



6. POWER SPECTRAL DENSITY TEST

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8dBm/3kHz	2400-2483.5	PASS

6.2 TEST PROCEDURE

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

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

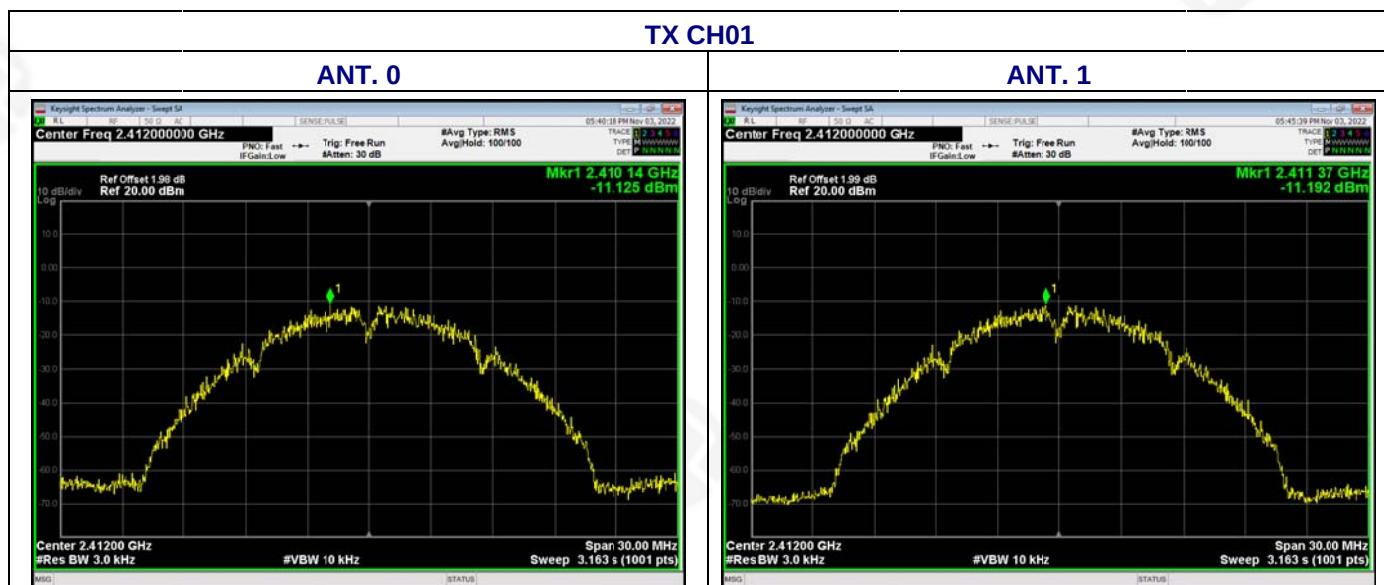
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.



6.6 TEST RESULT

Temperature :	26°C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	TX b Mode		

Frequency	Power Spectral Density ANT. 0 (dBm/3kHz)	Power Spectral Density ANT. 1 (dBm/3kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-11.13	-11.19	-8.15	8	PASS
2437 MHz	-11.68	-11.21	-8.43	8	PASS
2462 MHz	-11.13	-10.05	-7.55	8	PASS



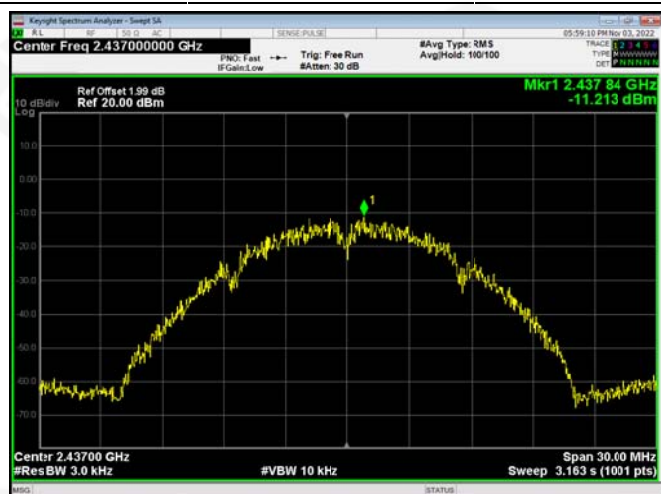


TX CH06

ANT. 0



ANT. 1



TX CH11

ANT. 0



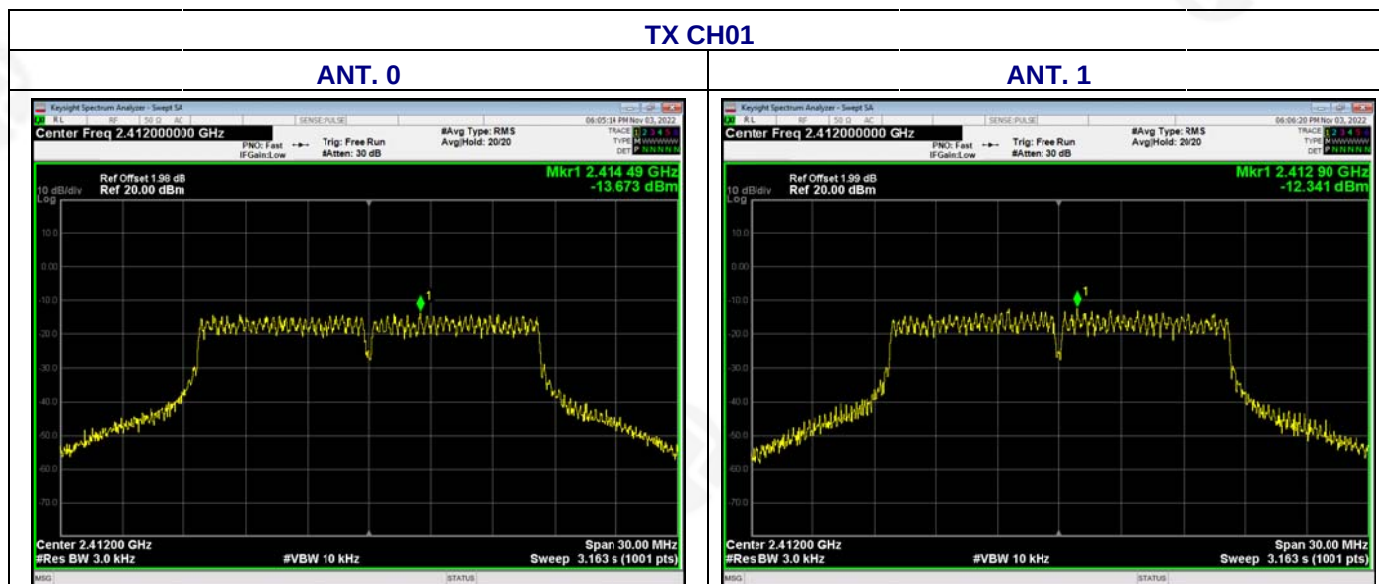
ANT. 1





Temperature :	26°C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	TX g Mode		

Frequency	Power Spectral Density ANT. 0 (dBm/3kHz)	Power Spectral Density ANT. 1 (dBm/3kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-13.67	-12.34	-9.94	8	PASS
2437 MHz	-13.42	-12.71	-10.04	8	PASS
2462 MHz	-13.84	-11.62	-9.58	8	PASS



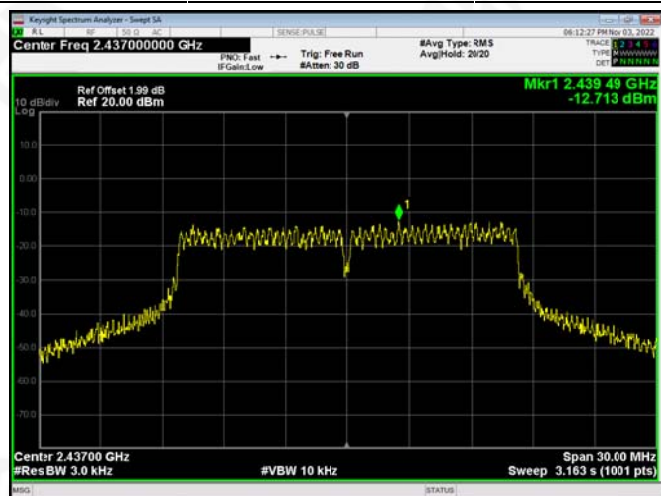


TX CH06

ANT. 0

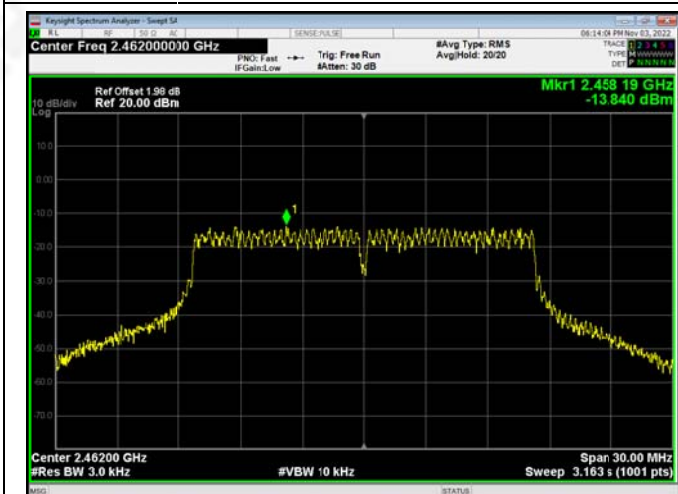


ANT. 1

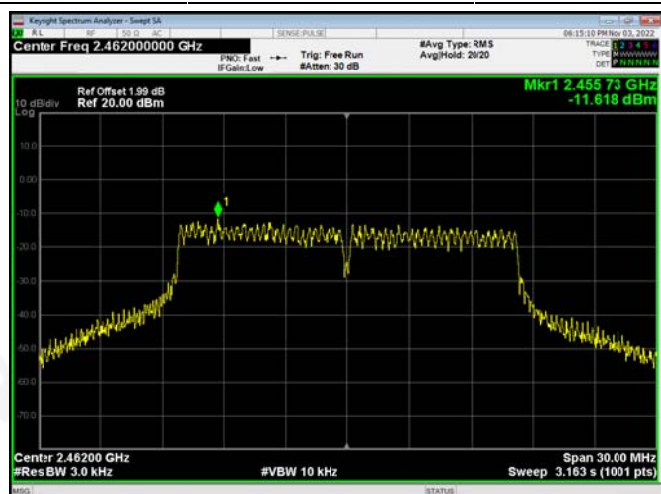


TX CH11

ANT. 0



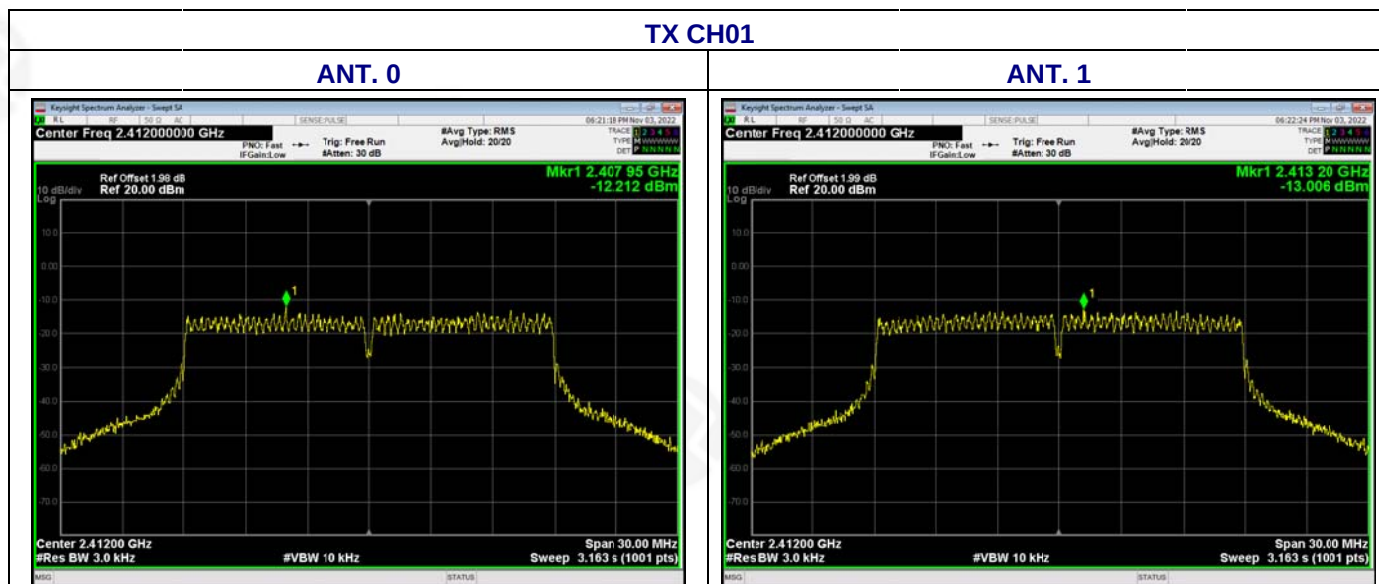
ANT. 1





Temperature :	26°C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	TX n Mode(20M)		

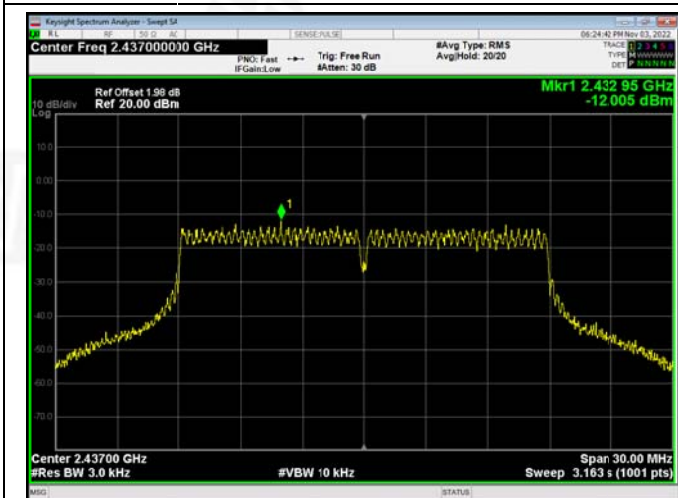
Frequency	Power Spectral Density ANT. 0 (dBm/3kHz)	Power Spectral Density ANT. 1 (dBm/3kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-12.21	-13.01	-9.58	8	PASS
2437 MHz	-12.01	-12.36	-9.17	8	PASS
2462 MHz	-13.05	-11.95	-9.45	8	PASS



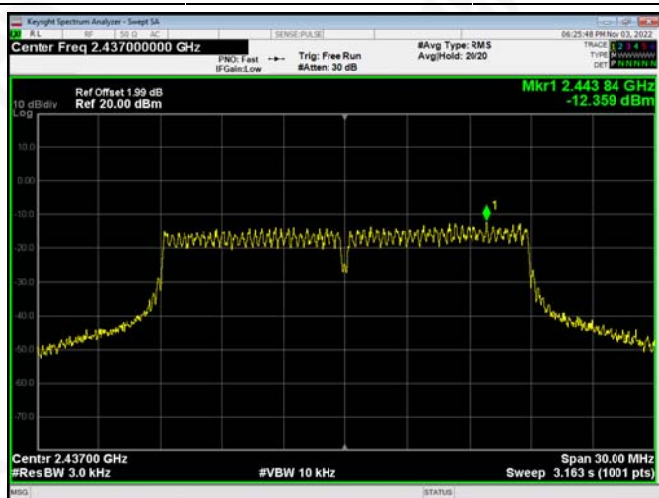


TX CH06

ANT. 0

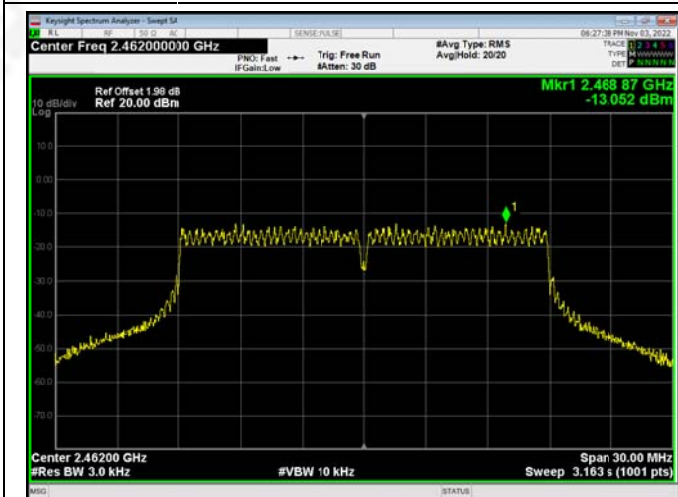


ANT. 1

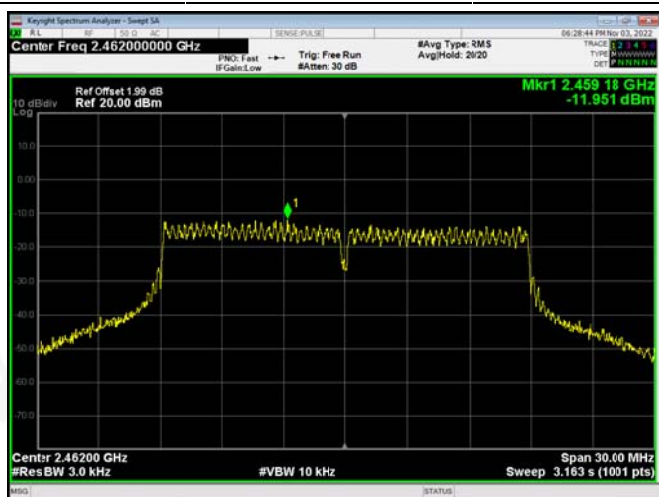


TX CH11

ANT. 0



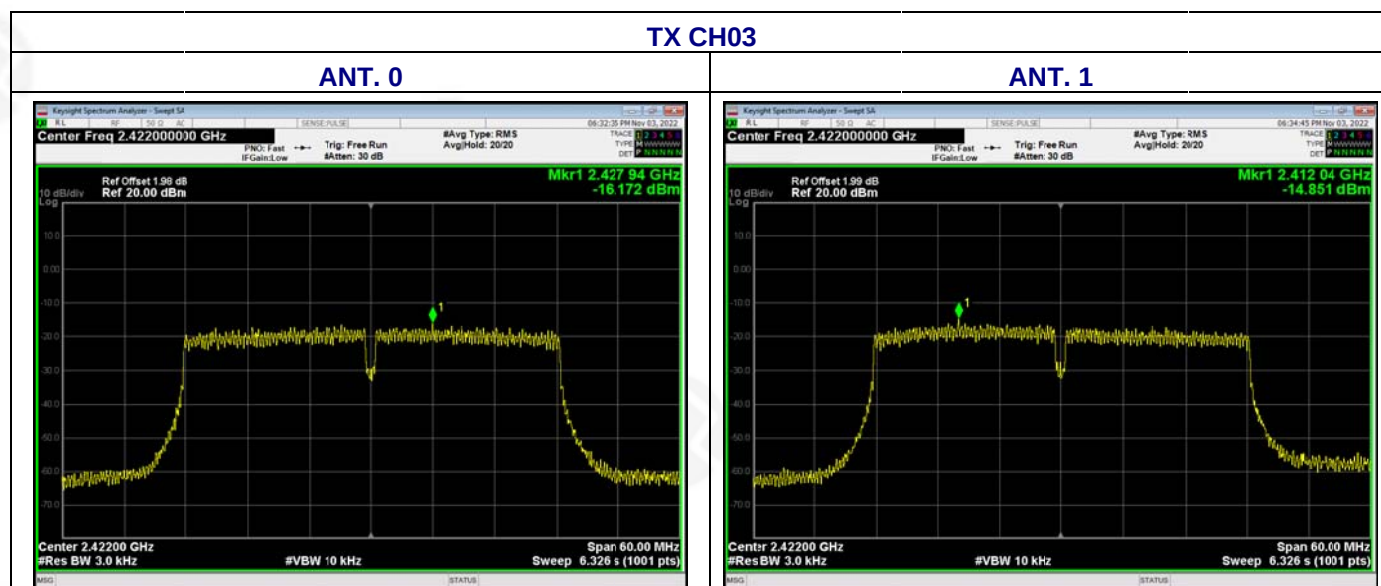
ANT. 1





Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	TX n Mode(40M)		

Frequency	Power Spectral Density ANT. 0 (dBm/3kHz)	Power Spectral Density ANT. 1 (dBm/3kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422 MHz	-16.17	-14.85	-12.45	8	PASS
2437 MHz	-16.21	-14.97	-12.54	8	PASS
2452 MHz	-16.17	-14.78	-12.41	8	PASS



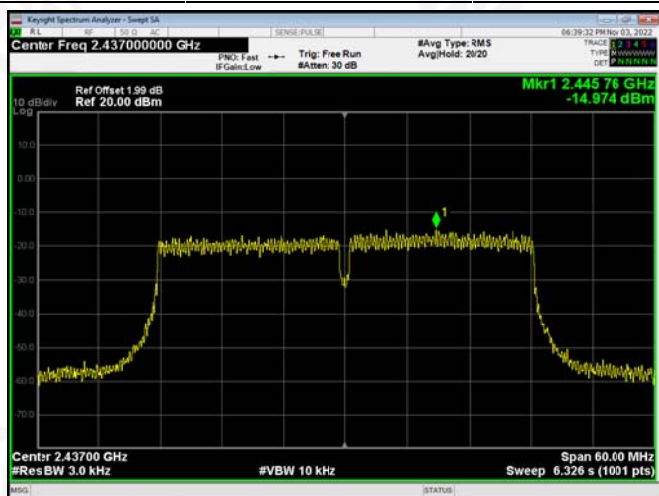


TX CH06

ANT. 0

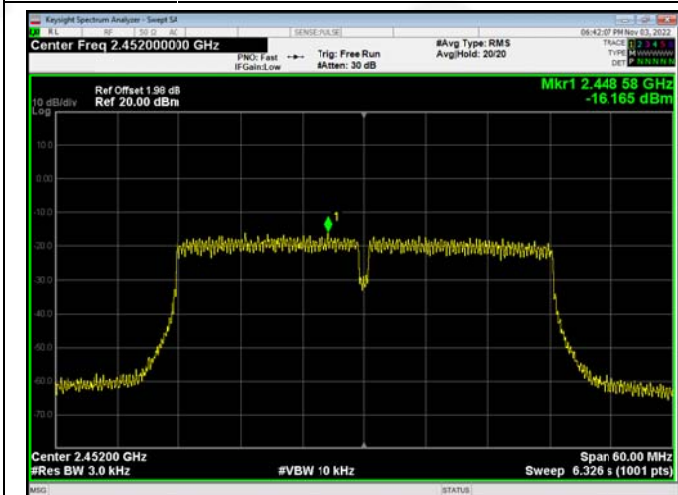


ANT. 1

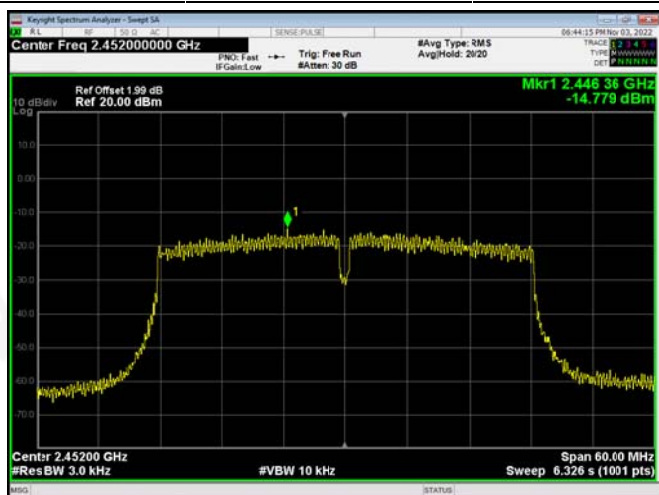


TX CH09

ANT. 0



ANT. 1





7. CHANNEL BANDWIDTH& 99% OCCUPY BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

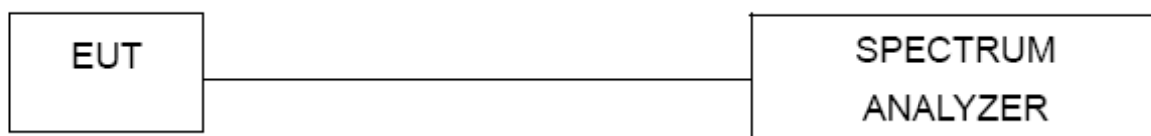
7.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



7.6 TEST RESULT

Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	ANT. 0 Mode		

Test CH	-6dB Occupy Bandwidth (MHz)					Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(KHz)	
Lowest	8.023	16.439	17.673	35.167	>500	Pass
Middle	8.058	16.473	17.714	34.393		
Highest	8.033	16.501	17.735	35.769		

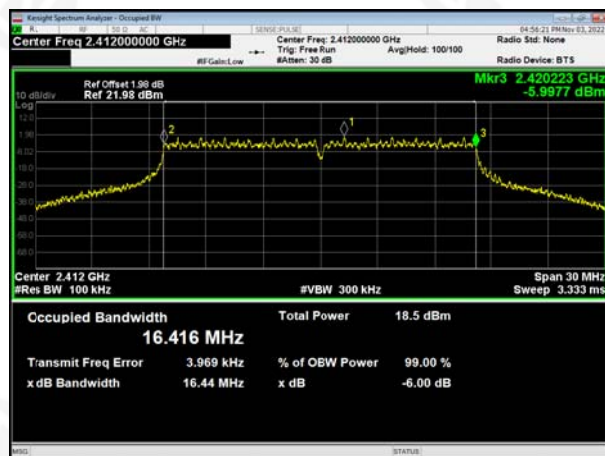
Test CH	99%Occupy Bandwidth (MHz)			
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Lowest	12.831	16.509	17.705	35.962
Middle	12.865	16.465	17.682	35.906
Highest	12.775	16.495	17.728	36.05



-6 dB OBW Test plot as follows:
802.11b

802.11g

Lowest channel



Middle channel



Highest channel

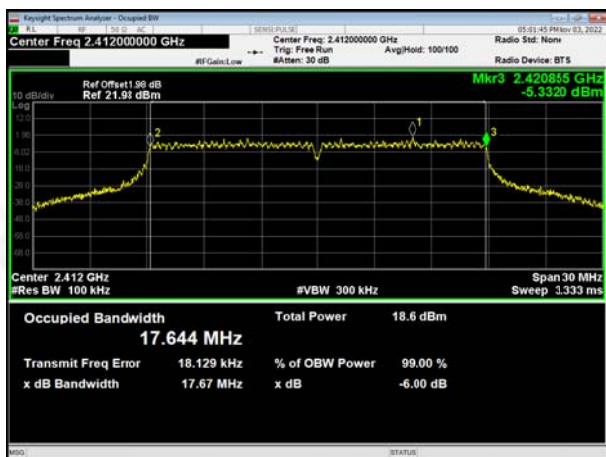




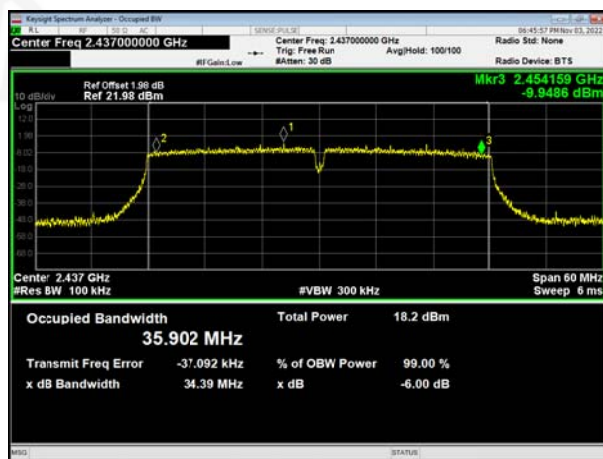
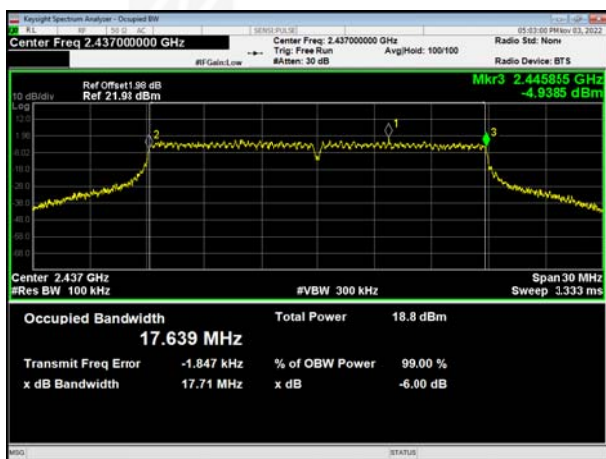
802.11n20

802.11n40

Lowest channel



Middle channel



Highest channel





99% OBW Test plot as follows:

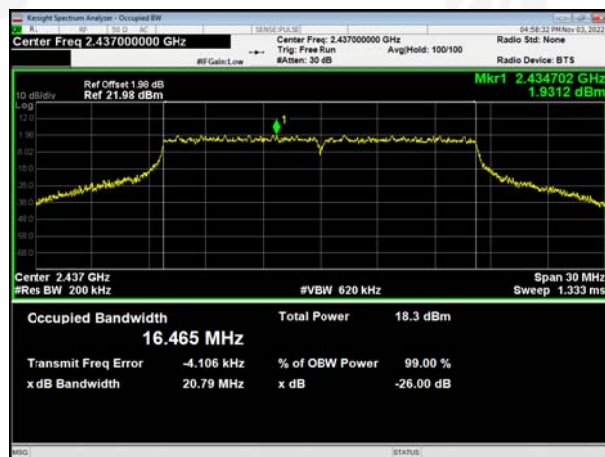
802.11b

802.11g

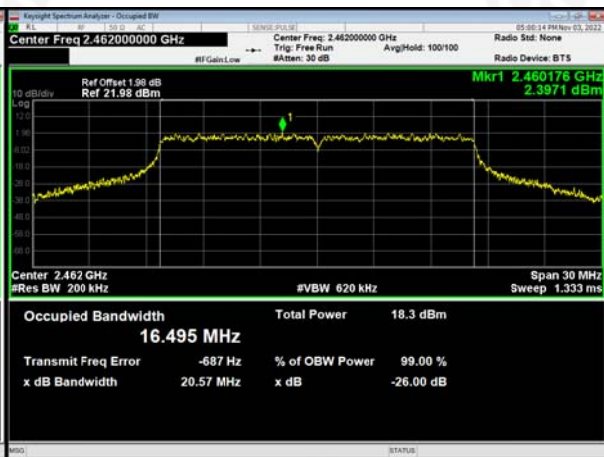
Lowest channel



Middle channel



Highest channel

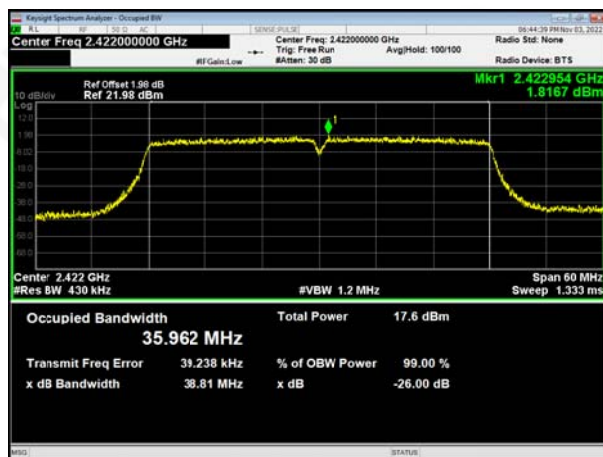
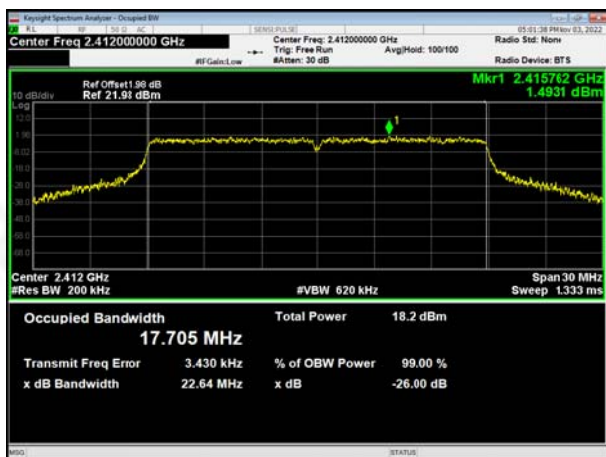




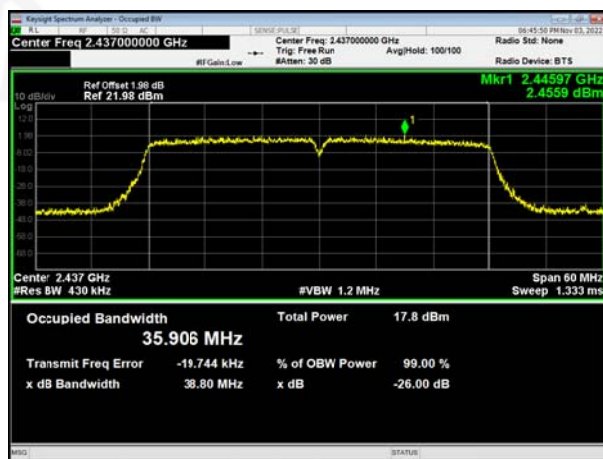
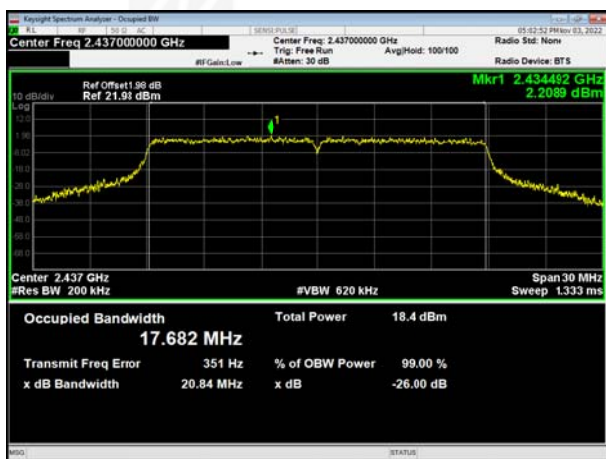
802.11n20

802.11n40

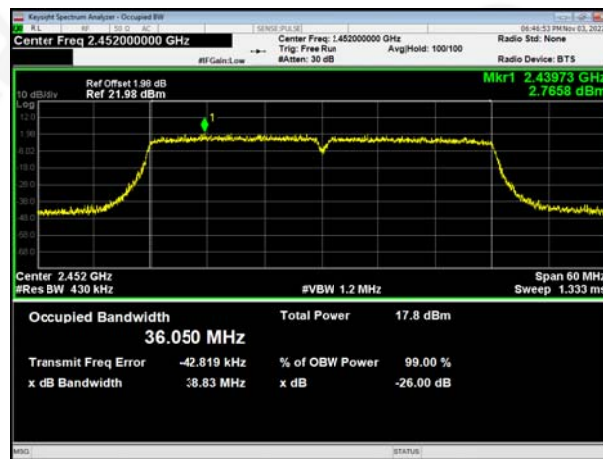
Lowest channel



Middle channel



Highest channel





Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	ANT. 1 Mode		

Test CH	-6dB Occupy Bandwidth (MHz)					Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(KHz)	
Lowest	8.027	16.408	17.709	35.619	>500	Pass
Middle	7.556	16.459	17.658	36.254		
Highest	8.528	16.437	17.642	30.115		

Test CH	99%Occupy Bandwidth (MHz)			
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Lowest	12.526	16.416	17.641	35.916
Middle	12.731	16.52	17.723	36.093
Highest	12.9	16.513	17.729	35.734

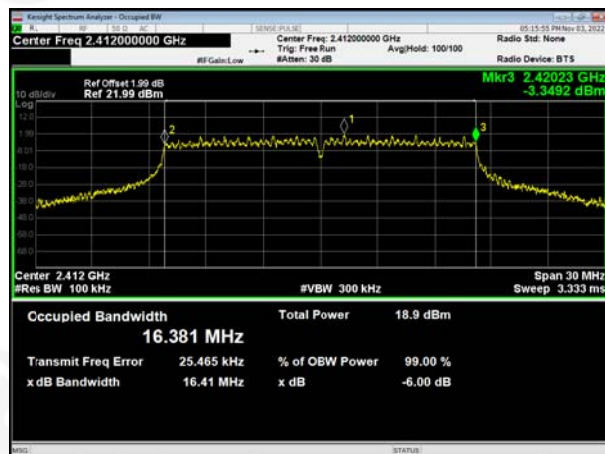


-6 dB OBW Test plot as follows:

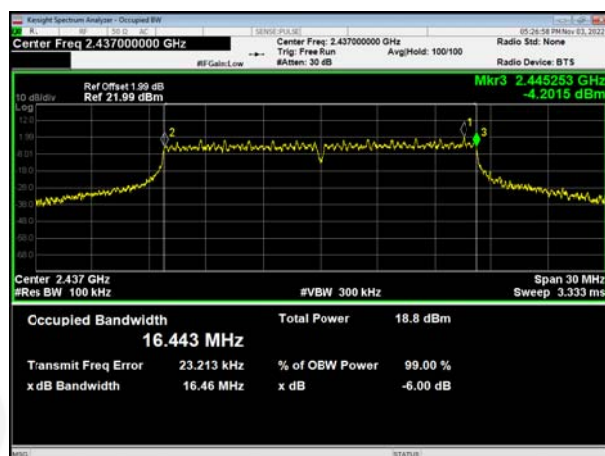
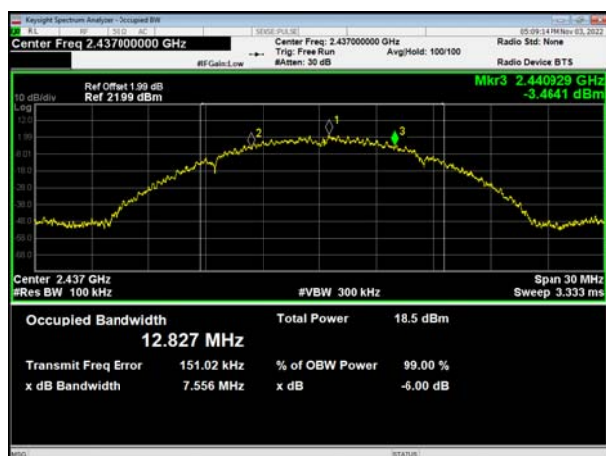
802.11b

802.11g

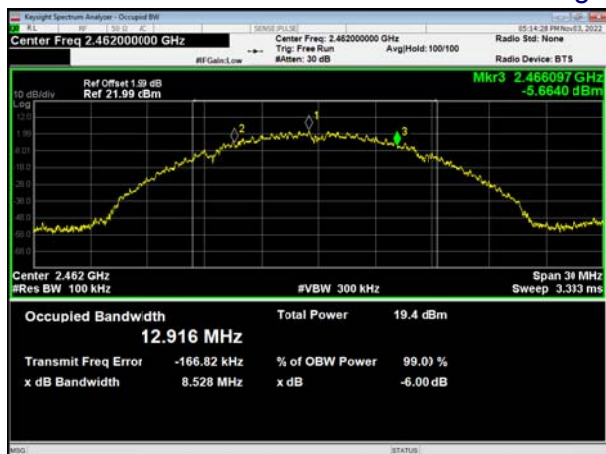
Lowest channel



Middle channel



Highest channel





802.11n20

802.11n40

Lowest channel



Middle channel



Highest channel

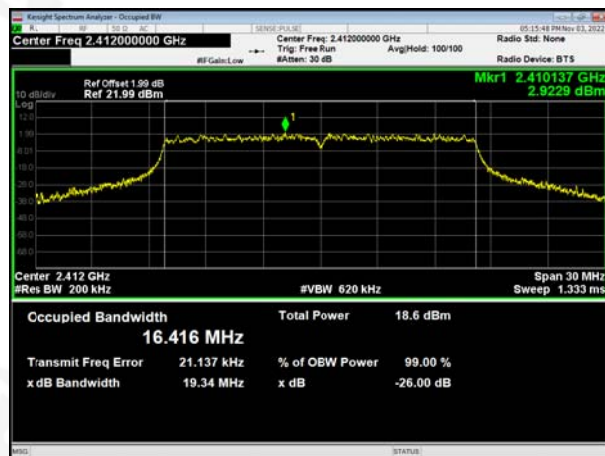




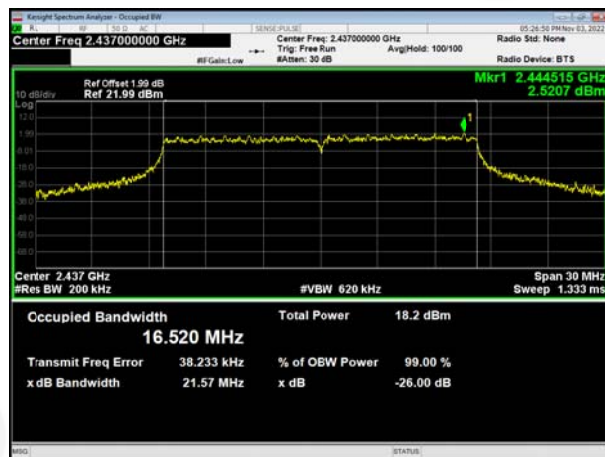
99% OBW Test plot as follows:
802.11b

802.11g

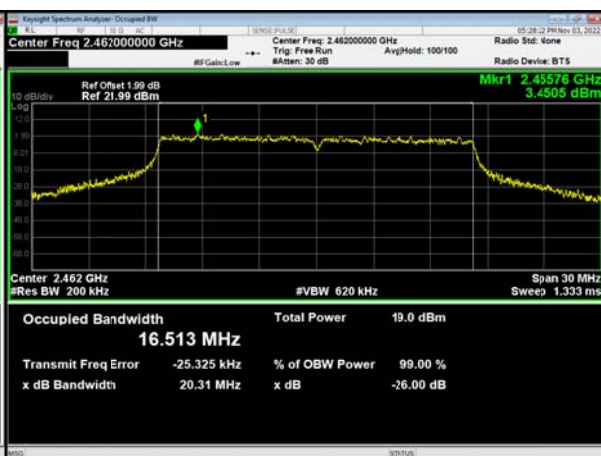
Lowest channel



Middle channel



Highest channel

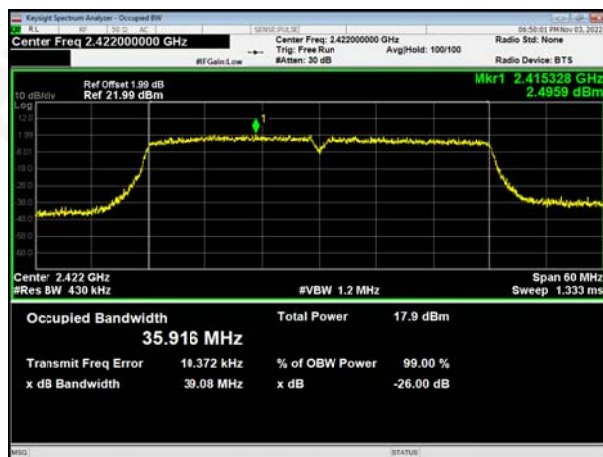
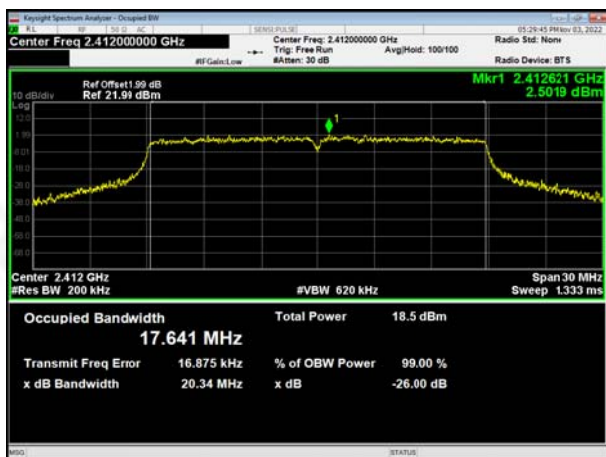




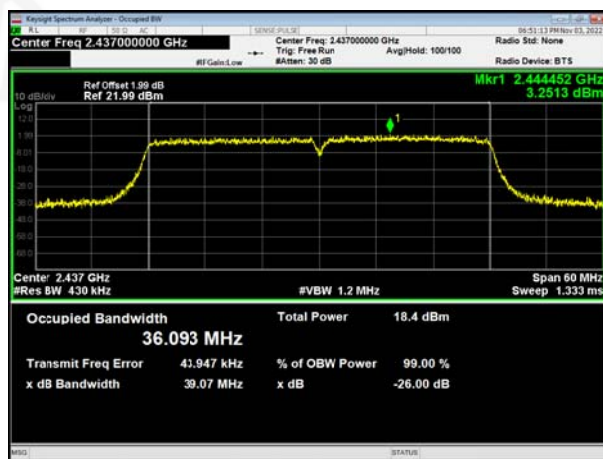
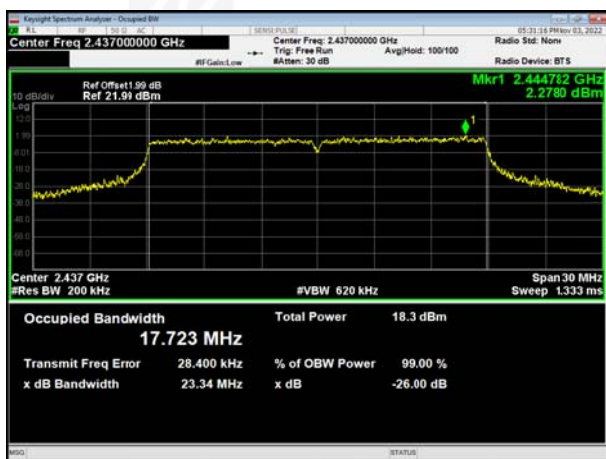
802.11n20

802.11n40

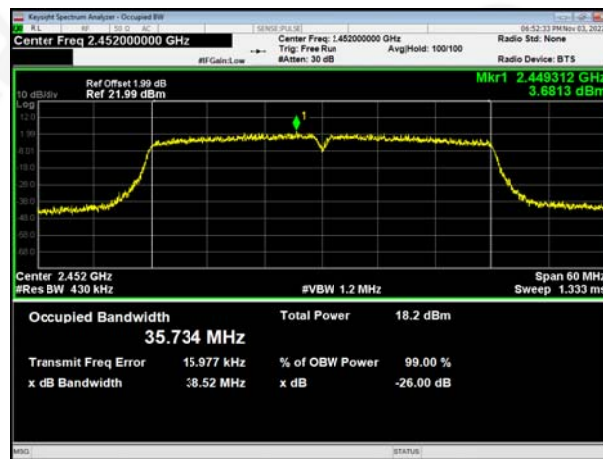
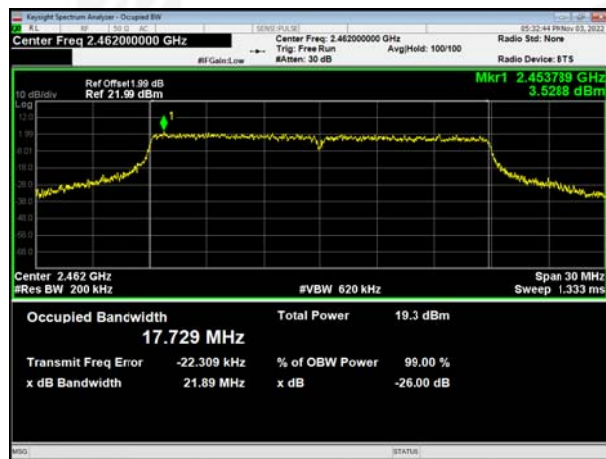
Lowest channel



Middle channel



Highest channel





8. PEAK OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

8.1 APPLIED PROCEDURES/LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



8.6 TEST RESULT

Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V

Mode	Frequency	ANT. 0EIRP Power (dBm)	ANT. 1 EIRP Power (dBm)	Total EIRPPower (dBm)	Limit (dBm/MHz)
802.11 b	2412 MHz	8.64	8.73	11.70	30
	2437 MHz	8.54	8.63	11.60	30
	2462 MHz	8.56	8.69	11.64	30
802.11 g	2412 MHz	7.36	7.57	10.48	30
	2437 MHz	7.46	7.37	10.43	30
	2462 MHz	7.29	7.48	10.40	30
802.11 n20	2412 MHz	6.56	6.33	9.46	30
	2437 MHz	6.75	6.31	9.55	30
	2462 MHz	6.63	6.18	9.42	30
802.11 n40	2422 MHz	5.37	5.76	8.58	30
	2437 MHz	5.18	5.47	8.34	30
	2452 MHz	5.47	5.59	8.54	30



9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

9.1 APPLICABLE STANDARD

in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

9.2 TEST PROCEDURE

Using the following spectrum analyzer setting:

- A) Set the RBW = 100KHz.
- B) Set the VBW = 300KHz.
- C) Sweep time = auto couple.
- D) Detector function = peak.
- E) Trace mode = max hold.
- F) Allow trace to fully stabilize.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

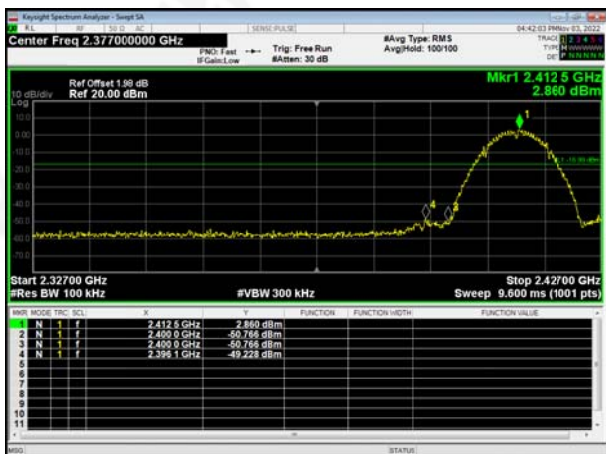
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

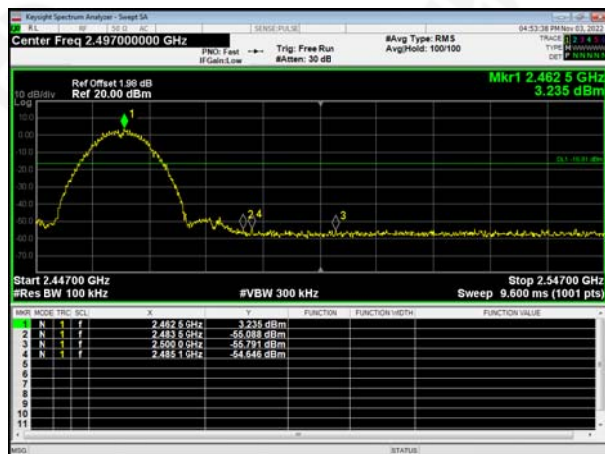


Test plot as follows:

Test mode:	802.11b ANT. 0
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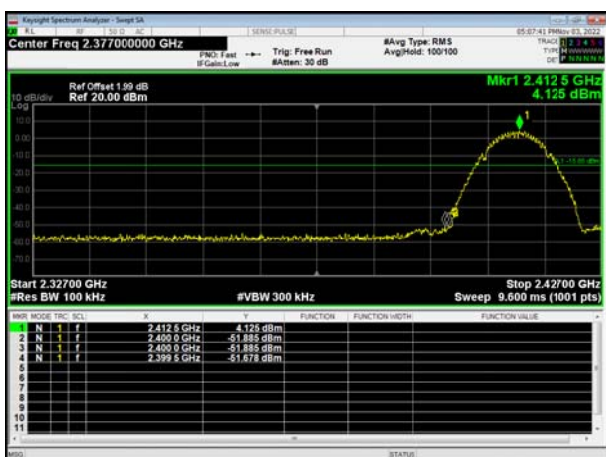


Lowest channel

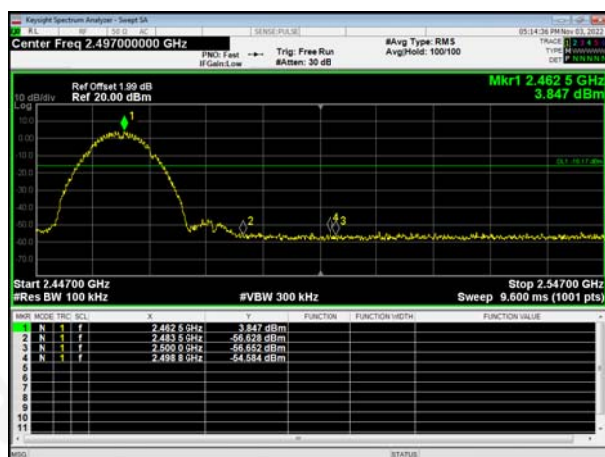


Highest channel

Test mode:	802.11b ANT. 1
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Lowest channel

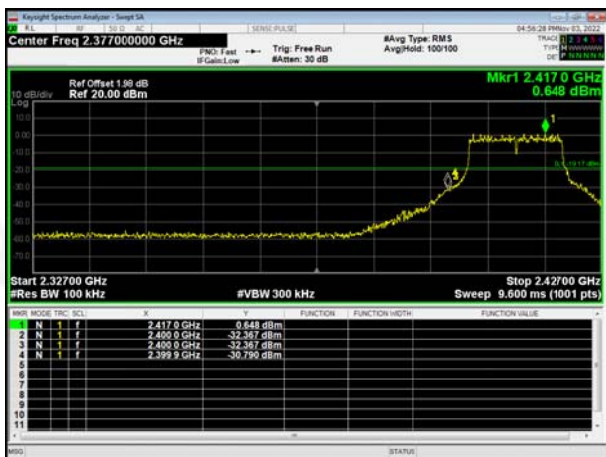


Highest channel

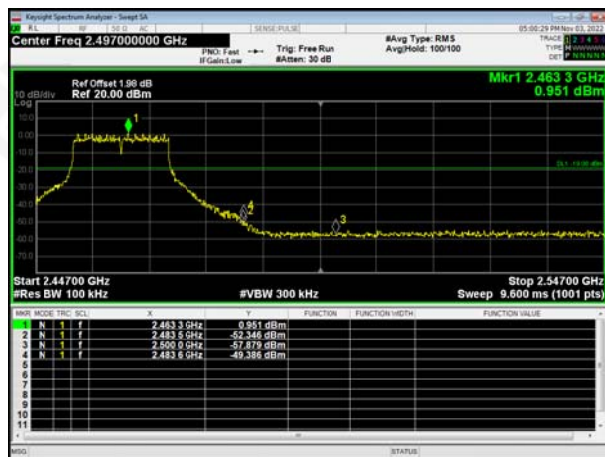


Test mode:

802.11gANT. 0



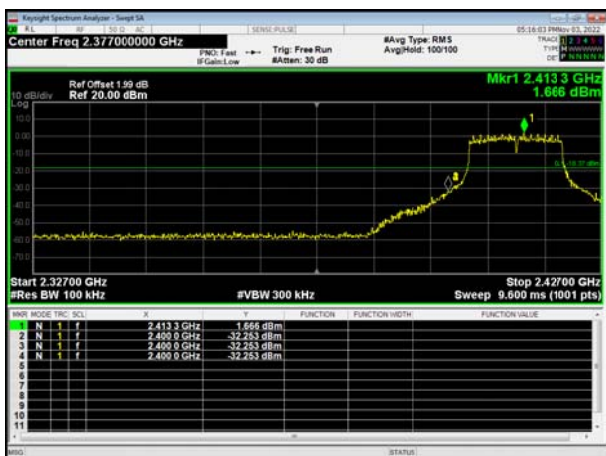
Lowest channel



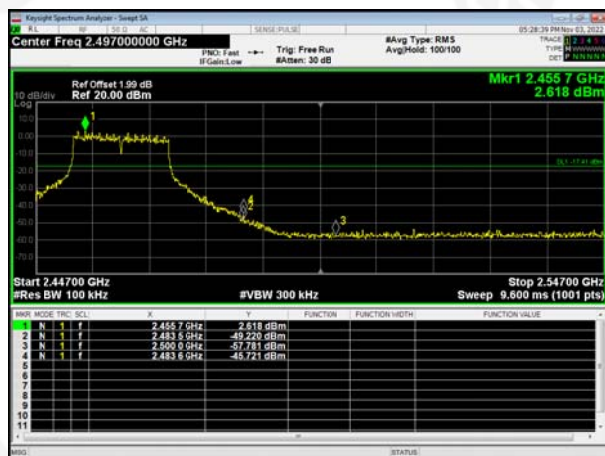
Highest channel

Test mode:

802.11gANT. 1



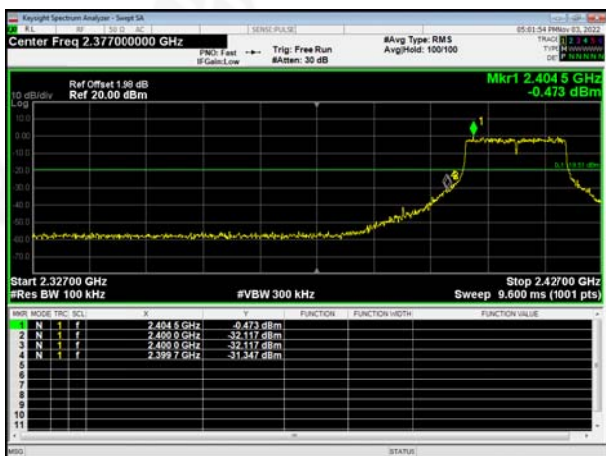
Lowest channel



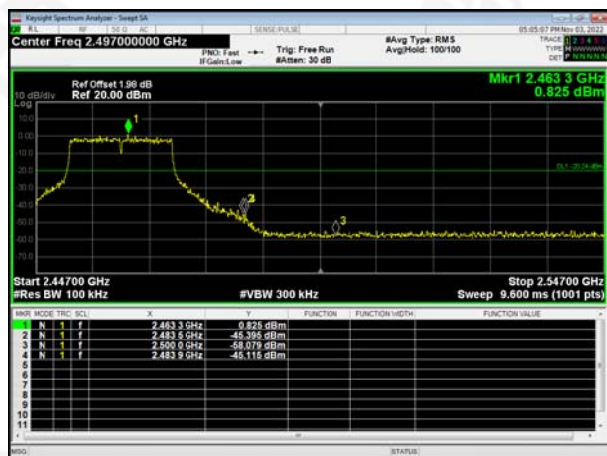
Highest channel



Test mode: 802.11n(HT20) ANT. 0

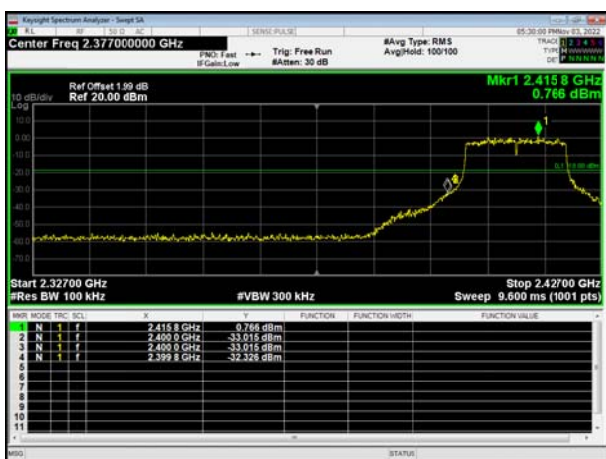


Lowest channel



Highest channel

Test mode: 802.11n(HT20) ANT. 1



Lowest channel

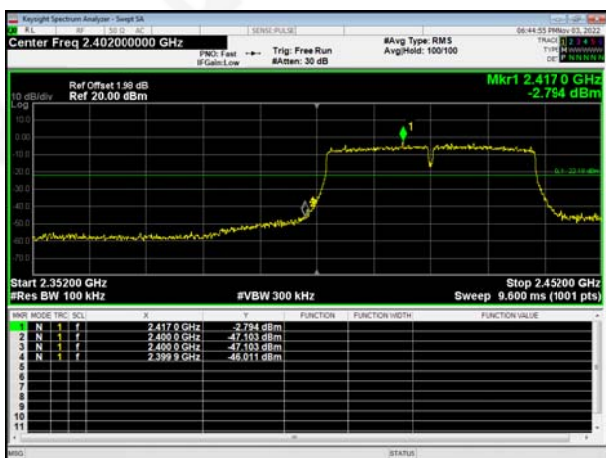


Highest channel

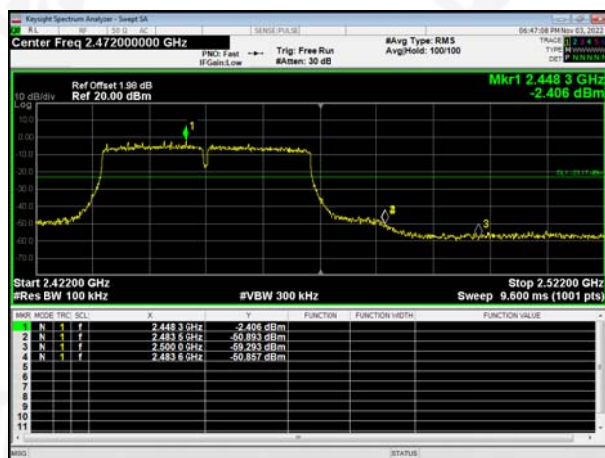


Test mode:

802.11n(HT40) ANT. 0



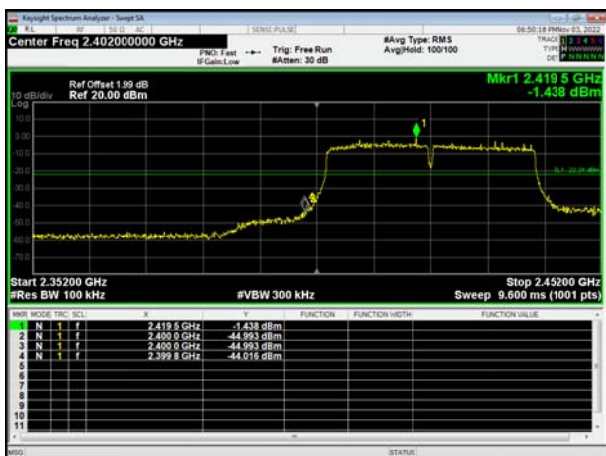
Lowest channel



Highest channel

Test mode:

802.11n(HT40) ANT. 1



Lowest channel



Highest channel

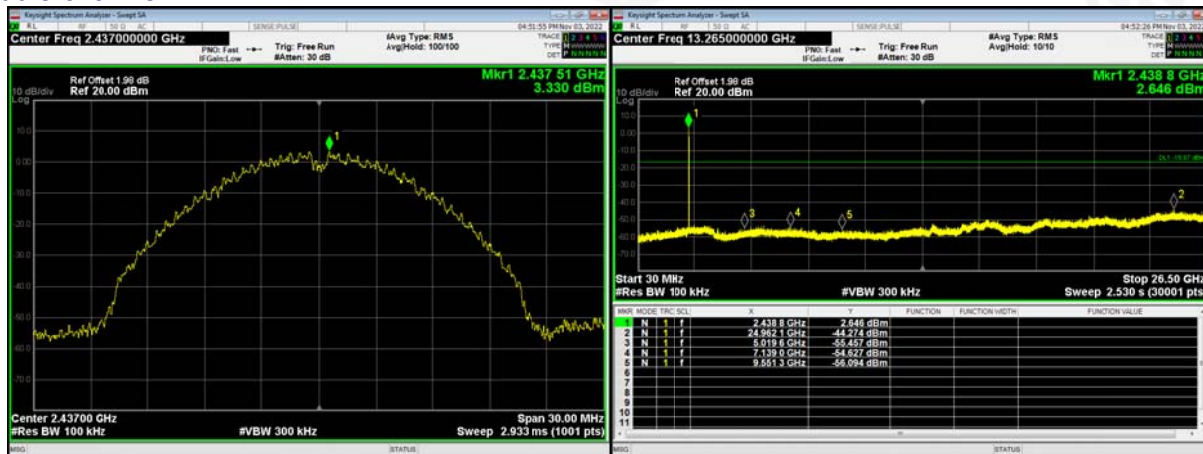


Test plot as follows:

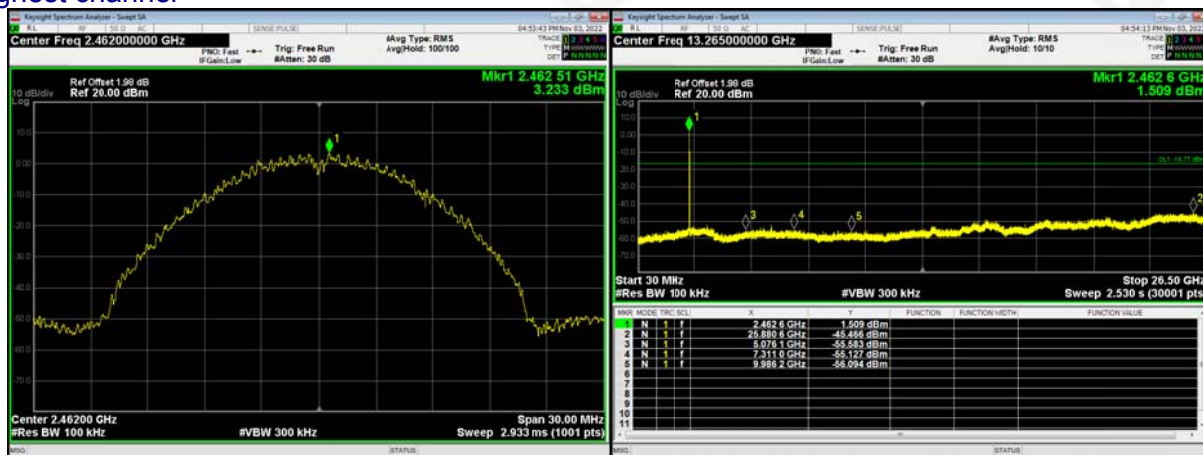
802.11b ANT. 0
Lowest channel



Middle channel

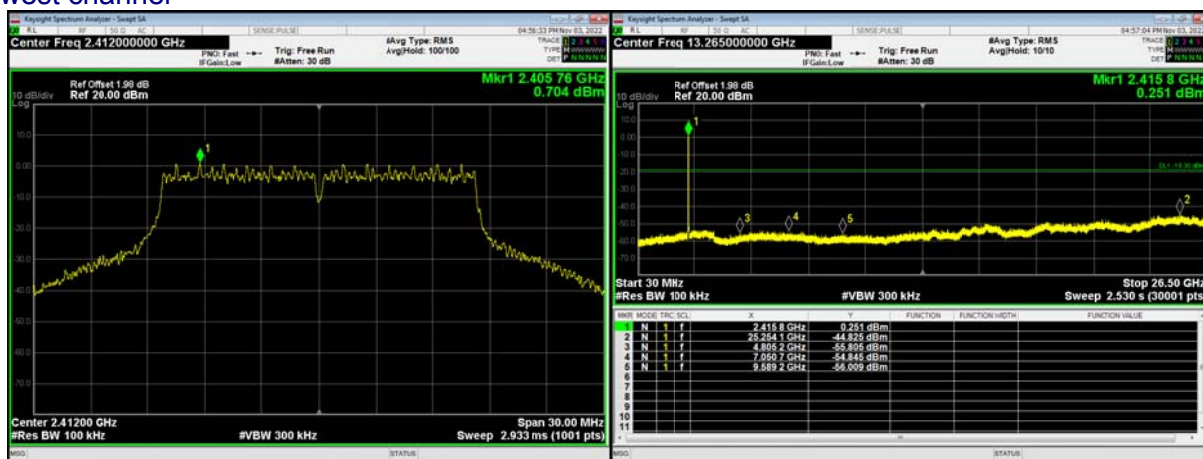


Highest channel

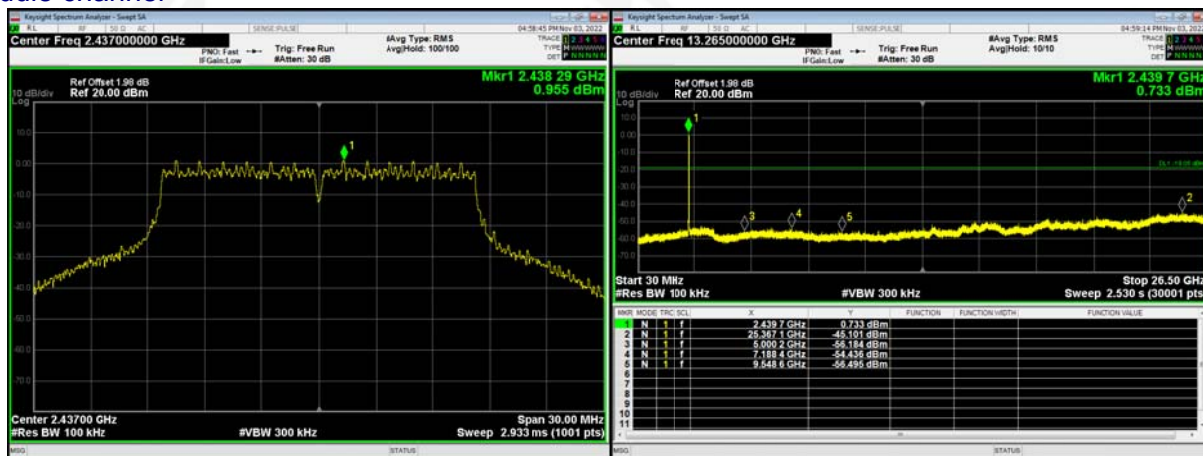




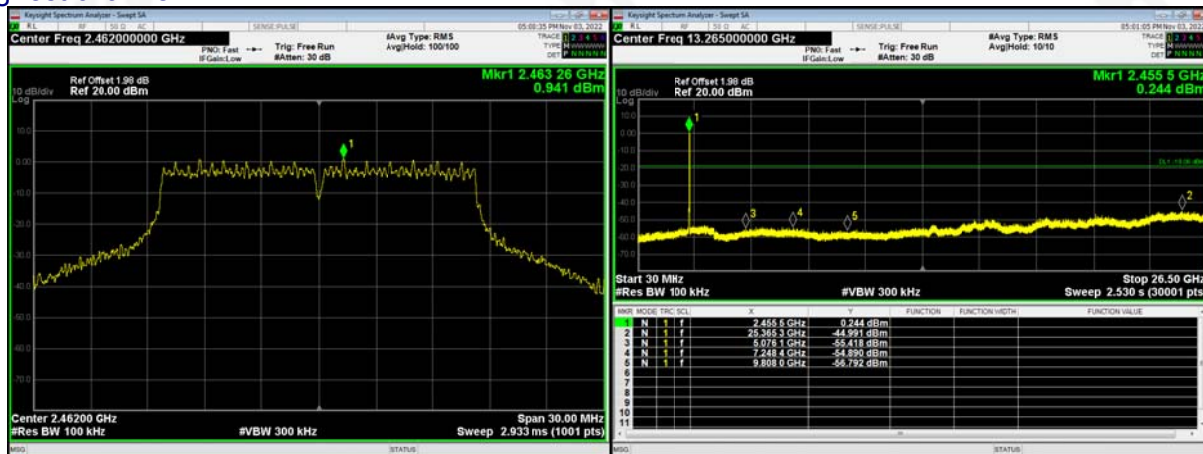
802.11g ANT. 0 Lowest channel



Middle channel



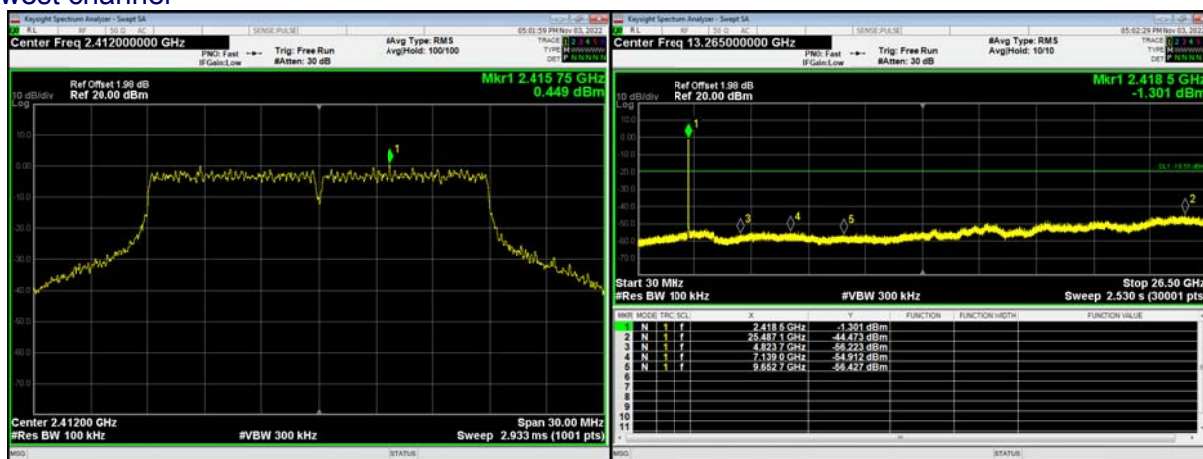
Highest channel



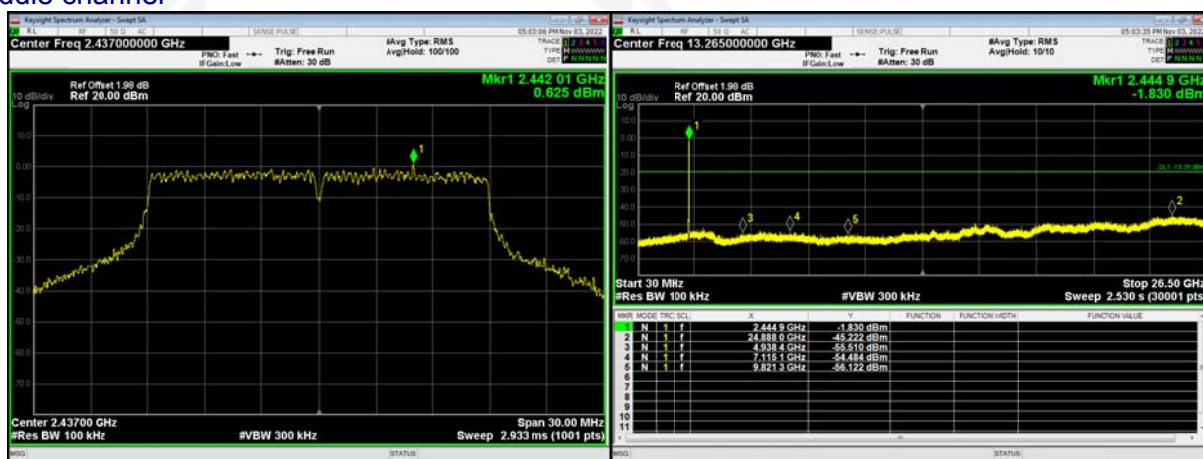


802.11n(HT20) ANT. 0

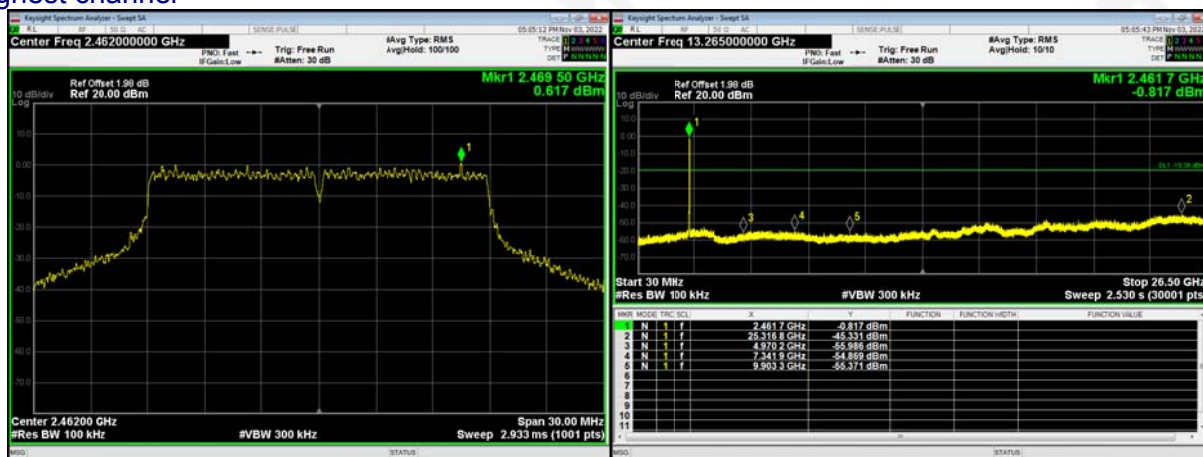
Lowest channel



Middle channel

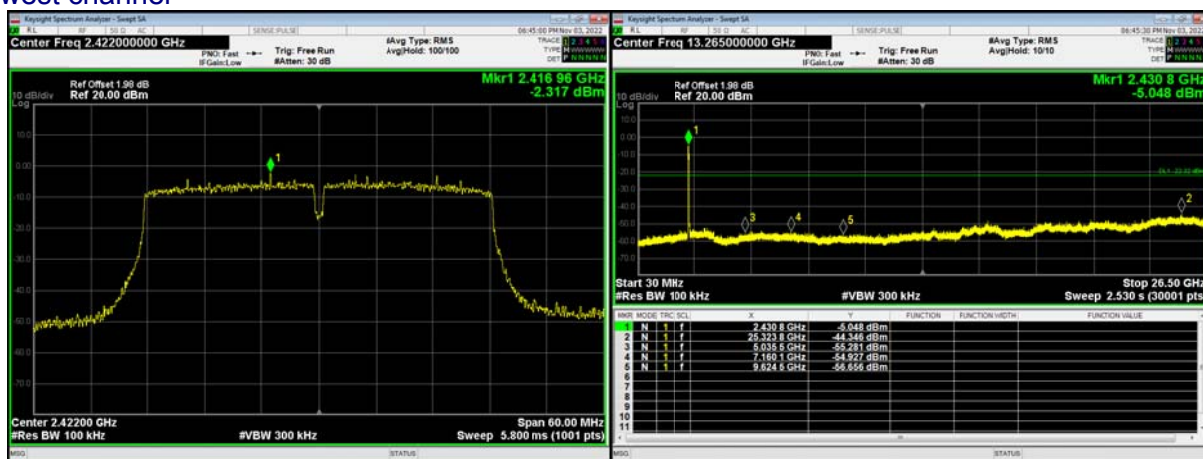


Highest channel

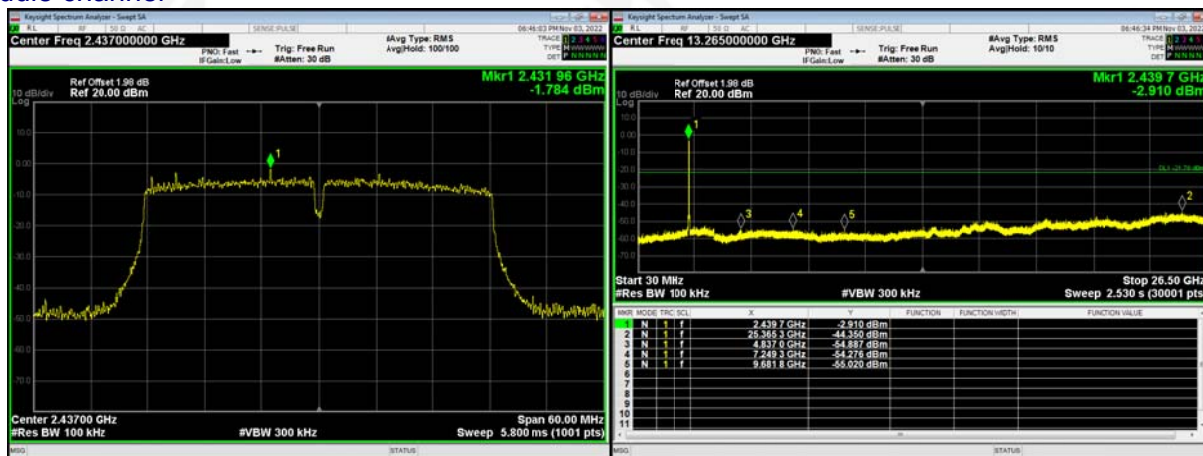




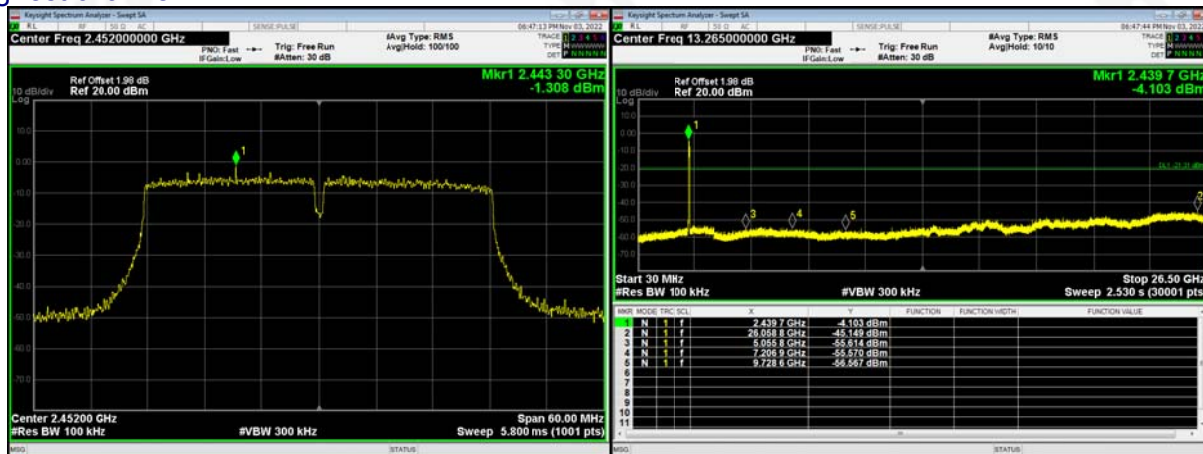
802.11n(HT40) ANT. 0 Lowest channel



Middle channel

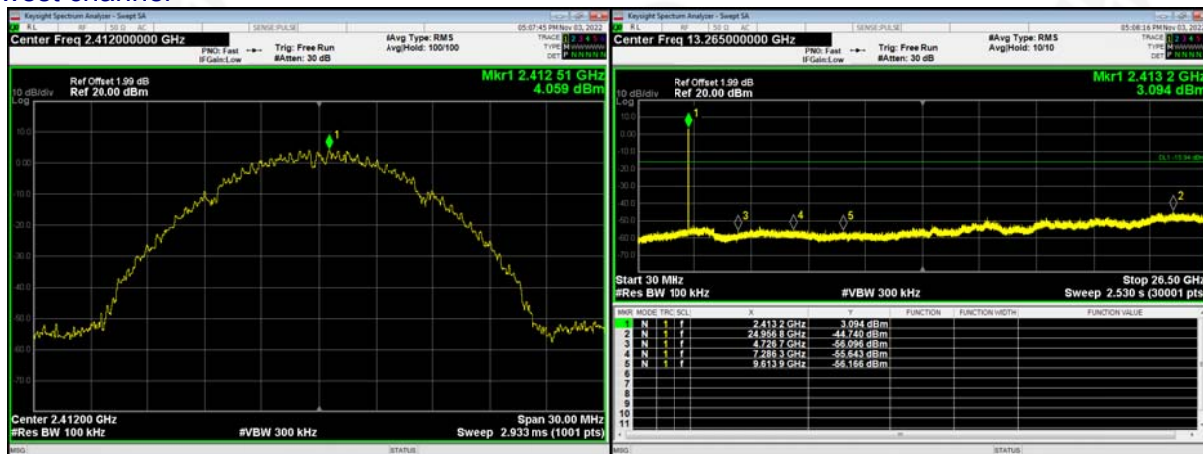


Highest channel

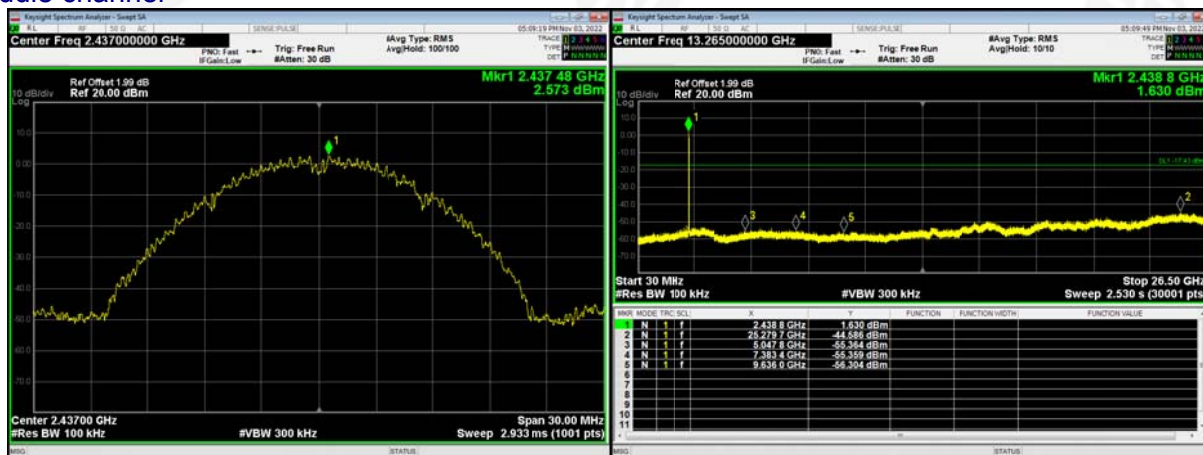




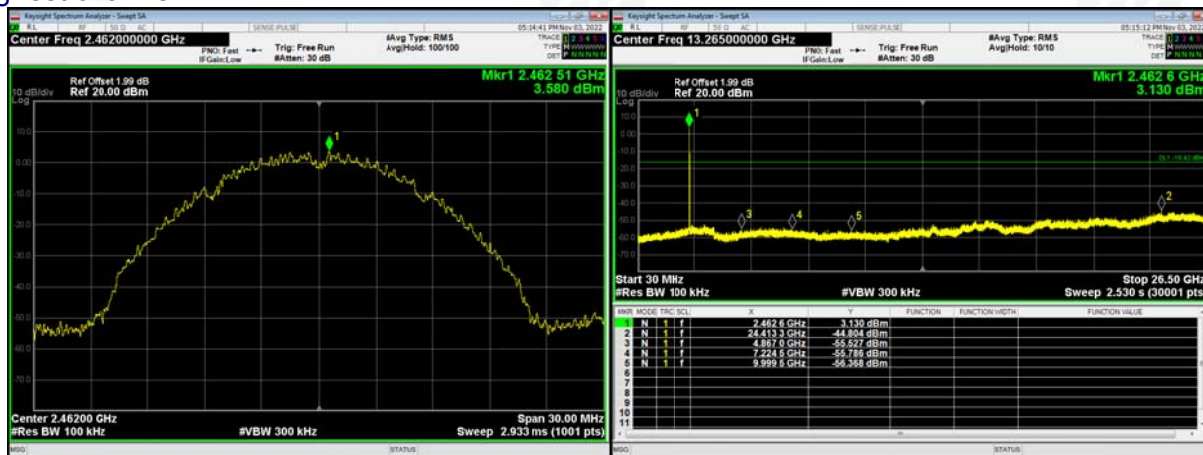
802.11b ANT. 1 Lowest channel



Middle channel

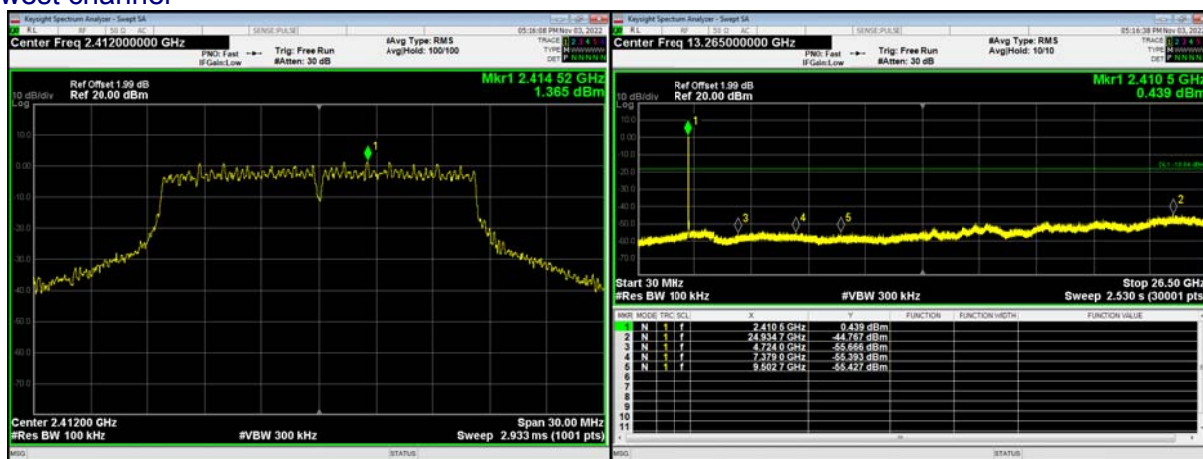


Highest channel

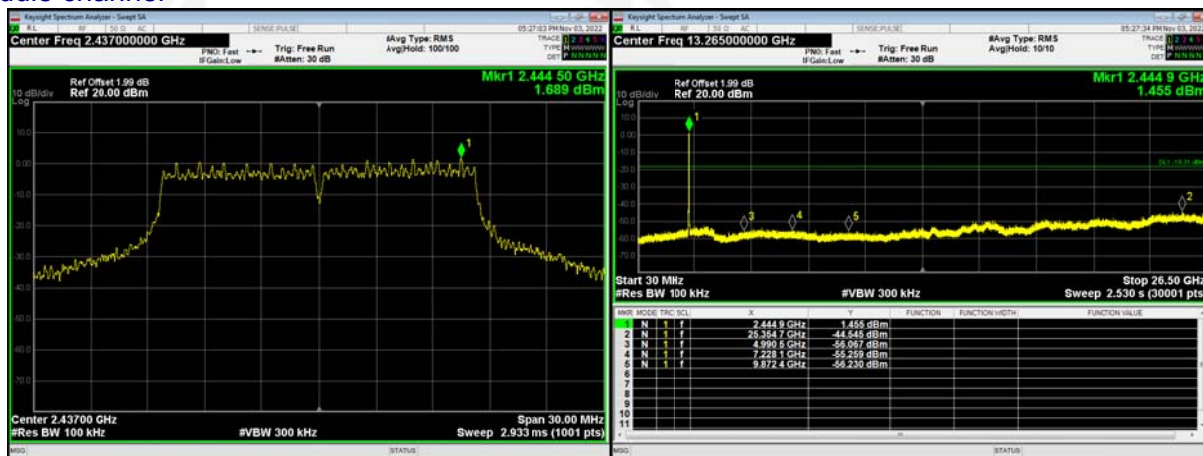




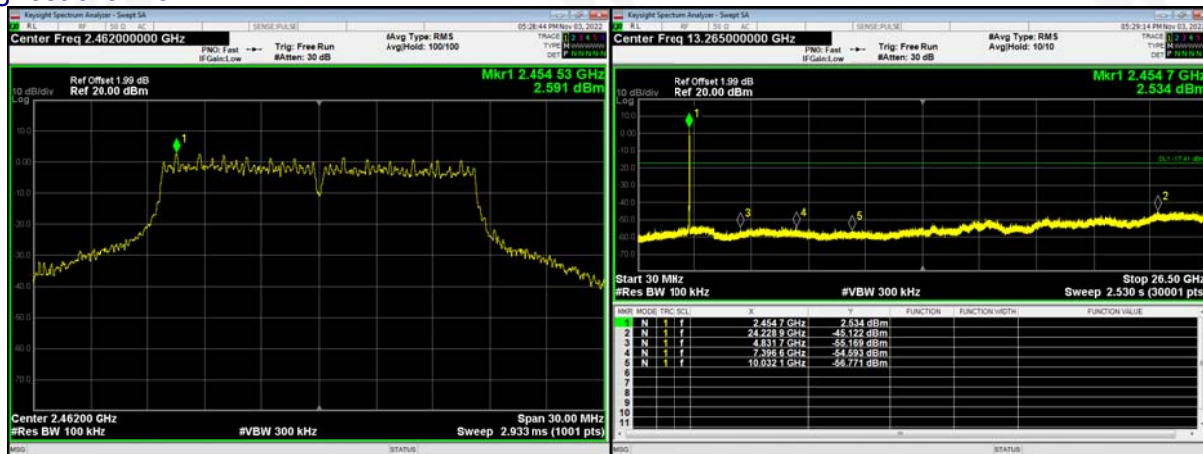
802.11g ANT. 1 Lowest channel



Middle channel



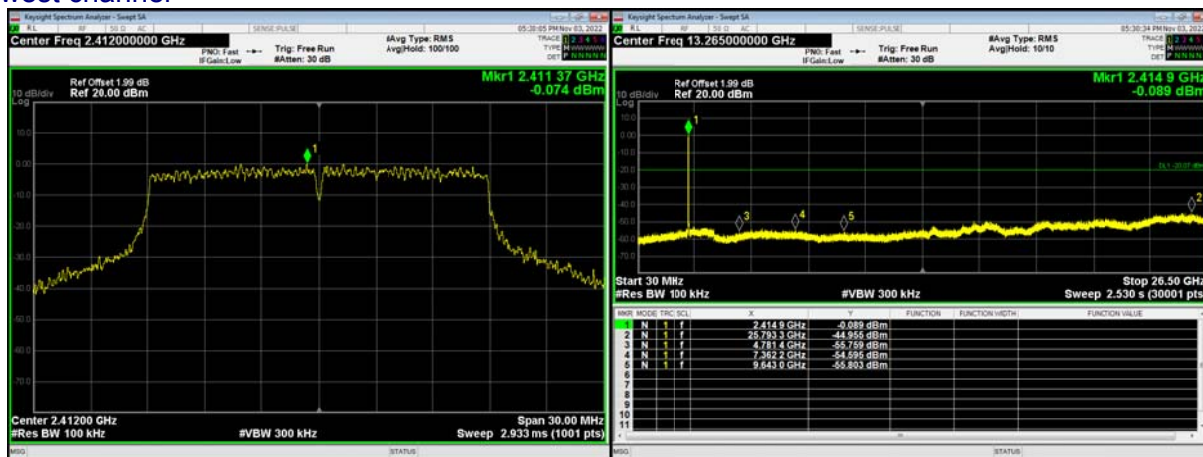
Highest channel



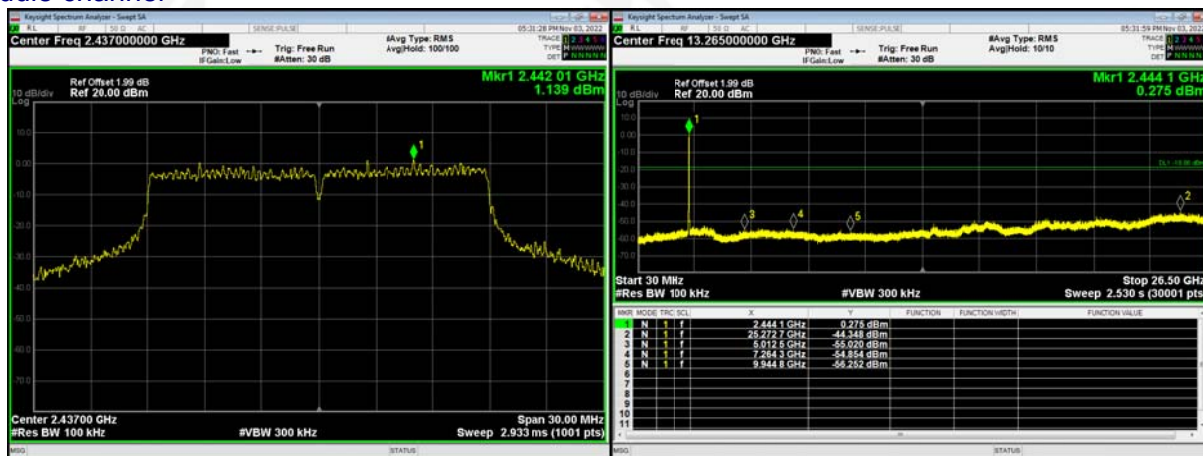


802.11n(HT20) ANT. 1

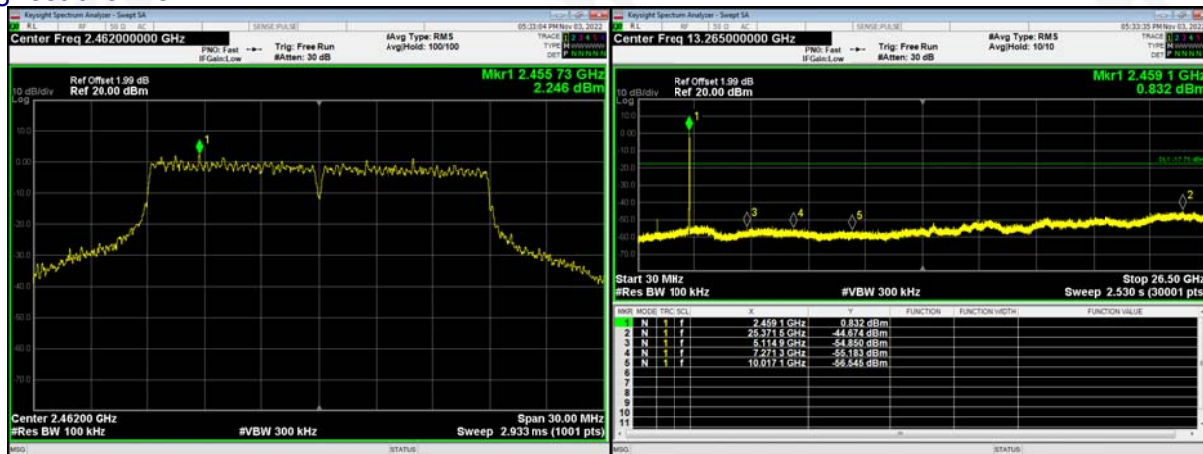
Lowest channel



Middle channel



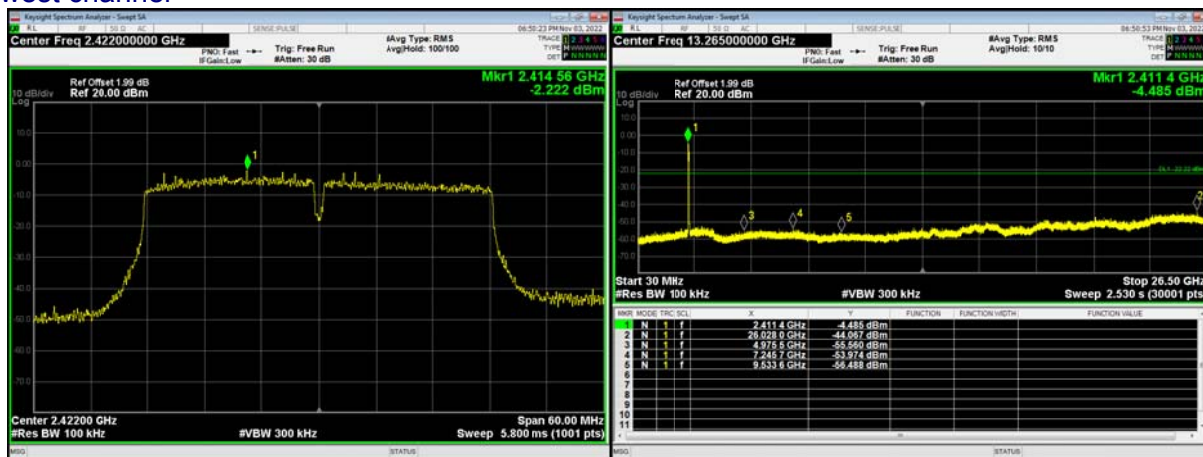
Highest channel



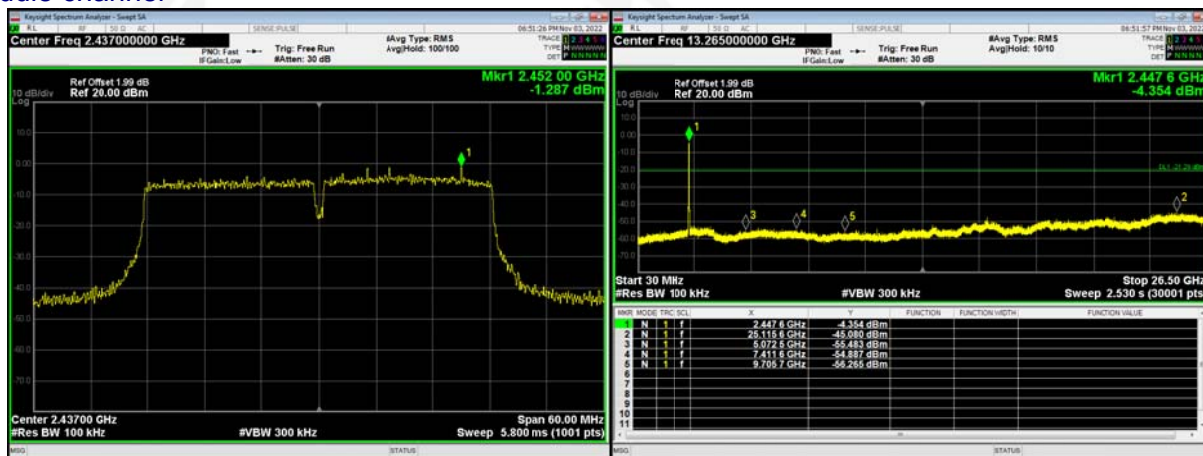


802.11n(HT40) ANT. 1

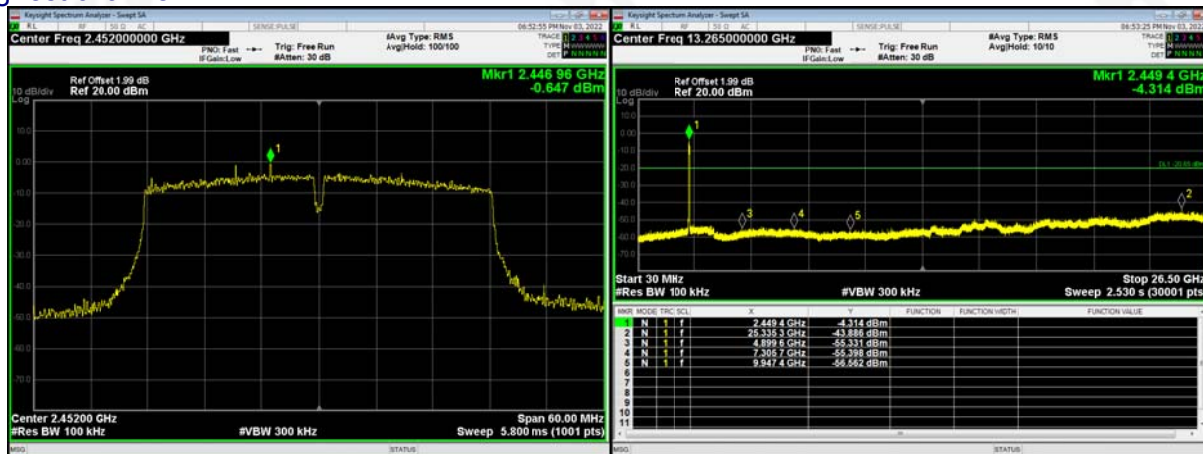
Lowest channel



Middle channel



Highest channel





10. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c)	
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.		
15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.		
EUT Antenna:		
The antenna is FPCBAntenna, the best case gain of the ANT. 0 is 3.87dBiand ANT. 1 is 2.57dBi, reference to the Internal Photos for details		



11. TEST SETUP PHOTO

Reference to the Test Setup Photos for details.

12. EUT CONSTRUCTIONAL DETAILS

Reference to the External Photos and Internal Photos for details.

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