



3.4 CONDUCTED BAND EDGE EMISSION&CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

3.4.1 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).

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.

3.4.2 TEST PROCEDURE

Using the following spectrum analyzer setting:

Set the RBW = 100KHz.

Set the VBW = 300KHz.

Sweep time = auto couple.

Detector function = Peak.

Trace mode = max hold.

Allow trace to fully stabilize.

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 $\geq [3 \times \text{RBW}]$.

e) Detector =peak.

f)Sweep time= auto couple.

g) Trace mode=max hold.

h)Allow trace to fully stabilize.

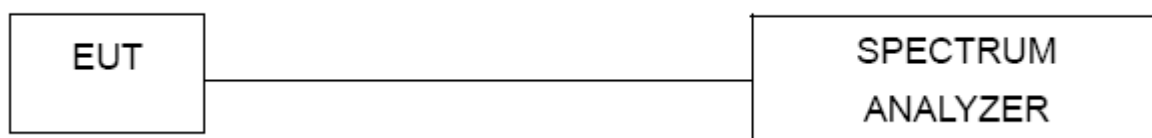
i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

3.4.3 DEVIATION FROM STANDARD

No deviation.

3.4.4 TEST SETUP



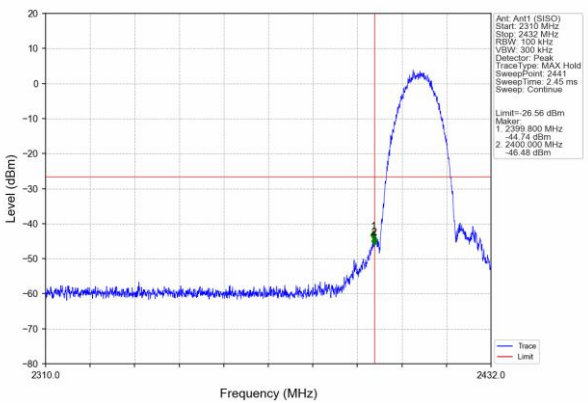
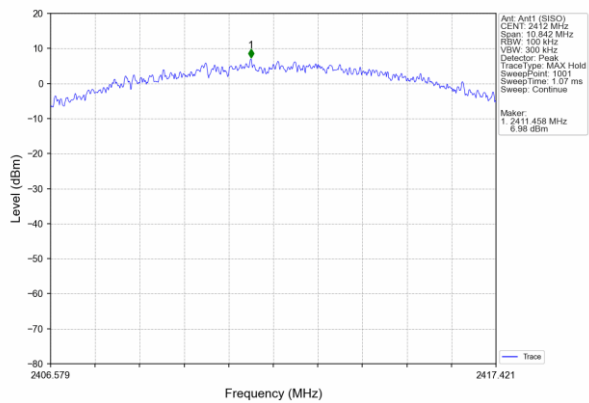
3.4.5 EUT OPERATION CONDITIONS

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.

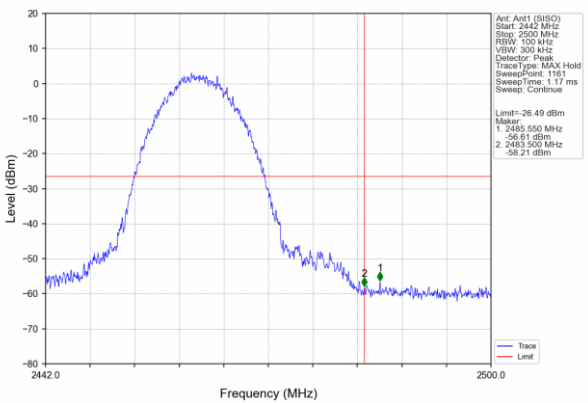
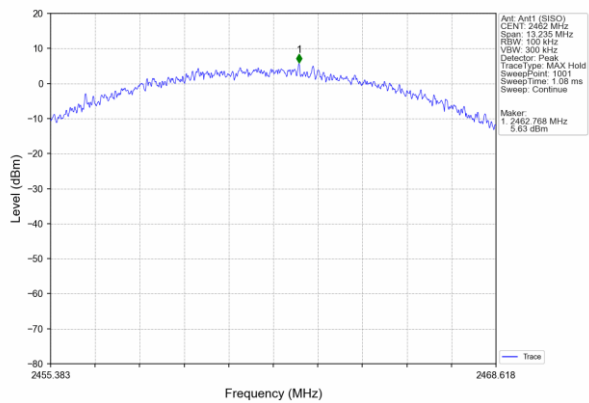
3.4.6 TEST RESULTS



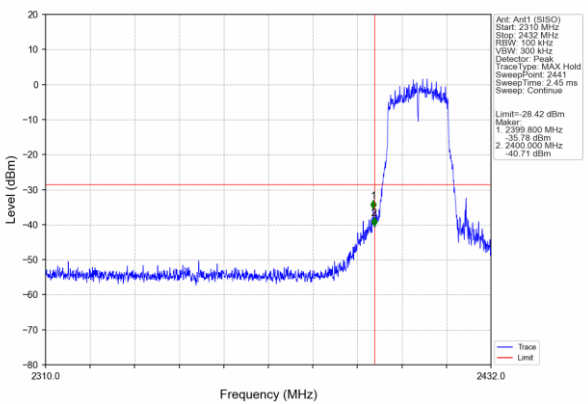
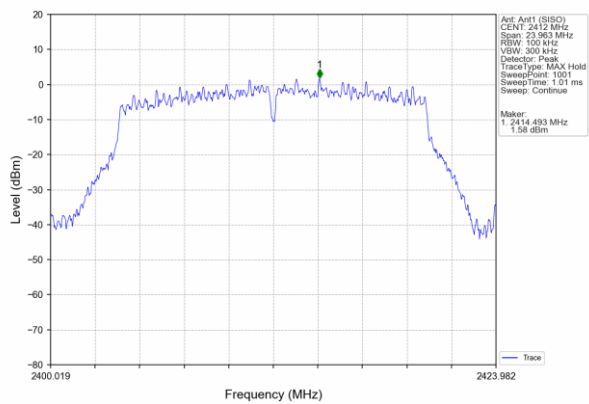
For Conducted
802.11b 2412MHz



802.11b 2462MHz

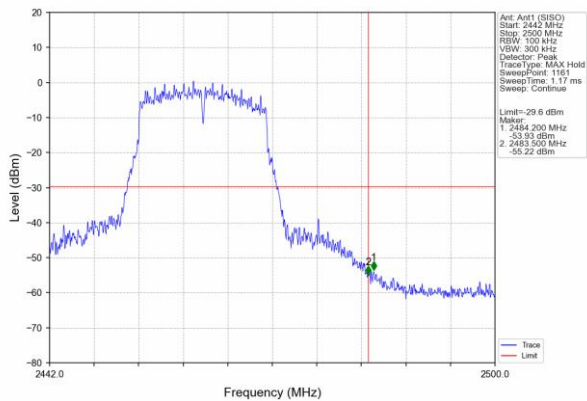
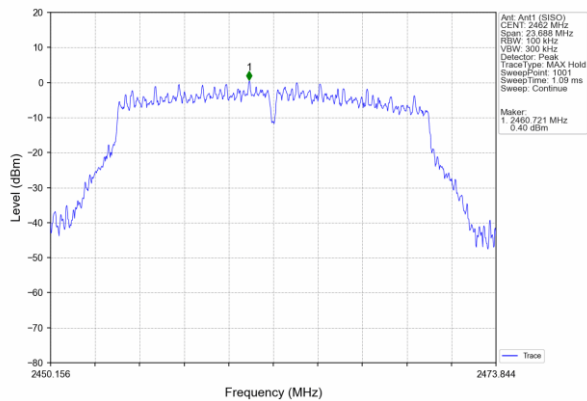


802.11g 2412MHz

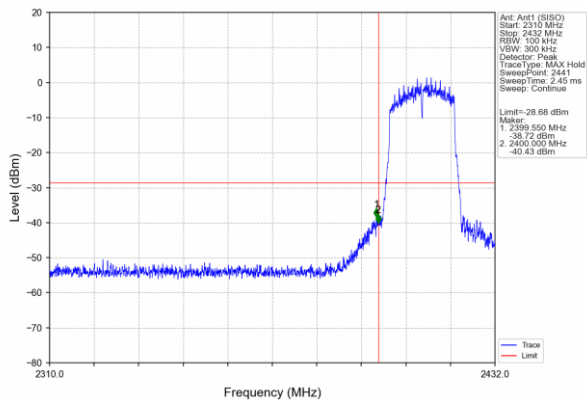
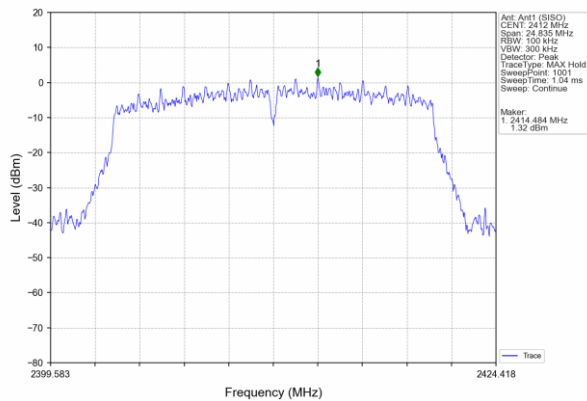




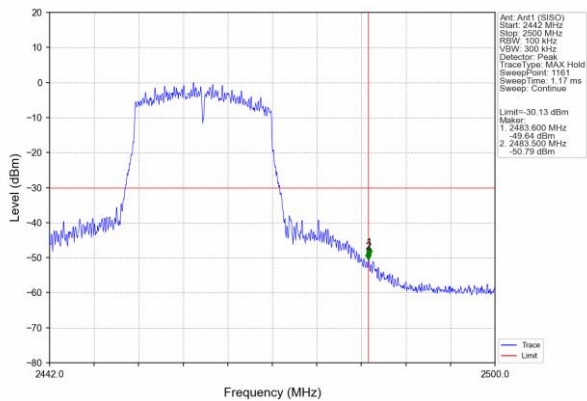
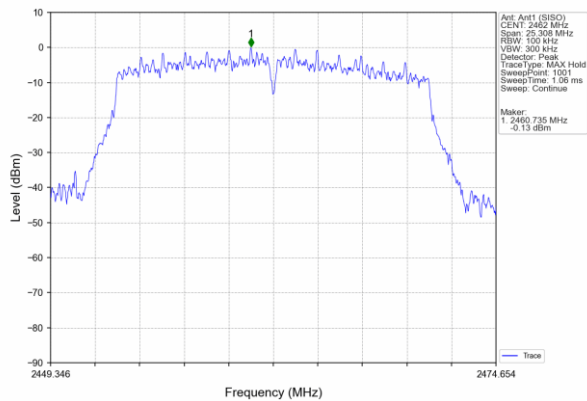
802.11g 2462MHz



802.11n 20 2412MHz

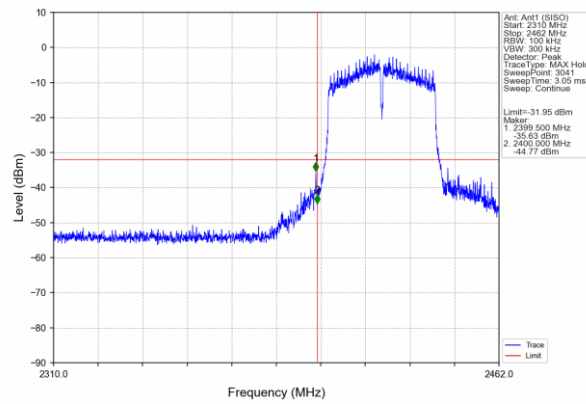
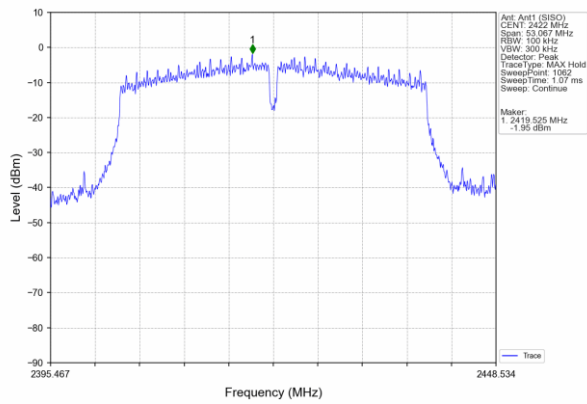


802.11n20 2462MHz

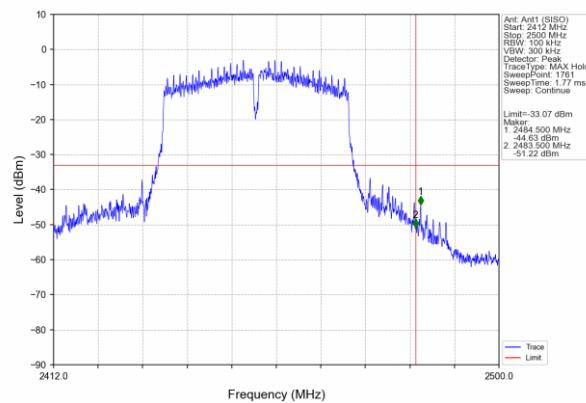
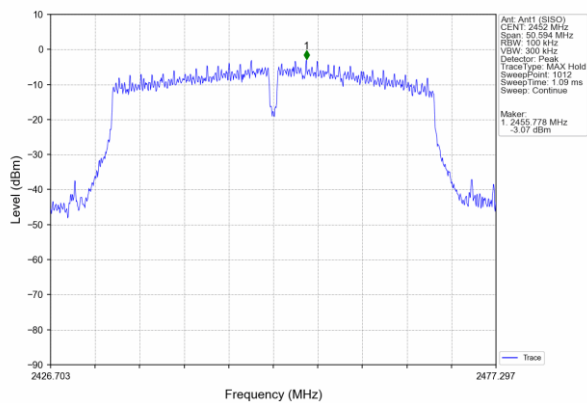




802.11n 40 2422MHz



802.11n40 2452MHz

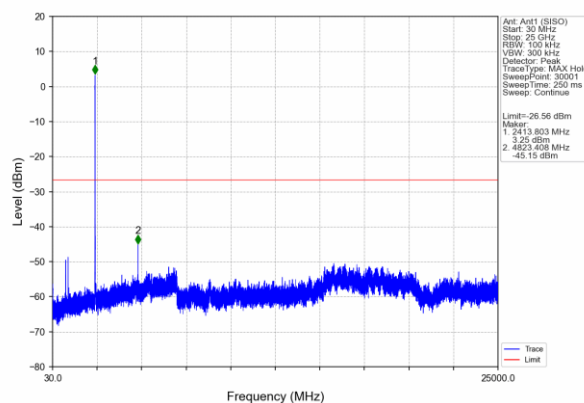
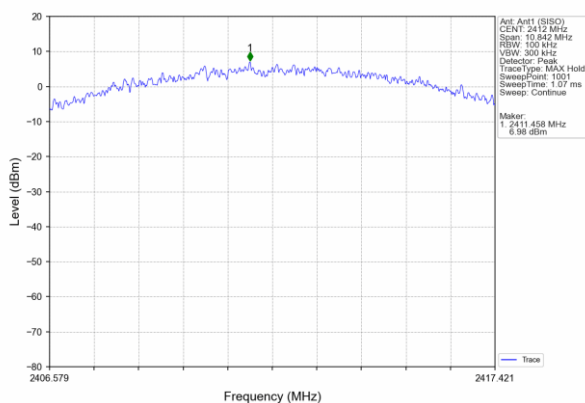




For Conducted

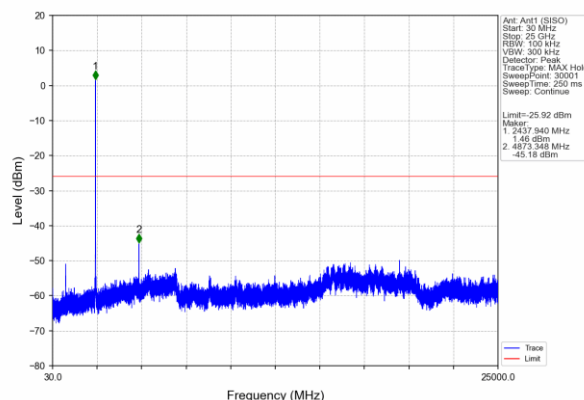
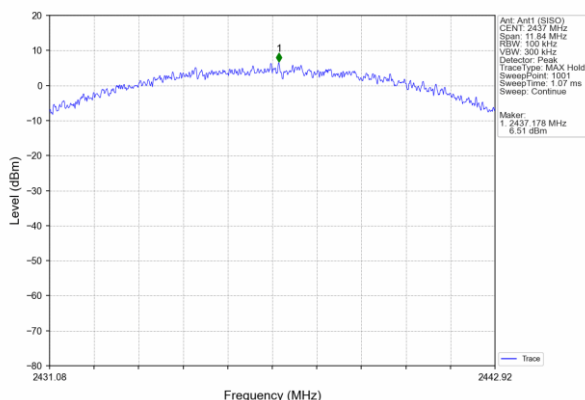
During the test, pre-scan the all modulation, and found the 802.11b mode which it is worse case.

Test channel:	Lowest channel
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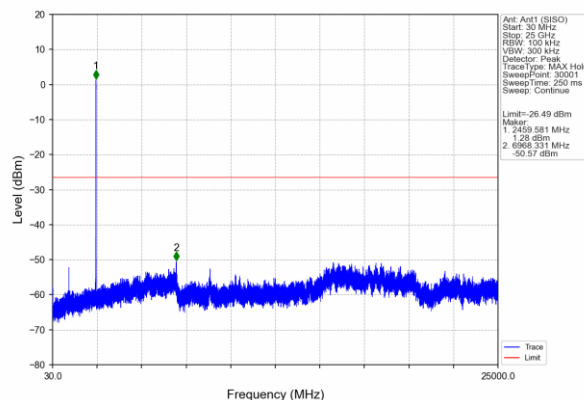
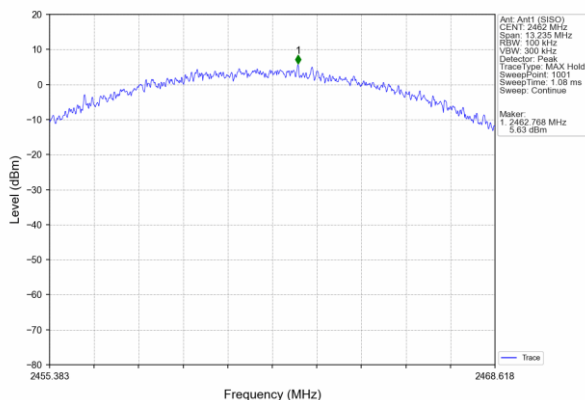
0.03GHz~26.5GHz

Test channel:	Middle channel
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0.03GHz~26.5GHz

Test channel:	Highest channel
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0.03GHz~26.5GHz



4. AVERAGE OUTPUT POWER

4.1 APPLIED PROCEDURES / LIMIT

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

4.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Set span to at least 1.5 times the OBW.
- Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
- Set VBW $\geq [3 \times \text{RBW}]$.
- Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- If transmit duty cycle < 98%, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at the maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
- Trace average at least 100 traces in power averaging (rms) mode.
- 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.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



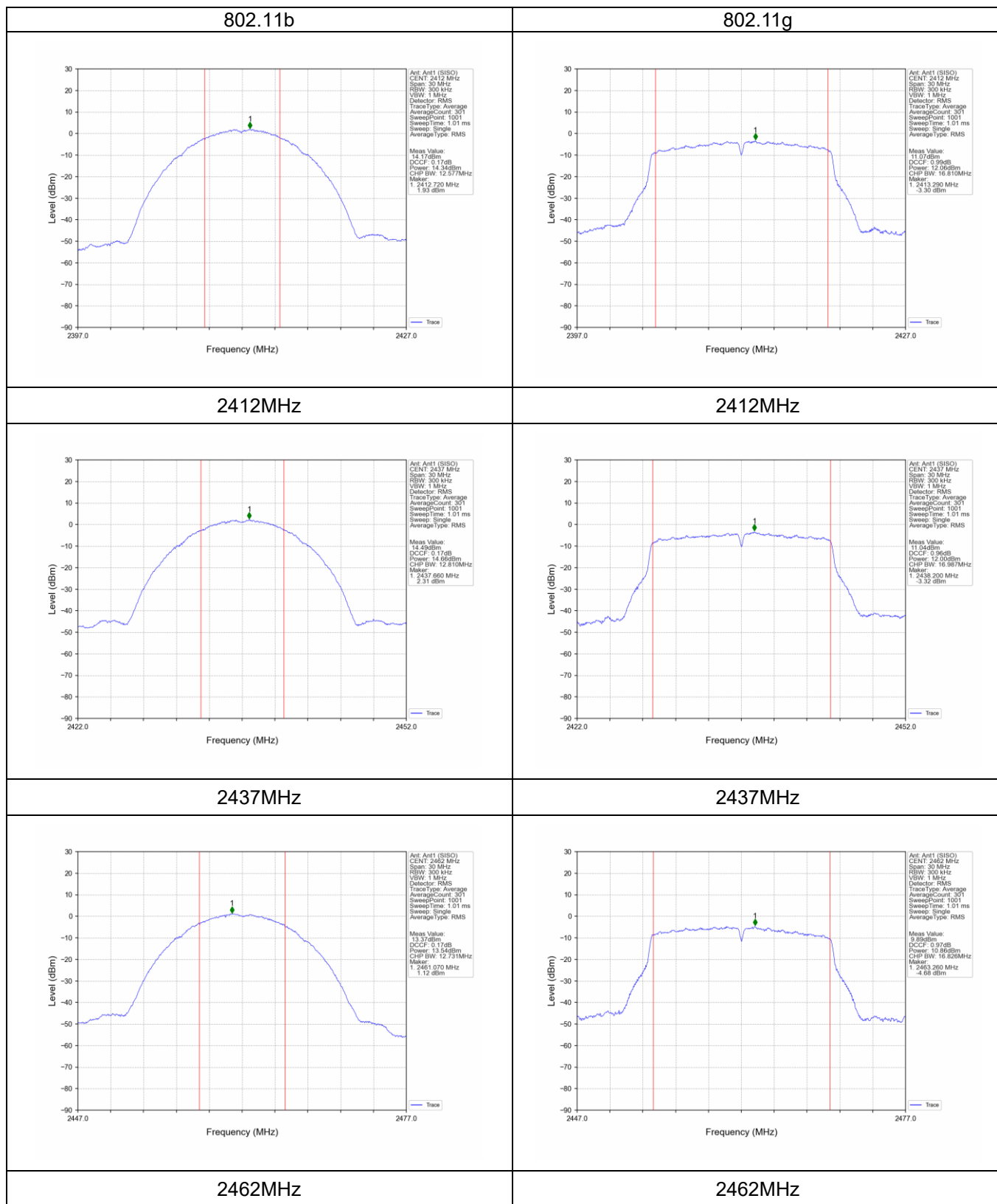
4.1.4 EUT OPERATION CONDITIONS

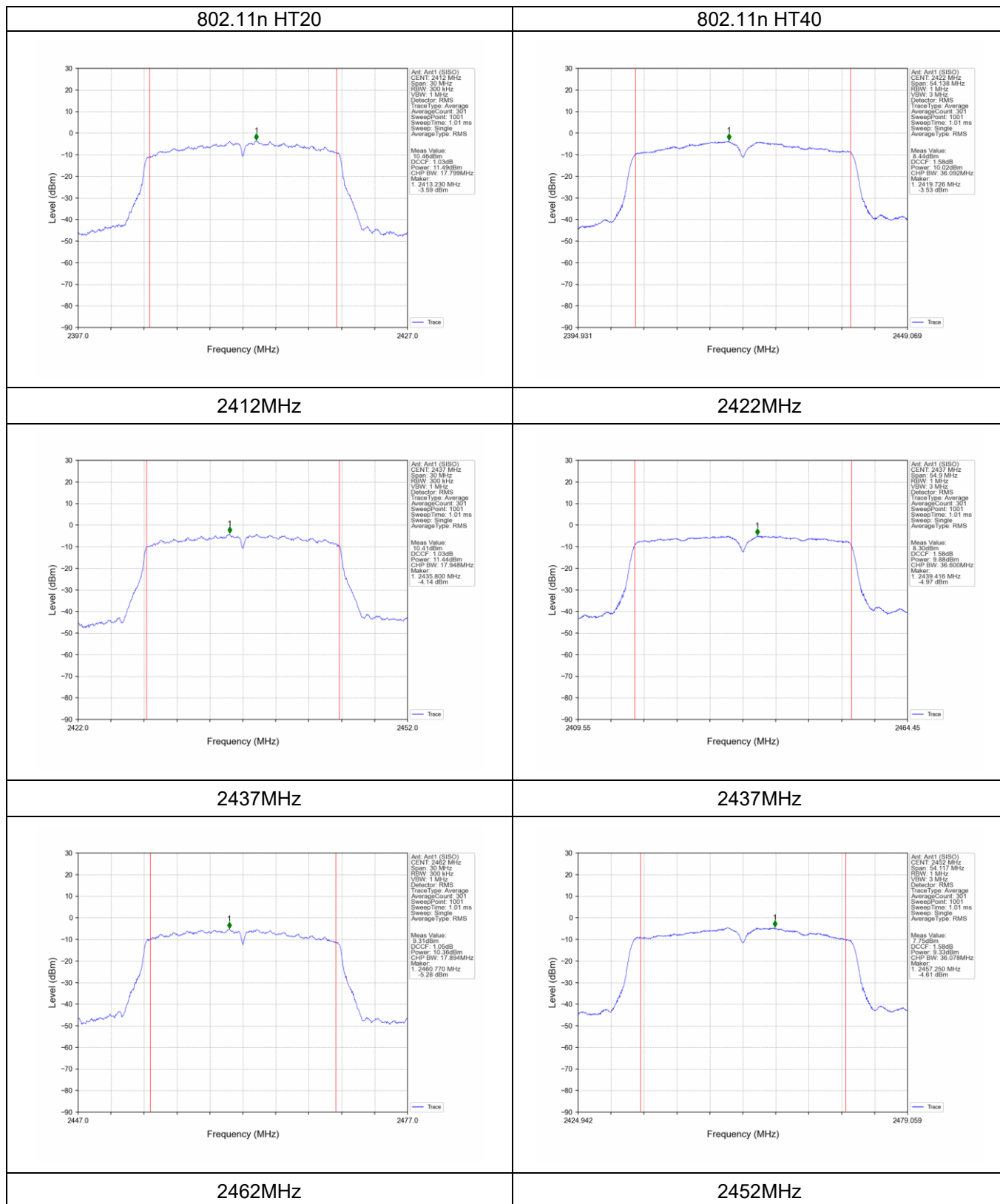
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**4.1.5 TEST RESULTS**

Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 12V

Mode	Test Channel	Average Output Power (dBm)	LIMIT (dBm)
802.11b	Low	14.34	30.00
	Middle	14.66	30.00
	High	13.54	30.00
802.11g	Low	12.06	30.00
	Middle	12.00	30.00
	High	10.86	30.00
802.11n HT20	Low	11.49	30.00
	Middle	11.44	30.00
	High	10.36	30.00
802.11n HT40	Low	10.02	30.00
	Middle	9.88	30.00
	High	9.33	30.00







5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

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

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	$RBW \geq 3kHz$
VB	$VBW \geq 3RBW$
Detector	power averaging (rms) or sample detector (when rms not available).
Trace	rms/average
Sweep Time	Auto

5.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

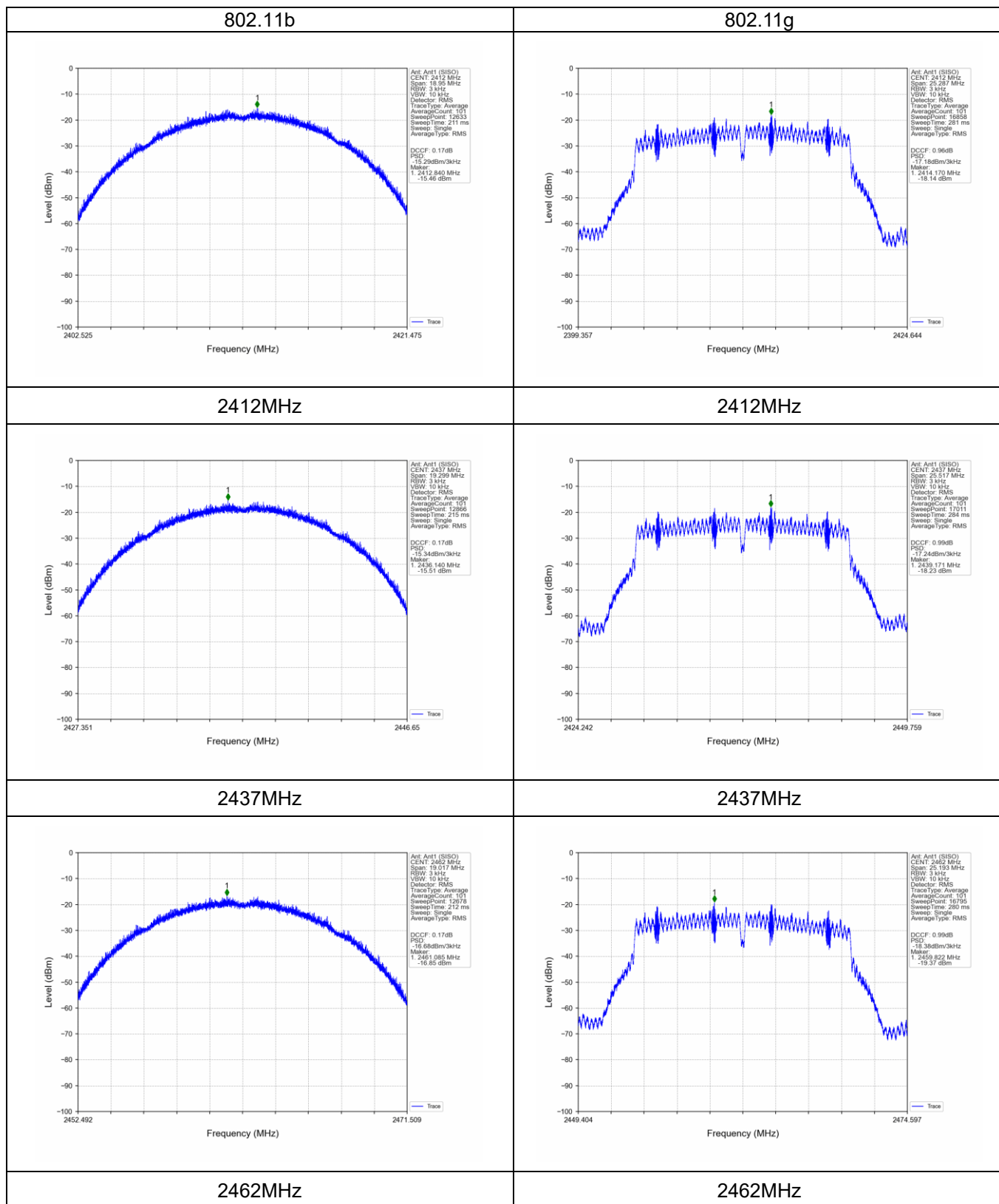


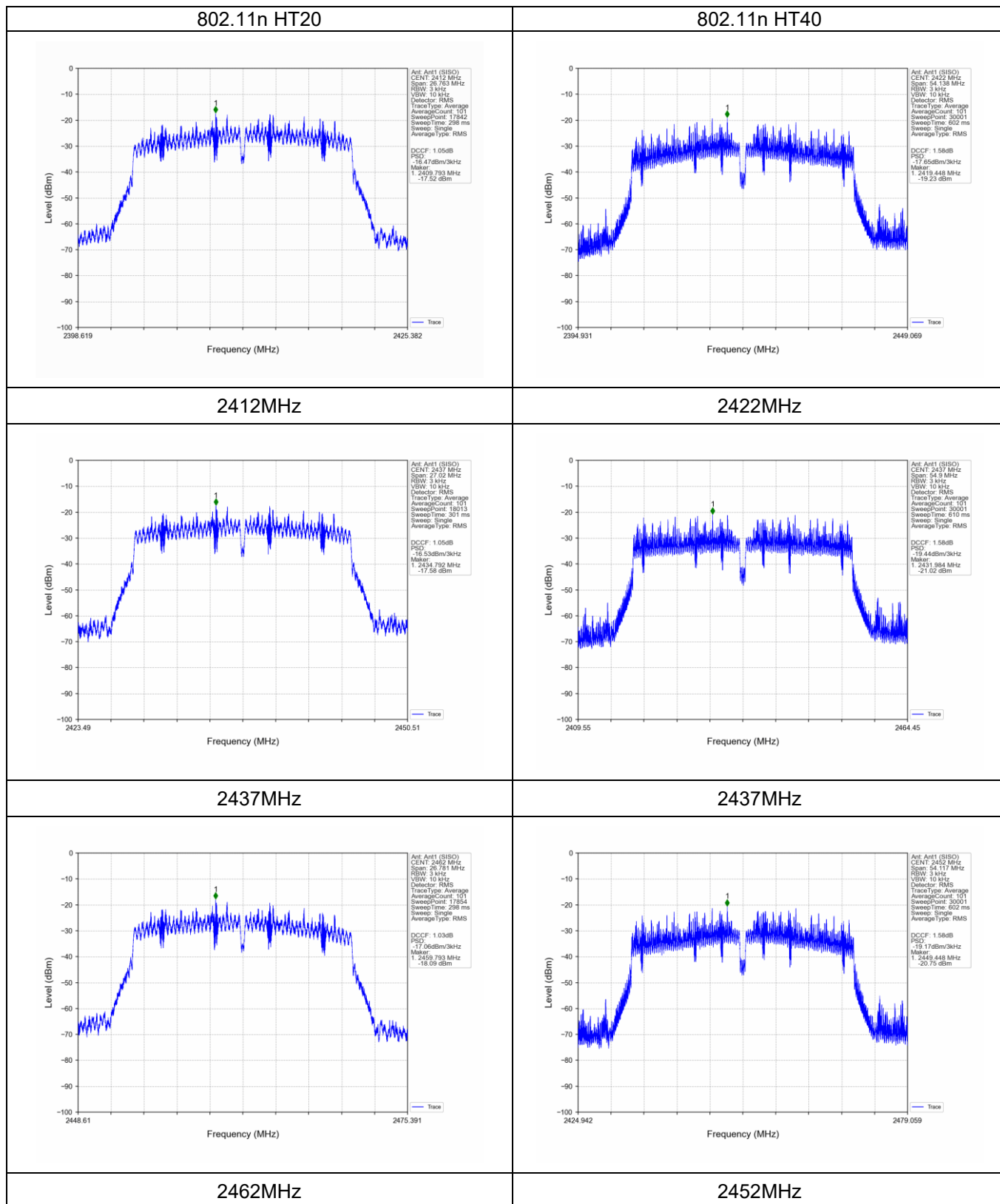
5.1.4 EUT OPERATION CONDITIONS

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.

**5.1.5 TEST RESULTS**

Mode	Test Channel	Test Result (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11b	Low	-15.29	8	PASS
	Middle	-15.34	8	PASS
	High	-16.68	8	PASS
802.11g	Low	-17.18	8	PASS
	Middle	-17.24	8	PASS
	High	-18.38	8	PASS
802.11n20	Low	-16.47	8	PASS
	Middle	-16.53	8	PASS
	High	-17.06	8	PASS
802.11n40	Low	-17.65	8	PASS
	Middle	-19.44	8	PASS
	High	-19.17	8	PASS







6. 6DB BANDWIDTH TEST

6.1 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

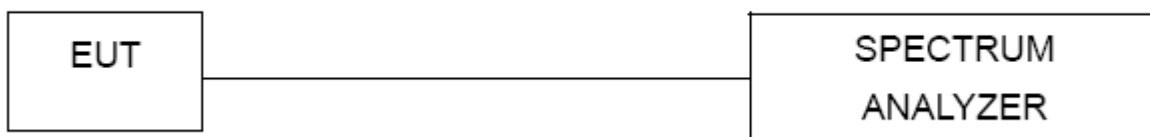
6.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) \geq 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.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

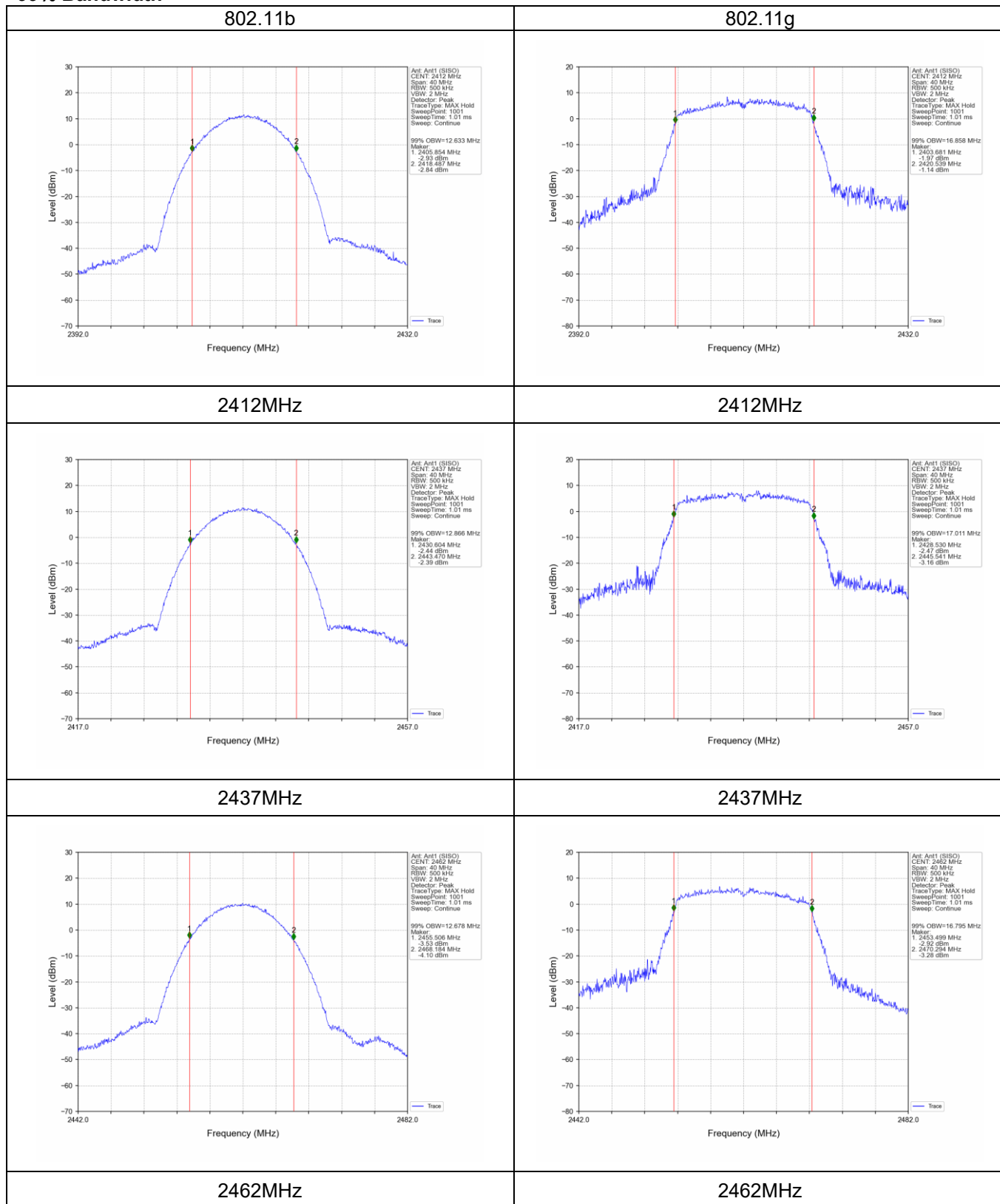
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

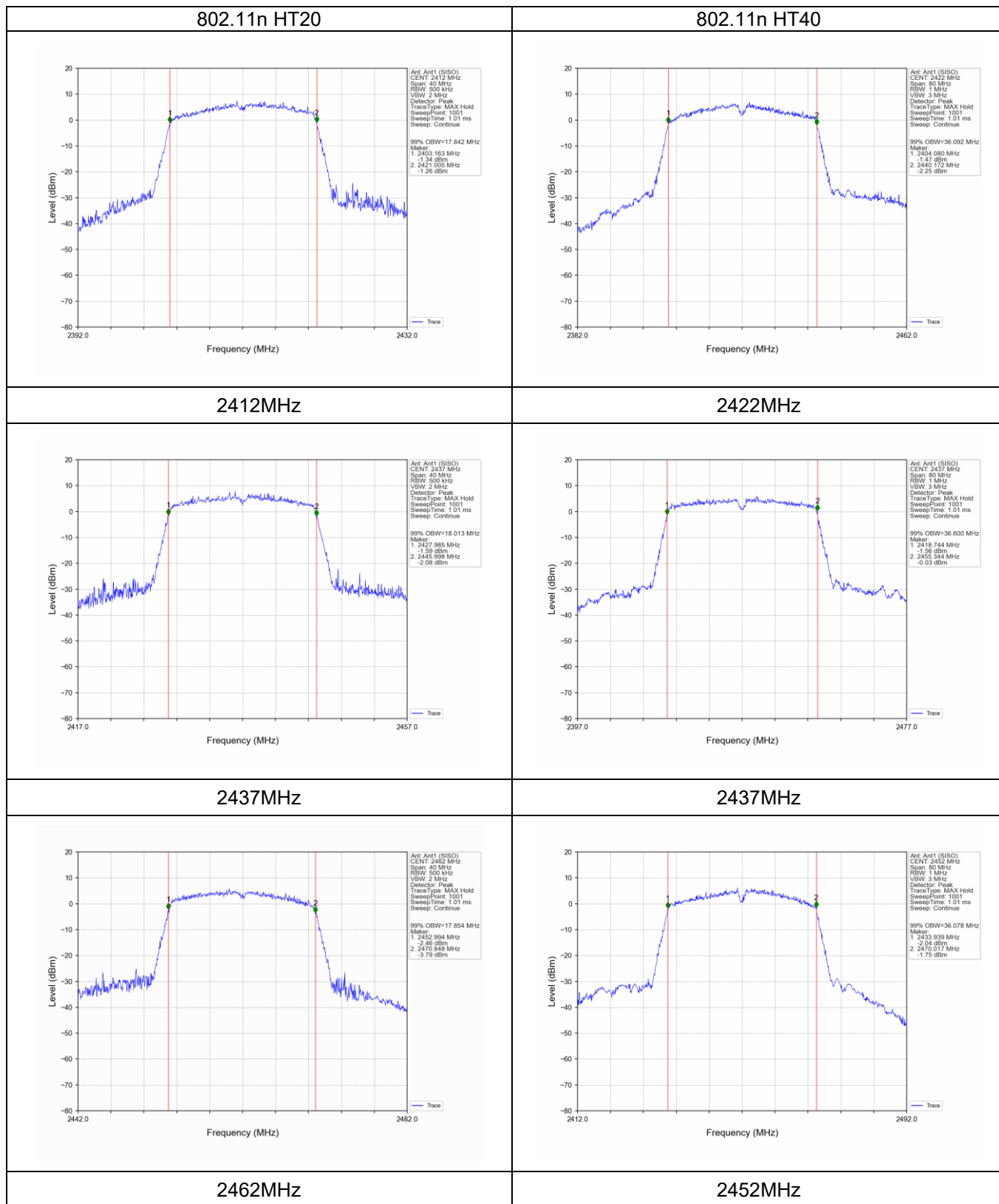
**6.1.5 TEST RESULTS**

	Test Channel	6dB Bandwidth (MHz)	99%Bandwidth (MHz)	Limit (MHz)	Result
802.11b	Low	7.228	12.633	0.5	Pass
	Middle	7.893	12.866	0.5	Pass
	High	8.823	12.678	0.5	Pass
802.11g	Low	15.682	16.858	0.5	Pass
	Middle	16.056	17.011	0.5	Pass
	High	15.813	16.795	0.5	Pass
802.11n HT20	Low	13.621	17.842	0.5	Pass
	Middle	14.223	18.013	0.5	Pass
	High	14.776	17.854	0.5	Pass
802.11n HT40	Low	33.898	36.092	0.5	Pass
	Middle	35.181	36.600	0.5	Pass
	High	31.375	36.078	0.5	Pass



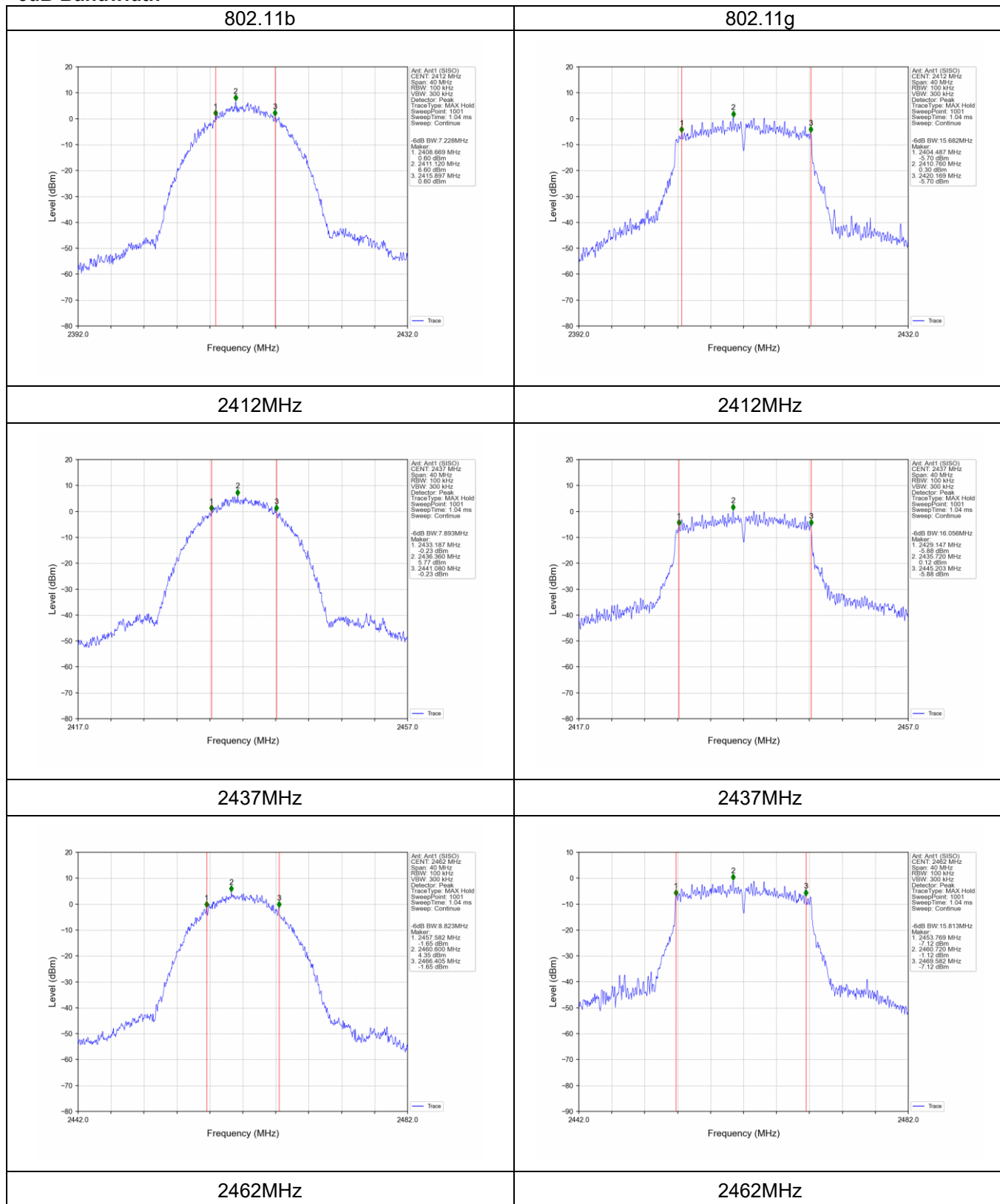
99% Bandwidth





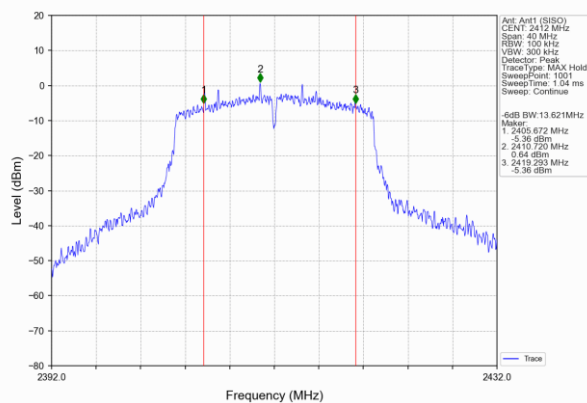


6dB Bandwidth

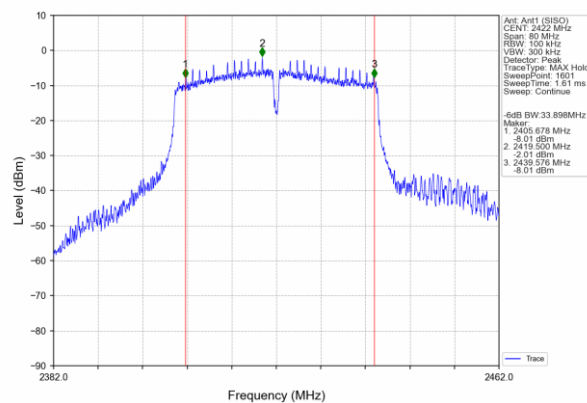




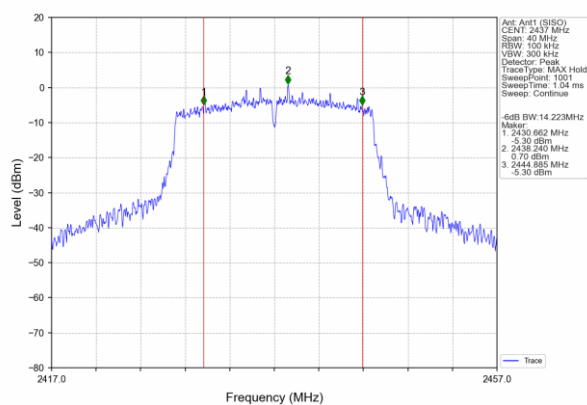
802.11n HT20



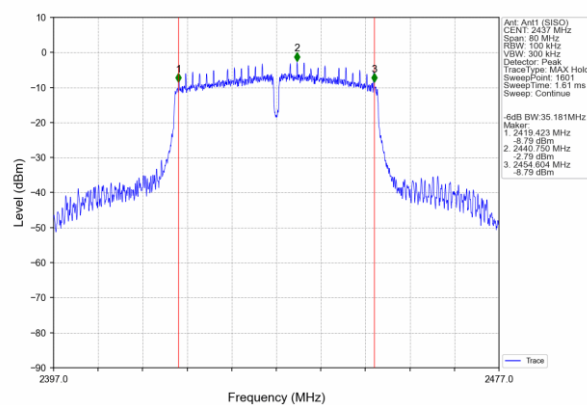
802.11n HT40



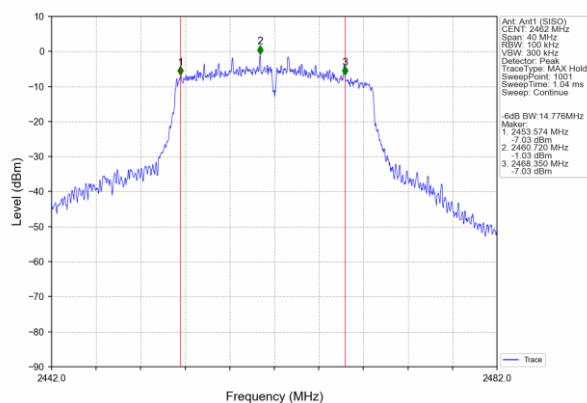
2412MHz



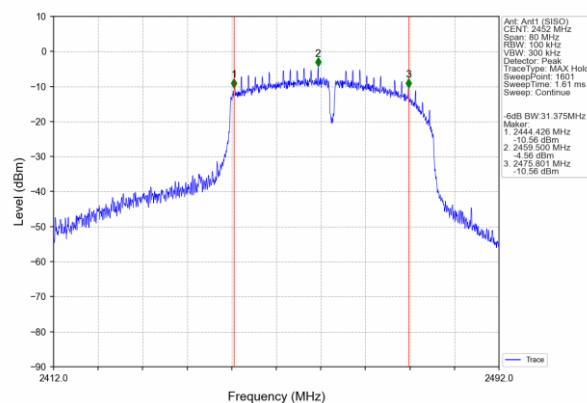
2422MHz



2437MHz



2437MHz



2462MHz

2452MHz



7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

7.2 EUT ANTENNA

The EUT antenna is Internal Antenna, It comply with the standard requirement.

8. TEST SEUUP PHOTO

Reference to the appendix I for details.

9. EUT PHOTO

Reference to the appendix II for details.

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