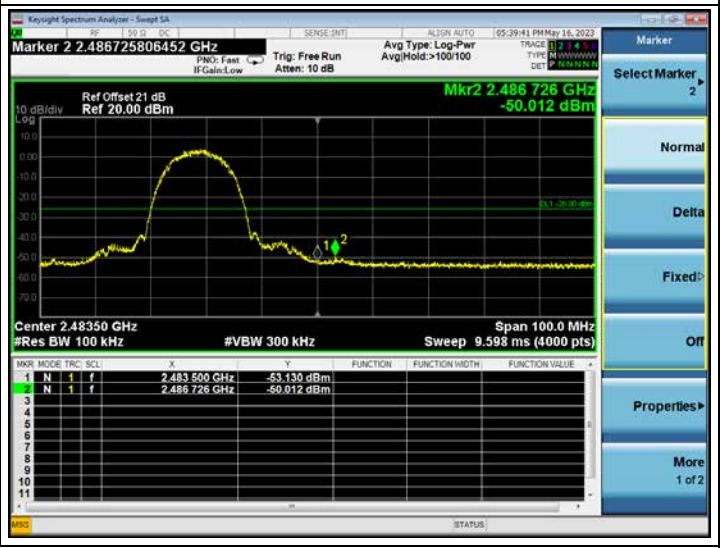
802.11b	
CH2437	
Reference Level	
	
Emission Level	
	

802.11b

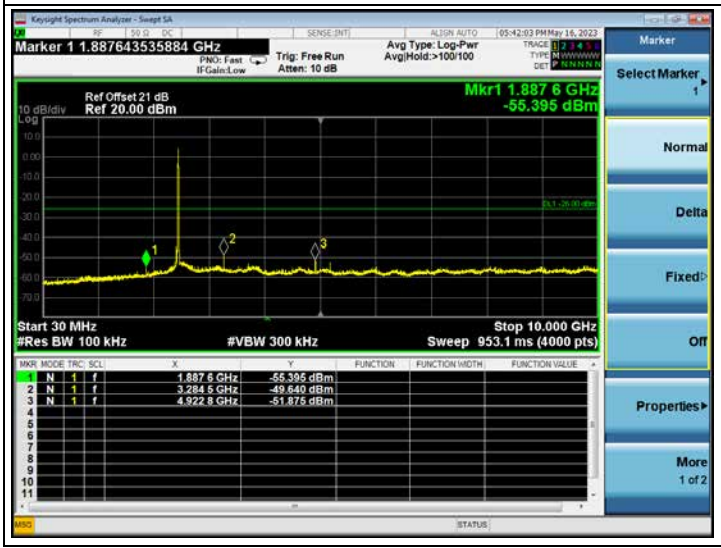
CH2462

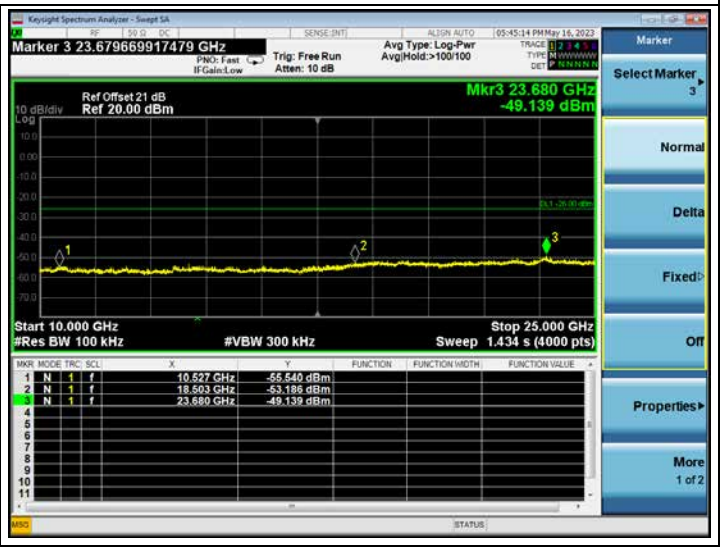
Reference Level

Higher Edge



Emission Level



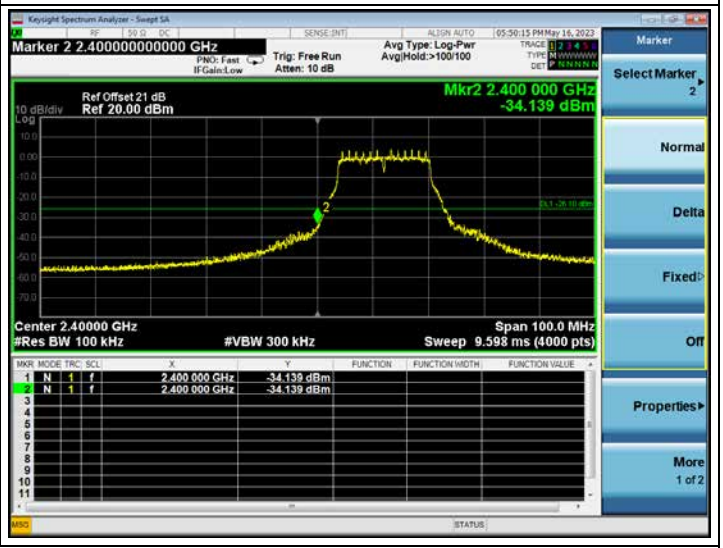


802.11g

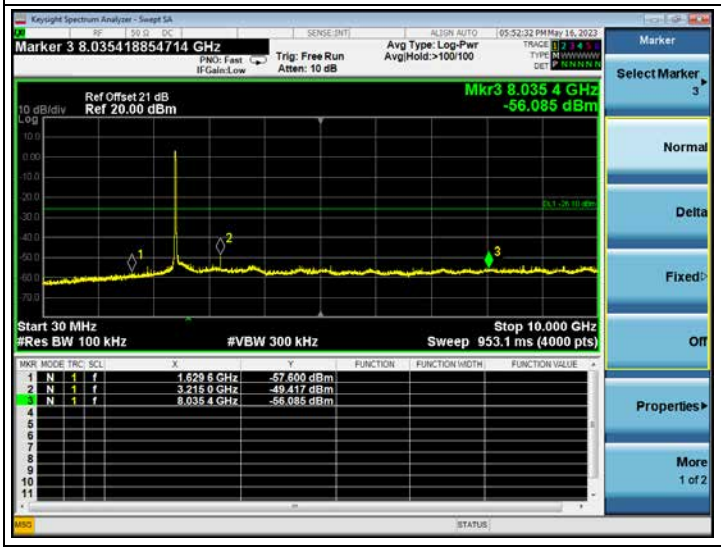
CH2412

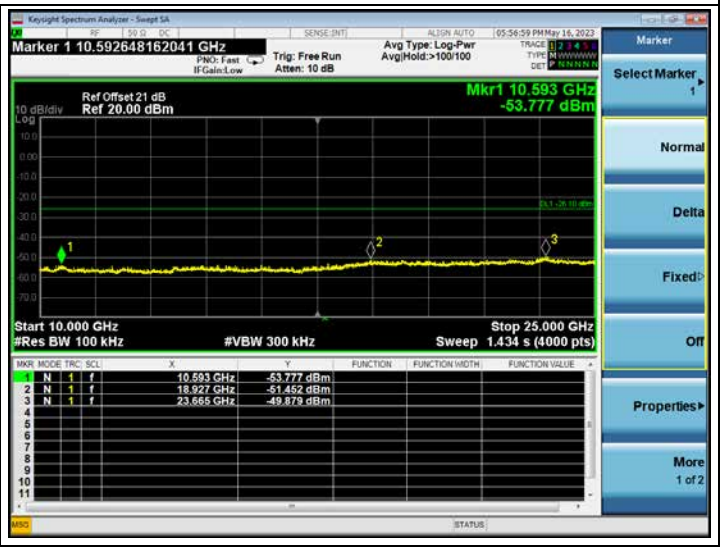
Reference Level

Lower Edge



Emission Level

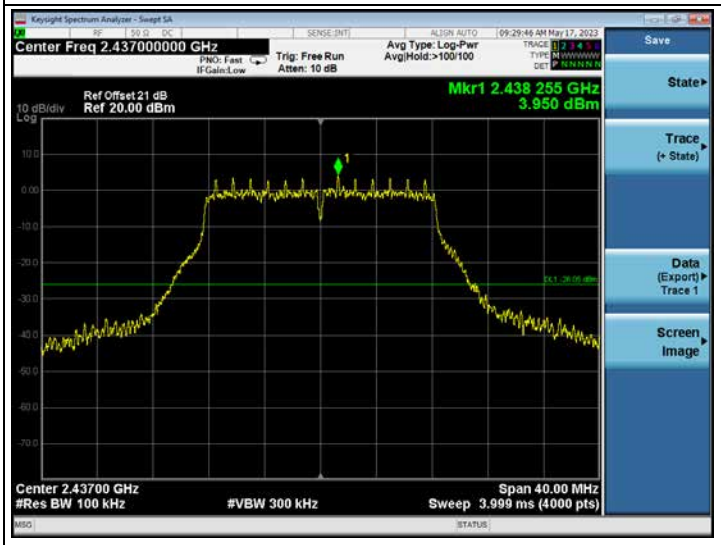




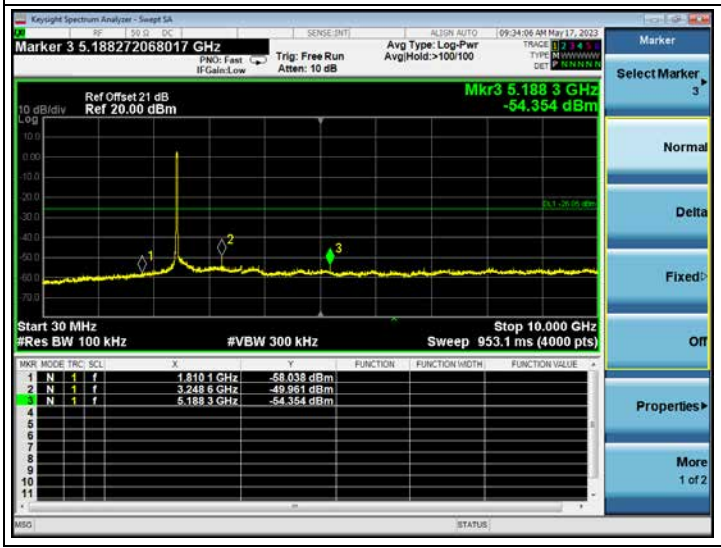
802.11g

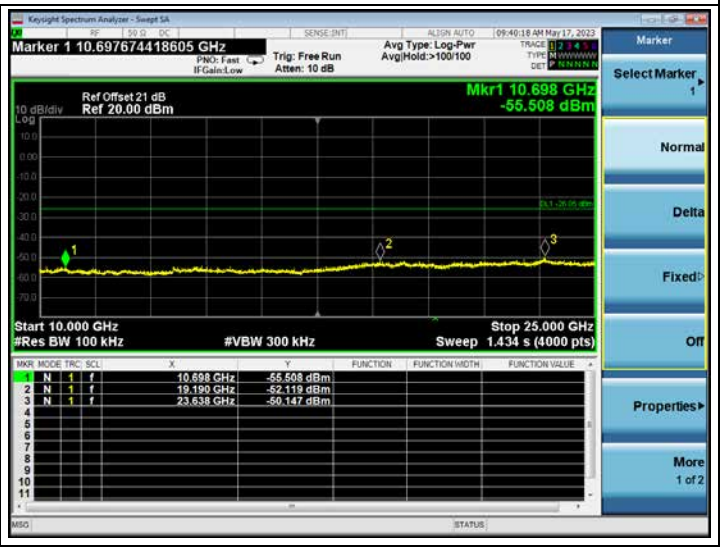
CH2437

Reference Level



Emission Level

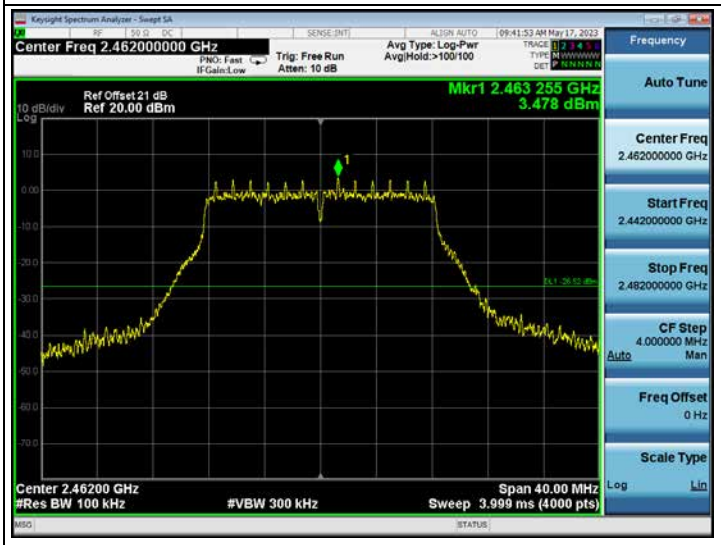




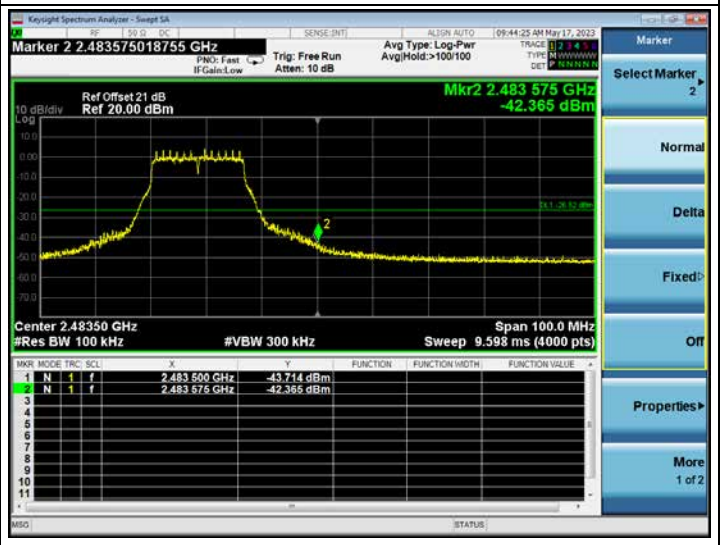
802.11g

CH2462

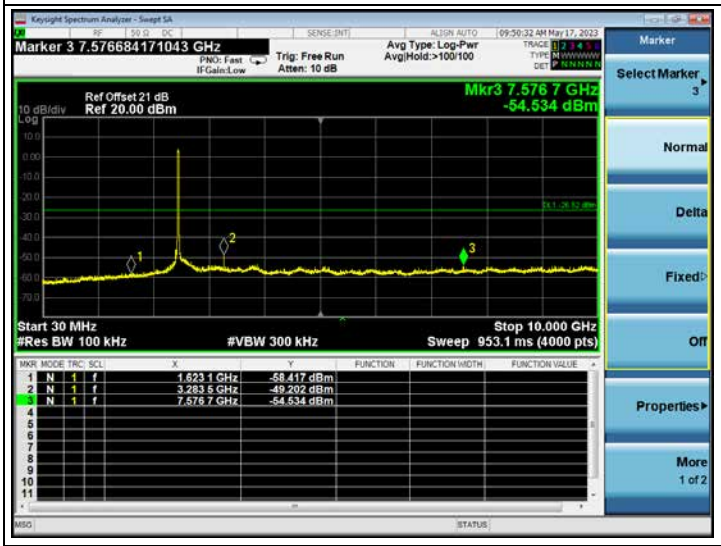
Reference Level

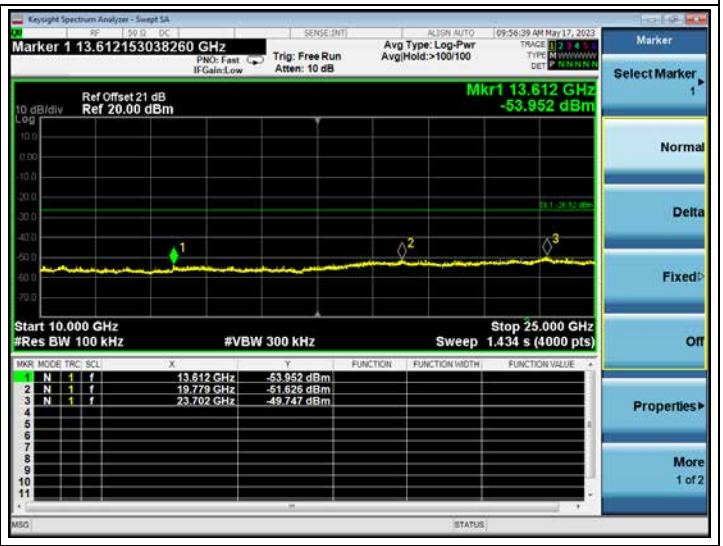


Higher Edge



Emission Level



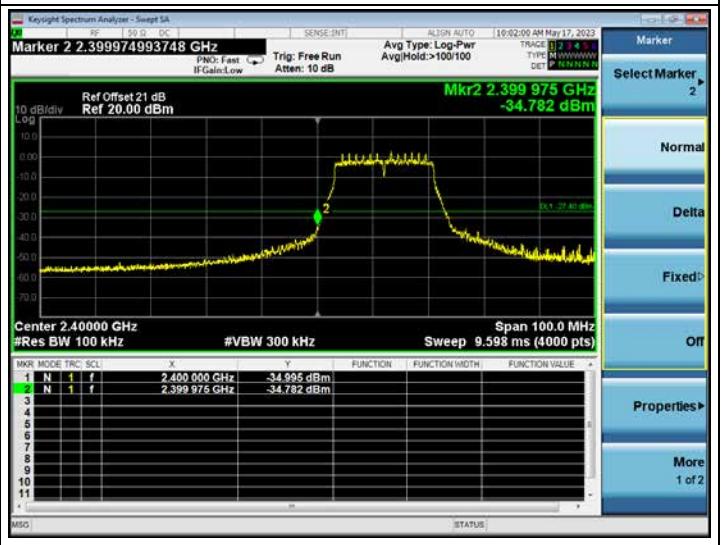


802.11n20

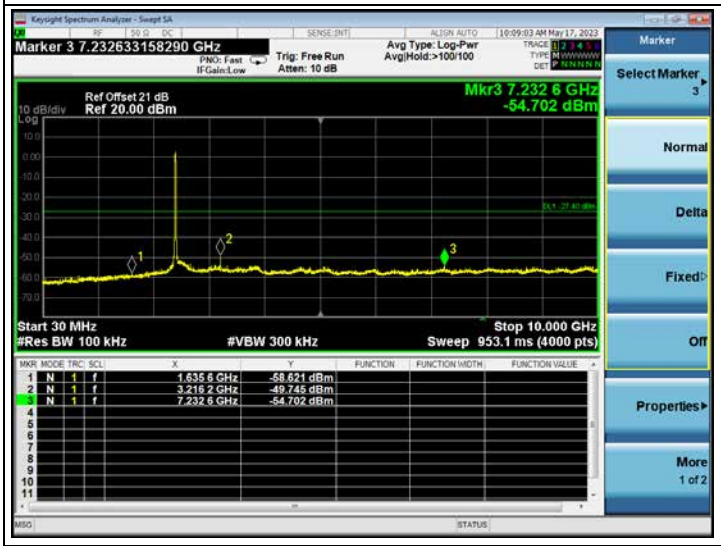
CH2412

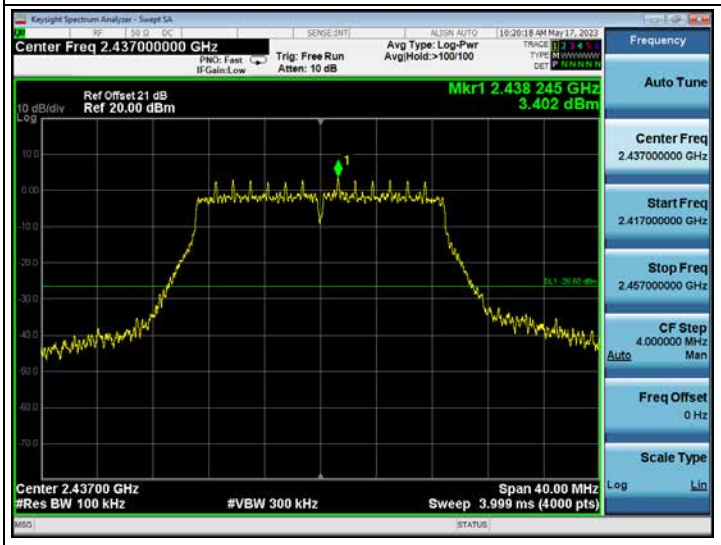
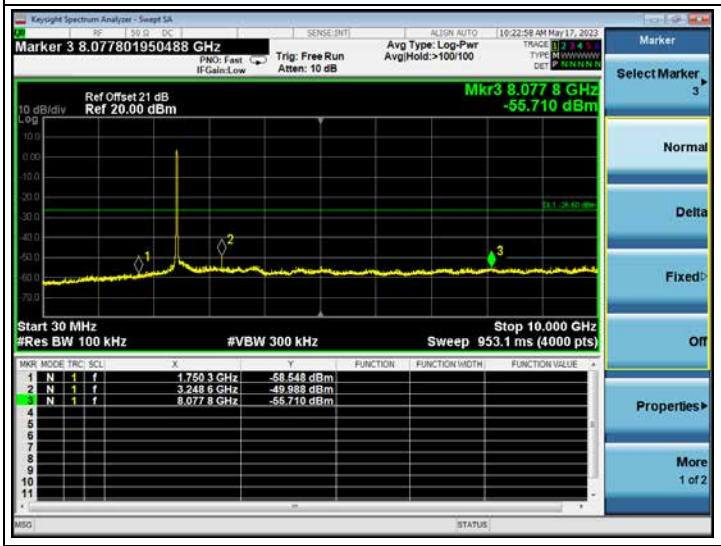
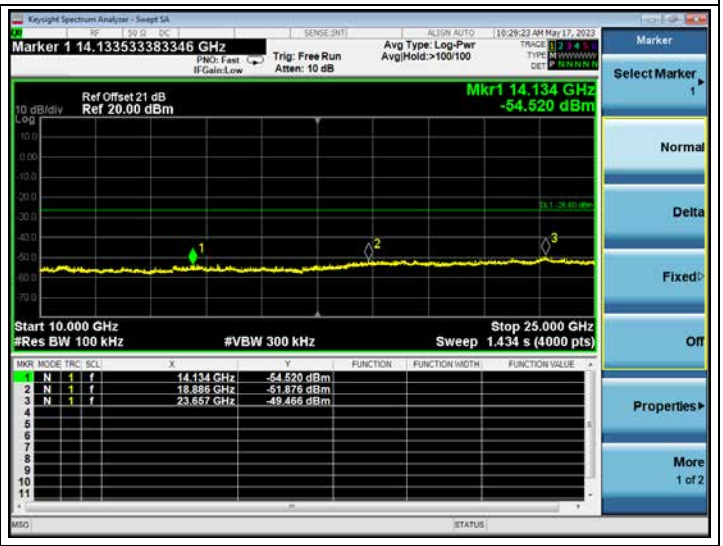
Reference Level

Lower Edge



Emission Level



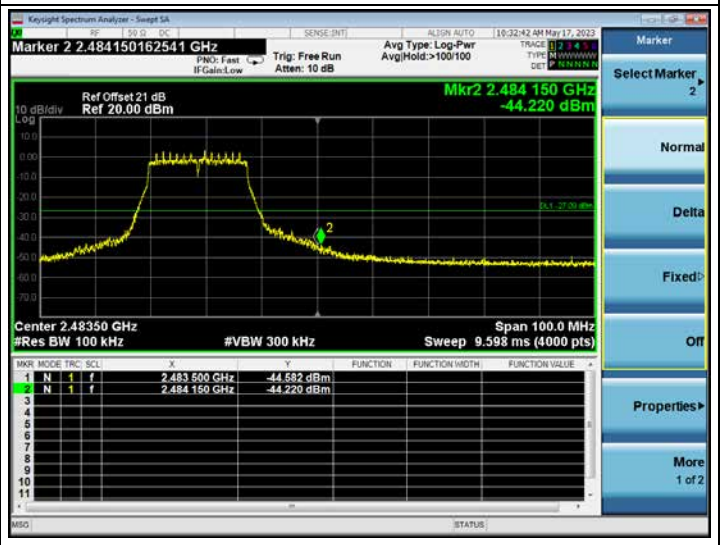
802.11n20	
CH2437	
Reference Level	
	
Emission Level	
	

802.11n20

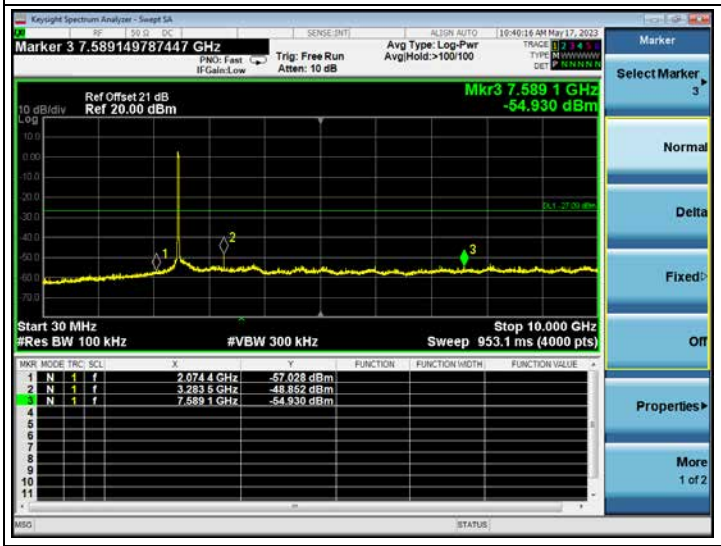
CH2462

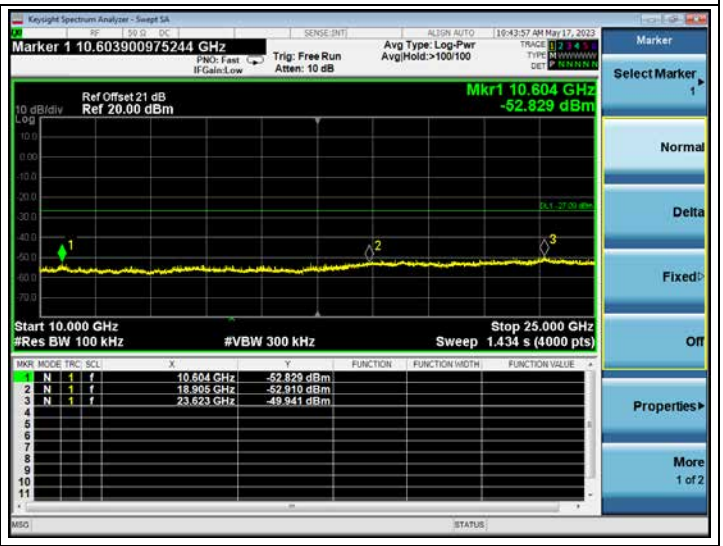
Reference Level

Higher Edge



Emission Level





9 POWER SPECTRAL DENSITY MEASUREMENT

9.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2022.09.15	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2022.09.21	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2022.09.21	1 Year

9.2 Block Diagram of Test Setup

The Same as section 5.2.

9.3 Specification Limits (§15.247(e))

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band. The same method of determining the conducted output power shall be used to determine the power spectral density.

9.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

9.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Method AVGPSD-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction.
a) Measure the duty cycle (D) of the transmitter output signal.
b) Set analyzer center frequency to DTS channel center frequency.
c) Set the span to at least 1.5 times the OBW.
d) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set the VBW ≥ [3 × RBW].
f) Detector = power averaging (rms) or sample detector (when rms not available).
g) Ensure that the number of measurement points in the sweep ≥ [2 × span / RBW].
h) Sweep time = auto couple.
i) Do not use sweep triggering; allow sweep to “free run.”
j) Employ trace averaging (rms) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add [10 log (1 / D)], where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.
m) If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point

requirement as the RBW is reduced).

The test procedure is defined in ANSI C63.10-2013 (11.10.5 Measurement Procedure “Method AVGPSD-2” was used).

9.6 Test Results

PASSED.

All the test results are attached in next pages.

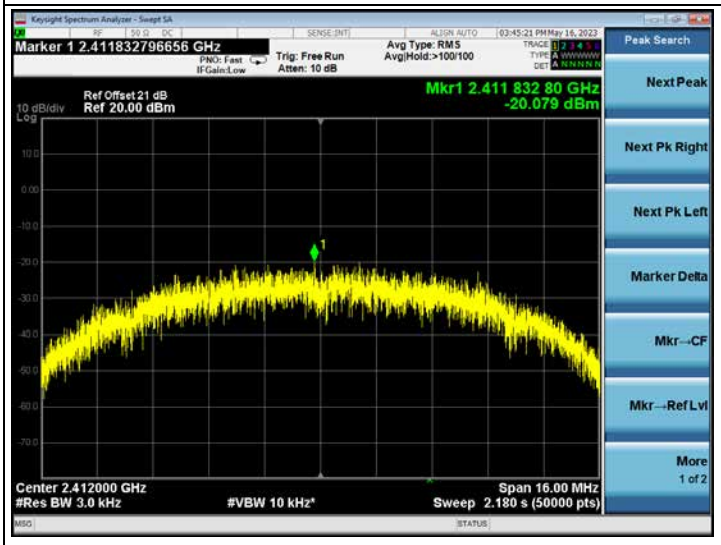
(Test Date: 2023.05.16 Temperature: 23℃ Humidity: 51 %)

Mode	Channel	Frequency (MHz)	**Average Power Spectral Density (dBm)**	**Power Spectral Density (dBm)**	Limit
802.11b	1	2412	**-20.079**	**-15.229**	8 dBm
	6	2437	**-19.271**	**-14.421**	8 dBm
	11	2462	**-19.963**	**-15.113**	8 dBm
802.11g	1	2412	**-19.176**	**-14.286**	8 dBm
	6	2437	**-19.582**	**-14.692**	8 dBm
	11	2462	**-18.792**	**-13.902**	8 dBm
802.11n20	1	2412	**-19.441**	**-14.431**	8 dBm
	6	2437	**-19.368**	**-14.358**	8 dBm
	11	2462	**-19.276**	**-14.266**	8 dBm

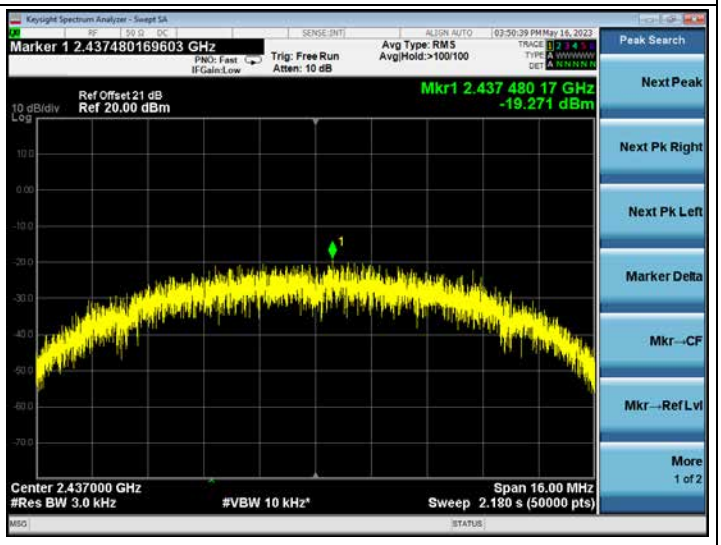
Note1: Power Spectral Density = Average Power Spectral Density + DCCF
Note2: The DCCF(Duty Cycle Correct Factor) shows on section 2.4.

802.11b

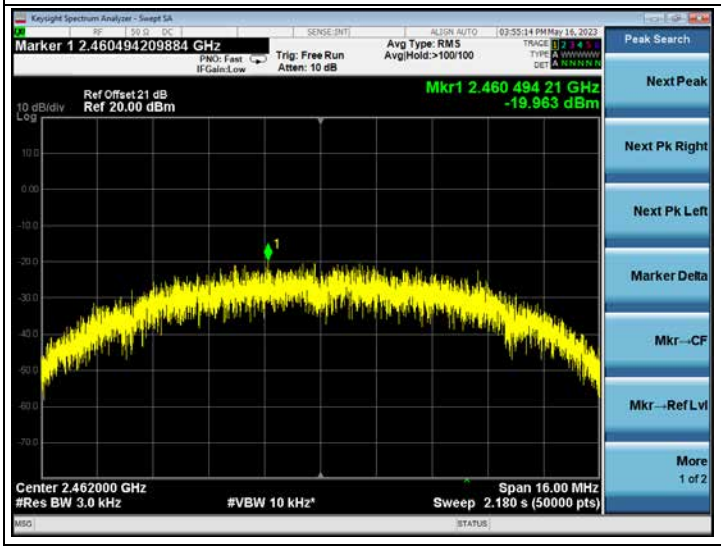
CH2412



CH2437

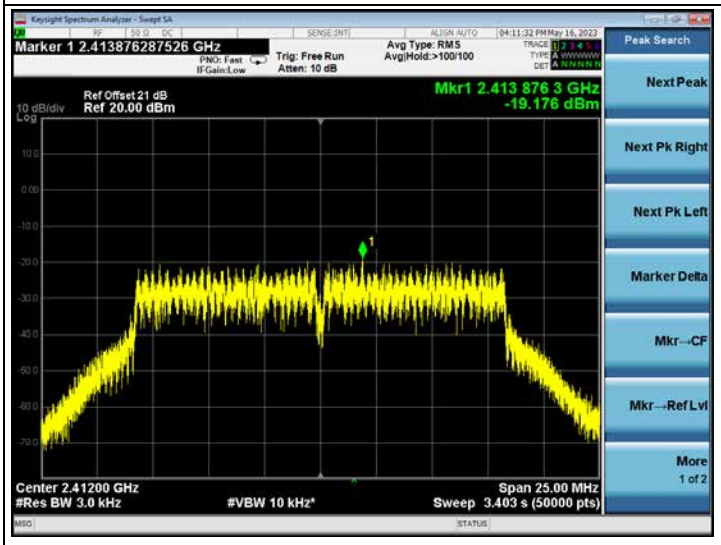


CH2462

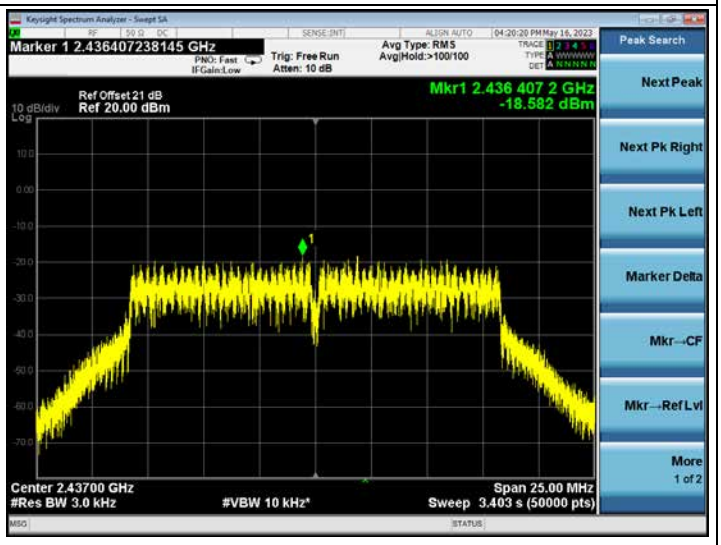


802.11g

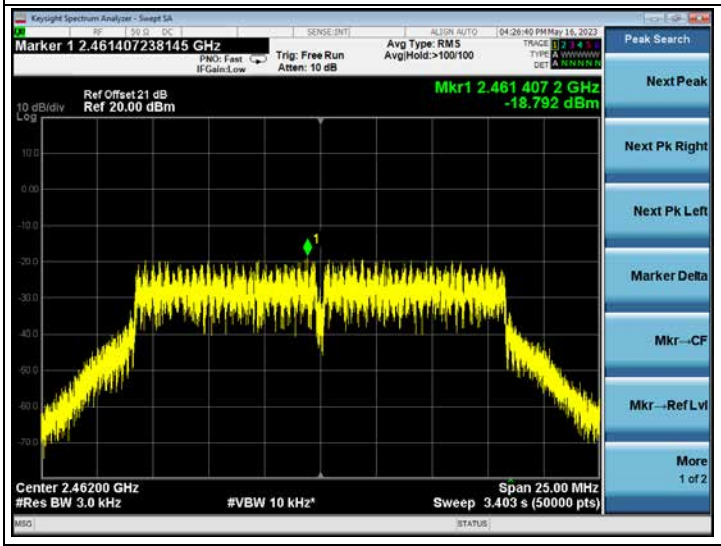
CH2412



CH2437



CH2462



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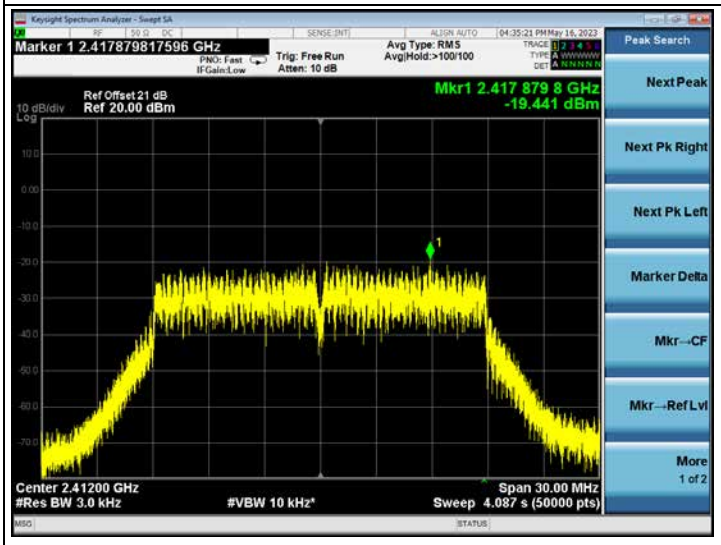
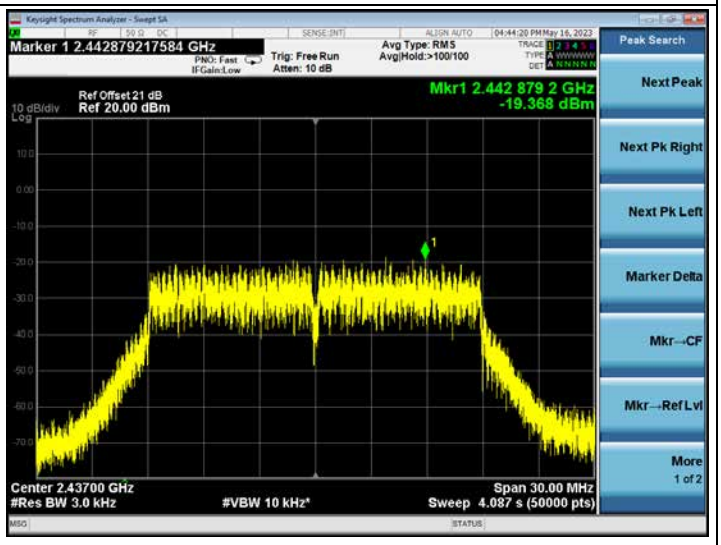


CH2437



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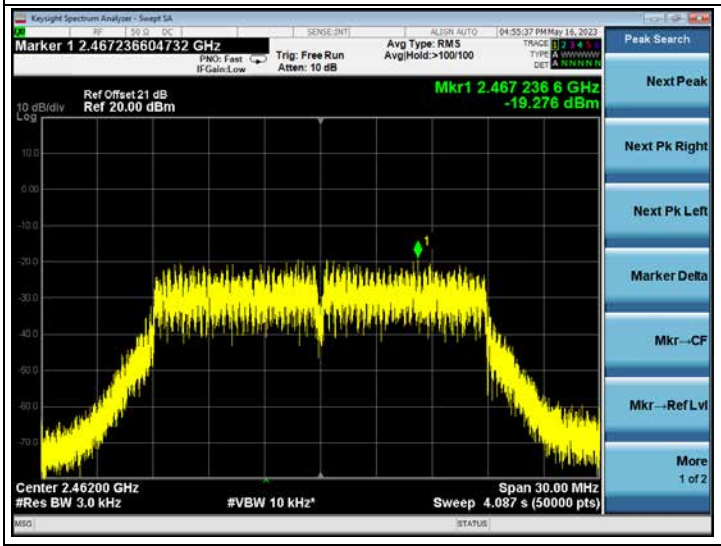

10 ANTENNA REQUIREMENT

10.1 Specification Limits (§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.

10.2 Result

According to KDB 353028 D1, the following describes the three ways that can be used to demonstrate compliance to Section 15.203: a) Antenna permanently attached. b) Unique (non-standard) antenna connector. c) Professional installation.
For this product, the antenna is: ☑ Antenna permanently attached ☐ Unique (non-standard) antenna connector ☐ Professional installation ☐ not meet any of ways list above that ☑ compliant ☐ not compliant with the requirement of Section 15.203.

11 DEVIATION TO TEST SPECIFICATIONS

None.

12 MEASUREMENT UNCERTAINTY LIST

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2.
The uncertainties value is not used in determining the PASS/FAIL results.

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Conducted Emission No.1 Shielded Room	9kHz~150kHz	±3.1 dB
	150kHz~30MHz	±2.6 dB
Conducted Emission No.3 Shielded Room	9kHz~150kHz	±3.1 dB
	150kHz~30MHz	±2.6 dB
Radiated Emission	30MHz~200MHz, Horizontal	±3.8 dB
	30MHz~200MHz, Vertical	±4.1 dB
	200MHz~1000MHz, Horizontal	±3.6 dB
	200MHz~1000MHz, Vertical	±5.1 dB
	1GHz~6GHz	±5.3 dB
	6GHz~18GHz	±5.3 dB
	18GHz~40GHz	±3.5 dB
Output Power Test	50MHz~18GHz	0.77 dB
Power Density Test	9kHz~6GHz	1.08 dB
RF Frequency Test	9kHz~40GHz	$6*10^{-4}$
Bandwidth Test	9kHz~6GHz	$1.5*10^{-3}$
RF Radiated Power Test	30MHz~1000MHz	3.06 dB
Conducted Output Power Test	50MHz~18GHz	0.83 dB
AC Voltage(<10kHz) Test	120V~230V	0.04 %
DC Power Test	0V~30V	0.4 %
Temperature	-40℃~+100℃	0.52 ℃
Humidity	30%~95%	2.6 %