



## 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

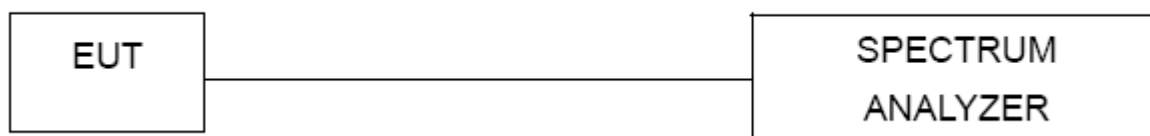
### 7.2 TEST PROCEDURE

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 12V
Antenna :	Main Antenna		

Test CH	-6dB Occupy Bandwidth (MHz)					Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(KHz)	
Lowest	10.941	17.192	18.234	36.760	>500	Pass
Middle	16.585	17.192	18.234	36.760		
Highest	16.671	17.106	18.234	36.760		

Test CH	99% Occupy Bandwidth (MHz)				Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	
Lowest	14.935	16.411	17.627	35.890	Pass
Middle	14.935	16.411	17.627	35.890	
Highest	14.935	16.411	17.627	35.890	

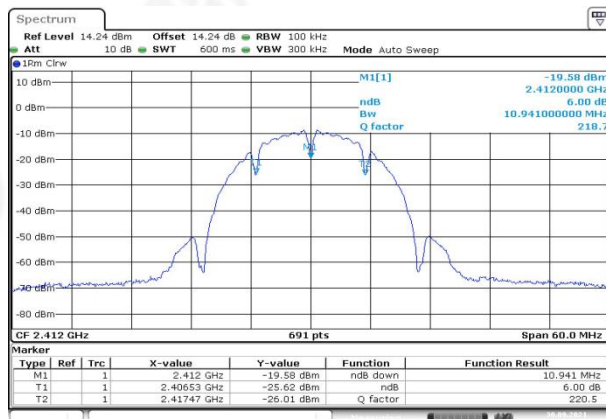


The 6dB Bandwidth test plot as follows:

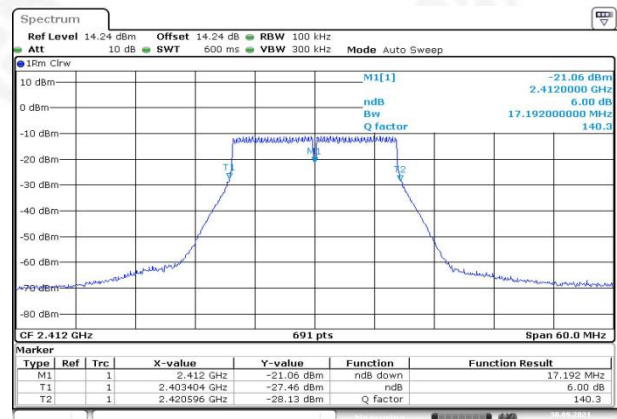
802.11b

802.11g

Lowest channel

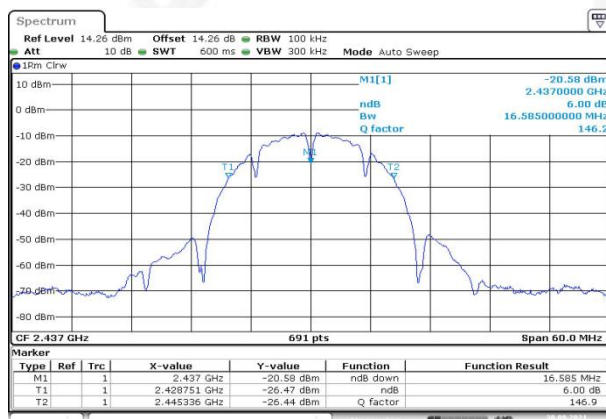


Date: 30 SEP.2021 16:42:25

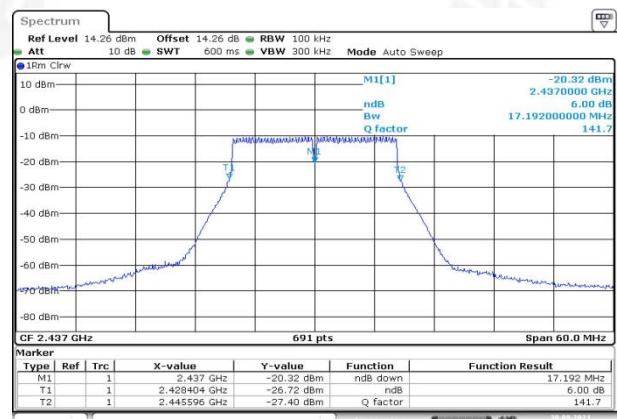


Date: 30 SEP.2021 17:07:00

Middle channel

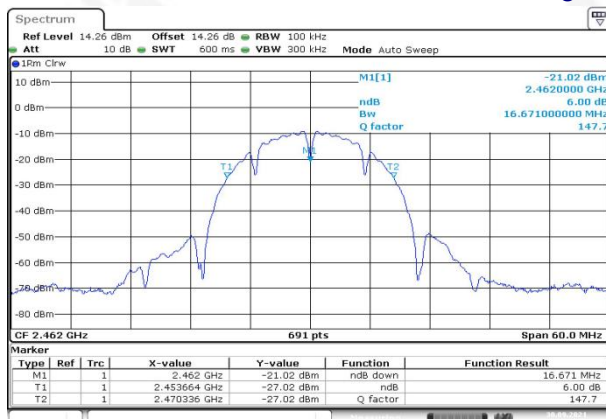


Date: 30 SEP.2021 16:45:21

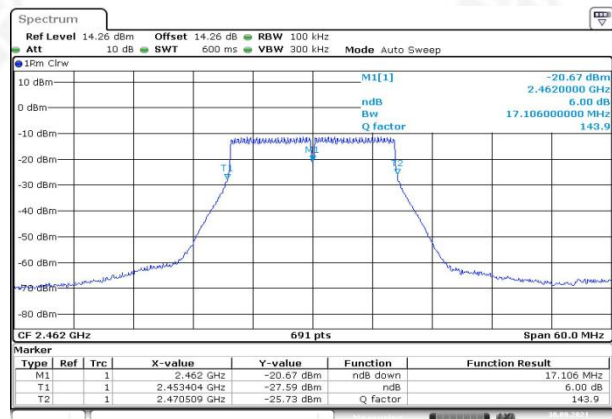


Date: 30 SEP.2021 17:08:41

Highest channel



Date: 30 SEP.2021 16:47:00



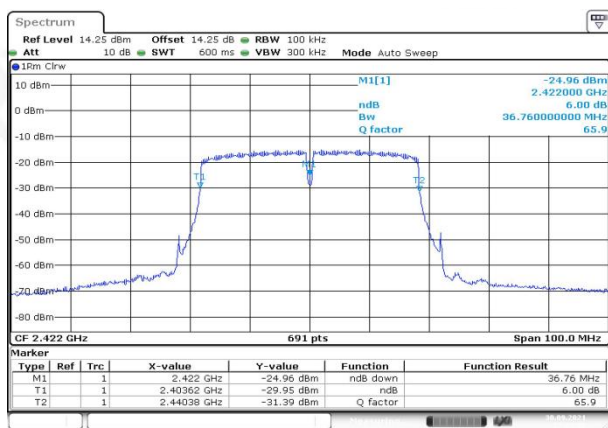
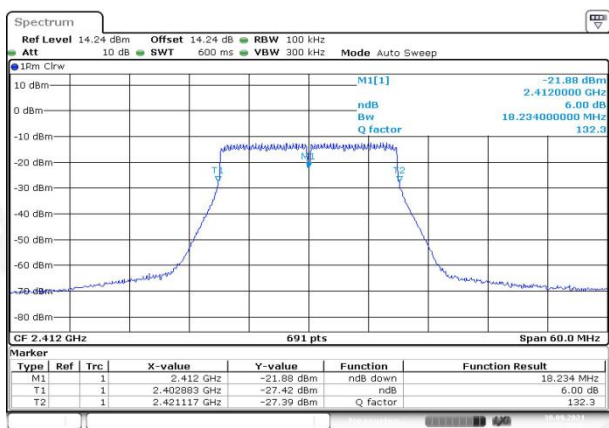
Date: 30 SEP.2021 17:10:36



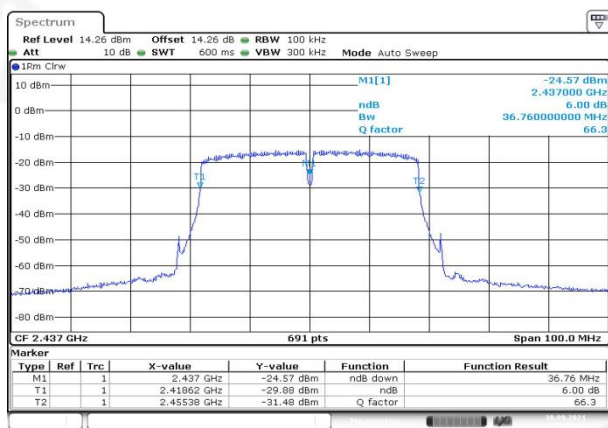
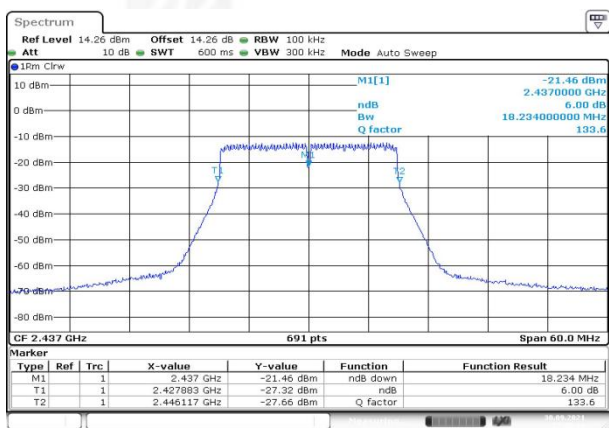
802.11n20

802.11n40

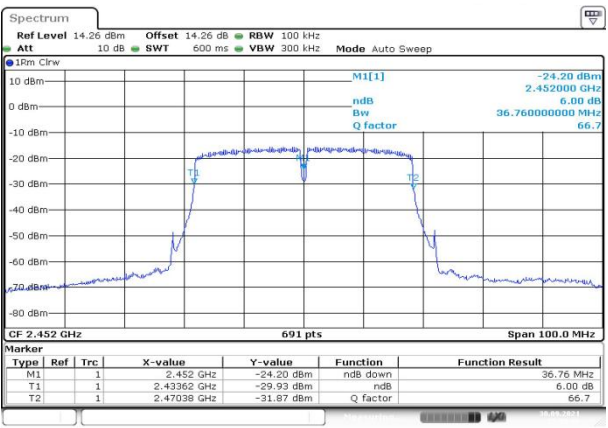
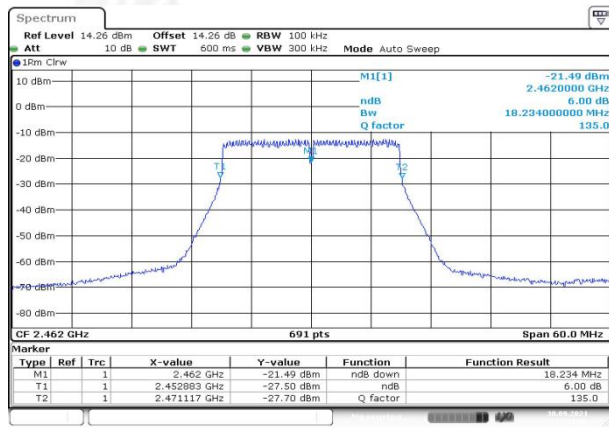
### Lowest channel



### Middle channel



### Highest channel



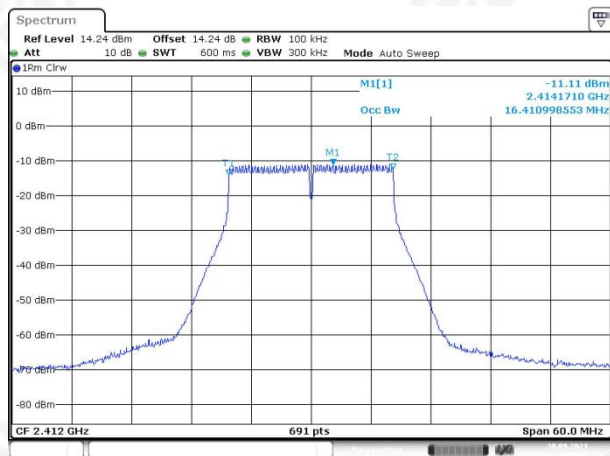
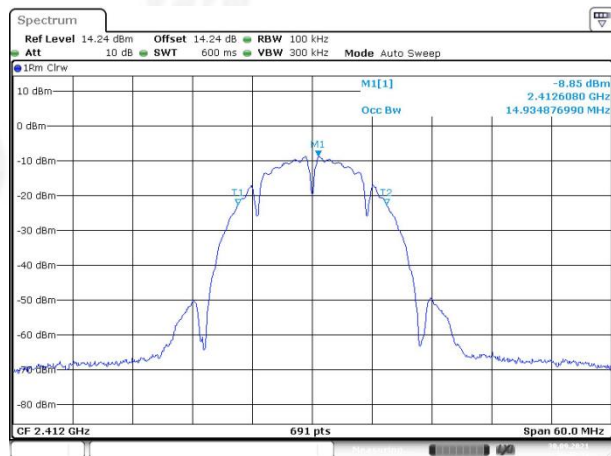


The 99% Bandwidth test plot as follows:

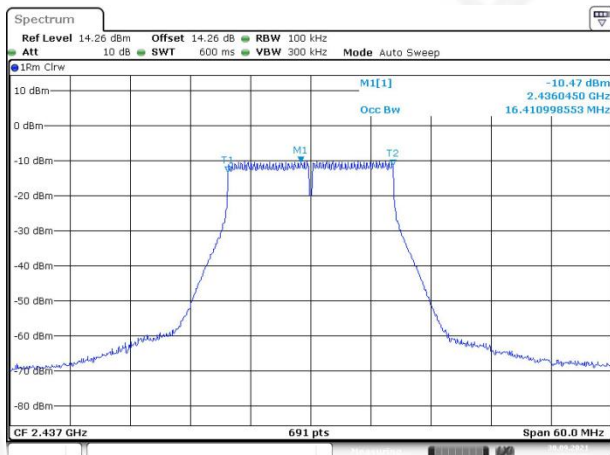
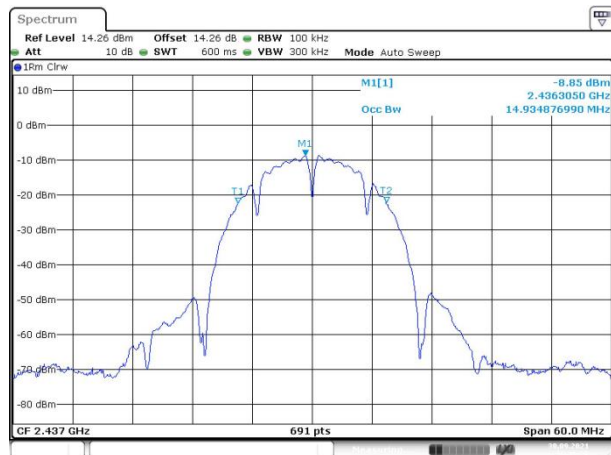
802.11b

802.11g

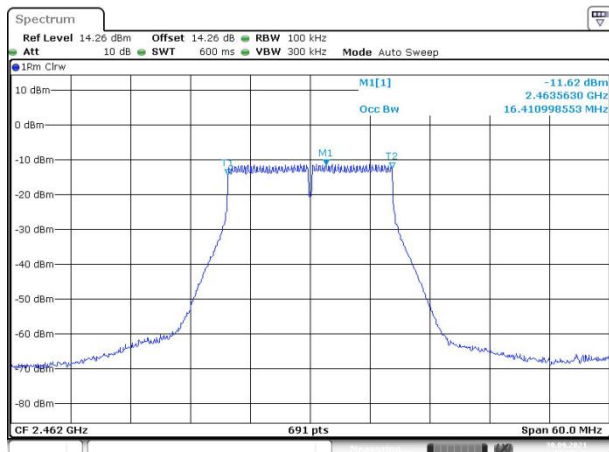
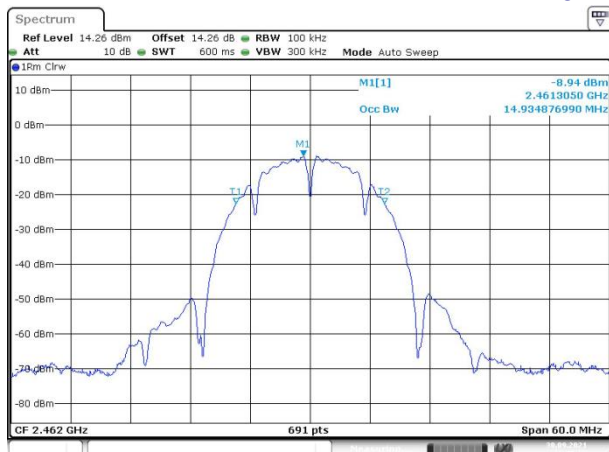
Lowest channel



Middle channel



Highest channel



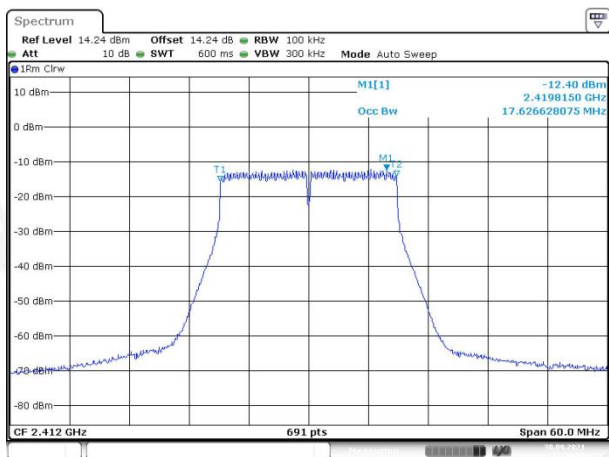




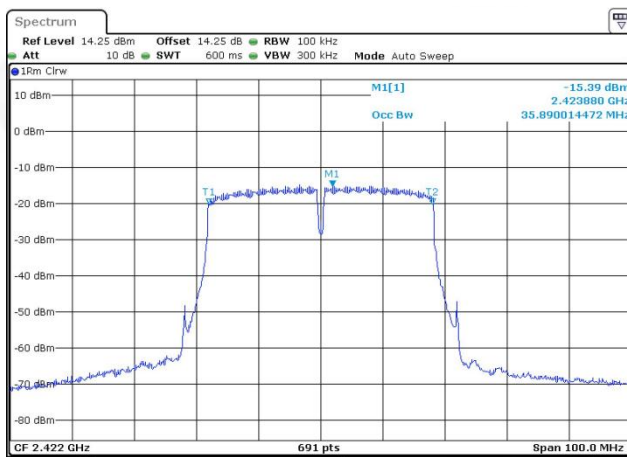
802.11n20

802.11n40

### Lowest channel

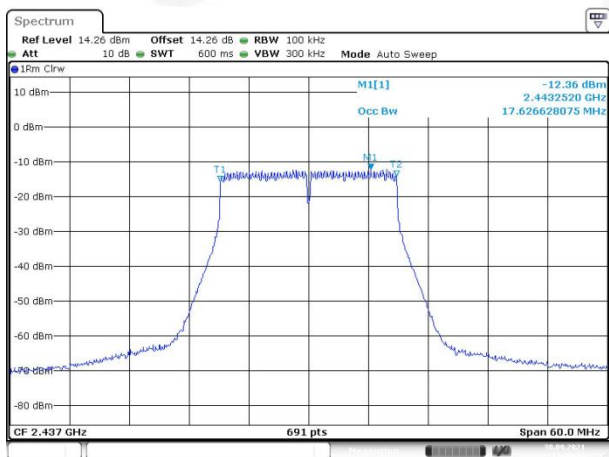


Date: 30.SEP.2021 17:18:55

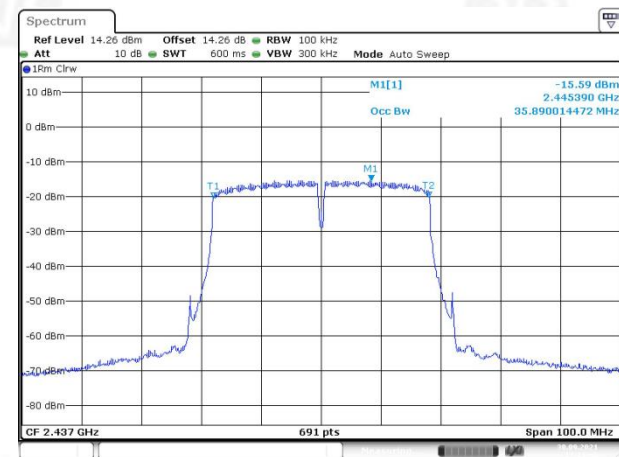


Date: 30.SEP.2021 17:30:02

### Middle channel

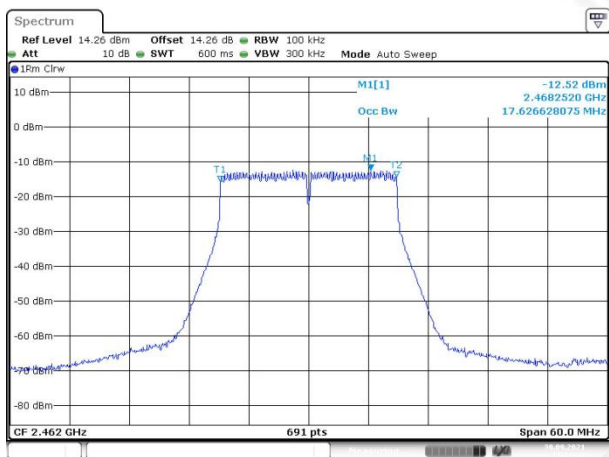


Date: 30.SEP.2021 17:20:24

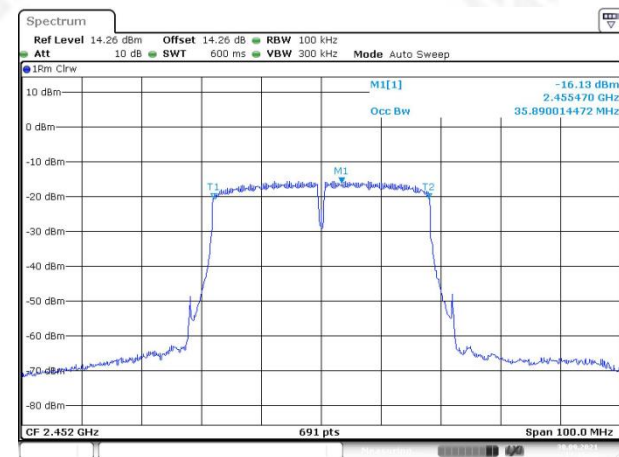


Date: 30.SEP.2021 17:31:41

### Highest channel



Date: 30.SEP.2021 17:21:46



Date: 30.SEP.2021 17:35:37



Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 12V
Antenna :	AUX Antenna		

Test CH	-6dB Occupy Bandwidth (MHz)					Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(KHz)	
Lowest	10.941	17.192	18.234	36.760	>500	Pass
Middle	16.671	17.192	18.234	36.760		
Highest	16.498	17.106	18.148	36.760		

Test CH	99% Occupy Bandwidth (MHz)				Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	
Lowest	14.935	16.411	17.627	35.890	Pass
Middle	14.935	16.411	17.627	35.890	
Highest	14.935	16.411	17.627	35.890	

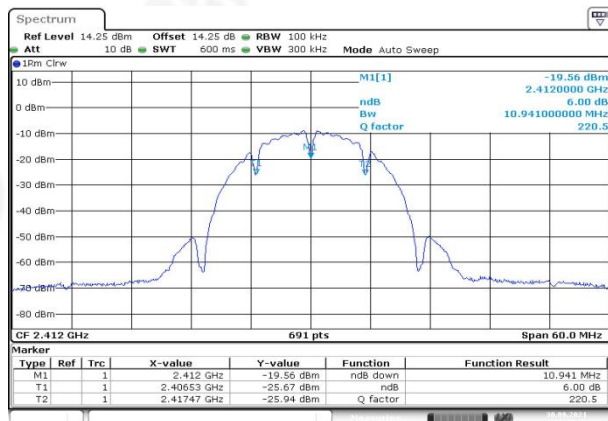


The 6dB bandwidth test plot as follows:

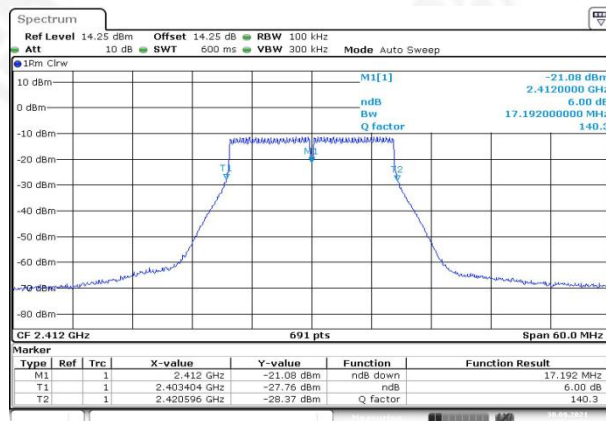
802.11b

802.11g

Lowest channel

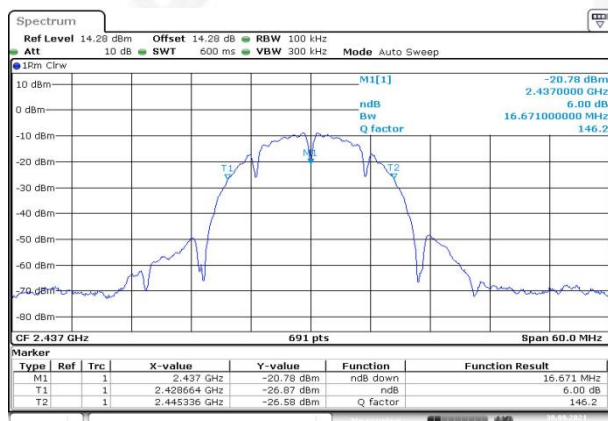


Date: 30 SEP. 2021 16:49:39

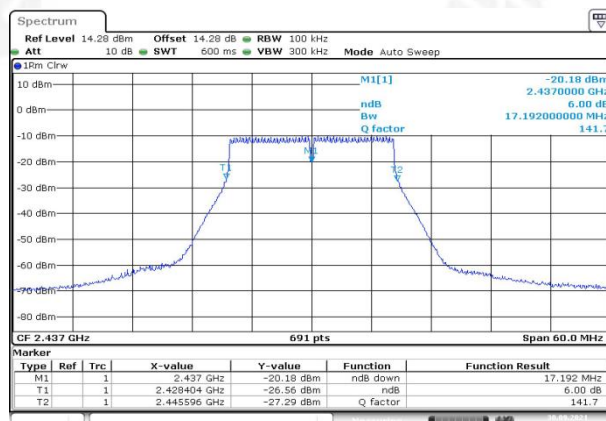


Date: 30 SEP. 2021 17:12:52

Middle channel

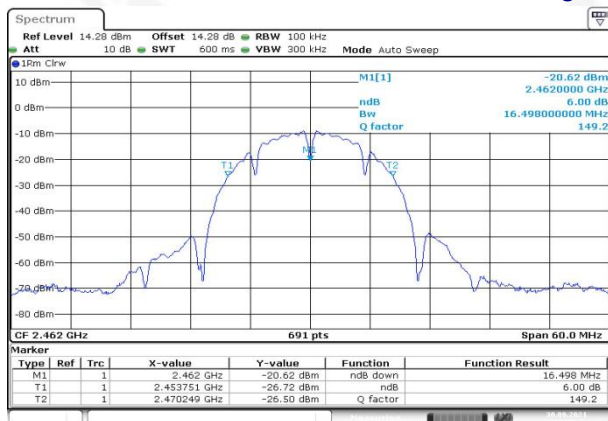


Date: 30 SEP. 2021 16:51:16

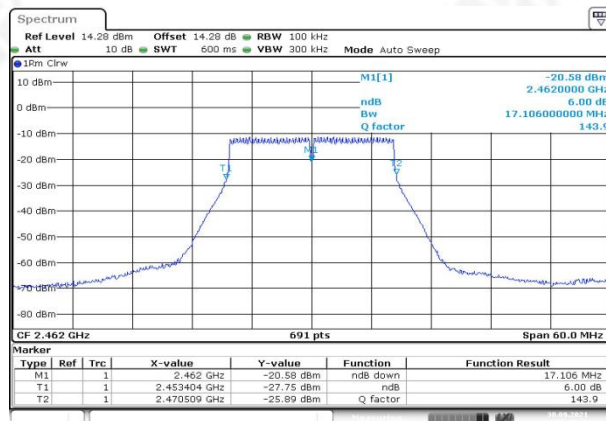


Date: 30 SEP. 2021 17:14:21

Highest channel



Date: 30 SEP. 2021 16:52:40



Date: 30 SEP. 2021 17:15:40

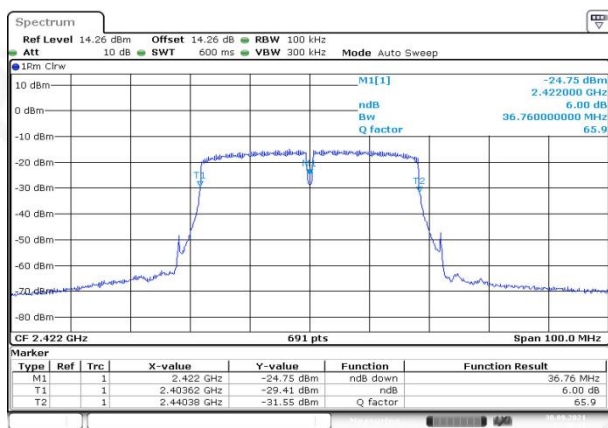
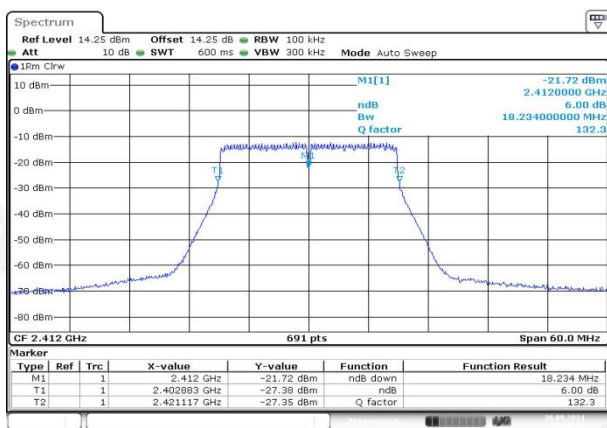




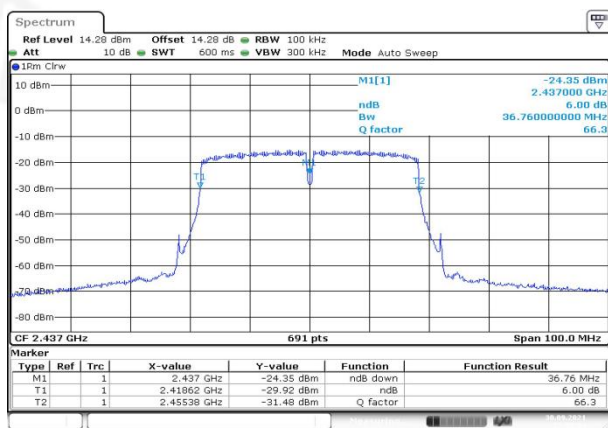
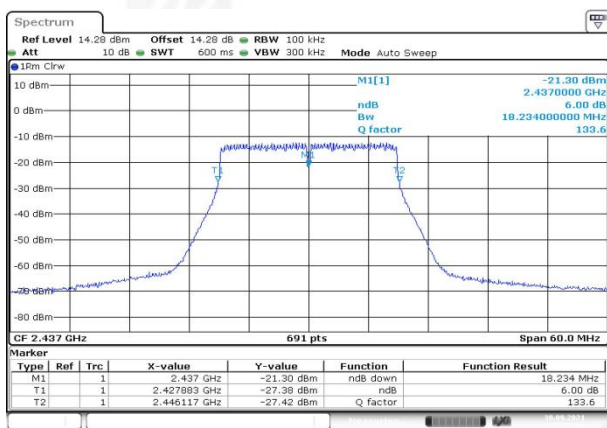
802.11n20

802.11n40

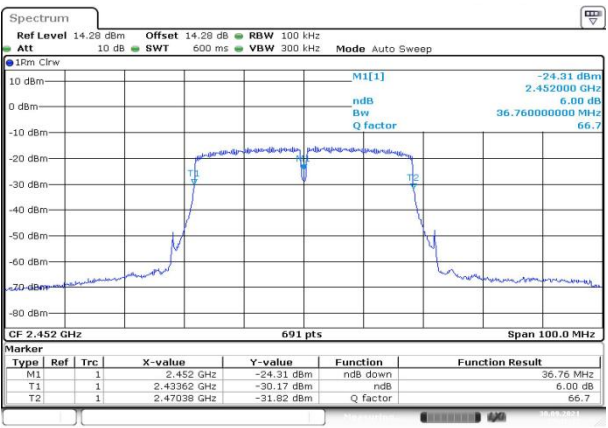
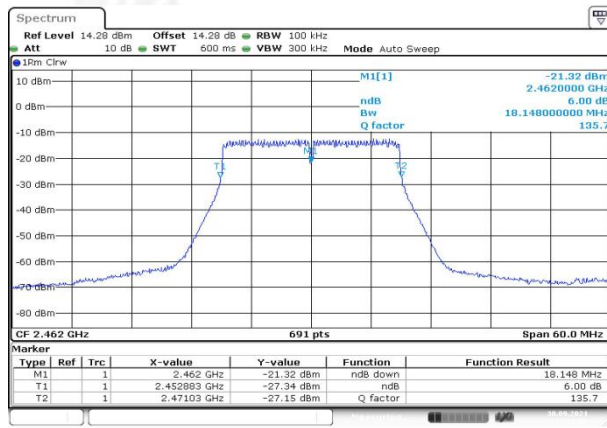
### Lowest channel



### Middle channel



### Highest channel



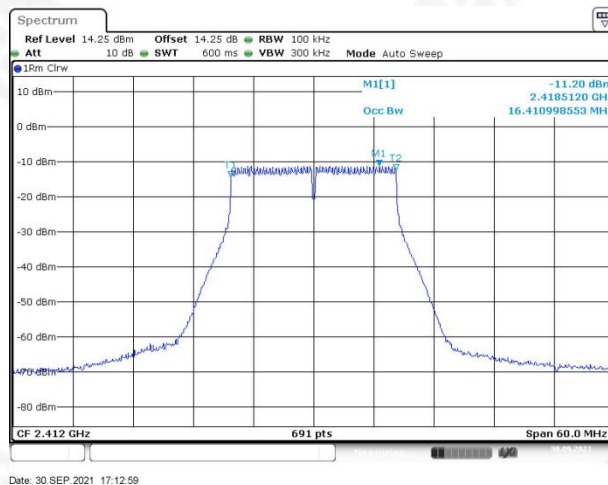
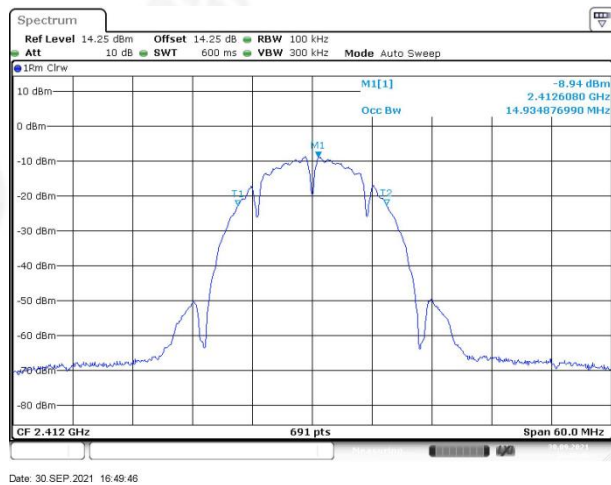


The 99% Bandwidth test plot as follows:

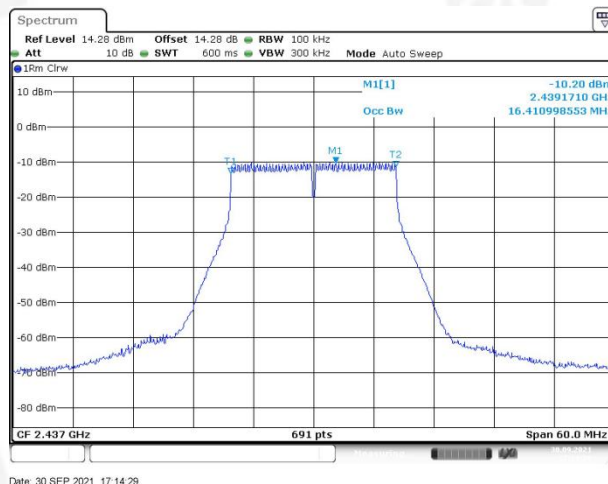
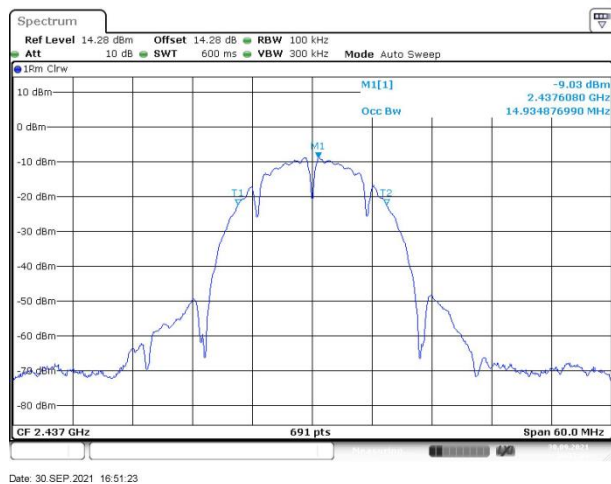
802.11b

802.11g

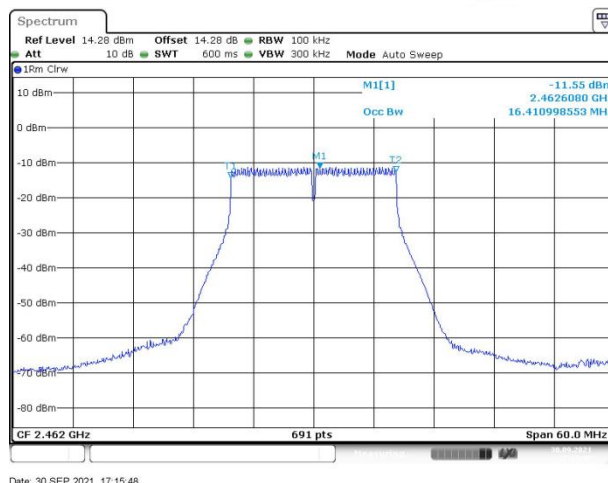
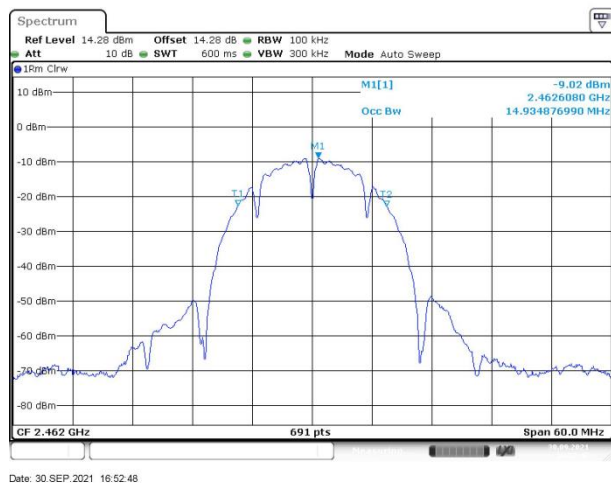
Lowest channel



Middle channel



Highest channel

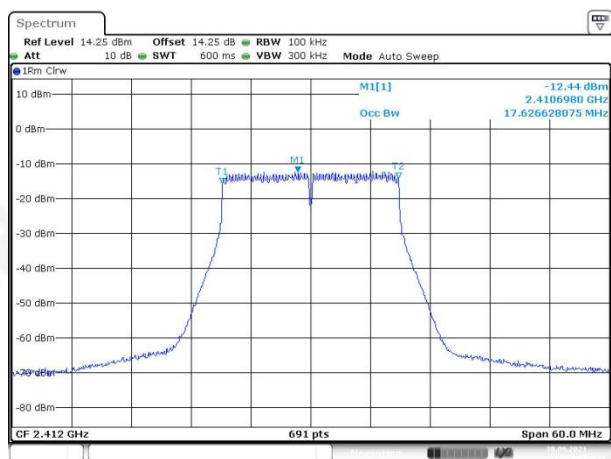




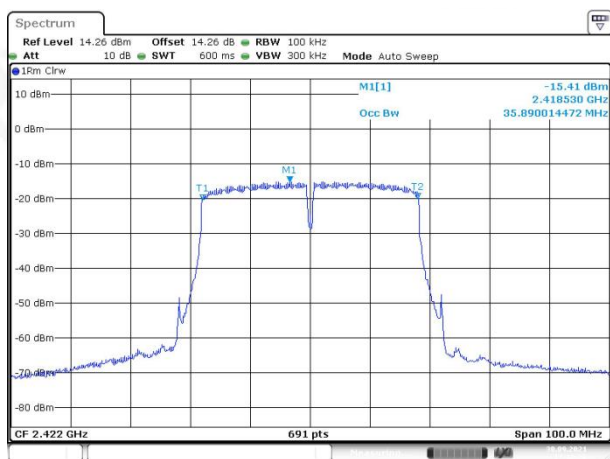
802.11n20

802.11n40

### Lowest channel

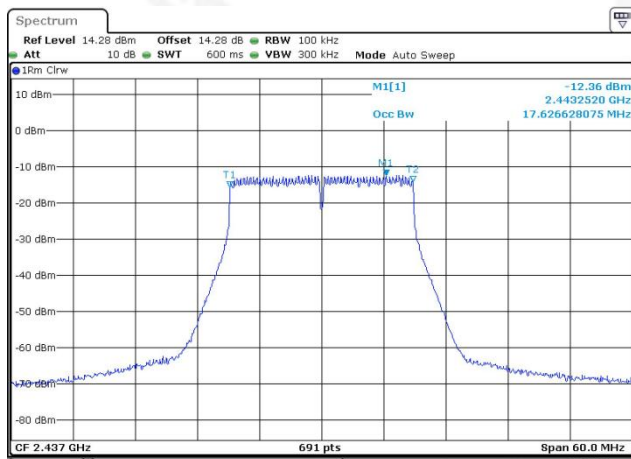


Date: 30 SEP 2021 17:23:45

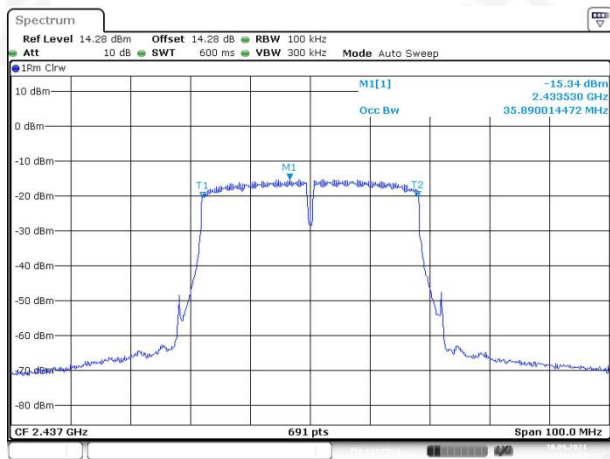


Date: 30 SEP 2021 17:38:29

### Middle channel

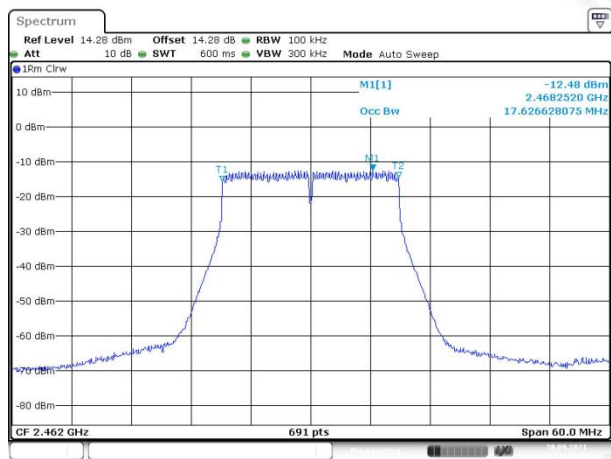


Date: 30 SEP 2021 17:25:18

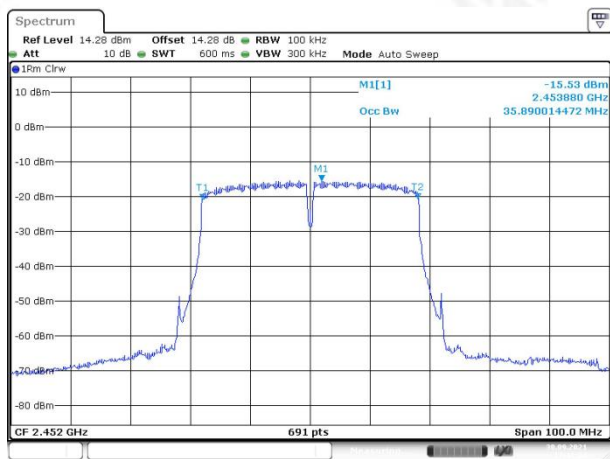


Date: 30 SEP 2021 17:40:02

### Highest channel



Date: 30 SEP 2021 17:26:47



Date: 30 SEP 2021 17:41:25



## 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 12V

### Main Antenna:

Test CH	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	13.97	13.83	13.03	13.19	30.00	Pass
Middle	13.61	14.59	13.25	13.12		
Highest	13.64	13.51	13.14	12.90		

### AUX Antenna:

Test CH	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	13.68	13.38	13.08	13.15	30.00	Pass
Middle	13.62	14.48	13.19	13.13		
Highest	13.56	13.47	13.11	12.95		





## 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

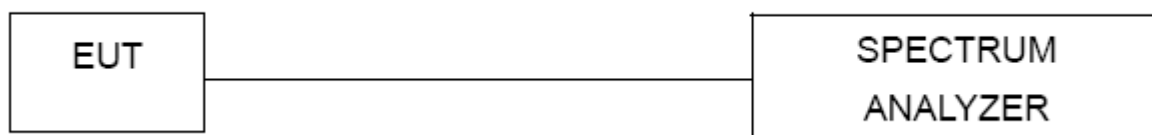
Using the following spectrum analyzer setting:

- 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

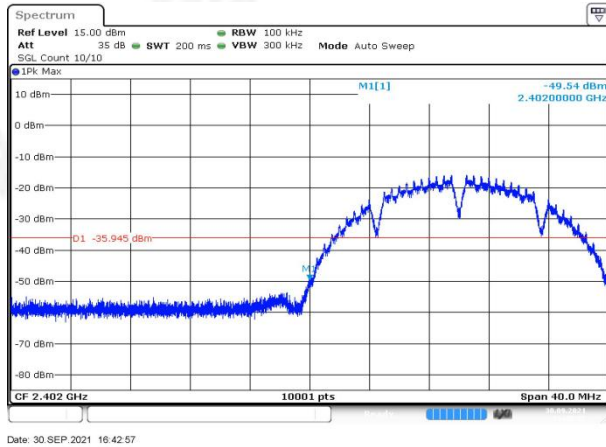
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 9.6 TEST RESULTS

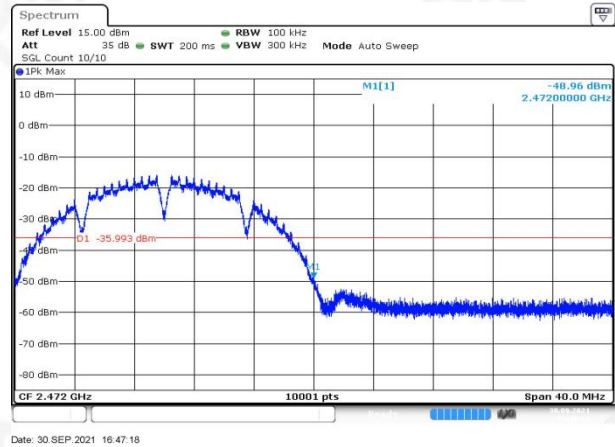


The Band edge test plot(Main Antenna)as follows:

Test mode:	802.11b
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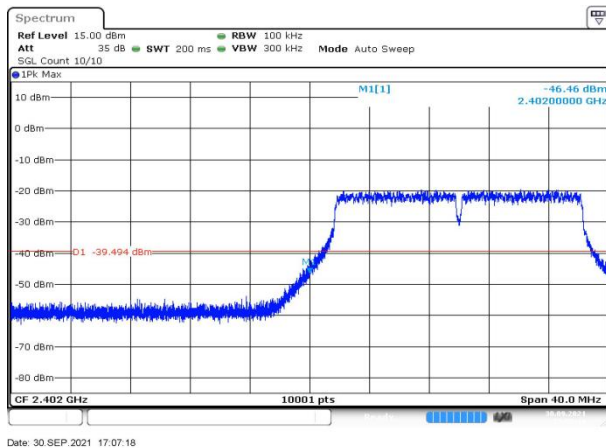


Lowest channel

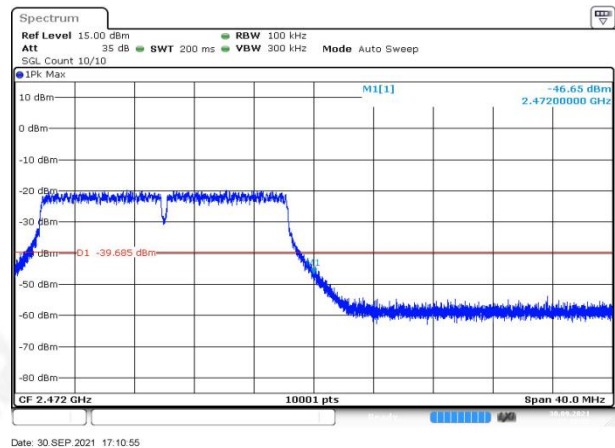


Highest channel

Test mode:	802.11g
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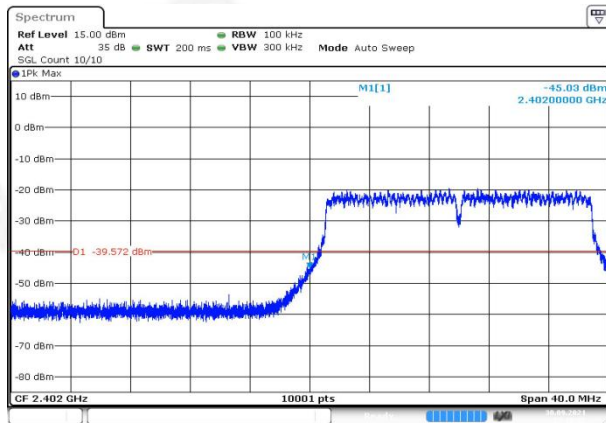
Lowest channel



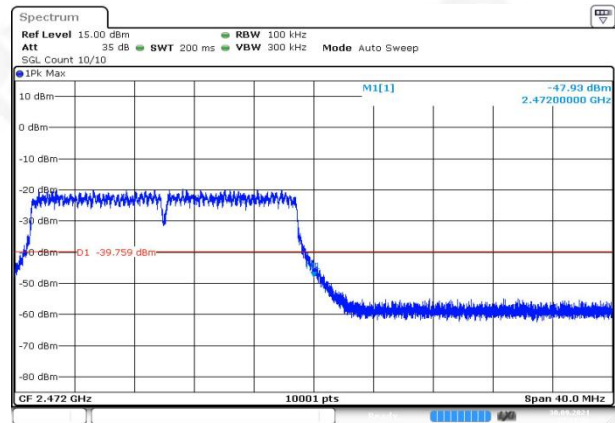
Highest channel



Test mode: 802.11n(HT20)

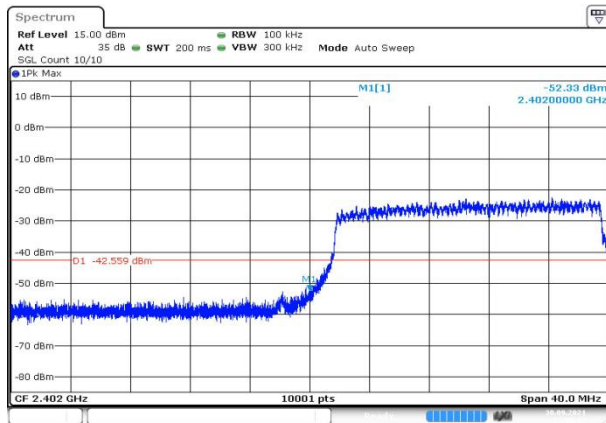


Lowest channel

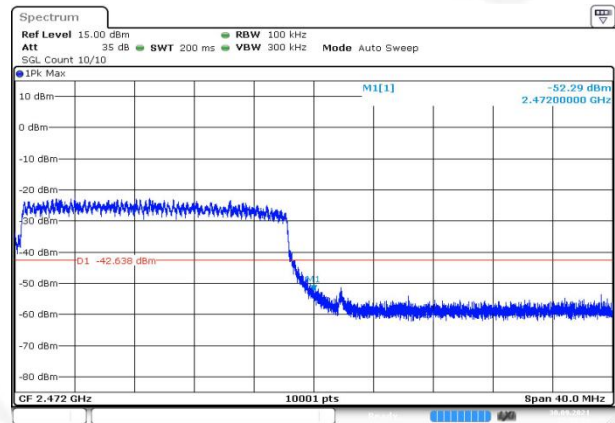


Highest channel

Test mode: 802.11n(HT40)



Lowest channel

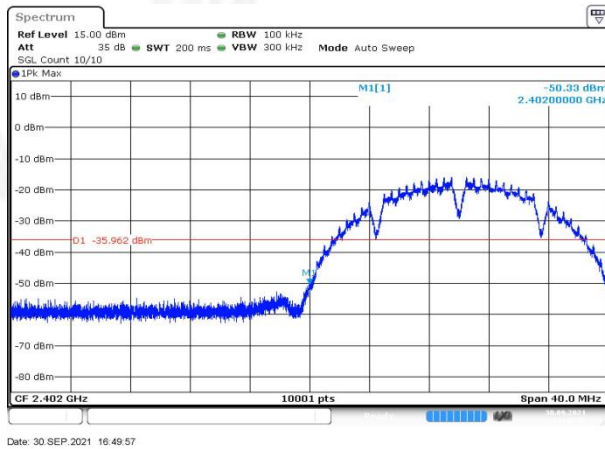


Highest channel

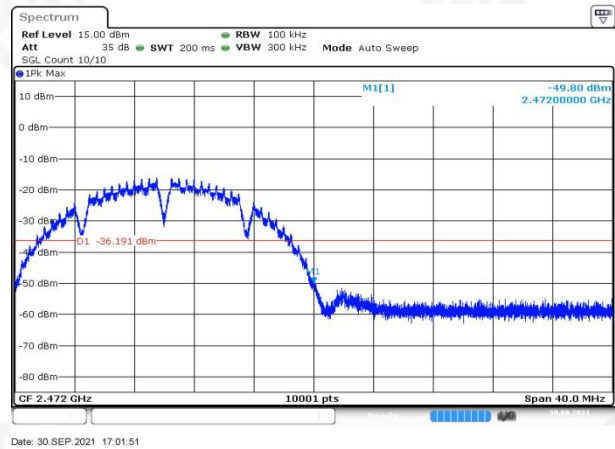


The Band edge test plot(AUX Antenna)as follows:

Test mode: 802.11b

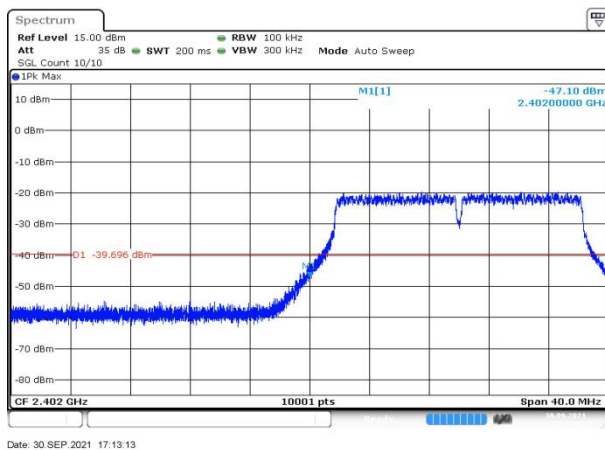


Lowest channel

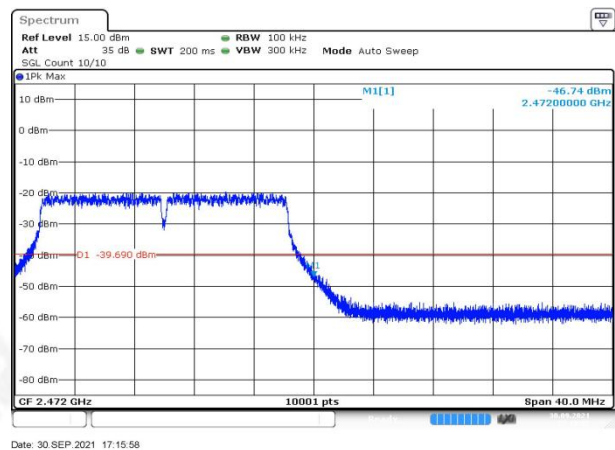


Highest channel

Test mode: 802.11g

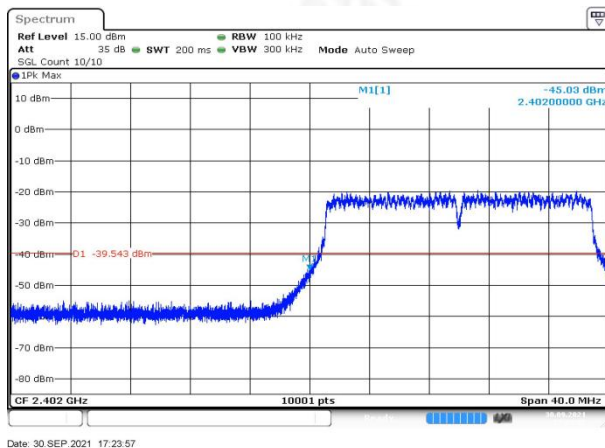


Lowest channel

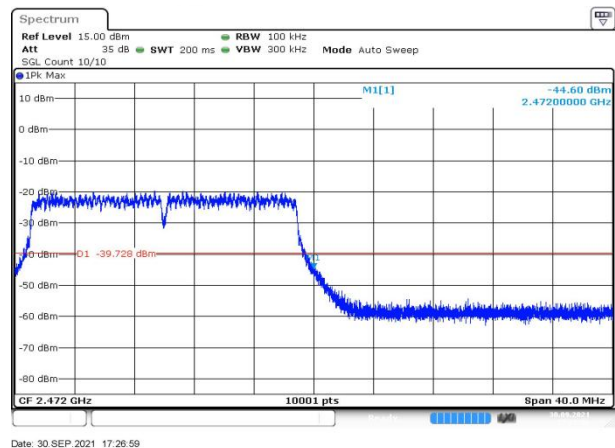


Highest channel

Test mode: 802.11n(HT20)



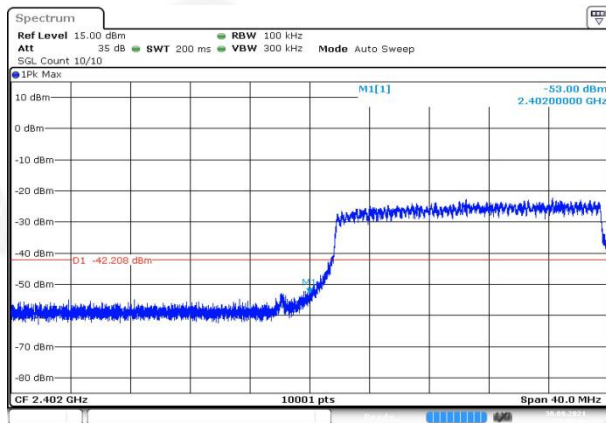
Lowest channel



Highest channel

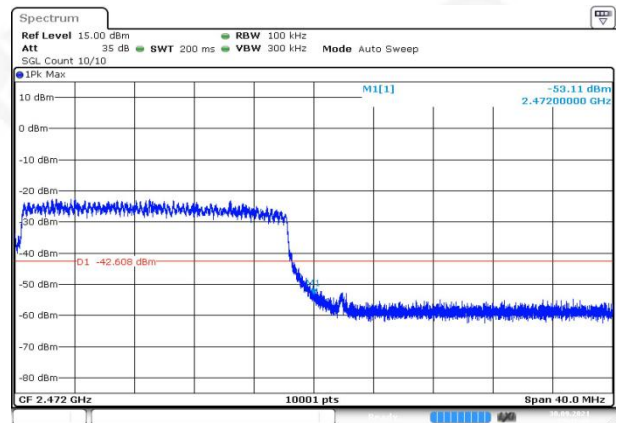


Test mode: 802.11n(HT40)



Date: 30 SEP.2021 17:38:41

Lowest channel



Date: 30 SEP.2021 17:41:36

Highest channel



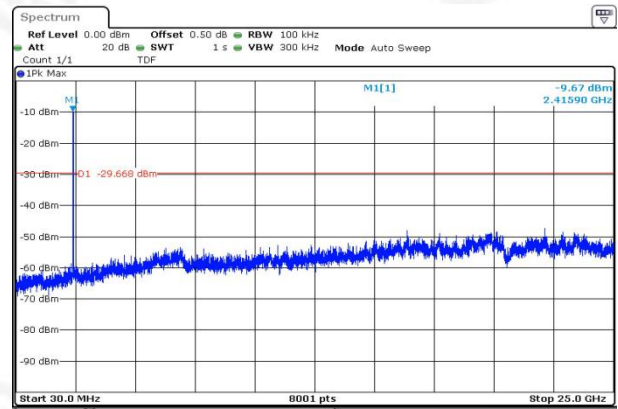
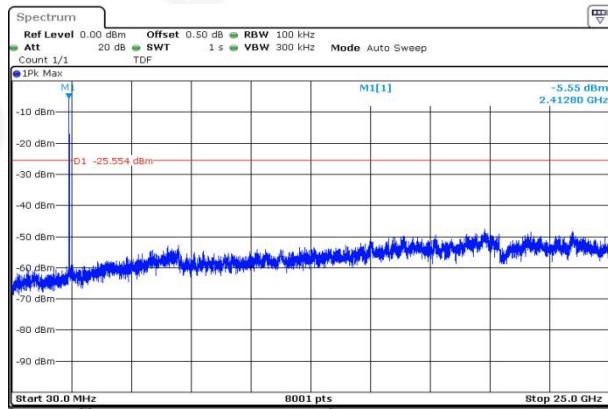


## The Spurious Emission(Main antenna) Test plot as follows:

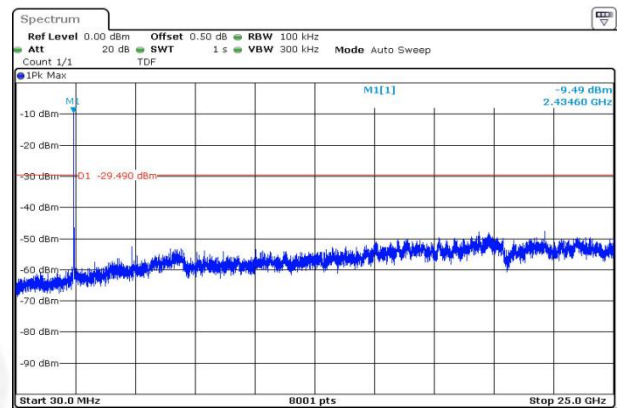
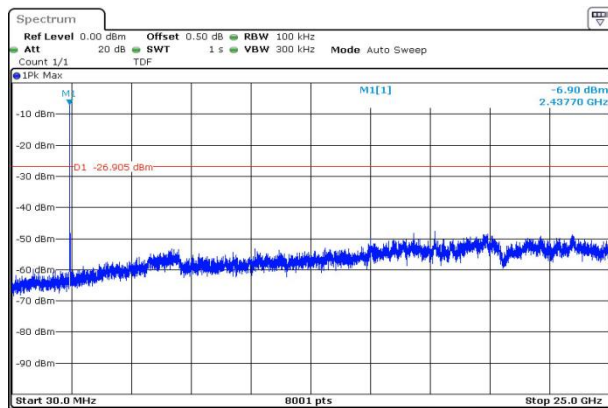
802.11b

802.11g

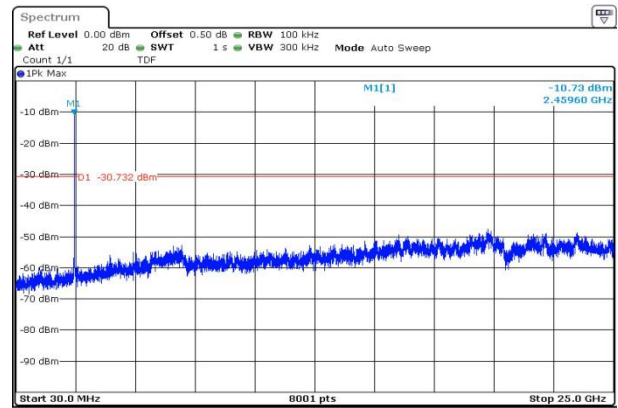
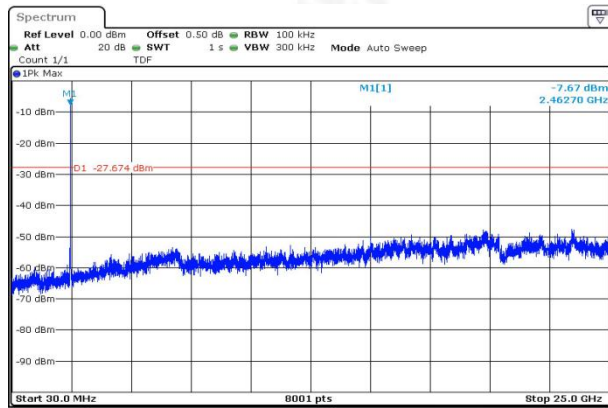
### Lowest channel



### Middle channel



### Highest channel

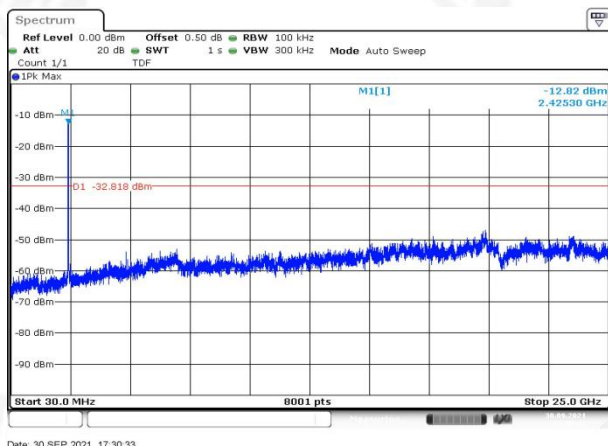
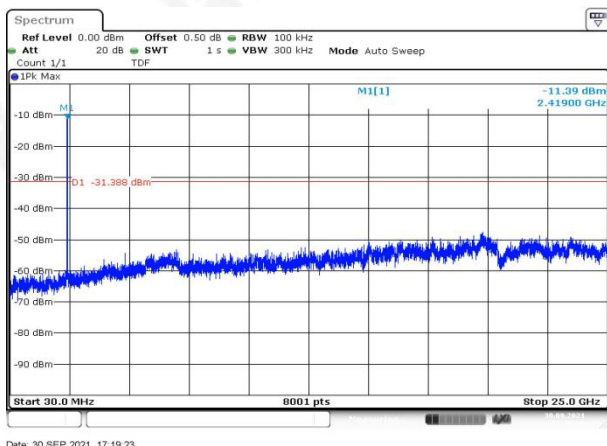




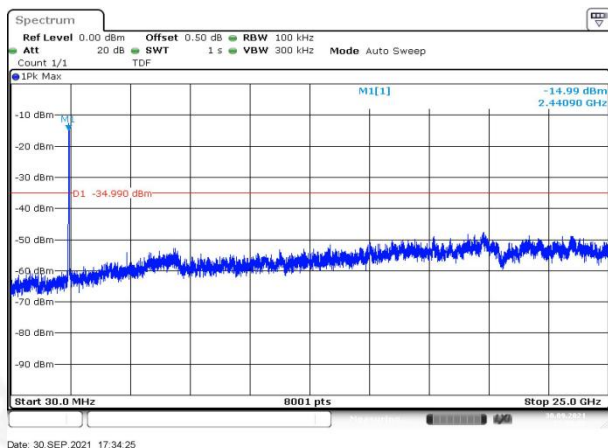
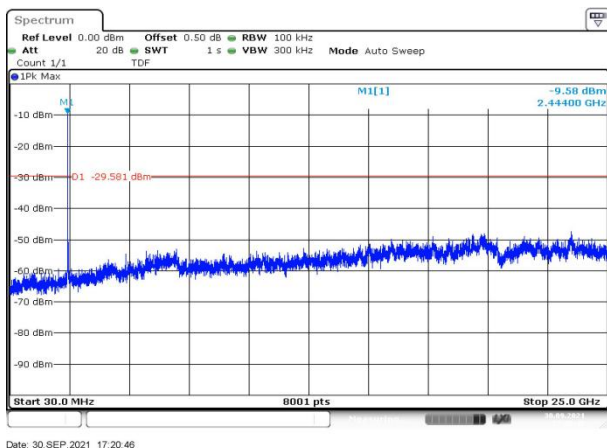
802.11n20

802.11n40

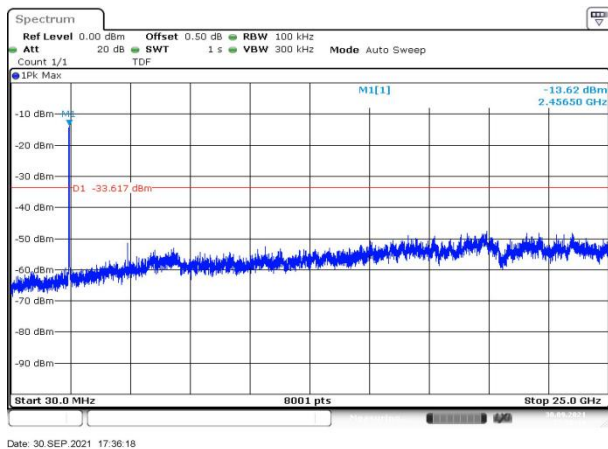
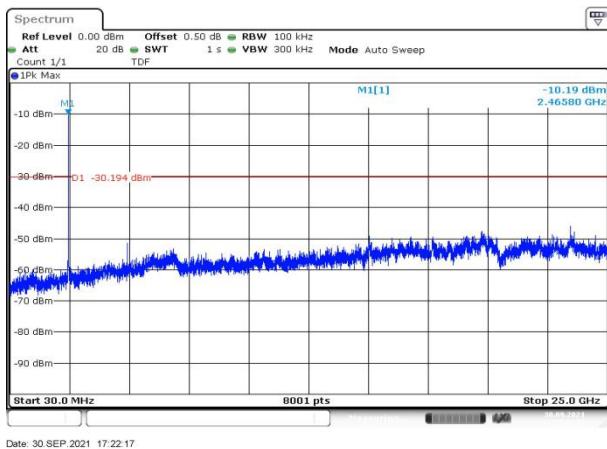
Lowest channel



Middle channel



Highest channel



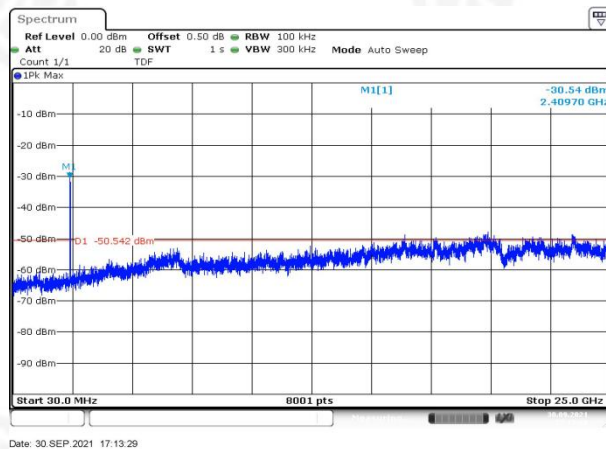
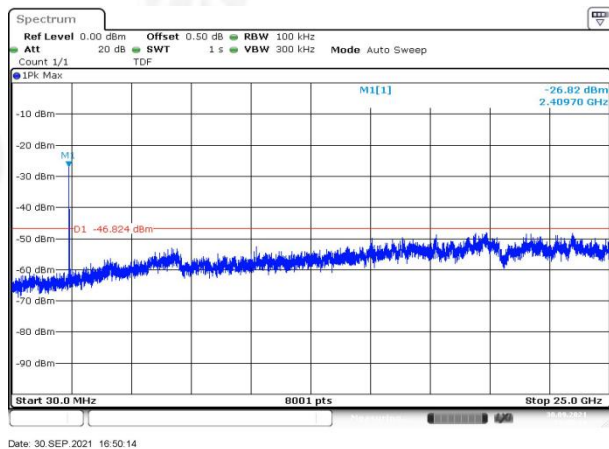


The Spurious Emission(AUX antenna) Test plot as follows:

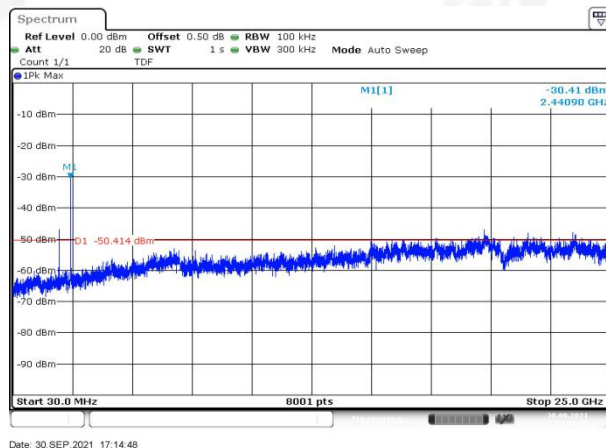
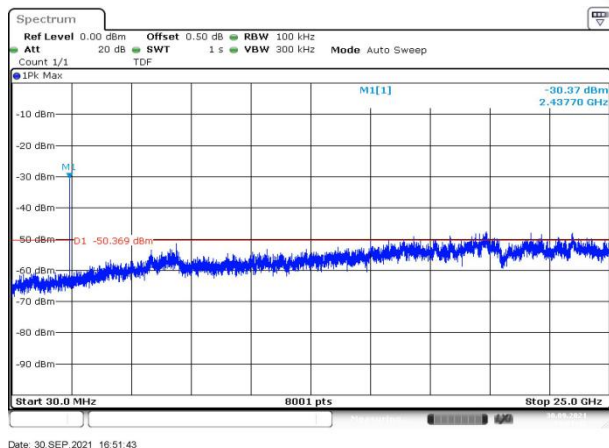
802.11b

802.11g

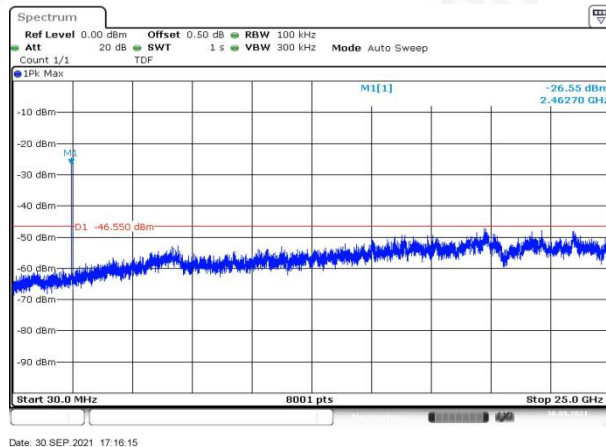
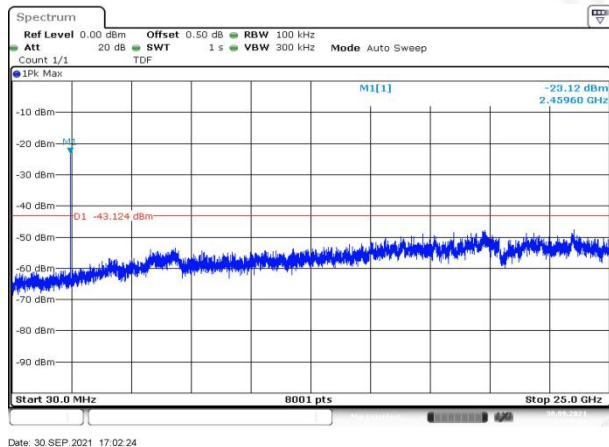
Lowest channel



Middle channel



Highest channel

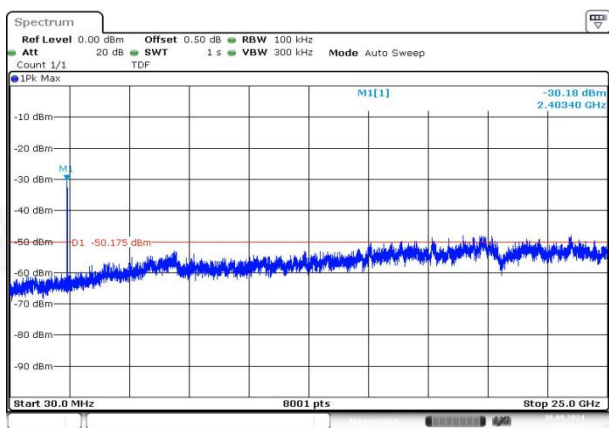




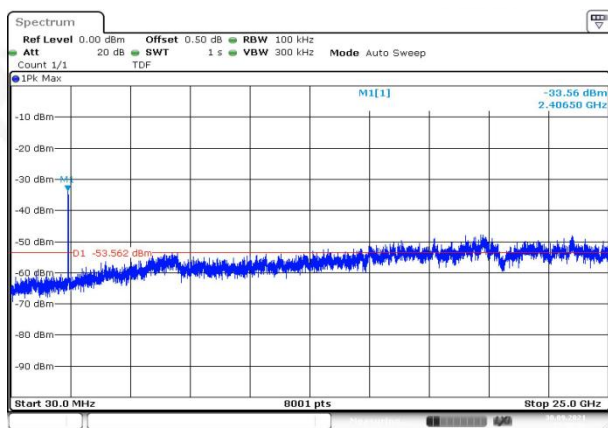
802.11n20

802.11n40

### Lowest channel

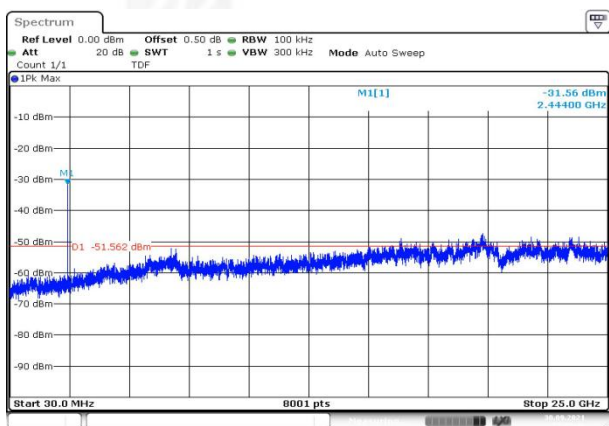


Date: 30 SEP 2021 17:24:14

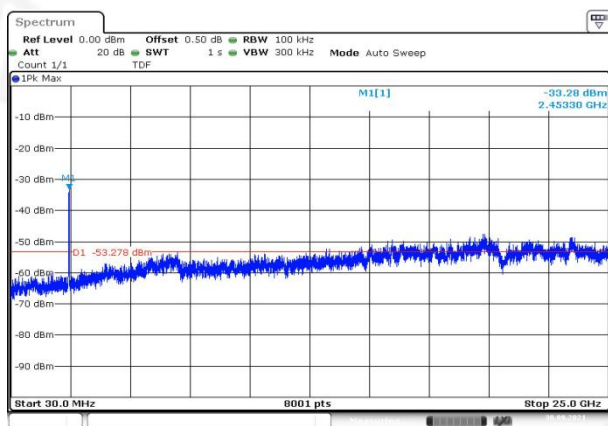


Date: 30 SEP 2021 17:38:59

### Middle channel

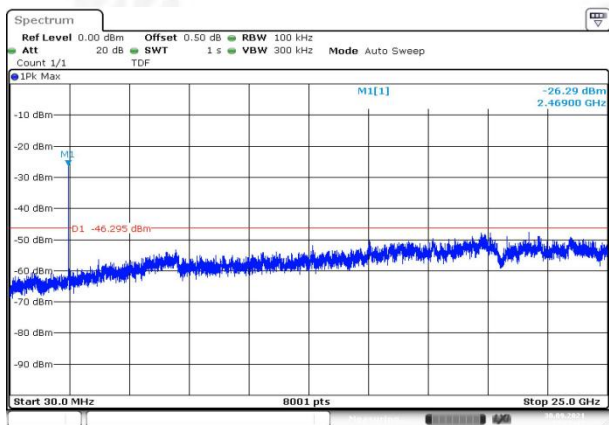


Date: 30 SEP 2021 17:25:41

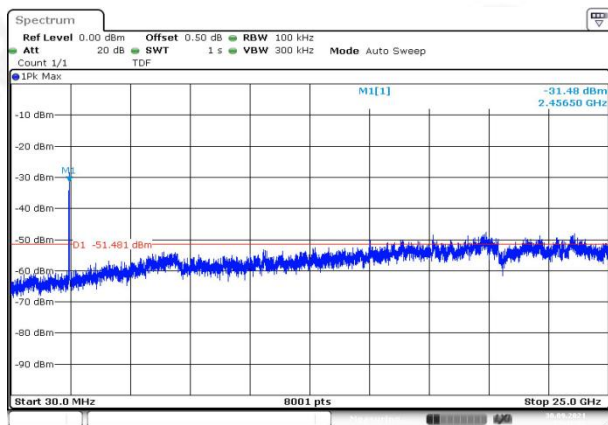


Date: 30 SEP 2021 17:40:22

### Highest channel



Date: 30 SEP 2021 17:27:15



Date: 30 SEP 2021 17:41:52



## 10. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<p>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.</p> <p>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.</p>	
EUT Antenna:	
The antenna is whip Antenna, the best case gain of the antenna is 3dBi, reference to the appendix II for details	





#### 11. TEST SETUP PHOTO

Reference to the appendix I for details.

#### 12. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

#### 13. PHOTOGRAPHS OF THE EUT

See the APPENDIX 1-EUT PHOTO.

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