4.4. UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

4.4.1. Applicable Standard

According to FCC Part15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02

4.4.2. Conformance Limit

According to FCC Part 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.

4.4.3. Test Configuration

Test according to clause 3.1 radio frequency test setup 1

4.4.4. Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer
Reference level measurement
Establish a reference level by using the following procedure:
Set instrument center frequency to DTS channel center frequency.
Set the span to ≥ 1.5 times the DTS bandwidth.
Set the RBW = 100 kHz.
Set the VBW ≥ 3 x RBW.
Set Detector = peak.
Set Sweep time = auto couple.
Set Trace mode = max hold.
Allow trace to fully stabilize.
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.

Emission level measurement

Set the center frequency and span to encompass frequency range to be measured.
Set the RBW = 100 kHz.
Set the VBW =300 kHz.
Set Detector = Peak
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
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) are attenuated by at least the minimum requirements . Report the three highest emissions relative to the limit.

Test Results

All the antennas and modulation modes were tested, and the worst data for is shown in the table below.

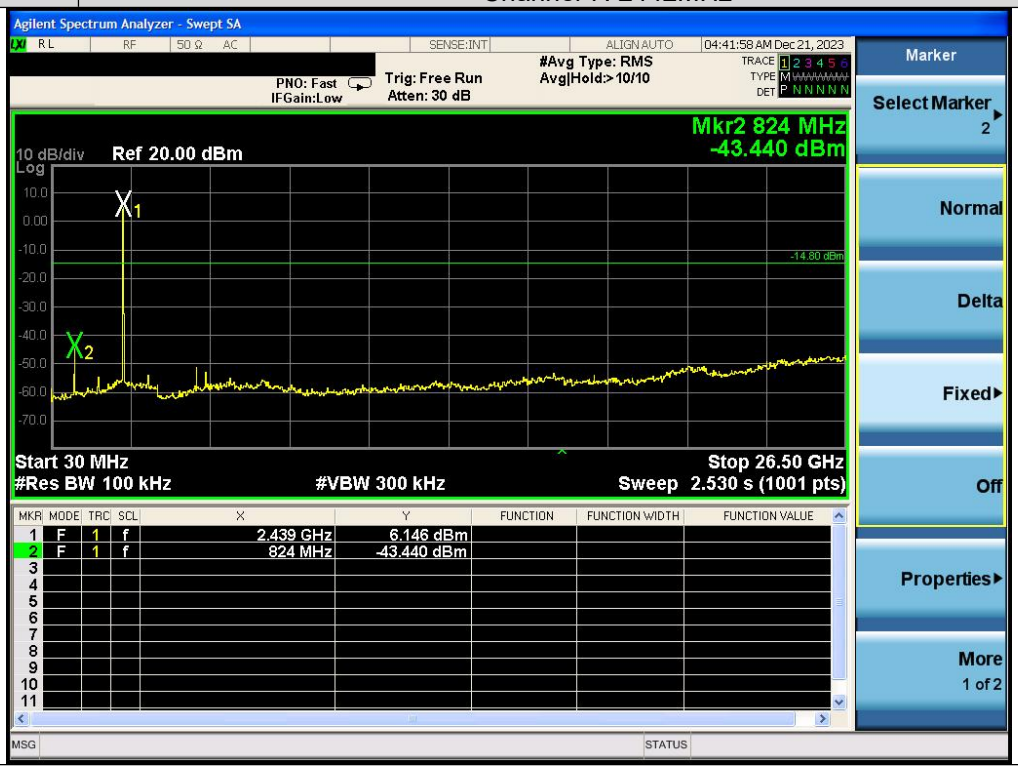
Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			

Test Model	Band edge			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			

Test Model	Unwanted Emissions in non-restricted frequency bands			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			

Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 7: 2442MHz			

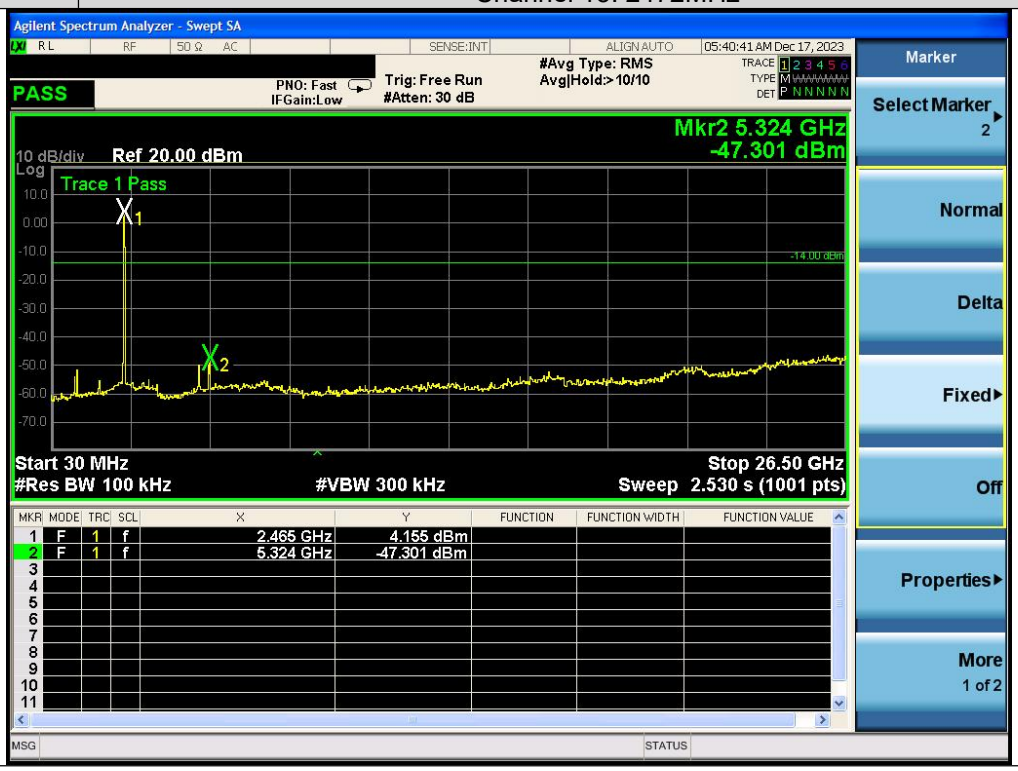
Test Model	Unwanted Emissions in non-restricted frequency bands			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 7: 2442MHz			



Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

Test Model	Band edge			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

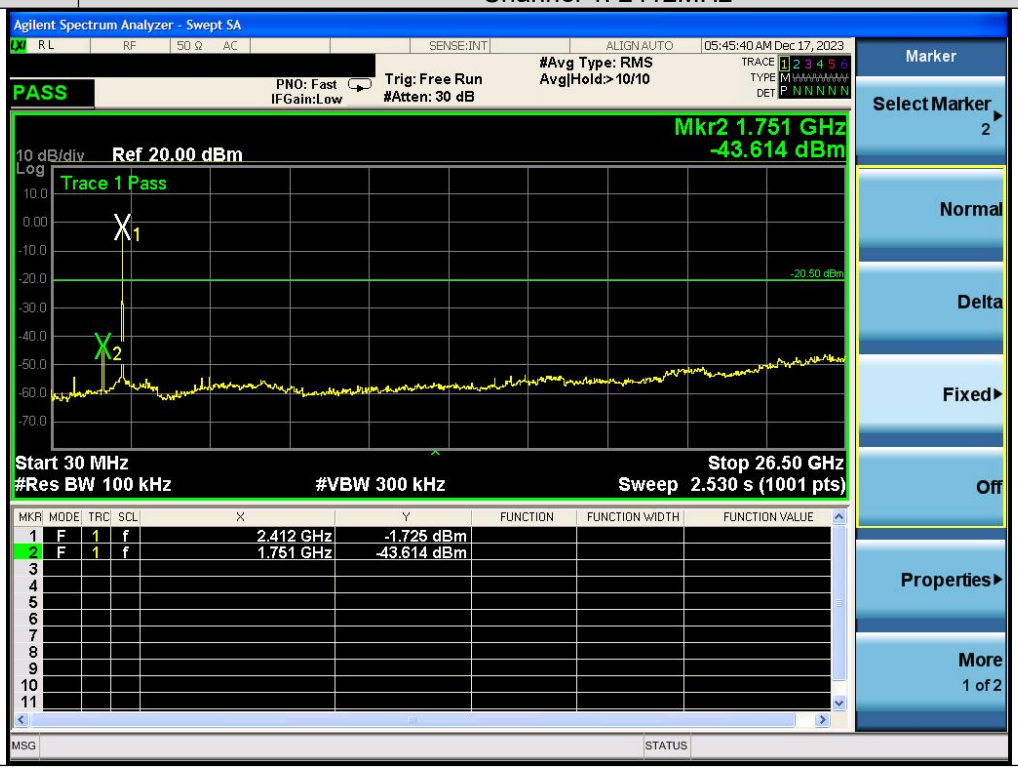
Test Model	Unwanted Emissions in non-restricted frequency bands			
	☒ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			



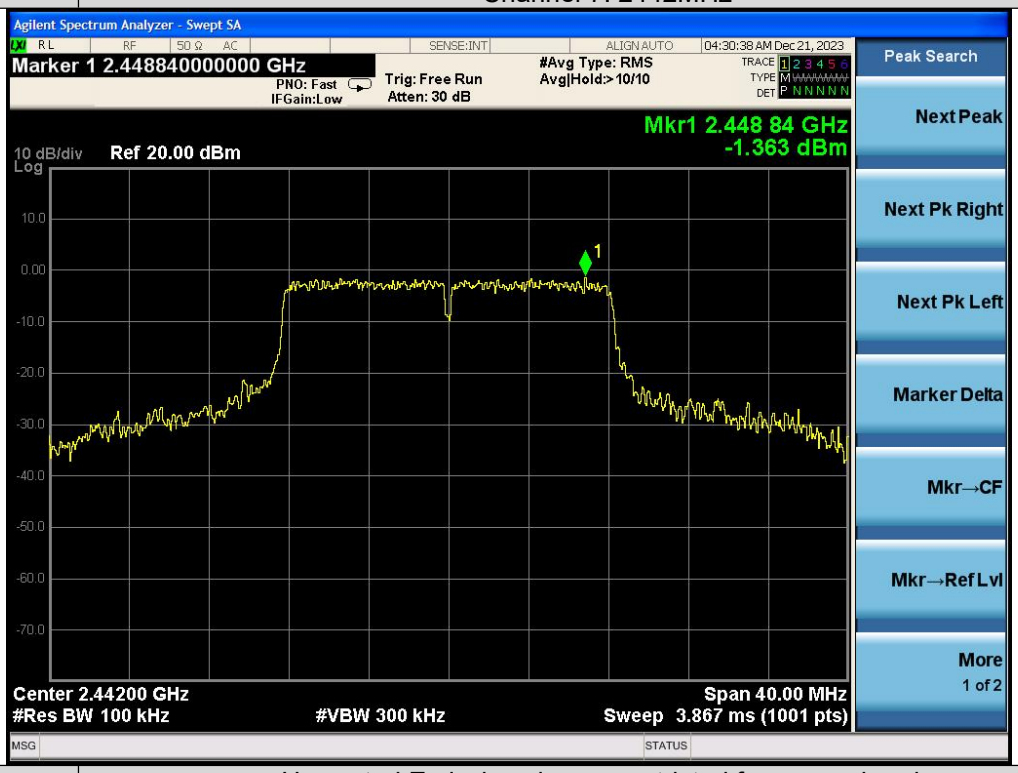
Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐802.11b	☒802.11g	☐802.11n(HT20)	☐802.11n(HT40)
	Channel 1: 2412MHz			

Test Model	Band edge			
	☐802.11b	☒802.11g	☐802.11n(HT20)	☐802.11n(HT40)
	Channel 1: 2412MHz			

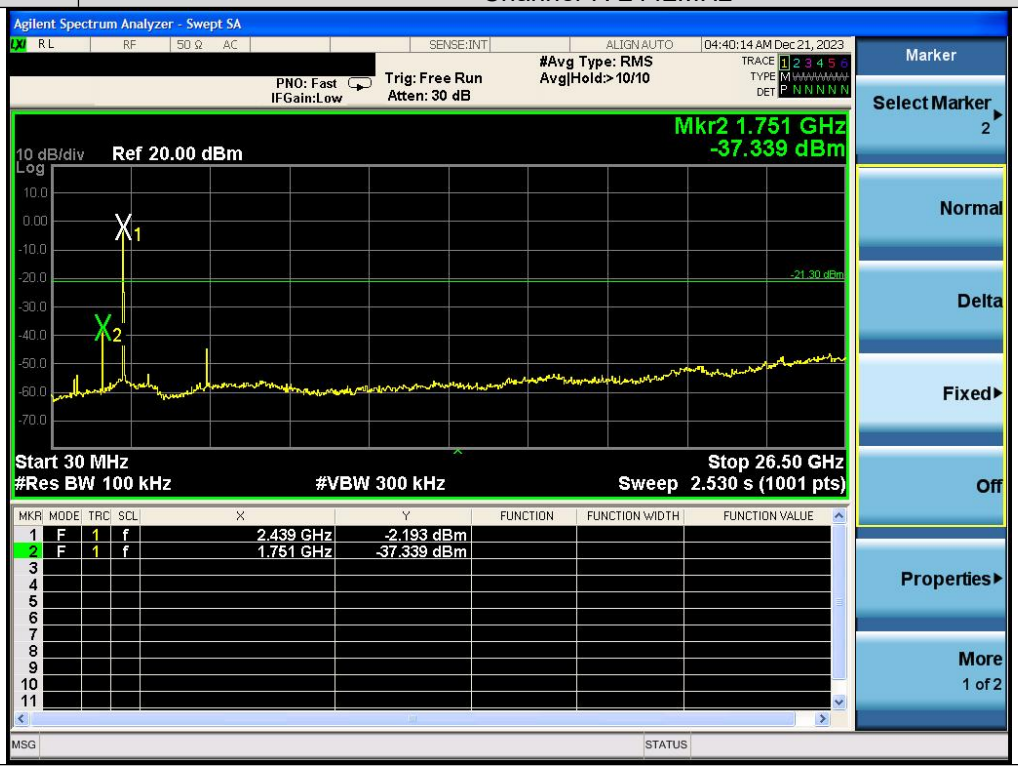
Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☒ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			



Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐ 802.11b	☒ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 7: 2442MHz			



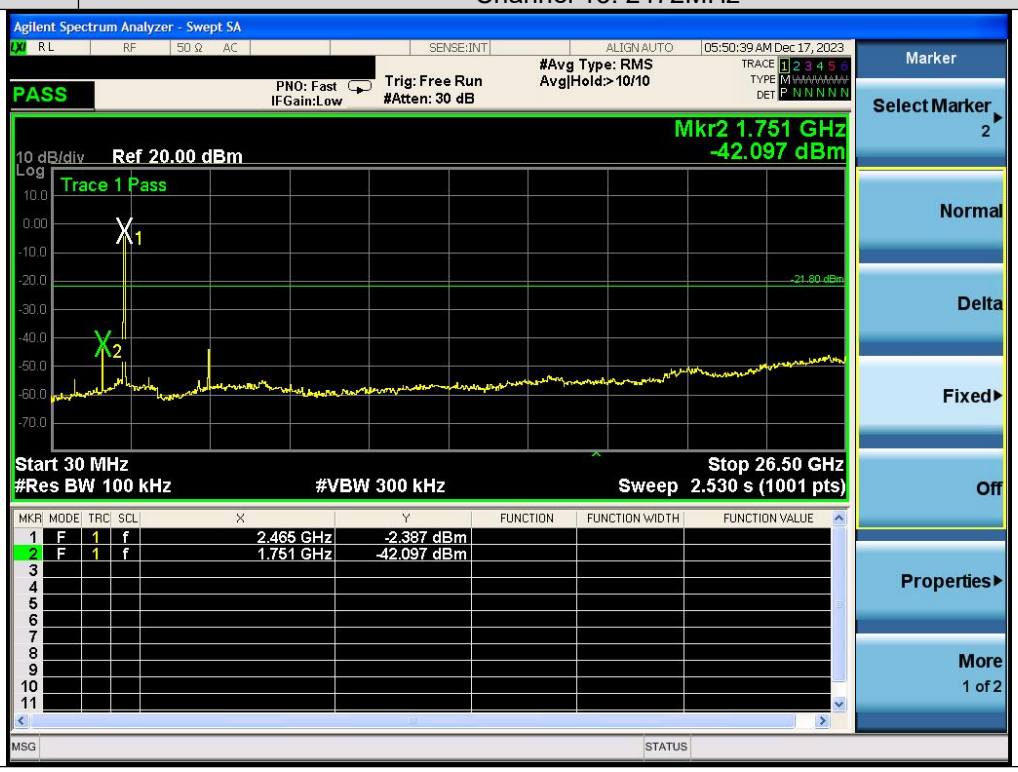
Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☒ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 7: 2442MHz			



Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐ 802.11b	☒ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

Test Model	Band edge			
	☐ 802.11b	☒ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☒ 802.11g	☐ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

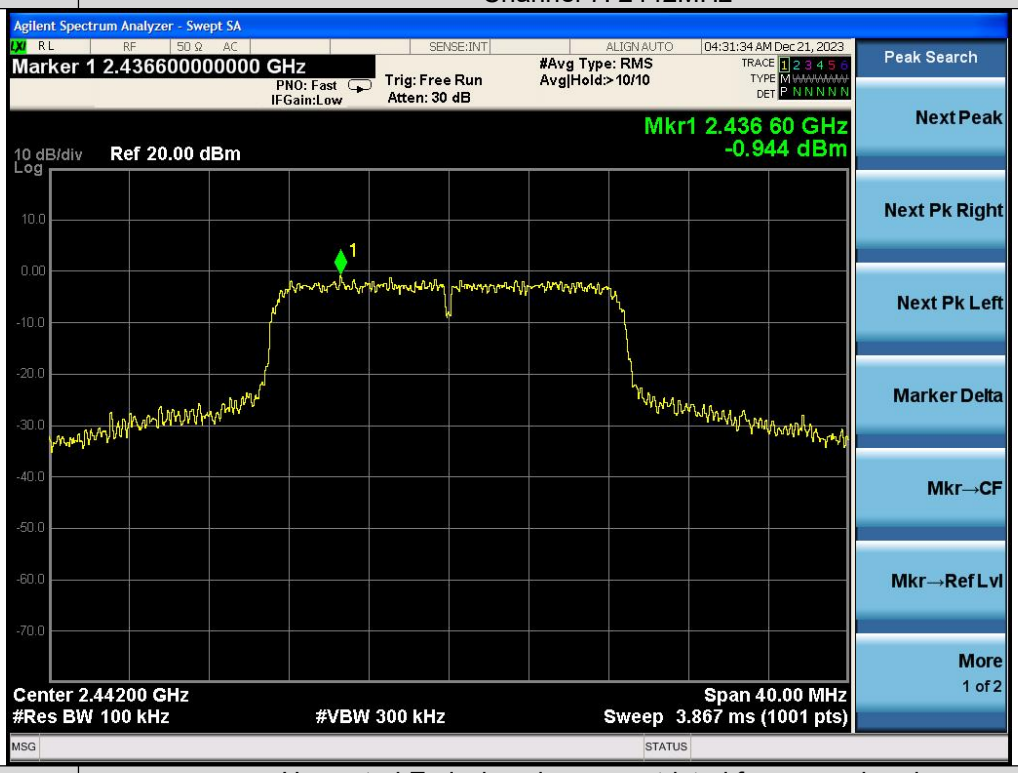


Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			

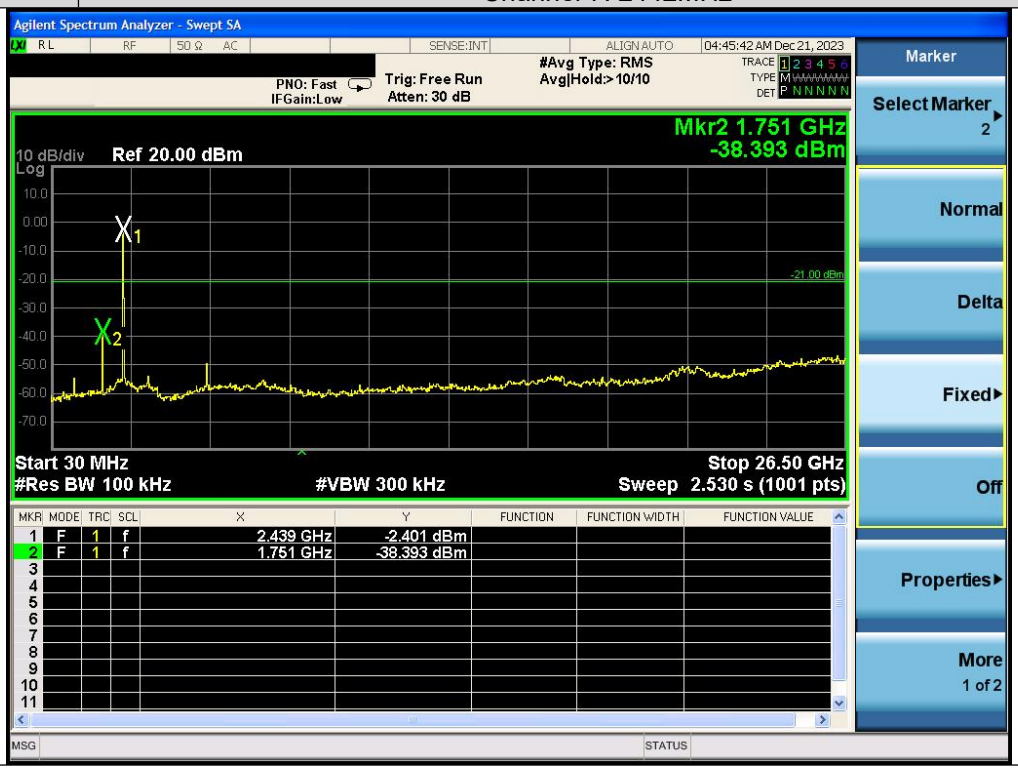
Test Model	Band edge			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			

Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 1: 2412MHz			

Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐802.11b	☐802.11g	☒802.11n(HT20)	☐802.11n(HT40)
	Channel 7: 2442MHz			



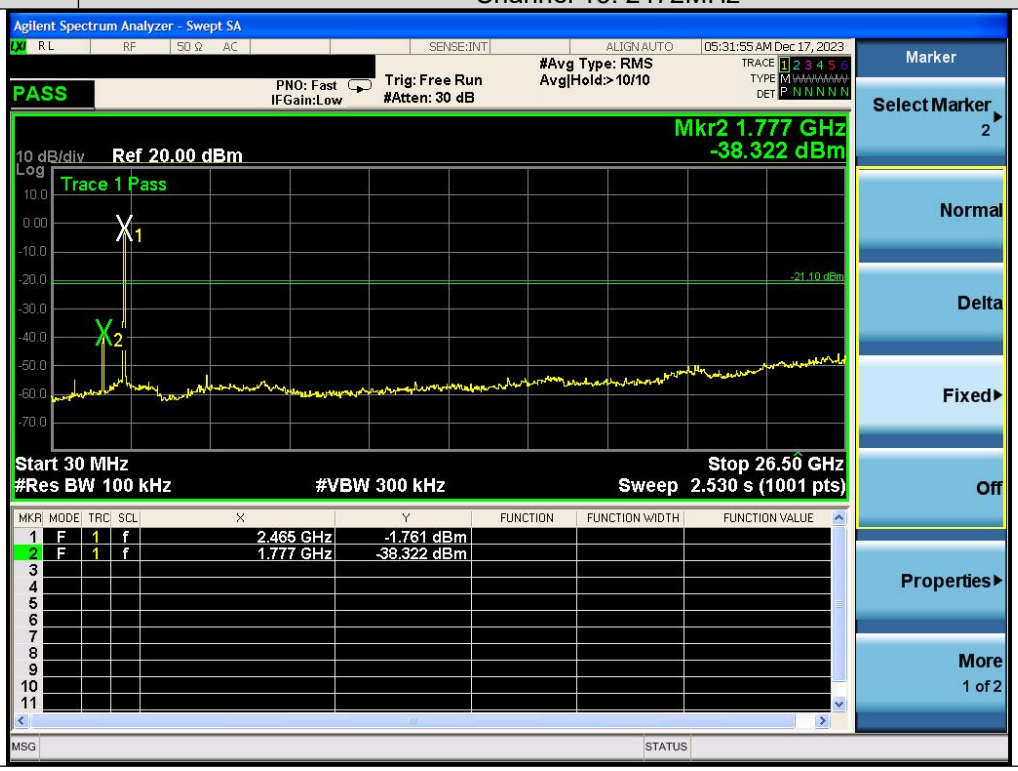
Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐802.11b	☐802.11g	☒802.11n(HT20)	☐802.11n(HT40)
	Channel 7: 2442MHz			



Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

Test Model	Band edge			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	Channel 13: 2472MHz			

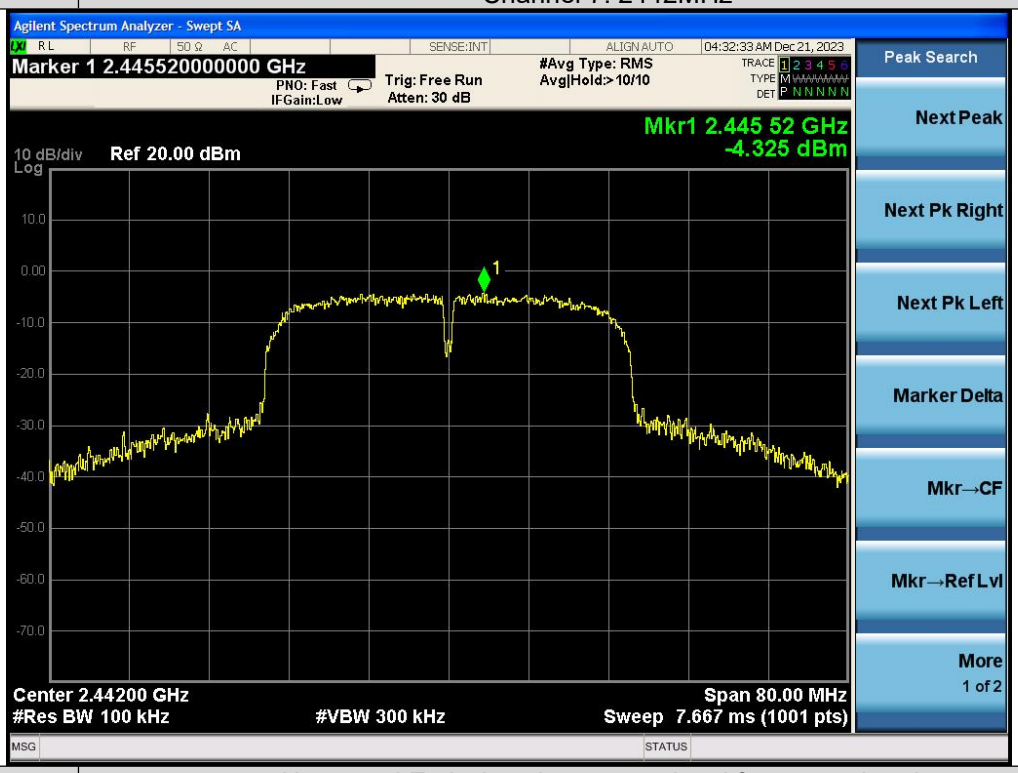


Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☒ 802.11n(HT40)
	Channel 3: 2422MHz			

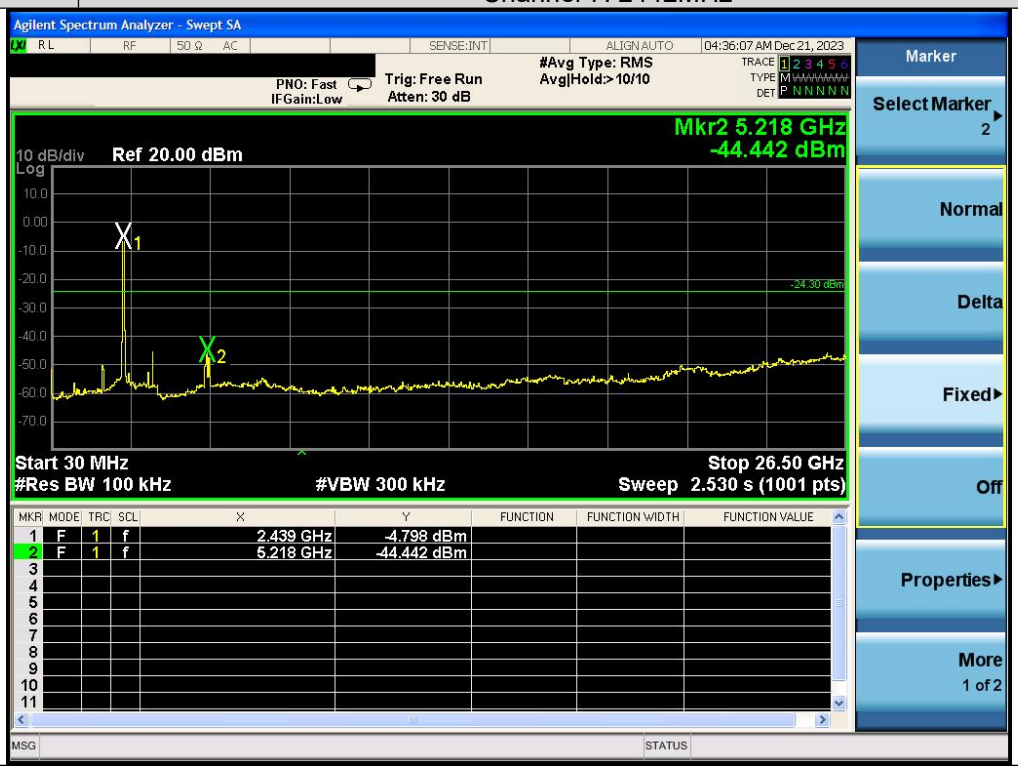
Test Model	Band edge			
	☐ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☒ 802.11n(HT40)
	Channel 3: 2422MHz			

Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☒ 802.11n(HT40)
	Channel 3: 2422MHz			

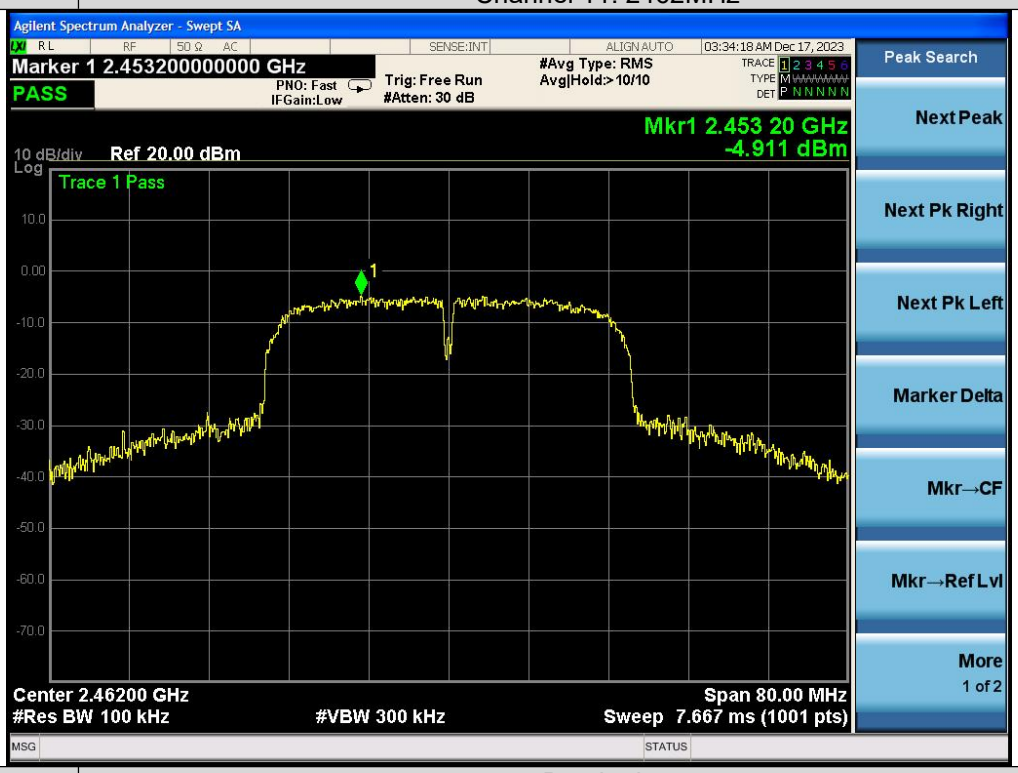
Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐802.11b	☐802.11g	☐802.11n(HT20)	☒802.11n(HT40)
	Channel 7: 2442MHz			



Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐802.11b	☐802.11g	☐802.11n(HT20)	☒802.11n(HT40)
	Channel 7: 2442MHz			

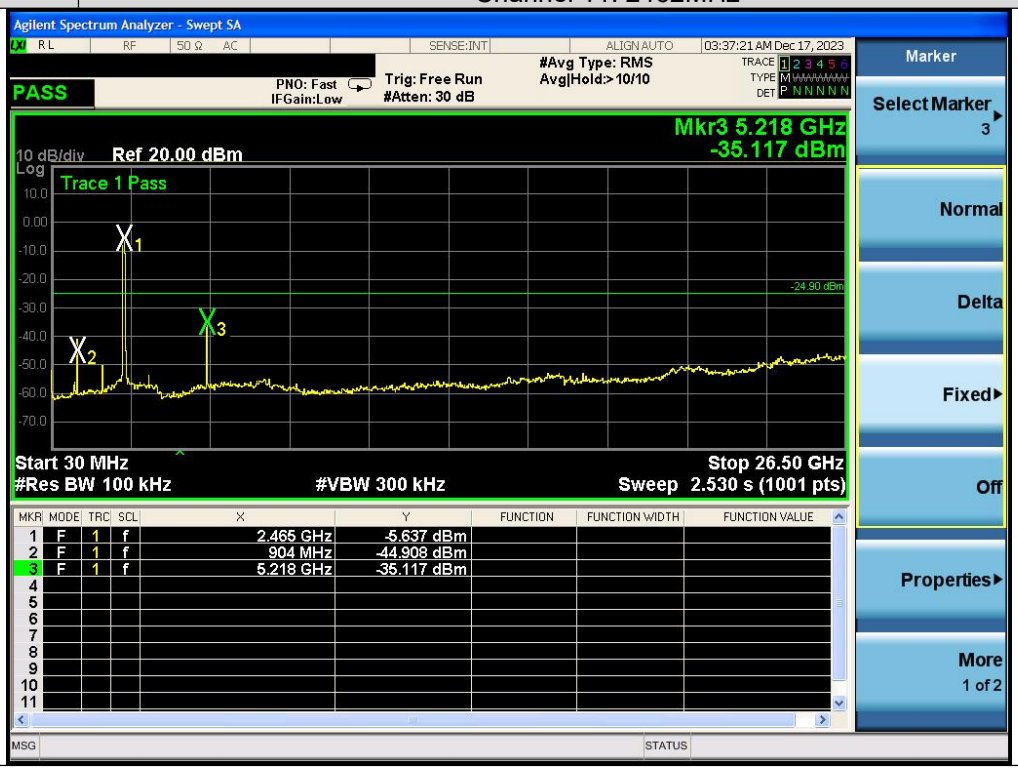


Test Model	PSD(Power Spectral Density) RBW=100kHz, VBW =300 kHz			
	☐ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☒ 802.11n(HT40)
	Channel 11: 2462MHz			



Test Model	Band edge			
	☐ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☒ 802.11n(HT40)
	Channel 11: 2462MHz			

Test Model	Unwanted Emissions in non-restricted frequency bands			
	☐ 802.11b	☐ 802.11g	☐ 802.11n(HT20)	☒ 802.11n(HT40)
	Channel 11: 2462MHz			



4.5. RADIATED SPURIOUS EMISSION

4.5.1. Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

4.5.2. Conformance Limit

According to FCC Part 15.247(d): 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)).

According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

4.5.3. Test Configuration

Test according to clause 3.2 radio frequency test setup 2

4.5.4. Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
For Above 1GHz:
The EUT was placed on a turn table which is 1.5m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 1GHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 30MHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 9kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 150KHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 200Hz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further

adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

Test Results：

■ Spurious Emission below 30MHz (9KHz to 30MHz)

Frequency	Factor	Meter Reading	Emission Level	Limits	Margin	Detector Type	Ant. Pol.
(MHz)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)		H/V
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor

■ **Spurious Emission Above 1GHz (1GHz to 25GHz)**

All modes 2.4G 802.11b/g/n have been tested, and the worst result recorded was report as below:

Test mode:	802.11 b		Frequency:		Channel 1: 2412MHz		
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4825	50.81	-1.02	49.79	74	-24.21	peak	V
4842	38.67	-1.01	37.66	54	-16.34	AVG	V
4825	55.67	-1.02	54.65	74	-19.35	peak	H
4842	43.64	-1.01	42.63	54	-11.37	AVG	H

Test mode:	802.11 b		Frequency:		Channel 7: 2442MHz		
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4836	48.62	-1.02	47.6	74	-26.4	peak	V
4880	35.58	-1.01	34.57	54	-19.43	AVG	V
4836	52.60	-1.02	51.58	74	-22.42	peak	H
4880	34.25	-1.01	33.24	54	-20.76	AVG	H

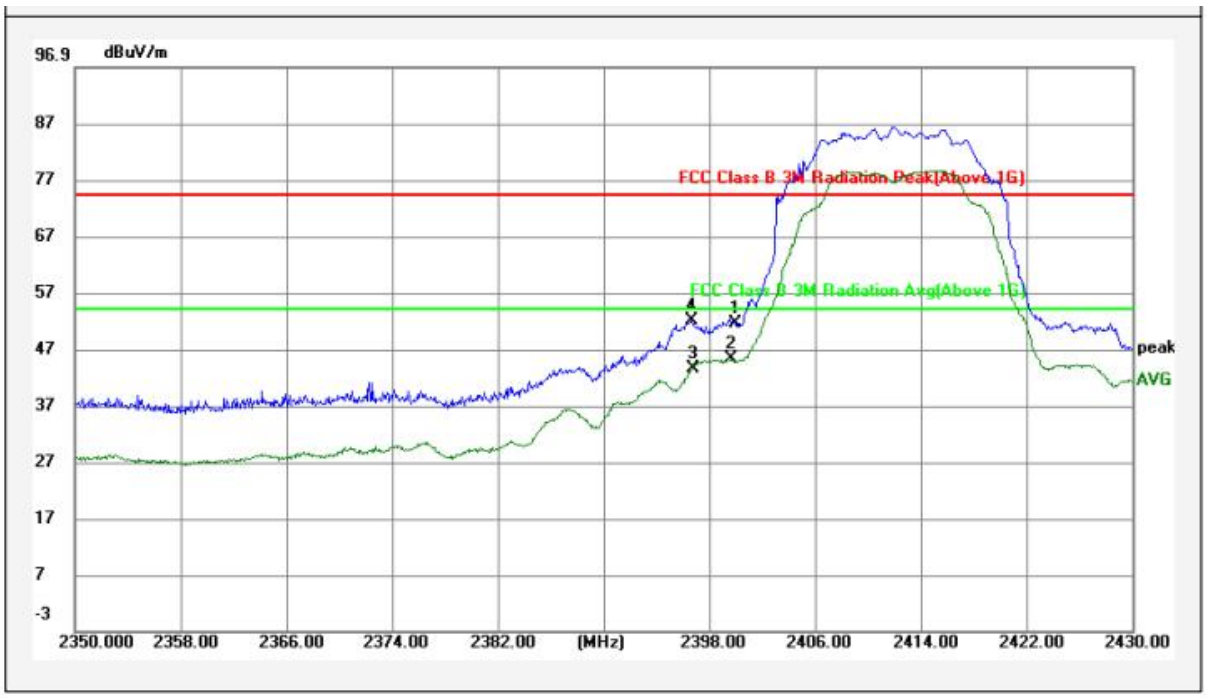
Test mode:	802.11 b		Frequency:		Channel 13: 2472MHz		
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4944	57.89	-1.01	56.88	74	-17.12	peak	V
4961	45.64	-1	44.64	54	-9.36	AVG	V
17966	39.87	16.93	56.8	74	-17.2	peak	V
17864	28.74	16.72	45.46	54	-8.54	AVG	V
4944	55.32	-1.01	54.31	74	-19.69	peak	H
4961	43.06	-1	42.06	54	-11.94	AVG	H
17864	39.4	16.72	56.12	74	-17.88	peak	H
17932	28.74	16.87	45.61	54	-8.39	AVG	H

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission in Restricted Band 2350-2430MHz and 2450-2500MHz

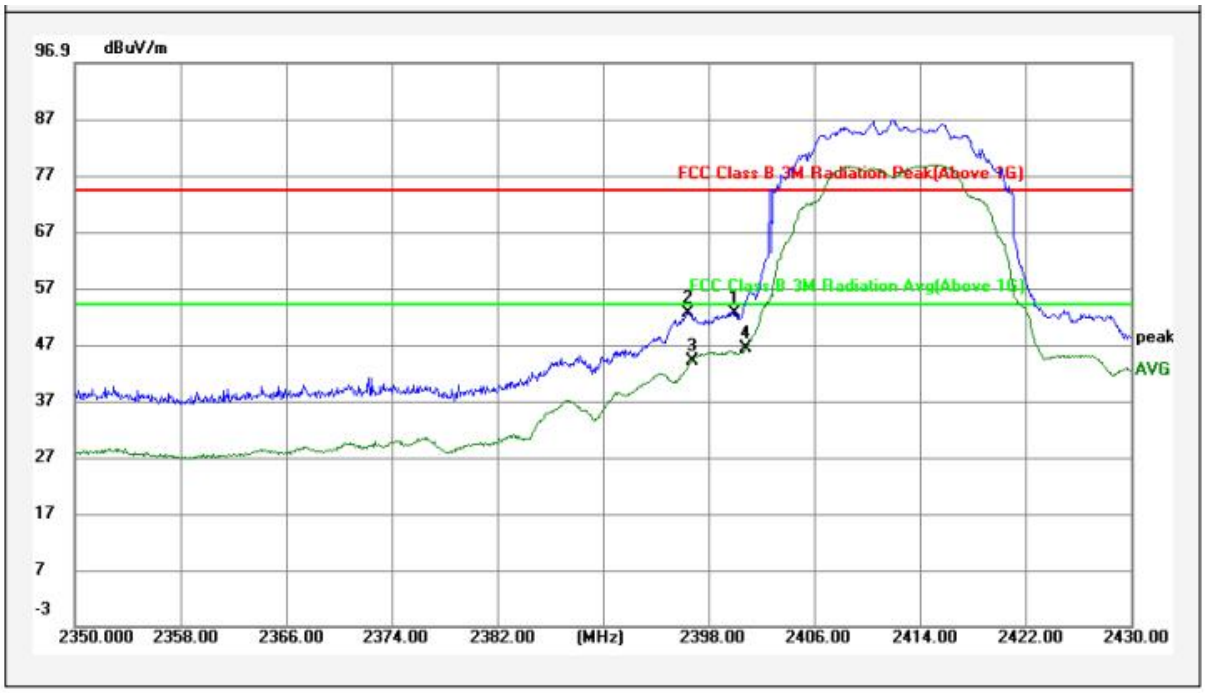
All modes 2.4G 802.11b/g/n have been tested, and the worst result recorded was report as below:

Test Mode:	802.11b	2412MHz	Test Channel	Lowest
Temperature:	23.7℃		Phase:	Vertical
Relative Humidity:	57%		Pressure:	98.3KPa



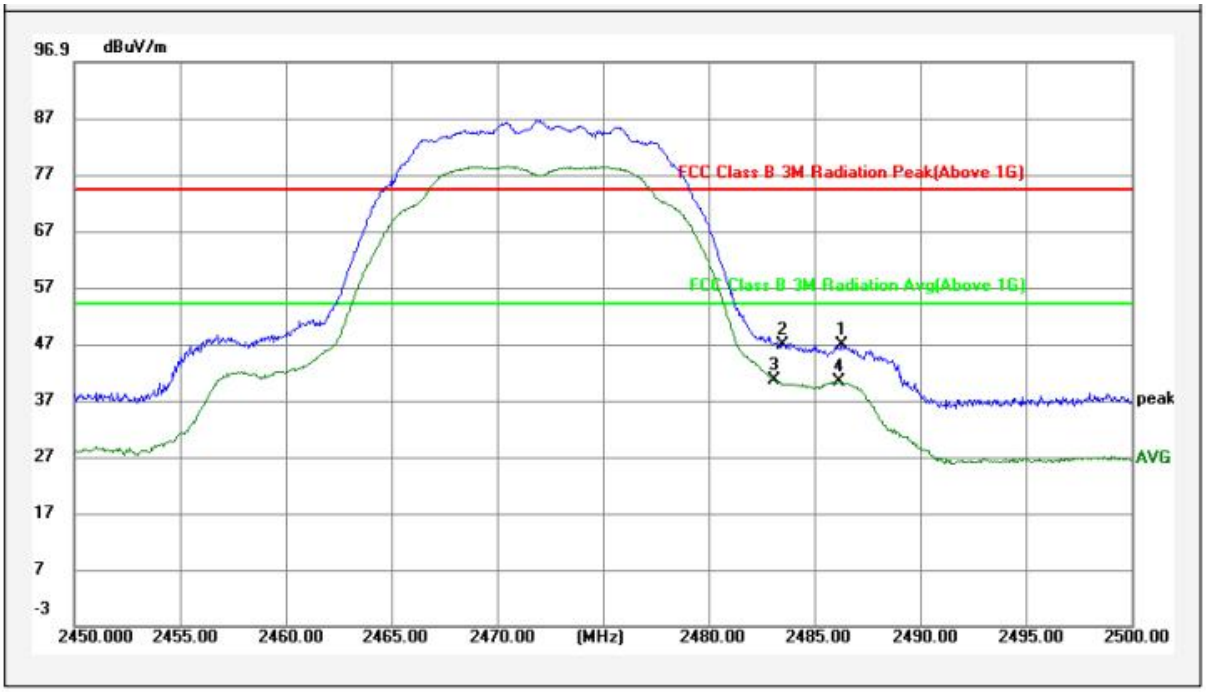
No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	2400.000	-4.79	56.20	51.41	74.00	-22.59	peak		
2	2399.600	-4.79	50.06	45.27	54.00	-8.73	AVG	*	
3	2396.720	-4.80	48.36	43.56	54.00	-10.44	AVG		
4	2396.640	-4.80	56.73	51.93	74.00	-22.07	peak		

Test Mode:	802.11b	2412MHz	Test Channel	Lowest
Temperature:	23.7℃		Phase:	Horizontal
Relative Humidity:	57%		Pressure:	98.3KPa



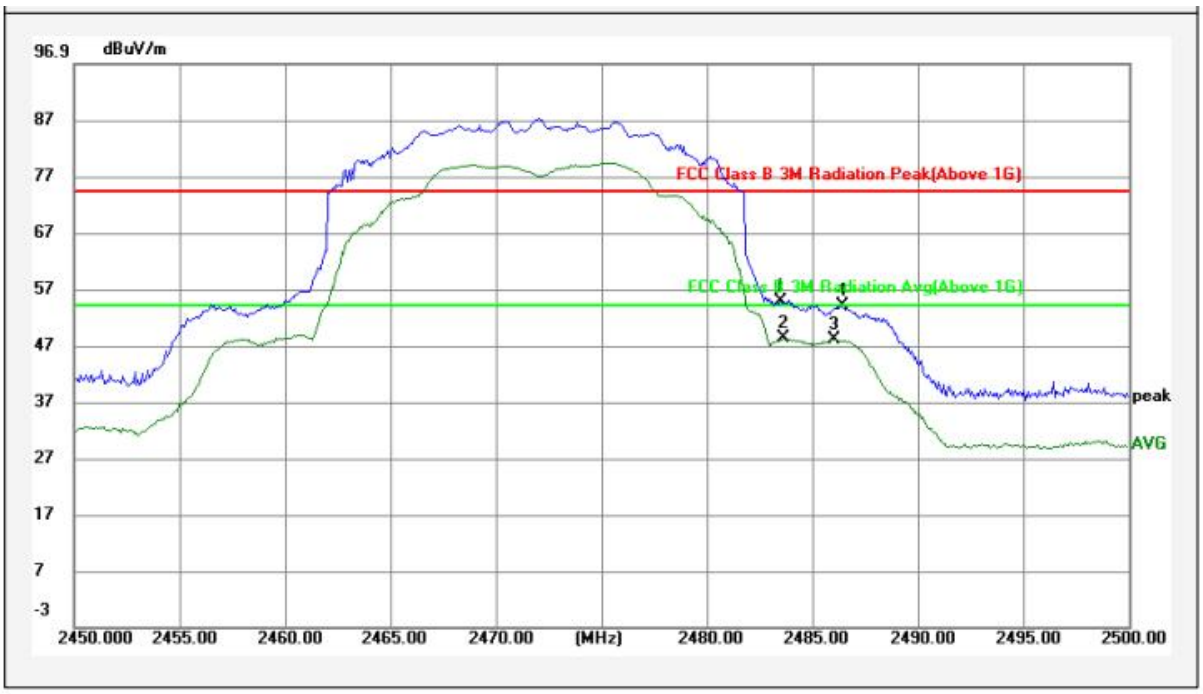
No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	2400.000	-4.79	57.22	52.43	74.00	-21.57	peak		
2	2396.400	-4.80	57.40	52.60	74.00	-21.40	peak		
3	2396.720	-4.80	48.86	44.06	54.00	-9.94	AVG		
4	2400.800	-4.79	50.96	46.17	54.00	-7.83	AVG	*	

Test Mode:	802.11b	2472MHz	Test Channel	Highest
Temperature:	23.7℃		Phase:	Vertical
Relative Humidity:	57%		Pressure:	98.3KPa



No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	2486.300	-4.46	51.18	46.72	74.00	-27.28	peak		
2	2483.500	-4.46	51.21	46.75	74.00	-27.25	peak		
3	2483.100	-4.47	44.89	40.42	54.00	-13.58	AVG	*	
4	2486.150	-4.46	44.72	40.26	54.00	-13.74	AVG		

Test Mode:	802.11b	2472MHz	Test Channel	Highest
Temperature:	23.7℃		Phase:	Horizontal
Relative Humidity:	57%		Pressure:	98.3KPa



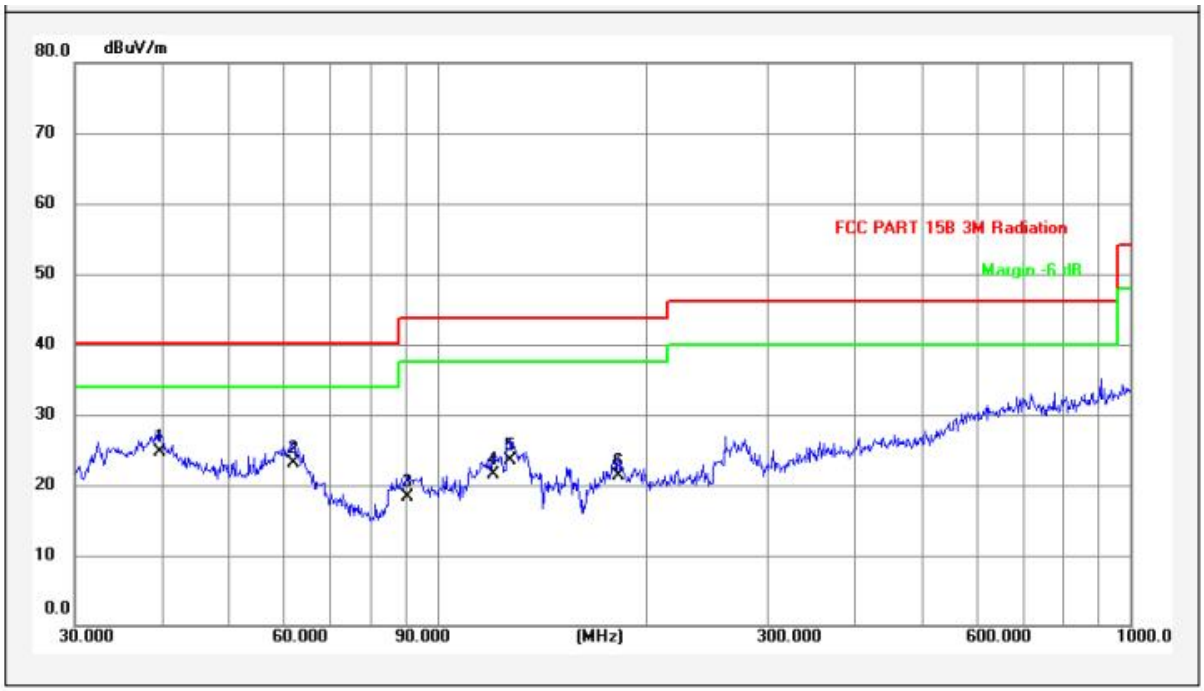
No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	2483.500	-4.46	59.32	54.86	74.00	-19.14	peak		
2	2483.660	-4.46	52.65	48.19	54.00	-5.81	AVG	*	
3	2485.975	-4.46	52.49	48.03	54.00	-5.97	AVG		
4	2486.396	-4.46	58.43	53.97	74.00	-20.03	peak		

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission below 1GHz (30MHz to 1GHz)

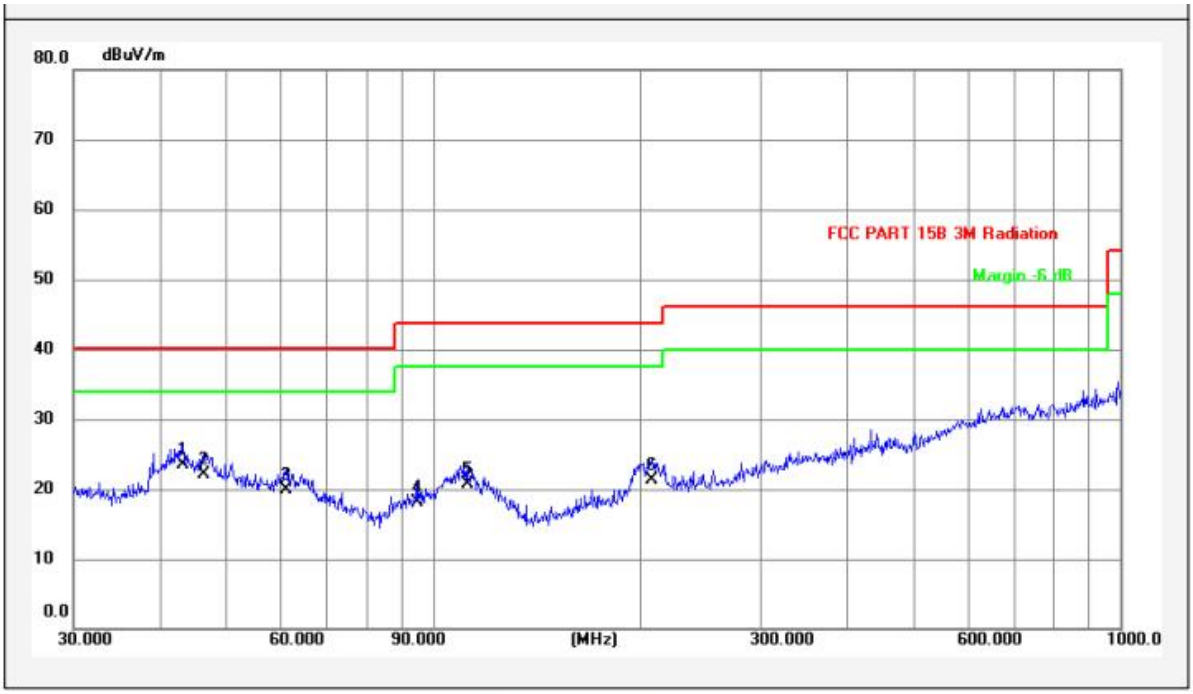
All antenna modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded was report as below:

Test Mode:	802.11b	2412MHz	Test Voltage:	AC 120V/60Hz
Temperature:	24.5℃		Phase:	Vertical
Relative Humidity:	52%		Pressure:	101.4KPa



No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	39.8542	11.40	13.32	24.72	40.00	-15.28	QP	*	
2	61.9950	10.90	12.11	23.01	40.00	-16.99	QP		
3	90.5374	8.82	9.50	18.32	43.50	-25.18	QP		
4	120.6991	9.18	12.23	21.41	43.50	-22.09	QP		
5	127.2176	8.07	15.45	23.52	43.50	-19.98	QP		
6	182.5592	9.05	12.20	21.25	43.50	-22.25	QP		

Test Mode:	802.11b	2412MHz	Test Voltage:	AC 120V/60Hz
Temperature:	24.5℃		Phase:	Horizontal
Relative Humidity:	52%		Pressure:	101.4KPa



No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	43.3534	12.34	11.19	23.53	40.00	-16.47	QP	*	
2	46.3402	12.67	9.38	22.05	40.00	-17.95	QP		
3	61.1315	11.11	8.89	20.00	40.00	-20.00	QP		
4	94.7600	9.62	8.45	18.07	43.50	-25.43	QP		
5	112.1304	9.81	10.88	20.69	43.50	-22.81	QP		
6	208.5801	10.87	10.37	21.24	43.50	-22.26	QP		

4.6. CONDUCTED EMISSION TEST

4.6.1. Applicable Standard

According to FCC Part 15.207(a)

4.6.2. Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

Remark: Test results were obtained from the following equation:
Measurement (dBμV) = LISN Factor (dB) + Cable Loss (dB) + Reading (dBμV)
Margin (dB) = Measurement (dBμV) - Limit (dBμV)

4.6.3. Test Configuration

Test according to clause 3.3 conducted emission test setup

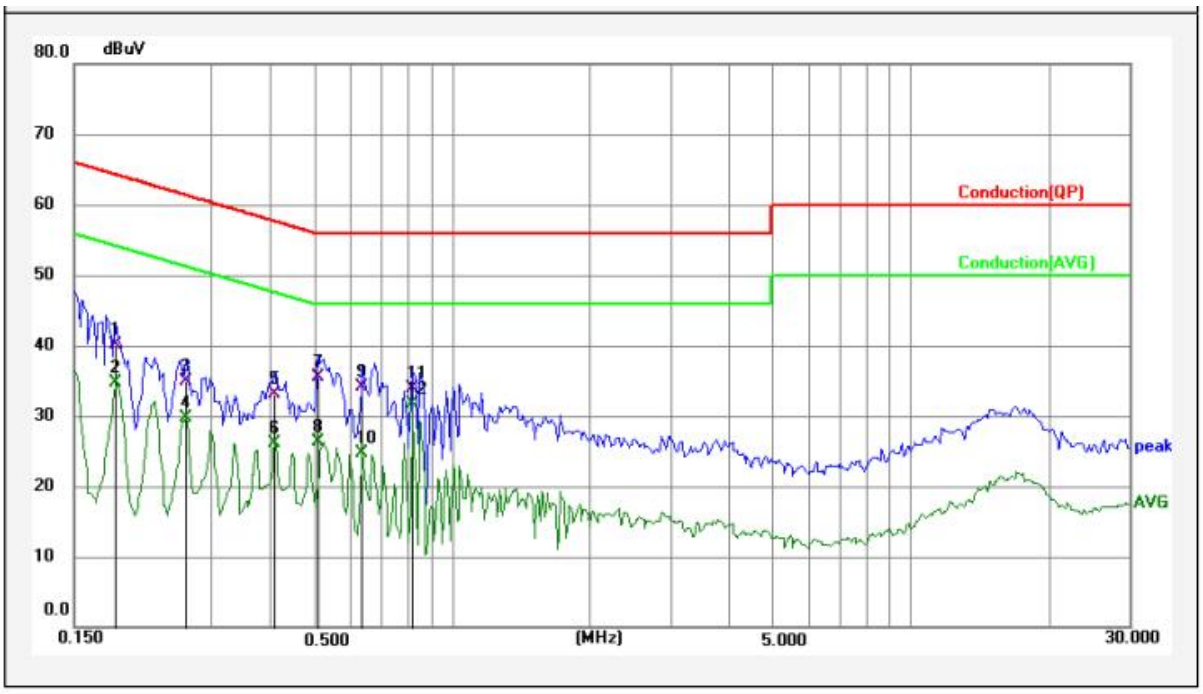
4.6.4. Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

Test Results：

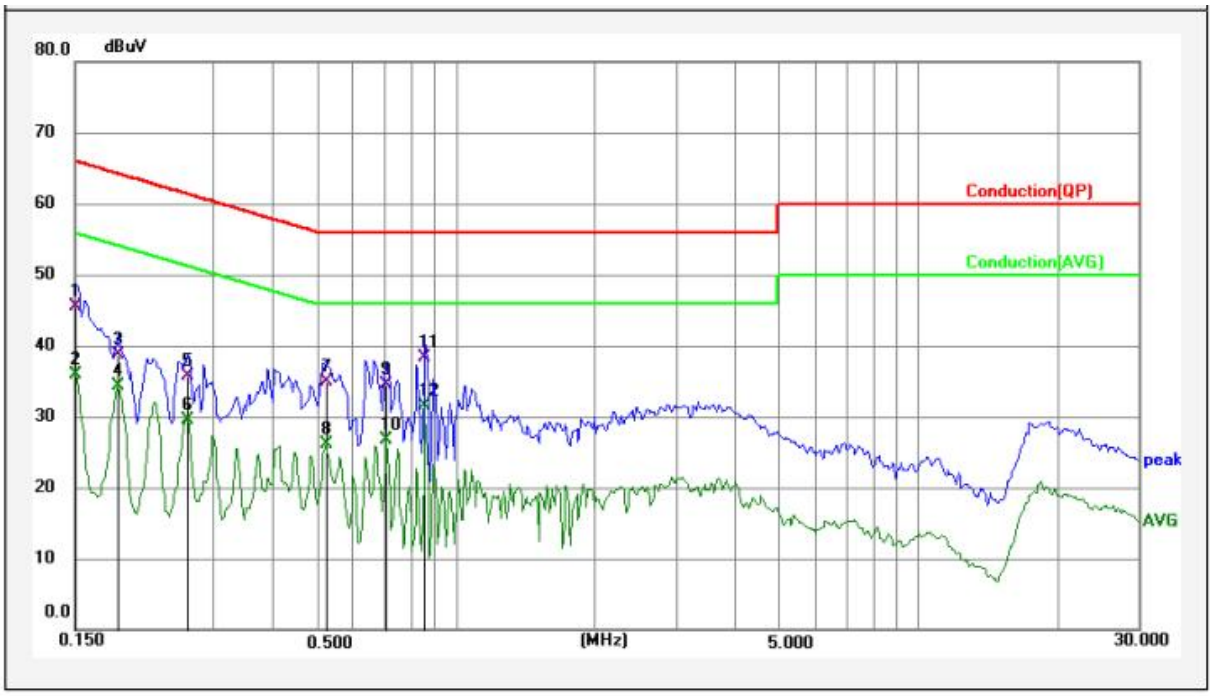
All antenna modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded was report as below:

Test Mode:	802.11b	2412MHz	Test Voltage:	AC 120V/60Hz
Temperature:	22.1℃		Phase:	L1
Relative Humidity:	53%		Pressure:	101.7KPa



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	MK.	Remark
1	0.1844	10.72	29.38	40.10	64.29	-24.19	QP		
2	0.1844	10.72	23.90	34.62	54.29	-19.67	AVG		
3	0.2641	10.76	24.14	34.90	61.30	-26.40	QP		
4	0.2641	10.76	18.95	29.71	51.30	-21.59	AVG		
5	0.4126	10.84	22.36	33.20	57.60	-24.40	QP		
6	0.4126	10.84	15.21	26.05	47.60	-21.55	AVG		
7	0.5116	10.89	24.71	35.60	56.00	-20.40	QP		
8	0.5116	10.89	15.36	26.25	46.00	-19.75	AVG		
9	0.6391	11.00	23.20	34.20	56.00	-21.80	QP		
10	0.6391	11.00	13.66	24.66	46.00	-21.34	AVG		
11	0.8185	11.10	22.80	33.90	56.00	-22.10	QP		
12	0.8185	11.10	20.62	31.72	46.00	-14.28	AVG	*	

Test Mode:	802.11b	2412MHz	Test Voltage:	AC 120V/60Hz
Temperature:	22.1℃		Phase:	N
Relative Humidity:	53%		Pressure:	101.7KPa



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	MK.	Remark
1	0.1512	10.82	34.68	45.50	65.93	-20.43	QP		
2	0.1512	10.82	25.16	35.98	55.93	-19.95	AVG		
3	0.1859	10.88	27.82	38.70	64.22	-25.52	QP		
4	0.1859	10.88	23.38	34.26	54.22	-19.96	AVG		
5	0.2641	10.93	24.87	35.80	61.30	-25.50	QP		
6	0.2641	10.93	18.63	29.56	51.30	-21.74	AVG		
7	0.5240	11.04	23.86	34.90	56.00	-21.10	QP		
8	0.5240	11.04	15.11	26.15	46.00	-19.85	AVG		
9	0.7094	10.93	23.67	34.60	56.00	-21.40	QP		
10	0.7094	10.93	15.82	26.75	46.00	-19.25	AVG		
11	0.8588	10.96	27.34	38.30	56.00	-17.70	QP		
12	0.8588	10.96	20.52	31.48	46.00	-14.52	AVG	*	

4.7. ANTENNA APPLICATION

4.7.1. Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2. Result

PASS.

The EUT has 1 antenna: PCB Antenna for WiFi 2.4G , the gain is 3.28dBi;

☒ Antenna use a permanently attached antenna which is not replaceable.

☐ Not using a standard antenna jack or electrical connector for antenna replacement

☐ The antenna has to be professionally installed (please provide method of installation)

Note:which in accordance to section 15.203, please refer to the internal photos.

--------- END OF REPORT --------