

**Combine with Antenna 0 and Antenna 1****Test Mode:** TX / IEEE 802.11n HT20 MHz (CH Low)**Tested by:** Darry Wu**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** August 28, 2018

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1909.000	53.24	-5.58	47.66	74.00	-26.34	V	Peak
2413.000	46.46	-2.74	43.72	74.00	-30.28	V	Peak
4825.000	52.50	4.41	56.91	74.00	-17.09	V	Peak
4825.000	41.52	4.41	45.93	54.00	-8.07	V	AVG
4996.000	44.52	4.97	49.49	74.00	-24.51	V	Peak
7246.000	43.80	8.18	51.98	74.00	-22.02	V	Peak
8164.000	41.76	9.56	51.32	74.00	-22.68	V	Peak
1621.000	47.86	-6.65	41.21	74.00	-32.79	H	Peak
1954.000	57.53	-5.29	52.24	74.00	-21.76	H	Peak
1954.000	54.55	-5.29	49.26	54.00	-4.74	H	AVG
4303.000	41.99	2.66	44.65	74.00	-29.35	H	Peak
4825.000	48.62	4.41	53.03	74.00	-20.97	H	Peak
4825.000	42.97	4.41	47.38	54.00	-6.62	H	Peak
6292.000	40.71	6.55	47.26	74.00	-26.74	H	Peak
7336.000	42.09	8.36	50.45	74.00	-23.55	H	Peak
8047.000	41.58	9.62	51.20	74.00	-22.80	H	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Test Mode: TX / IEEE 802.11n HT20 MHz (CH Mid)Tested by: Darry WuAmbient temperature: 24°C Relative humidity: 52% RHDate: August 28, 2018

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1909.000	56.03	-5.58	50.45	74.00	-23.55	V	Peak
2440.000	47.88	-2.59	45.29	74.00	-28.71	V	Peak
4879.000	49.88	4.59	54.47	74.00	-19.53	V	Peak
4879.000	41.98	4.59	46.57	54.00	-7.43	V	AVG
4996.000	44.82	4.97	49.79	74.00	-24.21	V	Peak
5653.000	41.71	5.93	47.64	74.00	-26.36	V	Peak
7318.000	43.93	8.32	52.25	74.00	-21.75	V	Peak
7318.000	40.99	8.32	49.31	54.00	-4.69	V	AVG
1954.000	56.79	-5.29	51.50	74.00	-22.50	H	Peak
2440.000	46.98	-2.59	44.39	74.00	-29.61	H	Peak
4879.000	45.88	4.59	50.47	74.00	-23.53	H	Peak
6535.000	41.16	6.95	48.11	74.00	-25.89	H	Peak
7318.000	41.51	8.32	49.83	74.00	-24.17	H	Peak
8056.000	41.57	9.62	51.19	74.00	-22.81	H	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / EEE 802.11n HT20 MHz (CH High)

Tested by: Darry Wu

Ambient temperature: 24°C Relative humidity: 52% RH

Date: August 28, 2018

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1954.000	49.80	-5.29	44.51	74.00	-29.49	V	Peak
2467.000	50.66	-2.44	48.22	74.00	-25.78	V	Peak
4924.000	56.62	4.73	61.35	74.00	-12.65	V	Peak
4924.000	46.56	4.73	51.29	54.00	-2.71	V	AVG
5464.000	41.93	5.81	47.74	74.00	-26.26	V	Peak
7390.000	45.10	8.46	53.56	74.00	-20.44	V	Peak
7390.000	39.52	8.46	47.98	54.00	-6.02	V	AVG
8002.000	42.06	9.65	51.71	74.00	-22.29	V	Peak
1486.000	47.65	-6.91	40.74	74.00	-33.26	H	Peak
1954.000	56.03	-5.29	50.74	74.00	-23.26	H	Peak
2458.000	46.76	-2.49	44.27	74.00	-29.73	H	Peak
4924.000	55.63	4.73	60.36	74.00	-13.64	H	Peak
4924.000	42.96	4.73	47.69	54.00	-6.31	H	AVG
5698.000	41.99	5.95	47.94	74.00	-26.06	H	Peak
8380.000	41.59	9.44	51.03	74.00	-22.97	H	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Combine with Antenna 0 and Antenna 1

Test Mode: TX/ IEEE 802.11n HT40 MHz (CH Low)

Tested by: Darry Wu

Ambient temperature: 24°C **Relative humidity:** 52% RH

Date: August 28, 2018

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1747.000	48.94	-6.38	42.56	74.00	-31.44	V	Peak
1909.000	51.72	-5.58	46.14	74.00	-27.86	V	Peak
4852.000	48.44	4.50	52.94	74.00	-21.06	V	Peak
4852.000	42.61	4.50	47.11	54.00	-6.89	V	Peak
4996.000	45.29	4.97	50.26	74.00	-23.74	V	Peak
5374.000	42.95	5.65	48.60	74.00	-25.40	V	AVG
7336.000	41.69	8.36	50.05	74.00	-23.95	V	Peak
1486.000	47.74	-6.91	40.83	74.00	-33.17	H	Peak
1954.000	55.35	-5.29	50.06	74.00	-23.94	H	Peak
2521.000	45.56	-2.22	43.34	74.00	-30.66	H	Peak
4843.000	47.51	4.47	51.98	74.00	-22.02	H	Peak
5293.000	42.26	5.50	47.76	74.00	-26.24	H	Peak
7345.000	40.63	8.37	49.00	74.00	-25.00	H	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11n HT40 MHz (CH Mid)

Tested by: Darry Wu

Ambient temperature: 24°C **Relative humidity:** 52% RH

Date: August 28, 2018

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1909.000	51.66	-5.58	46.08	74.00	-27.92	V	Peak
2449.000	46.34	-2.54	43.80	74.00	-30.20	V	Peak
4879.000	47.61	4.59	52.20	74.00	-21.80	V	Peak
4879.000	47.61	4.59	52.20	74.00	-21.80	V	Peak
4996.000	44.64	4.97	49.61	74.00	-24.39	V	Peak
7129.000	41.87	7.95	49.82	74.00	-24.18	V	AVG
7336.000	43.03	8.36	51.39	74.00	-22.61	V	Peak
1621.000	47.55	-6.65	40.90	74.00	-33.10	H	Peak
1954.000	54.74	-5.29	49.45	74.00	-24.55	H	Peak
3070.000	43.37	-1.24	42.13	74.00	-31.87	H	Peak
4879.000	45.66	4.59	50.25	74.00	-23.75	H	Peak
6265.000	41.13	6.51	47.64	74.00	-26.36	H	Peak
7228.000	40.92	8.14	49.06	74.00	-24.94	H	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11n HT40 MHz (CH High)**Tested by:** Darry Wu**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** August 28, 2018

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1954.000	50.78	-5.29	45.49	74.00	-28.51	V	Peak
2458.000	47.59	-2.49	45.10	74.00	-28.90	V	Peak
3205.000	43.58	-1.02	42.56	74.00	-31.44	V	Peak
4906.000	47.25	4.67	51.92	74.00	-22.08	V	Peak
7336.000	41.78	8.36	50.14	74.00	-23.86	V	Peak
7984.000	40.91	9.62	50.53	74.00	-23.47	V	Peak
1630.000	47.54	-6.64	40.90	74.00	-33.10	H	Peak
1954.000	55.77	-5.29	50.48	74.00	-23.52	H	Peak
2944.000	43.81	-1.46	42.35	74.00	-31.65	H	Peak
4906.000	46.85	4.67	51.52	74.00	-22.48	H	Peak
5158.000	42.83	5.26	48.09	74.00	-25.91	H	Peak
7507.000	41.49	8.69	50.18	74.00	-23.82	H	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



7.3. 6dB BANDWIDTH MEASUREMENT

7.3.1. LIMITS

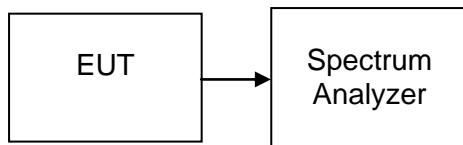
According to §15.247(a) (2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.3.2. TEST PROCEDURES (please refer to measurement standard)

8.1 Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW \geq 3 RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be \geq 6 dB.

7.3.3. TEST SETUP





7.3.4. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (kHz)		Limit (kHz)	Test Result
		Antenna 0	Antenna 1		
Low	2412	7053	7094	>500	PASS
Mid	2437	6115	7022		PASS
High	2462	7071	7069		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (kHz)		Limit (kHz)	Test Result
		Antenna 0	Antenna 1		
Low	2412	15170	15140	>500	PASS
Mid	2437	15160	15170		PASS
High	2462	15110	15160		PASS

Test mode: IEEE 802.11n HT20 MHz

Channel	Frequency (MHz)	Bandwidth (kHz)		Limit (kHz)	Test Result
		Antenna 0	Antenna 1		
Low	2412	15180	15170	>500	PASS
Mid	2437	15150	15140		PASS
High	2462	15170	15090		PASS

Test mode: IEEE 802.11n HT40 MHz

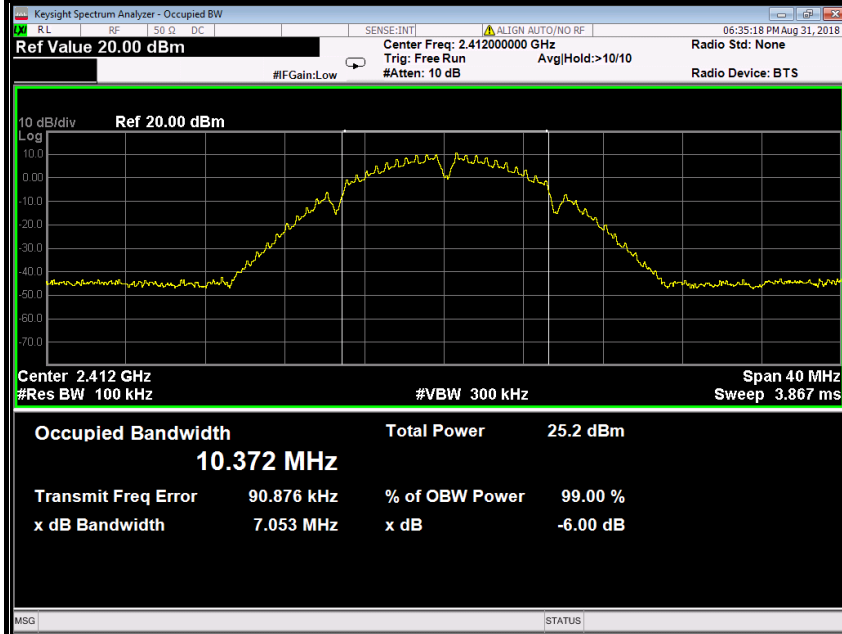
Channel	Frequency (MHz)	Bandwidth (kHz)		Limit (kHz)	Test Result
		Antenna 0	Antenna 1		
Low	2422	35130	35080	>500	PASS
Mid	2437	35110	35070		PASS
High	2452	35000	35090		PASS



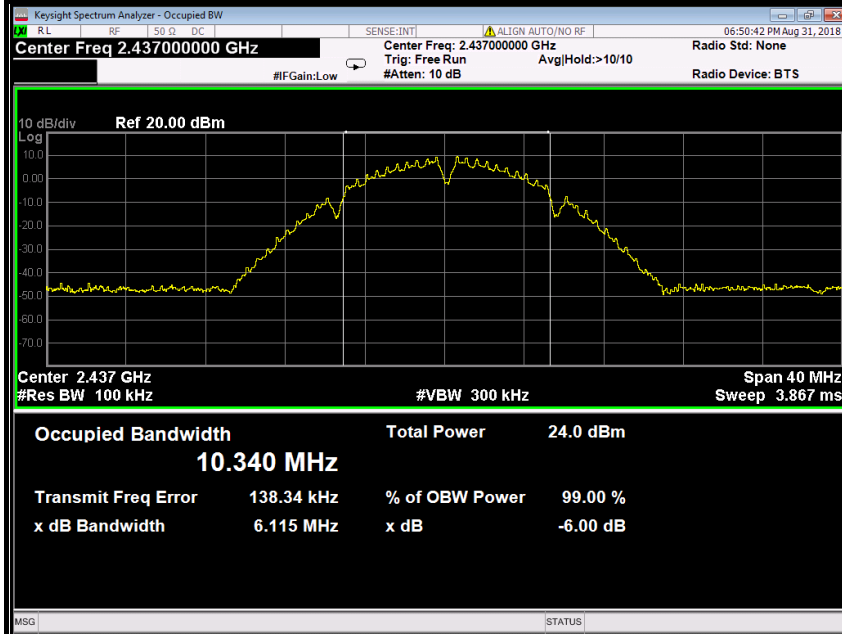
Test Plot

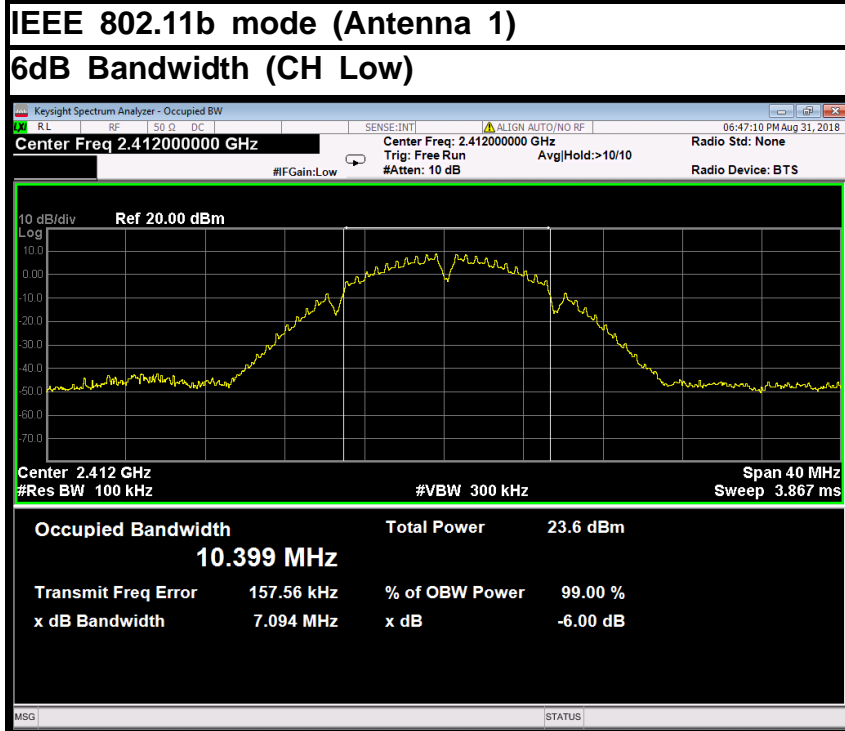
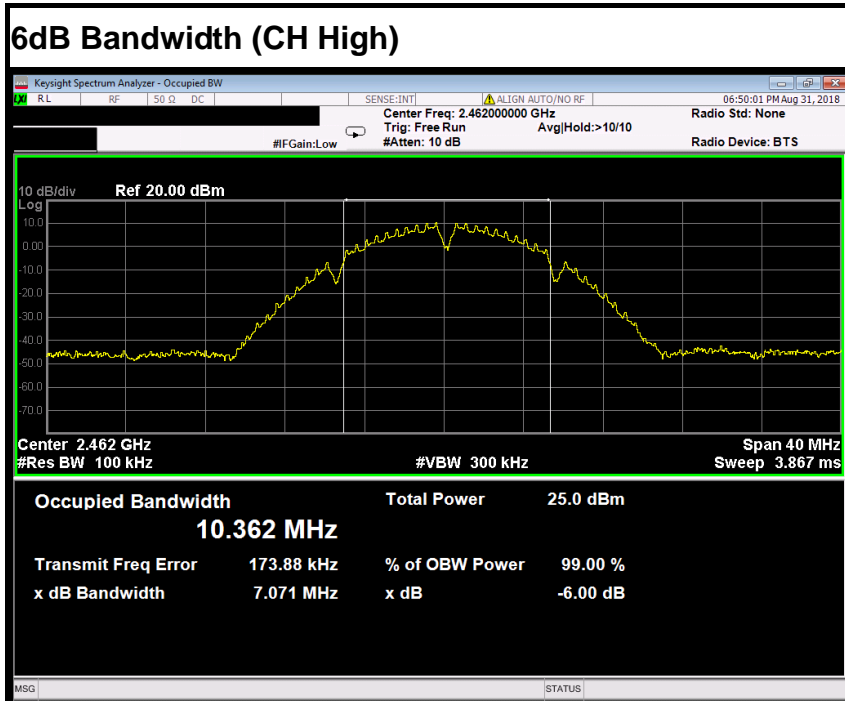
IEEE 802.11b mode (Antenna 0)

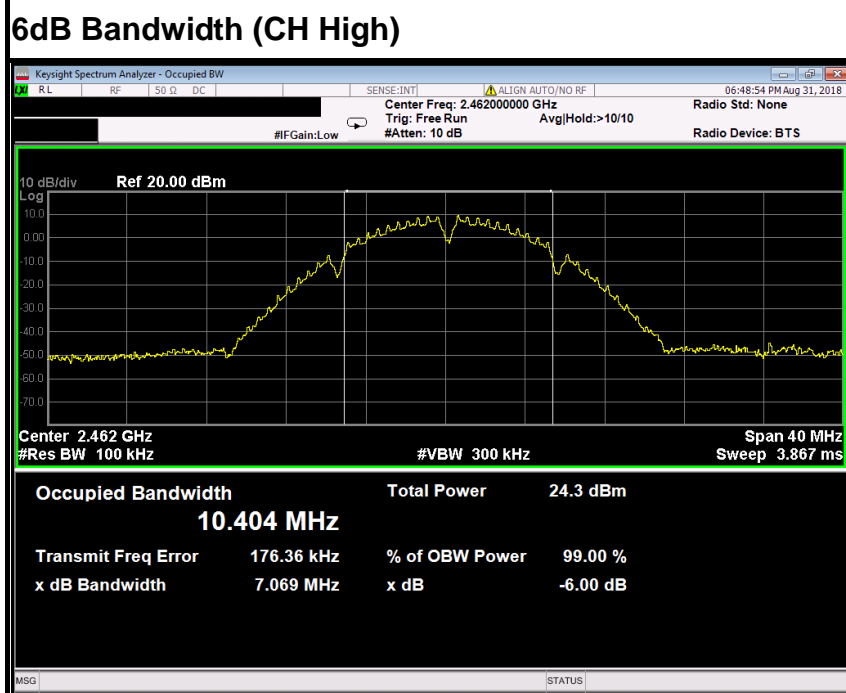
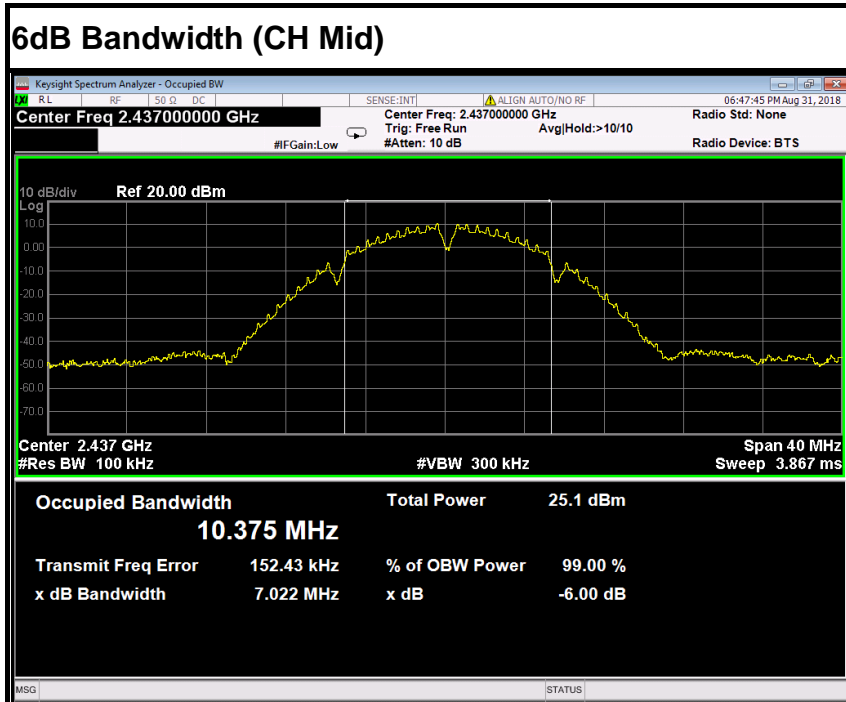
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



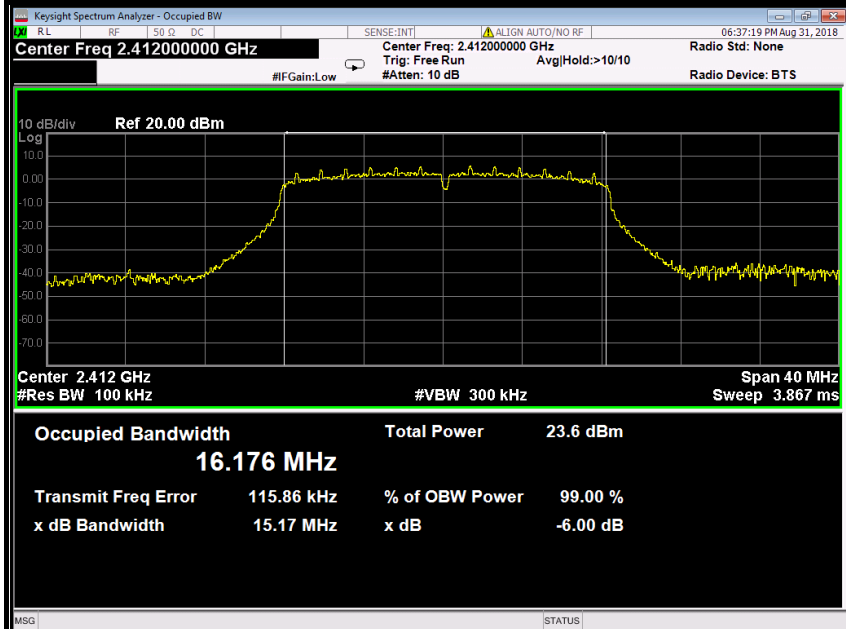




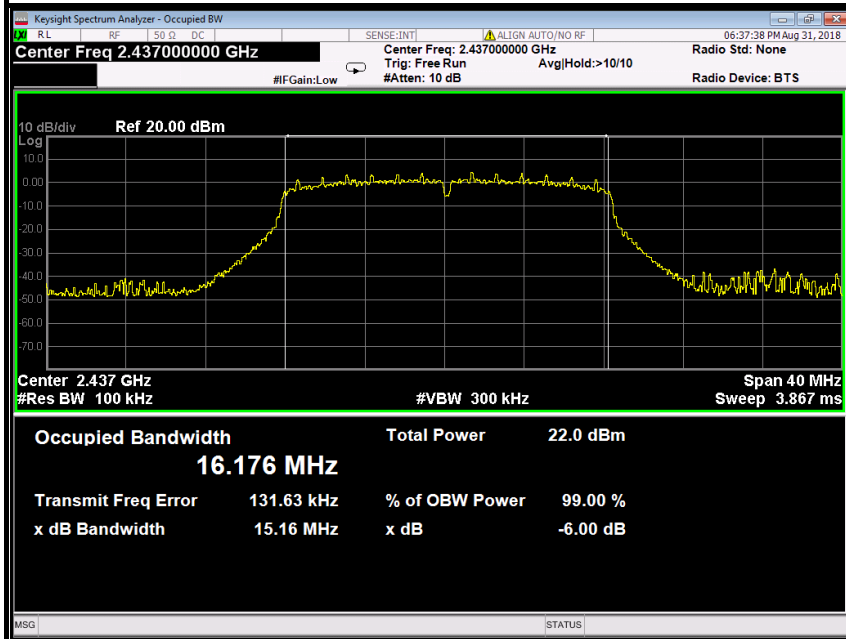


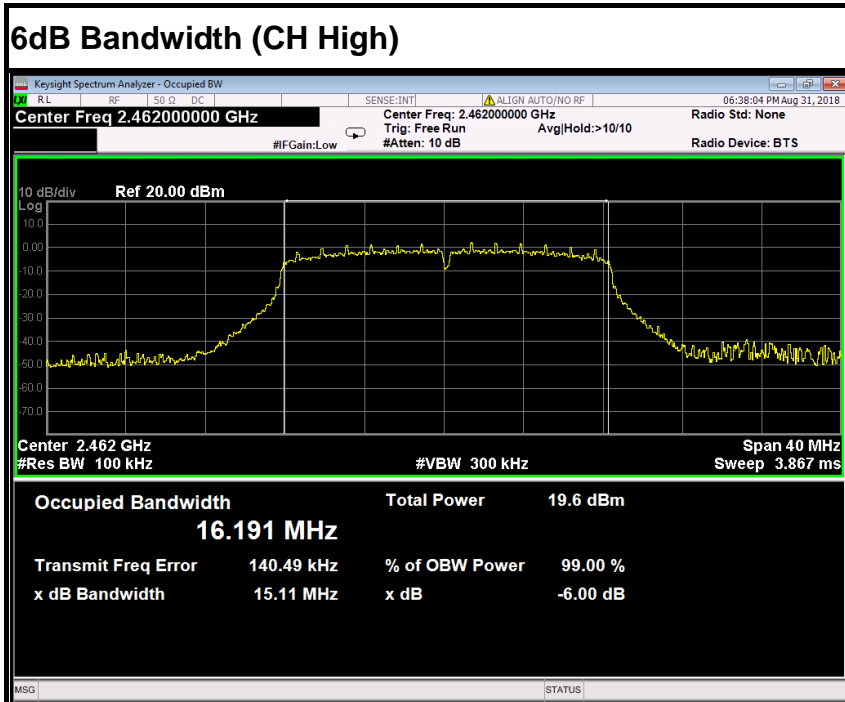
IEEE 802.11g mode (Antenna 0)

6dB Bandwidth (CH Low)



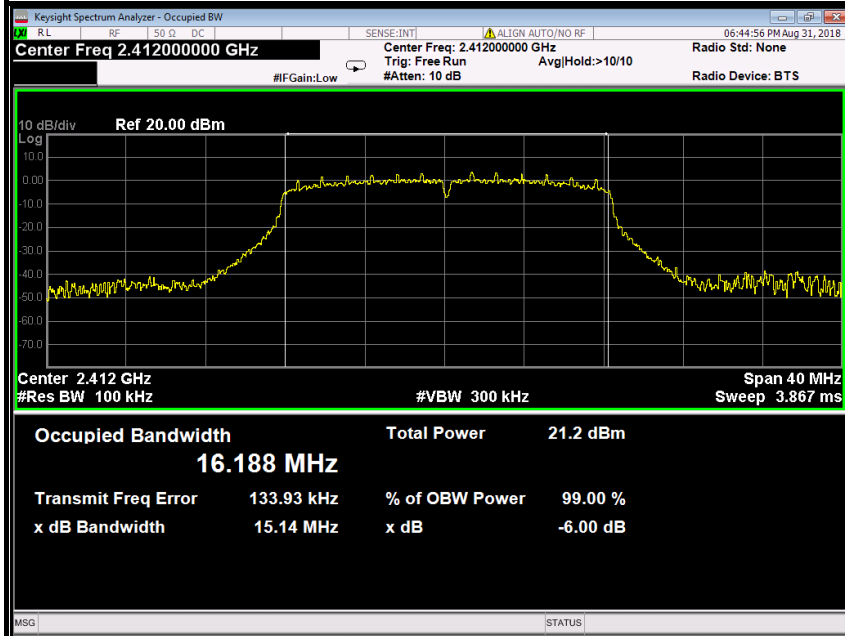
6dB Bandwidth (CH Mid)

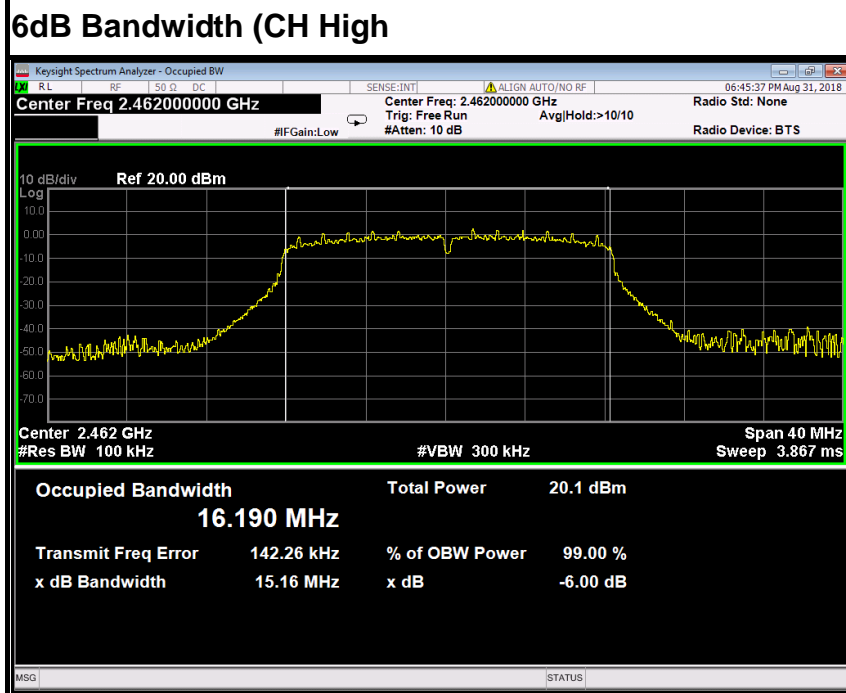
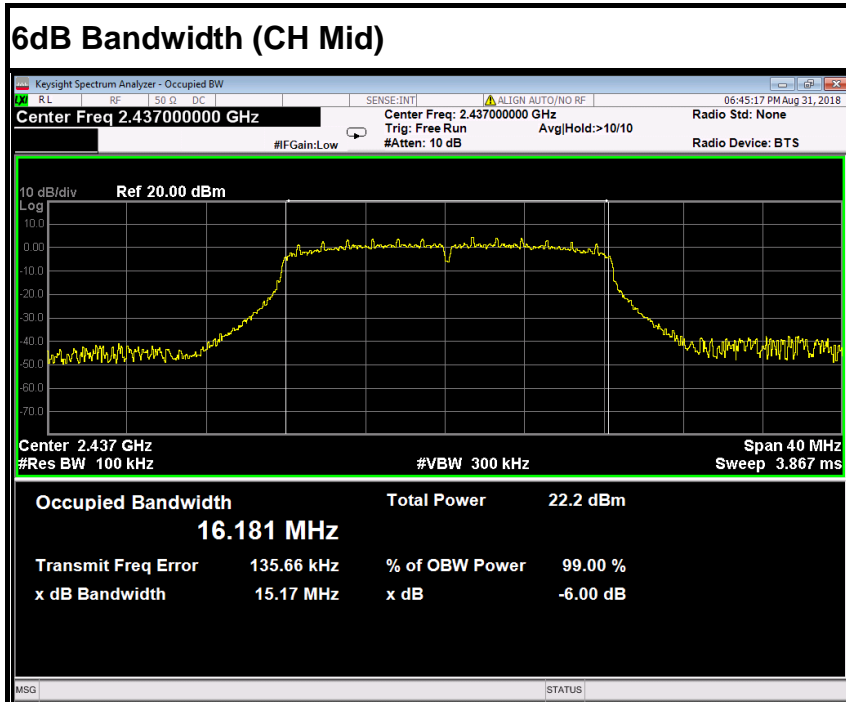


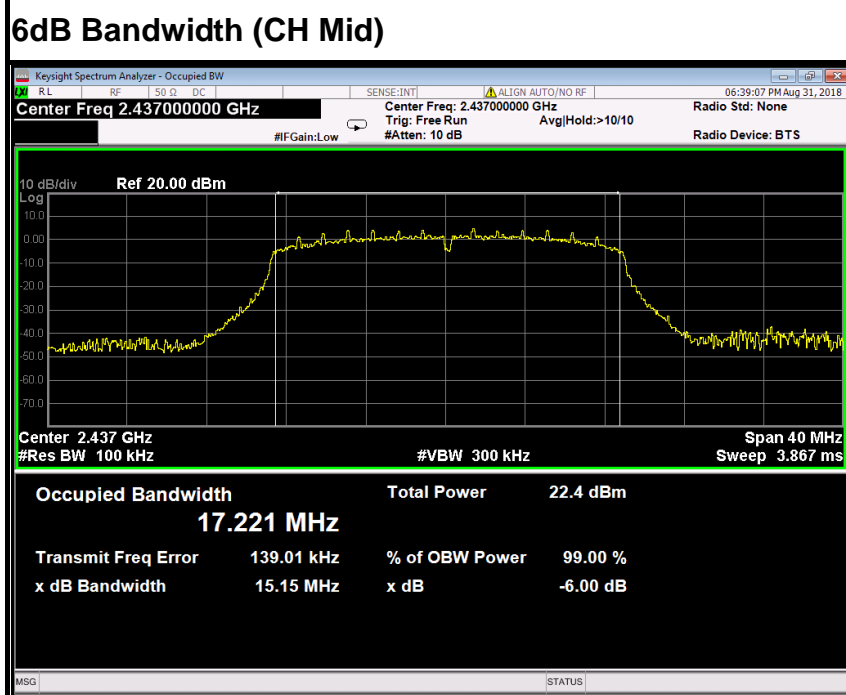
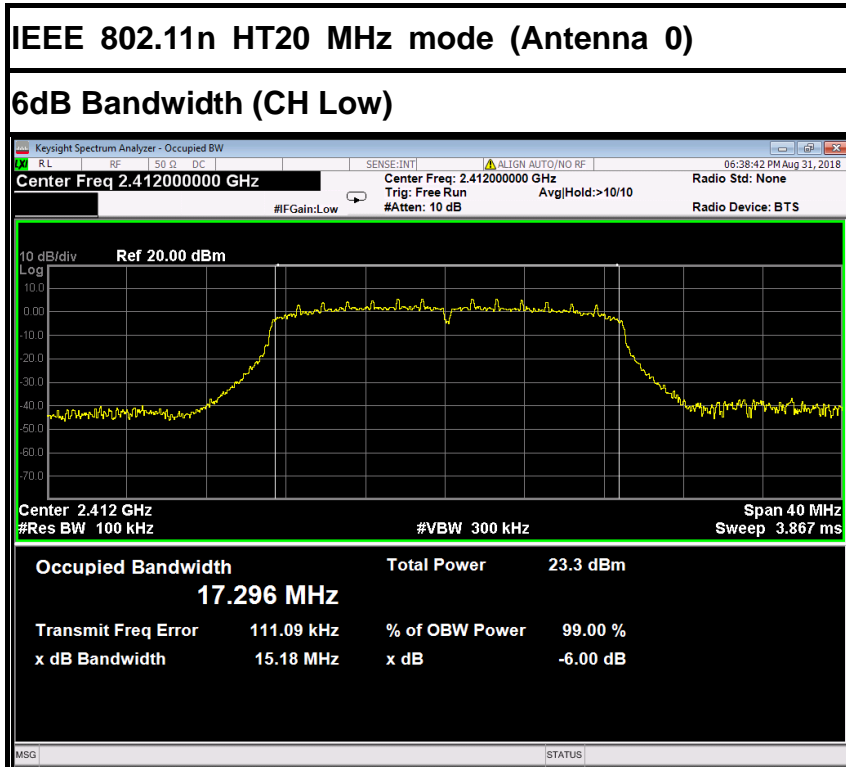


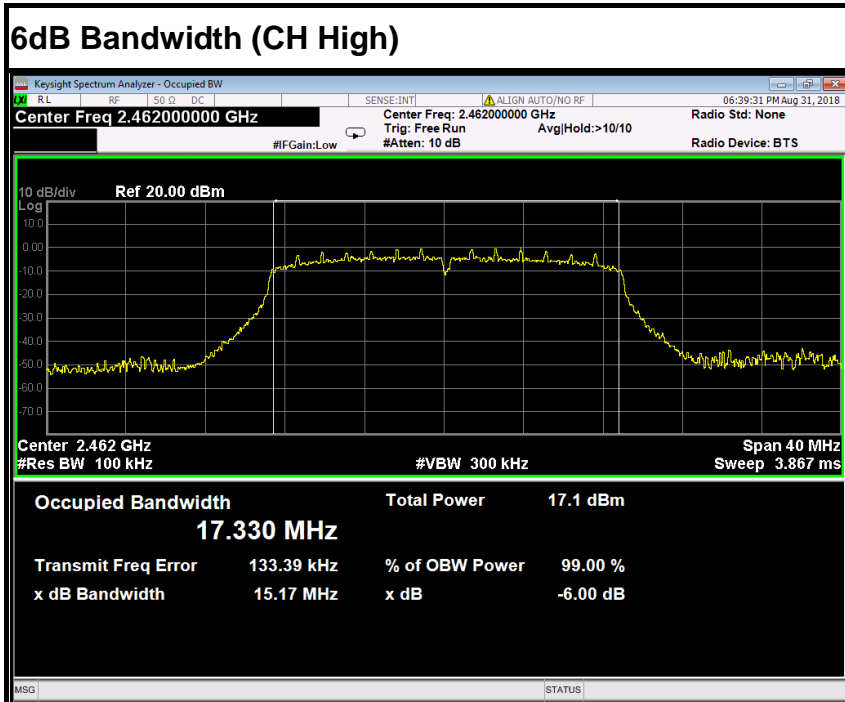
IEEE 802.11g mode (Antenna 1)

6dB Bandwidth (CH Low)



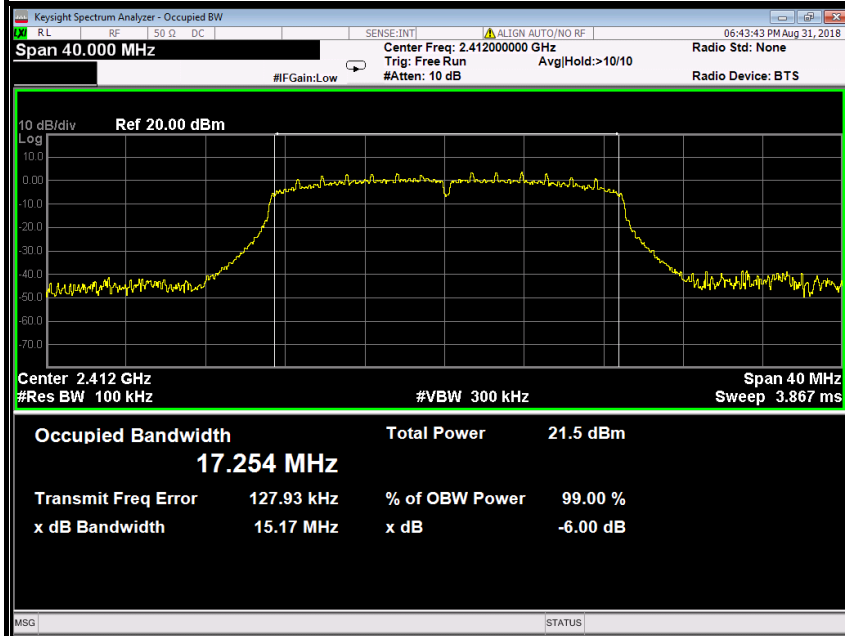


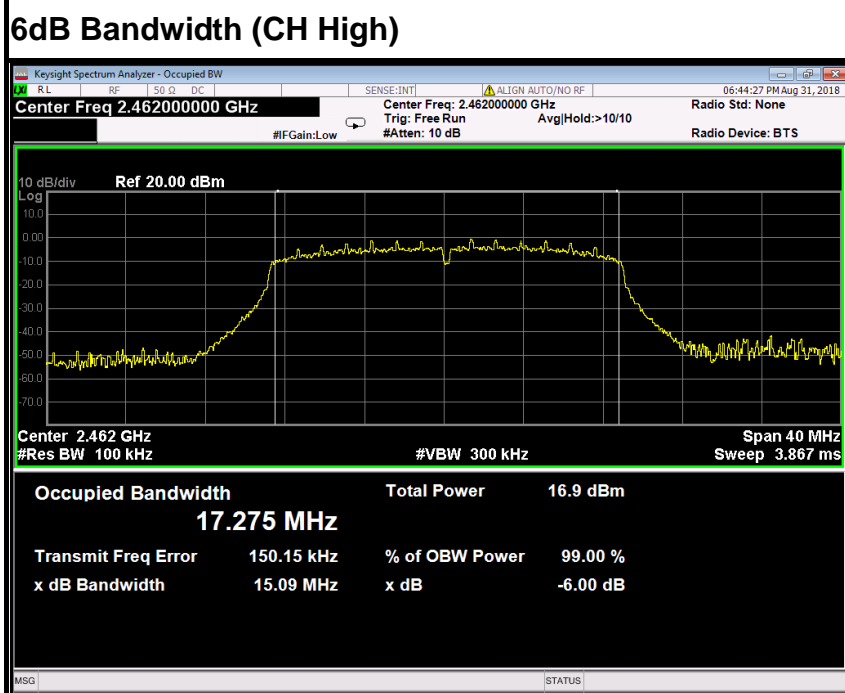
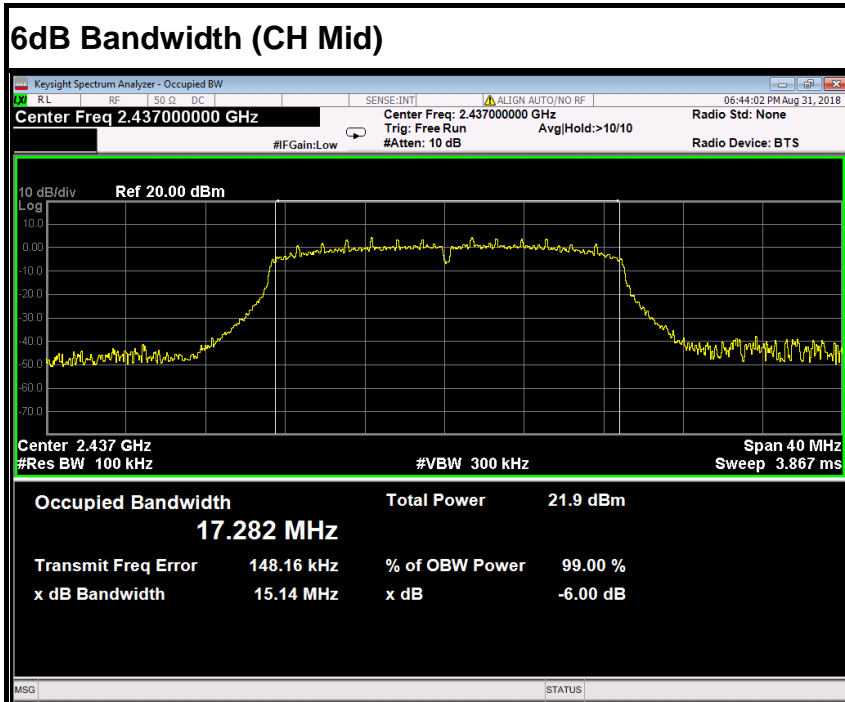


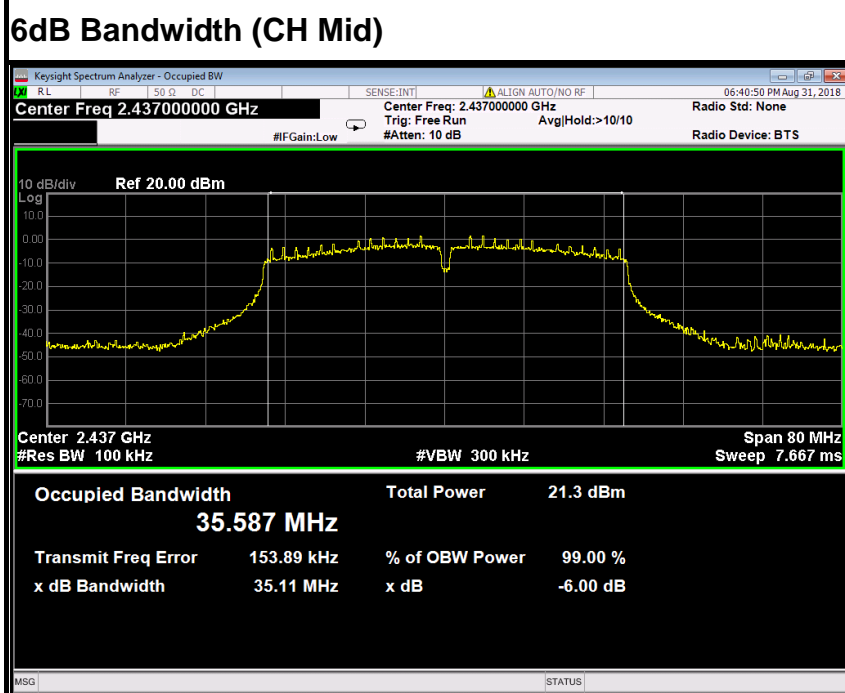
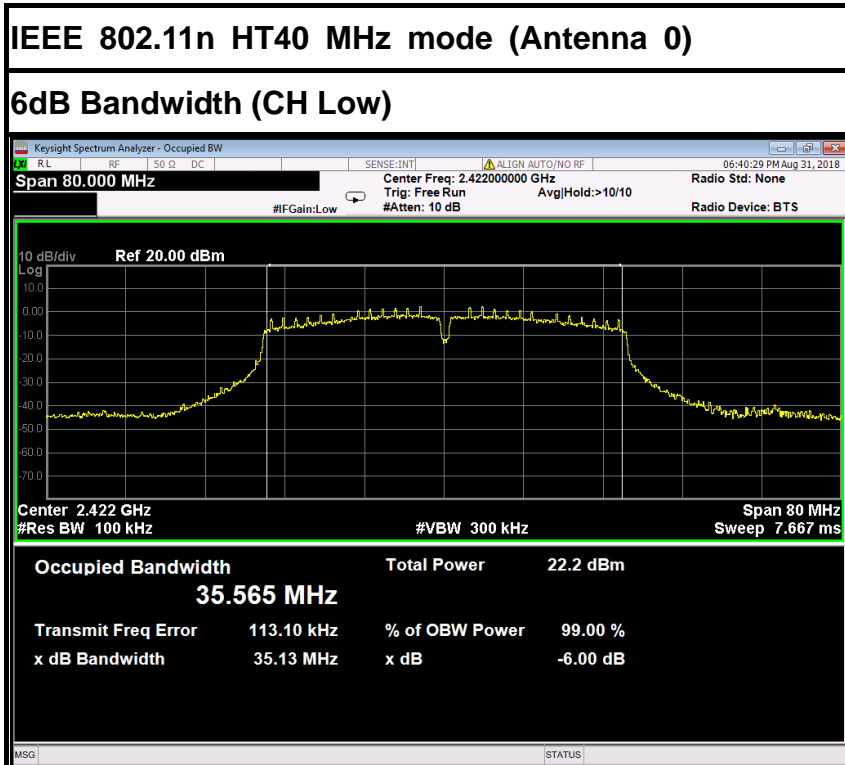


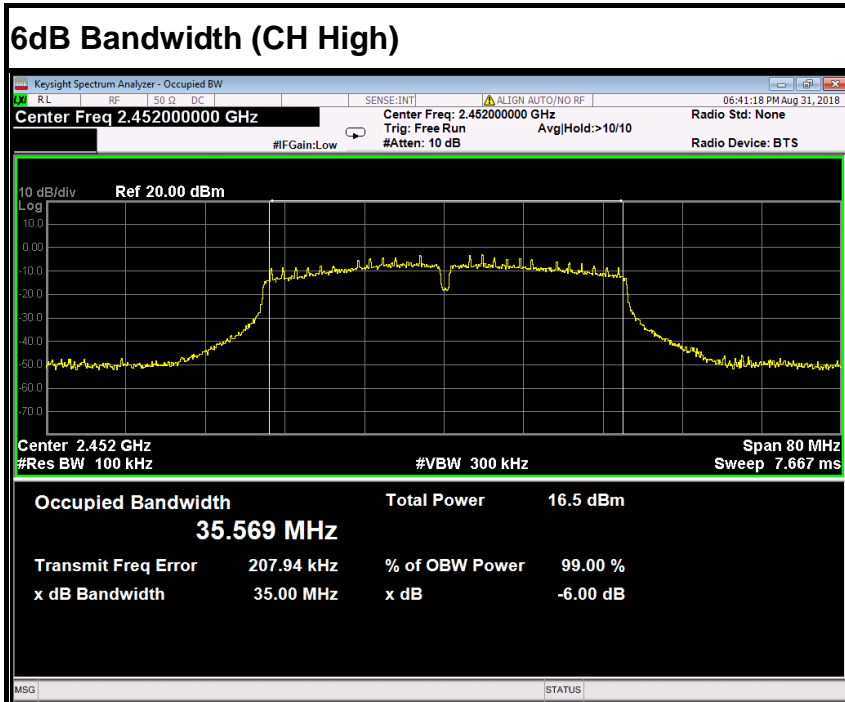
IEEE 802.11n HT20 MHz mode (Antenna 1)

6dB Bandwidth (CH Low)



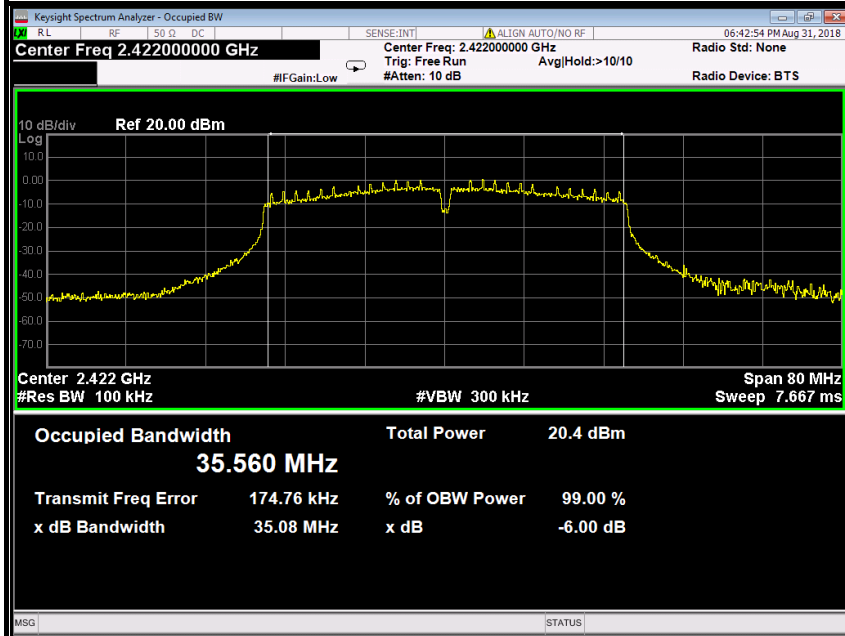


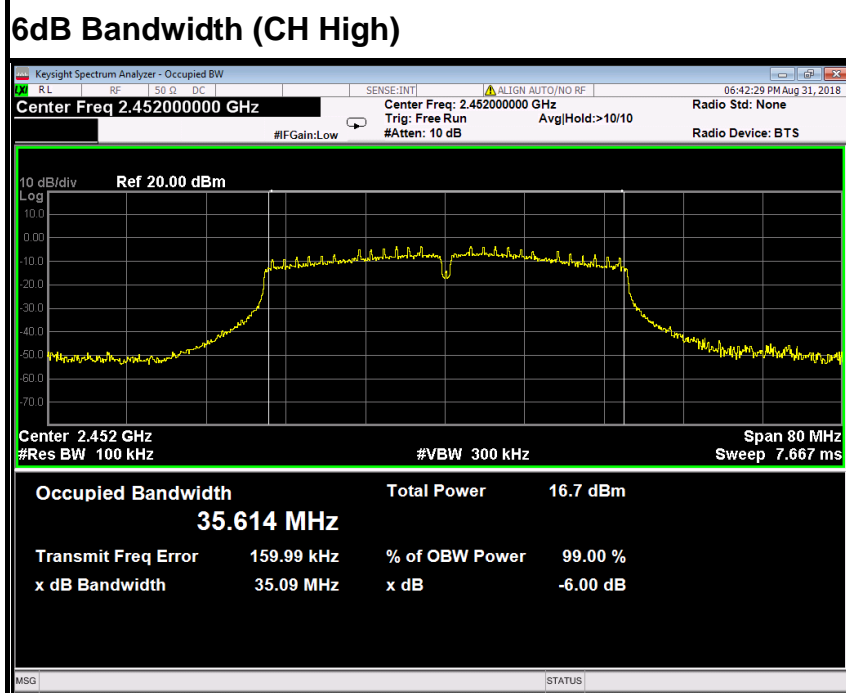
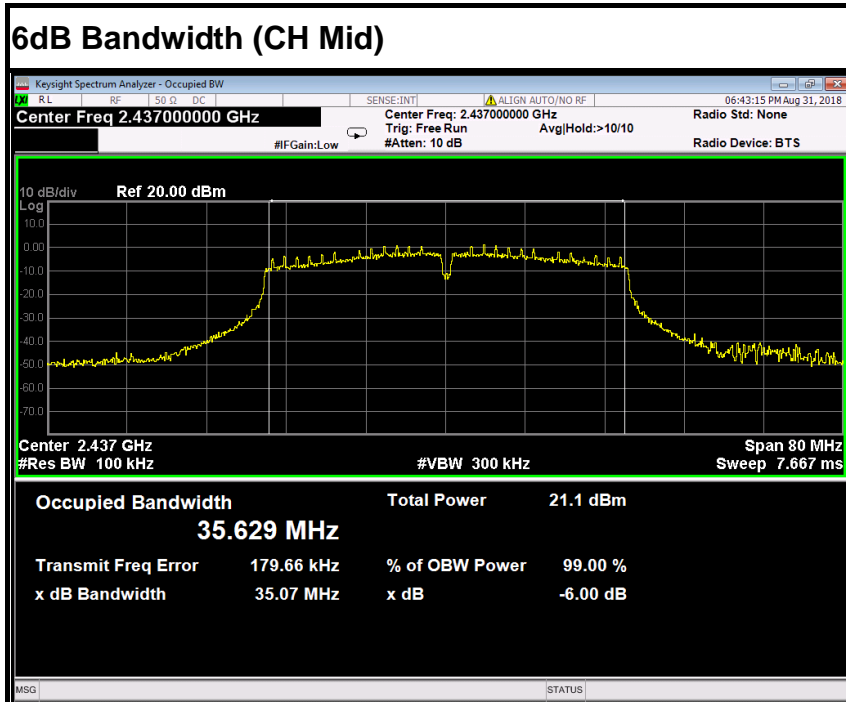




IEEE 802.11n HT40 MHz mode (Antenna 1)

6dB Bandwidth (CH Low)







7.4. ANTENNA GAIN

MEASUREMENT

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the DSSS mode is used.

MEASUREMENT PARAMETERS

Measurement parameter	
Detector	Peak
Sweep time	Auto
Resolution bandwidth	3 MHz
Video bandwidth	3 MHz
Trace-Mode	Max hold

LIMITS

FCC	IC
Antenna Gain	
6 dBi	



TEST RESULTS

Antenna 0

T_{nom}	V_{nom}	Lowest channel 2412MHz	Middle channel 2437MHz	Highest channel 2462MHz
Conducted power [dBm/MHz] Measured with DSSS modulation		10.79	9.47	10.60
Radiated power [dBm/MHz] Measured with DSSS modulation		13.01	12.83	12.65
Gain [dBi] Calculated		2.22	3.36	2.05
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)		

Antenna 1

T_{nom}	V_{nom}	Lowest channel 2412MHz	Middle channel 2437MHz	Highest channel 2462MHz
Conducted power [dBm/MHz] Measured with DSSS modulation		9.85	10.11	9.55
Radiated power [dBm/MHz] Measured with DSSS modulation		13.58	13.30	13.02
Gain [dBi] Calculated		3.73	3.19	3.47
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)		



7.5. PEAK OUTPUT POWER

7.5.1. LIMITS

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.5.2. TEST PROCEDURES (please refer to measurement standard)

9.1.1 RBW \geq DTS bandwidth

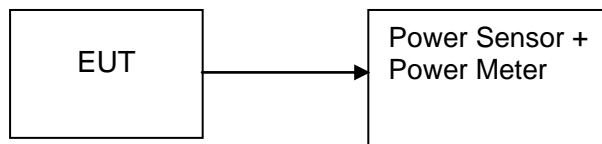
This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the *DTS bandwidth*.

- a) Set the RBW \geq DTS bandwidth.
- b) Set VBW \geq 3 RBW.
- c) Set span \geq 3 x RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

9.1.2 PKPM1 Peak power meter method

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

7.5.3. TEST SETUP





7.5.4. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b (Antenna 0)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Peak / AVG	Limit (W)	Result
Low	2412	20.95	0.12445	Peak	1	PASS
Mid	2437	19.62	0.09162			PASS
High	2462	20.75	0.11885			PASS
Low	2412	17.72	0.05916	AVG	1	PASS
Mid	2437	16.53	0.04498			PASS
High	2462	17.70	0.05888			PASS

Test mode: IEEE 802.11b (Antenna 1)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Peak / AVG	Limit (W)	Result
Low	2412	20.02	0.10046	Peak	1	PASS
Mid	2437	20.27	0.10641			PASS
High	2462	19.72	0.09376			PASS
Low	2412	16.86	0.04853	AVG	1	PASS
Mid	2437	17.26	0.05321			PASS
High	2462	16.67	0.04645			PASS

Test mode: IEEE 802.11g (Antenna 0)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Peak / AVG	Limit (W)	Result
Low	2412	22.92	0.19588	Peak	1	PASS
Mid	2437	22.27	0.16866			PASS
High	2462	20.75	0.11885			PASS
Low	2412	14.60	0.02884	AVG	1	PASS
Mid	2437	13.98	0.02500			PASS
High	2462	12.34	0.01714			PASS



Test mode: IEEE 802.11g (Antenna 1)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Peak / AVG	Limit (W)	Result
Low	2412	22.37	0.17258	Peak	1	PASS
Mid	2437	22.78	0.18967			PASS
High	2462	20.88	0.12246			PASS
Low	2412	13.99	0.02506	AVG	1	PASS
Mid	2437	14.44	0.02780			PASS
High	2462	12.54	0.01795			PASS

Test mode: IEEE 802.11n HT20 MHz(Combine with Antenna 0 and Antenna 1)

Channel	Frequency (MHz)	Output Power (dBm)			Output Power (W)	Peak / AVG	Limit (W)	Result
		Antenna 0	Antenna 1	Total				
Low	2412	22.98	21.93	25.50	0.35456	Peak	1	PASS
Mid	2437	22.28	22.87	25.60	0.36269			PASS
High	2462	17.68	18.02	20.86	0.12200			PASS
Low	2412	14.60	13.91	17.28	0.05344	AVG	1	PASS
Mid	2437	13.86	14.28	17.09	0.05111			PASS
High	2462	9.40	9.42	12.42	0.01746			PASS

Test mode: IEEE 802.11n HT40 MHz(Combine with Antenna 0 and Antenna 1)

Channel	Frequency (MHz)	Output Power (dBm)			Output Power (W)	Peak / AVG	Limit (W)	Result
		Antenna 0	Antenna 1	Total				
Low	2422	22.77	21.09	25.02	0.31776	Peak	1	PASS
Mid	2437	22.13	21.88	25.02	0.31748			PASS
High	2452	17.27	17.32	20.31	0.10728			PASS
Low	2422	14.32	12.54	16.53	0.04499	AVG	1	PASS
Mid	2437	13.64	13.33	16.50	0.04465			PASS
High	2452	8.66	8.76	11.72	0.01486			PASS



7.6. BAND EDGES MEASUREMENT

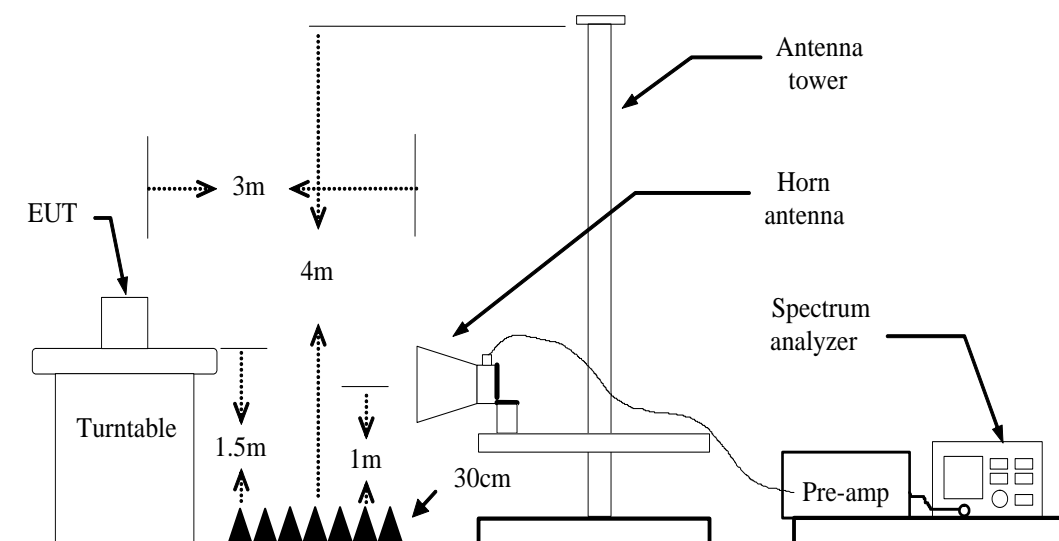
7.6.1. LIMITS

According to §15.247(d), 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 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

7.6.2. TEST PROCEDURES (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 1.5m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO / Detector=PEAK
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are

7.6.3. TEST SETUP



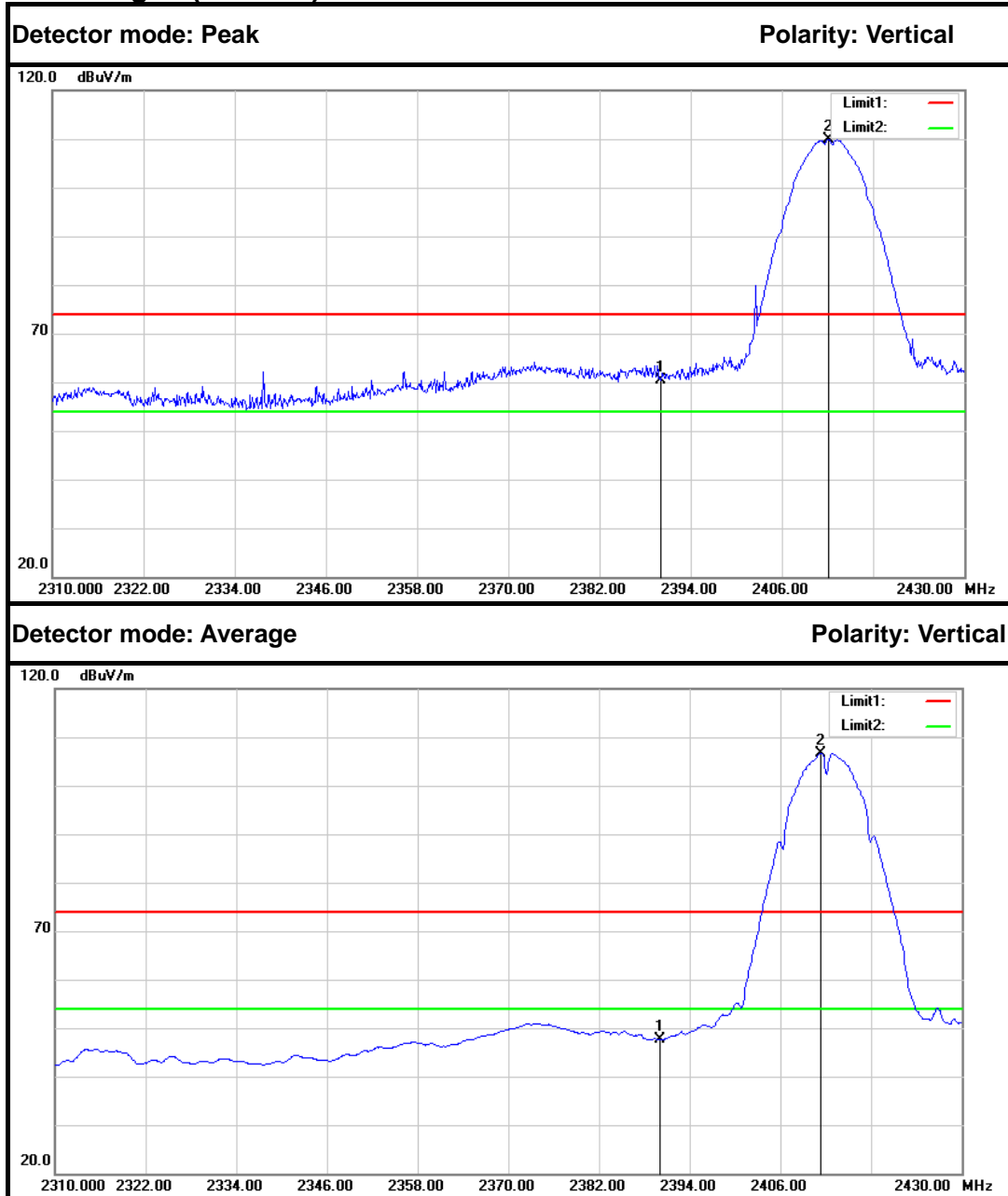


7.6.4. TEST RESULTS

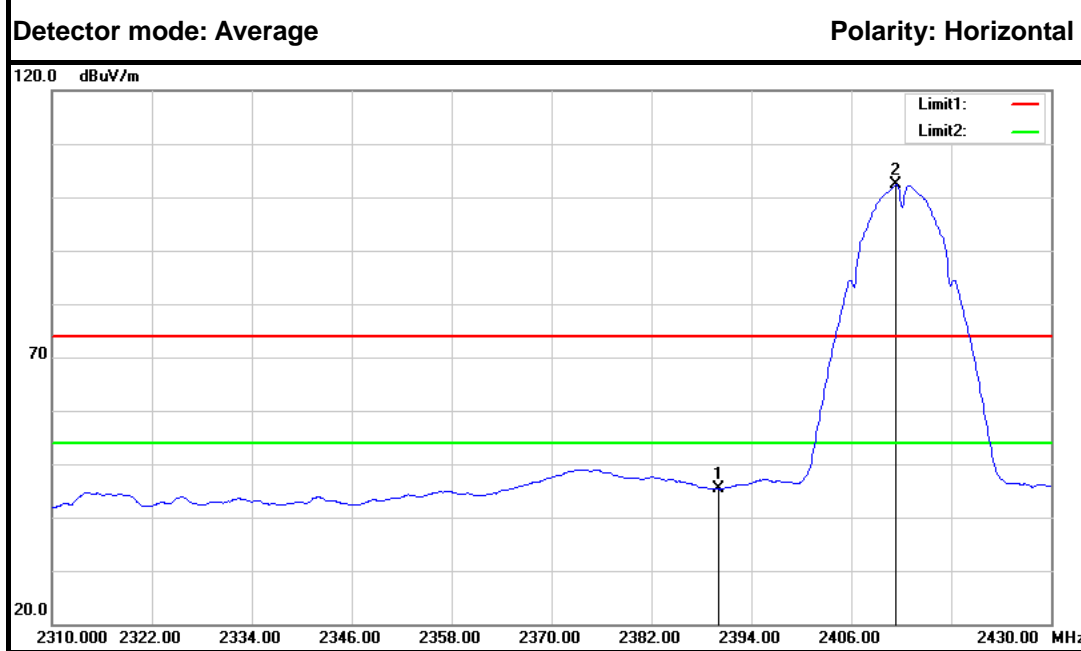
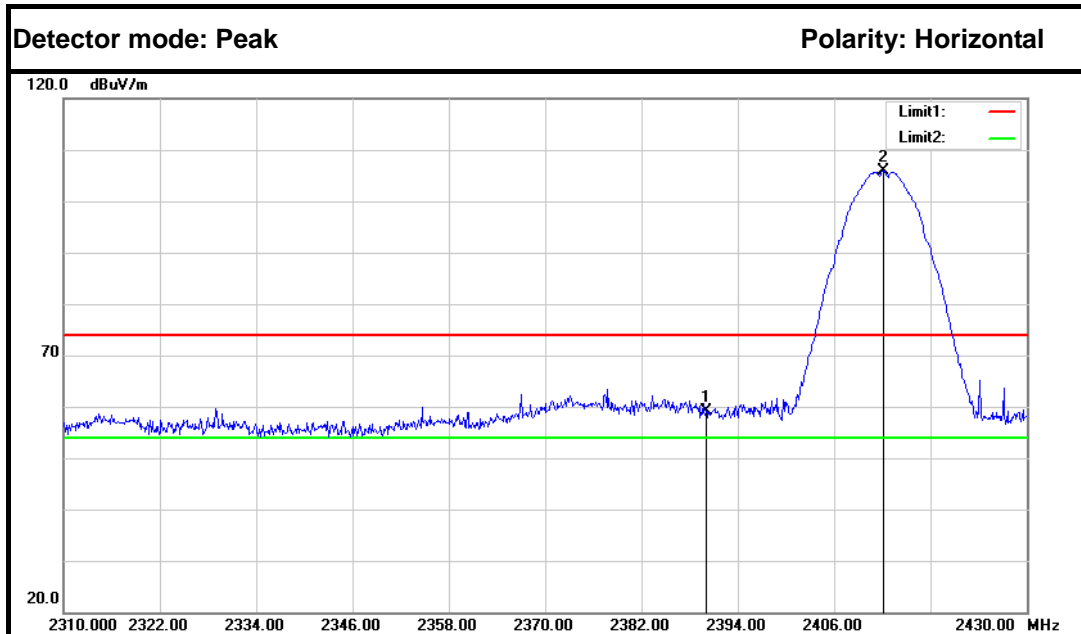
Test Plot

IEEE 802.11b mode (Antenna 0)

Band Edges (CH Low)



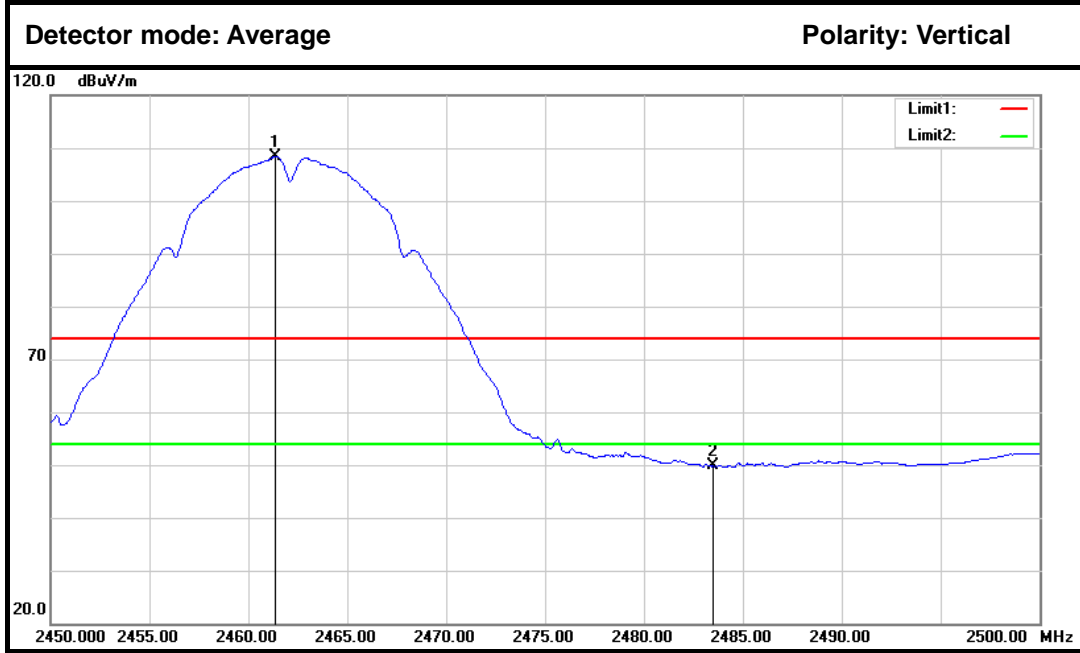
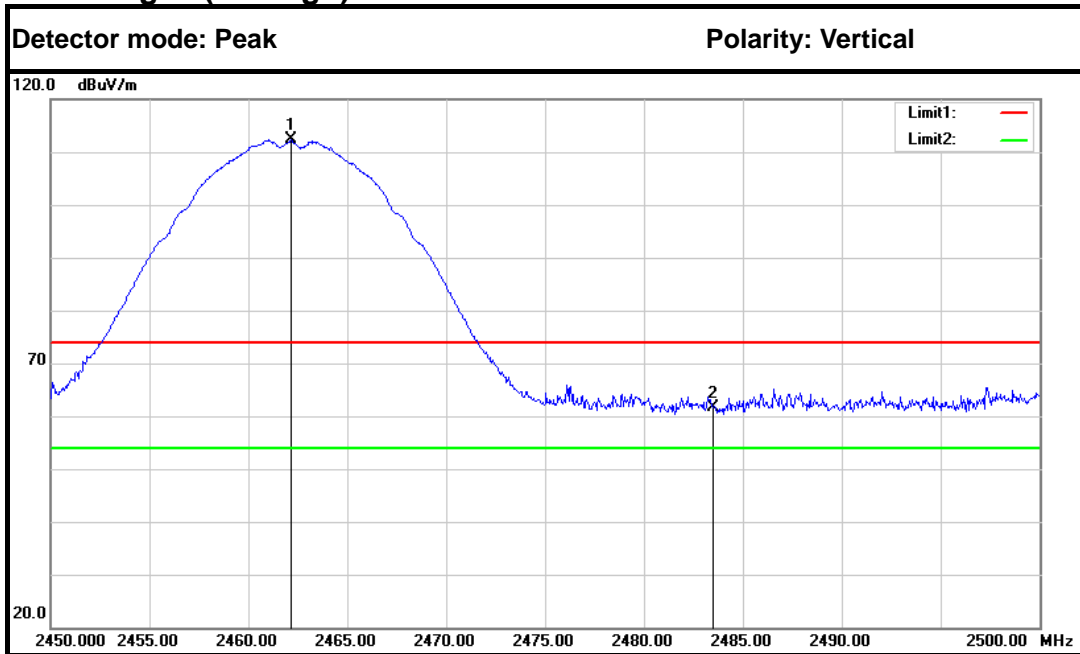
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	63.33	-2.86	60.47	74.00	-13.53	Peak	Vertical
2	2412.120	112.65	-2.74	109.91	---	---	Peak	Vertical
1	2390.000	50.45	-2.86	47.59	54.00	-6.41	Average	Vertical
2	2411.400	109.50	-2.75	106.75	---	---	Average	Vertical



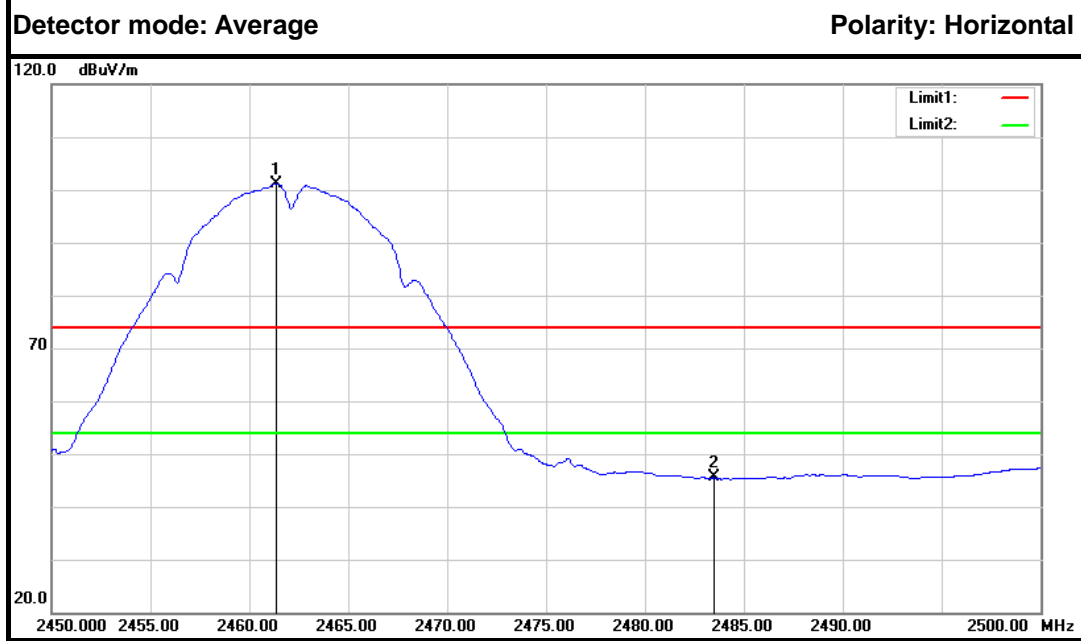
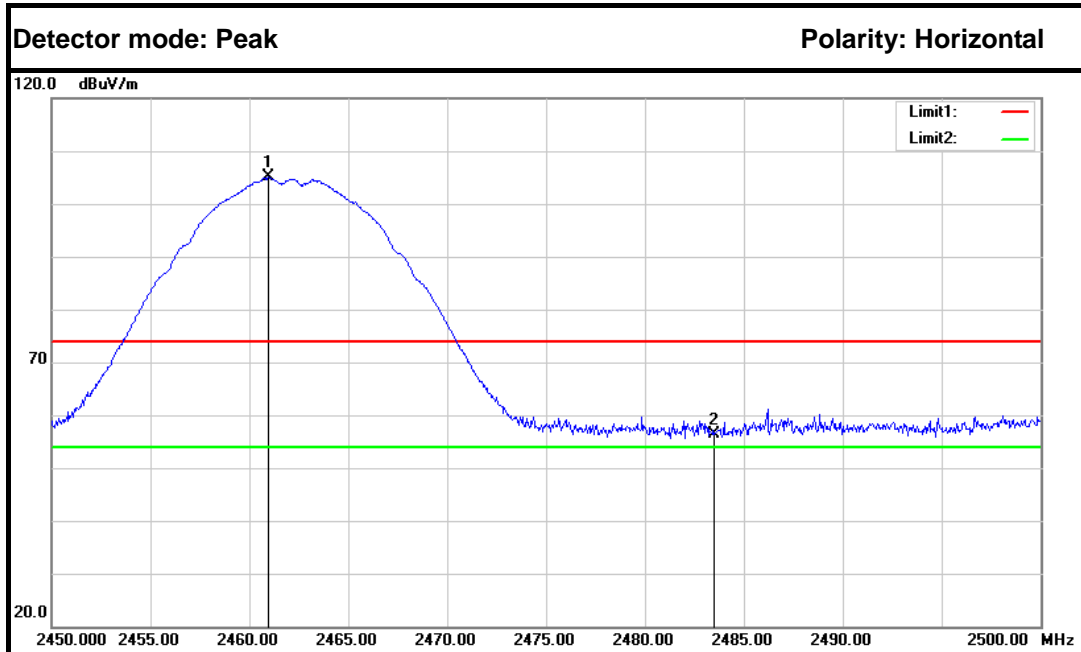
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	61.91	-2.86	59.05	74.00	-14.95	Peak	Horizontal
2	2412.120	108.63	-2.74	105.89	---	---	Peak	Horizontal
1	2390.000	48.15	-2.86	45.29	54.00	-8.71	Average	Horizontal
2	2411.280	105.15	-2.75	102.40	---	---	Average	Horizontal



Band Edges (CH High)



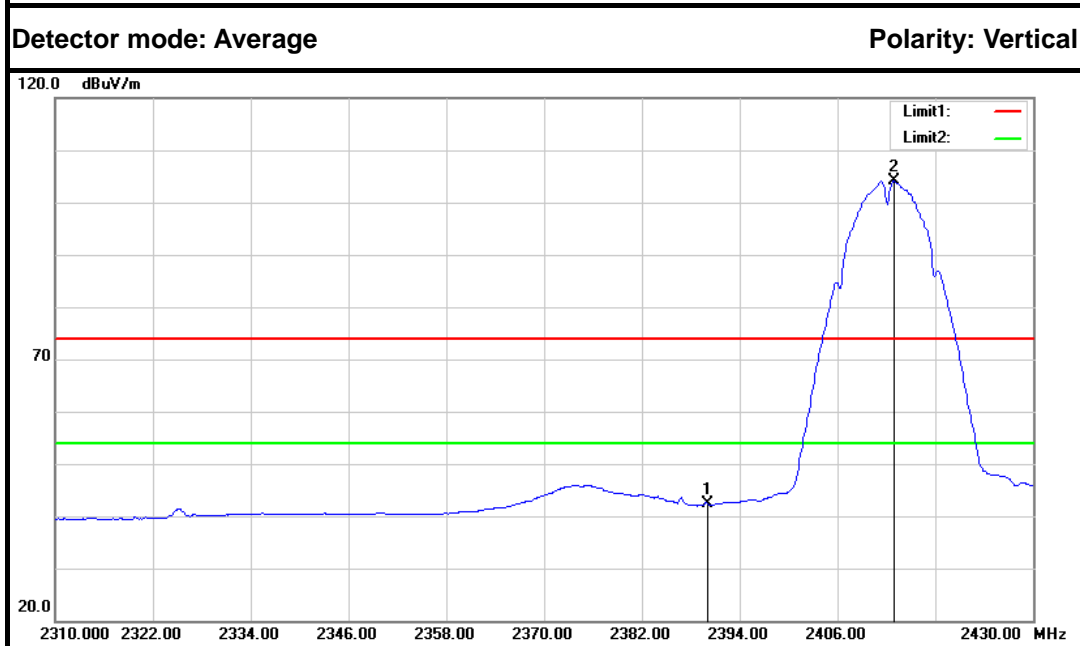
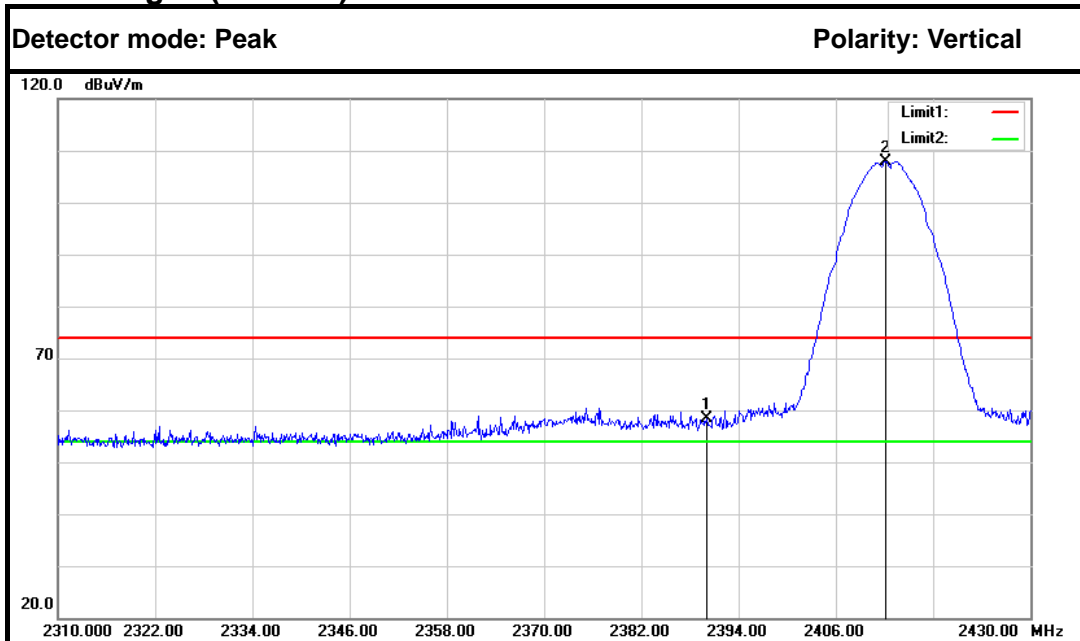
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2462.150	114.81	-2.47	112.34	---	---	Peak	Vertical
2	2483.500	64.08	-2.35	61.73	74.00	-12.27	Peak	Vertical
1	2461.350	110.90	-2.47	108.43	---	---	Average	Vertical
2	2483.500	52.11	-2.35	49.76	54.00	-4.24	Average	Vertical



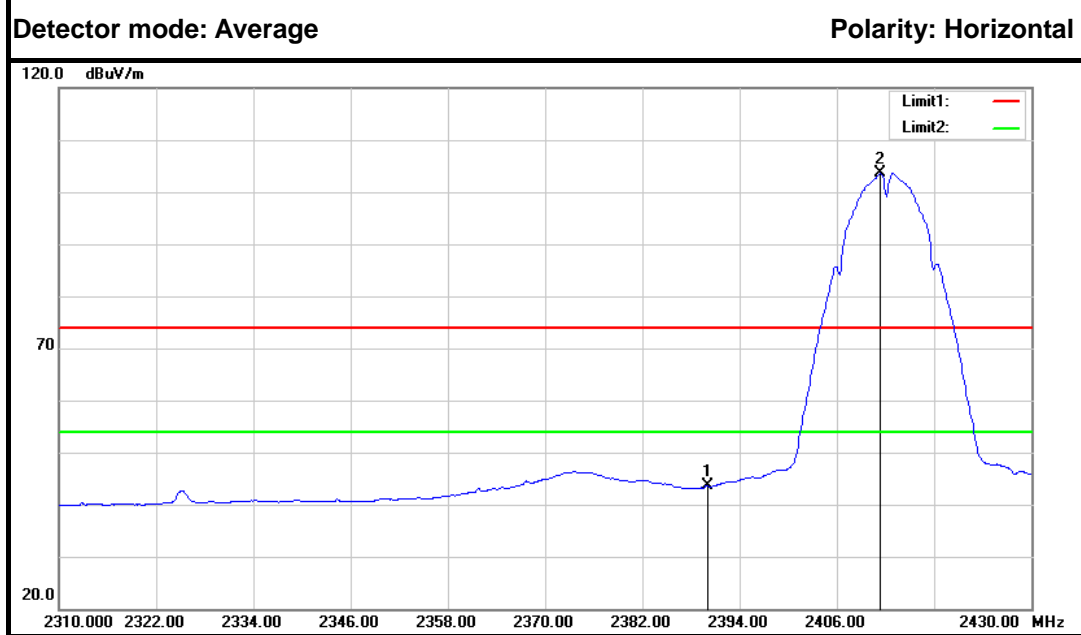
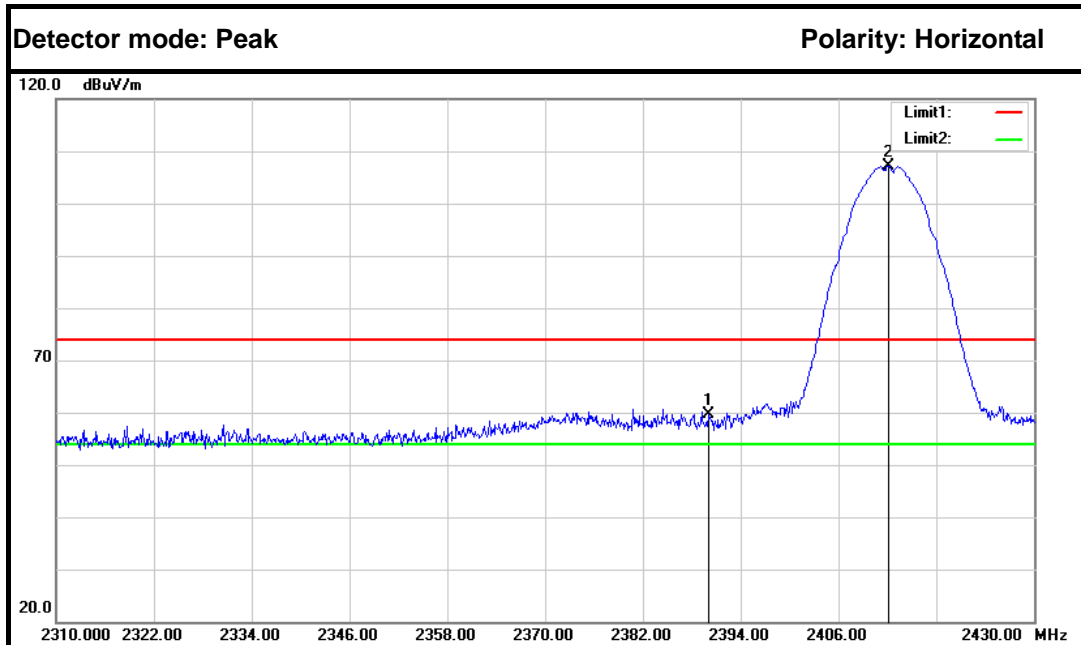
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2460.950	107.53	-2.47	105.06	---	---	Peak	Horizontal
2	2483.500	58.66	-2.35	56.31	74.00	-17.69	Peak	Horizontal
1	2461.350	103.67	-2.47	101.20	---	---	Average	Horizontal
2	2483.500	47.94	-2.35	45.59	54.00	-8.41	Average	Horizontal



IEEE 802.11b mode (Antenna 1)
Band Edges (CH Low)



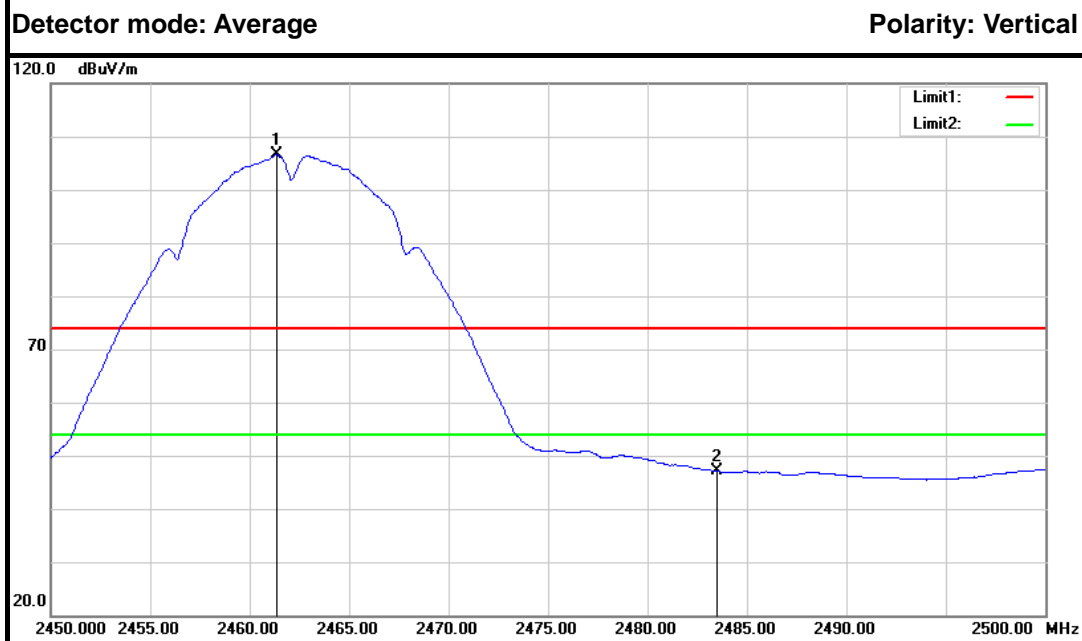
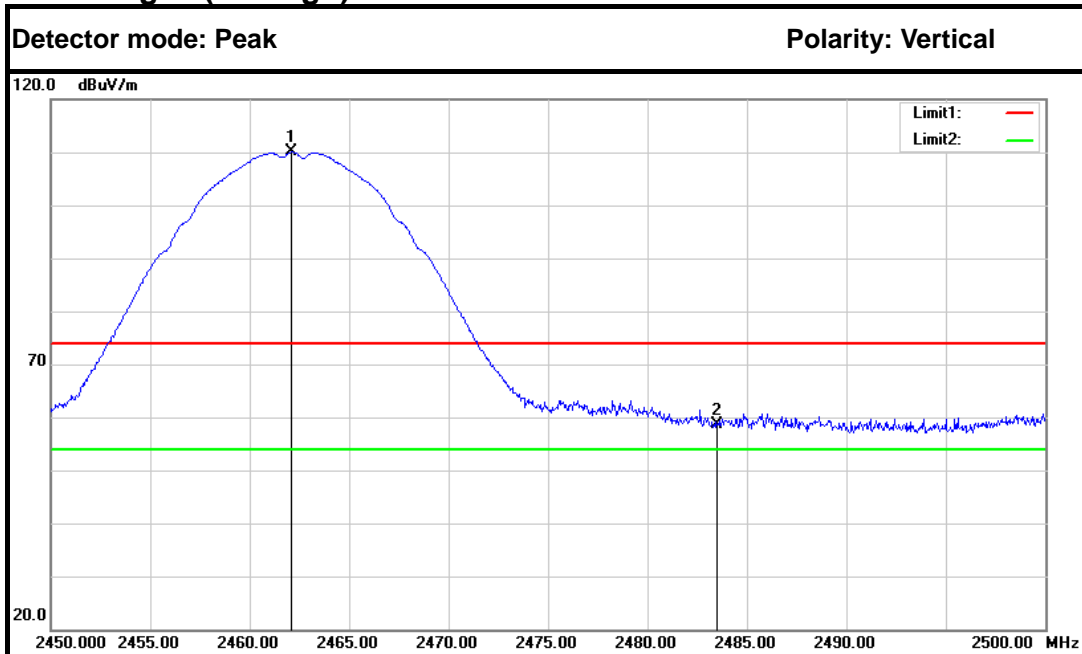
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	61.25	-2.86	58.39	74.00	-15.61	Peak	Vertical
2	2412.120	110.63	-2.74	107.89	---	---	Peak	Vertical
1	2390.000	45.16	-2.86	42.30	54.00	-11.70	Average	Vertical
2	2412.960	106.81	-2.74	104.07	---	---	Average	Vertical



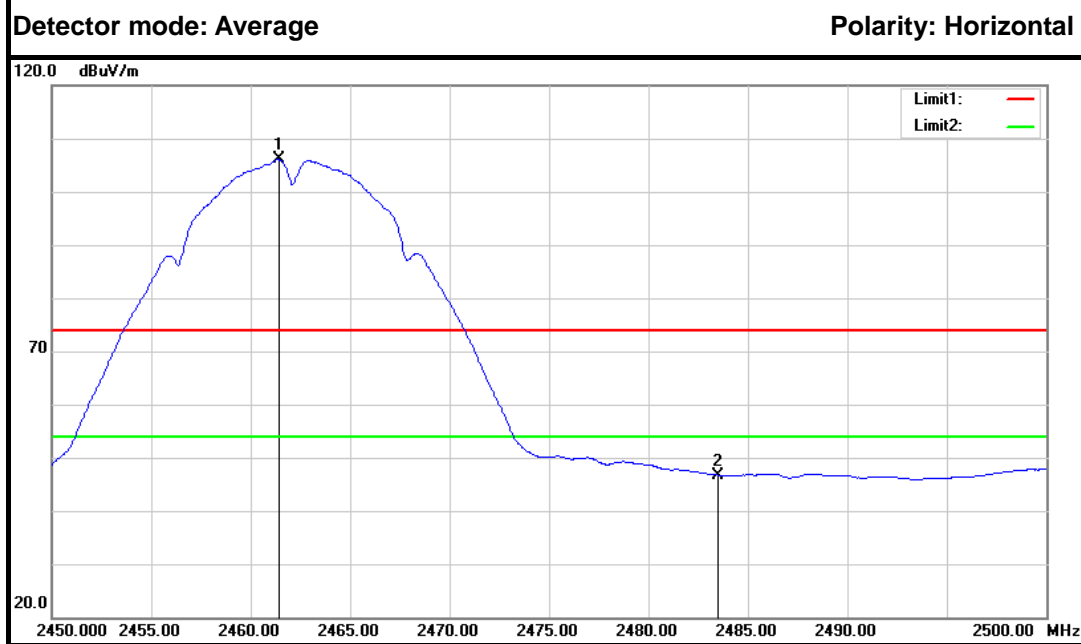
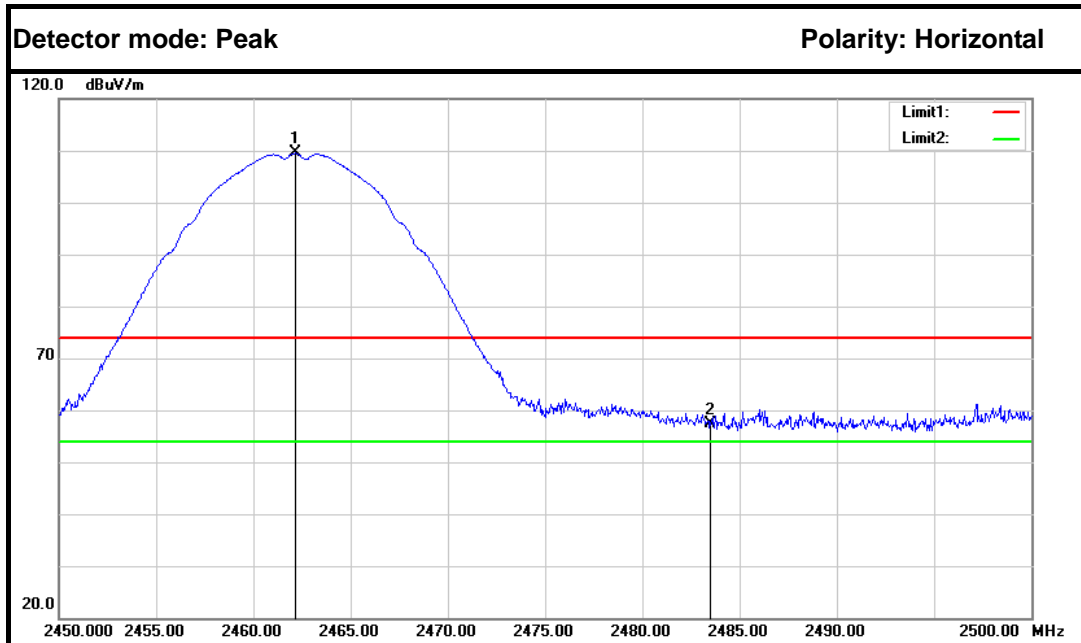
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	62.43	-2.86	59.57	74.00	-14.43	Peak	Horizontal
2	2412.120	109.91	-2.74	107.17	---	---	Peak	Horizontal
1	2390.000	46.37	-2.86	43.51	54.00	-10.49	Average	Horizontal
2	2411.280	106.36	-2.75	103.61	---	---	Average	Horizontal



Band Edges (CH High)



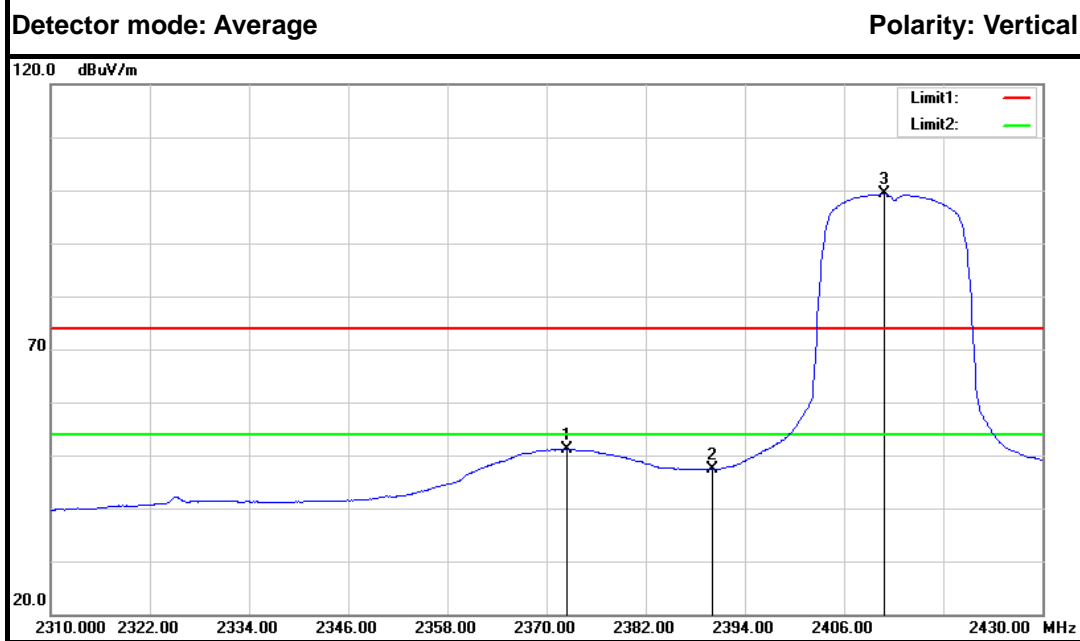
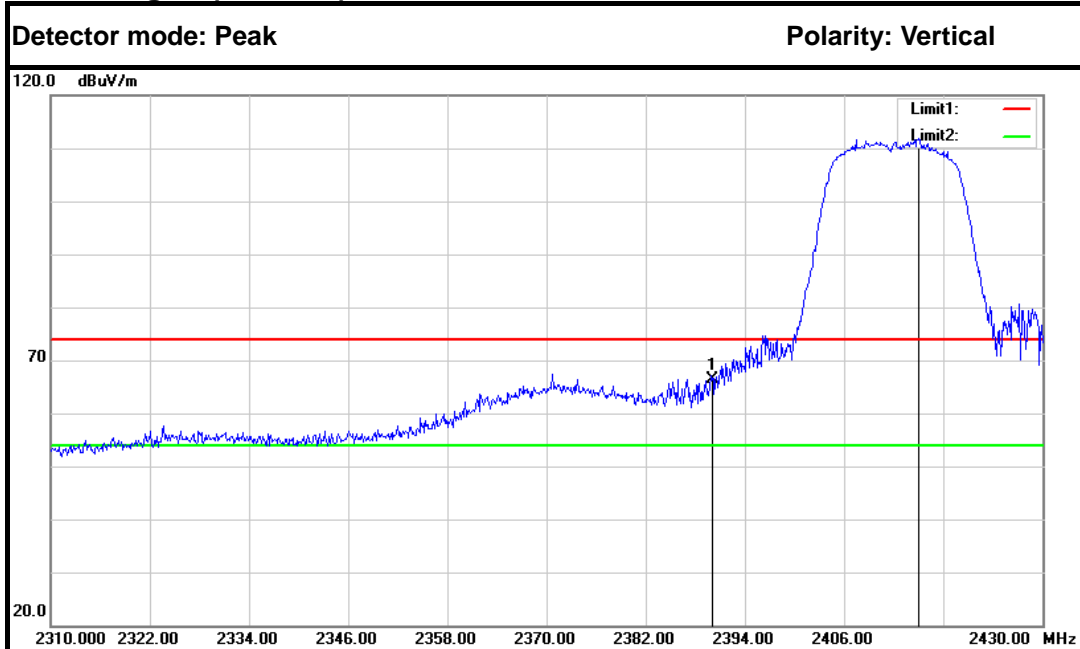
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2462.100	112.53	-2.47	110.06	---	---	Peak	Vertical
2	2483.500	61.04	-2.35	58.69	54.00	4.69	Peak	Vertical
1	2461.350	108.98	-2.47	106.51	---	---	Average	Vertical
2	2483.500	49.43	-2.35	47.08	54.00	-6.92	Average	Vertical



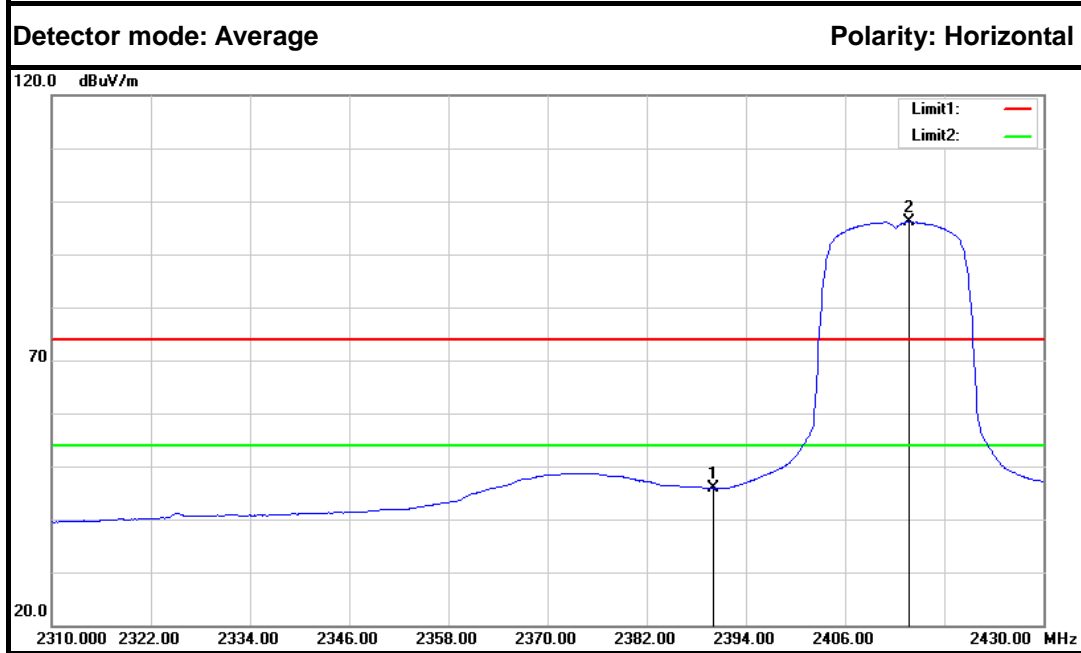
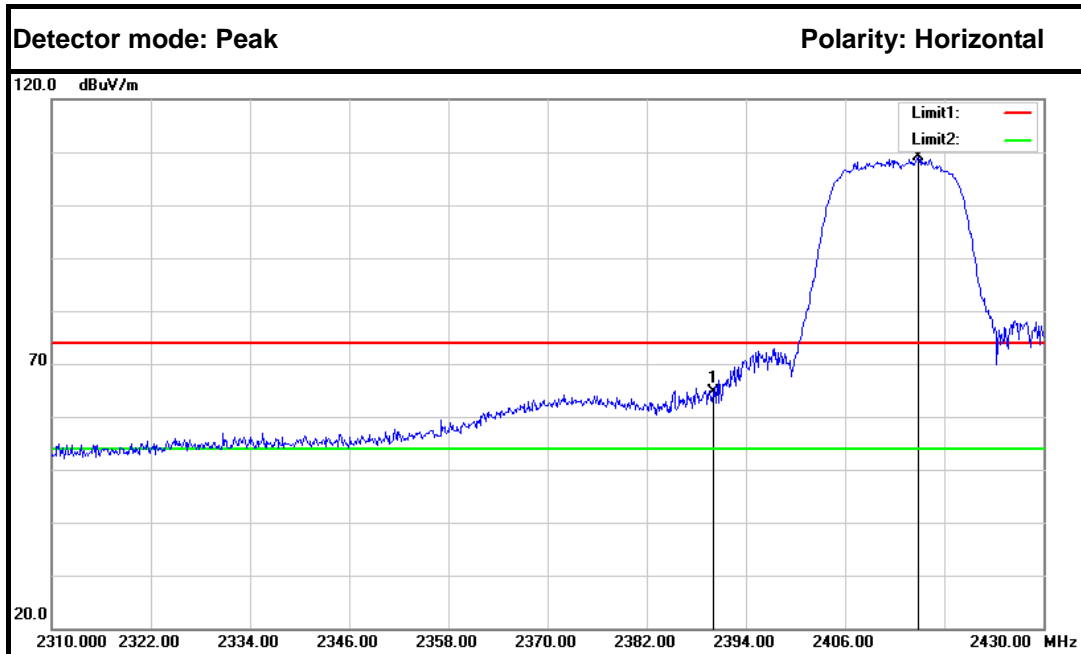
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2462.150	111.98	-2.47	109.51	---	---	Peak	Horizontal
2	2483.500	59.74	-2.35	57.39	74.00	-16.61	Peak	Horizontal
1	2461.400	108.51	-2.47	106.04	---	---	Average	Horizontal
2	2483.500	49.09	-2.35	46.74	54.00	-7.26	Average	Horizontal



IEEE 802.11g mode (Antenna 0)
Band Edges (CH Low)



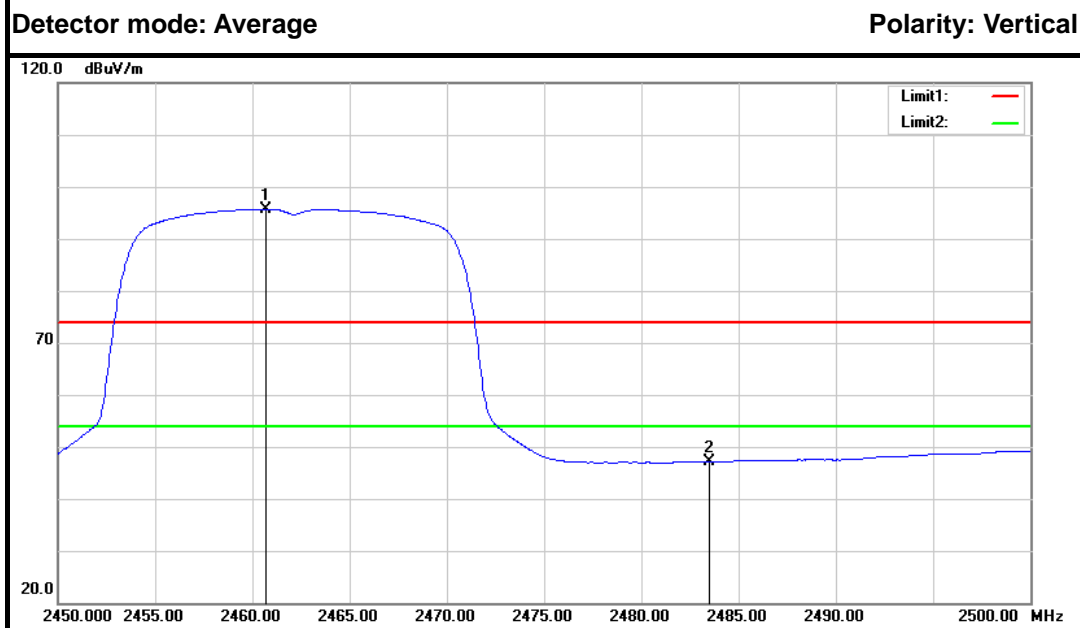
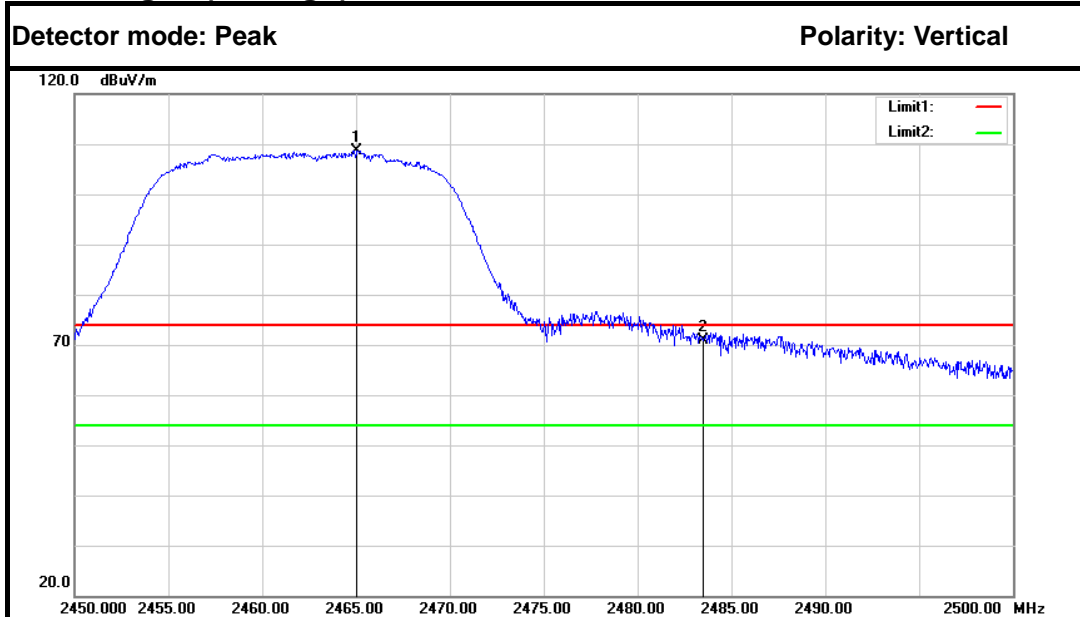
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	69.15	-2.86	66.29	74.00	-7.71	Peak	Vertical
2	2415.000	114.61	-2.73	111.88	---	---	Peak	Vertical
1	2372.400	54.15	-2.96	51.19	54.00	-2.81	Average	Vertical
2	2390.000	50.16	-2.86	47.30	54.00	-6.70	Average	Vertical
3	2410.920	102.03	-2.75	99.28	---	---	Average	Vertical



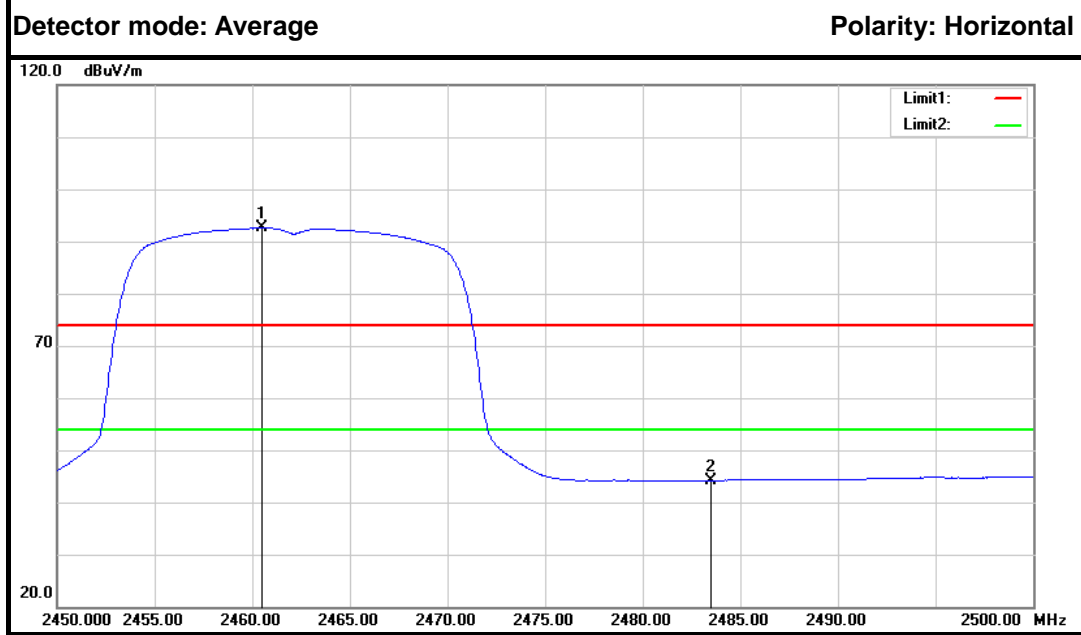
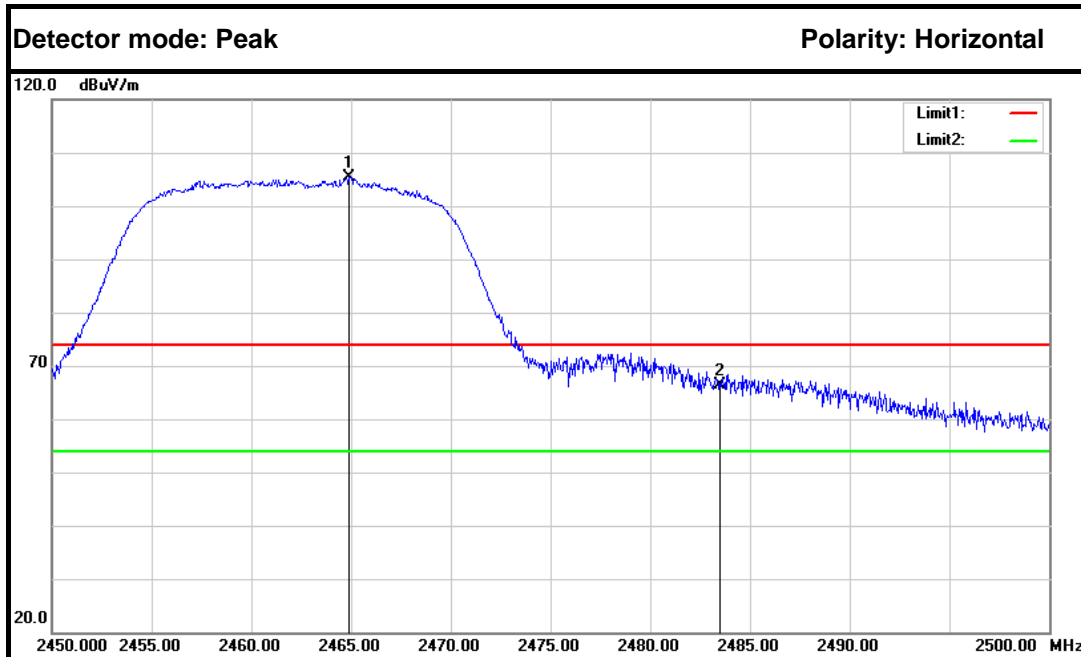
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	67.52	-2.86	64.66	74.00	-9.34	Peak	Horizontal
2	2414.880	111.92	-2.73	109.19	---	---	Peak	Horizontal
1	2390.000	48.62	-2.86	45.76	54.00	-8.24	Average	Horizontal
2	2413.800	98.79	-2.73	96.06	---	---	Average	Horizontal



Band Edges (CH High)



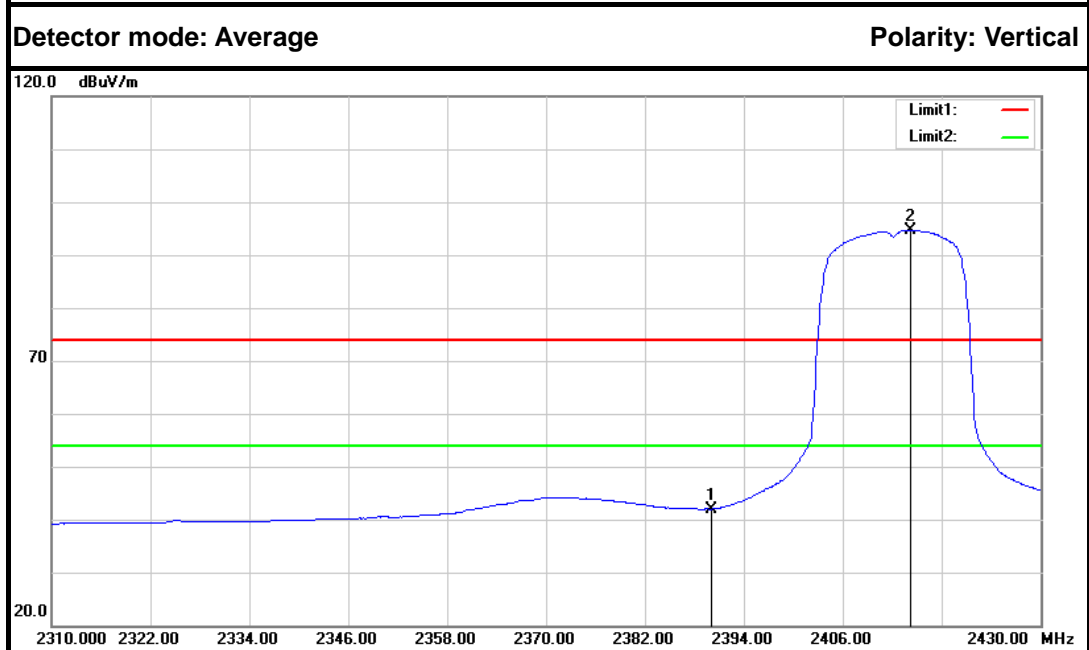
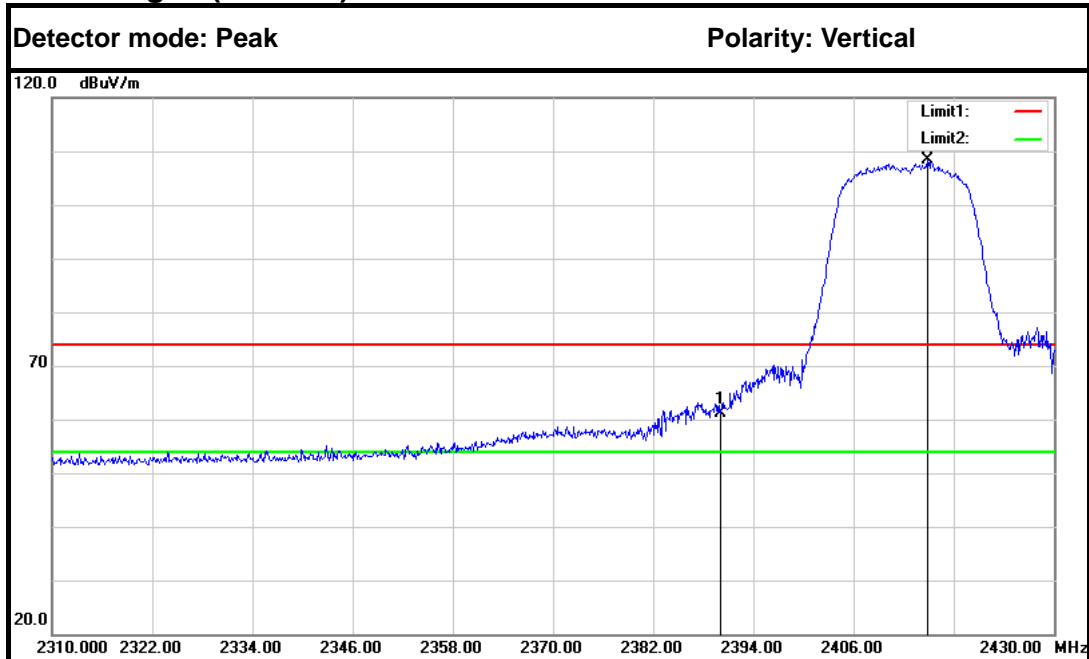
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2465.050	111.15	-2.45	108.70	---	---	Peak	Vertical
2	2483.500	73.19	-2.35	70.84	74.00	-3.16	Peak	Vertical
1	2460.700	98.21	-2.48	95.73	---	---	Average	Vertical
2	2483.500	49.50	-2.35	47.15	54.00	-6.85	Average	Vertical



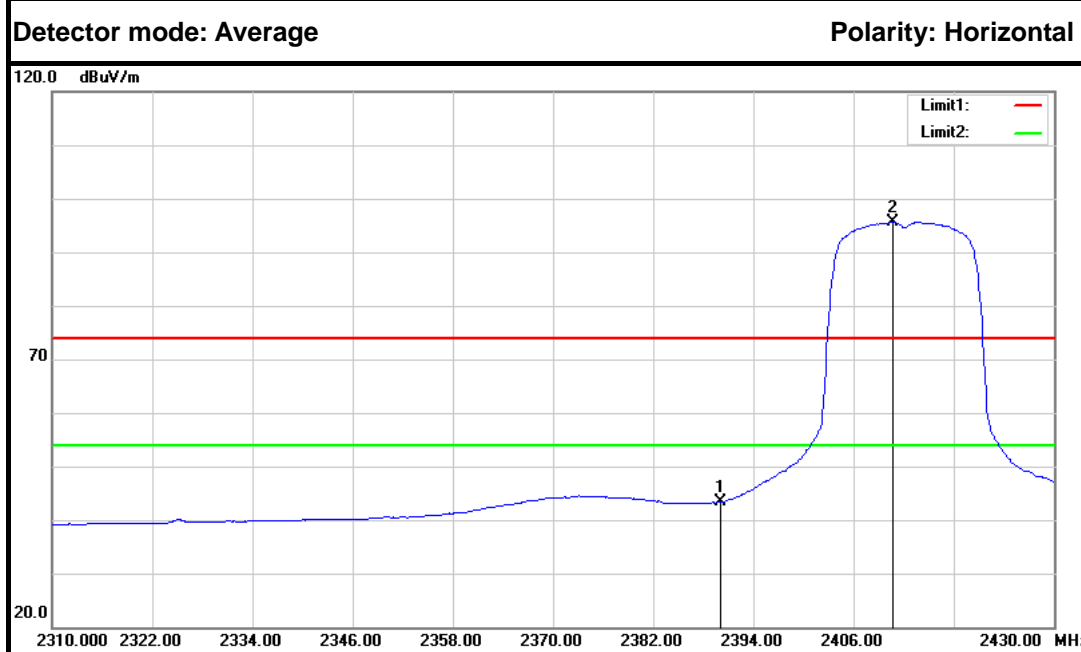
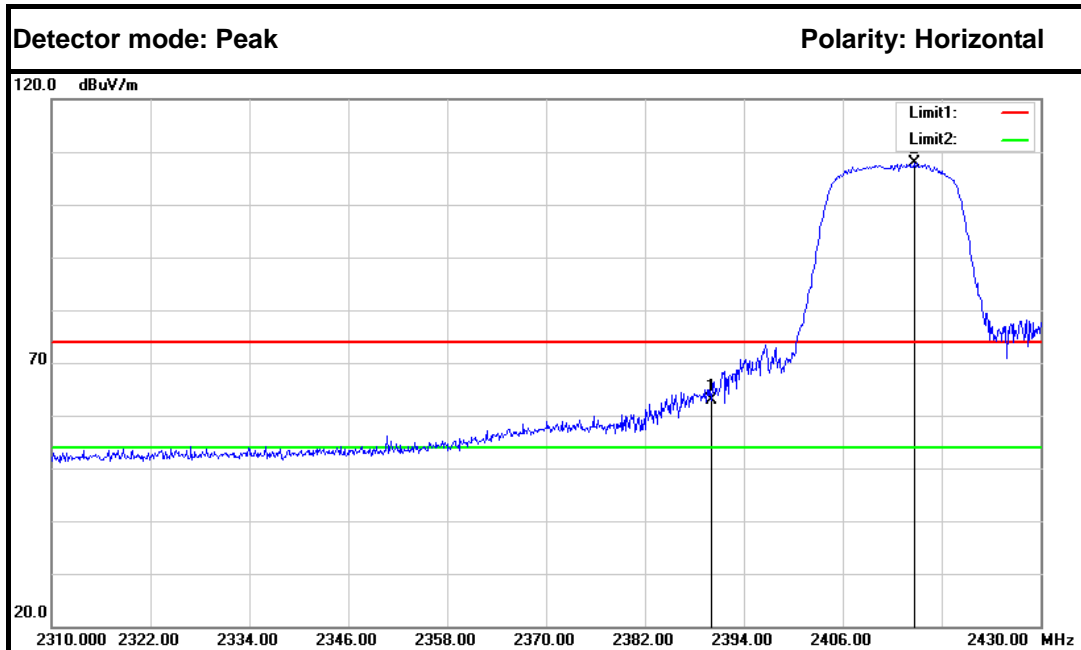
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2464.900	107.78	-2.45	105.33	---	---	Peak	Horizontal
2	2483.500	68.84	-2.35	66.49	74.00	-7.51	Peak	Horizontal
1	2460.500	95.04	-2.48	92.56	---	---	Average	Horizontal
2	2483.500	46.55	-2.35	44.20	54.00	-9.80	Average	Horizontal



IEEE 802.11g mode (Antenna 1)
Band Edges (CH Low)



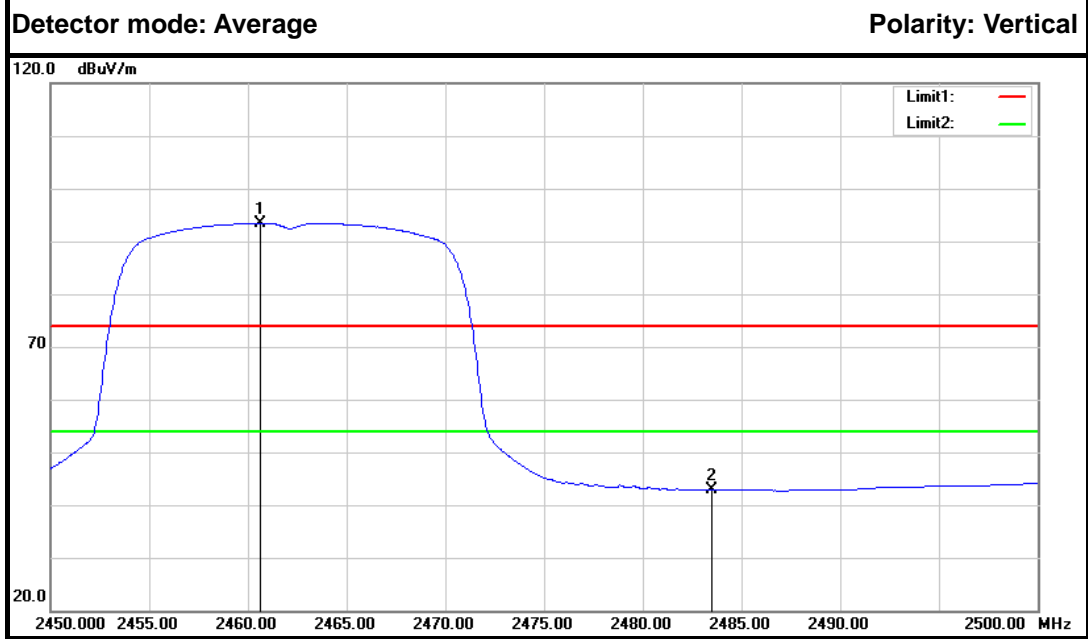
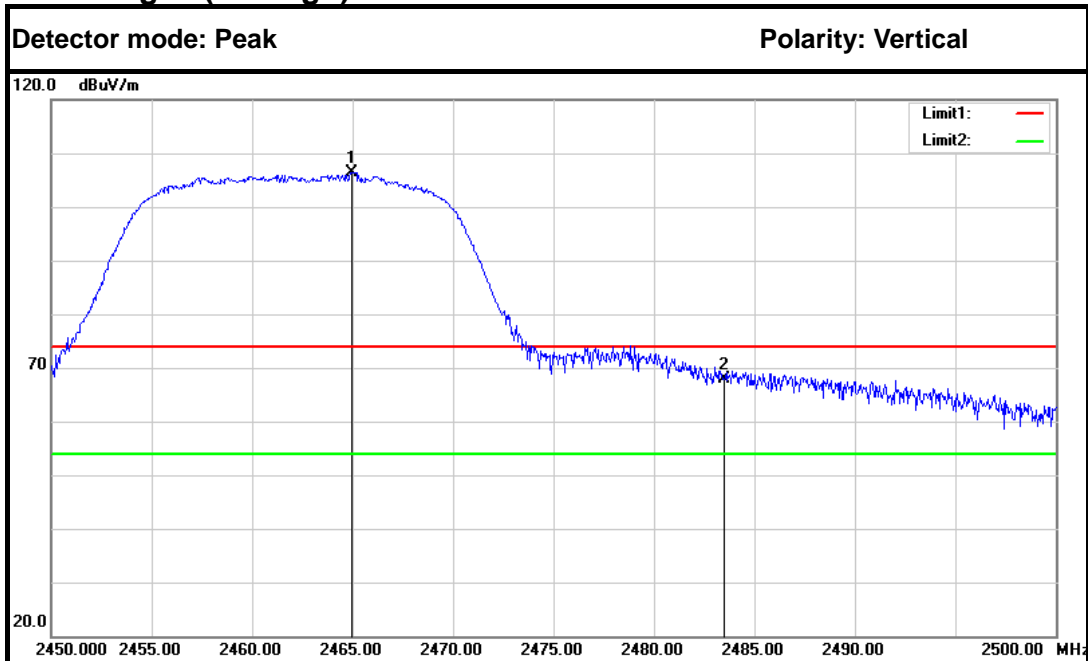
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	64.04	-2.86	61.18	74.00	-12.82	Peak	Vertical
2	2414.880	110.99	-2.73	108.26	---	---	Peak	Vertical
1	2390.000	44.84	-2.86	41.98	54.00	-12.02	Average	Vertical
2	2414.160	97.42	-2.73	94.69	---	---	Average	Vertical



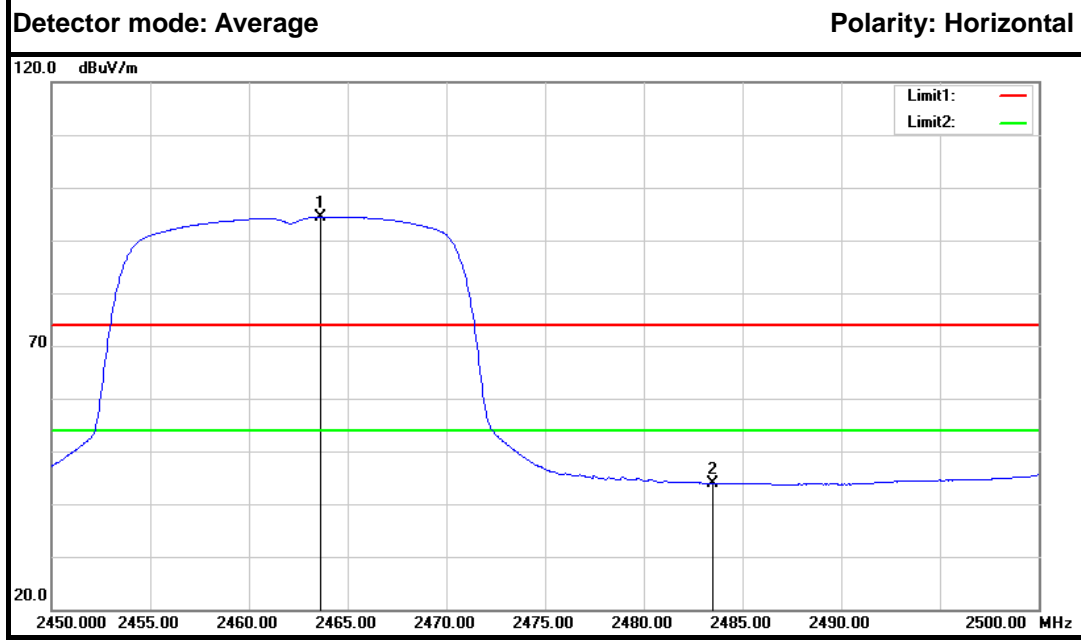
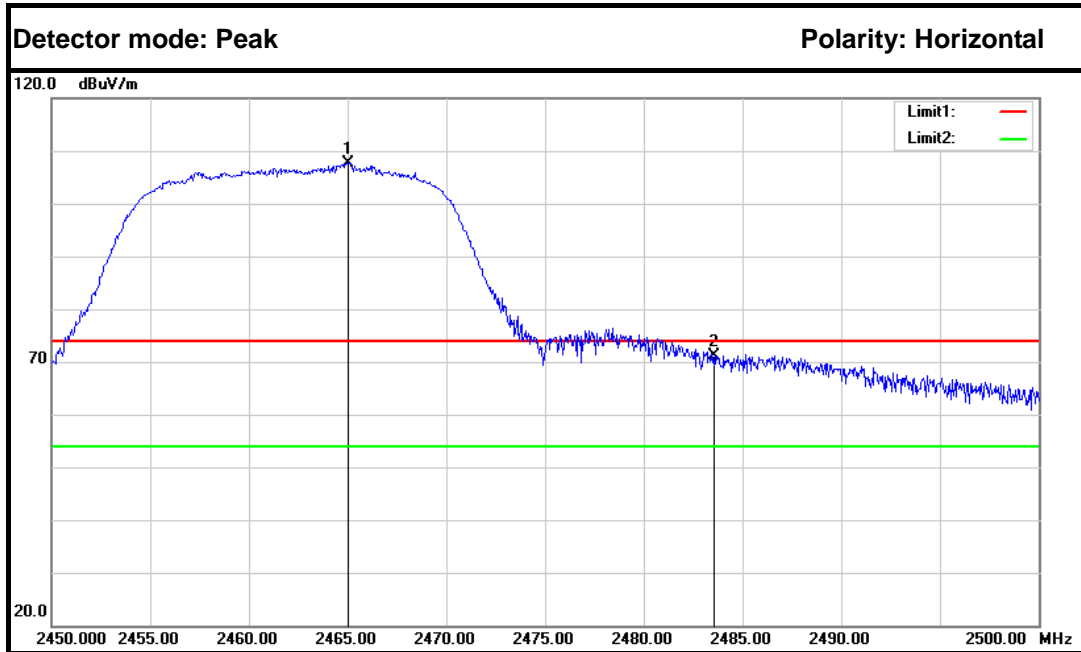
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	65.69	-2.86	62.83	74.00	-11.17	Peak	Horizontal
2	2414.640	110.49	-2.73	107.76	---	---	Peak	Horizontal
1	2390.000	46.15	-2.86	43.29	54.00	-10.71	Average	Horizontal
2	2410.680	98.33	-2.75	95.58	---	---	Average	Horizontal



Band Edges (CH High)



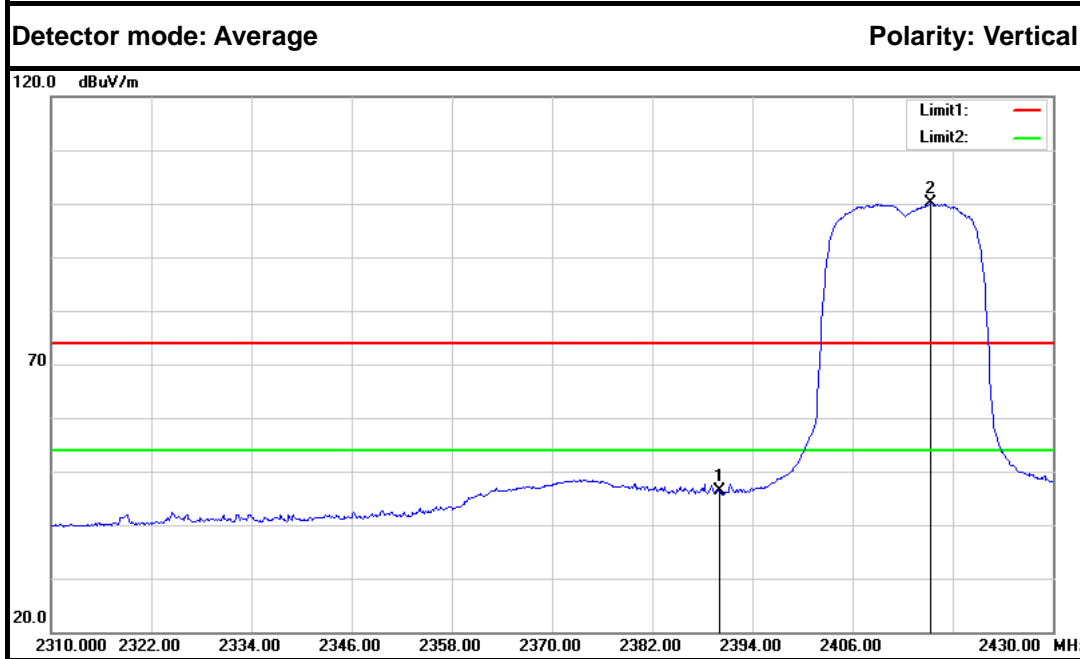
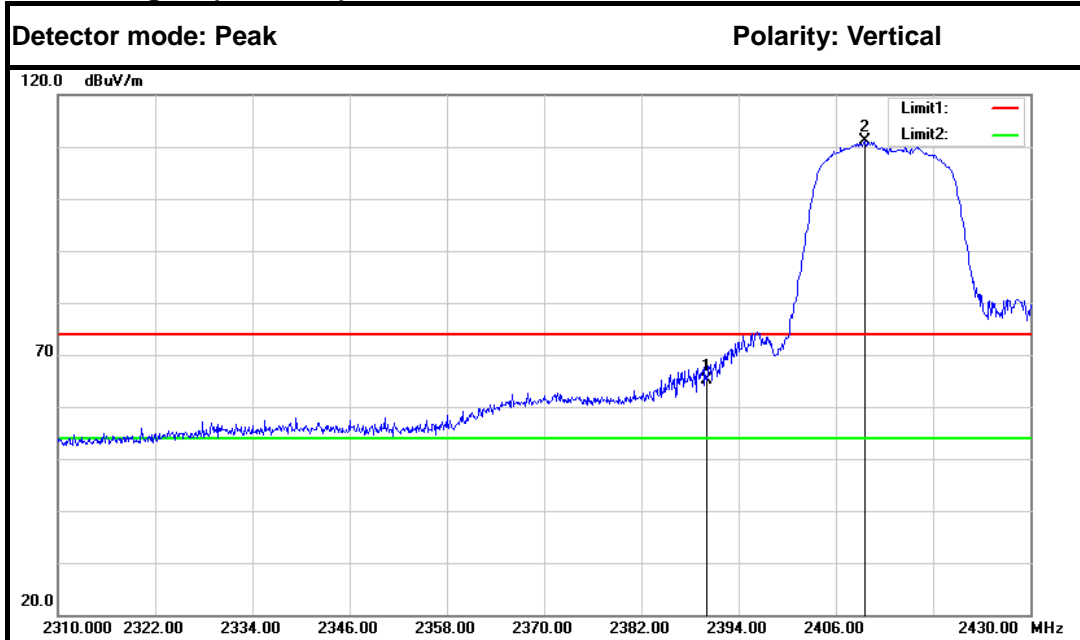
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2464.950	108.93	-2.45	106.48	---	---	Peak	Vertical
2	2483.500	70.25	-2.35	67.90	74.00	-6.10	Peak	Vertical
1	2460.650	95.97	-2.48	93.49	---	---	Average	Vertical
2	2483.500	45.18	-2.35	42.83	54.00	-11.17	Average	Vertical



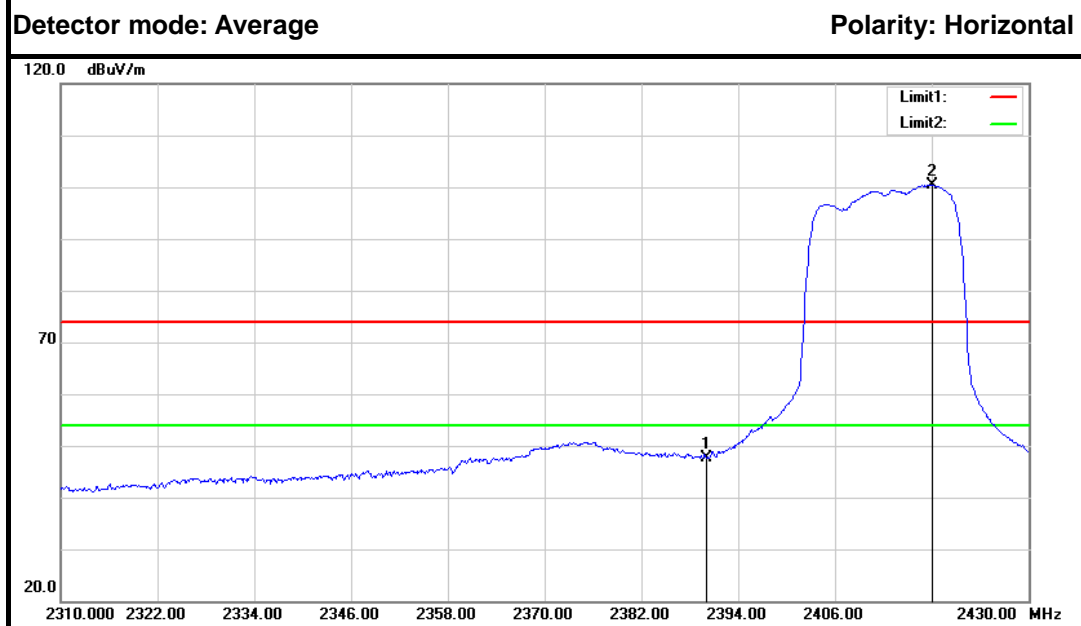
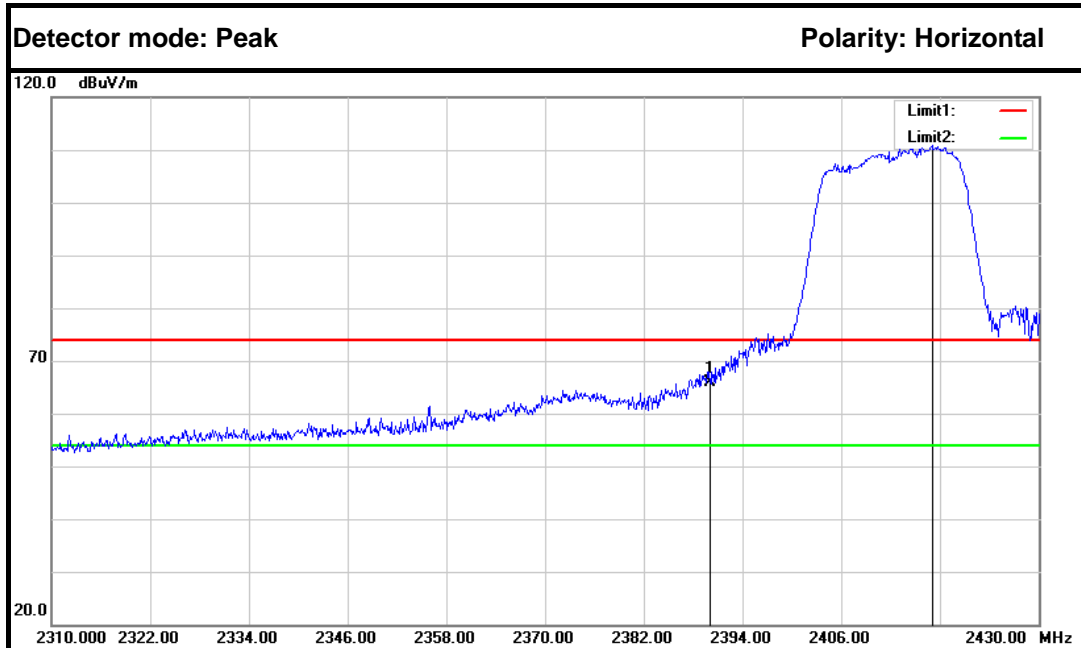
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2465.000	110.18	-2.45	107.73	---	---	Peak	Horizontal
2	2483.580	73.50	-2.35	71.15	74.00	-2.85	Peak	Horizontal
1	2463.600	96.92	-2.46	94.46	---	---	Average	Horizontal
2	2483.500	46.26	-2.35	43.91	54.00	-10.09	Average	Horizontal



IEEE 802.11n HT20 MHz mode (Combine with Antenna 0 and Antenna 1)
Band Edges (CH Low)



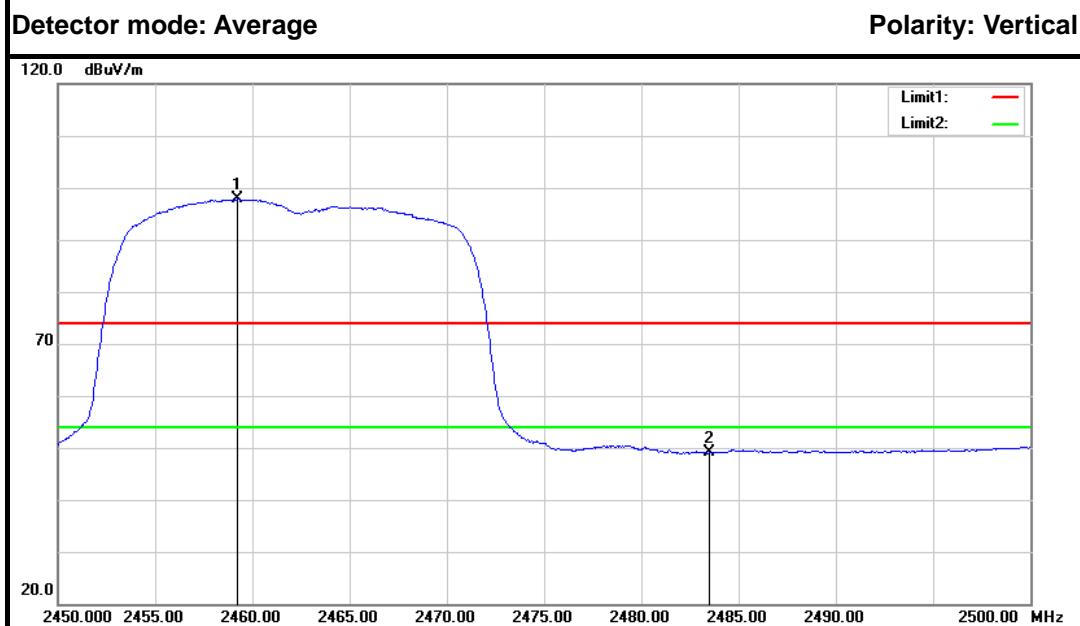
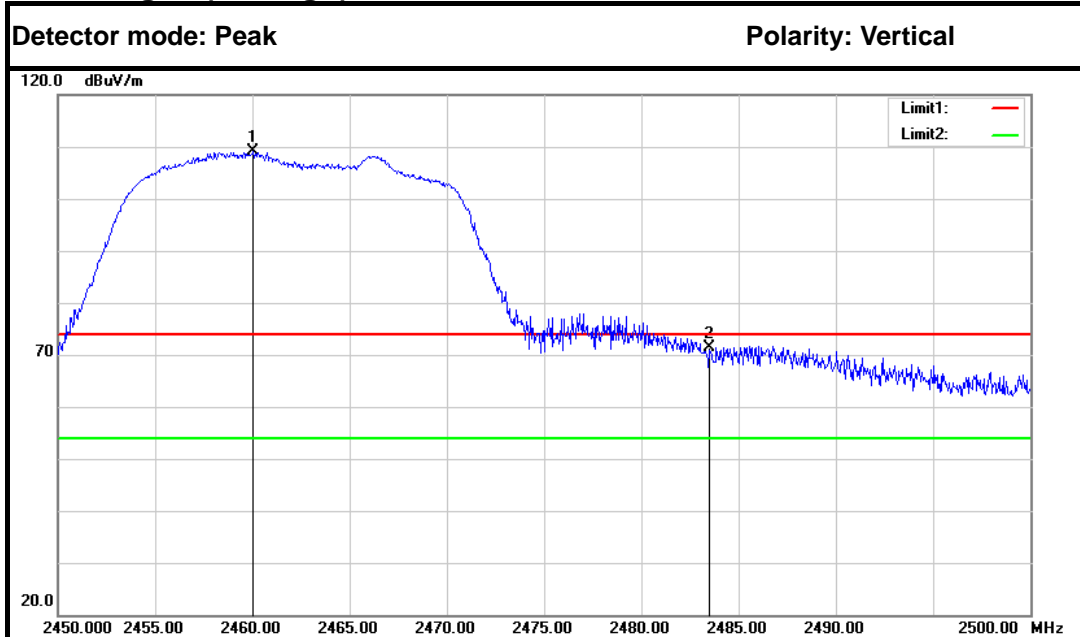
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	67.97	-2.86	65.11	74.00	-8.89	Peak	Vertical
2	2409.600	113.91	-2.76	111.15	---	---	Peak	Vertical
1	2390.000	49.17	-2.86	46.31	54.00	-7.69	Average	Vertical
2	2415.360	102.76	-2.72	100.04	---	---	Average	Vertical



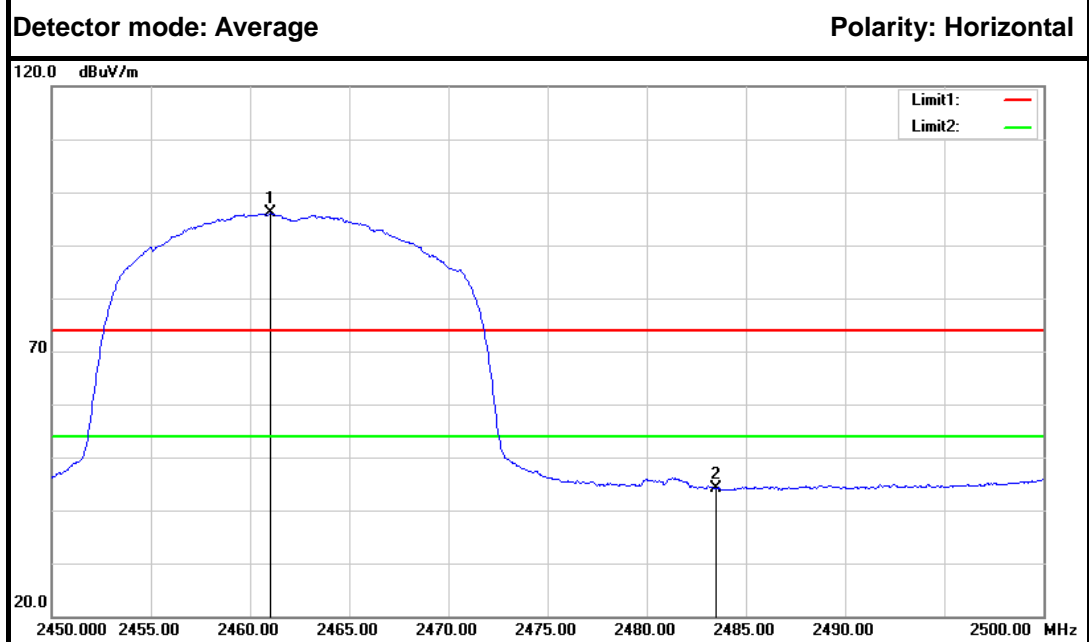
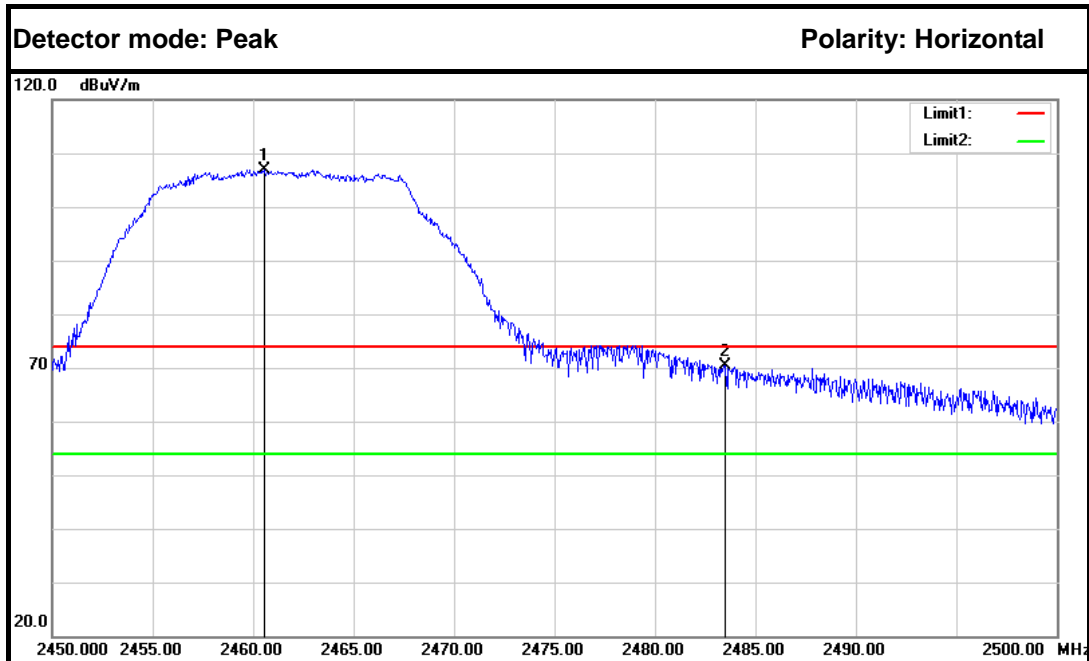
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	68.71	-2.86	65.85	74.00	-8.15	Peak	Horizontal
2	2417.040	113.53	-2.71	110.82	---	---	Peak	Horizontal
1	2390.000	50.61	-2.86	47.75	54.00	-6.25	Average	Horizontal
2	2418.120	103.17	-2.71	100.46	---	---	Average	Horizontal



Band Edges (CH High)



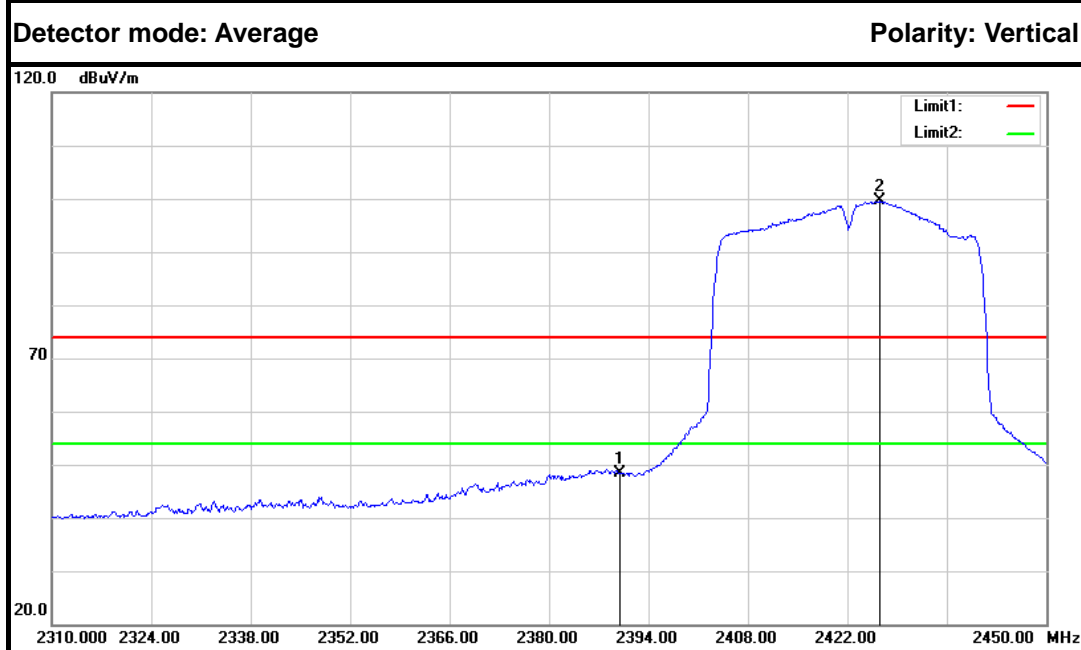
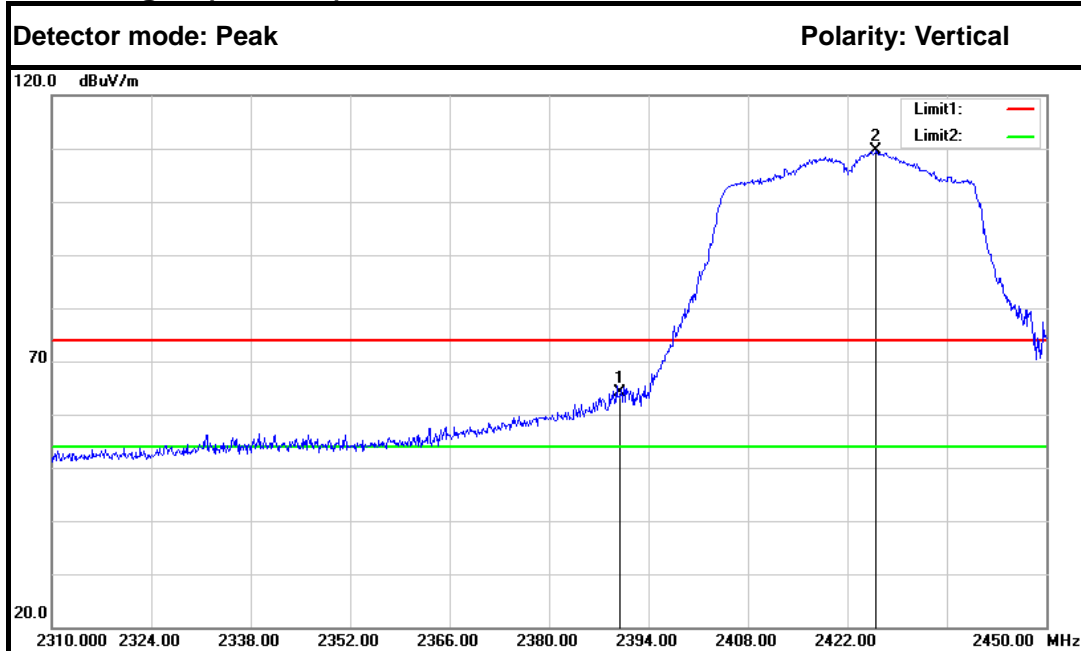
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2460.050	111.51	-2.48	109.03	---	---	Peak	Vertical
2	2483.500	73.77	-2.35	71.42	74.00	-2.58	Peak	Vertical
1	2459.250	100.27	-2.48	97.79	---	---	Average	Vertical
2	2483.500	51.36	-2.35	49.01	54.00	-4.99	Average	Vertical



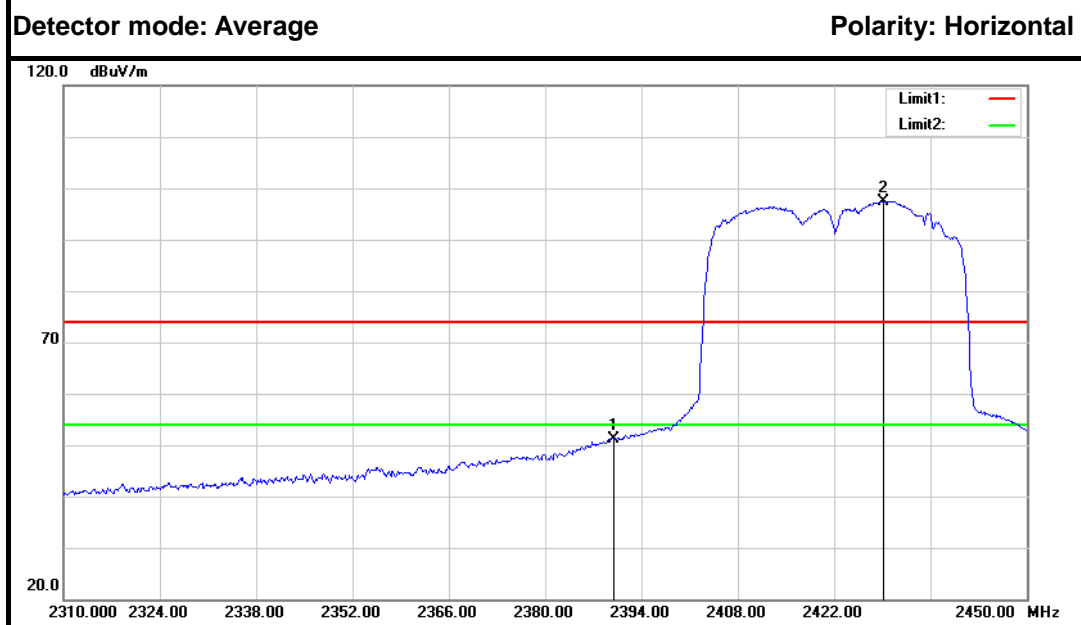
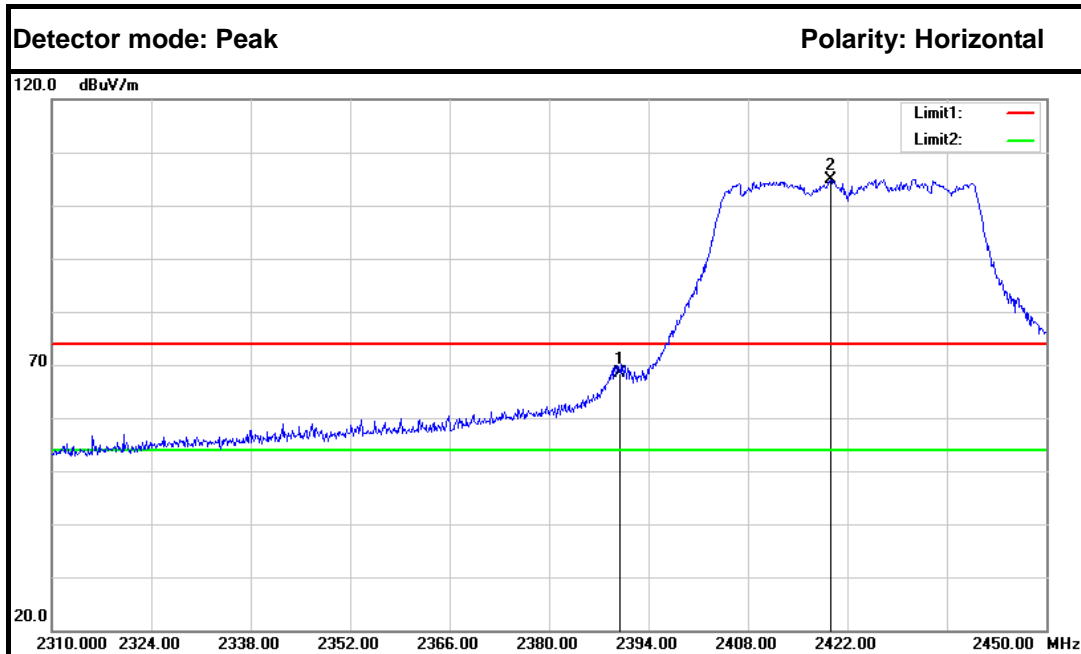
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2460.550	109.37	-2.48	106.89	---	---	Peak	Horizontal
2	2483.500	72.66	-2.35	70.31	74.00	-3.69	Peak	Horizontal
1	2461.000	98.48	-2.47	96.01	---	---	Average	Horizontal
2	2483.500	46.58	-2.35	44.23	54.00	-9.77	Average	Horizontal



IEEE 802.11n HT40 MHz mode (Combine with Antenna 0 and Antenna 1)
Band Edges (CH Low)



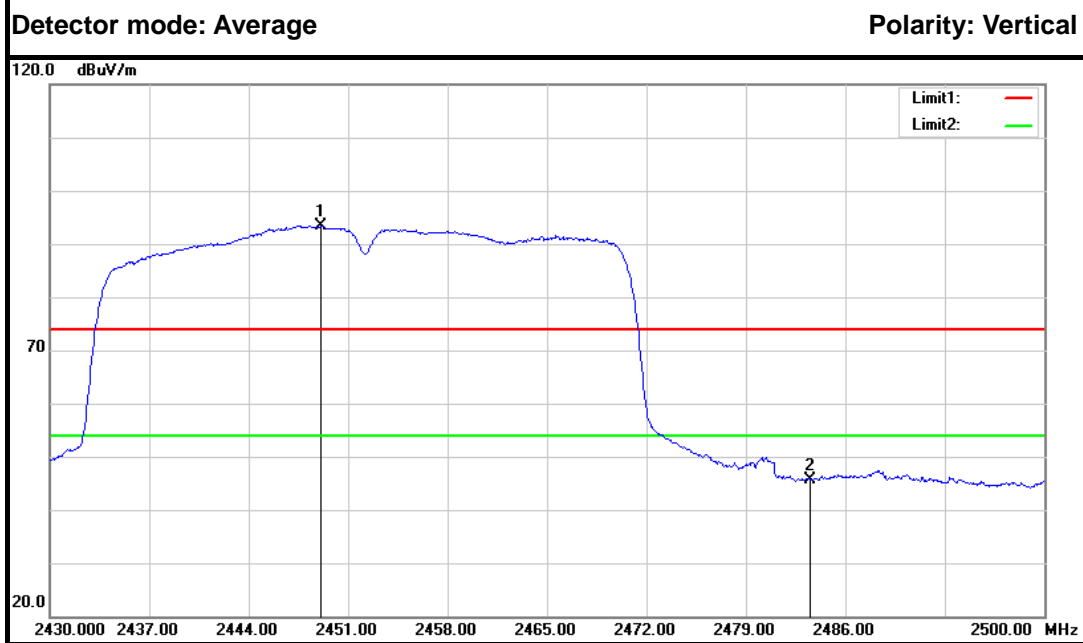
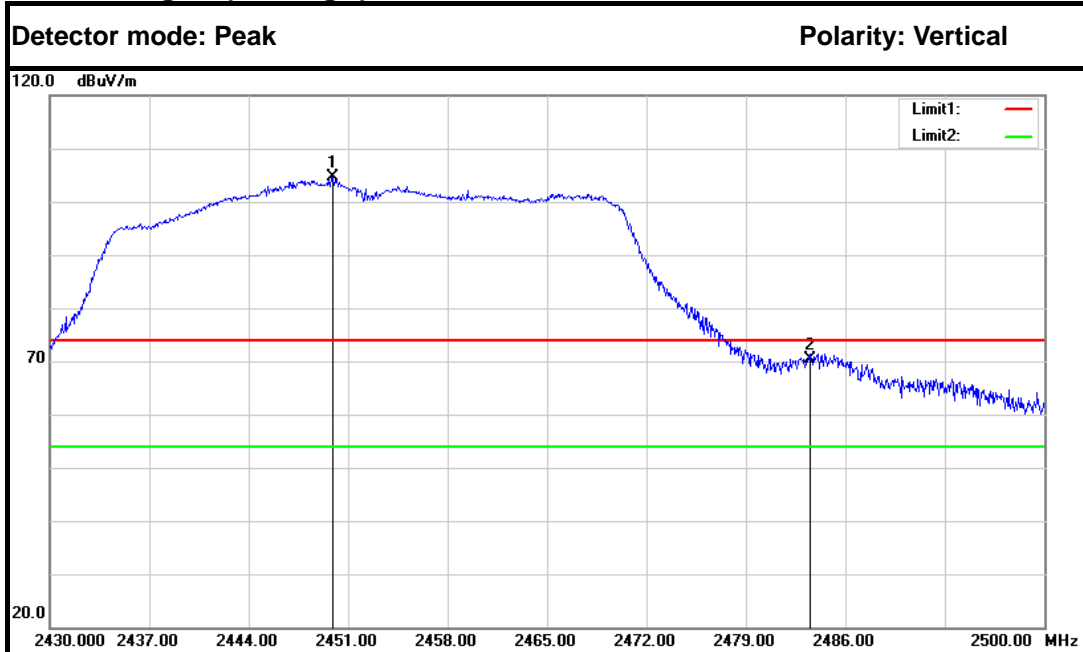
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	66.91	-2.86	64.05	74.00	-9.95	Peak	Vertical
2	2426.060	112.30	-2.67	109.63	---	---	Peak	Vertical
1	2390.000	51.34	-2.86	48.48	54.00	-5.52	Average	Vertical
2	2426.620	102.25	-2.66	99.59	---	---	Average	Vertical



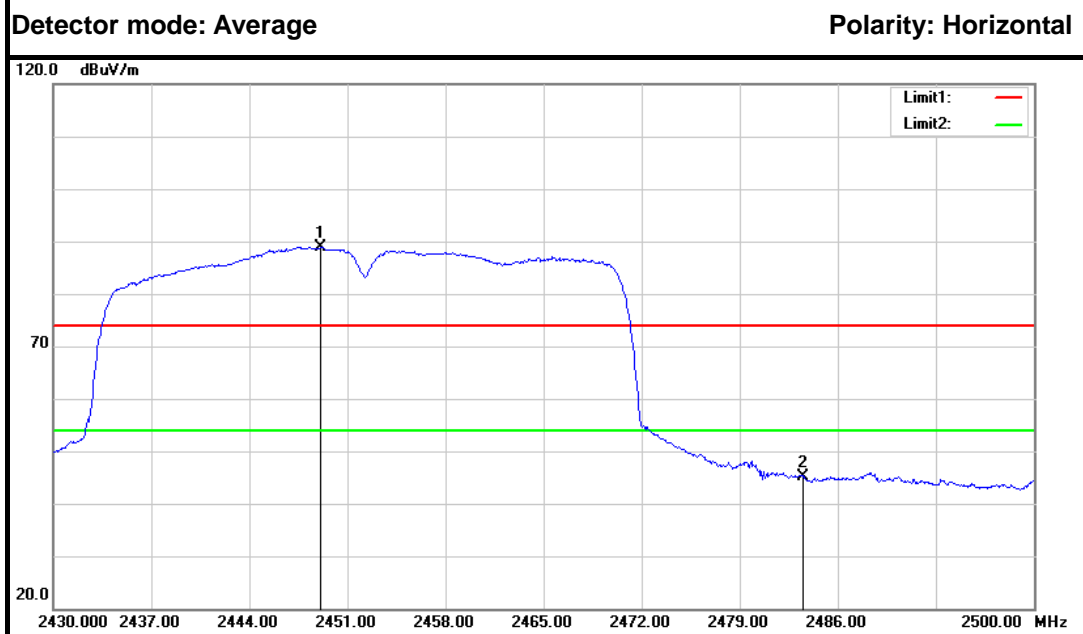
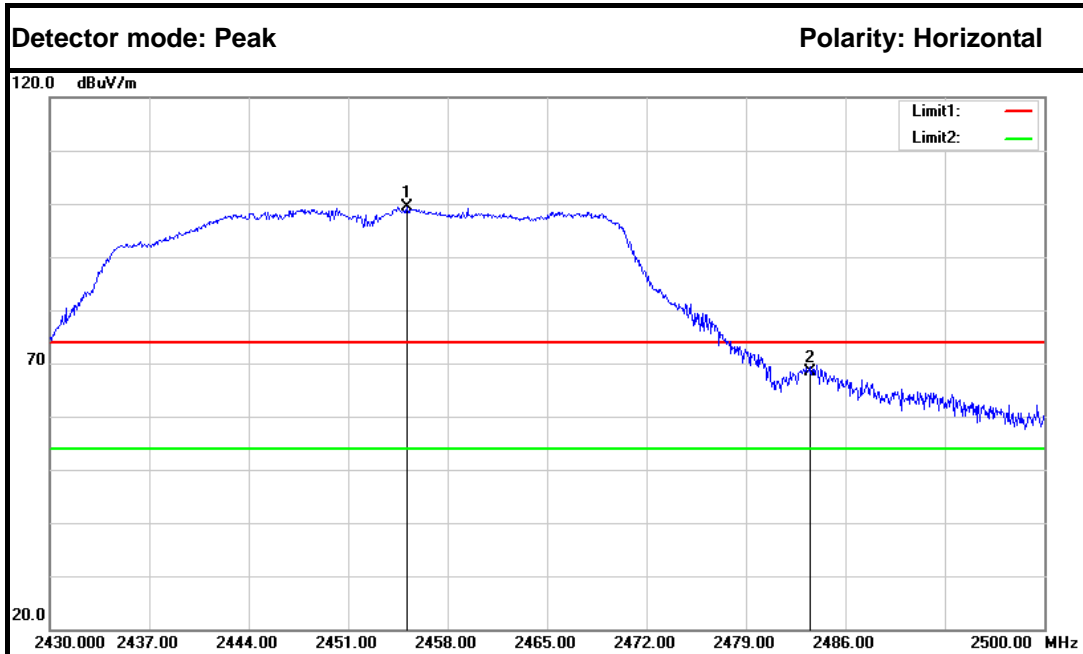
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2390.000	71.12	-2.86	68.26	74.00	-5.74	Peak	Horizontal
2	2419.620	107.65	-2.70	104.95	---	---	Peak	Horizontal
1	2390.000	53.91	-2.86	51.05	54.00	-2.95	Average	Horizontal
2	2429.140	100.15	-2.65	97.50	---	---	Average	Horizontal



Band Edges (CH High)



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2449.880	107.21	-2.53	104.68	---	---	Peak	Vertical
2	2483.500	72.66	-2.35	70.31	74.00	-3.69	Peak	Vertical
1	2449.110	95.88	-2.54	93.34	---	---	Average	Vertical
2	2483.500	47.97	-2.35	45.62	54.00	-8.38	Average	Vertical



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	2455.130	102.01	-2.51	99.50	---	---	Peak	Horizontal
2	2483.500	70.66	-2.35	68.31	74.00	-5.69	Peak	Horizontal
1	2449.110	91.38	-2.54	88.84	---	---	Average	Horizontal
2	2483.500	47.47	-2.35	45.12	54.00	-8.88	Average	Horizontal



7.7. PEAK POWER SPECTRAL DENSITY MEASUREMENT

7.7.1. LIMITS

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

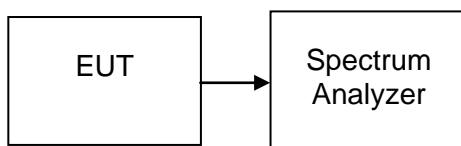
7.7.2. TEST PROCEDURES (please refer to measurement standard)

§15.247(e) specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission. The same method as used to determine the conducted output power shall be used to determine the power spectral density (i.e., if peak-detected fundamental power was measured then use the peak PSD procedure and if average fundamental power was measured then use the average PSD procedure).

10.2 Method PKPSD (peak PSD)

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.

7.7.3. TEST SETUP





7.7.4. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm)		Limit (dBm)	Test Result
		Antenna 0	Antenna 1		
Low	2412	-4.261	-5.009	8	PASS
Mid	2437	-5.261	-4.528		PASS
High	2462	-5.297	-4.716		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)		Limit (dBm)	Test Result
		Antenna 0	Antenna 1		
Low	2412	-10.061	-11.308	8	PASS
Mid	2437	-9.845	-10.495		PASS
High	2462	-12.754	-12.421		PASS

Test mode: IEEE 802.11n HT20 MHz (Combine with Antenna 0 and Antenna 1)

Channel	Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Test Result
		Antenna 0	Antenna 1	Total		
Low	2412	-10.279	-11.811	-7.967	8	PASS
Mid	2437	-10.989	-10.779	-7.872		PASS
High	2462	-15.770	-15.700	-12.725		PASS

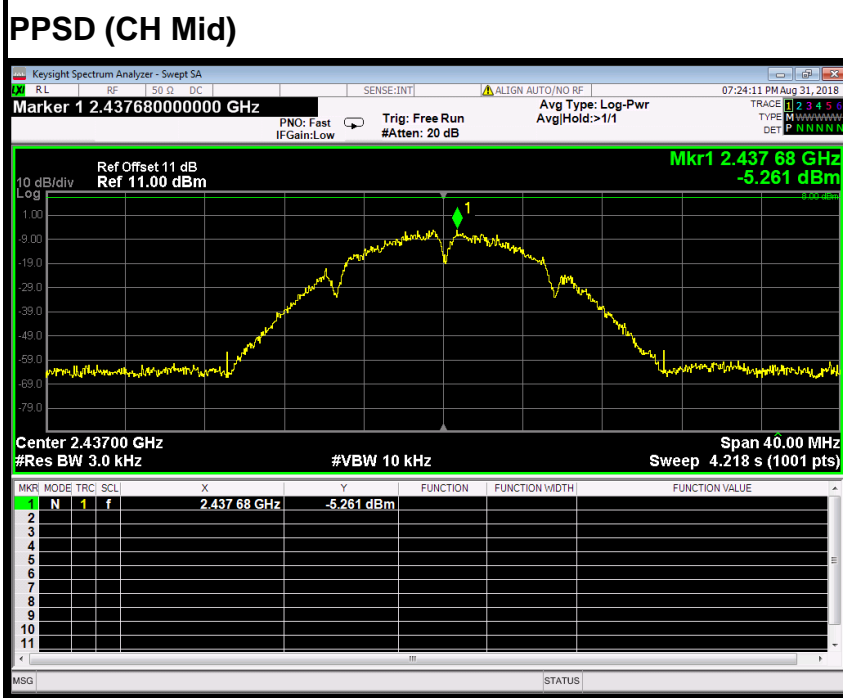
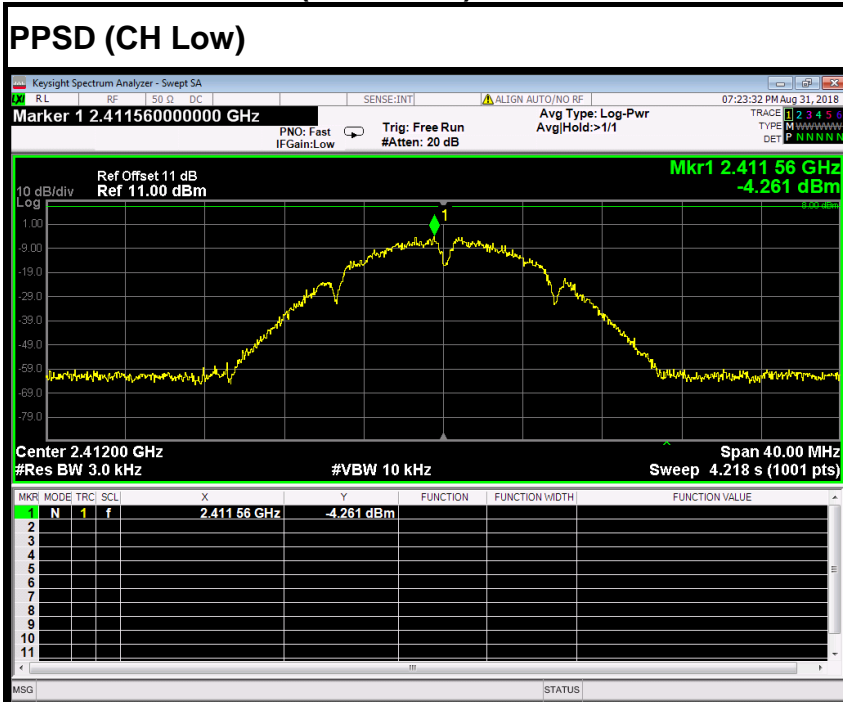
Test mode: IEEE 802.11n HT40 MHz (Combine with Antenna 0 and Antenna 1)

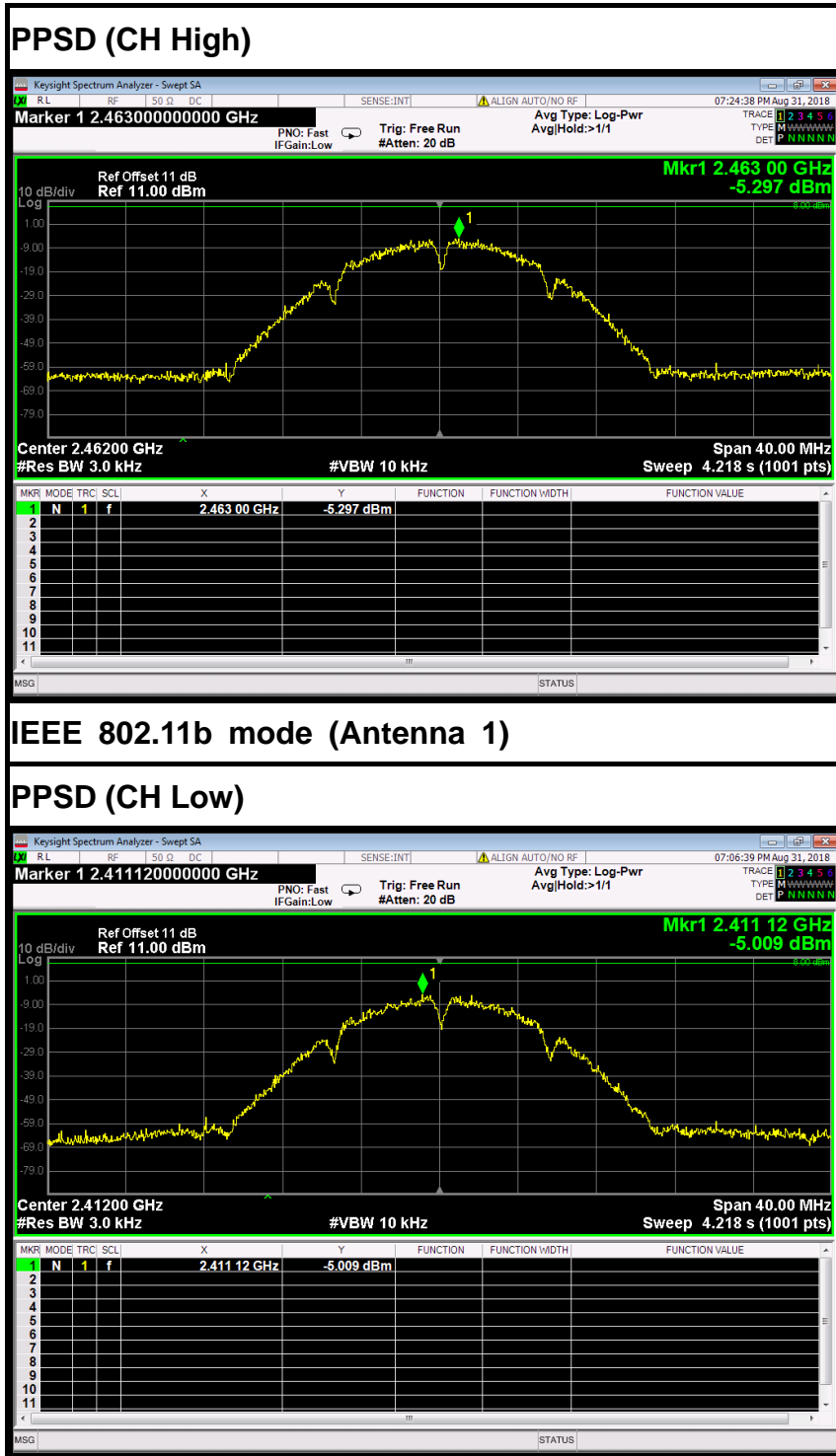
Channel	Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Test Result
		Antenna 0	Antenna 1	Total		
Low	2422	-12.769	-14.145	-10.392	8	PASS
Mid	2437	-13.998	-13.800	-10.888		PASS
High	2452	-18.784	-18.468	-15.613		PASS

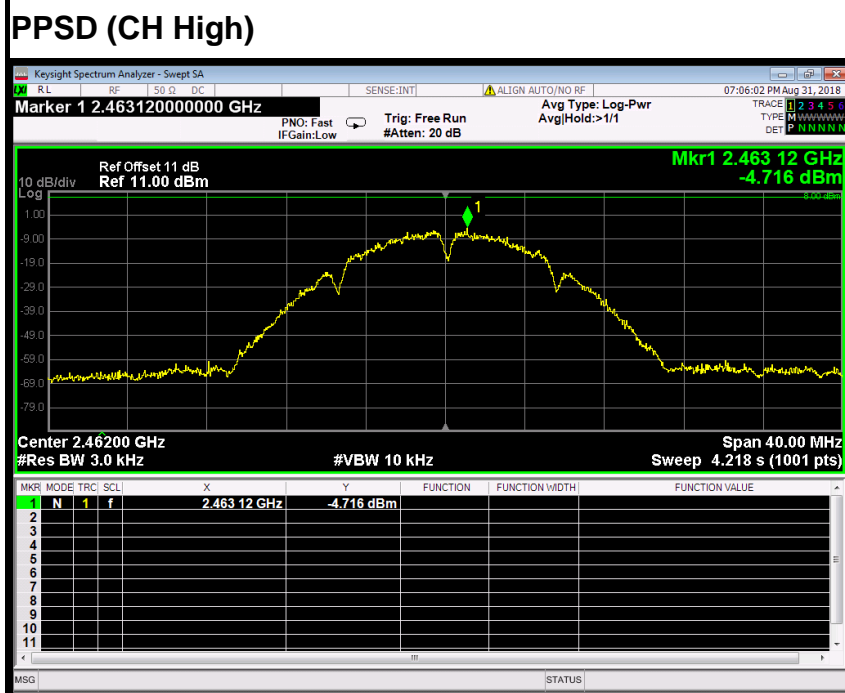
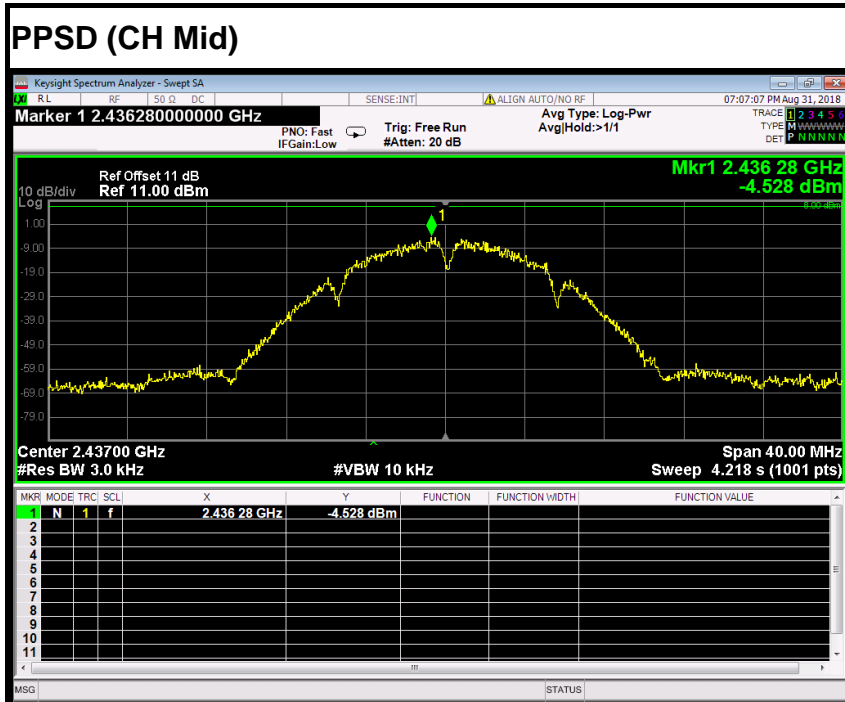


Test Plot

IEEE 802.11b mode (Antenna 0)



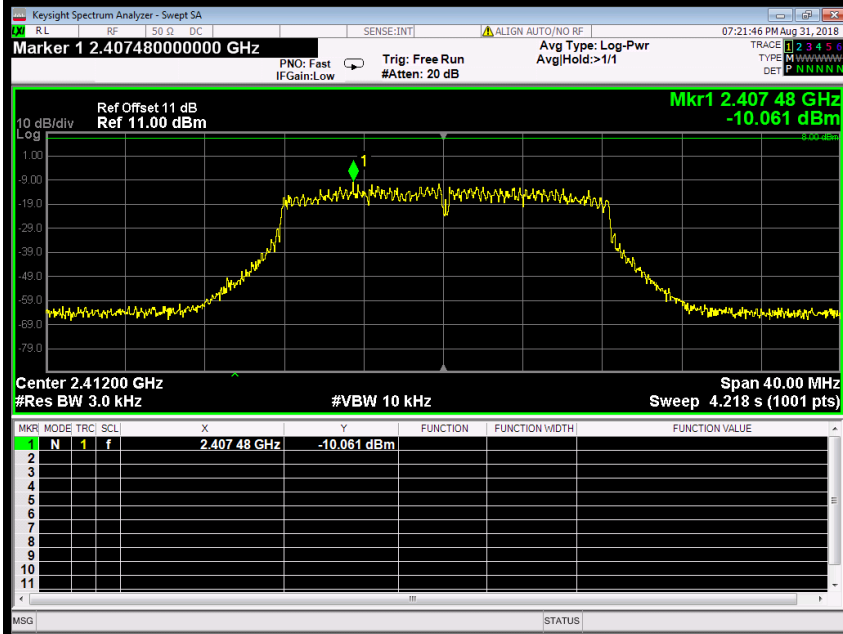




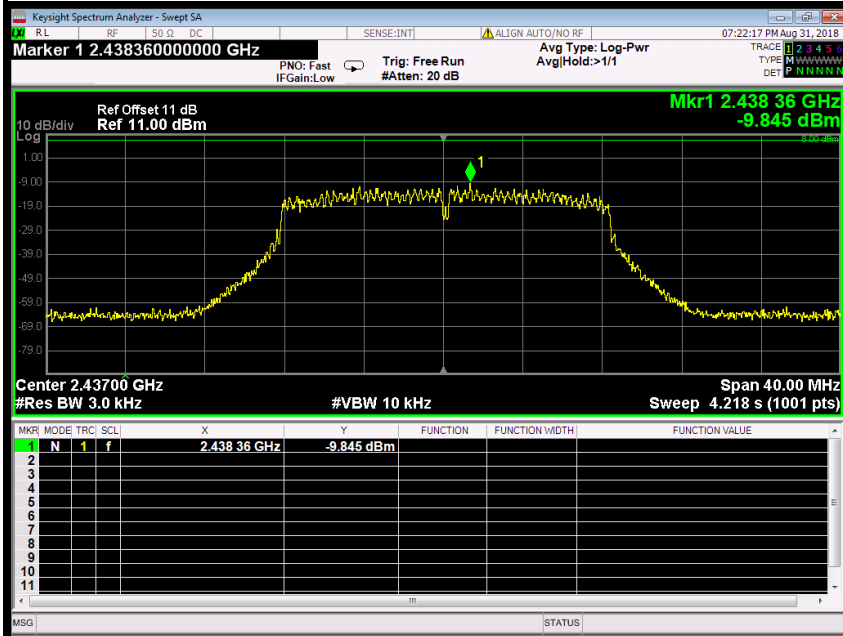


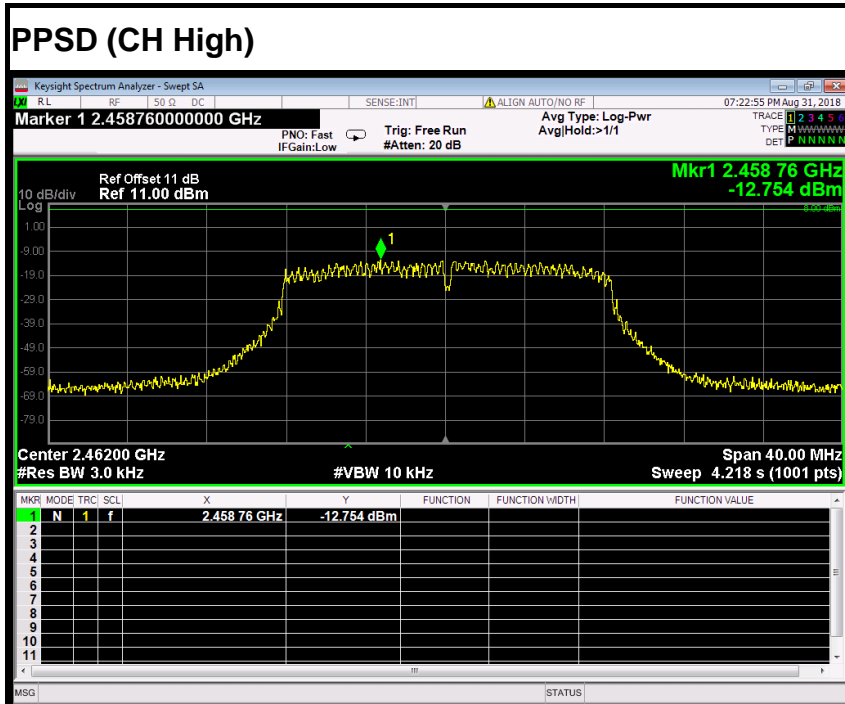
IEEE 802.11g mode (Antenna 0)

PPSD (CH Low)

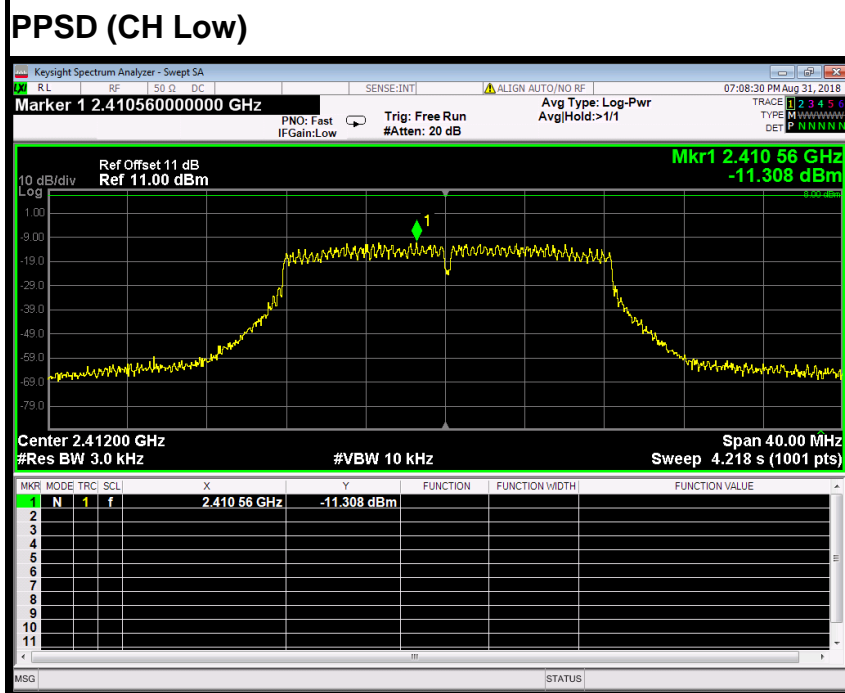


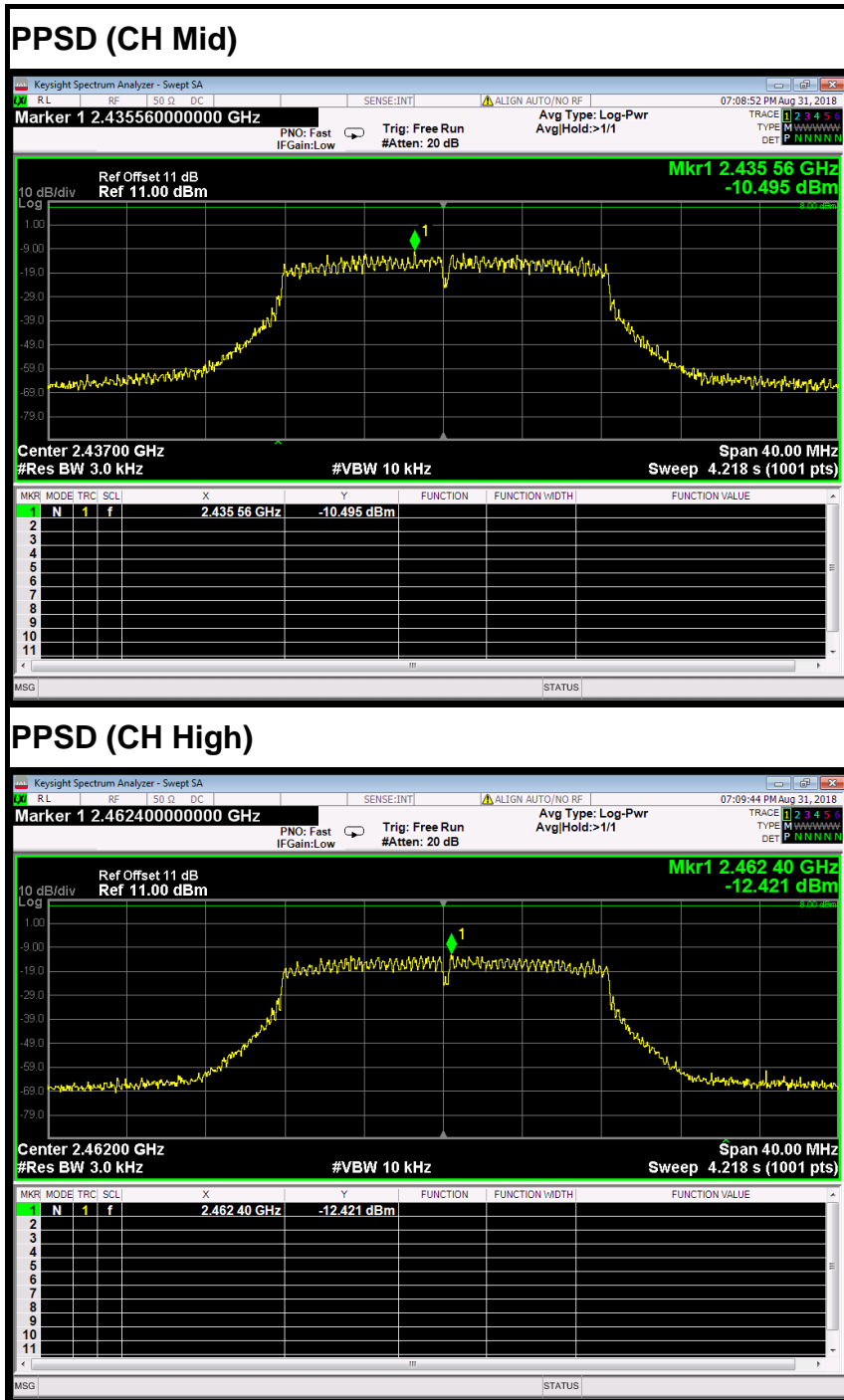
PPSD (CH Mid)





IEEE 802.11g mode (Antenna 1)

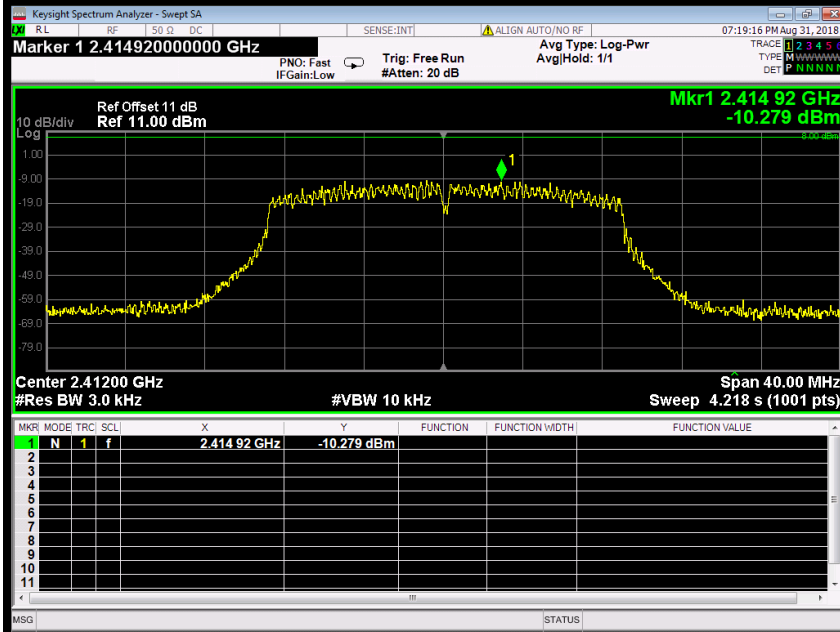




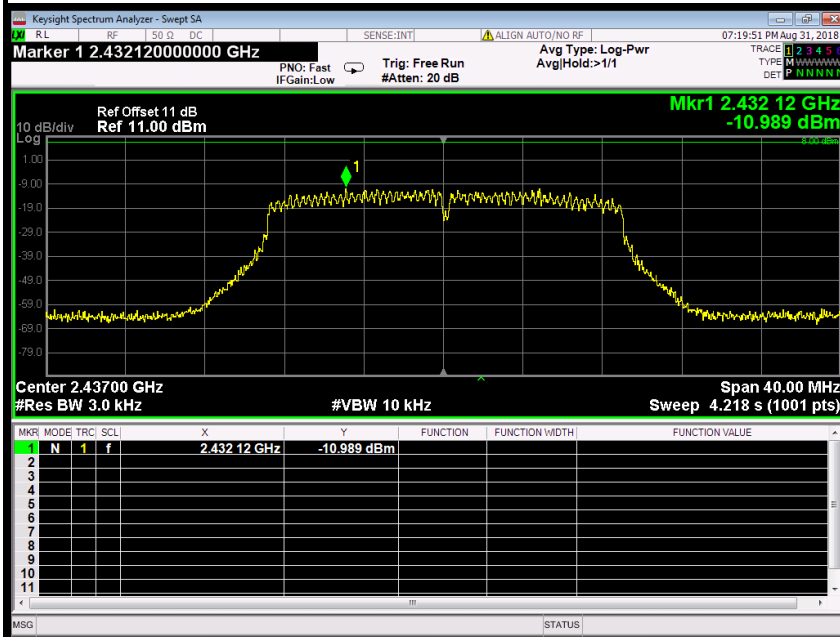


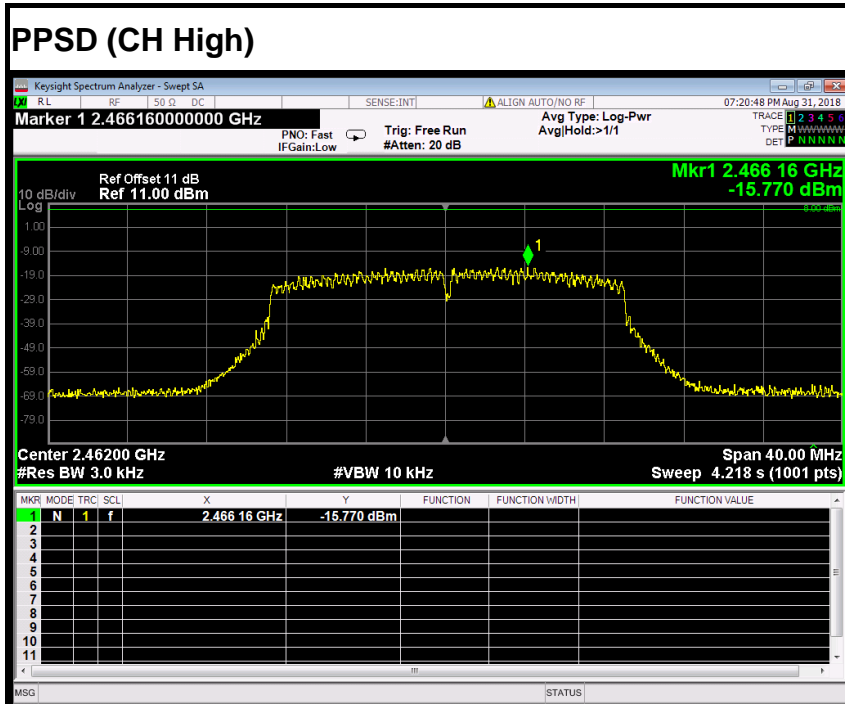
IEEE 802.11n HT20 MHz mode (Antenna 0)

PPSD (CH Low)

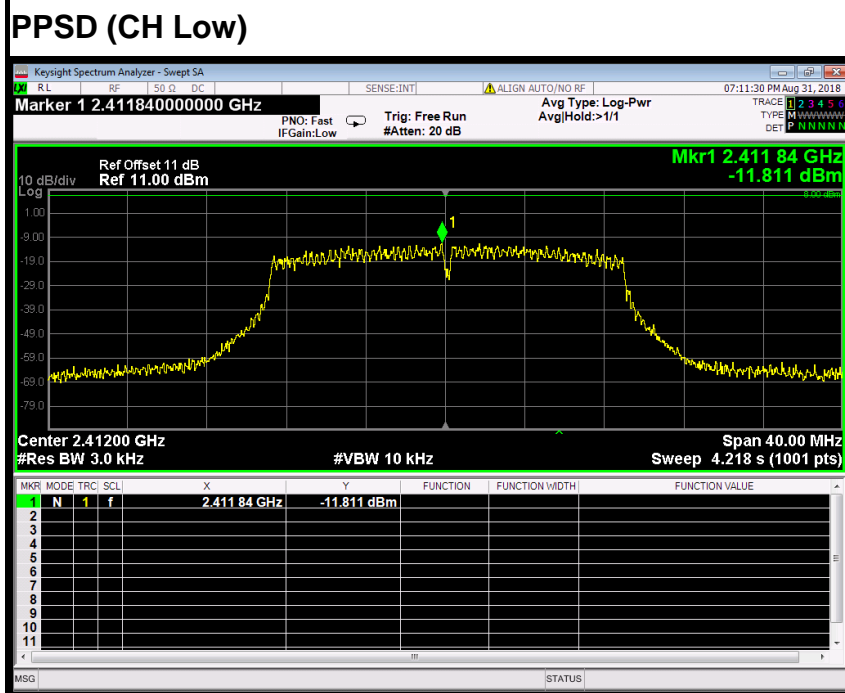


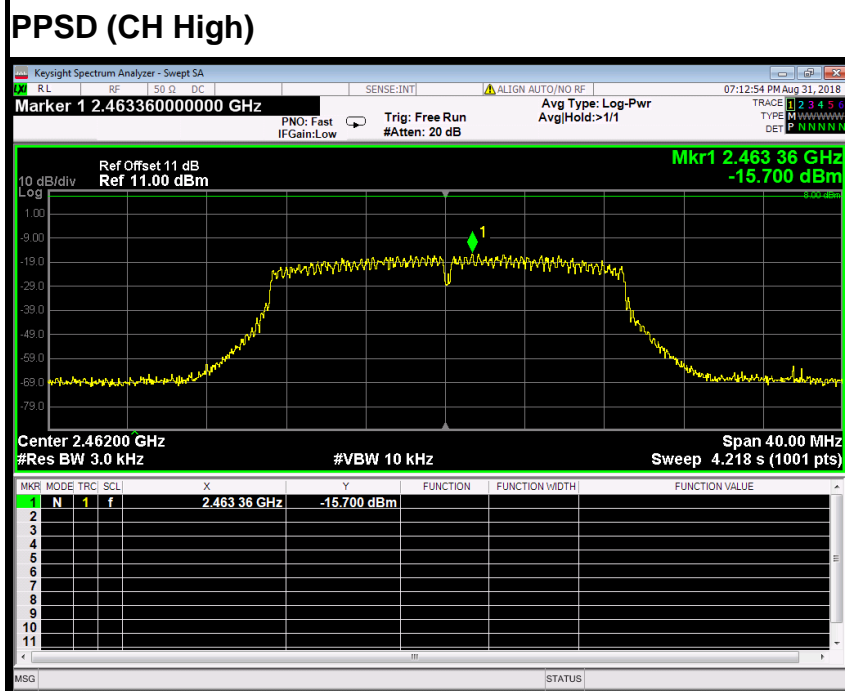
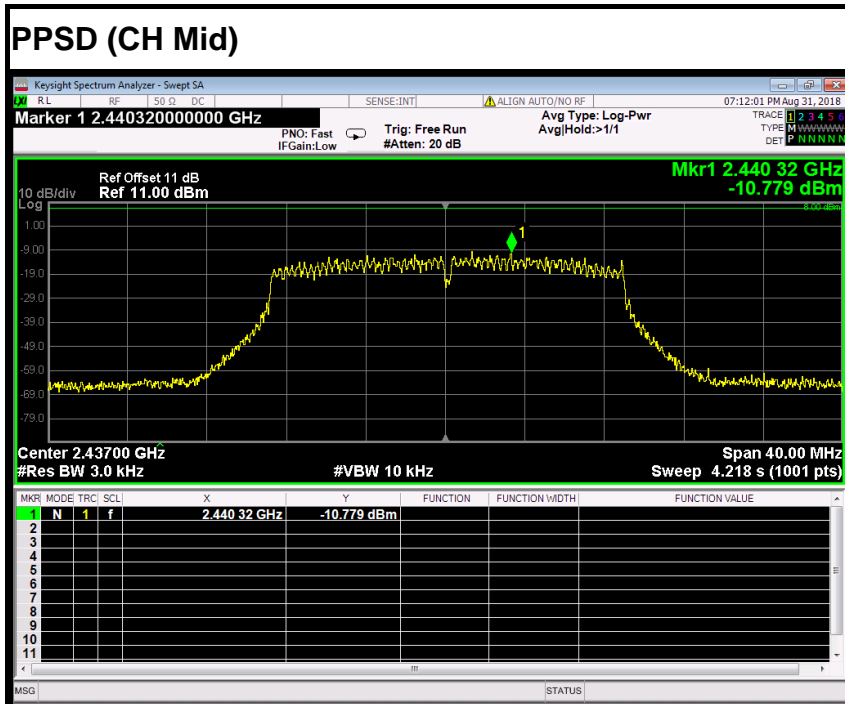
PPSD (CH Mid)





IEEE 802.11n HT20 MHz mode (Antenna 1)

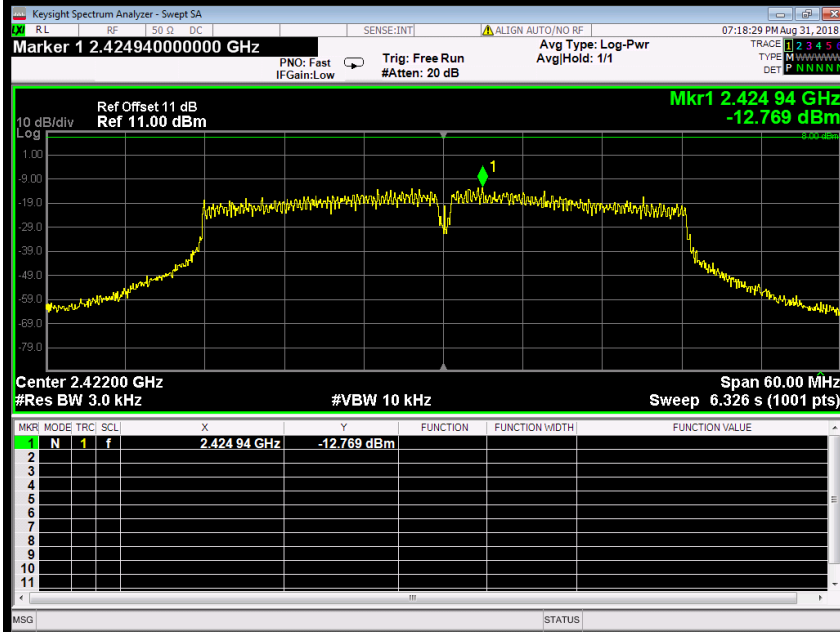




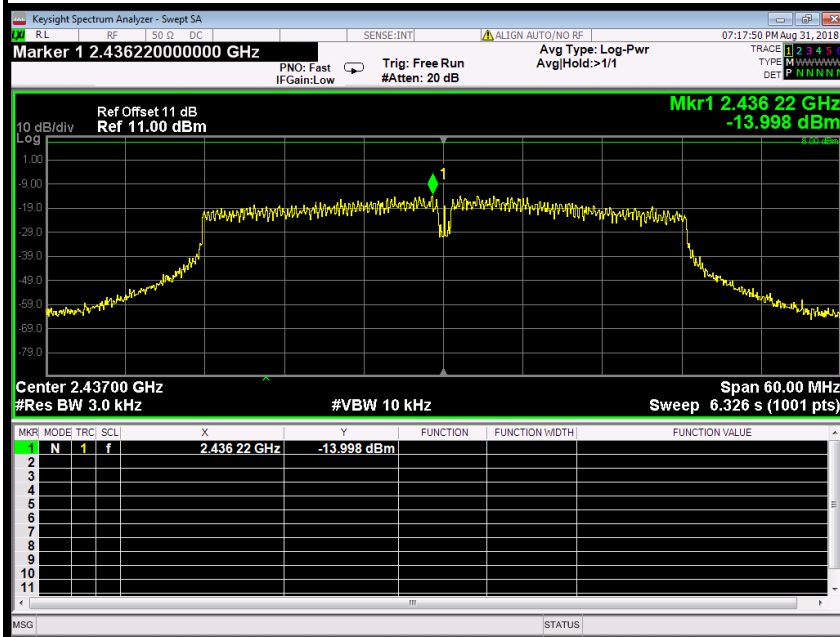


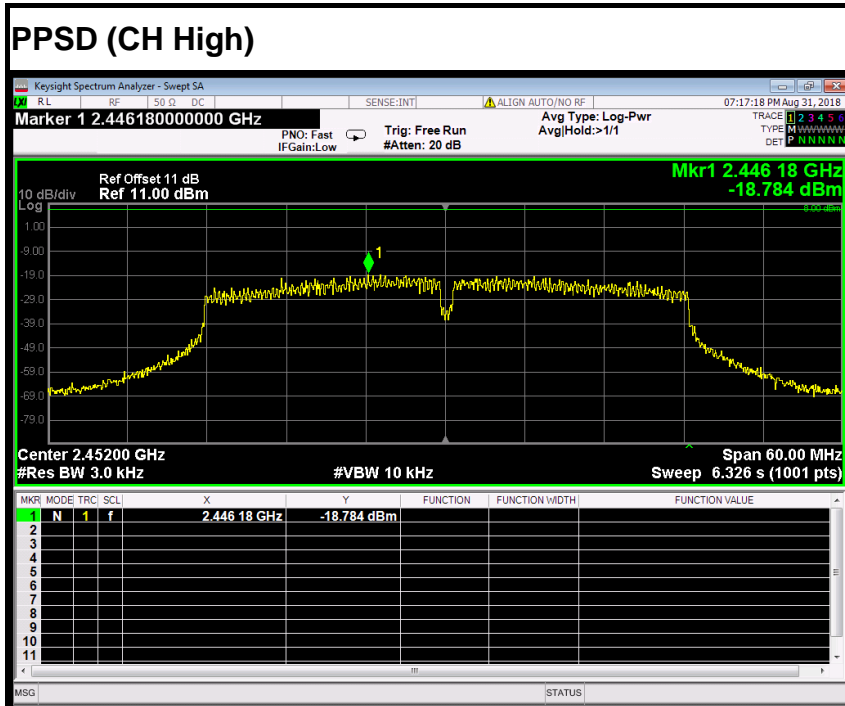
IEEE 802.11n HT40 MHz mode (Antenna 0)

PPSD (CH Low)



PPSD (CH Mid)





IEEE 802.11n HT40 MHz mode (Antenna 1)

