

FCC TEST REPORT

FCC ID:2AWIZHL4GMV2

Report Number..... : ZKT-221215L9440-01

Date of Test..... : Dec. 12, 2022 -- Dec. 19, 2022

Date of issue..... : Dec. 19, 2022

Total number of pages..... : 113

Test Result..... : PASS

Testing Laboratory..... : **Shenzhen ZKT Technology Co., Ltd.**

Address : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name : FIBRAIN sp. z o.o.

Address : Poland, Zaczernie 190F, 36-062

Manufacturer's name : FIBRAIN sp. z o.o.

Address : Poland, Zaczernie 190F, 36-062

Test specification:

Standard..... : FCC CFR Title 47 Part 15 Subpart C Section 15.247

Test procedure..... : ANSI C63.10:2013
KDB558074 D0115.247 Meas Guidance v 05r02

Non-standard test method : N/A

Test Report Form No..... : TRF-EL-110_V0

Test Report Form(s) Originator..... : ZKT Testing

Master TRF : Dated: 2020-01-06

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Product name..... : GPON ONT

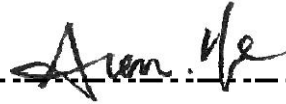
Trademark : /

Model/Type reference..... : HL-4GMV2/HL-4GMV3

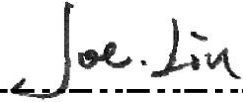
Ratings..... : DC 12V Adapter

Testing procedure and testing location:**Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.**Address.....: 1/F, No. 101, Building B, No. 6, Tangwei Community
Industrial Avenue, Fuhai Street, Bao'an District,
Shenzhen, China

Tested by (name + signature).....: Alen He



Reviewer (name + signature).....: Joe Liu



Approved (name + signature).....: Lake Xie



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1. VERSION

Report No.	Version	Description	Approved
ZKT-221215L9440-01	Rev.01	Initial issue of report	Dec. 19, 2022

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Result	Remark
FCC part 15.203/15.247 (c)	Antenna requirement	PASS	
FCC part 15.207	AC Power Line Conducted Emission	PASS	
FCC part 15.247 (b)(3)	Conducted Peak Output Power	PASS	
FCC part 15.247 (a)(2)	Channel Bandwidth& 99% OCB	PASS	
FCC part 15.247 (e)	Power Spectral Density	PASS	
FCC part 15.247(d)	Band Edge	PASS	
FCC part 15.205/15.209	Spurious Emission	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225

Designation Number: CN1299

IC Registered No.: 27033

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 % .

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power conducted	$\pm 0.16\text{dB}$
3	Spurious emissions conducted	$\pm 0.21\text{dB}$
4	All emissions radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	GPON ONT
Model No.:	HL-4GMV2
Serial No.:	HL-4GMV3
Model difference:	Their electrical circuit design, layout, components used and internal wiring are identical, Only the color will be different ,so the name will be different. Test sample model: HL-4GMV2
Hardware Version:	V1.0
Software Version:	V1.0
Sample(s) Status:	Engineer sample
Frequency range:	802.11b/802.11g /802.11n(HT20): 2412MHz -2462MHz 802.11n(HT40): 2422MHz -2452MHz
Channel numbers:	802.11b/802.11g /802.11n(HT20):11 802.11n(HT40):7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum(DSSS) 802.11g/802.11n(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing(OFDM)
Antenna Type:	FPC Antenna
Antenna gain:	WIFI ANT1:2dBi; WIFI ANT2:2dBi ; MIMO:5.01dBi
Power supply:	MODEL: GS-P120150E664 INPUT: 100-240V~ 50/60Hz 0.6A OUTPUT: 12V = 1.5A

Operation Frequency each of channel							
Channel	Frequency	Chann el	Frequency	Chann el	Frequency	Chann el	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)
	802.11b/802.11g /802.11n(HT20)

Lowest channel	2412MHz
Middle channel	2437MHz
Highest channel	2462MHz

Test channel	Frequency (MHz)
	802.11n(HT40)
Lowest channel	2422MHz
Middle channel	2437MHz
Highest channel	2452MHz

Worst Case Configuration

Description	MIMO (802.11g)
Antenna	MIMO
Channel	7
Data Rate (Mbps)	MCS7

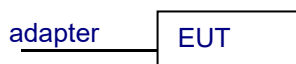
3.2 DESCRIPTION OF TEST MODES

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the duty cycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

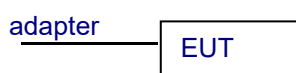
We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:				
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.				
Mode	802.11b	802.11g	802.11n (HT20)	802.11n (HT40)
Data rate	11Mbps	54Mbps	MCS7	MCS7

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission



Radiated Emission



Conducted Spurious



3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	adapter	SHENZHEN GROSUN TECHNOLOGY CO.,LTD	GS-P120150E664	/	SDOC
2					

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

3.5EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	Oct. 18, 2022	Oct. 17, 2023
2	Spectrum Analyzer (1GHz-40GHz)	R&S	FSQ	100363	Oct. 17, 2022	Oct. 16, 2023
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Oct. 18, 2022	Oct. 17, 2023
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	Oct. 17, 2022	Oct. 16, 2023
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	Oct. 17, 2022	Oct. 16, 2023
6	Loop Antenna	TESEQ	HLA6121	58357	Oct. 17, 2022	Oct. 16, 2023
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	060747	Oct. 17, 2022	Oct. 16, 2023
8	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	Oct. 18, 2022	Oct. 17, 2023
9	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Oct. 18, 2022	Oct. 17, 2023
10	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Oct. 18, 2022	Oct. 17, 2023
11	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Oct. 18, 2022	Oct. 17, 2023
12	ESG Signal Generator	Agilent	E4421B	N/A	Oct. 18, 2022	Oct. 17, 2023
13	Signal Generator	Agilent	N5182A	N/A	Oct. 22, 2022	Oct. 21, 2023
14	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	Oct. 17, 2022	Oct. 16, 2023
15	MWRF Power Meter Test system	MW	MW100-RPC B	N/A	Oct. 22, 2022	Oct. 21, 2023
16	Power sensor	KEYSIGHT	U200H	MY51190005	Oct. 22, 2022	Oct. 21, 2023
17	D.C. Power Supply	LongWei	TPR-6405D	N/A	Oct. 22, 2022	Oct. 21, 2023
18	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	\	\
19	RF Software	MW	MTS8310	V2.0.0.0	\	\
20	Turntable	MF	MF-7802BS	N/A	\	\
21	Antenna tower	MF	MF-7802BS	N/A	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Oct. 22, 2022	Oct. 21, 2023
2	LISN	CYBERTEK	EM5040A	E1850400149	Oct. 22, 2022	Oct. 21, 2023
3	Test Cable	N/A	C01	N/A	Oct. 18, 2022	Oct. 17, 2023
4	Test Cable	N/A	C02	N/A	Oct. 18, 2022	Oct. 17, 2023
5	EMI Test Receiver	R&S	ESCI3	101393	Oct. 17, 2022	Oct. 16, 2023
6	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	\	\

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

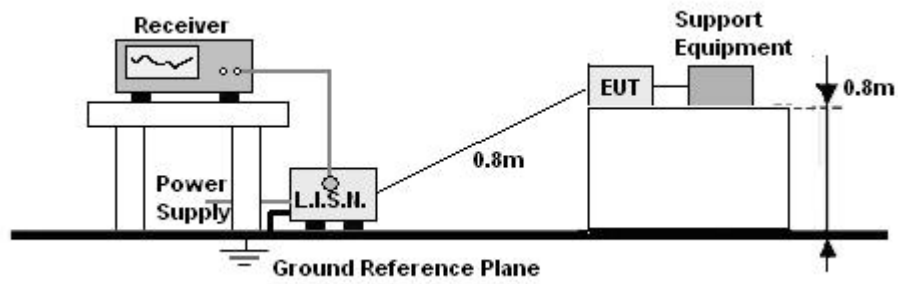
4.1.2 TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.e.
8. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



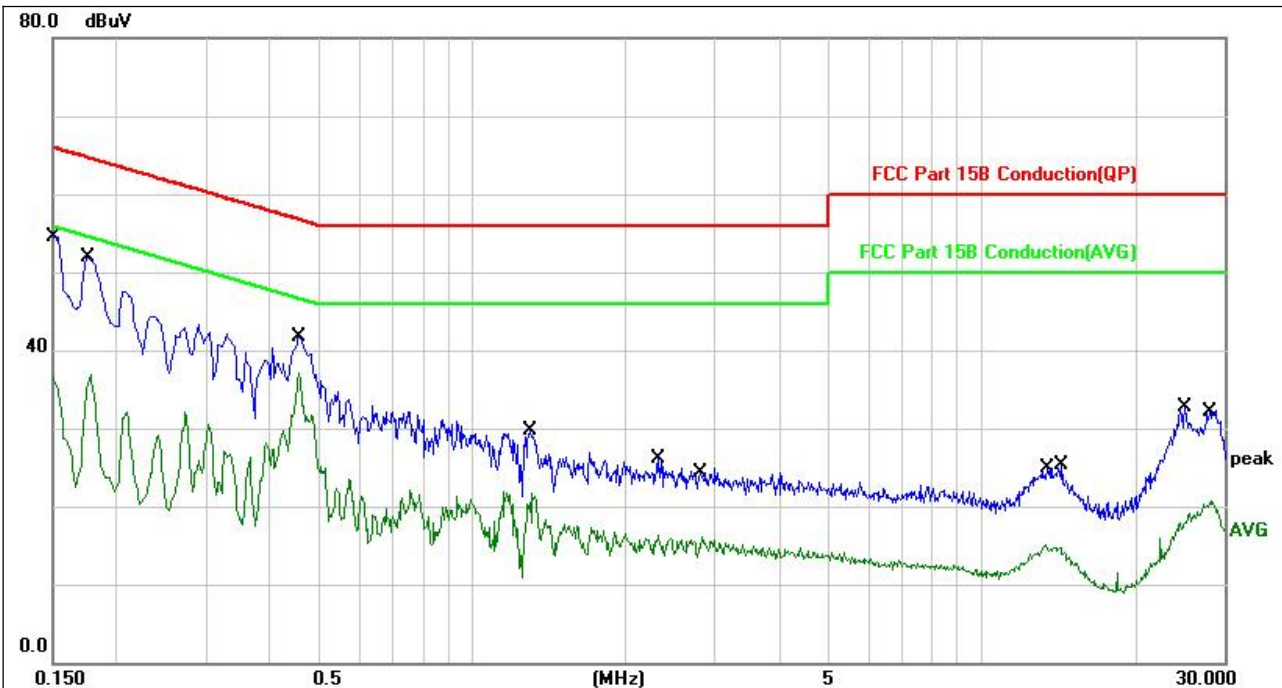
4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

4.1.6 TEST RESULT

Temperature :	26°C	Relative Humidity:	54%
Pressure :	101kPa	Phase	L
Test Voltage :	AC 120V/60Hz	Test Mode	802.11b-Middle channel

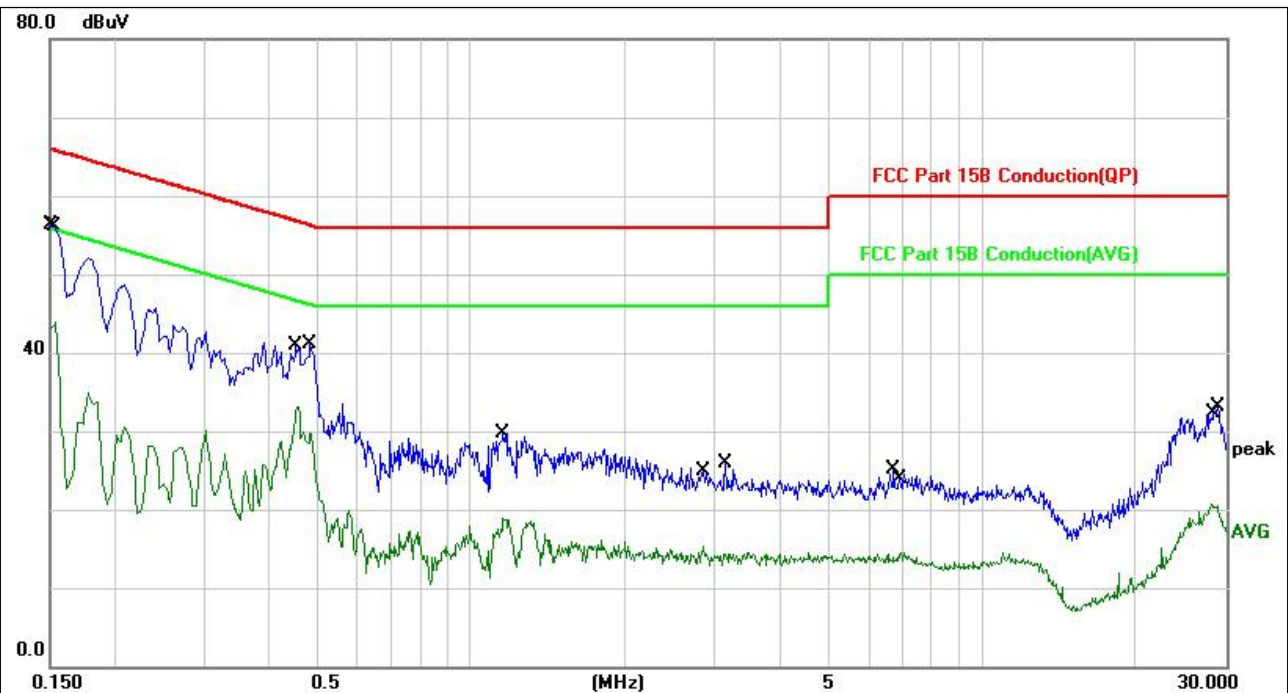


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	44.55	10.05	54.60	65.99	-11.39	QP	
2		0.1780	26.85	10.07	36.92	54.57	-17.65	AVG	
3		0.4580	31.53	10.20	41.73	56.73	-15.00	QP	
4	*	0.4580	26.86	10.20	37.06	46.73	-9.67	AVG	
5		1.2980	19.52	10.13	29.65	56.00	-26.35	QP	
6		1.3140	11.57	10.13	21.70	46.00	-24.30	AVG	
7		2.3140	16.08	10.01	26.09	56.00	-29.91	QP	
8		2.8260	6.19	9.94	16.13	46.00	-29.87	AVG	
9		13.3660	5.19	9.97	15.16	50.00	-34.84	AVG	
10		14.4140	15.37	9.92	25.29	60.00	-34.71	QP	
11		25.1460	23.05	9.73	32.78	60.00	-27.22	QP	
12		28.2820	10.88	9.79	20.67	50.00	-29.33	AVG	

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor
4. The test data shows only the worst case

Temperature :	26°C	Relative Humidity:	54%
Pressure :	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode	802.11b-Middle channel



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	46.19	10.05	56.24	65.99	-9.75	QP	
2		0.1539	33.76	10.05	43.81	55.78	-11.97	AVG	
3		0.4580	22.98	10.20	33.18	46.73	-13.55	AVG	
4		0.4860	30.82	10.20	41.02	56.24	-15.22	QP	
5		1.1539	19.59	10.15	29.74	56.00	-26.26	QP	
6		1.1539	8.70	10.15	18.85	46.00	-27.15	AVG	
7		2.8540	5.36	9.93	15.29	46.00	-30.71	AVG	
8		3.1460	16.00	9.85	25.85	56.00	-30.15	QP	
9		6.7060	15.24	9.89	25.13	60.00	-34.87	QP	
10		6.9220	4.60	9.87	14.47	50.00	-35.53	AVG	
11		28.1020	10.88	9.79	20.67	50.00	-29.33	AVG	
12		28.8340	23.25	9.78	33.03	60.00	-26.97	QP	

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor
4. The test data shows only the worst case

4.2 RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average

4.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of variable-height antenna tower.

- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- g. Different from above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change from table 0.8 metre to 1.5 metre (Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

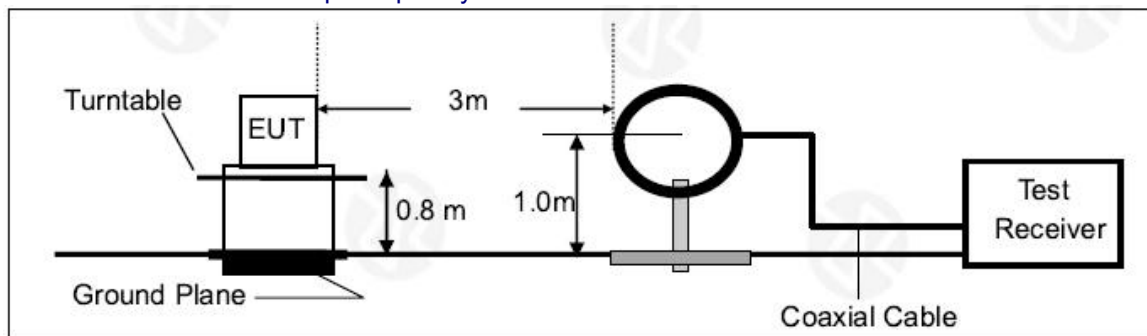
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

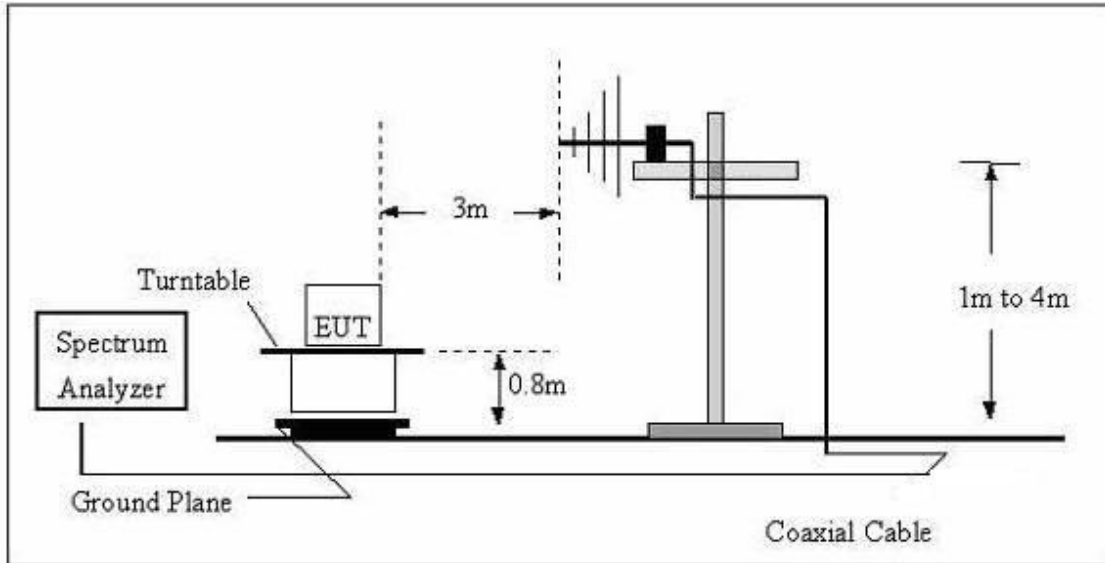
No deviation

4.2.4 TEST SETUP

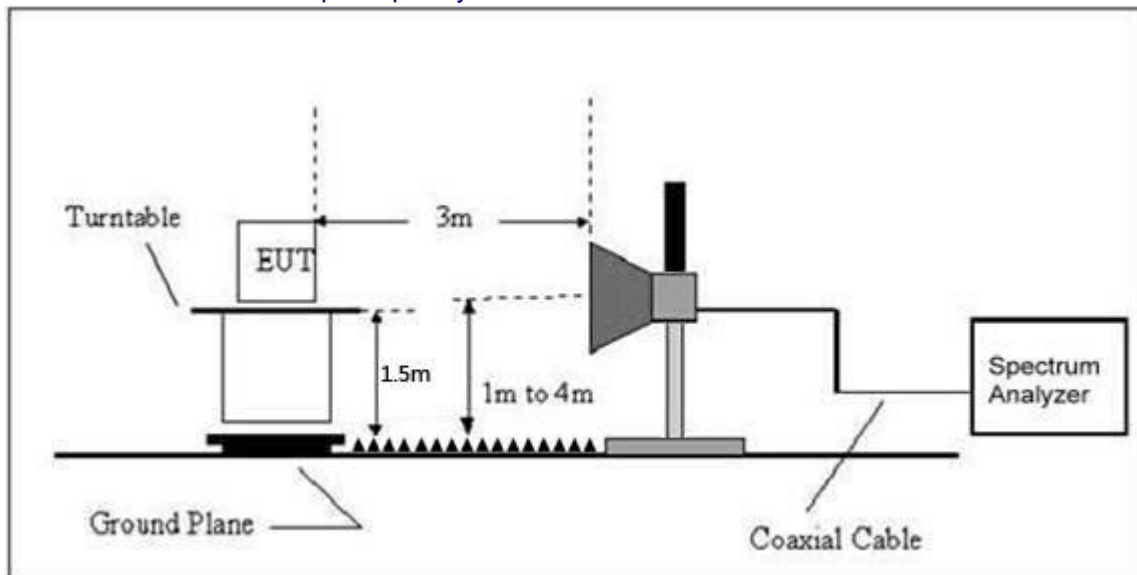
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 EUT OPERATING 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.

4.2.6 TEST RESULTS

Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

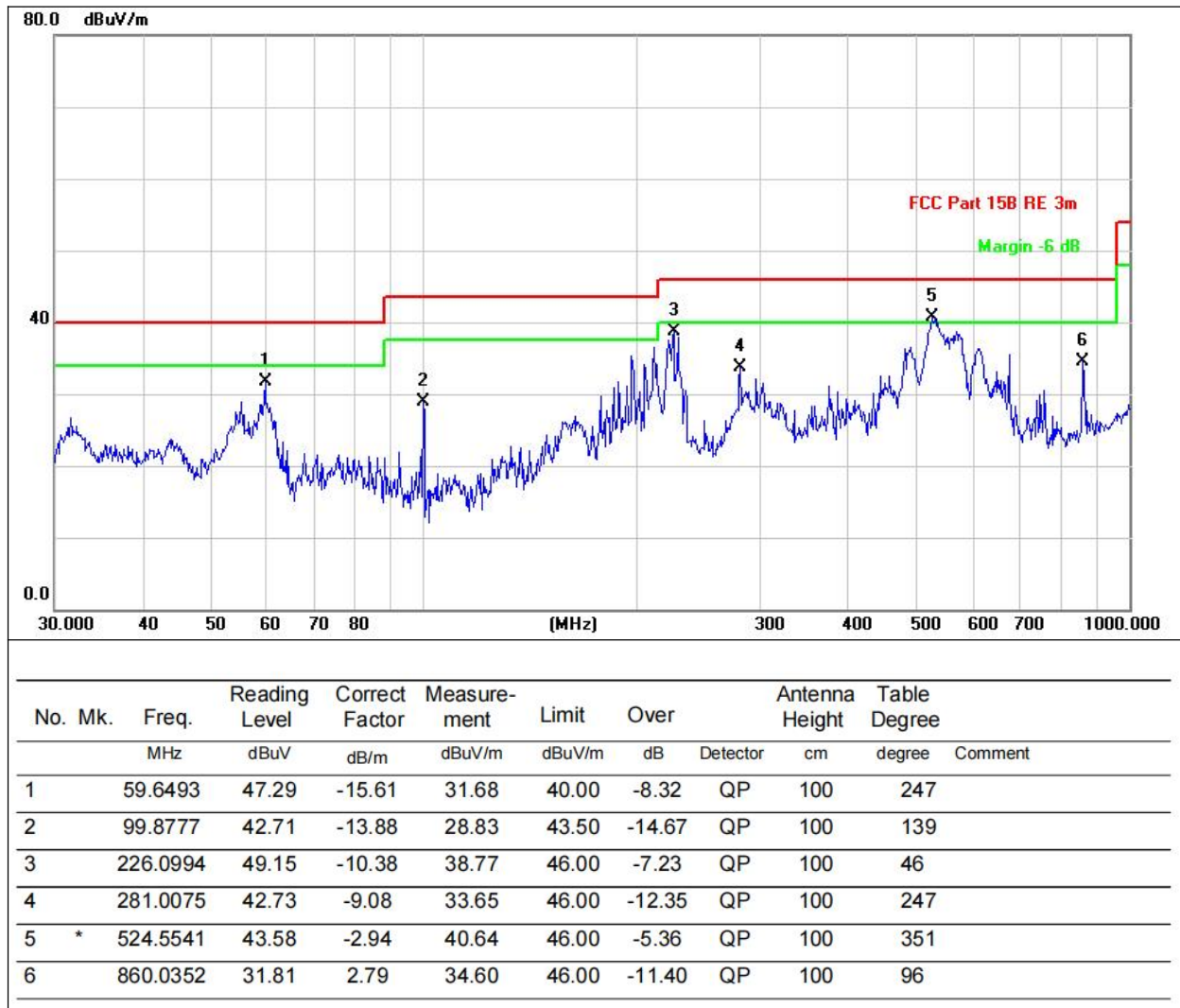
Between 30MHz – 1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test mode	802.11b-Middle channel



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		72.5916	45.03	-15.12	29.91	40.00	-10.09	QP	100	325	
2		125.0066	43.21	-10.45	32.76	43.50	-10.74	QP	100	147	
3	*	197.2001	49.93	-10.12	39.81	43.50	-3.69	QP	100	183	
4		229.2931	50.41	-10.44	39.97	46.00	-6.03	QP	100	28	
5	!	296.1836	49.06	-8.26	40.80	46.00	-5.20	QP	100	341	
6		375.9385	45.53	-6.29	39.24	46.00	-6.76	QP	100	175	

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test mode	802.11b-Middle channel



Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The test data shows only the worst case

1GHz~25GHz

802.11b-ANT1

Polar (H/V)	Frequency	Meter Reading	Pre-ampl ifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Low Channel:2412MHz									
V	4824	55.22	30.55	5.77	24.66	55.10	74.00	-18.90	PK
V	4824	42.00	30.55	5.77	24.66	41.88	54.00	-12.12	AV
V	7236	53.15	30.33	6.32	24.55	53.69	74.00	-20.31	PK
V	7236	39.41	30.33	6.32	24.55	39.95	54.00	-14.05	AV
V	9648	50.08	30.85	7.45	24.69	51.37	74.00	-22.63	PK
V	9648	36.43	30.85	7.45	24.69	37.72	54.00	-16.28	AV
H	4824	55.25	30.55	5.77	24.66	55.13	74.00	-18.87	PK
H	4824	41.03	30.55	5.77	24.66	40.91	54.00	-13.09	AV
H	7236	52.90	30.33	6.32	24.55	53.44	74.00	-20.56	PK
H	7236	38.94	30.33	6.32	24.55	39.48	54.00	-14.52	AV
H	9648	52.34	30.85	7.45	24.69	53.63	74.00	-20.37	PK
H	9648	38.44	30.85	7.45	24.69	39.73	54.00	-14.27	AV

Polar (H/V)	Frequency	Meter Reading	Pre-ampl ifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Middle Channel:2437MHz									
V	4874	55.11	30.55	5.77	24.66	54.99	74.00	-19.01	PK
V	4874	41.60	30.55	5.77	24.66	41.48	54.00	-12.52	AV
V	7311	54.75	30.33	6.32	24.55	55.29	74.00	-18.71	PK
V	7311	40.13	30.33	6.32	24.55	40.67	54.00	-13.33	AV
V	9748	50.79	30.85	7.45	24.69	52.08	74.00	-21.92	PK
V	9748	38.02	30.85	7.45	24.69	39.31	54.00	-14.69	AV
H	4874	54.93	30.55	5.77	24.66	54.81	74.00	-19.19	PK
H	4874	41.24	30.55	5.77	24.66	41.12	54.00	-12.88	AV
H	7311	54.73	30.33	6.32	24.55	55.27	74.00	-18.73	PK
H	7311	39.22	30.33	6.32	24.55	39.76	54.00	-14.24	AV
H	9748	50.99	30.85	7.45	24.69	52.28	74.00	-21.72	PK
H	9748	38.14	30.85	7.45	24.69	39.43	54.00	-14.57	AV

Polar (H/V)	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
High Channel:2462MHz									
V	4924	55.27	30.55	5.77	24.66	55.15	74.00	-18.85	PK
V	4924	41.24	30.55	5.77	24.66	41.12	54.00	-12.88	AV
V	7386	53.76	30.33	6.32	24.55	54.30	74.00	-19.70	PK
V	7386	39.78	30.33	6.32	24.55	40.32	54.00	-13.68	AV
V	9848	52.08	30.85	7.45	24.69	53.37	74.00	-20.63	PK
V	9848	36.96	30.85	7.45	24.69	38.25	54.00	-15.75	AV
H	4924	55.67	30.55	5.77	24.66	55.55	74.00	-18.45	PK
H	4924	41.29	30.55	5.77	24.66	41.17	54.00	-12.83	AV
H	7386	53.69	30.33	6.32	24.55	54.23	74.00	-19.77	PK
H	7386	41.54	30.33	6.32	24.55	42.08	54.00	-11.92	AV
H	9848	51.16	30.85	7.45	24.69	52.45	74.00	-21.55	PK
H	9848	38.93	30.85	7.45	24.69	40.22	54.00	-13.78	AV

802.11b-ANT2

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:2412MHz									
V	4824	54.26	30.55	5.77	24.66	54.14	74.00	-19.86	PK
V	4824	40.03	30.55	5.77	24.66	39.91	54.00	-14.09	AV
V	7236	53.50	30.33	6.32	24.55	54.04	74.00	-19.96	PK
V	7236	41.03	30.33	6.32	24.55	41.57	54.00	-12.43	AV
V	9648	52.42	30.85	7.45	24.69	53.71	74.00	-20.29	PK
V	9648	37.27	30.85	7.45	24.69	38.56	54.00	-15.44	AV
H	4824	55.41	30.55	5.77	24.66	55.29	74.00	-18.71	PK
H	4824	41.29	30.55	5.77	24.66	41.17	54.00	-12.83	AV
H	7236	54.73	30.33	6.32	24.55	55.27	74.00	-18.73	PK
H	7236	41.32	30.33	6.32	24.55	41.86	54.00	-12.14	AV
H	9648	50.12	30.85	7.45	24.69	51.41	74.00	-22.59	PK
H	9648	36.87	30.85	7.45	24.69	38.16	54.00	-15.84	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amp lifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	
Middle Channel:2437MHz									
V	4874	56.08	30.55	5.77	24.66	55.96	74.00	-18.04	PK
V	4874	41.83	30.55	5.77	24.66	41.71	54.00	-12.29	AV
V	7311	52.82	30.33	6.32	24.55	53.36	74.00	-20.64	PK
V	7311	40.73	30.33	6.32	24.55	41.27	54.00	-12.73	AV
V	9748	51.19	30.85	7.45	24.69	52.48	74.00	-21.52	PK
V	9748	37.88	30.85	7.45	24.69	39.17	54.00	-14.83	AV
H	4874	54.41	30.55	5.77	24.66	54.29	74.00	-19.71	PK
H	4874	40.76	30.55	5.77	24.66	40.64	54.00	-13.36	AV
H	7311	54.52	30.33	6.32	24.55	55.06	74.00	-18.94	PK
H	7311	39.28	30.33	6.32	24.55	39.82	54.00	-14.18	AV
H	9748	51.47	30.85	7.45	24.69	52.76	74.00	-21.24	PK
H	9748	37.41	30.85	7.45	24.69	38.70	54.00	-15.30	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:2462MHz									
V	4924	54.42	30.55	5.77	24.66	54.30	74.00	-19.70	PK
V	4924	39.95	30.55	5.77	24.66	39.83	54.00	-14.17	AV
V	7386	53.48	30.33	6.32	24.55	54.02	74.00	-19.98	PK
V	7386	40.79	30.33	6.32	24.55	41.33	54.00	-12.67	AV
V	9848	52.50	30.85	7.45	24.69	53.79	74.00	-20.21	PK
V	9848	37.95	30.85	7.45	24.69	39.24	54.00	-14.76	AV
H	4924	56.01	30.55	5.77	24.66	55.89	74.00	-18.11	PK
H	4924	40.60	30.55	5.77	24.66	40.48	54.00	-13.52	AV
H	7386	54.61	30.33	6.32	24.55	55.15	74.00	-18.85	PK
H	7386	39.53	30.33	6.32	24.55	40.07	54.00	-13.93	AV
H	9848	51.41	30.85	7.45	24.69	52.70	74.00	-21.30	PK
H	9848	36.82	30.85	7.45	24.69	38.11	54.00	-15.89	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. During the test, pre-scan the 802.11b/g/n mode, and found the 802.11b mode which it is worse case.
5. The test data shows only the worst case

5. RADIATED BAND EMISSION MEASUREMENT**5.1 TEST REQUIREMENT:**

Test Requirement:	FCC Part 15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	Above	Peak	1MHz	3MHz	Peak
	1GHz	Average	1MHz	3MHz	Average

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).

5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could bestopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dBmargin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the Highest channel

Note:

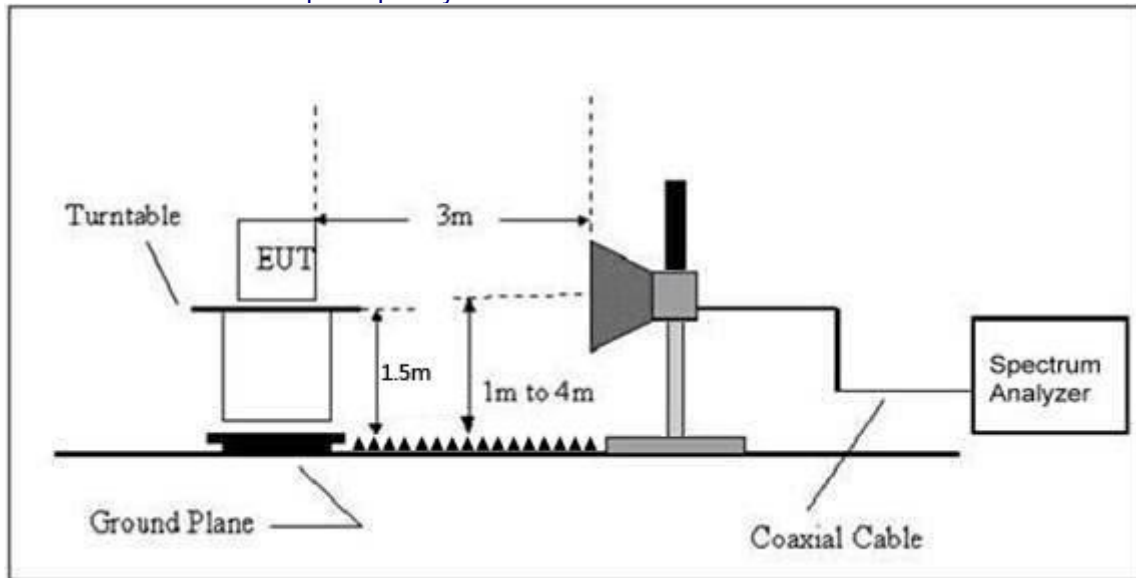
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.3 DEVIATION FROM TEST STANDARD

No deviation

5.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



5.5 EUT OPERATING 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.

5.6 TEST RESULT

ANT1

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11b	Low Channel 2412MHz										
	H	2390.00	55.22	30.22	4.85	23.98	53.83	74	-20.17	PK	PASS
	H	2390.00	37.12	30.22	4.85	23.98	35.73	54	-18.27	AV	PASS
	H	2400.00	52.22	30.22	4.85	23.98	50.83	74	-23.17	PK	PASS
	H	2400.00	39.53	30.22	4.85	23.98	38.14	54	-15.86	AV	PASS
	V	2390.00	52.25	30.22	4.85	23.98	50.86	74	-23.14	PK	PASS
	V	2390.00	42.47	30.22	4.85	23.98	41.08	54	-12.92	AV	PASS
	V	2400.00	53.55	30.22	4.85	23.98	52.16	74	-21.84	PK	PASS
	V	2400.00	37.38	30.22	4.85	23.98	35.99	54	-18.01	AV	PASS
	High Channel 2462MHz										
	H	2483.50	54.36	30.22	4.85	23.98	52.97	74	-21.03	PK	PASS
	H	2485.50	35.76	30.22	4.85	23.98	34.37	54	-19.63	AV	PASS
	H	2500.00	52.52	30.22	4.85	23.98	51.13	74	-22.87	PK	PASS
	H	2500.00	39.33	30.22	4.85	23.98	37.94	54	-16.06	AV	PASS
	V	2483.50	53.38	30.22	4.85	23.98	51.99	74	-22.01	PK	PASS
	V	2485.50	40.80	30.22	4.85	23.98	39.41	54	-14.59	AV	PASS
	V	2500.00	51.44	30.22	4.85	23.98	50.05	74	-23.95	PK	PASS
	V	2500.00	39.51	30.22	4.85	23.98	38.12	54	-15.88	AV	PASS
	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11g	Low Channel 2412MHz										
	H	2390.00	53.42	30.22	4.85	23.98	52.03	74	-21.97	PK	PASS
	H	2390.00	35.84	30.22	4.85	23.98	34.45	54	-19.55	AV	PASS
	H	2400.00	54.63	30.22	4.85	23.98	53.24	74	-20.76	PK	PASS
	H	2400.00	38.04	30.22	4.85	23.98	36.65	54	-17.35	AV	PASS
	V	2390.00	51.91	30.22	4.85	23.98	50.52	74	-23.48	PK	PASS
	V	2390.00	40.54	30.22	4.85	23.98	39.15	54	-14.85	AV	PASS
	V	2400.00	52.46	30.22	4.85	23.98	51.07	74	-22.93	PK	PASS
	V	2400.00	39.56	30.22	4.85	23.98	38.17	54	-15.83	AV	PASS
	High Channel 2462MHz										
	H	2483.50	55.18	30.22	4.85	23.98	53.79	74	-20.21	PK	PASS
	H	2485.50	37.15	30.22	4.85	23.98	35.76	54	-18.24	AV	PASS
	H	2500.00	52.85	30.22	4.85	23.98	51.46	74	-22.54	PK	PASS
	H	2500.00	37.76	30.22	4.85	23.98	36.37	54	-17.63	AV	PASS
	V	2483.50	49.97	30.22	4.85	23.98	48.58	74	-25.42	PK	PASS
	V	2485.50	42.64	30.22	4.85	23.98	41.25	54	-12.75	AV	PASS
	V	2500.00	51.04	30.22	4.85	23.98	49.65	74	-24.35	PK	PASS
	V	2500.00	38.83	30.22	4.85	23.98	37.44	54	-16.56	AV	PASS
	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11n20	Low Channel 2412MHz										
	H	2390.00	53.67	30.22	4.85	23.98	52.28	74	-21.72	PK	PASS
	H	2390.00	36.19	30.22	4.85	23.98	34.80	54	-19.20	AV	PASS
	H	2400.00	54.38	30.22	4.85	23.98	52.99	74	-21.01	PK	PASS
	H	2400.00	39.17	30.22	4.85	23.98	37.78	54	-16.22	AV	PASS
	V	2390.00	50.18	30.22	4.85	23.98	48.79	74	-25.21	PK	PASS
	V	2390.00	41.92	30.22	4.85	23.98	40.53	54	-13.47	AV	PASS
	V	2400.00	53.00	30.22	4.85	23.98	51.61	74	-22.39	PK	PASS
	V	2400.00	39.72	30.22	4.85	23.98	38.33	54	-15.67	AV	PASS

	High Channel 2462MHz										
	H	2483.50	56.68	30.22	4.85	23.98	55.29	74	-18.71	PK	PASS
	H	2485.50	36.94	30.22	4.85	23.98	35.55	54	-18.45	AV	PASS
	H	2500.00	52.99	30.22	4.85	23.98	51.60	74	-22.40	PK	PASS
	H	2500.00	38.15	30.22	4.85	23.98	36.76	54	-17.24	AV	PASS
	V	2483.50	53.30	30.22	4.85	23.98	51.91	74	-22.09	PK	PASS
	V	2485.50	40.08	30.22	4.85	23.98	38.69	54	-15.31	AV	PASS
	V	2500.00	52.39	30.22	4.85	23.98	51.00	74	-23.00	PK	PASS
	V	2500.00	36.88	30.22	4.85	23.98	35.49	54	-18.51	AV	PASS
	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11n40	Low Channel 2422MHz										
	H	2390.00	53.20	30.22	4.85	23.98	51.81	74	-22.19	PK	PASS
	H	2390.00	38.30	30.22	4.85	23.98	36.91	54	-17.09	AV	PASS
	H	2400.00	53.17	30.22	4.85	23.98	51.78	74	-22.22	PK	PASS
	H	2400.00	38.64	30.22	4.85	23.98	37.25	54	-16.75	AV	PASS
	V	2390.00	53.25	30.22	4.85	23.98	51.86	74	-22.14	PK	PASS
	V	2390.00	39.94	30.22	4.85	23.98	38.55	54	-15.45	AV	PASS
	V	2400.00	53.10	30.22	4.85	23.98	51.71	74	-22.29	PK	PASS
	V	2400.00	38.45	30.22	4.85	23.98	37.06	54	-16.94	AV	PASS
	High Channel 2452MHz										
	H	2483.50	53.04	30.22	4.85	23.98	51.65	74	-22.35	PK	PASS
	H	2485.50	35.86	30.22	4.85	23.98	34.47	54	-19.53	AV	PASS
	H	2500.00	51.86	30.22	4.85	23.98	50.47	74	-23.53	PK	PASS
	H	2500.00	39.62	30.22	4.85	23.98	38.23	54	-15.77	AV	PASS
	V	2483.50	52.01	30.22	4.85	23.98	50.62	74	-23.38	PK	PASS
	V	2485.50	41.83	30.22	4.85	23.98	40.44	54	-13.56	AV	PASS
	V	2500.00	51.25	30.22	4.85	23.98	49.86	74	-24.14	PK	PASS
	V	2500.00	37.03	30.22	4.85	23.98	35.64	54	-18.36	AV	PASS

ANT2

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11b	Low Channel 2412MHz										
	H	2390.00	54.92	30.22	4.85	23.98	53.53	74	-20.47	PK	PASS
	H	2390.00	38.49	30.22	4.85	23.98	37.10	54	-16.90	AV	PASS
	H	2400.00	53.85	30.22	4.85	23.98	52.46	74	-21.54	PK	PASS
	H	2400.00	40.71	30.22	4.85	23.98	39.32	54	-14.68	AV	PASS
	V	2390.00	53.01	30.22	4.85	23.98	51.62	74	-22.38	PK	PASS
	V	2390.00	41.42	30.22	4.85	23.98	40.03	54	-13.97	AV	PASS
	V	2400.00	52.20	30.22	4.85	23.98	50.81	74	-23.19	PK	PASS
	V	2400.00	38.95	30.22	4.85	23.98	37.56	54	-16.44	AV	PASS
	High Channel 2462MHz										
	H	2483.50	52.96	30.22	4.85	23.98	51.57	74	-22.43	PK	PASS
	H	2485.50	35.97	30.22	4.85	23.98	34.58	54	-19.42	AV	PASS
	H	2500.00	54.64	30.22	4.85	23.98	53.25	74	-20.75	PK	PASS
	H	2500.00	39.83	30.22	4.85	23.98	38.44	54	-15.56	AV	PASS
	V	2483.50	49.97	30.22	4.85	23.98	48.58	74	-25.42	PK	PASS
	V	2485.50	40.70	30.22	4.85	23.98	39.31	54	-14.69	AV	PASS
	V	2500.00	53.10	30.22	4.85	23.98	51.71	74	-22.29	PK	PASS
	V	2500.00	37.86	30.22	4.85	23.98	36.47	54	-17.53	AV	PASS

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11g	Low Channel 2412MHz										
	H	2390.00	54.81	30.22	4.85	23.98	53.42	74	-20.58	PK	PASS
	H	2390.00	35.88	30.22	4.85	23.98	34.49	54	-19.51	AV	PASS
	H	2400.00	52.26	30.22	4.85	23.98	50.87	74	-23.13	PK	PASS
	H	2400.00	39.18	30.22	4.85	23.98	37.79	54	-16.21	AV	PASS
	V	2390.00	49.80	30.22	4.85	23.98	48.41	74	-25.59	PK	PASS
	V	2390.00	41.42	30.22	4.85	23.98	40.03	54	-13.97	AV	PASS
	V	2400.00	50.83	30.22	4.85	23.98	49.44	74	-24.56	PK	PASS
	V	2400.00	38.38	30.22	4.85	23.98	36.99	54	-17.01	AV	PASS
	High Channel 2462MHz										
	H	2483.50	53.00	30.22	4.85	23.98	51.61	74	-22.39	PK	PASS
	H	2485.50	36.02	30.22	4.85	23.98	34.63	54	-19.37	AV	PASS
	H	2500.00	54.41	30.22	4.85	23.98	53.02	74	-20.98	PK	PASS
	H	2500.00	40.63	30.22	4.85	23.98	39.24	54	-14.76	AV	PASS
	V	2483.50	53.68	30.22	4.85	23.98	52.29	74	-21.71	PK	PASS
	V	2485.50	40.82	30.22	4.85	23.98	39.43	54	-14.57	AV	PASS
	V	2500.00	51.99	30.22	4.85	23.98	50.60	74	-23.40	PK	PASS
	V	2500.00	38.28	30.22	4.85	23.98	36.89	54	-17.11	AV	PASS
	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11n20	Low Channel 2412MHz										
	H	2390.00	54.49	30.22	4.85	23.98	53.10	74	-20.90	PK	PASS
	H	2390.00	35.95	30.22	4.85	23.98	34.56	54	-19.44	AV	PASS
	H	2400.00	53.84	30.22	4.85	23.98	52.45	74	-21.55	PK	PASS
	H	2400.00	38.76	30.22	4.85	23.98	37.37	54	-16.63	AV	PASS
	V	2390.00	53.28	30.22	4.85	23.98	51.89	74	-22.11	PK	PASS
	V	2390.00	39.80	30.22	4.85	23.98	38.41	54	-15.59	AV	PASS
	V	2400.00	50.98	30.22	4.85	23.98	49.59	74	-24.41	PK	PASS
	V	2400.00	38.04	30.22	4.85	23.98	36.65	54	-17.35	AV	PASS
	High Channel 2462MHz										
	H	2483.50	54.44	30.22	4.85	23.98	53.05	74	-20.95	PK	PASS
	H	2485.50	37.29	30.22	4.85	23.98	35.90	54	-18.10	AV	PASS
	H	2500.00	53.64	30.22	4.85	23.98	52.25	74	-21.75	PK	PASS
	H	2500.00	40.62	30.22	4.85	23.98	39.23	54	-14.77	AV	PASS
	V	2483.50	52.50	30.22	4.85	23.98	51.11	74	-22.89	PK	PASS
	V	2485.50	40.46	30.22	4.85	23.98	39.07	54	-14.93	AV	PASS
	V	2500.00	53.46	30.22	4.85	23.98	52.07	74	-21.93	PK	PASS
	V	2500.00	39.35	30.22	4.85	23.98	37.96	54	-16.04	AV	PASS
	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11n40	Low Channel 2422MHz										
	H	2390.00	54.66	30.22	4.85	23.98	53.27	74	-20.73	PK	PASS
	H	2390.00	36.47	30.22	4.85	23.98	35.08	54	-18.92	AV	PASS
	H	2400.00	51.81	30.22	4.85	23.98	50.42	74	-23.58	PK	PASS
	H	2400.00	40.53	30.22	4.85	23.98	39.14	54	-14.86	AV	PASS
	V	2390.00	49.96	30.22	4.85	23.98	48.57	74	-25.43	PK	PASS
	V	2390.00	41.62	30.22	4.85	23.98	40.23	54	-13.77	AV	PASS
	V	2400.00	52.07	30.22	4.85	23.98	50.68	74	-23.32	PK	PASS
	V	2400.00	39.43	30.22	4.85	23.98	38.04	54	-15.96	AV	PASS
	High Channel 2452MHz										
	H	2483.50	56.51	30.22	4.85	23.98	55.12	74	-18.88	PK	PASS
	H	2485.50	36.97	30.22	4.85	23.98	35.58	54	-18.42	AV	PASS

	H	2500.00	52.06	30.22	4.85	23.98	50.67	74	-23.33	PK	PASS
	H	2500.00	37.97	30.22	4.85	23.98	36.58	54	-17.42	AV	PASS
	V	2483.50	51.10	30.22	4.85	23.98	49.71	74	-24.29	PK	PASS
	V	2485.50	42.23	30.22	4.85	23.98	40.84	54	-13.16	AV	PASS
	V	2500.00	53.00	30.22	4.85	23.98	51.61	74	-22.39	PK	PASS
	V	2500.00	38.47	30.22	4.85	23.98	37.08	54	-16.92	AV	PASS

MIMO

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11n20	Low Channel 2412MHz										
	H	2390.00	53.76	30.22	4.85	23.98	52.37	74	-21.63	PK	PASS
	H	2390.00	38.11	30.22	4.85	23.98	36.72	54	-17.28	AV	PASS
	H	2400.00	53.98	30.22	4.85	23.98	52.59	74	-21.41	PK	PASS
	H	2400.00	39.38	30.22	4.85	23.98	37.99	54	-16.01	AV	PASS
	V	2390.00	51.39	30.22	4.85	23.98	50.00	74	-24.00	PK	PASS
	V	2390.00	40.41	30.22	4.85	23.98	39.02	54	-14.98	AV	PASS
	V	2400.00	52.07	30.22	4.85	23.98	50.68	74	-23.32	PK	PASS
	V	2400.00	36.97	30.22	4.85	23.98	35.58	54	-18.42	AV	PASS
	High Channel 2462MHz										
	H	2483.50	56.36	30.22	4.85	23.98	54.97	74	-19.03	PK	PASS
	H	2485.50	38.44	30.22	4.85	23.98	37.05	54	-16.95	AV	PASS
	H	2500.00	52.27	30.22	4.85	23.98	50.88	74	-23.12	PK	PASS
	H	2500.00	38.52	30.22	4.85	23.98	37.13	54	-16.87	AV	PASS
	V	2483.50	50.68	30.22	4.85	23.98	49.29	74	-24.71	PK	PASS
	V	2485.50	40.53	30.22	4.85	23.98	39.14	54	-14.86	AV	PASS
	V	2500.00	53.56	30.22	4.85	23.98	52.17	74	-21.83	PK	PASS
	V	2500.00	38.65	30.22	4.85	23.98	37.26	54	-16.74	AV	PASS
	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margi n(dB)	Detec tor Type	Result
802.11n40	Low Channel 2422MHz										
	H	2390.00	54.04	30.22	4.85	23.98	52.65	74	-21.35	PK	PASS
	H	2390.00	35.84	30.22	4.85	23.98	34.45	54	-19.55	AV	PASS
	H	2400.00	52.19	30.22	4.85	23.98	50.80	74	-23.20	PK	PASS
	H	2400.00	40.41	30.22	4.85	23.98	39.02	54	-14.98	AV	PASS
	V	2390.00	52.70	30.22	4.85	23.98	51.31	74	-22.69	PK	PASS
	V	2390.00	40.25	30.22	4.85	23.98	38.86	54	-15.14	AV	PASS
	V	2400.00	52.29	30.22	4.85	23.98	50.90	74	-23.10	PK	PASS
	V	2400.00	39.15	30.22	4.85	23.98	37.76	54	-16.24	AV	PASS
	High Channel 2452MHz										
	H	2483.50	56.48	30.22	4.85	23.98	55.09	74	-18.91	PK	PASS
	H	2485.50	37.00	30.22	4.85	23.98	35.61	54	-18.39	AV	PASS
	H	2500.00	53.06	30.22	4.85	23.98	51.67	74	-22.33	PK	PASS
	H	2500.00	39.15	30.22	4.85	23.98	37.76	54	-16.24	AV	PASS
	V	2483.50	52.23	30.22	4.85	23.98	50.84	74	-23.16	PK	PASS
	V	2485.50	42.27	30.22	4.85	23.98	40.88	54	-13.12	AV	PASS
	V	2500.00	51.41	30.22	4.85	23.98	50.02	74	-23.98	PK	PASS
	V	2500.00	37.40	30.22	4.85	23.98	36.01	54	-17.99	AV	PASS

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

6.POWER SPECTRAL DENSITY TEST

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D0115.247 Meas Guidance v 05r02

6.1 APPLIED PROCEDURES / LIMIT

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

6.2 TEST PROCEDURE

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

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP**6.5 EUT OPERATION CONDITIONS**

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

6.6 TEST RESULT

PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS

7. CHANNEL BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

7.1 APPLIED PROCEDURES / LIMIT

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

7.2 TEST PROCEDURE

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

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

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

7.6 TEST RESULT

PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS

8. OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

8.1 APPLIED PROCEDURES/LIMIT

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

8.2 TEST PROCEDURE

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

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

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

8.6 TEST RESULT

PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS

9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

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

9.1 APPLICABLE STANDARD

in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in15.209(a).

9.2 TEST PROCEDURE

Using the following spectrum analyzer setting:

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

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



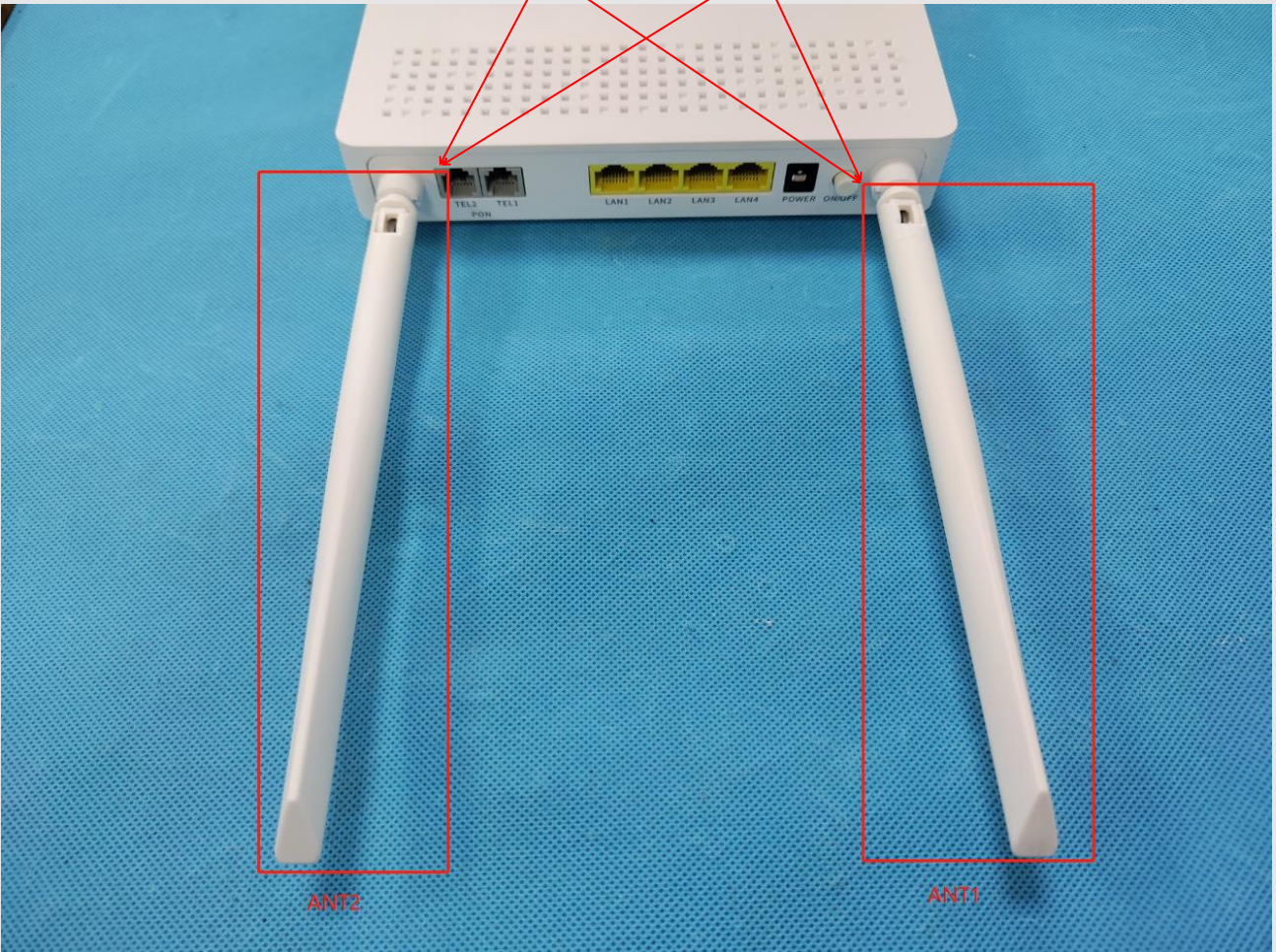
9.5 EUT OPERATION CONDITIONS

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

9.6 TEST RESULTS

PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS

10. ANTENNA REQUIREMENT

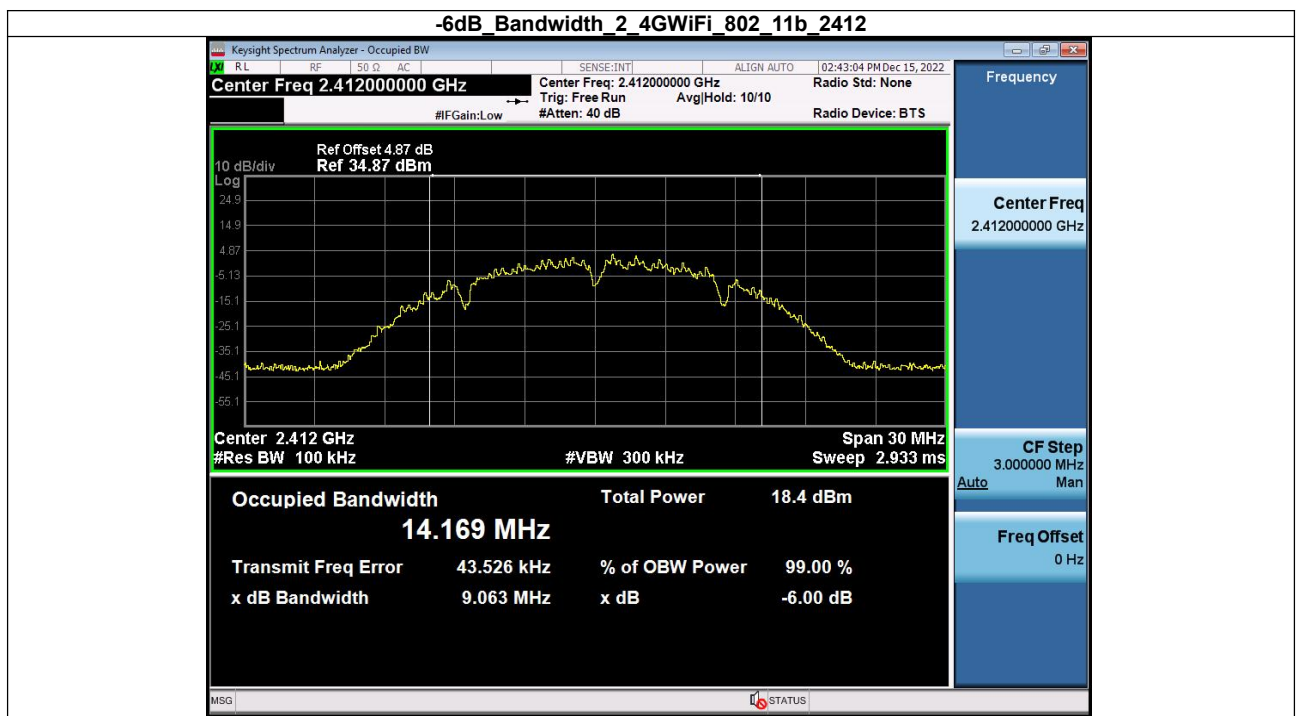
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, 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. Refer to statement below for compliance. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.	
EUT Antenna: The antenna used in this product are FPC antenna, and the best case gain of the antenna is antenna port 1: 2dBi and Antenna port 2:2dBi.	
	

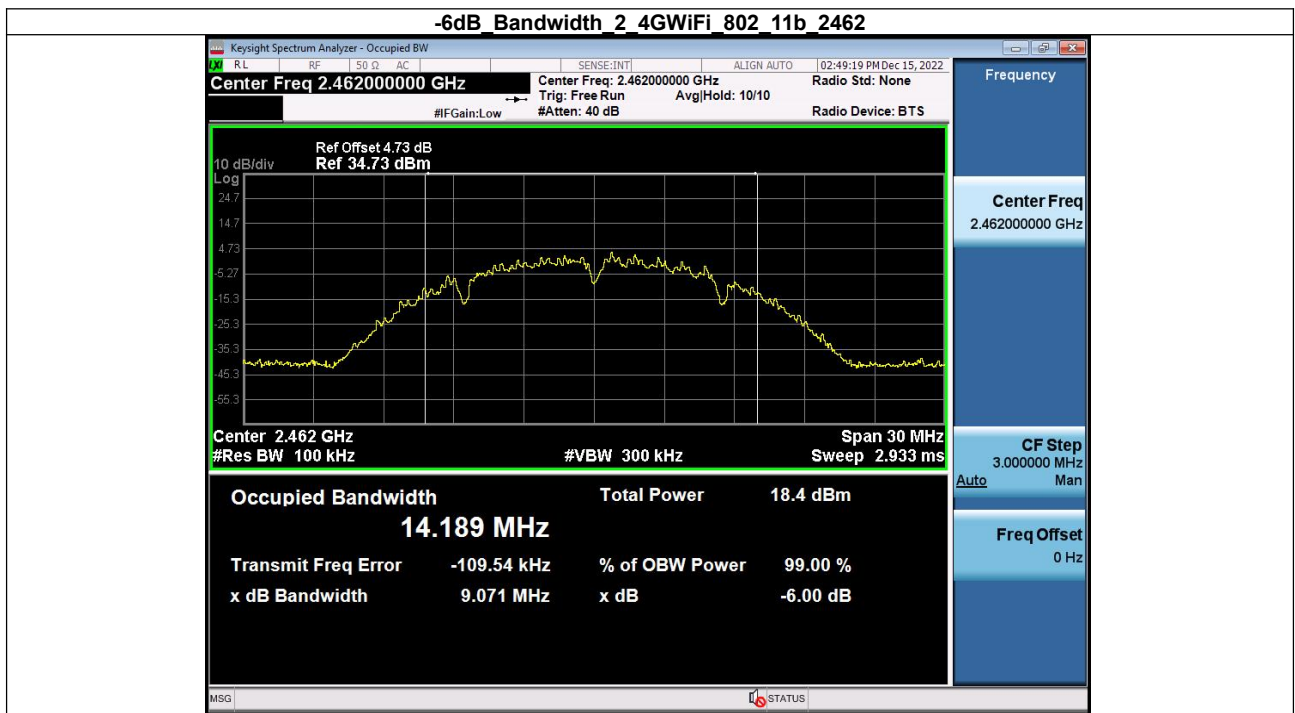
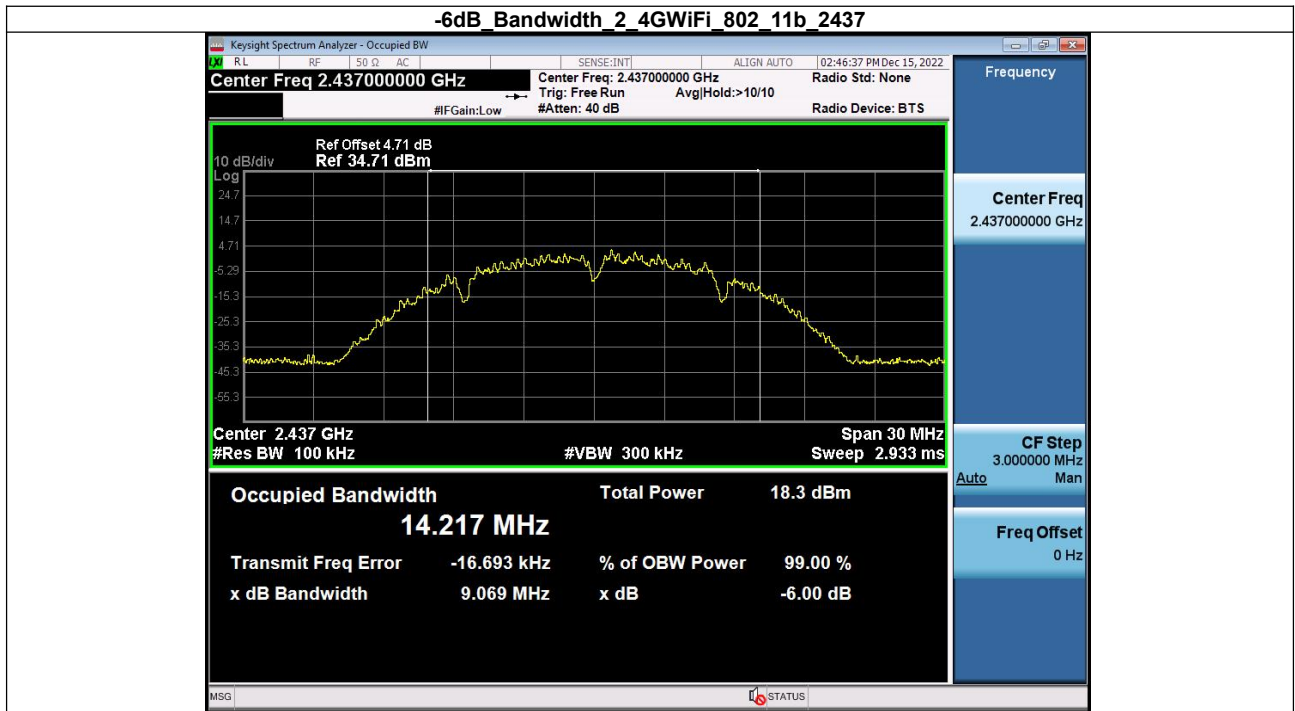
11.APPENDIX1

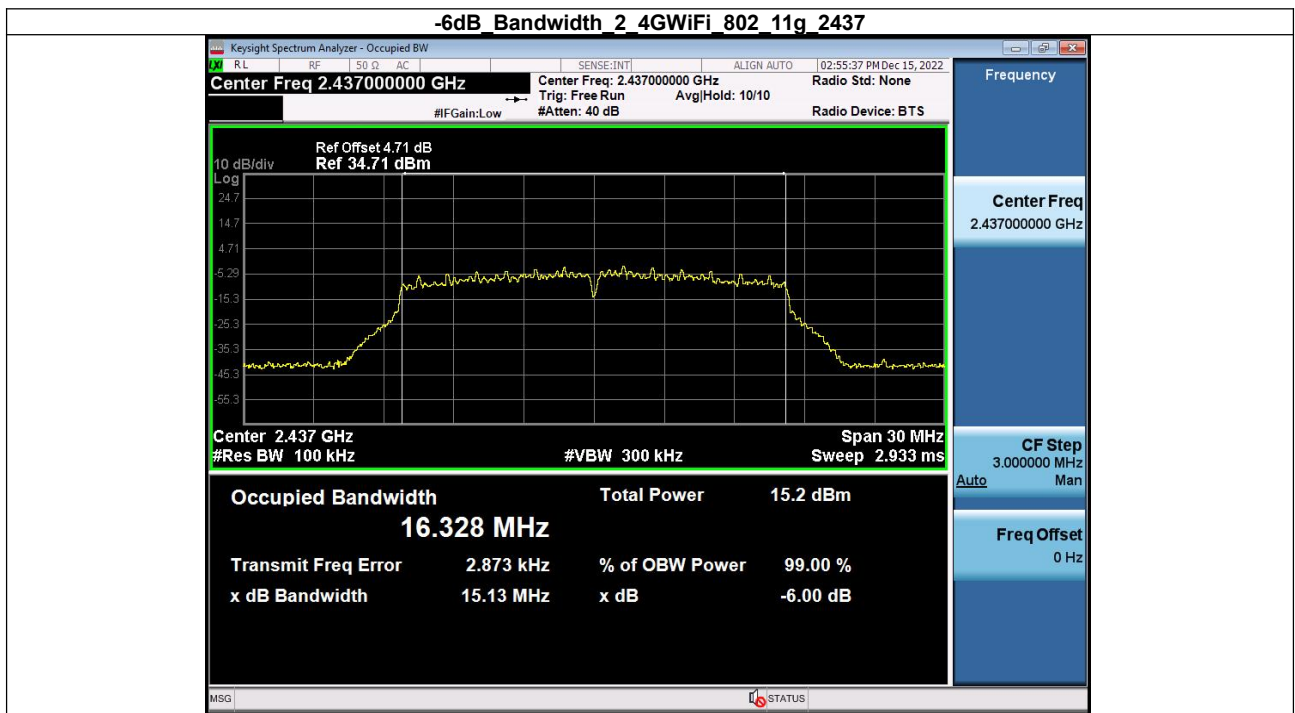
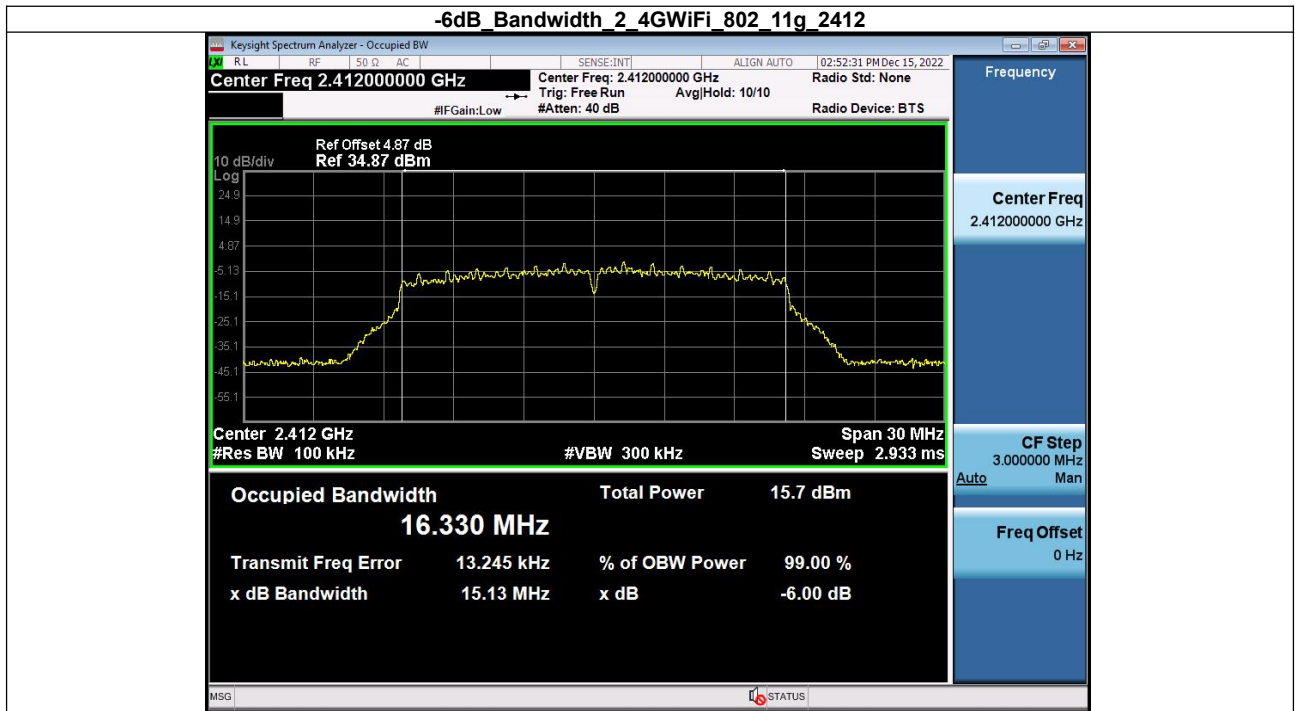
11.1. -6DB BANDWIDTH

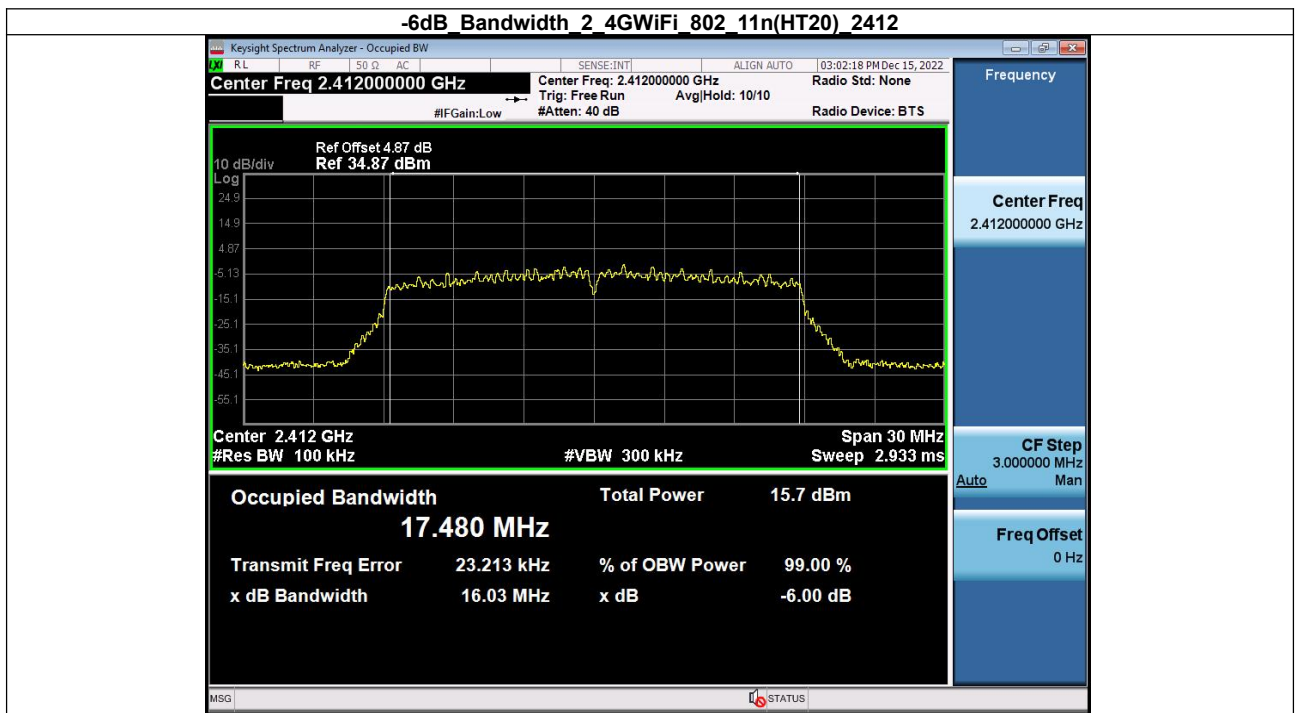
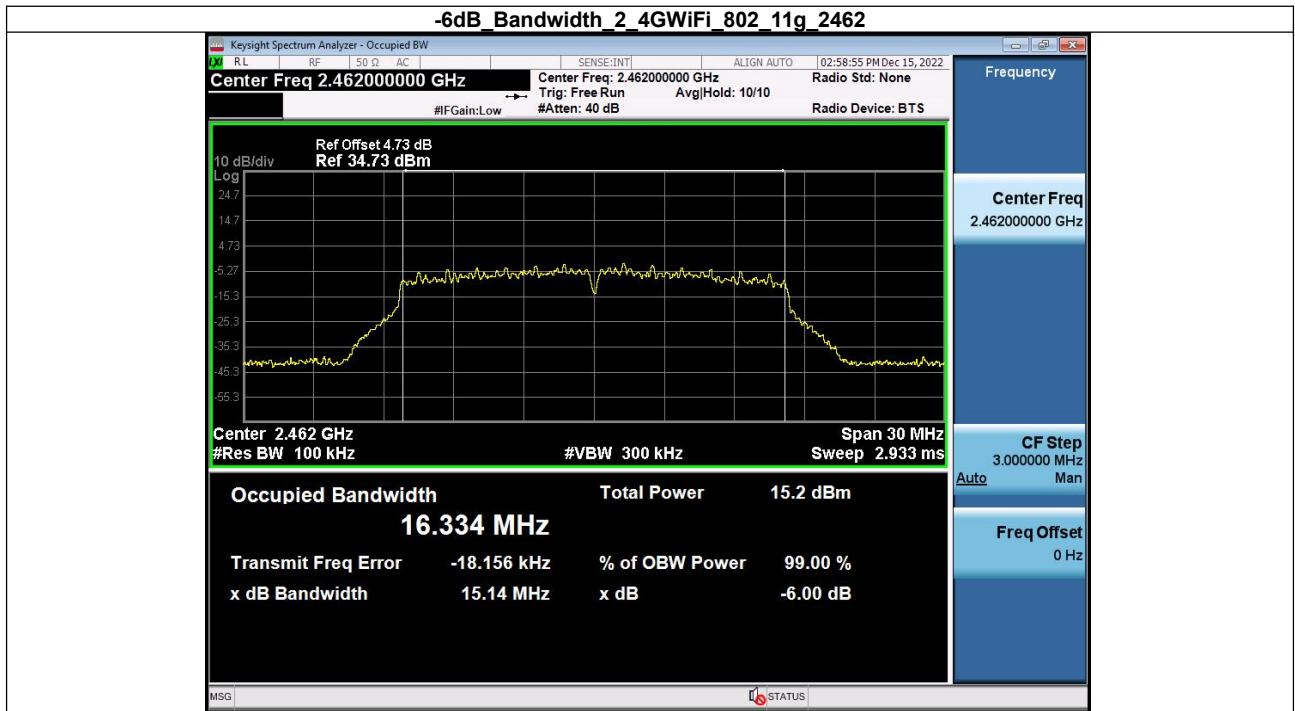
Condition	Antenna	Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
NVNT	ANT1	802.11b	2412.00	9.06	500	Pass
NVNT	ANT1	802.11b	2437.00	9.07	500	Pass
NVNT	ANT1	802.11b	2462.00	9.07	500	Pass
NVNT	ANT1	802.11g	2412.00	15.13	500	Pass
NVNT	ANT1	802.11g	2437.00	15.13	500	Pass
NVNT	ANT1	802.11g	2462.00	15.14	500	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	16.03	500	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	16.03	500	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	15.13	500	Pass
NVNT	ANT1	802.11n(HT40)	2422.00	35.12	500	Pass
NVNT	ANT1	802.11n(HT40)	2437.00	35.10	500	Pass
NVNT	ANT1	802.11n(HT40)	2452.00	35.09	500	Pass

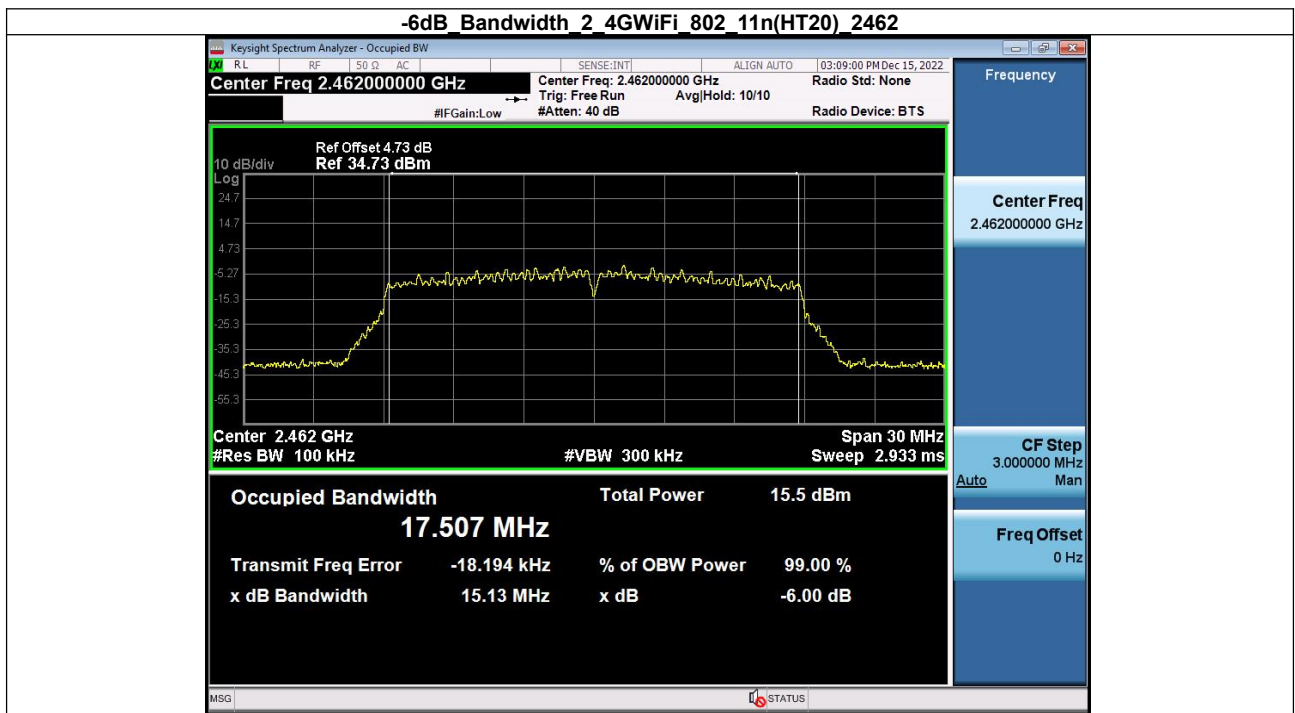
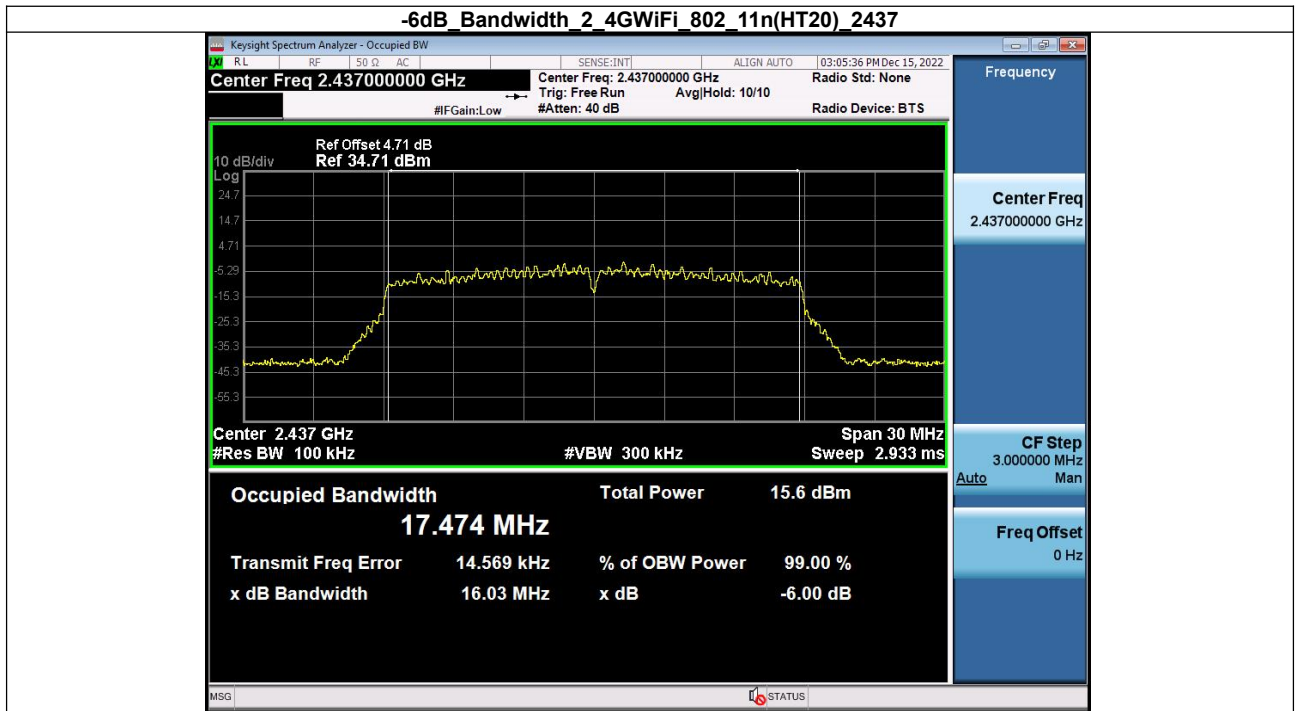
Condition	Antenna	Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
NVNT	ANT2	802.11b	2412.00	9.06	500	Pass
NVNT	ANT2	802.11b	2437.00	9.07	500	Pass
NVNT	ANT2	802.11b	2462.00	9.07	500	Pass
NVNT	ANT2	802.11g	2412.00	15.69	500	Pass
NVNT	ANT2	802.11g	2437.00	15.13	500	Pass
NVNT	ANT2	802.11g	2462.00	15.13	500	Pass
NVNT	ANT2	802.11n(HT20)	2412.00	16.01	500	Pass
NVNT	ANT2	802.11n(HT20)	2437.00	15.13	500	Pass
NVNT	ANT2	802.11n(HT20)	2462.00	15.13	500	Pass
NVNT	ANT2	802.11n(HT40)	2422.00	35.11	500	Pass
NVNT	ANT2	802.11n(HT40)	2437.00	35.11	500	Pass
NVNT	ANT2	802.11n(HT40)	2452.00	35.10	500	Pass

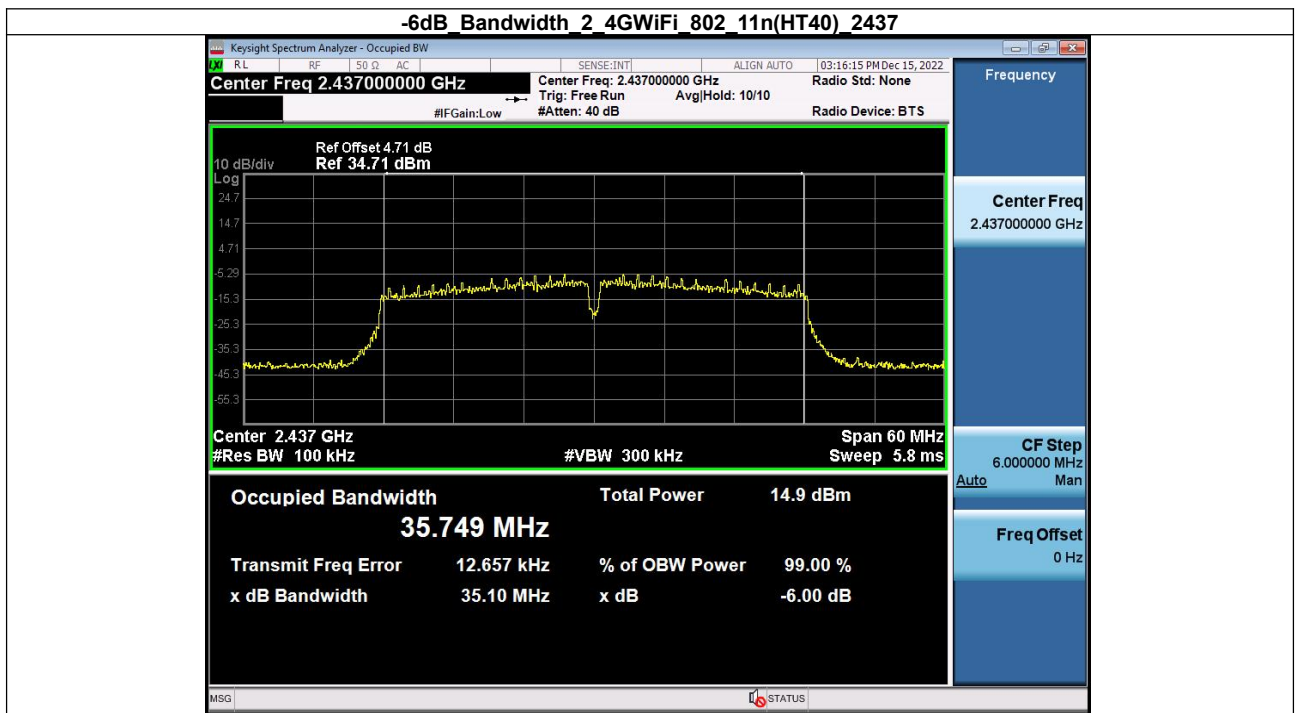
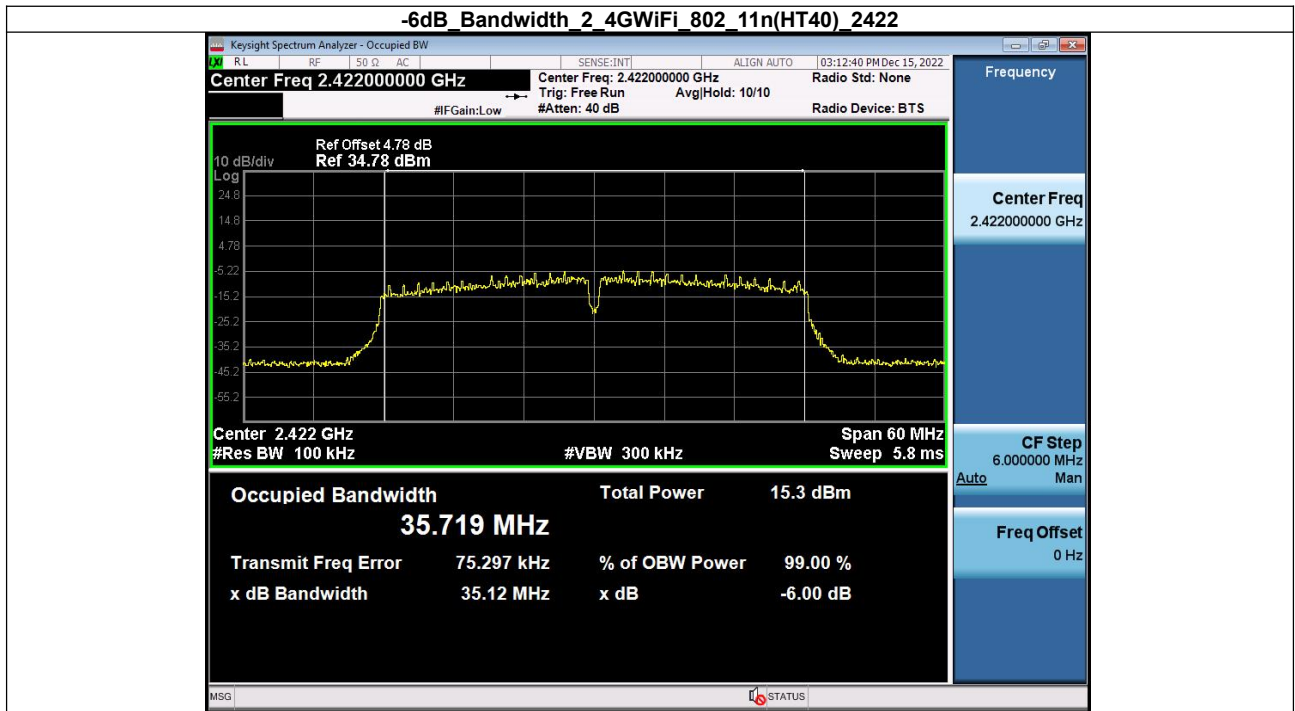


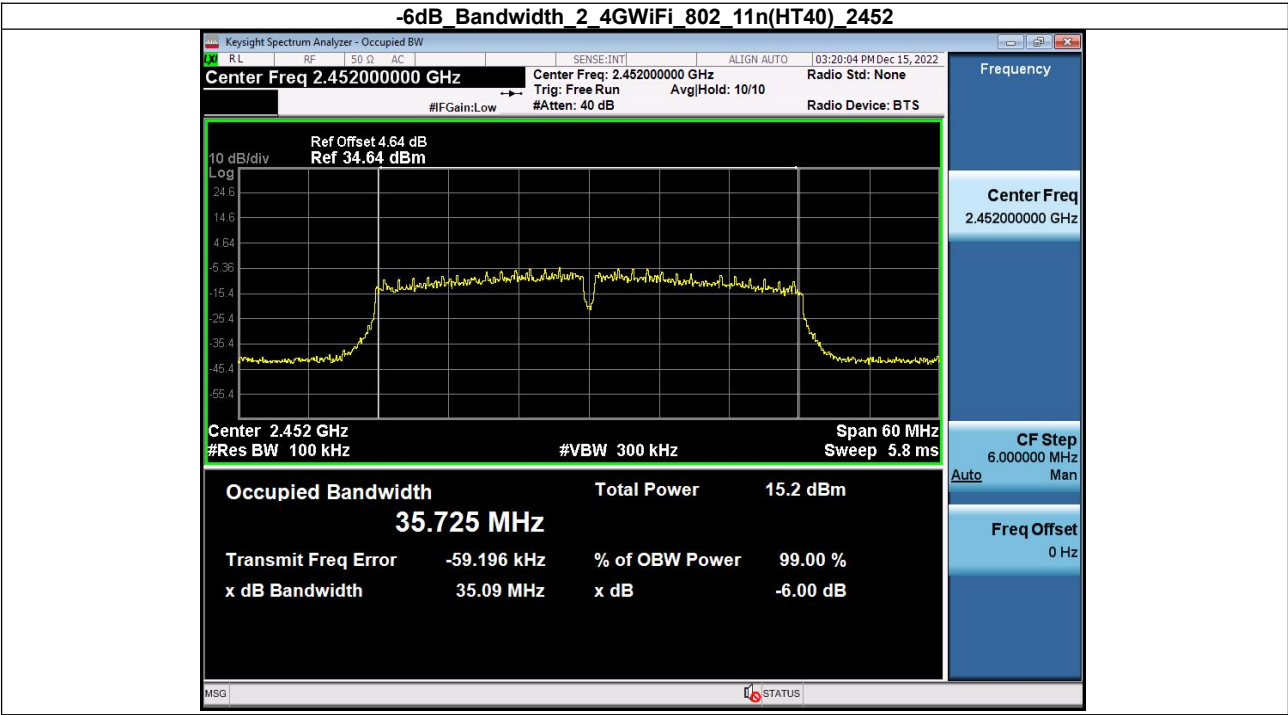




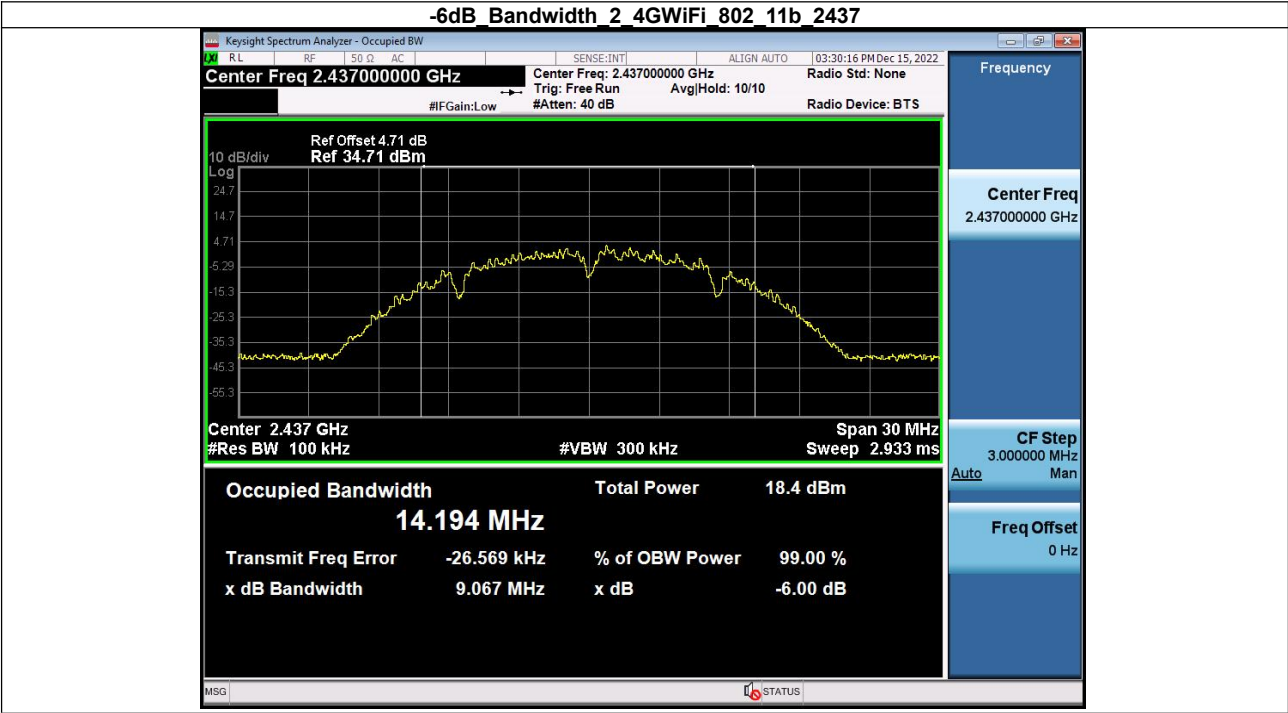


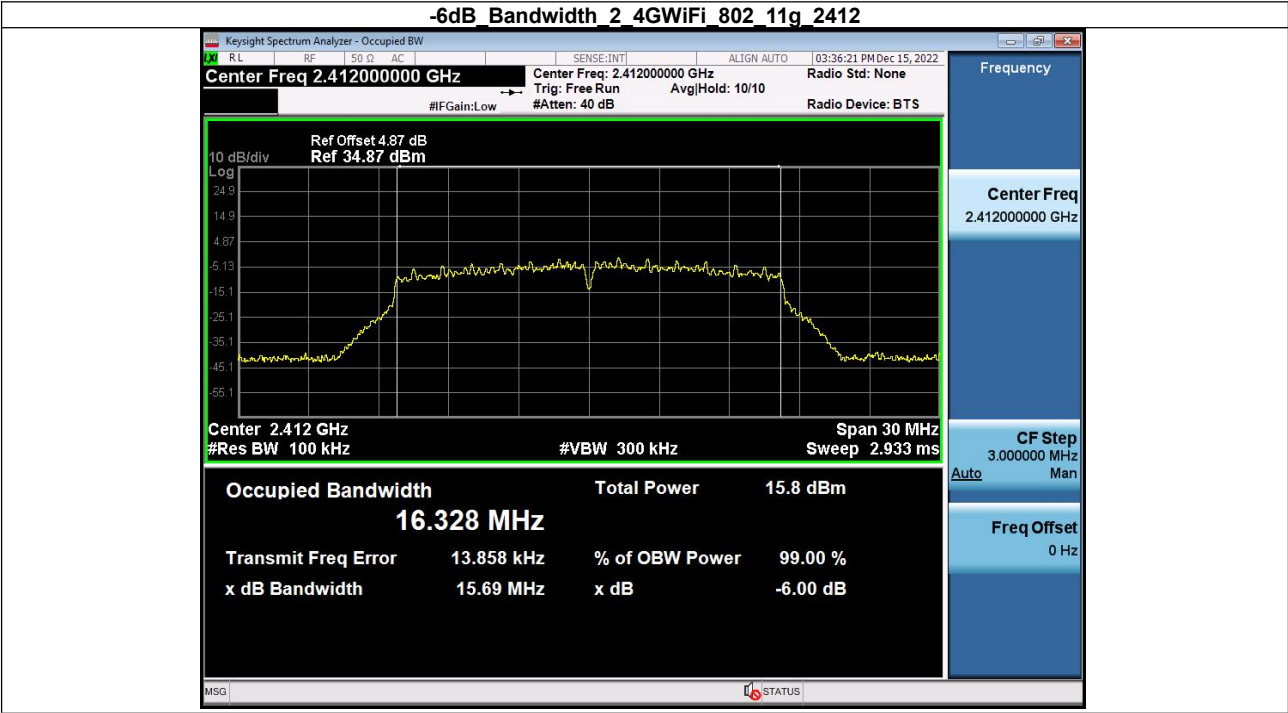


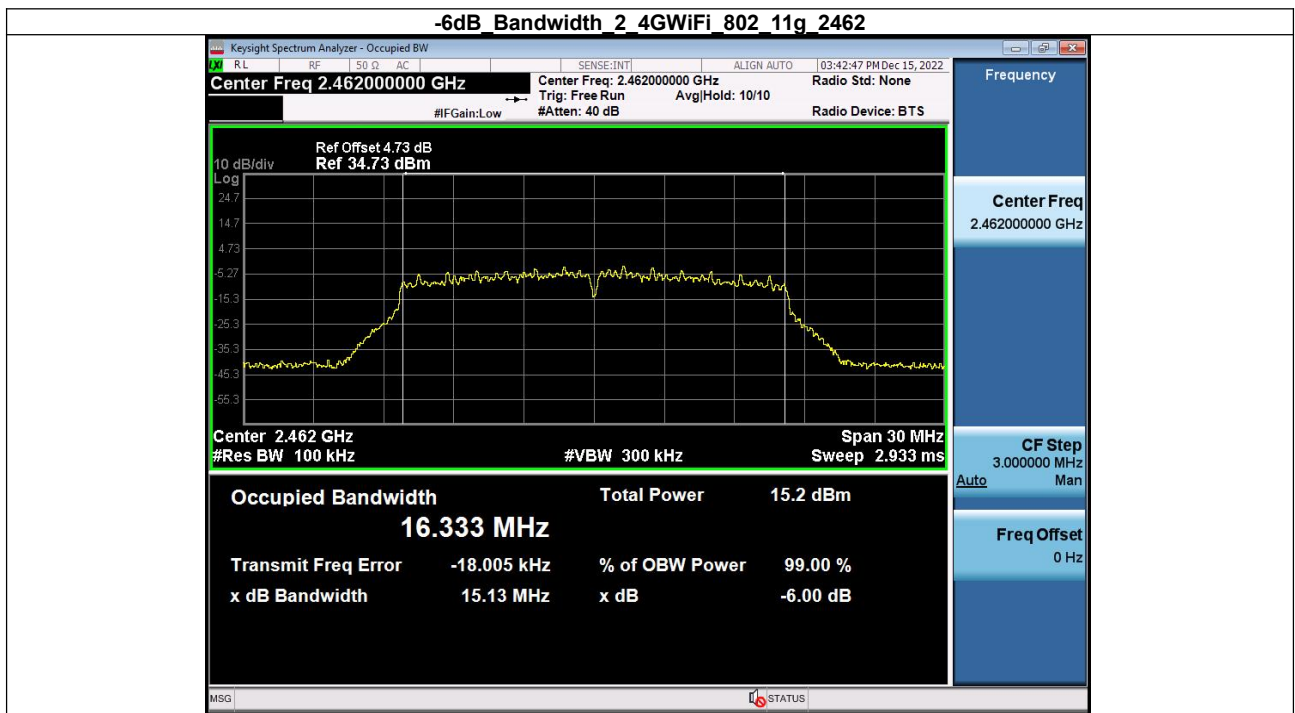
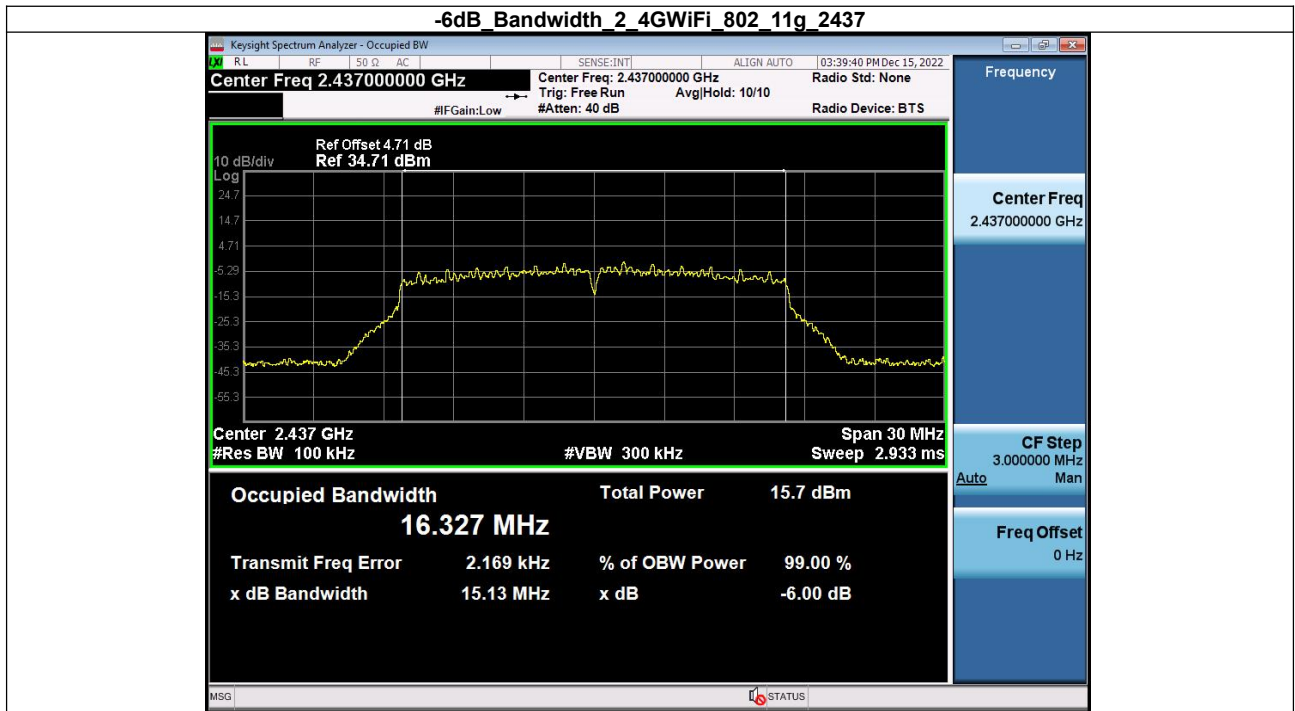


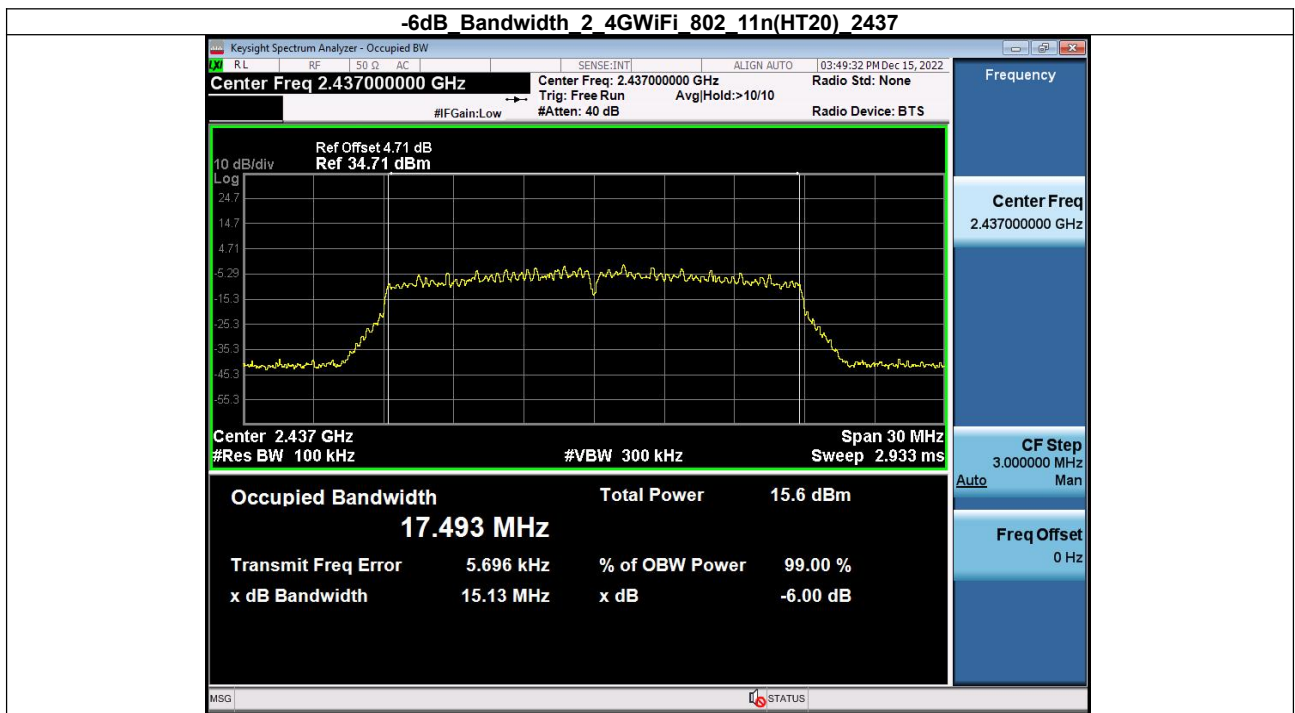
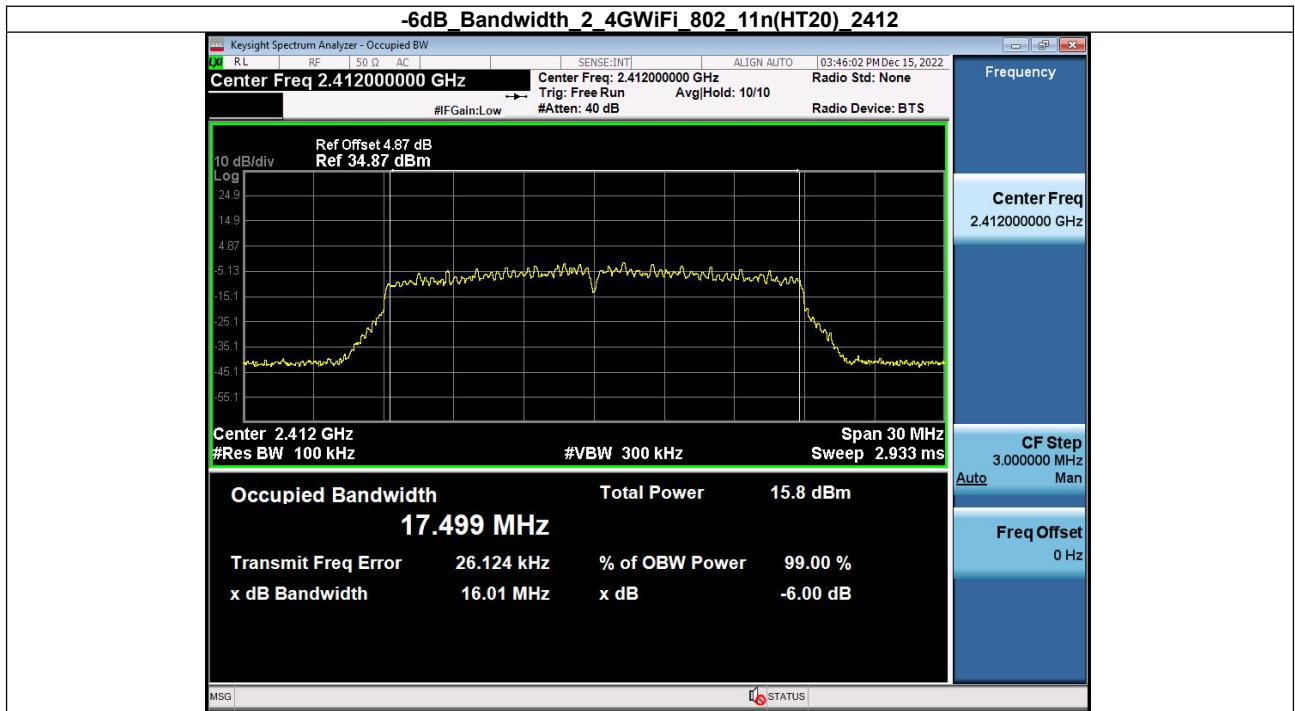


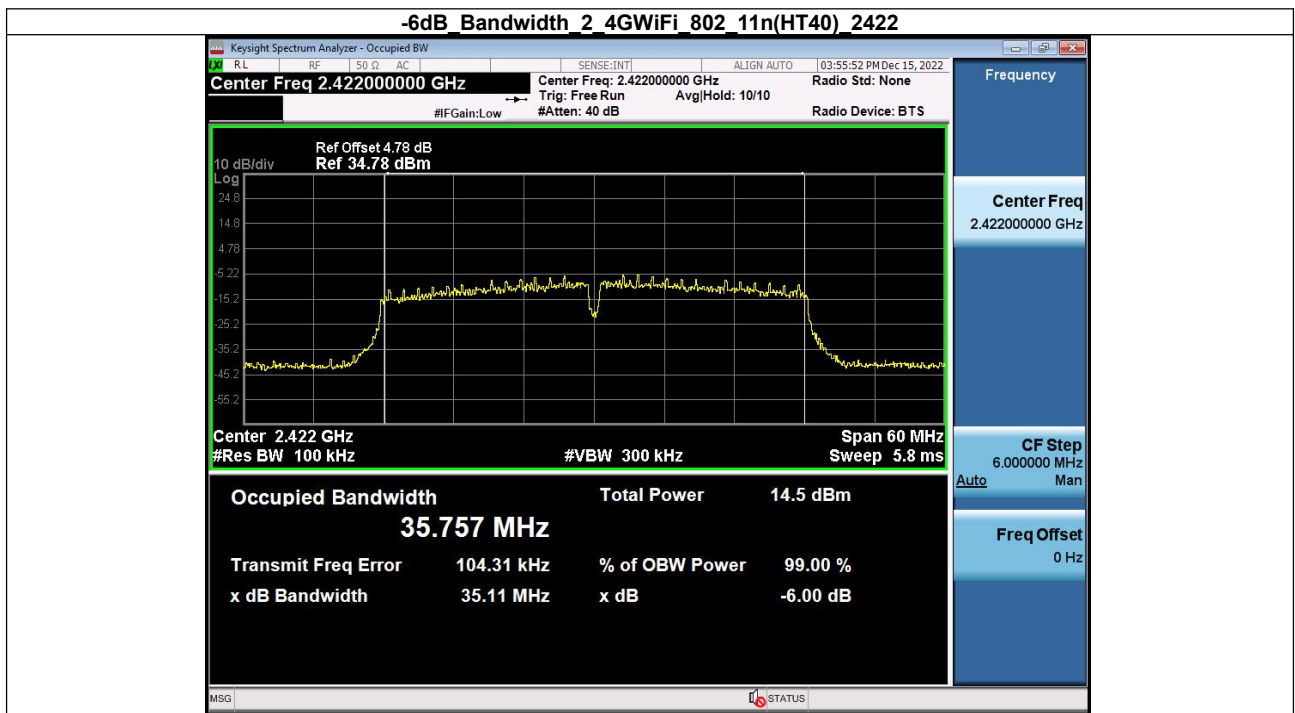
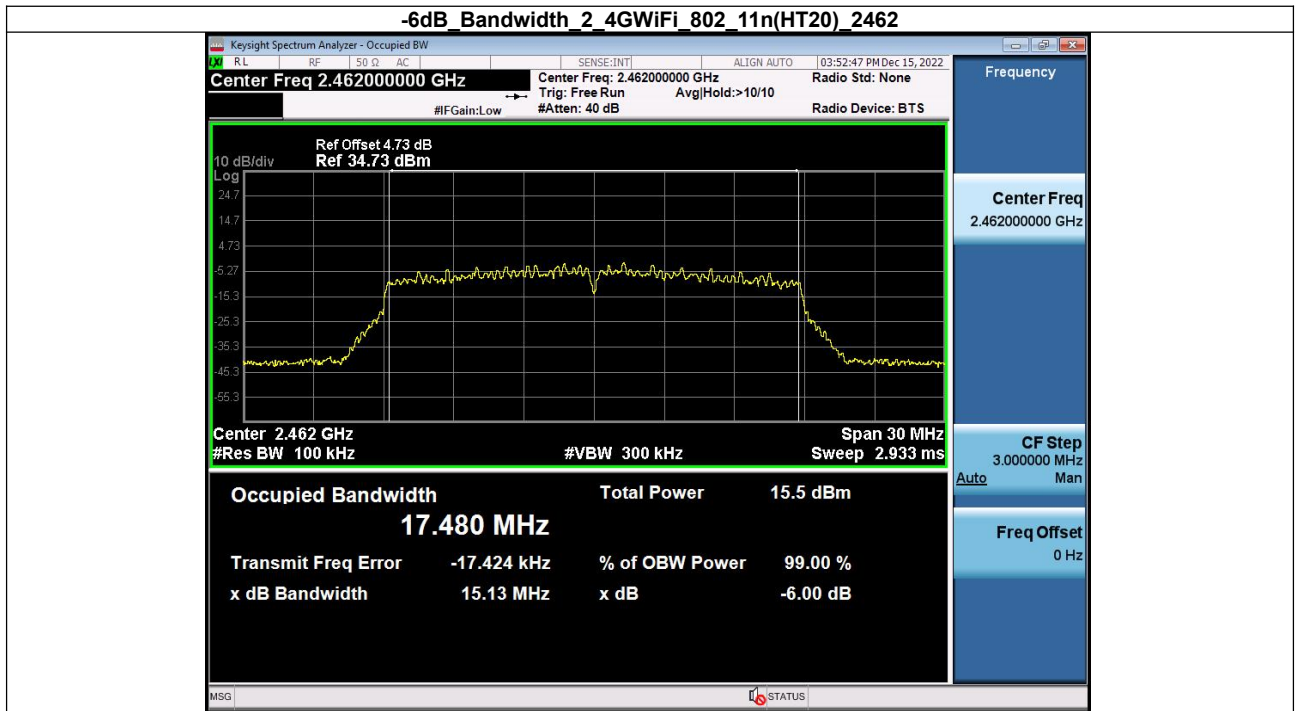
ANT2

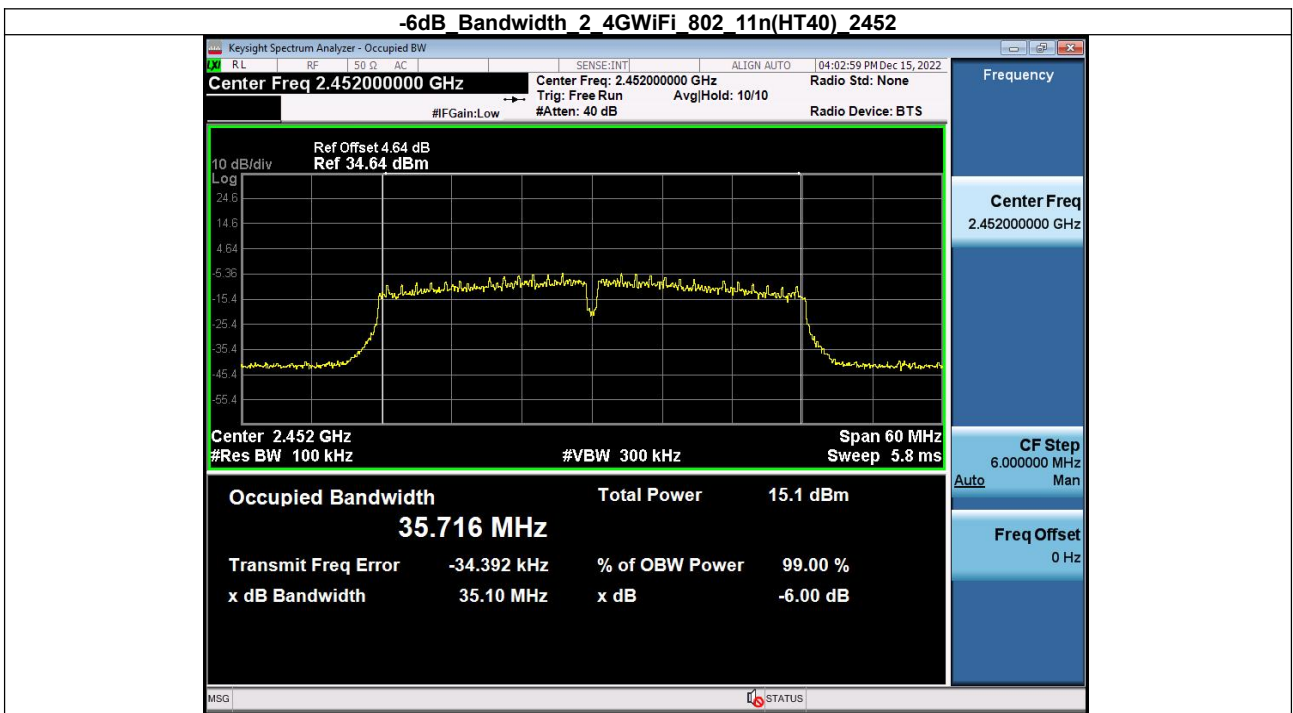
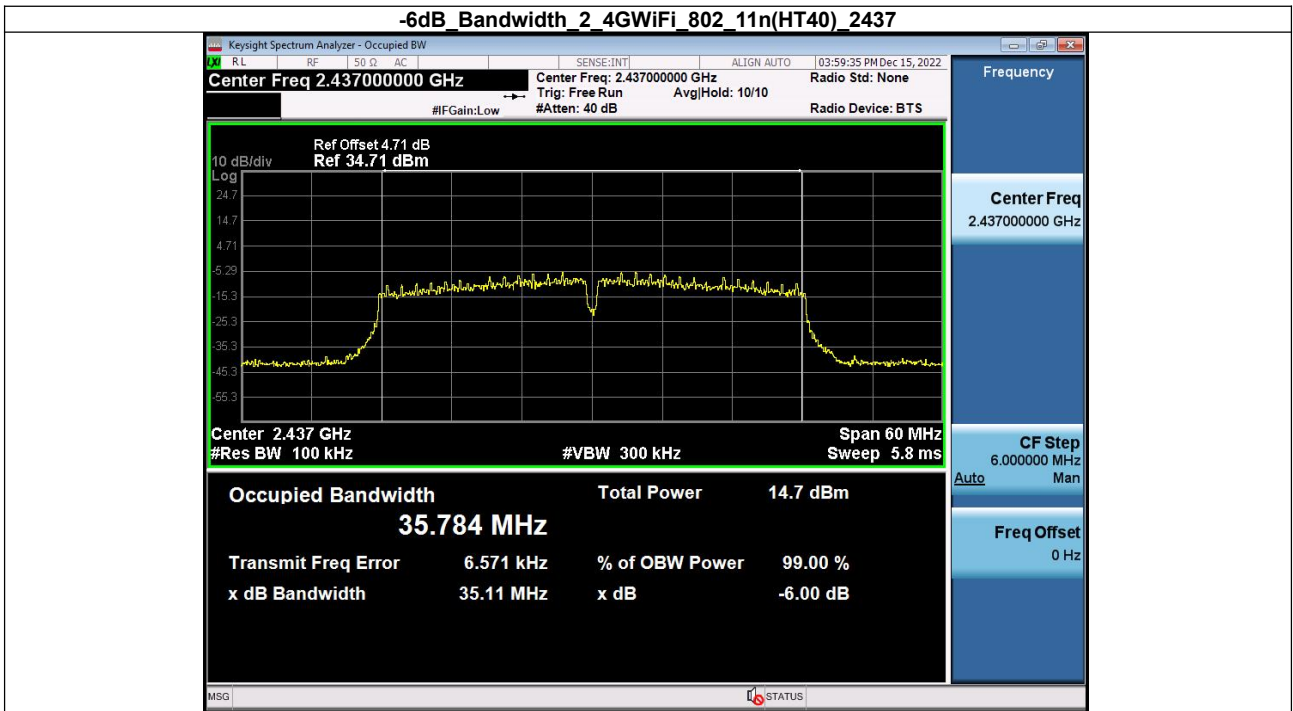












11.2. BANDEDGE

Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark_frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	2383.36	-38.71	-16.43	Pass
NVNT	ANT1	802.11b	2462.00	2490.78	-38.77	-16.61	Pass
NVNT	ANT1	802.11g	2412.00	2368.69	-39.07	-21.52	Pass
NVNT	ANT1	802.11g	2462.00	2484.74	-39.33	-21.91	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	2399.94	-38.26	-21.47	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	2494.58	-39.08	-22.38	Pass
NVNT	ANT1	802.11n(HT40)	2422.00	2387.09	-39.34	-25.63	Pass
NVNT	ANT1	802.11n(HT40)	2452.00	2486.67	-39.33	-25.76	Pass

Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark_frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT2	802.11b	2412.00	2392.54	-39.03	-16.25	Pass
NVNT	ANT2	802.11b	2462.00	2497.60	-39.44	-16.94	Pass
NVNT	ANT2	802.11g	2412.00	2346.96	-39.13	-21.34	Pass
NVNT	ANT2	802.11g	2462.00	2484.59	-39.31	-21.90	Pass
NVNT	ANT2	802.11n(HT20)	2412.00	2351.10	-38.58	-22.00	Pass
NVNT	ANT2	802.11n(HT20)	2462.00	2491.65	-39.02	-21.83	Pass
NVNT	ANT2	802.11n(HT40)	2422.00	2358.44	-38.27	-25.23	Pass
NVNT	ANT2	802.11n(HT40)	2452.00	2487.96	-39.30	-25.37	Pass

1_Reference_Level_2_4GWiFi_802_11b_2412



2_Bandedge_2_4GWiFi_NVNT_ANT1_802_11b_2412

