FCC Part 15, Subpart C

Test Report

FCC ID:	2A6XZ-LAGOFRAME01
Applicant:	Lago Digital, Inc.
Address:	530 7th Ave Suite 1001 NY, NY 10018
Manufacturer:	Lago Digital, Inc.
Address:	530 7th Ave Suite 1001 NY, NY 10018
Product(s):	33 inch Frame
Brand(s):	N/A
Test Model(s):	LAGO Frame Genesis
Series Model(s):	N/A
Test Date:	Apr. 24, 2022 ~ June 15, 2022
Issued Date:	June 17, 2022
Issued By:	Hwa-Hsing (Dongguan) Testing Co., Ltd.
Address:	No.101, Bld. N1, Yuyuan 2Rd, Yuyuan Industrial Park, HuangJiang Town, Dongguan, China
Test Firm Registration No.:	915896
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

The above equipment has been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Tank Tan — *Tank Tan*

Reviewed by : Scott He — *Scott He*

Approved by : — *Harry Li*

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Release Control Record

Issue No.	Description	Date Issued
220214LE03-RF-US-03	Original Release	June 17, 2022

1. Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247) KDB 558074 D01 15.247 Meas Guidance v05r02 KDB 662911 D01 v02r01 ANSI C63.10:2013			
Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit.
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB Bandwidth	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used. The device is professionally installed

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (sDoC). The test report has been issued separately.

1.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:
The listed uncertainties are the worst cases uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.66 dB
Radiated Emissions up to 1 GHz	9KHz ~ 30MHz	2.16 dB
	30MHz ~ 1000MHz	3.47 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.84 dB
	18GHz ~ 40GHz	4.67 dB

1.2 Modification Record

There were no modifications required for compliance.

2. General Information

2.1 General Description of EUT

Product(s)	33 inch Frame
Test Model(s)	LAGO Frame Genesis
Sample No.	HS220509-01-03; HS220509-01-06
Series Model(s)	N/A
Status of EUT	Engineering prototype
Power Supply Rating	100-240V~,1.2A,50~60Hz, 120W
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate	DSSS, OFDM
Operating Frequency	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
Number of Channel	802.11b, 802.11g, 802.11n (20MHz): 2412 ~ 2462MHz 802.11n (40MHz): 2422 ~ 2452MHz
Maximum Output Power	18.25dBm
Antenna Type	Dipole Antenna
Max. Antenna Gain	2.50dBi
Antenna Connector	I-PEX
Accessory Device	N/A
Data Cable Supplied	AC Cable：2.00m, no code, shielded

Note:

1. Please refer to the EUT photo document (Reference No.: 220214EL03-01&-02) for detailed product photo.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.
3. The EUT incorporates MIMO function. Co-related with 2 antenna transmission and 2 antenna reception.

Support mode	Frequency band	Transmit and receive mode	Transmit and Receive Chain
802.11b	2412~2462MHz	MIMO	2TX/2RX
802.11g	2412~2462MHz	MIMO	2TX/2RX
802.11n HT20	2412~2462MHz	MIMO	2TX/2RX
802.11n HT40	2422~2452MHz	MIMO	2TX/2RX

2.2 Description of Test Channels

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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

7 channels are provided for 802.11n (40MHz):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

*Power setting value from test software:

Mode	Channel No.	Freq. (MHz)	Power Setting
802.11b	1	2412	49
	6	2437	Default
	11	2462	61
802.11g	1	2412	35
	6	2437	Default
	11	2462	33
802.11 n20	1	2412	35
	6	2437	Default
	11	2462	36
802.11 n40	1	2422	54
	6	2437	Default
	11	2452	30

2.3 Test Mode Applicability and Tested Channel Detail

Applicable test items	X-Axis	Y-Axis	Z-Axis	Voltage Supply
AC Power Conducted Emission	N/A	N/A	N/A	AC120V, 60Hz
Radiated Emissions	√	√	√	
Band Edge Measurement	N/A	N/A	N/A	
Antenna Port Emission	N/A	N/A	N/A	
6dB Bandwidth	N/A	N/A	N/A	
Occupied Bandwidth Measurement	N/A	N/A	N/A	
Conducted power	N/A	N/A	N/A	
Power Spectral Density	N/A	N/A	N/A	
1. The EUT had been pre-tested on the positioned of each 3 Axis. 2. “N/A” means no effect.				

Applicable test items	Antenna Transmit and receive mode	X-Axis	Y-Axis	Z-Axis
Radiated Emissions	MIMO	√	√	√

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Condition:

Applicable test items	Environmental Conditions	Tested by
AC Power Conducted Emission	25deg. C, 65%RH	Jim Xu
Radiated Emissions	25deg. C, 65%RH	Jim Xu
Antenna Port Conducted Measurement	25deg. C, 65%RH	Dragon long

Radiated Emission Test (Above 1GHz):

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1, 6, 11	DSSS	1.0
802.11g	1, 6, 11	OFDM	6.0
802.11n (20MHz)	1, 6, 11	OFDM	7.2
802.11n (40MHz)	3, 6, 9	OFDM	15.0

Radiated Emission Test (Below 1GHz):

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1, 6, 11	DSSS	1

Power Line Conducted Emission Test:

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1, 6, 11	DSSS	1

Antenna Port Conducted Measurement:

*This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	DSSS	1.0
802.11g	1 to 11	OFDM	6.0
802.11n (20MHz)	1 to 11	OFDM	7.2
802.11n (40MHz)	3 to 9	OFDM	15.0

2.4 Description of Support Units

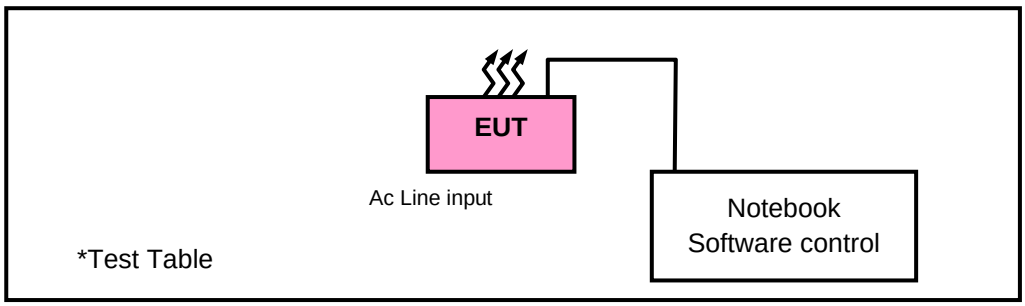
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook	Lenovo	ThinkPad X280	SL10P97665	N/A

Insert Cable Connections to/from EUT provided by test team.

No.	Signal Cable Description Of The Above Support Units
1.	USB serial cable Un-shielding 1.0m

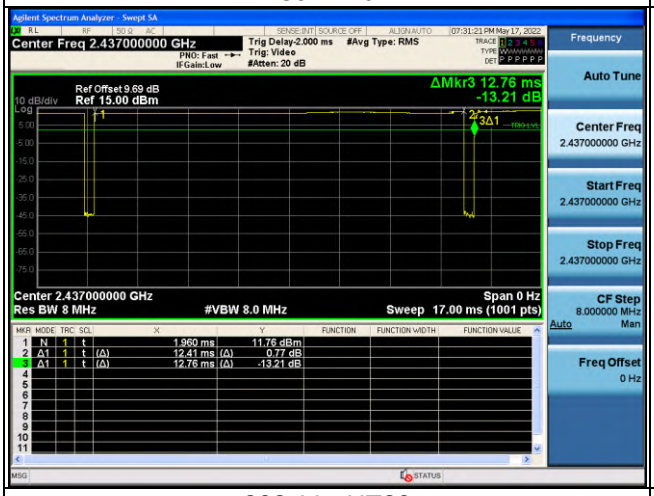
2.5 Configuration of System under Test



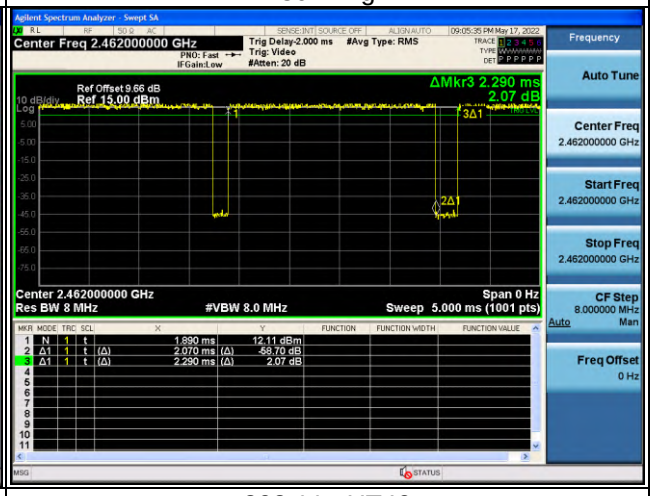
2.6 Duty Cycle of Test Signal

Test mode	Duty cycle (%)	Duty cycle factor=10*log (1/duty cycle) (dB)
802.11b	97.26%	0.121
802.11g	90.39%	0.439
802.11n HT20	95.05%	0.220
802.11n HT40	82.61%	0.830

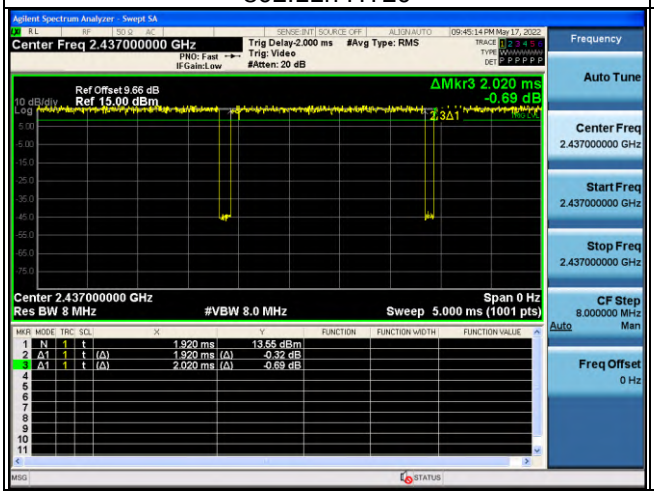
802.11b



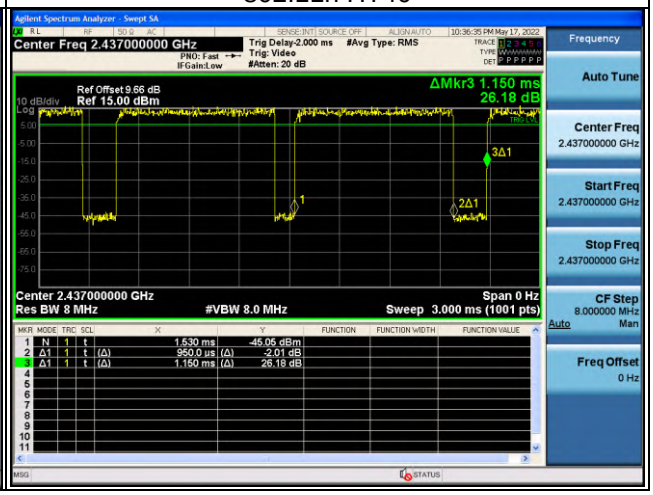
802.11g



802.11n HT20



802.11n HT40



3. Test Types and Results

3.1 Radiated Emission and Band-edge Measurement

3.1.1 Limits of radiated emission and band-edge measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/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
* DTS emissions in non-restricted frequency bands Subclause 11.11 of ANSI C63.10 is applicable. * DTS emissions in restricted frequency bands Subclause 11.12 of ANSI C63.10 is applicable		

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.1.2 Test Instruments

Radiated emission below 30MHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	100962	2023-01-13
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	NSEMC003	2023-04-15
Test software	FARAD	FARAD	EZ_EMCV1.1.4.2	N/A
Loop Antenna	EMCI	HLA 6121	56735	2023-04-15
Preamplifier	EMCI	EMC001340	980201	2022-09-08
Antenna Tower	MF	MFA-440H	NA	NA
Turn Table	MF	MFT-201SS	NA	NA
Antenna Tower&Turn Table Controller	MF	MF-7802	NA	NA

Frequency Range below 1GHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	NSEMC003	2023-04-15
EMI Test Receiver	Rohde&Schwarz	ESR7	100962	2023-01-13
Broadband antenna	Schwarzbeck	VULB 9168	00937	2023-09-12
Signal Amplifier	Com-power	PAM-103	18020051	2022-09-08
Attenuator	Rohde&Schwarz	TS2GA-6dB	18101101	N/A
Test software	FARAD	FARAD	EZ_EMCV1.1.4.2	N/A

Frequency Range 1-18GHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	NSEMC003	2023-04-15
Horn Antenna	Schwarzbeck	BBHA 9120D	01959	2022-09-12
Broadband Coaxial Preamplifier	Com-power	PAM-118A	1804003	2022-09-07
Spectrum	Keysight	N9020A	MY51240612	2022-09-08
Antenna Tower	MF	MFA-440H	NA	NA
Turn Table	MF	MFT-201SS	NA	NA
Antenna Tower&Turn Table Controller	MF	MF-7802	NA	NA

Frequency Range 18-40GHz:

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	NSEMC003	2023-04-15
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2023-01-13
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170242	2023-04-10
Pre-Amplifier	EMCI	EMC 184045	980102	2023-01-12
Antenna Tower	MF	MFA-440H	NA	NA
Turn Table	MF	MFT-201SS	NA	NA
Antenna Tower&Turn Table Controller	MF	MF-7802	NA	NA

Note: 1. The calibration interval of the above test instruments is 12/24months(*) and the calibrations are traceable to CEPREI/CHINA.

2. The test was performed in 966.

3.1.3 Test Procedures

a. Peak emission levels are measured by setting the instrument as follow:

1) RBW & VBW setting as a function of frequency:

Frequency	RBW	VBW
9kHz~150kHz	200Hz	600Hz
0.15MHz~30MHz	9kHz	30kHz
30MHz~1000MHz	120kHz	300kHz
>1000MHz	1MHz	3MHz

2) Detector = peak.
3) Sweep time = auto.
4) Trace mode = max hold.
5) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be lengthened for low-duty-cycle applications.)

Note: If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement

b. Average emission levels are measured by setting the instrument as follow:

- **Trace averaging with continuous EUT transmission at full power**

If the EUT can be configured or modified to transmit continuously (D ≥ 98%). then the average emission levels shall be measured using the following method (with EUT transmitting continuously):

1) RBW=1 MHz (unless otherwise specified).
2) VBW ≥ 3 *RBW.
3) Detector =RMS
4) Sweep time = auto.
5) Perform a trace average of at least 100 traces.

- **Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction**

If continuous transmission of the EUT (D ≥ 98%) cannot be achieved and the duty cycle is constant (duty cycle variations are less than ±2%). then the following procedure shall be used

1) The EUT shall be configured to operate at the maximum achievable duty cycle.
2) Measure the duty cycle D of the transmitter output signal as described in 11.6.
3) RBW=1 MHz (unless otherwise specified).
4) VBW ≥ 3 *RBW.
5) Detector =RMS
6) Sweep time = auto.
7) Perform a trace average of at least 100 traces.

A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

*If power averaging (rms) mode was used in step 5). then the applicable correction factor is [10 10g (1/ D)], where D is the duty cycle.

**If linear voltage averaging mode was used in step f). then the applicable correction factor is [20 10g (1/D)], where D is the duty cycle.

***If a specific emission is demonstrated to be continuous (D > 98%) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that

- **Reduced VBW Averaqing across ON and OFF times of the EUT transmissions with max hold**

If continuous transmission of the EUT (D > 98%) cannot be achieved and the duty cycle is not constant (duty cycle variations exceed ±2%), then the following procedure shall be used:

1) RBW = 1MHz.
2) VBW ≥ 1/T.
3) Detector =peak
4) Sweep time = auto.
5) Trace mode = max hold.
6) Allow max hold to run for at least [50 x (1/ D)] traces

c. The EUT was placed on the top of a rotating table 0.8 meters (below 1GHz) / 1.5 meters (1-18GHz) / 1.5 meters (18-40GHz) above the reference ground. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The EUT was set 3meters away from the interference-receiving antenna (Below 1GHz) & (Above 1-18GHz), which was mounted on the top of a variable-height antenna tower. The EUT was set 1meters away from the interference-receiving antenna (18-40GHz).
e. The height of antenna 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.
f. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
g. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
h. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

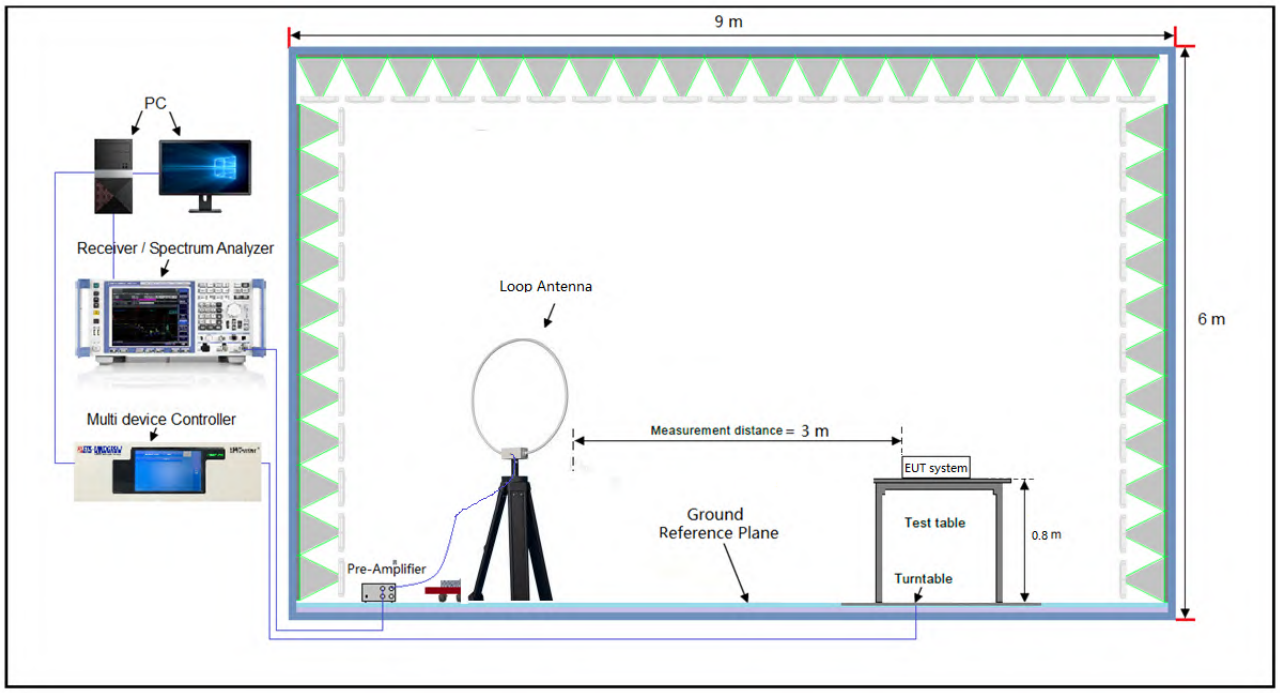
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth =3mHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth =1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is =10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 Deviation from Test Standard

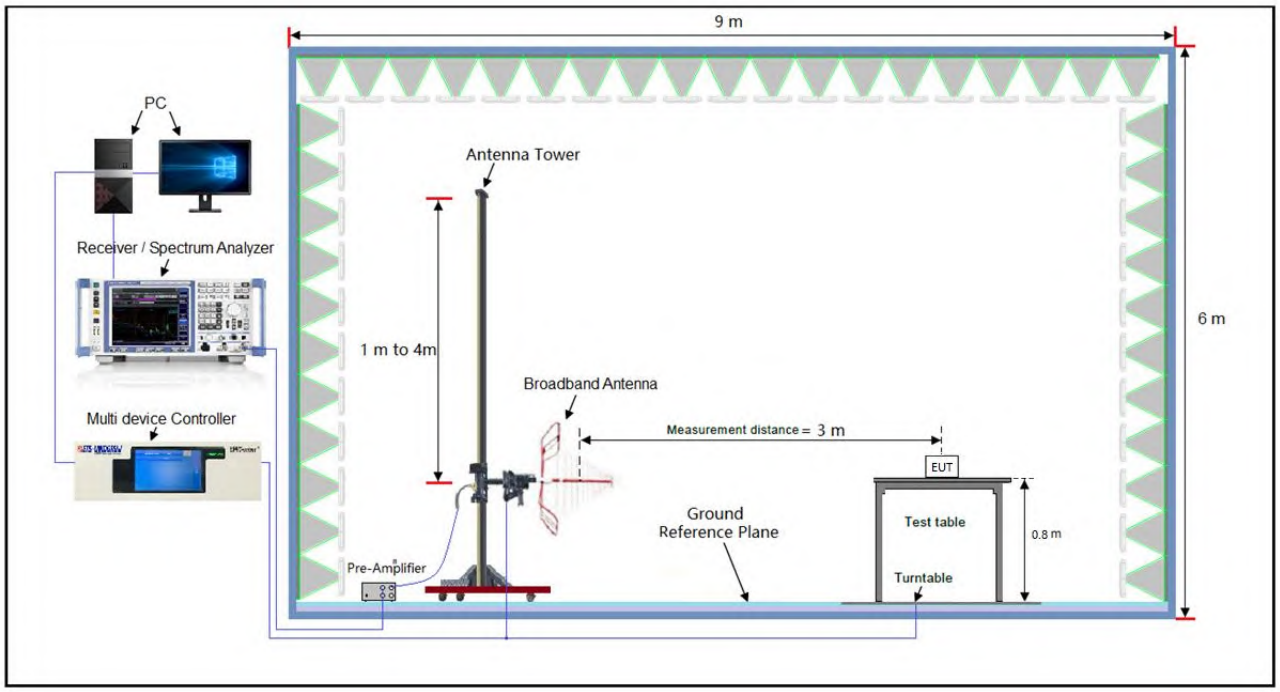
No deviation.

3.1.5 Test Setup

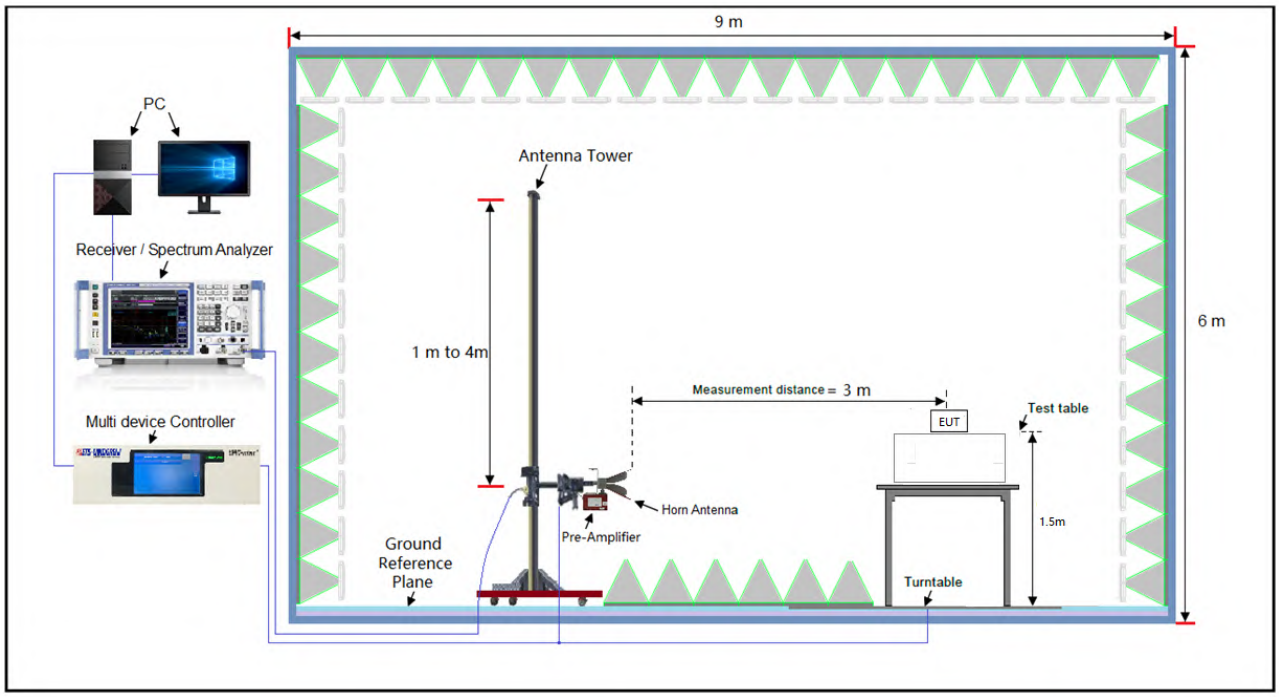
Radiated emission below 30MHz:



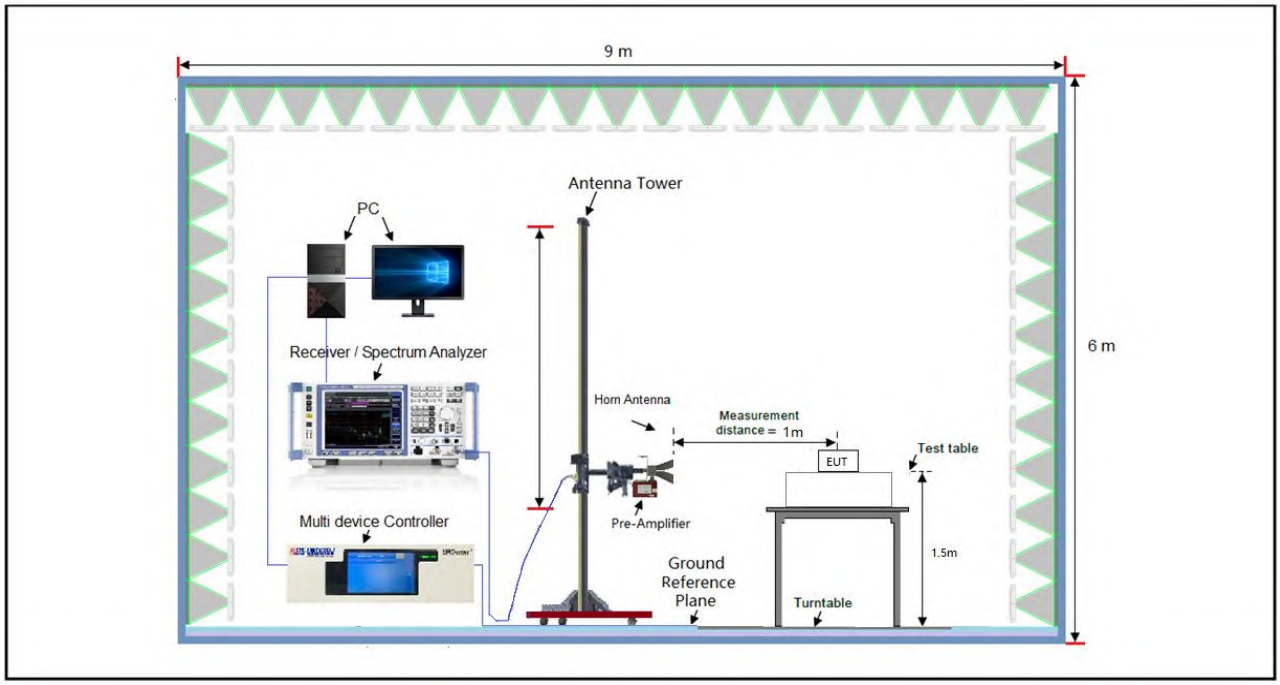
Frequency Range below 1GHz:



Frequency Range 1-18GHz:



Frequency Range 18-40GHz:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.

b. Set the EUT under transmission condition continuously at specific channel frequency.

3.1.7 Test Results

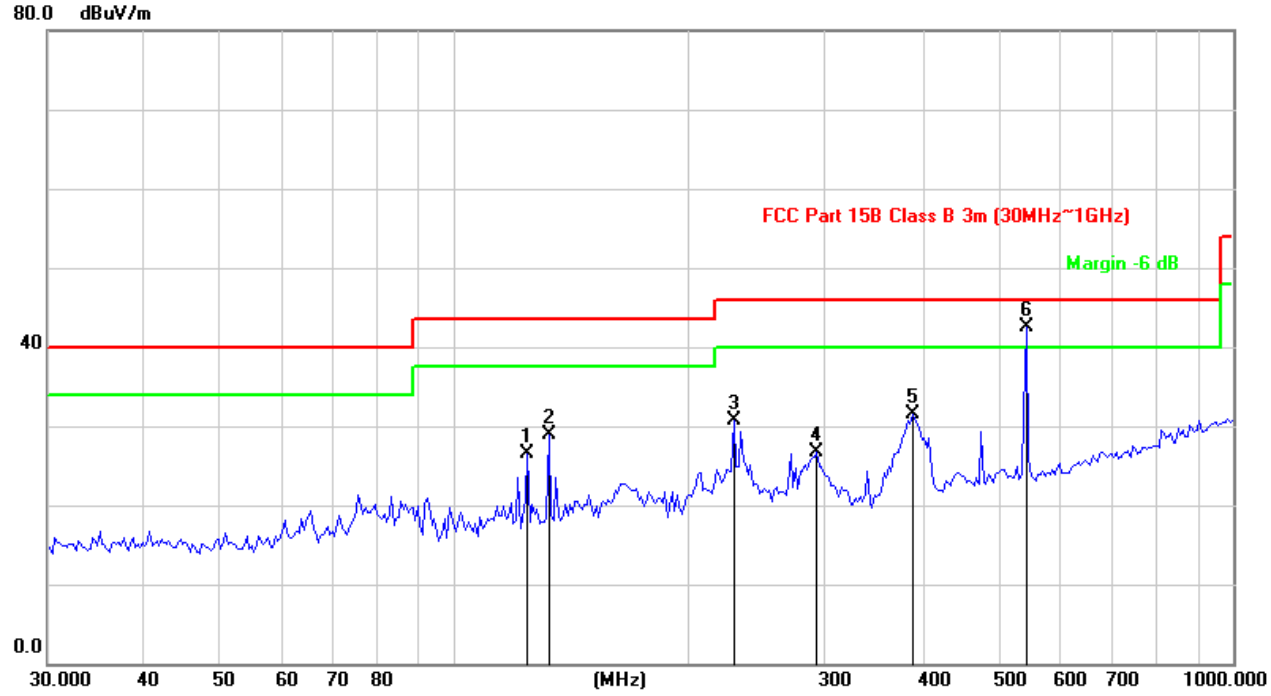
9kHz ~ 30MHz Data:

The amplitude of spurious emissions attenuated more than 20dB below the permissible value is not required to be report.

30MHz ~ 1GHz Worst-Case Data:

Test Mode	802.11b 2462MHz TX		
Test Channel	Channel 11	Frequency Range	30MHz ~ 1GHz
Detector Function	Peak (PK) Quasi-peak (QP)	Tested By	Jim Xu

Antennal Polarity &Test Distance: Horizontal at 3m



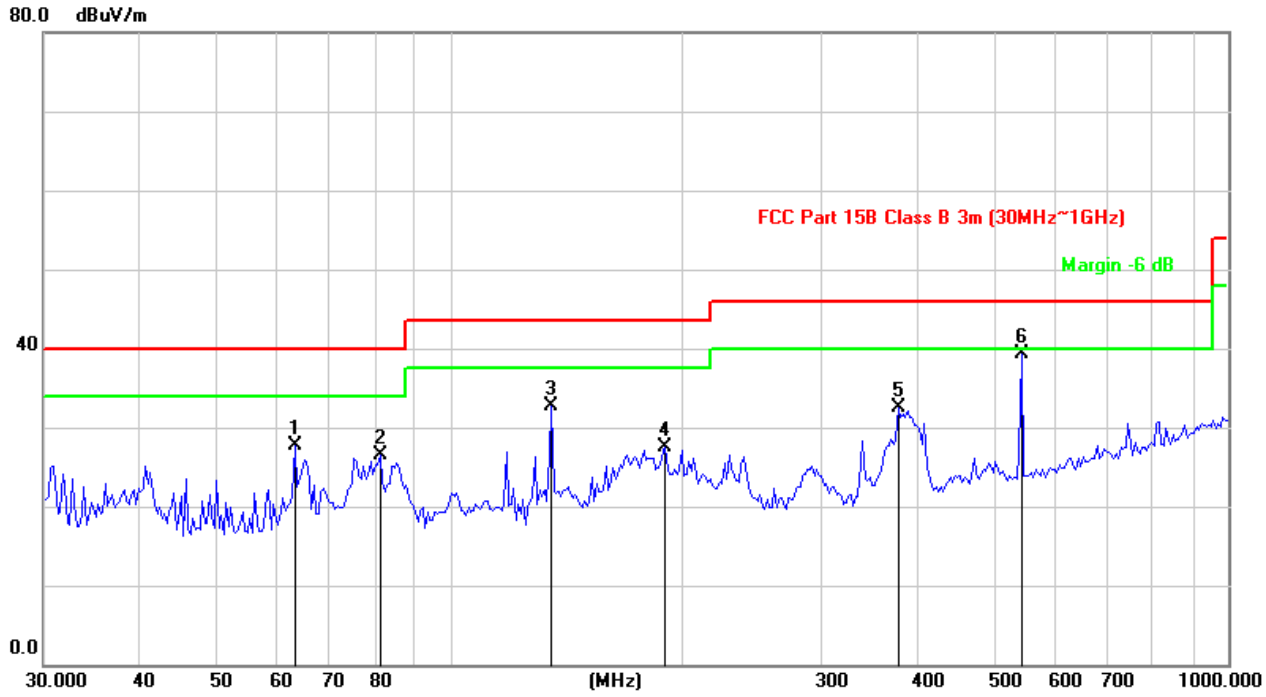
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	124.0501	42.49	-15.92	26.57	43.50	-16.93	peak	300	169
2	132.1489	44.36	-15.54	28.82	43.50	-14.68	peak	200	296
3	228.6173	46.65	-15.88	30.77	46.00	-15.23	peak	300	182
4	292.3643	41.10	-14.36	26.74	46.00	-19.26	peak	200	311
5	387.2565	43.69	-12.14	31.55	46.00	-14.45	peak	200	248
6	542.6104	50.80	-8.34	42.46	46.00	-3.54	peak	200	116

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value

Test Mode	802.11b 2462MHz TX		
Test Channel	Channel 11	Frequency Range	30MHz ~ 1GHz
Detector Function	Peak (PK) Quasi-peak (QP)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	63.1857	44.70	-16.92	27.78	40.00	-12.22	peak	200	182
2	81.3740	44.27	-17.79	26.48	40.00	-13.52	peak	100	261
3	134.9645	48.04	-15.35	32.69	43.50	-10.81	peak	200	247
4	189.1076	42.95	-15.54	27.41	43.50	-16.09	peak	100	140
5	376.5227	44.74	-12.31	32.43	46.00	-13.57	peak	100	169
6	542.6104	47.74	-8.34	39.40	46.00	-6.60	peak	100	232

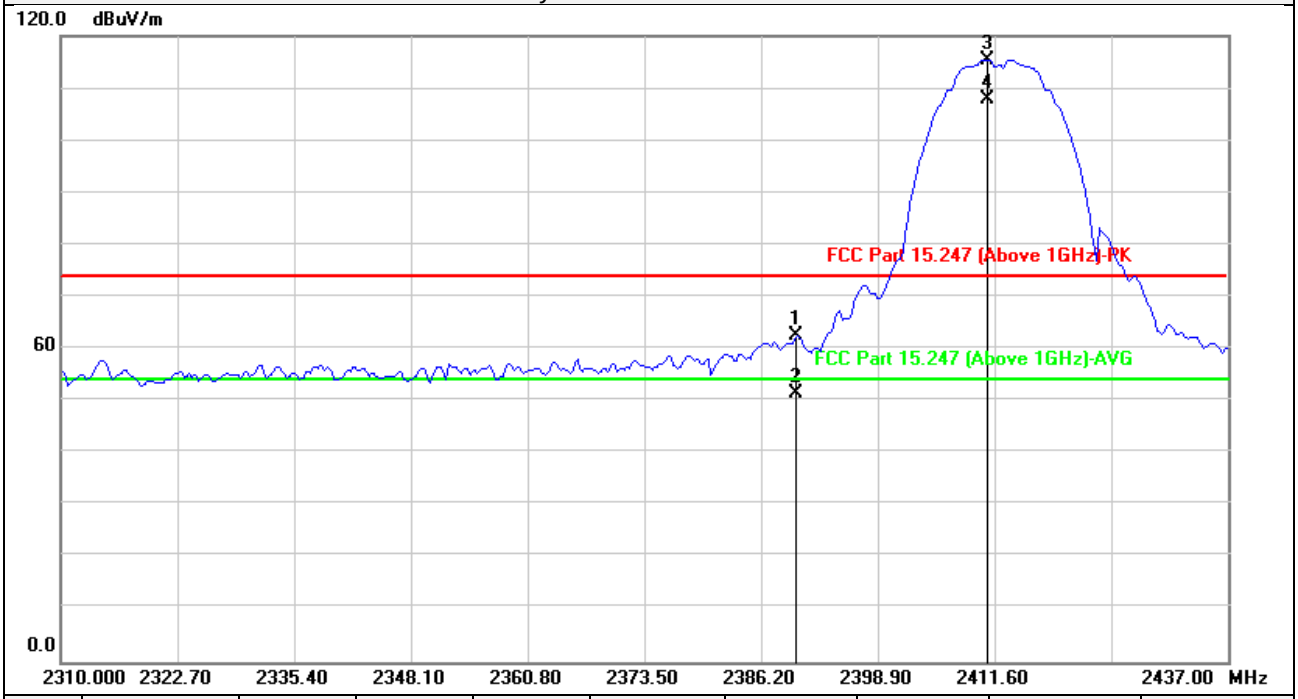
Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value

Above 1GHz Data:

Test Mode	802.11b: 2412MHz TX		
Test channel	Channel 1	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



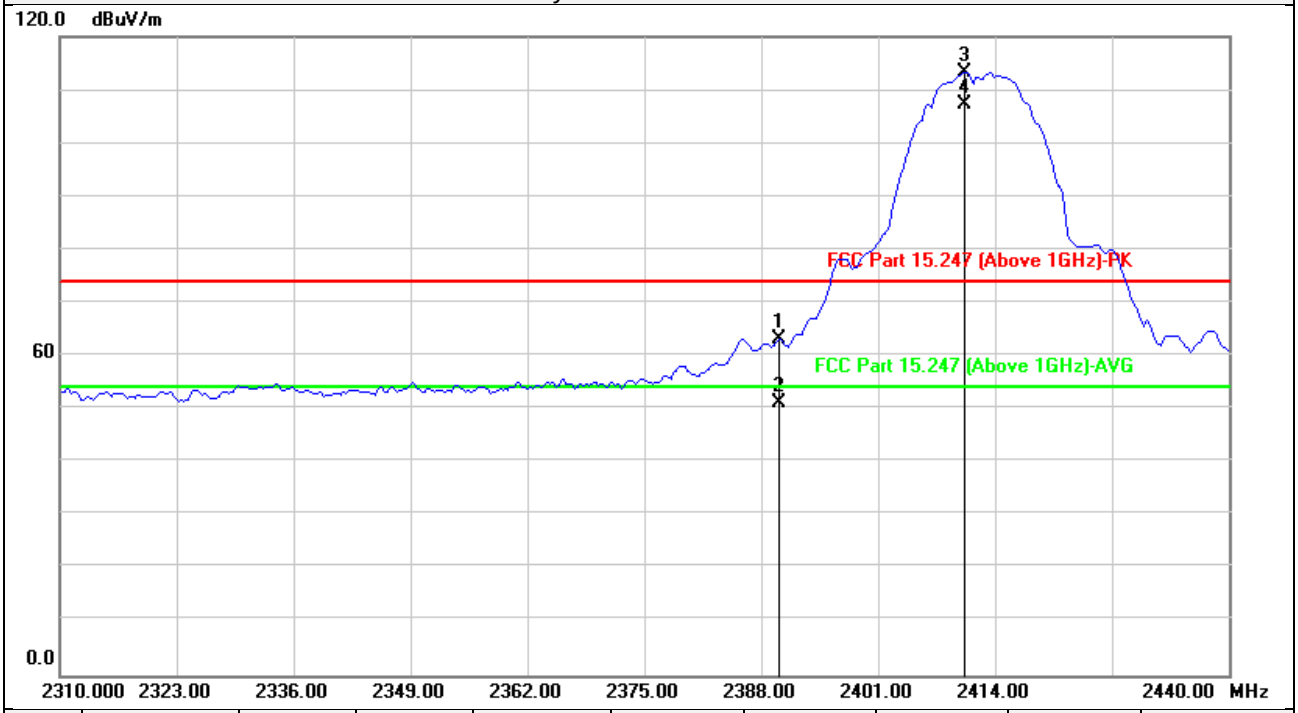
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2390.000	61.72	0.69	62.41	74.00	-11.59	peak	310	166
2	2390.000	50.87	0.69	51.56	54.00	-2.44	AVG	310	166
3	2410.786	114.77	0.72	115.49			peak	310	166
4	2410.786	107.17	0.72	107.89			AVG	310	166
5	4824.000	31.93	7.17	39.10	74.00	-34.90	peak	100	167
6	4824.000	25.23	7.17	32.40	54.00	-21.60	AVG	100	167
7	7236.000	34.19	12.13	46.32	74.00	-27.68	peak	100	132
8	7236.000	24.94	12.13	37.07	54.00	-16.93	AVG	100	132

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

Test Mode	802.11b: 2412MHz TX		
Test channel	Channel 1	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2390.000	62.45	0.69	63.14	74.00	-10.86	peak	388	168
2	2390.000	50.33	0.69	51.02	54.00	-2.98	AVG	388	168
3	2410.561	112.42	0.72	113.14			peak	388	168
4	2410.561	106.63	0.72	107.35			AVG	388	168
5	4824.000	44.14	7.17	51.31	74.00	-22.69	peak	134	205
6	4824.000	41.07	7.17	48.24	54.00	-5.76	AVG	134	205
7	7236.000	35.45	12.13	47.58	74.00	-26.42	peak	131	134
8	7236.000	26.57	12.13	38.70	54.00	-15.30	AVG	131	134

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

Test Mode	802.11b: 2437MHz TX		
Test channel	Channel 6	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

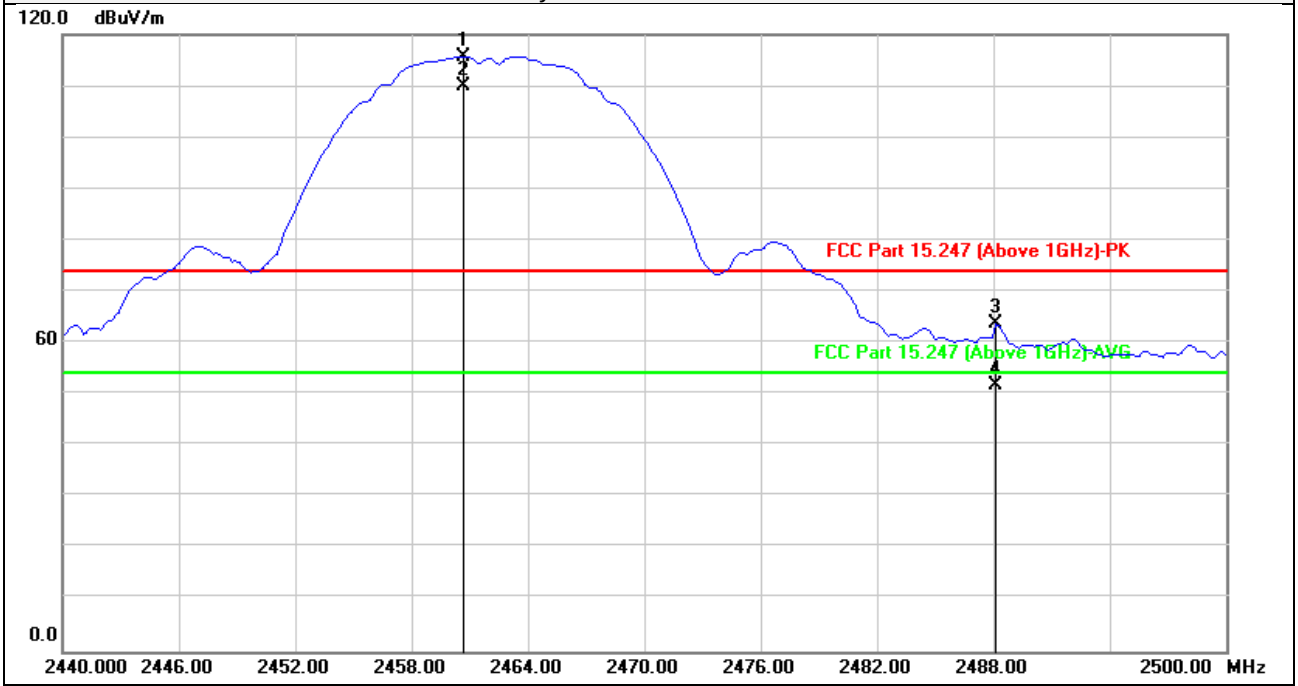
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	110.16	0.76	111.92			peak	195	113
2	2437.000	102.42	0.76	103.18			AVG	195	113
3	4874.000	32.32	7.30	39.62	74.00	-34.38	peak	195	113
4	4874.000	26.20	7.30	33.50	54.00	-20.50	AVG	195	113
5	7311.000	35.68	12.24	47.92	74.00	-26.08	peak	195	113
6	7311.000	25.92	12.24	38.16	54.00	-15.84	AVG	195	113
Antennal Polarity& Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	107.43	0.76	108.19			peak	205	187
2	2437.000	100.90	0.76	101.66			AVG	205	187
3	4874.000	31.12	7.30	38.42	74.00	-35.58	peak	205	187
4	4874.000	24.81	7.30	32.11	54.00	-21.89	AVG	205	187
5	7311.000	36.32	12.24	48.56	74.00	-25.44	peak	205	187
6	7311.000	24.87	12.24	37.11	54.00	-16.89	AVG	205	187

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

Test Mode	802.11b: 2462MHz TX		
Test channel	Channel 11	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



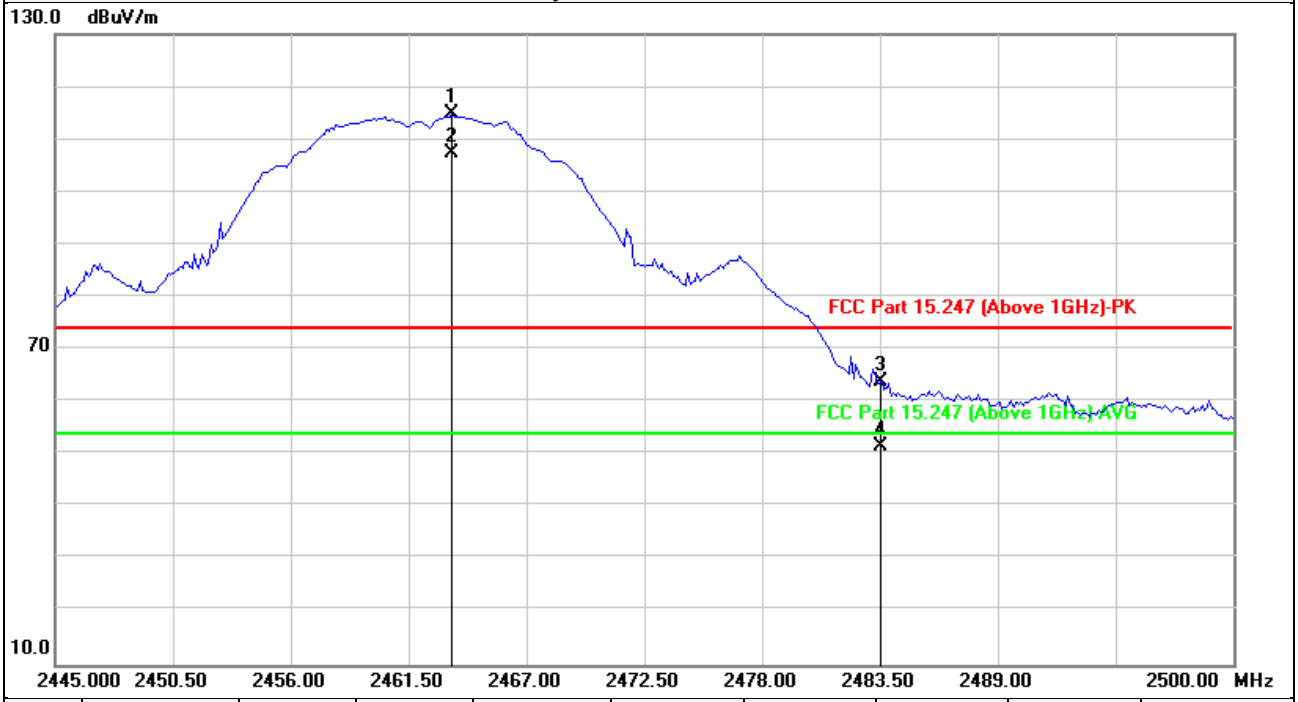
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2460.681	114.99	0.80	115.79			peak	314	175
2	2460.681	109.20	0.80	110.00			AVG	314	175
3	2488.096	62.93	0.84	63.77	74.00	-10.23	peak	314	175
4	2488.096	50.83	0.84	51.67	54.00	-2.33	AVG	314	175
5	4924.000	38.21	7.46	45.67	74.00	-28.33	peak	114	121
6	4924.000	30.72	7.46	38.18	54.00	-15.82	AVG	114	121
7	7386.000	34.97	12.35	47.32	74.00	-26.68	peak	100	110
8	7386.000	25.84	12.35	38.19	54.00	-15.81	AVG	100	110

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11b: 2462MHz TX		
Test channel	Channel 11	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



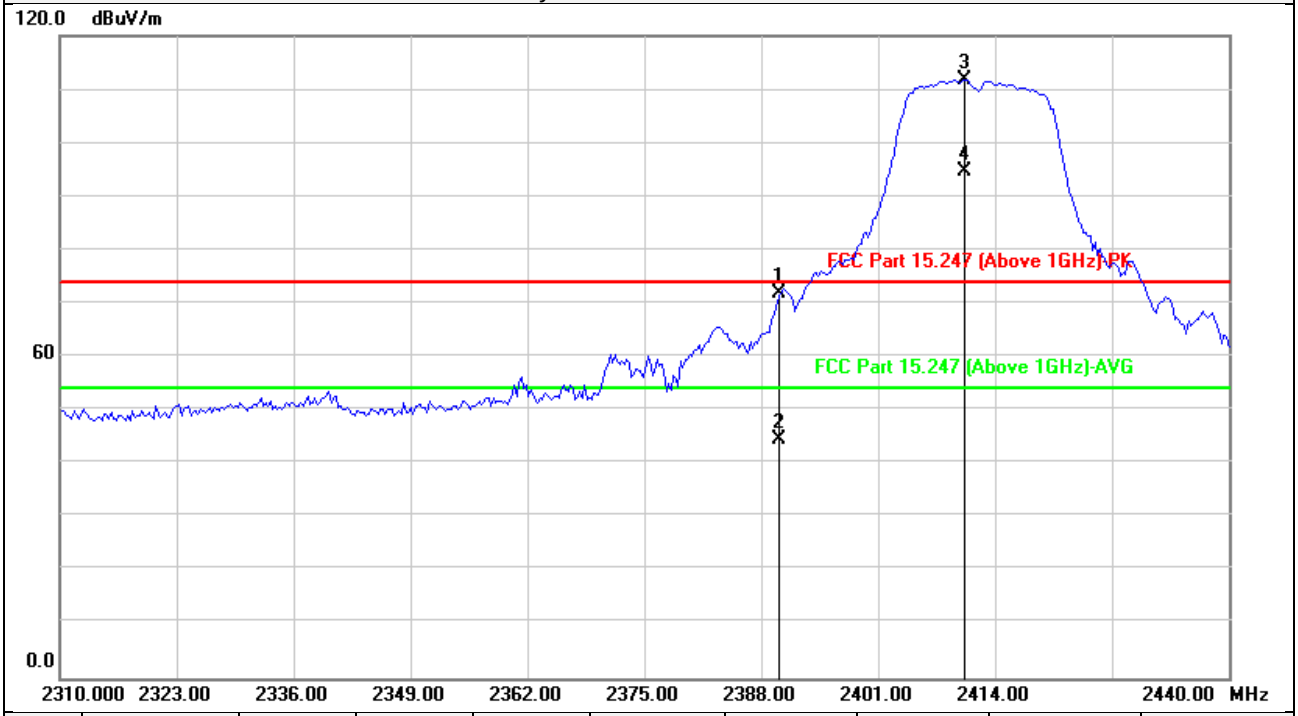
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2463.517	113.95	0.80	114.75			peak	400	166
2	2463.517	106.48	0.80	107.28			AVG	400	166
3	2483.500	62.97	0.84	63.81	74.00	-10.19	peak	400	166
4	2483.500	50.58	0.84	51.42	54.00	-2.58	AVG	400	166
5	4924.000	45.04	7.46	52.50	74.00	-21.50	peak	282	163
6	4924.000	42.46	7.46	49.92	54.00	-4.08	AVG	282	163
7	9848.000	25.37	16.32	41.69	74.00	-32.31	peak	100	115
8	9848.000	33.77	16.32	50.09	54.00	-3.91	AVG	100	115

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11g: 2412MHz TX		
Test channel	Channel 1	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



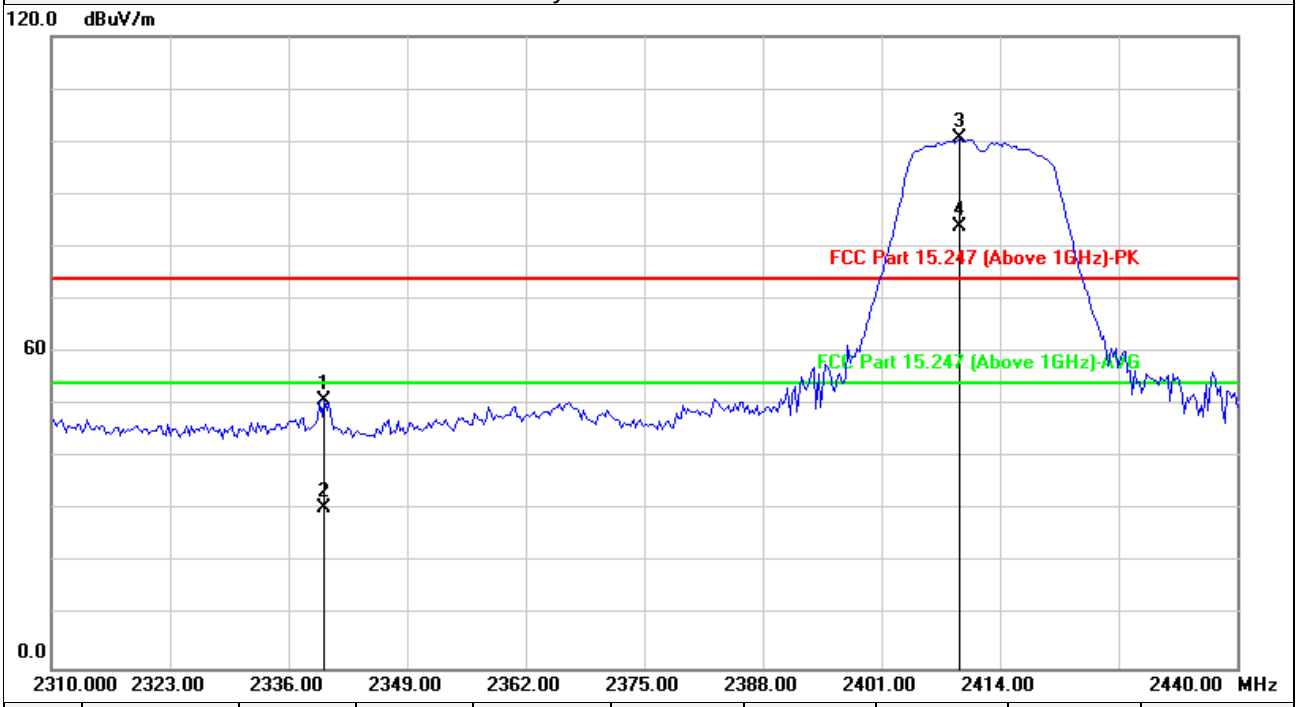
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2390.000	71.04	0.69	71.73	74.00	-2.27	peak	354	174
2	2390.000	43.82	0.69	44.51	54.00	-9.49	AVG	354	174
3	2410.561	111.01	0.72	111.73			peak	354	174
4	2410.561	93.90	0.72	94.62			AVG	354	174
5	4824.000	37.72	7.17	44.89	74.00	-29.11	peak	110	114
6	4824.000	31.06	7.17	38.23	54.00	-15.77	AVG	110	114
7	7236.000	36.46	12.13	48.59	74.00	-25.41	peak	100	131
8	7236.000	23.65	12.13	35.78	54.00	-18.22	AVG	100	131

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

Test Mode	802.11g: 2412MHz TX		
Test channel	Channel 1	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2339.960	50.17	0.60	50.77	74.00	-23.23	peak	100	115
2	2339.960	29.76	0.60	30.36	54.00	-23.64	AVG	100	115
3	2409.519	99.86	0.72	100.58			peak	100	115
4	2409.519	83.17	0.72	83.89			AVG	100	115
5	4824.000	42.50	7.17	49.67	74.00	-24.33	peak	221	195
6	4824.000	39.49	7.17	46.66	54.00	-7.34	AVG	221	195
7	7236.000	36.40	12.13	48.53	74.00	-25.47	peak	105	118
8	7236.000	24.86	12.13	36.99	54.00	-17.01	AVG	105	118

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

Test Mode	802.11g: 2437MHz TX		
Test channel	Channel 6	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

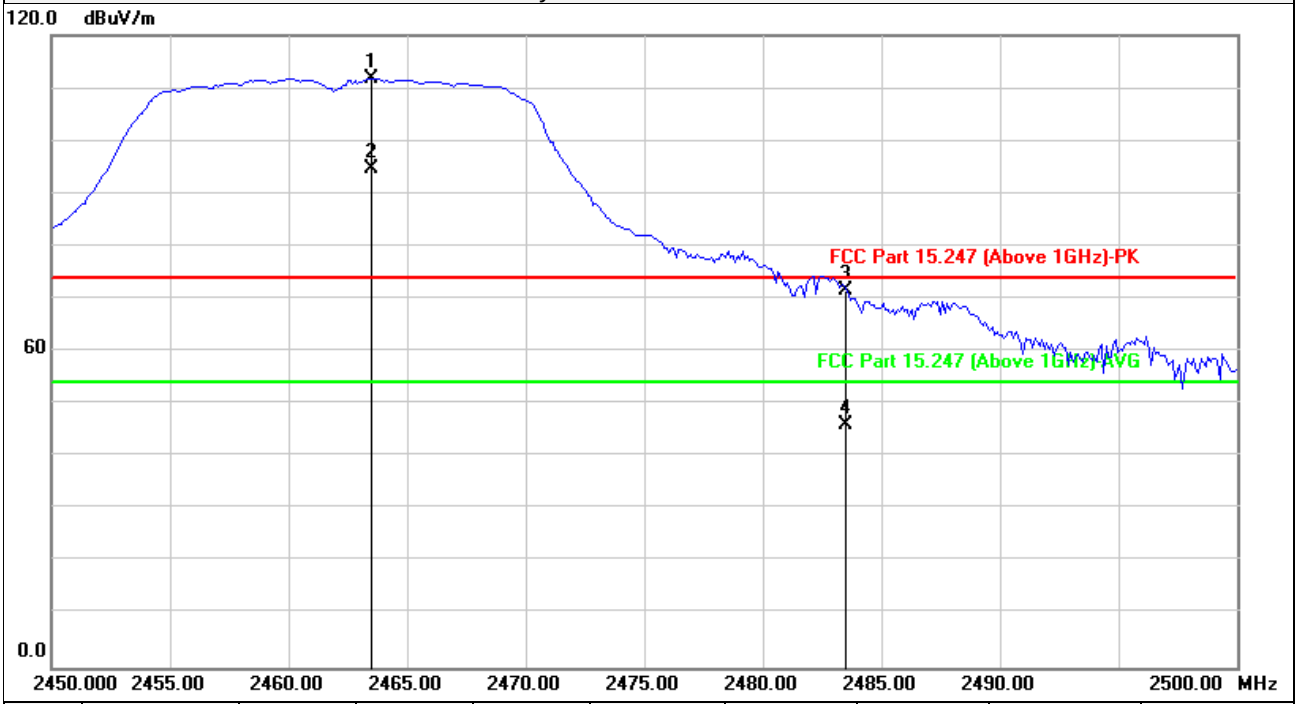
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	108.57	0.76	109.33			peak	119	92
2	2437.000	101.43	0.76	102.19			AVG	119	92
3	4874.000	30.16	7.30	37.46	74.00	-36.54	peak	119	92
4	4874.000	26.81	7.30	34.11	54.00	-19.89	AVG	119	92
5	7311.000	35.09	12.24	47.33	74.00	-26.67	peak	119	92
6	7311.000	24.95	12.24	37.19	54.00	-16.81	AVG	119	92
Antennal Polarity& Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	109.90	0.76	110.66			peak	160	133
2	2437.000	102.88	0.76	103.64			AVG	160	133
3	4874.000	32.11	7.30	39.41	74.00	-34.59	peak	160	133
4	4874.000	26.39	7.30	33.69	54.00	-20.31	AVG	160	133
5	7311.000	36.92	12.24	49.16	74.00	-24.84	peak	160	133
6	7311.000	25.56	12.24	37.80	54.00	-16.20	AVG	160	133

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

Test Mode	802.11g: 2462MHz TX		
Test channel	Channel 11	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



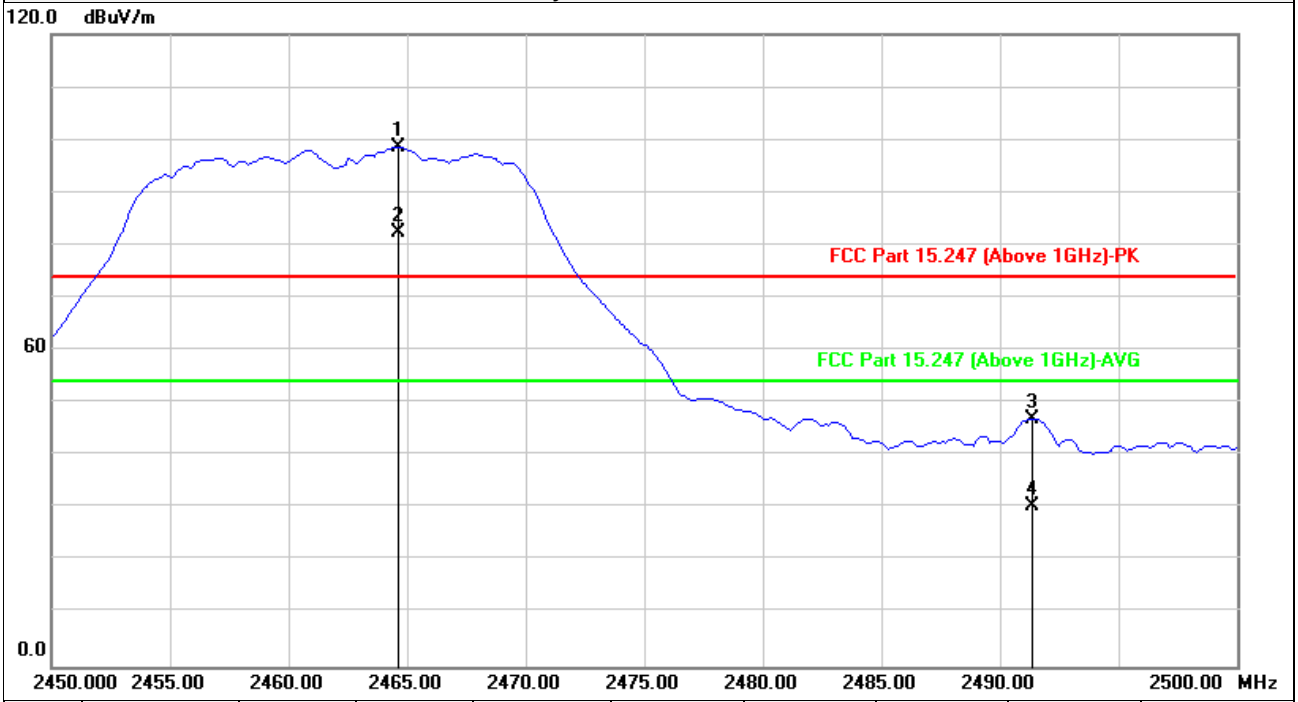
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2463.527	110.91	0.80	111.71			peak	350	173
2	2463.527	93.71	0.80	94.51			AVG	350	173
3	2483.500	70.77	0.84	71.61	74.00	-2.39	peak	350	173
4	2483.500	45.35	0.84	46.19	54.00	-7.81	AVG	350	173
5	4924.000	35.65	7.46	43.11	74.00	-30.89	peak	100	118
6	4924.000	27.90	7.46	35.36	54.00	-18.64	AVG	100	118
7	7386.000	33.92	12.35	46.27	74.00	-27.73	peak	110	108
8	7386.000	24.08	12.35	36.43	54.00	-17.57	AVG	110	108

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11g: 2462MHz TX		
Test channel	Channel 11	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



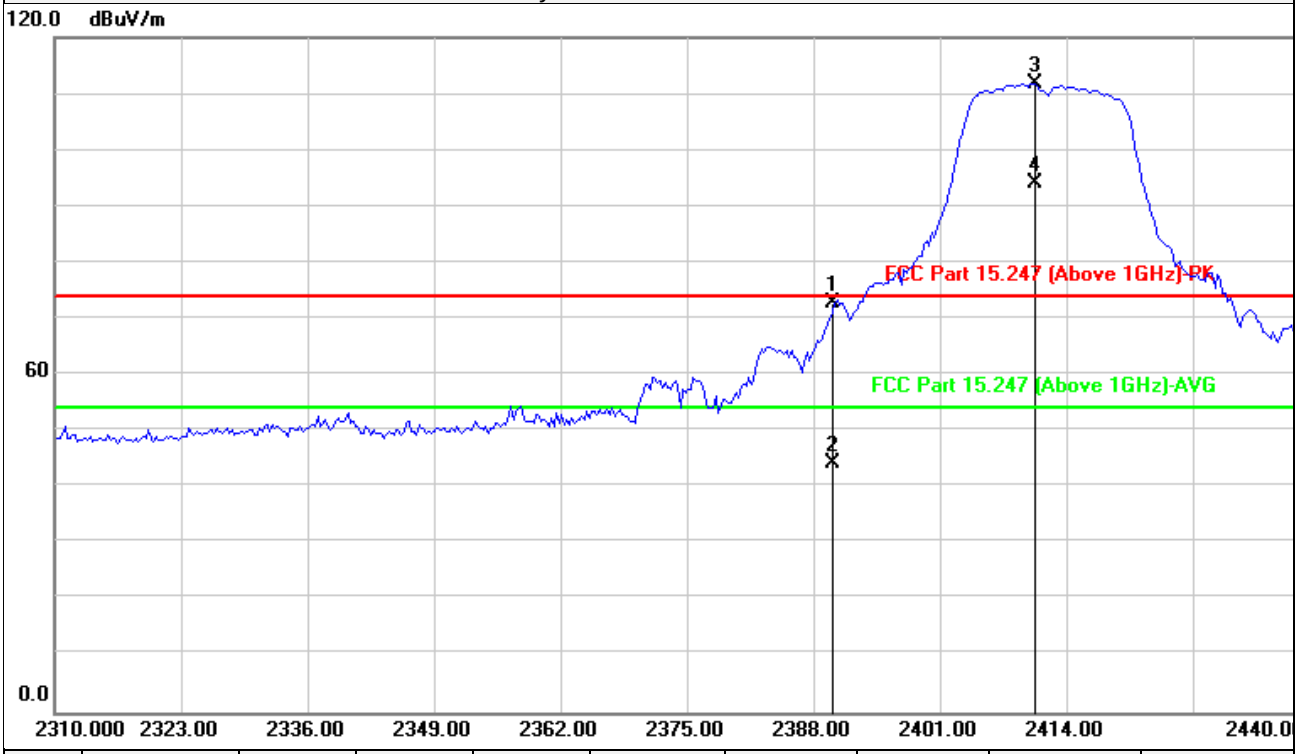
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2464.629	97.81	0.80	98.61			peak	100	154
2	2464.629	81.70	0.80	82.50			AVG	100	154
3	2491.383	46.24	0.85	47.09	74.00	-26.91	peak	100	154
4	2491.383	29.65	0.85	30.50	54.00	-23.50	AVG	100	154
5	4924.000	44.10	7.46	51.56	74.00	-22.44	peak	286	206
6	4924.000	39.71	7.46	47.17	54.00	-6.83	AVG	286	206
7	7386.000	34.14	12.35	46.49	74.00	-27.51	peak	100	165
8	7386.000	25.52	12.35	37.87	54.00	-16.13	AVG	100	165

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11n HT20: 2412MHz TX		
Test channel	Channel 1	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



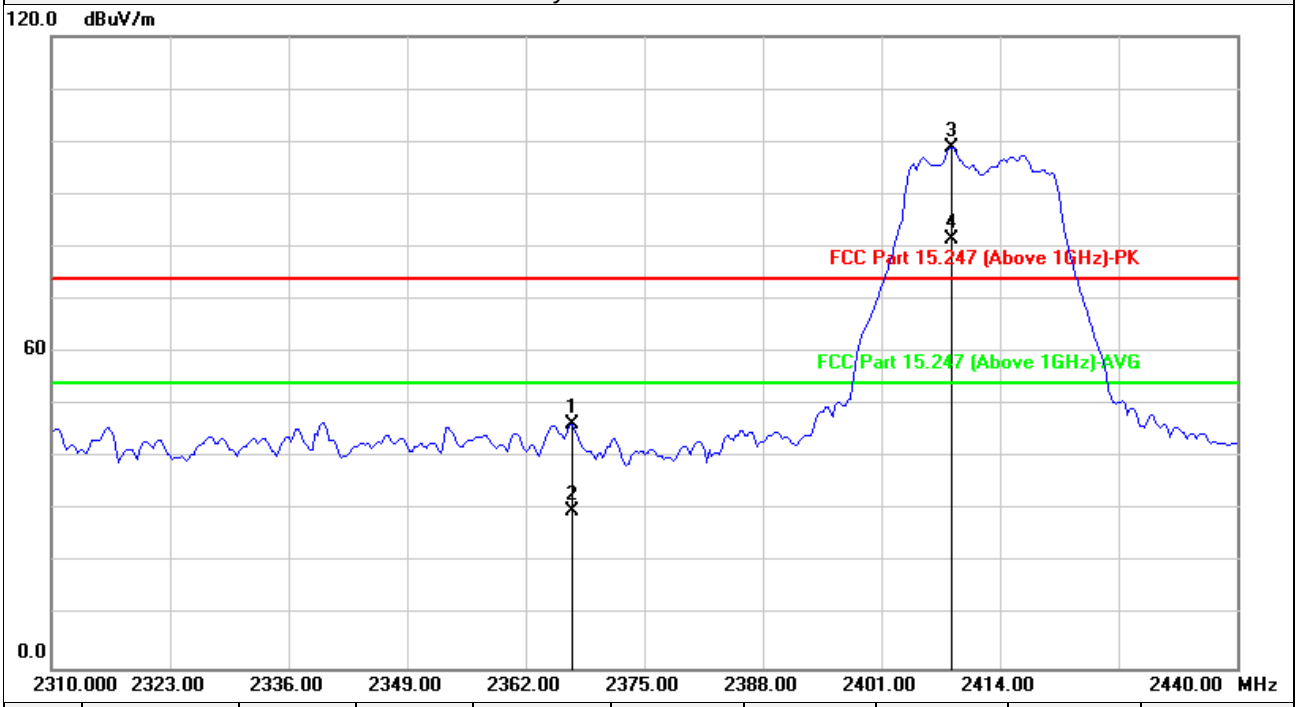
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2390.000	72.15	0.69	72.84	74.00	-1.16	peak	351	174
2	2390.000	43.63	0.69	44.32	54.00	-9.68	AVG	351	174
3	2410.822	110.94	0.72	111.66			peak	351	174
4	2410.822	93.27	0.72	93.99			AVG	351	174
5	4924.000	44.10	7.46	51.56	74.00	-22.44	peak	286	206
6	4924.000	39.71	7.46	47.17	54.00	-6.83	AVG	286	206
7	7386.000	34.14	12.35	46.49	74.00	-27.51	peak	100	165
8	7386.000	25.52	12.35	37.87	54.00	-16.13	AVG	100	165

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

Test Mode	802.11n HT20: 2412MHz TX		
Test channel	Channel 1	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2367.054	45.66	0.66	46.32	74.00	-27.68	peak	100	115
2	2367.054	29.17	0.66	29.83	54.00	-24.17	AVG	100	115
3	2408.738	98.25	0.72	98.97			peak	100	115
4	2408.738	80.75	0.72	81.47			AVG	100	115
5	4824.000	41.36	7.17	48.53	74.00	-25.47	peak	229	192
6	4824.000	39.82	7.17	46.99	54.00	-7.01	AVG	229	192
7	7236.000	36.19	12.13	48.32	74.00	-25.68	peak	110	116
8	7236.000	24.38	12.13	36.51	54.00	-17.49	AVG	110	116

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

Test Mode	802.11n HT20: 2437MHz TX		
Test channel	Channel 6	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

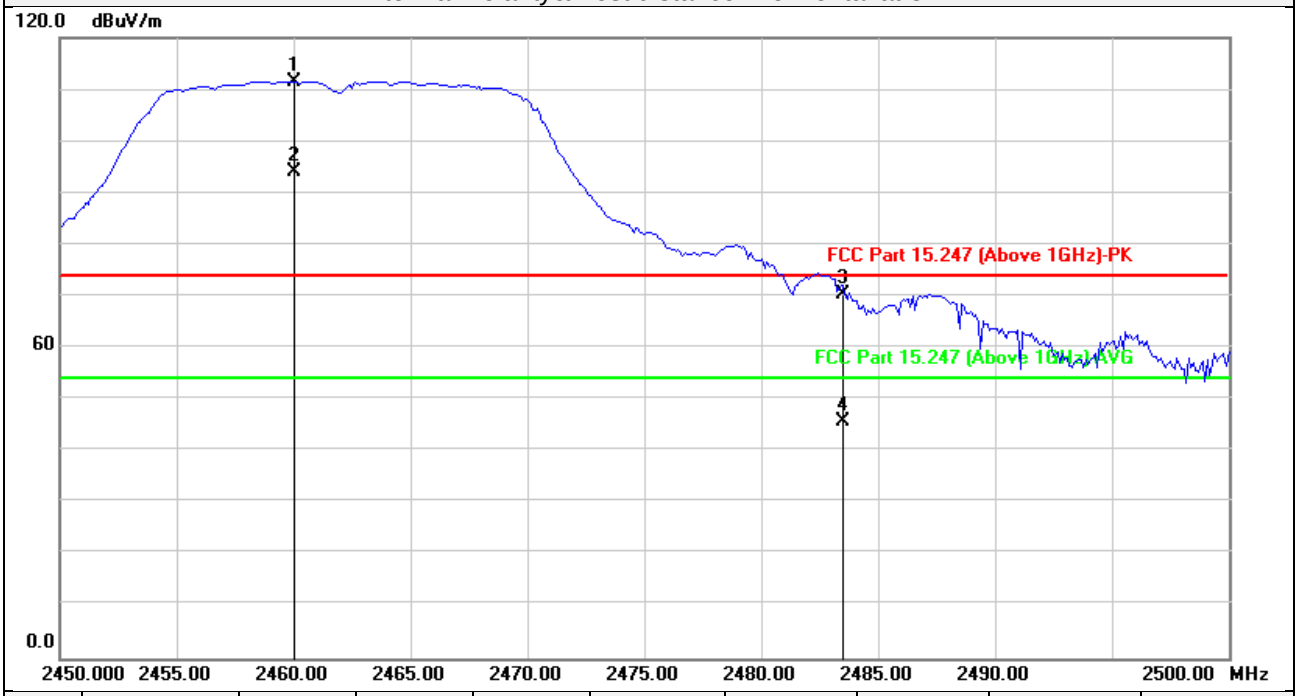
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	111.16	0.76	112.92			peak	318	265
2	2437.000	104.40	0.76	105.16			AVG	318	265
3	4874.000	31.61	7.30	38.91	74.00	-35.09	peak	318	265
4	4874.000	28.36	7.30	35.66	54.00	-18.34	AVG	318	265
5	7311.000	33.95	12.24	46.19	74.00	-27.81	peak	318	265
6	7311.000	24.57	12.24	36.81	54.00	-17.19	AVG	318	264
Antennal Polarity& Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	108.67	0.76	109.43			peak	100	199
2	2437.000	102.40	0.76	103.16			AVG	100	199
3	4874.000	32.11	7.30	39.41	74.00	-34.59	peak	100	199
4	4874.000	28.81	7.30	36.11	54.00	-17.89	AVG	100	199
5	7311.000	34.91	12.24	47.15	74.00	-26.85	peak	100	199
6	7311.000	23.68	12.24	35.92	54.00	-18.08	AVG	100	199

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

Test Mode	802.11n HT20: 2462MHz TX		
Test channel	Channel 11	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



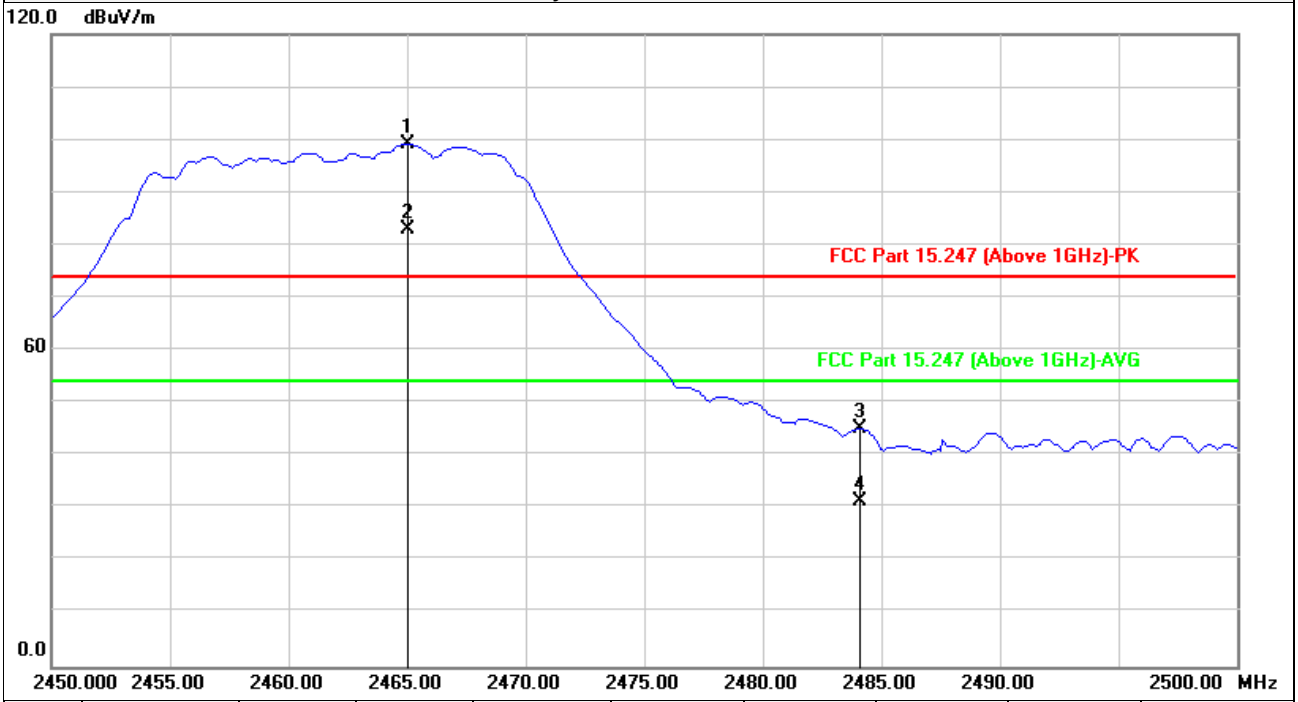
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2460.020	110.78	0.80	111.58			peak	350	175
2	2460.020	93.23	0.80	94.03			AVG	350	175
3	2483.500	69.52	0.84	70.36	74.00	-3.64	peak	350	175
4	2483.500	44.87	0.84	45.71	54.00	-8.29	AVG	350	175
5	4924.000	35.46	7.46	42.92	74.00	-31.08	peak	100	113
6	4924.000	23.27	7.46	30.73	54.00	-23.27	AVG	100	113
7	7386.000	44.17	12.35	56.52	74.00	-17.48	peak	100	139
8	7386.000	27.89	12.35	40.24	54.00	-13.76	AVG	100	139

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11n HT20: 2462MHz TX		
Test channel	Channel 11	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



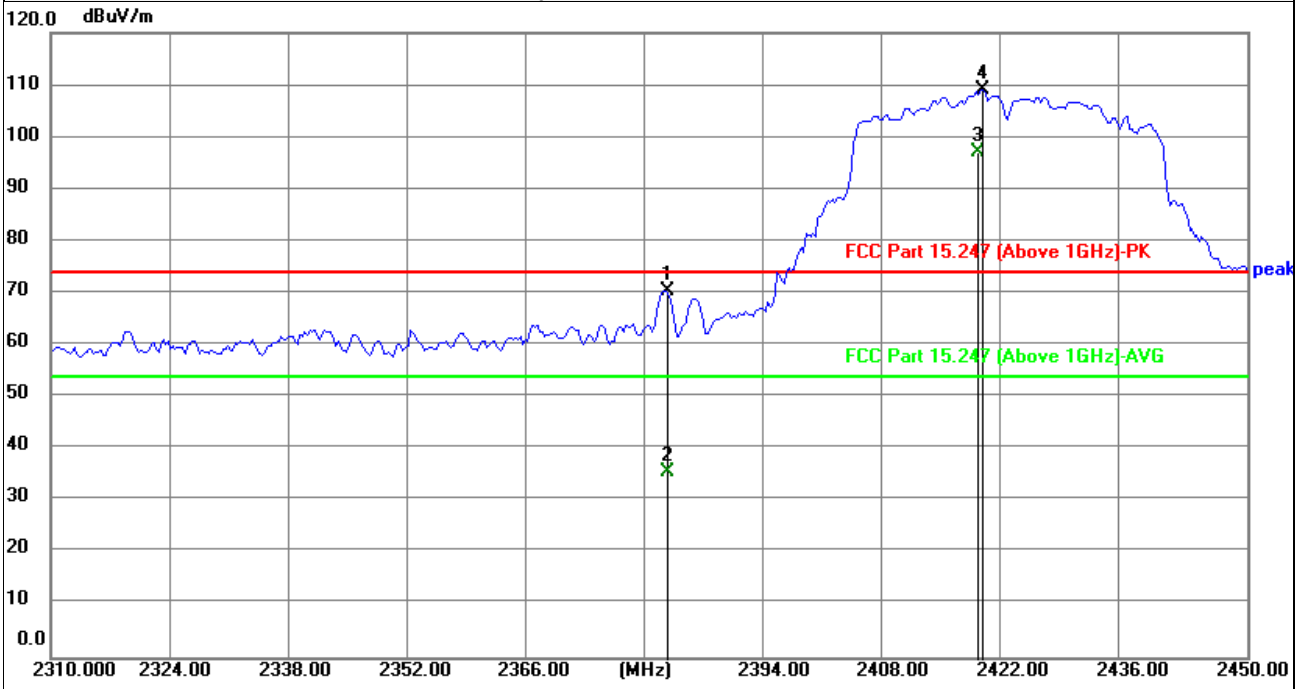
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2465.030	98.36	0.80	99.16			peak	100	154
2	2465.030	82.16	0.80	82.96			AVG	100	154
3	2484.068	44.24	0.84	45.08	74.00	-28.92	peak	100	154
4	2484.068	30.46	0.84	31.30	54.00	-22.70	AVG	100	154
5	4924.000	43.41	7.46	50.87	74.00	-23.13	peak	220	160
6	4924.000	29.85	7.46	37.31	54.00	-16.69	AVG	220	160
7	7386.000	44.11	12.35	56.46	74.00	-17.54	peak	137	133
8	7386.000	27.15	12.35	39.50	54.00	-14.50	AVG	137	133

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11n HT40: 2422MHz TX		
Test channel	Channel 3	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



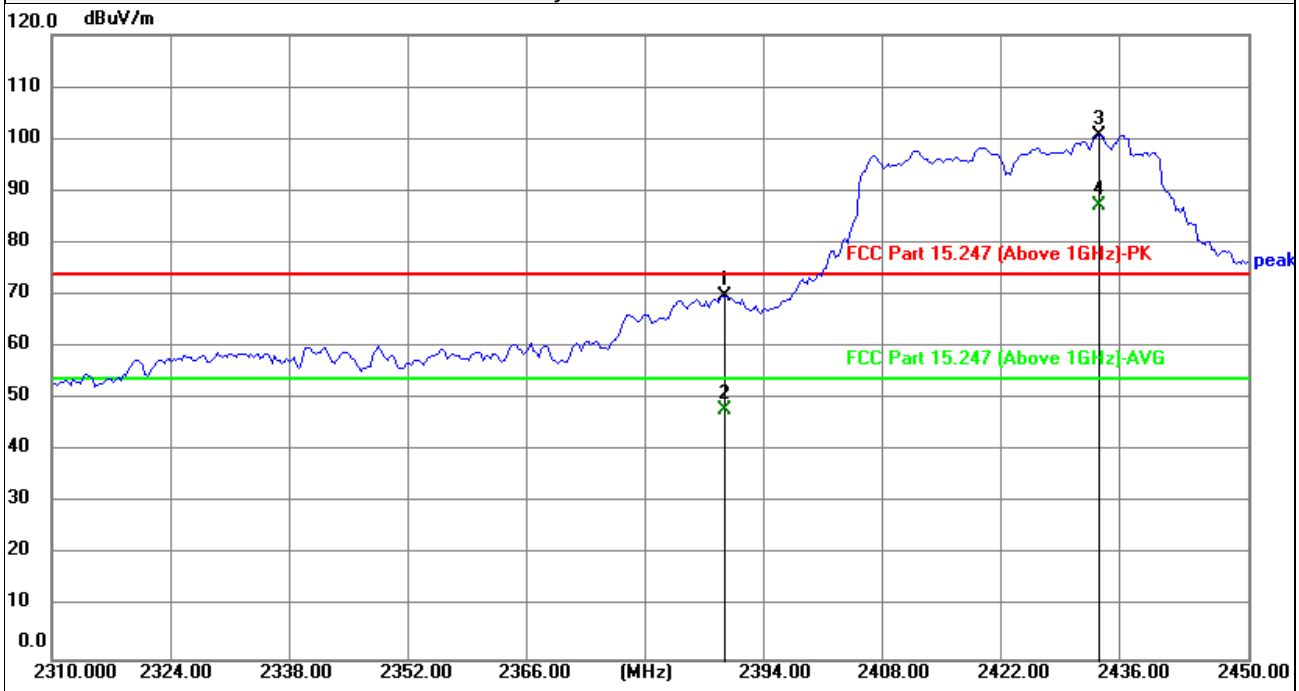
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2381.824	69.65	0.68	70.33	74.00	-3.67	peak	100	98
2	2381.824	35.07	0.68	35.75	54.00	-18.25	AVG	100	98
3	2418.577	96.51	0.73	97.24			AVG	100	98
4	2418.858	108.26	0.73	108.99			peak	100	98
5	4844.000	43.43	7.22	50.65	74.00	-23.35	peak	221	116
6	4844.000	31.95	7.22	39.17	54.00	-14.83	AVG	221	116
7	7266.000	32.97	12.16	45.13	74.00	-28.87	peak	100	166
8	7266.000	20.46	12.16	32.62	54.00	-21.38	AVG	100	166

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2422MHz: Fundamental frequency.

Test Mode	802.11n HT40: 2422MHz TX		
Test channel	Channel 3	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2388.557	69.07	0.68	69.75	74.00	-4.25	peak	286	180
2	2388.557	47.48	0.68	48.16	54.00	-5.84	AVG	286	180
3	2432.605	100.06	0.75	100.81			peak	286	180
4	2432.605	86.56	0.75	87.31			AVG	286	180
5	4844.000	46.72	4.56	51.28	74.00	-22.72	peak	100	43
6	4844.000	34.46	4.56	39.02	54.00	-14.98	AVG	100	43
7	7266.000	43.09	9.16	52.25	74.00	-21.75	peak	100	114
8	7266.000	31.67	9.16	40.83	54.00	-13.17	AVG	100	114

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2422MHz: Fundamental frequency.

Test Mode	802.11n HT40: 2437MHz TX		
Test channel	Channel 6	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

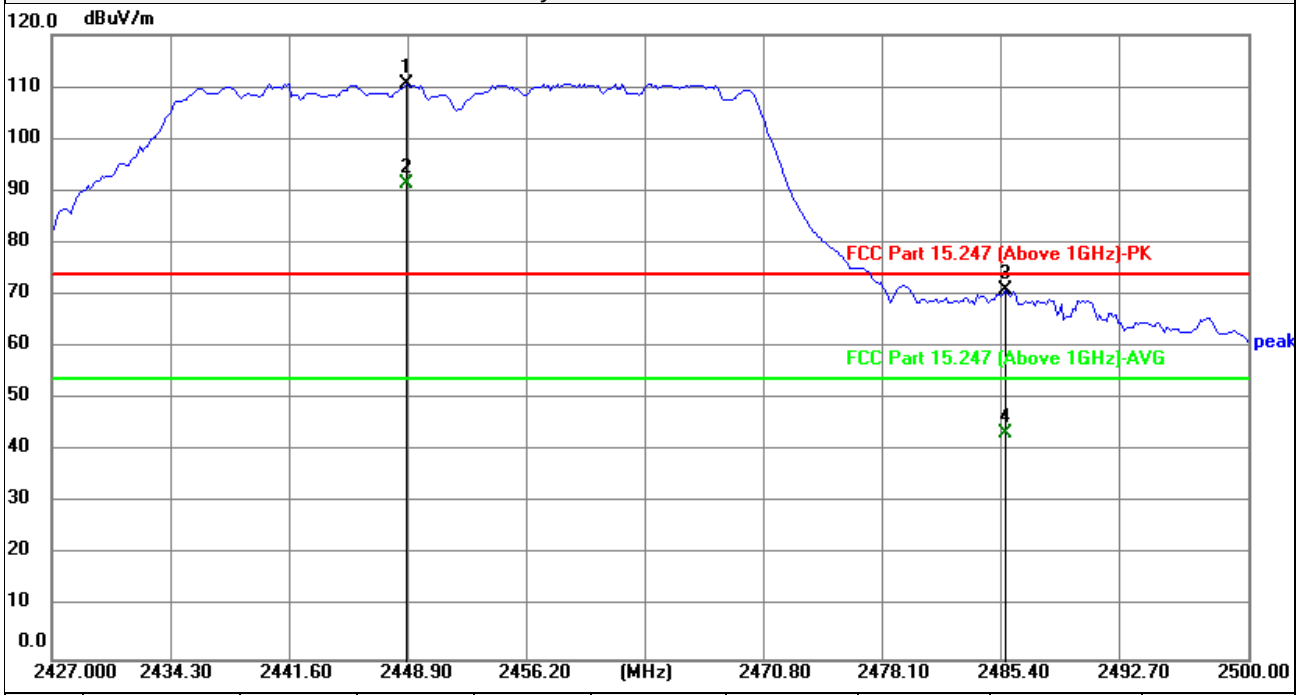
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	108.16	0.76	109.92			peak	293	46
2	2437.000	101.46	0.76	102.22			AVG	293	46
3	4874.000	41.88	7.30	49.18	74.00	-24.82	peak	293	46
4	4874.000	29.61	7.30	36.91	54.00	-17.09	AVG	293	46
5	7311.000	36.02	12.24	48.26	74.00	-25.74	peak	293	46
6	7311.000	24.87	12.24	37.11	54.00	-16.89	AVG	293	46
Antennal Polarity& Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	102.15	0.76	103.91			peak	346	209
2	2437.000	96.43	0.76	97.19			AVG	346	209
3	4874.000	41.07	7.30	48.37	74.00	-25.63	peak	346	209
4	4874.000	30.06	7.30	37.36	54.00	-16.64	AVG	346	209
5	7311.000	36.87	12.24	49.11	74.00	-24.89	peak	346	209
6	7311.000	24.58	12.24	36.82	54.00	-17.18	AVG	346	209

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

Test Mode	802.11n HT40: 2452MHz TX		
Test channel	Channel 9	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test distance: Horizontal at 3m



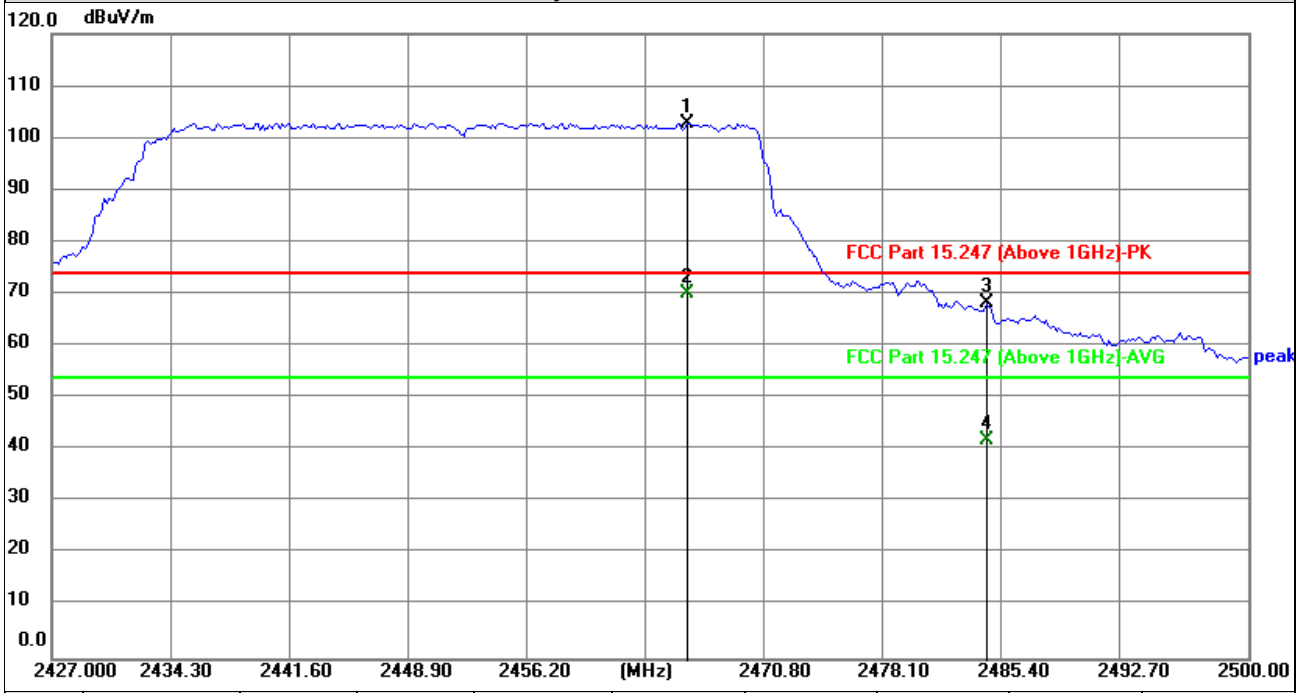
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2448.651	109.84	0.78	110.62			peak	338	162
2	2448.651	90.67	0.78	91.45			AVG	338	162
3	2485.224	70.09	0.85	70.94	74.00	-3.06	peak	338	162
4	2485.224	42.73	0.85	43.58	54.00	-10.42	AVG	338	162
5	4904.000	43.24	7.41	50.65	74.00	-23.35	peak	126	223
6	4904.000	31.76	7.41	39.17	54.00	-14.83	AVG	126	223
7	7356.000	33.50	12.30	45.80	74.00	-28.20	peak	105	155
8	7356.000	22.14	12.30	34.44	54.00	-19.56	AVG	105	155

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

Test Mode	802.11n HT40: 2452MHz TX		
Test channel	Channel 9	Frequency Range	1GHz ~ 25GHz
Detector Function	Peak (PK) Average (AVG)	Tested By	Jim Xu

Antennal Polarity& Test Distance: Vertical at 3m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2465.767	101.92	0.81	102.73			peak	270	202
2	2465.767	69.29	0.81	70.10			AVG	270	202
3	2484.054	67.63	0.84	68.47	74.00	-5.53	peak	270	202
4	2484.054	41.17	0.84	42.01	54.00	-11.99	AVG	270	202
5	4904.000	42.01	7.41	49.42	74.00	-24.58	peak	268	198
6	4904.000	30.96	7.41	38.37	54.00	-15.63	AVG	268	198
7	7356.000	33.81	12.30	46.11	74.00	-27.89	peak	100	166
8	7356.000	22.64	12.30	34.94	54.00	-19.06	AVG	100	166

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

3.2 Conducted Emission Measurement

3.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to0.50MHz.

3.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Due Date of Calibration
EMI Test Receiver Rohde&Schwarz	ESCI3	101418	2021/09/05
Artificial Mains Network Rohde&Schwarz	ENV216	3560.6550.15	2021/09/16
Test software FARAD	EZ_EMC V1.1.4.2	N/A	N/A

Note: 1. The calibration interval of the above test instruments is 12 months.
2. The test was performed in Shielded Room 1.

3.2.3 Test Procedures

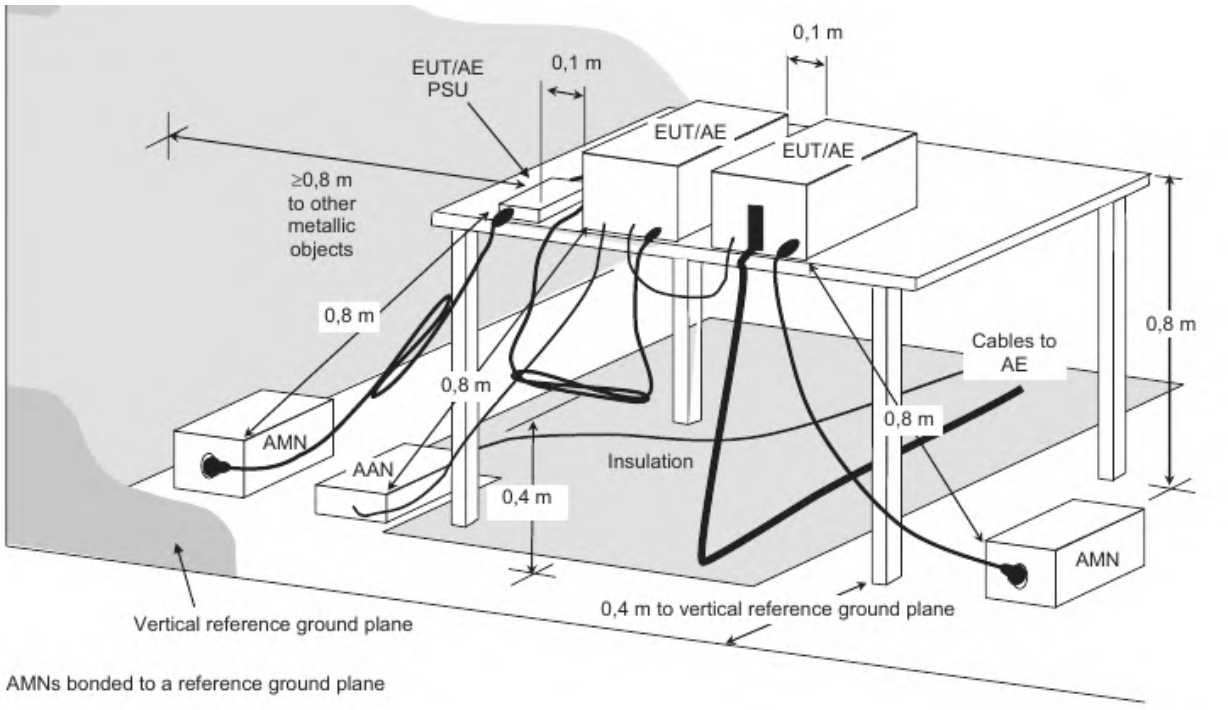
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB) was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 Deviation from Test Standard

No deviation.

3.2.5 Test setup



3.2.6 EUT Operating Conditions

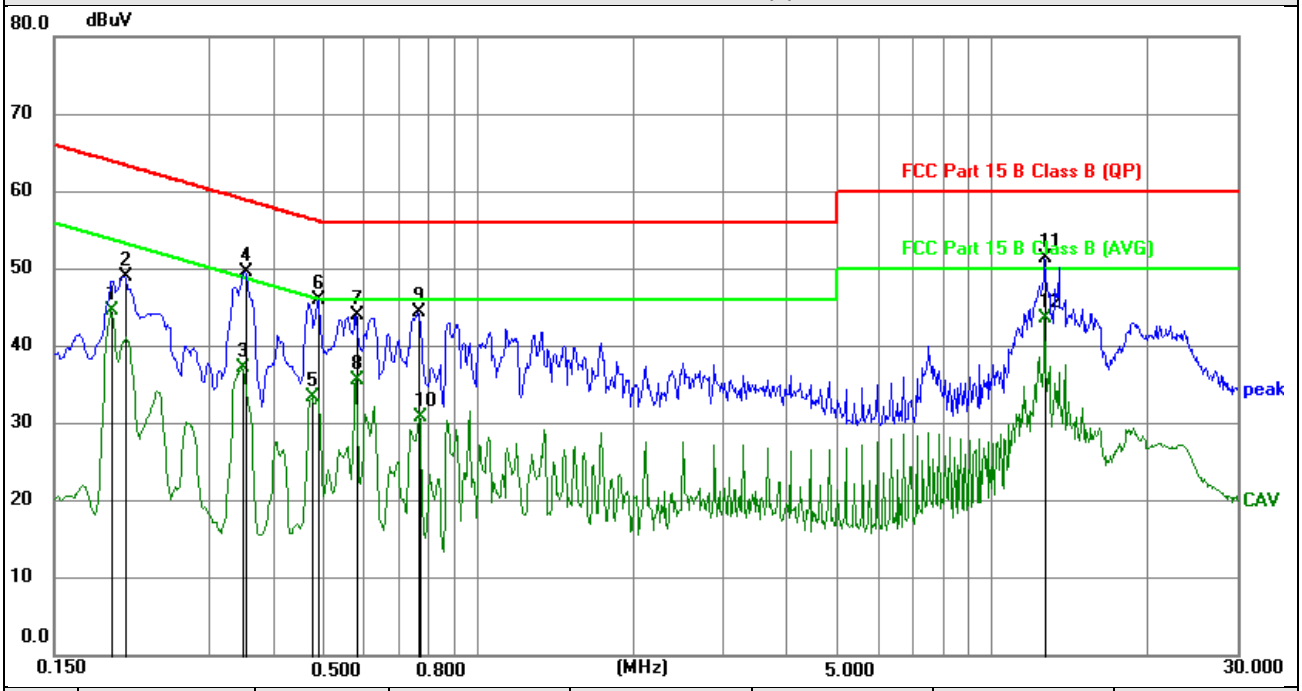
a. Placed the EUT on the testing table.

b. Set the EUT under transmission condition continuously at specific channel frequency.

3.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase of Power: Line (L)



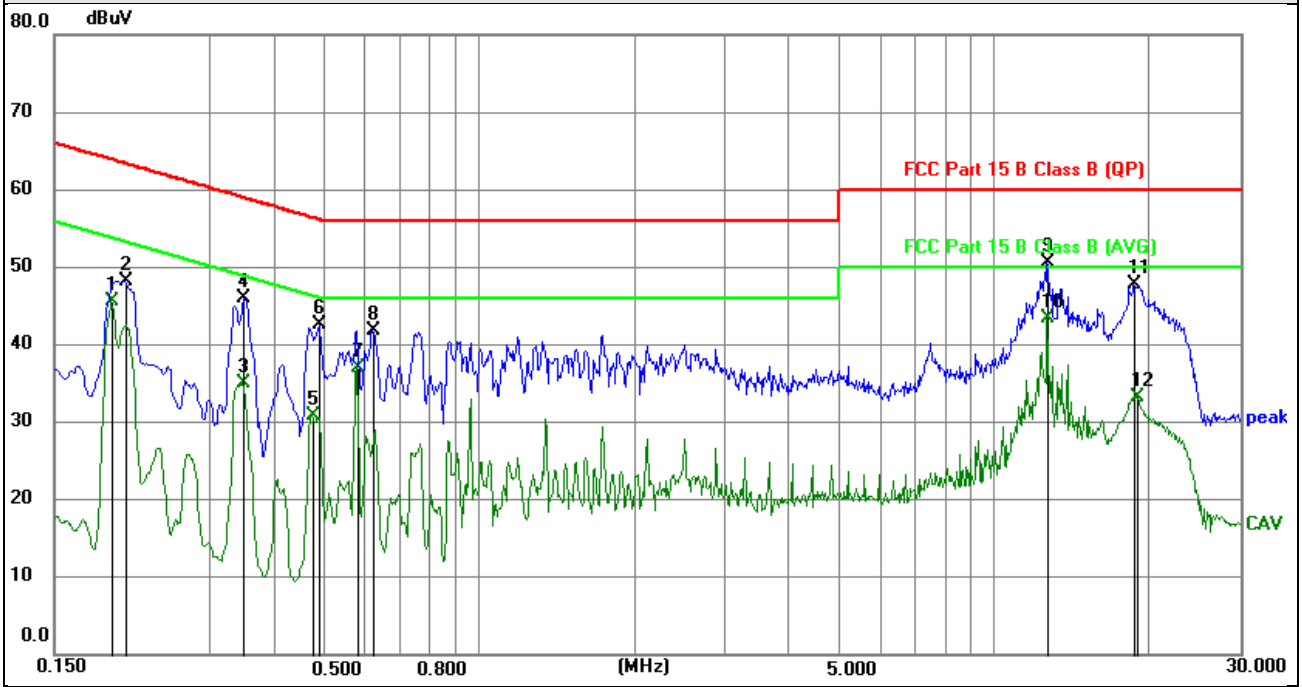
No	Frequency	Reading	Correction Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Detector
1	0.1928	34.48	10.15	44.63	53.92	-9.29	AVG
2	0.2040	38.85	10.14	48.99	63.45	-14.46	peak
3	0.3480	27.02	10.16	37.18	49.01	-11.83	AVG
4	0.3525	39.48	10.15	49.63	58.90	-9.27	peak
5	0.4762	23.27	10.10	33.37	46.41	-13.04	AVG
6	0.4897	35.98	10.10	46.08	56.17	-10.09	peak
7	0.5797	33.85	10.10	43.95	56.00	-12.05	peak
8	0.5797	25.60	10.10	35.70	46.00	-10.30	AVG
9	0.7665	34.37	10.10	44.47	56.00	-11.53	peak
10	0.7710	20.70	10.10	30.80	46.00	-15.20	AVG
11	12.6915	41.08	10.20	51.28	60.00	-8.72	peak
12	12.6915	33.38	10.20	43.58	50.00	-6.42	AVG

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase of Power: Neutral (N)



No.	Frequency	Reading	Correction Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Detector
1	0.1928	35.47	10.15	45.62	53.92	-8.30	AVG
2	0.2040	38.07	10.14	48.21	63.45	-15.24	peak
3	0.3480	24.97	10.14	35.11	49.01	-13.90	AVG
4	0.3502	35.82	10.13	45.95	58.96	-13.01	peak
5	0.4740	20.63	10.11	30.74	46.44	-15.70	AVG
6	0.4897	32.42	10.11	42.53	56.17	-13.64	peak
7	0.5797	26.97	10.10	37.07	46.00	-8.93	AVG
8	0.6225	31.66	10.10	41.76	56.00	-14.24	peak
9	12.6960	40.44	10.22	50.66	60.00	-9.34	peak
10	12.6960	33.23	10.22	43.45	50.00	-6.55	AVG
11	18.6967	37.40	10.36	47.76	60.00	-12.24	peak
12	18.9173	22.91	10.36	33.27	50.00	-16.73	AVG

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

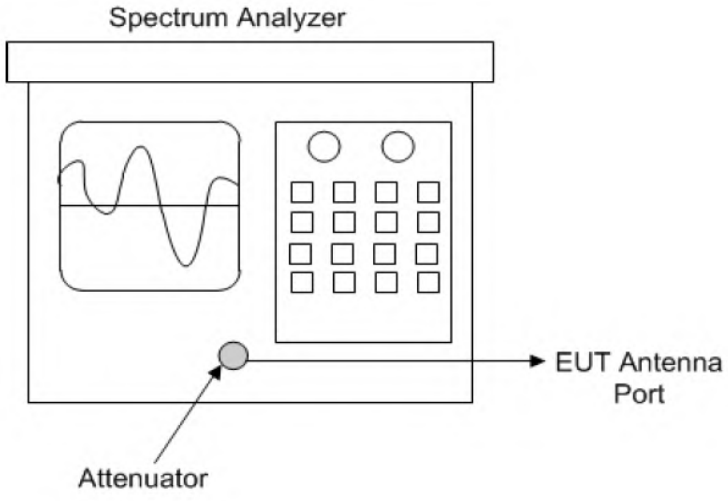
3.3 6dB Bandwidth Measurement

3.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

3.3.2 Test Setup

Subclause 11.8 of ANSI C63.10 is applicable.



Spectrum analyzer test configuration

3.3.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.3.4 Test Procedure

Option 1:

a. Set resolution bandwidth (RBW) = 30kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize.
g. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the dB bandwidth mode with *X* set to 6 dB. if the functionality described in 11.8.1 (i.e. RBW= 100 kHz. VBW ≥ 3*RBW. and 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 ≥6 dB

3.3.5 Deviation from Test Standard

No deviation.

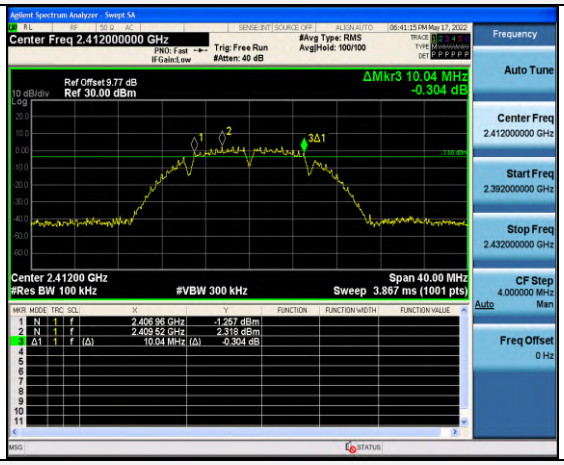
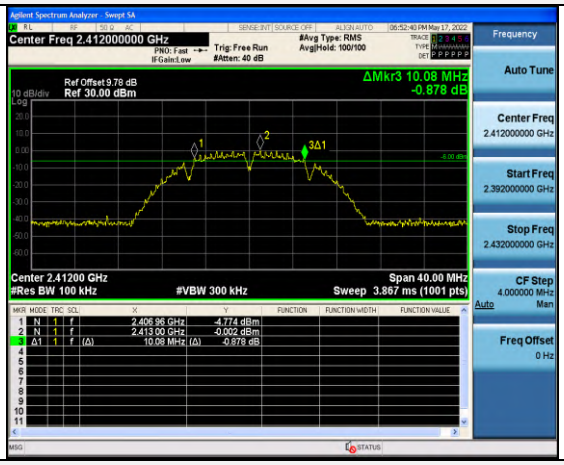
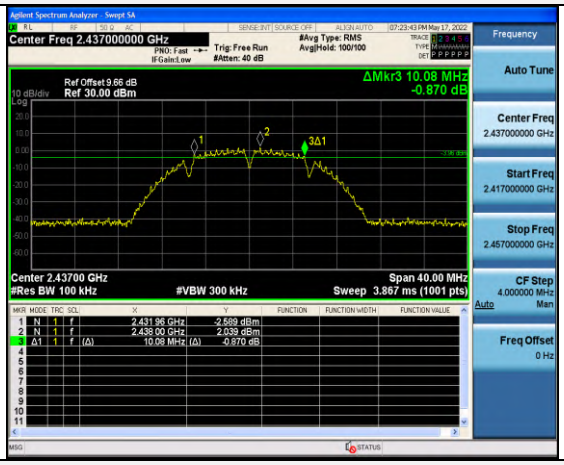
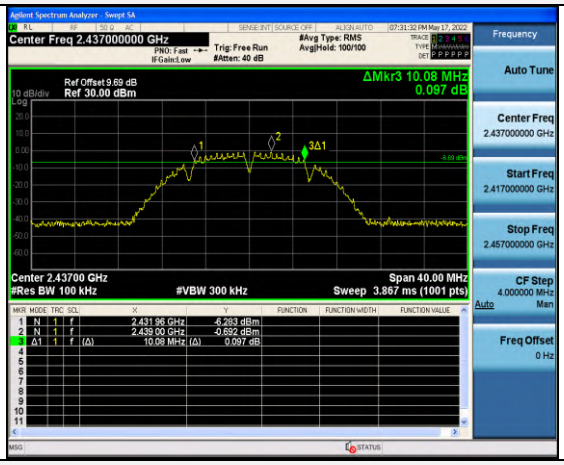
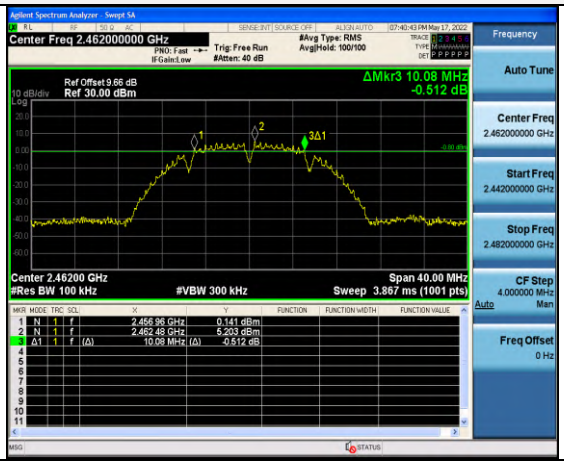
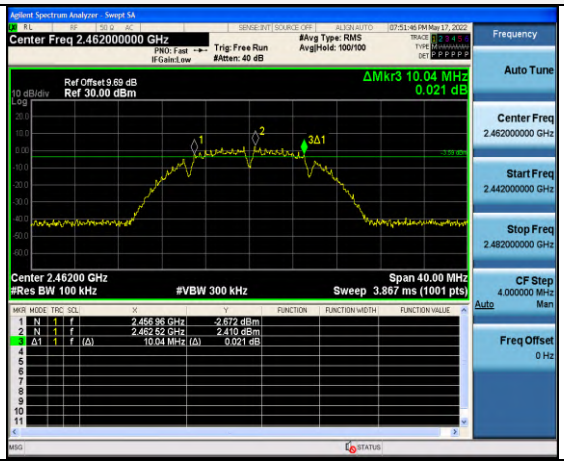
3.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

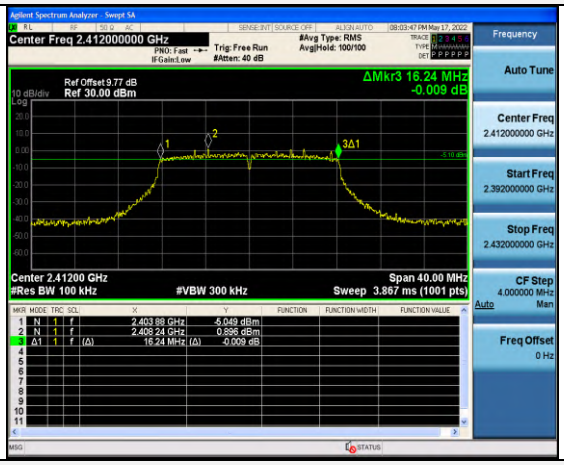
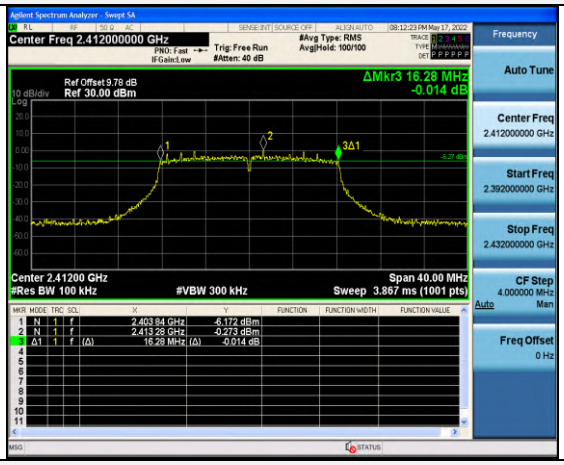
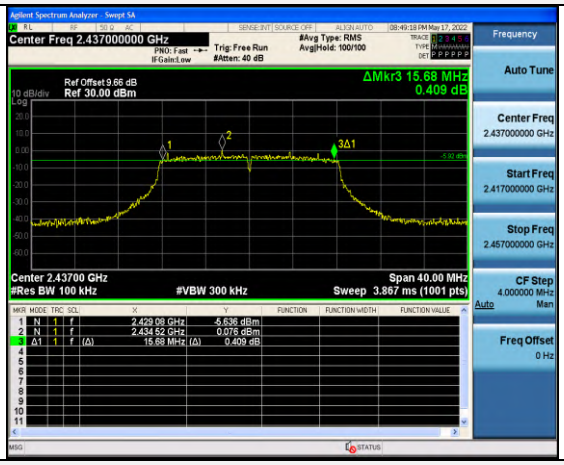
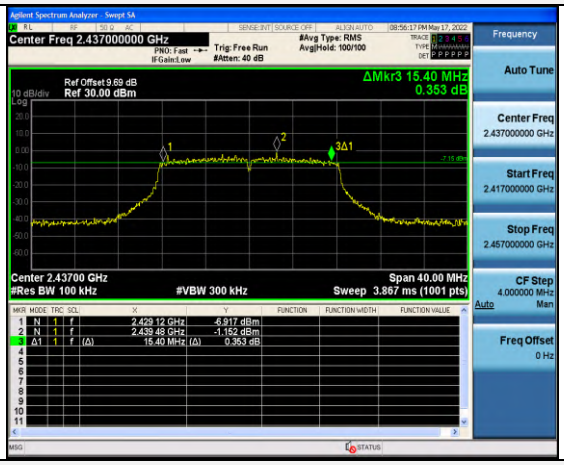
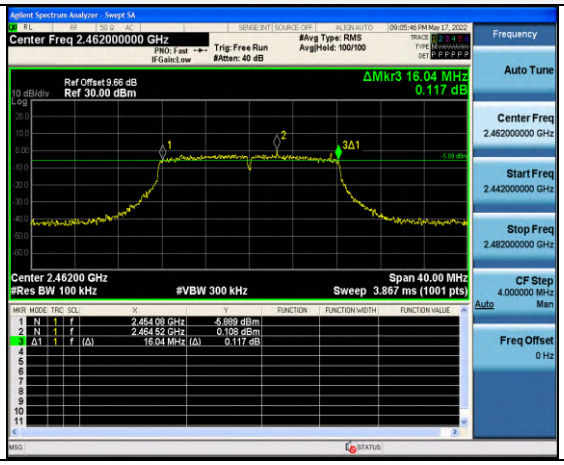
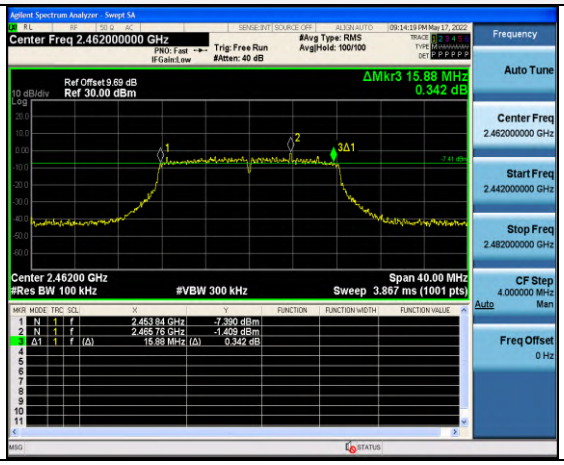
3.3.7 Test Result

Test Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
			ANT0	ANT1		
11b	1	2412	10.04	10.08	0.5	Pass
	6	2437	10.08	10.08	0.5	Pass
	11	2462	10.08	10.04	0.5	Pass
11g	1	2412	16.24	16.28	0.5	Pass
	6	2437	15.68	15.4	0.5	Pass
	11	2462	16.04	15.88	0.5	Pass
11n HT20	1	2412	16.56	16.24	0.5	Pass
	6	2437	16.92	16.92	0.5	Pass
	11	2462	16.28	17.04	0.5	Pass
11n HT40	3	2422	35.04	34.96	0.5	Pass
	6	2437	35.04	35.04	0.5	Pass
	9	2452	35.04	35.04	0.5	Pass

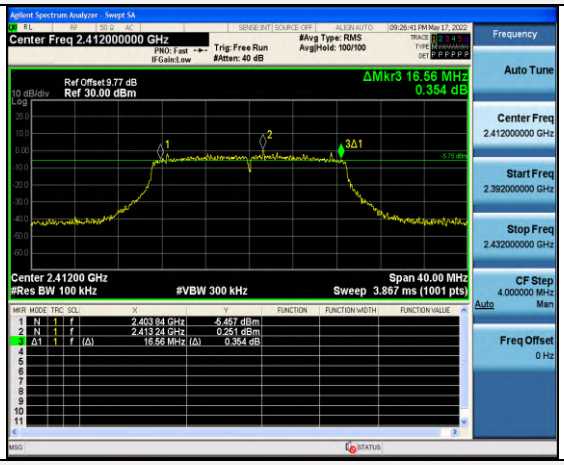
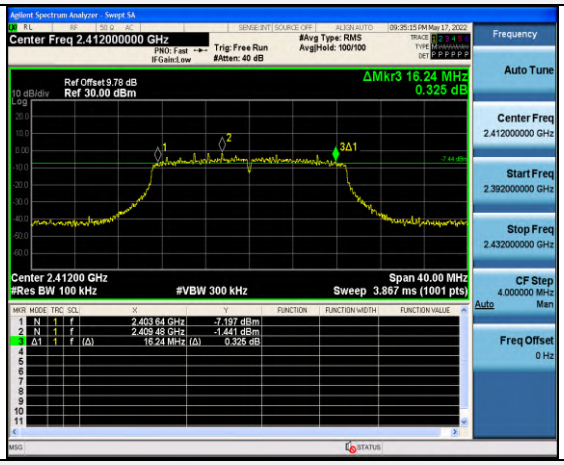
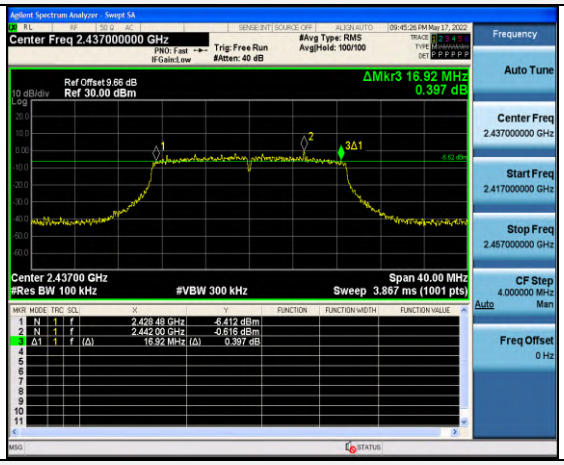
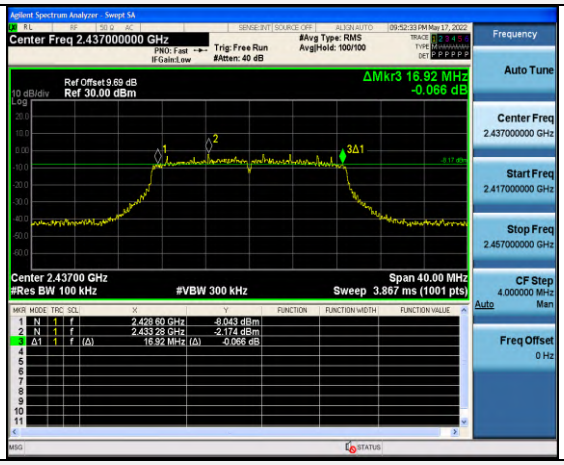
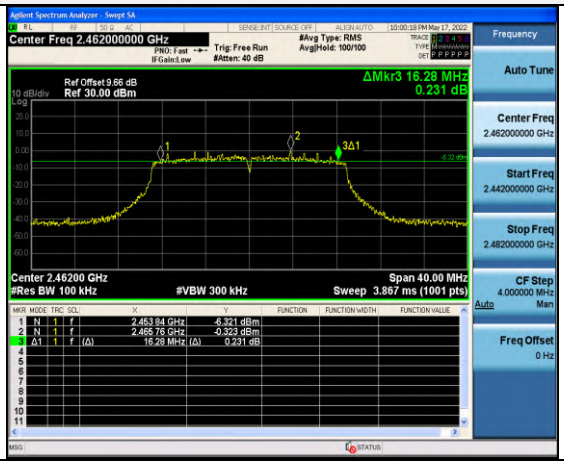
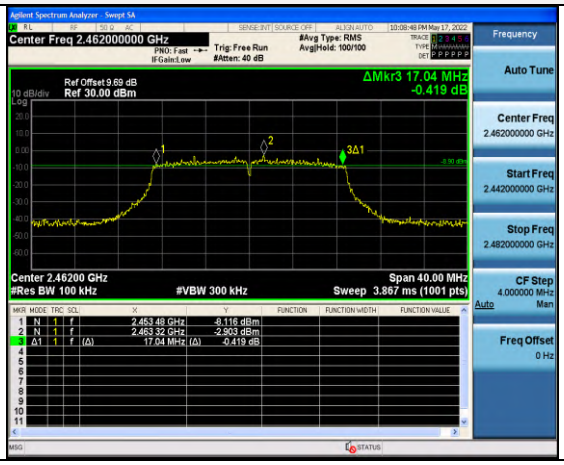
802.11b

TX Ant 0	TX Ant 1
CH1	CH1
	
CH6	CH6
	
CH11	CH11
	

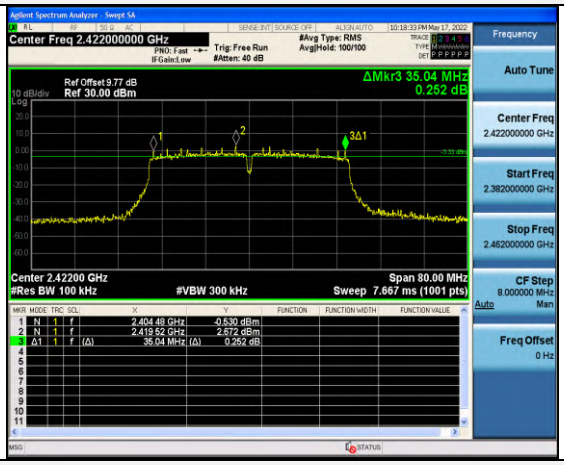
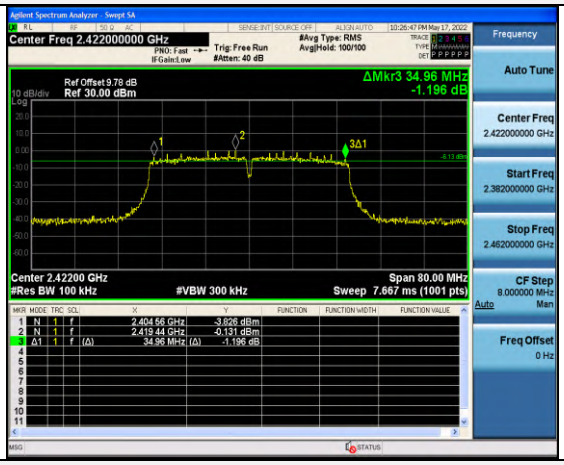
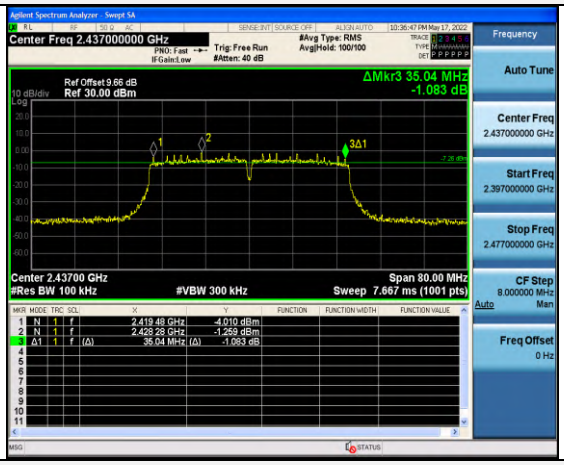
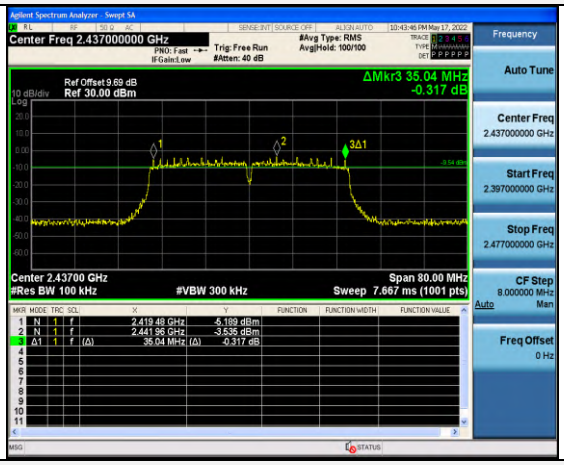
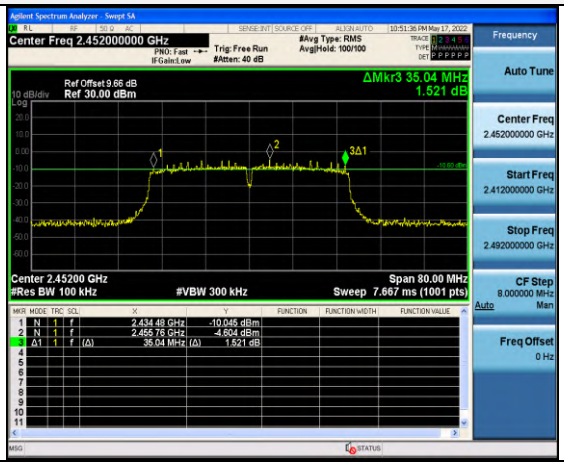
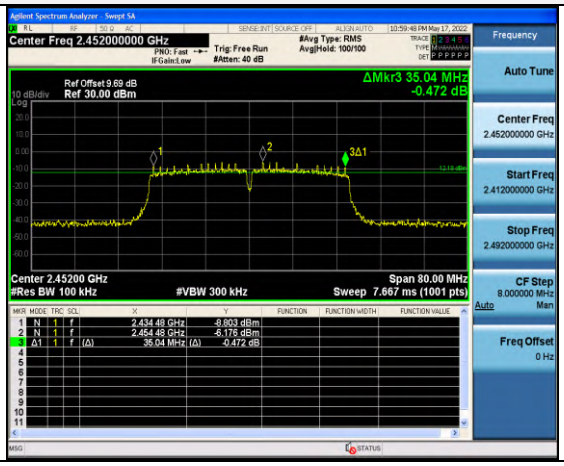
802.11g

TX Ant 0	TX Ant 1
CH1	CH1
	
CH6	CH6
	
CH11	CH11
	

802.11n HT20

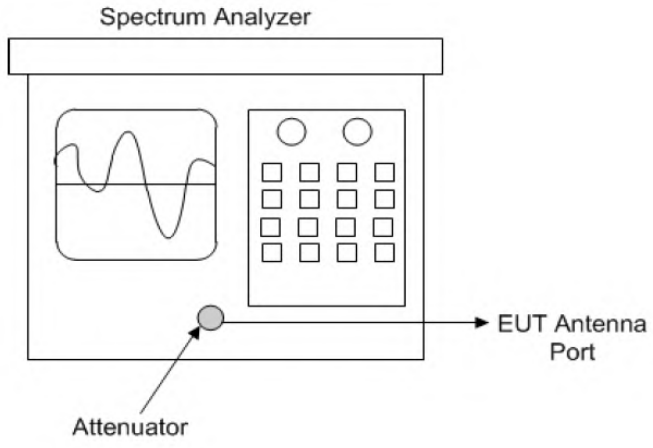
TX Ant 0	TX Ant 1
CH1	CH1
	
CH6	CH6
	
CH11	CH11
	

802.11n HT40

TX Ant 0	TX Ant 1
CH3	CH3
	
CH6	CH6
	
CH9	CH9
	

3.4 Occupied Bandwidth Measurement

3.4.1 Test Setup



3.4.2 Test Instruments

Refer to section 5 to get information of above instrument.

3.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to peak. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.4.4 Deviation from Test Standard

No deviation.

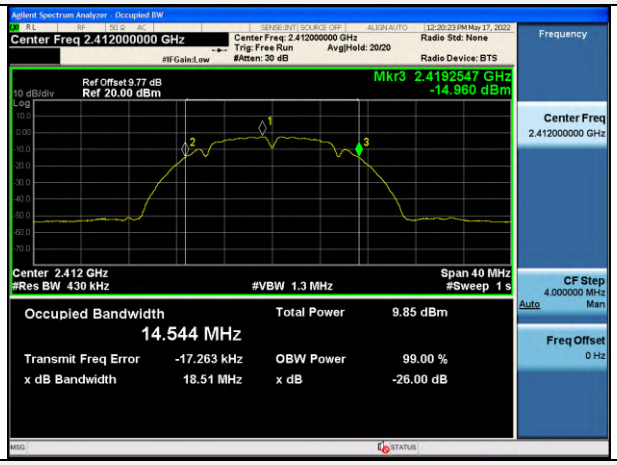
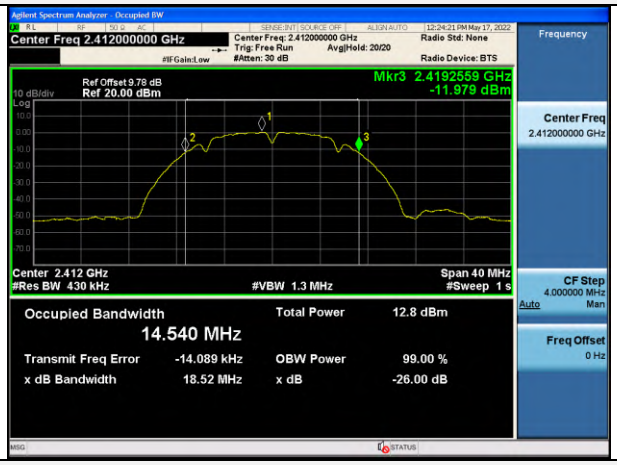
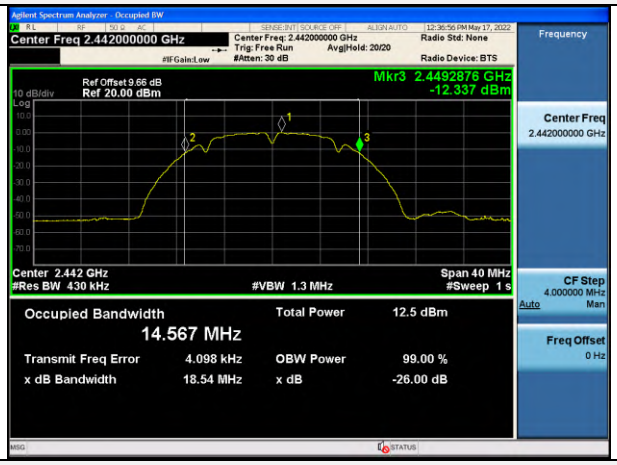
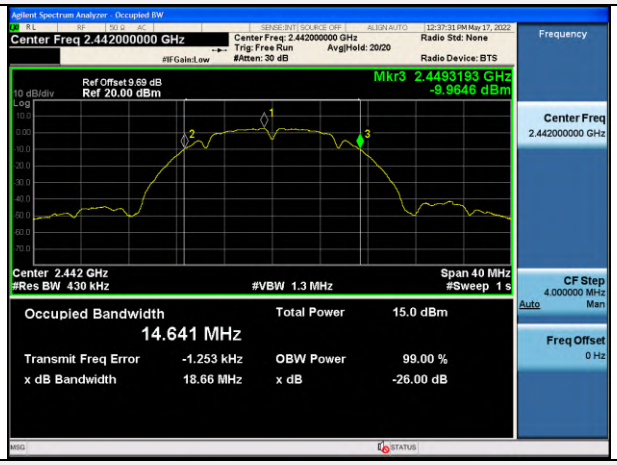
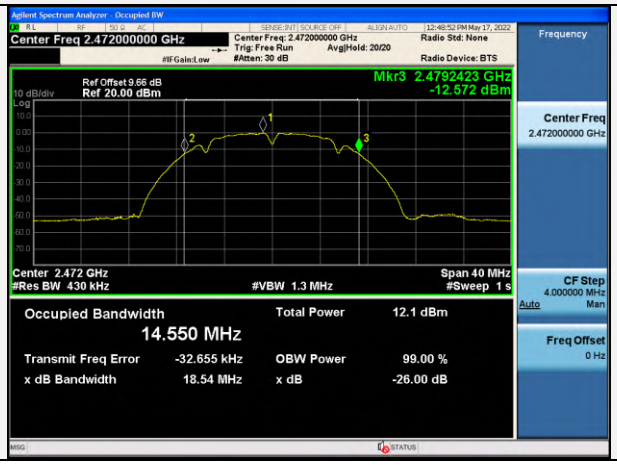
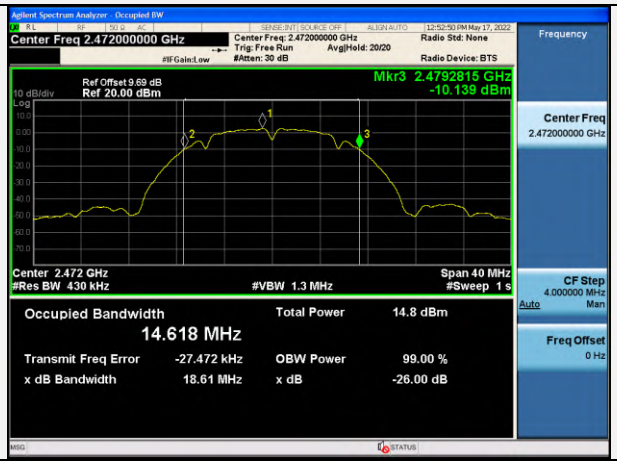
3.4.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

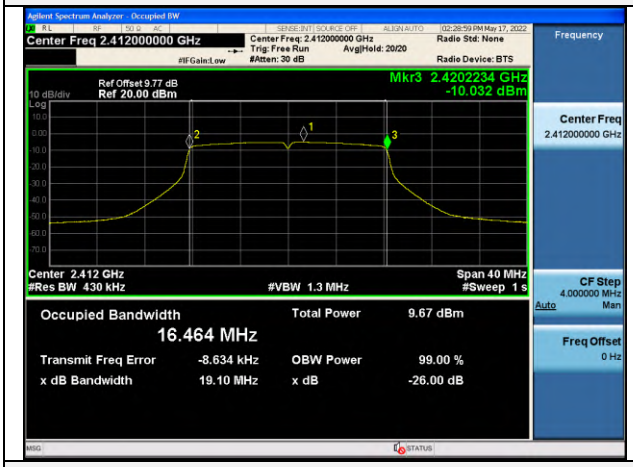
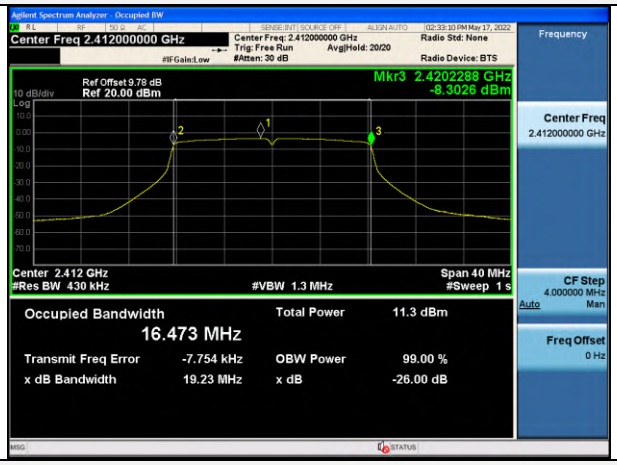
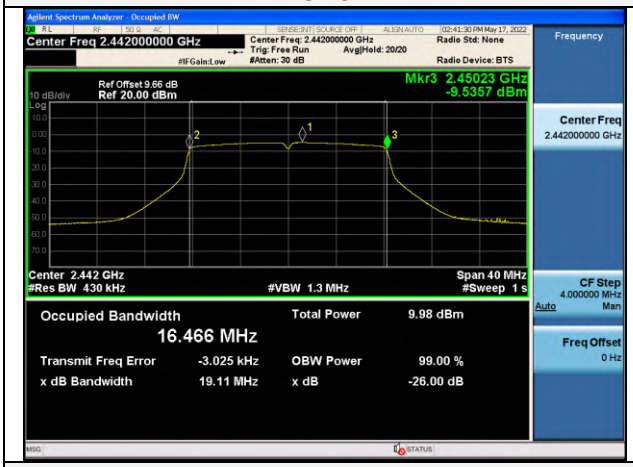
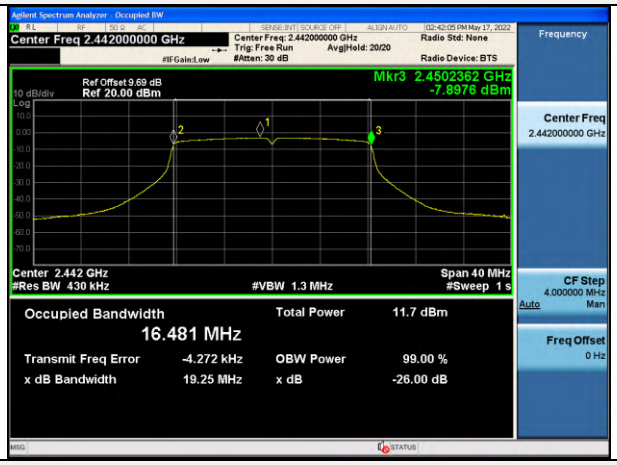
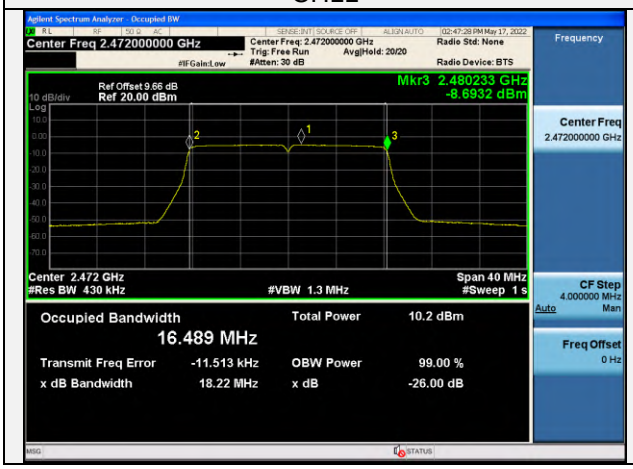
3.4.6 Test Results

Test Mode	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
			ANT0	ANT1	
11b	1	2412	14.544	14.540	Pass
	6	2437	14.567	14.641	Pass
	11	2462	14.550	14.618	Pass
11g	1	2412	16.464	16.473	Pass
	6	2437	16.466	16.481	Pass
	11	2462	16.489	16.497	Pass
11n HT20	1	2412	17.666	17.662	Pass
	6	2437	17.676	17.671	Pass
	11	2462	17.700	17.696	Pass
11n HT40	3	2422	36.128	36.118	Pass
	6	2437	36.145	36.138	Pass
	9	2452	36.108	36.108	Pass

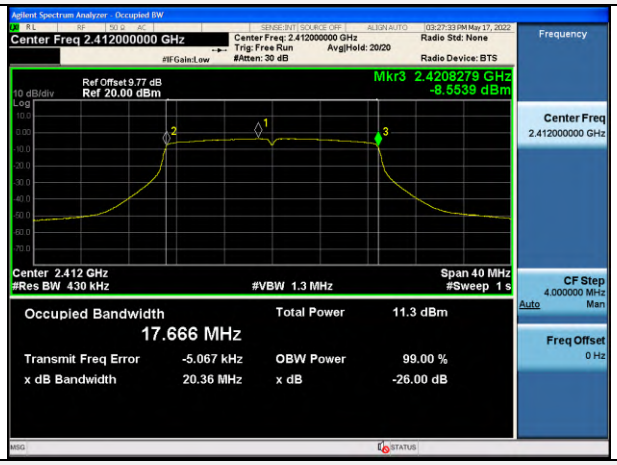
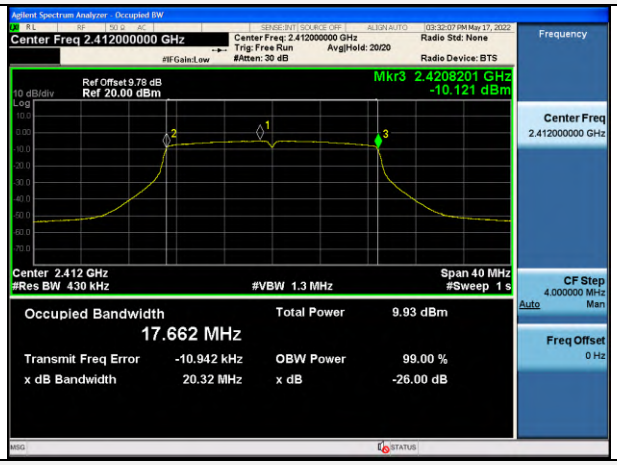
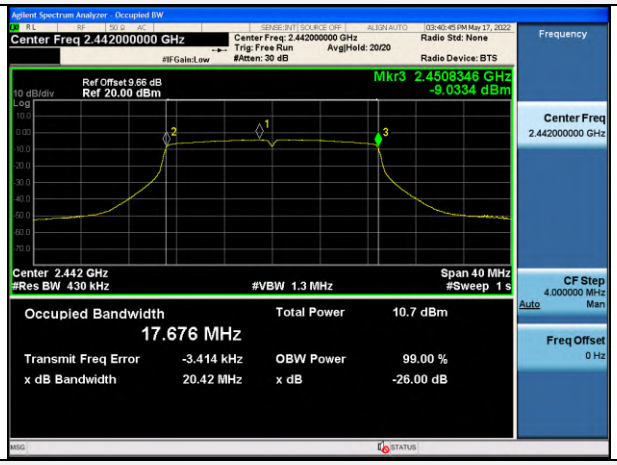
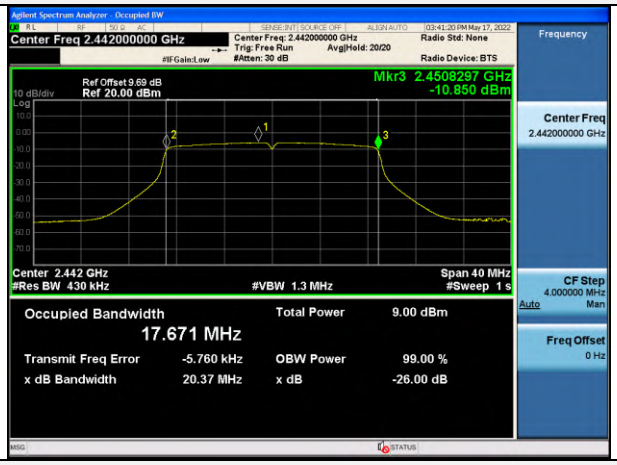
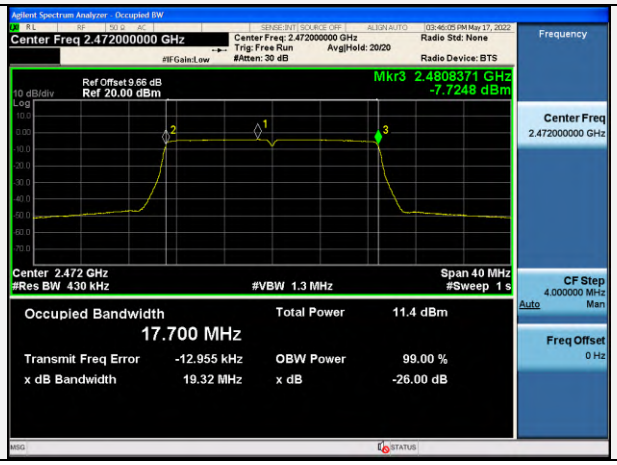
802.11b

TX Ant 0	TX Ant 1
CH1	CH1
	
CH6	CH6
	
CH11	CH11
	

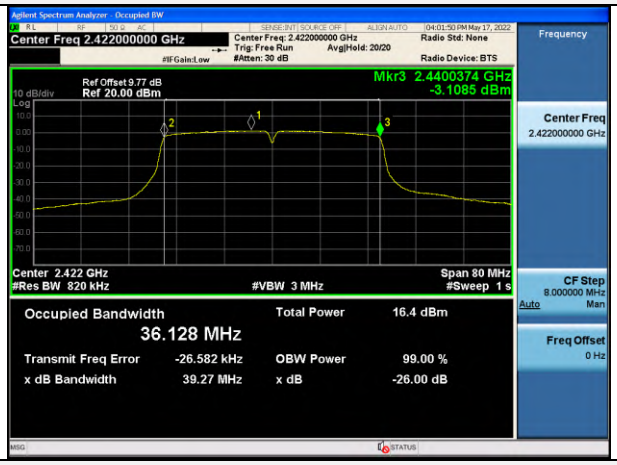
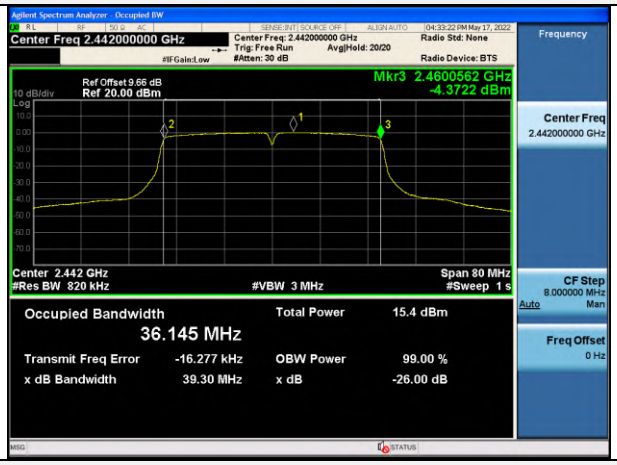
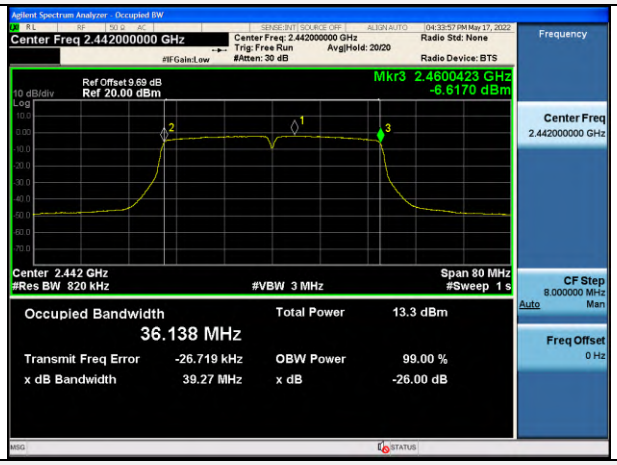
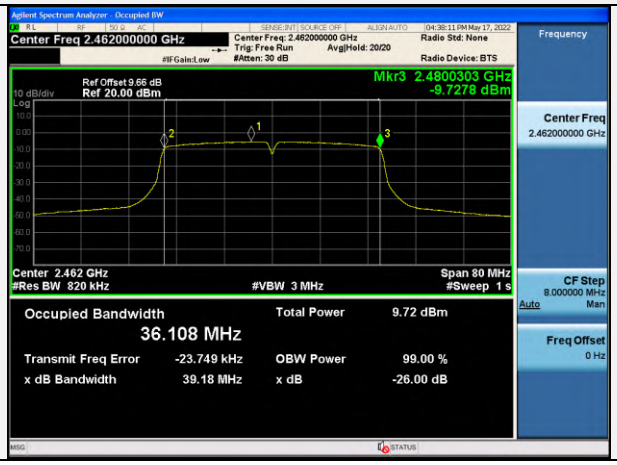
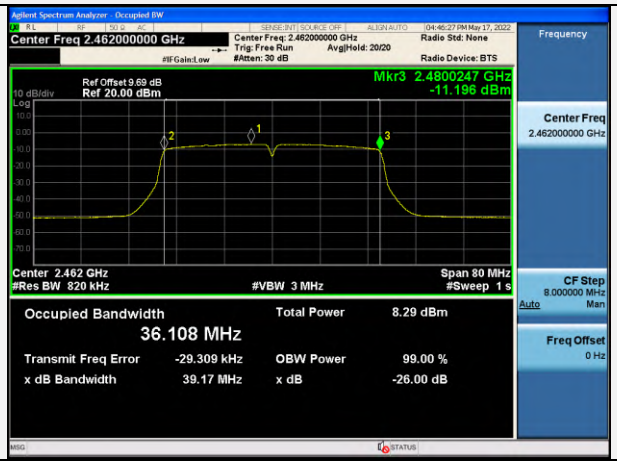
802.11g

TX Ant 0	TX Ant 1
CH1	CH1
	
CH6	CH6
	
CH11	CH11
	

802.11n HT20

TX Ant 0	TX Ant 1
CH1	CH1
	
CH6	CH6
	
CH11	CH11
	

802.11n HT40

TX Ant 0	TX Ant 1
CH3	CH3
	
CH6	CH6
	
CH9	CH9
	

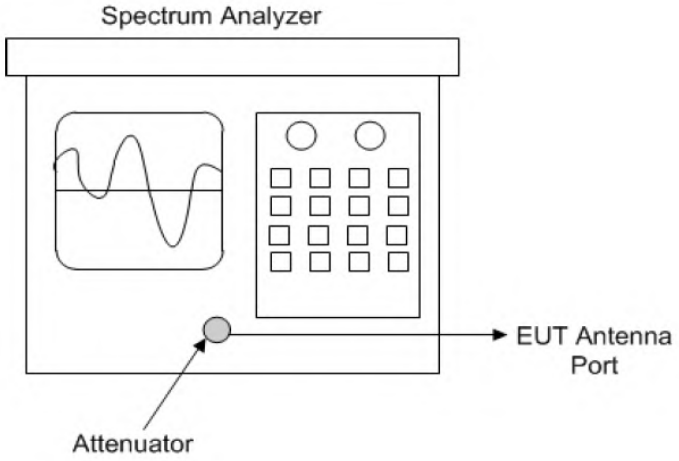
3.5 Conducted Output Power Measurement

3.5.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

3.5.2 Test Setup

- Measurement using a spectrum analyzer (SA) Subclause 11.9.2.2 of ANSI C63.10 is applicable



Spectrum analyzer output power test configuration

3.5.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.5.4 Test Procedures

Measurement using a spectrum analyzer (SA)，Selection of test method：

The proper test method is selected based on the following criteria:

a) **Method AVGSA-1 or method AVGSA-1A (alternative)** shall be applied if either of the following conditions can be satisfied:
1) The EUT transmits continuously (or with a D> 98%).
2) Sweep triggering can be implemented in such a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the instrument configured as in method AVGSA-1) is equal to or shorter than the duration T of each transmission from the EUT, and if those transmissions exhibit full power throughout their durations.

b) **Method AVGSA-2 or method AVGSA-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than +2%.

c) **Method AVGSA-3 or method AVGSA-3A** (alternative) shall be applied if the conditions of the preceding item a) and item b) cannot be achieved.

Method AVGSA-3 or method AVGSA-3A:

a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b) Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c) SA Setting:
1* Set span to at least 1.5 times the OBW
2* Set sweep trigger to "free run."
3* Set RBW= 1% to 5% of the OBW. not to exceed 1MHz.
4* Set VBW ≥ 3 x RBW
5* Number of points in sweep≥ 2 x span /RBW. (This gives bin-to-bin spacing ≤ RBW / 2. so that narrowband signals are not lost between frequency bins).
6* Sweep time ≤ (number of points in sweep) x T. where T is defined in 11.6. If this gives a sweep time less than the auto sweep time of the instrument. then method AVGSA-3 shall not be used (use AVGSA-3A). The purpose of this step is so that the averaging time in each bin is less than or equal to the minimum time of a transmission.
7* Detector =RMS (power averaging).
8* Trace mode =max hold.
9* Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
10* Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function. then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW
d. Measure the captured power within the band and recording the plot.
e. Repeat above procedures until all frequencies required were complete.

3.5.5 Deviation from Test Standard

No deviation.

3.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 Test Results

Test Mode	Test Channel	Channel Fre. (MHz)	Average Conducted Power (dBm)			Limit (dBm)
			ANT0	ANT1	Total Conducted power	
11b	1	2412	12.36	9.48	14.16	30
	6	2437	11.51	9.04	13.46	30
	11	2462	14.67	11.66	16.43	30
11g	1	2412	12.29	10.99	14.70	30
	6	2437	11.35	9.96	13.72	30
	11	2462	11.57	9.58	13.70	30
11n HT20	1	2412	11.84	10.22	14.12	30
	6	2437	10.87	9.40	13.21	30
	11	2462	10.88	9.09	13.09	30
11n HT40	3	2422	16.40	13.66	18.25	30
	6	2437	12.77	11.09	15.02	30
	9	2452	6.29	7.33	9.85	30

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

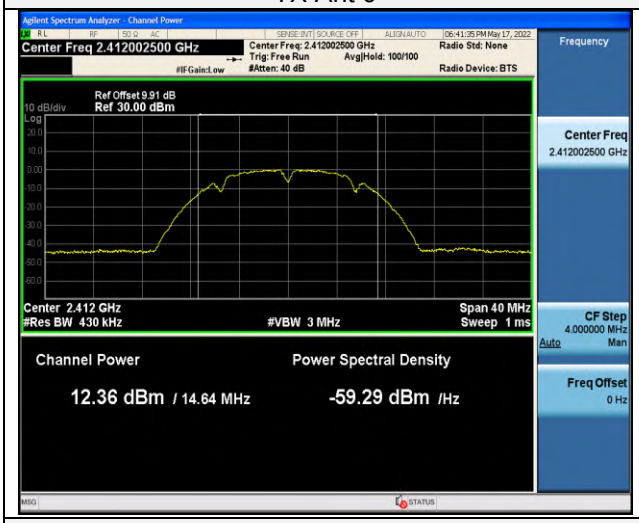
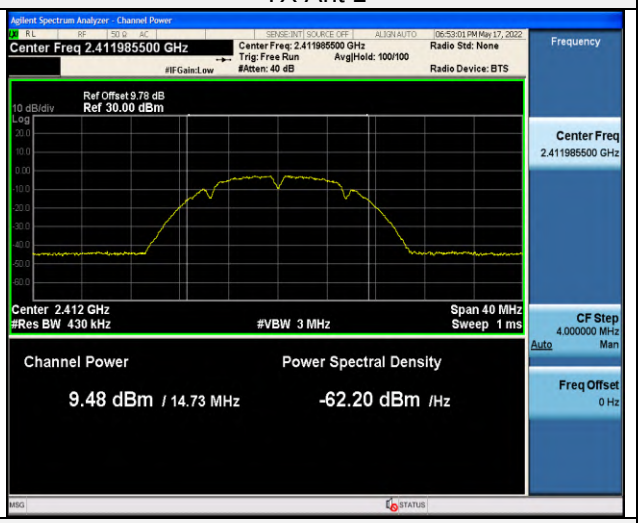
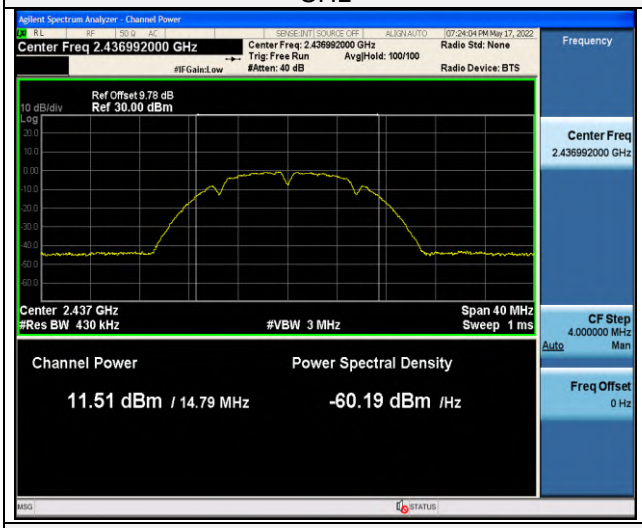
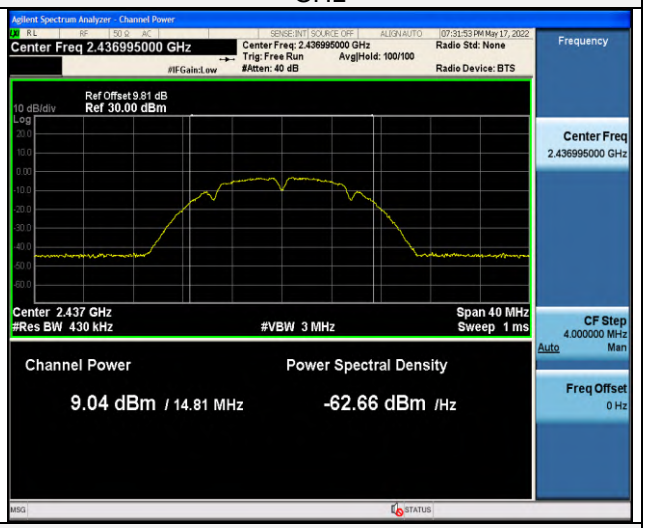
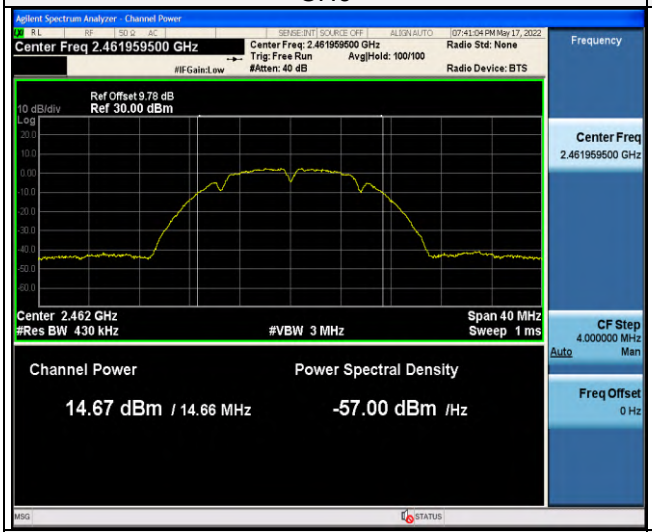
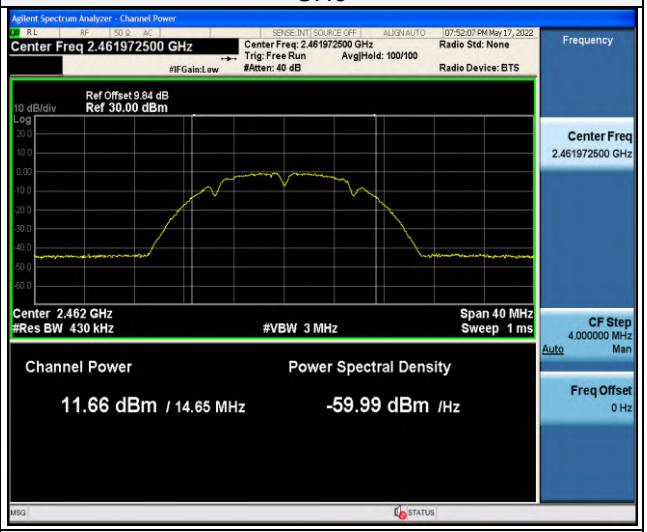
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

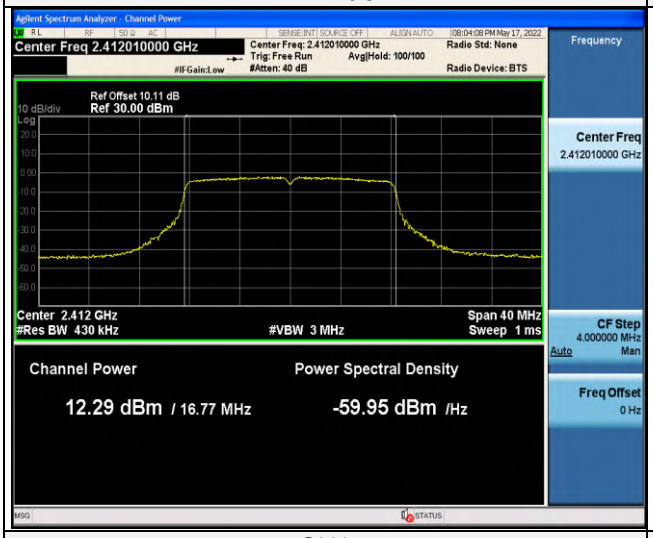
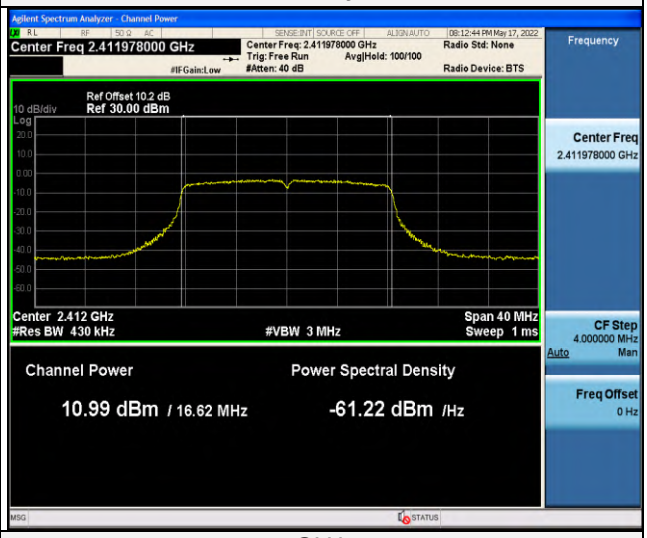
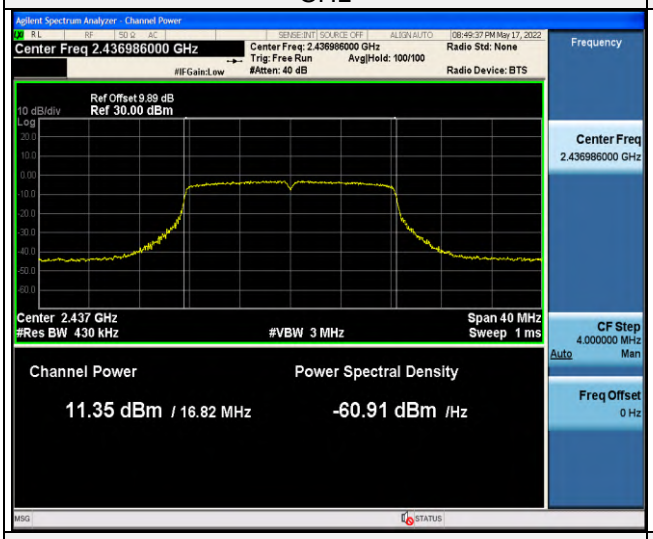
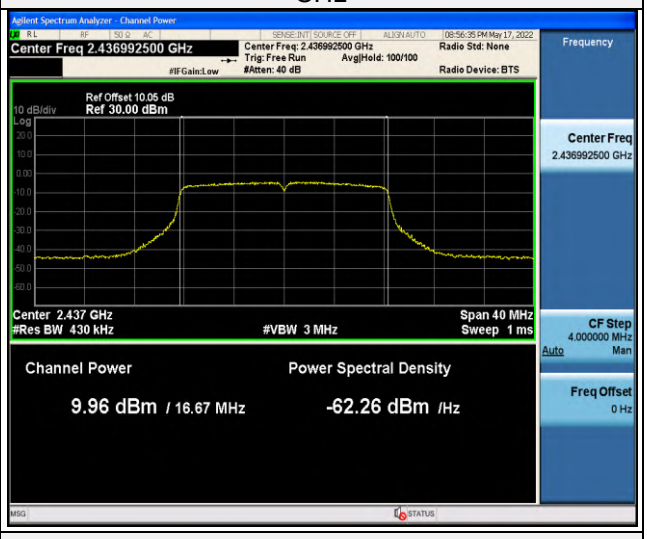
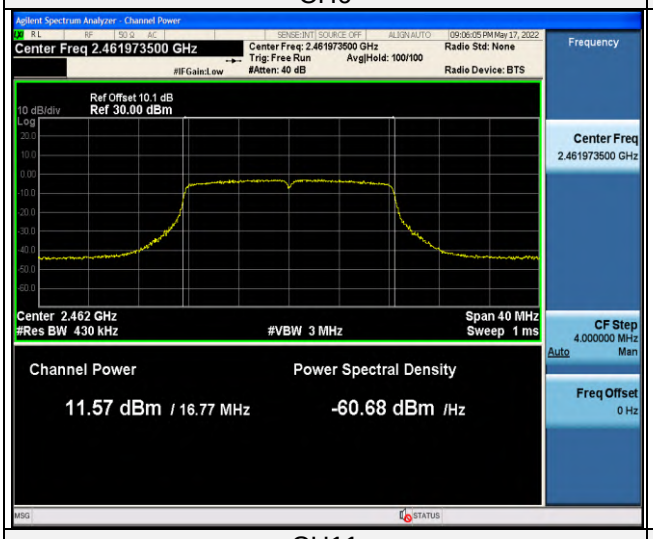
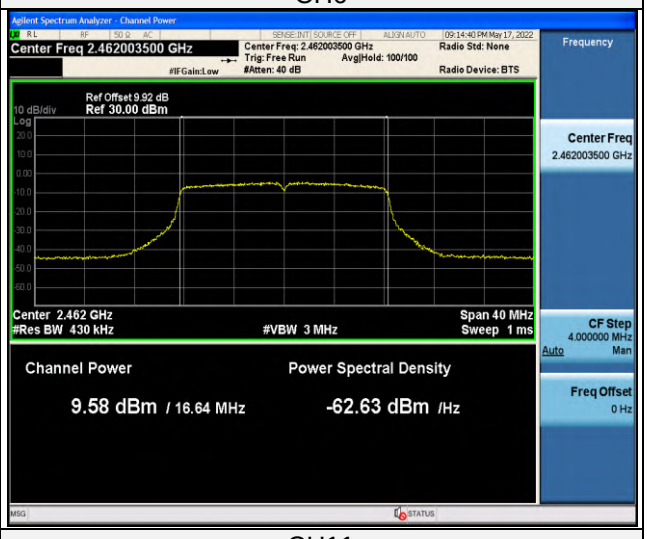
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

Average Power

802.11b

TX Ant 0	TX Ant 1
	
CH1	CH1
	
CH6	CH6
	
CH11	CH11

802.11g

TX Ant 0	TX Ant 1
	
CH1	CH1
	
CH6	CH6
	
CH11	CH11

802.11n HT20

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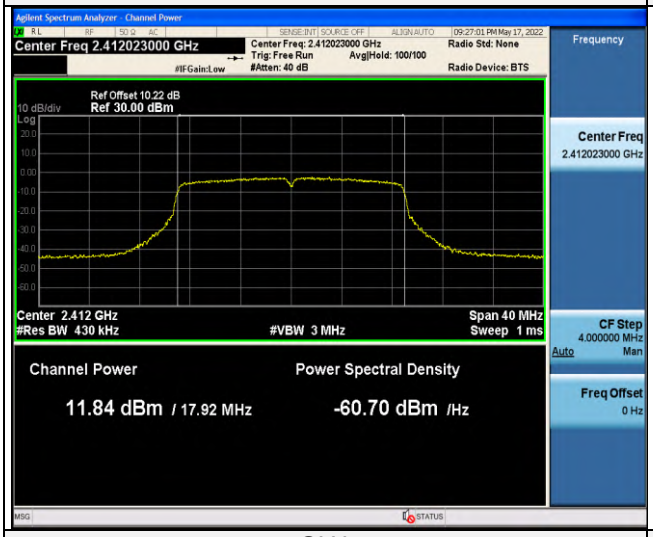	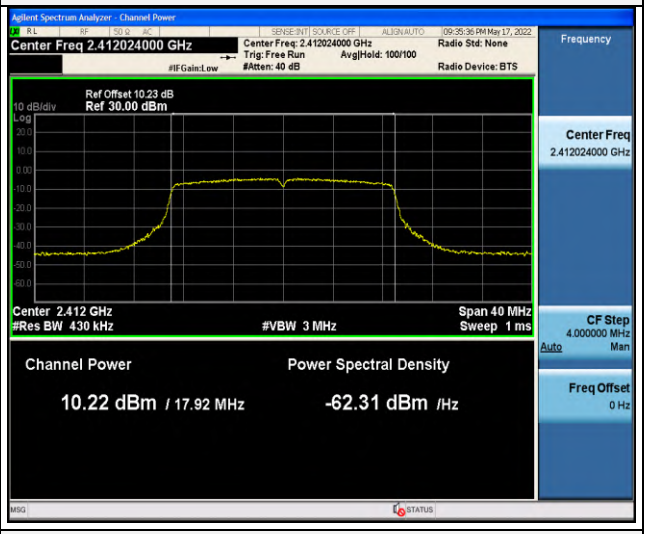
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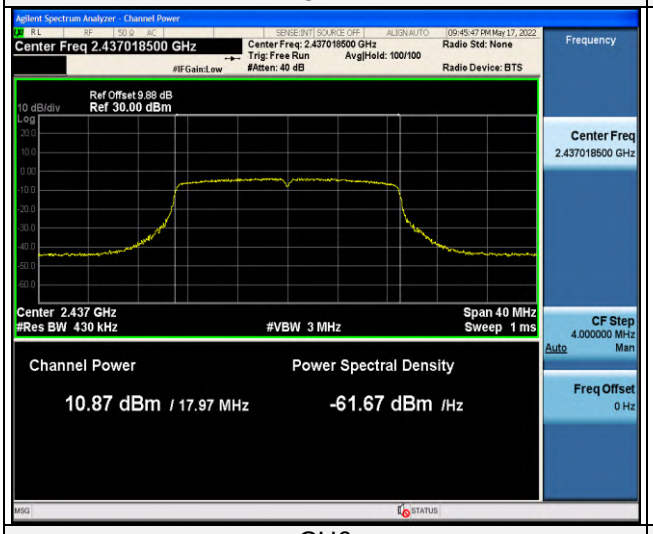	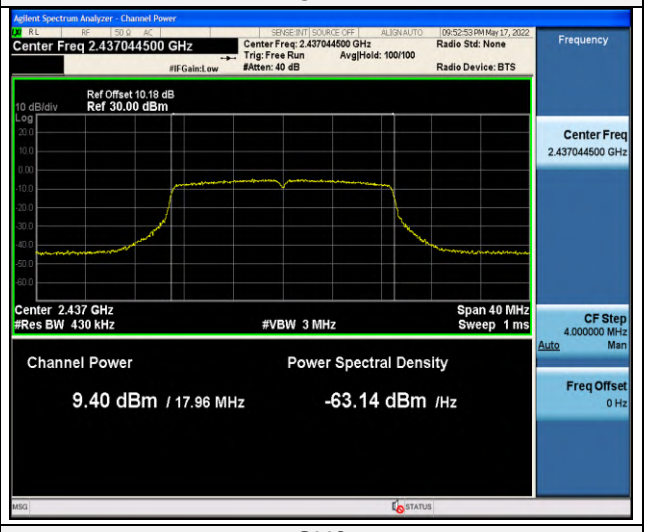
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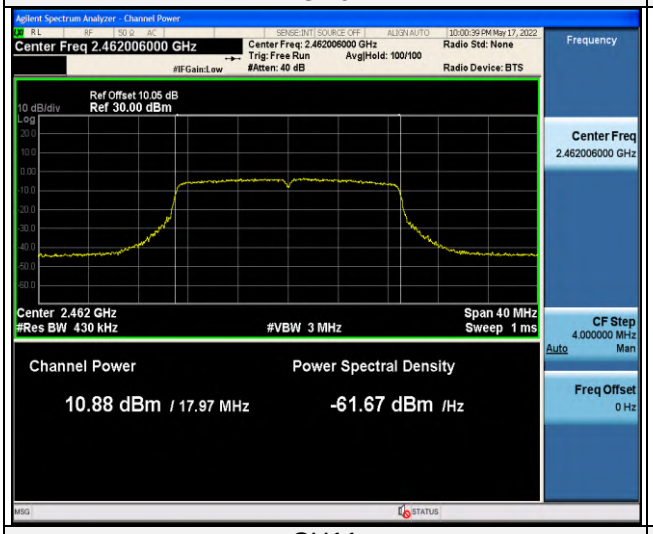	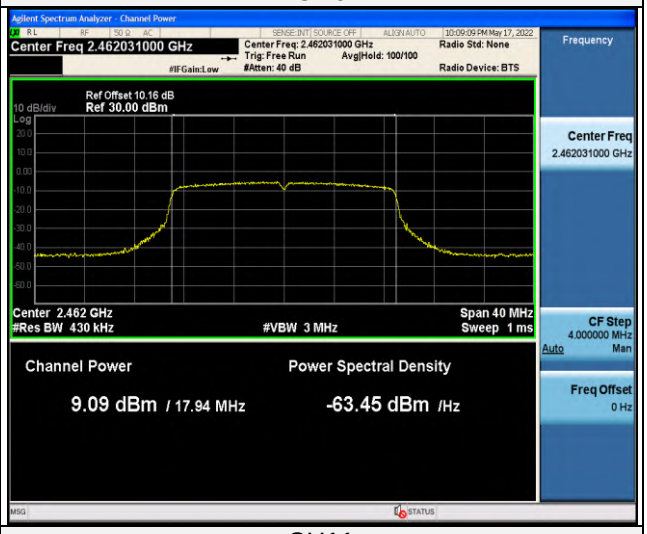
CH11	CH11

802.11n HT40

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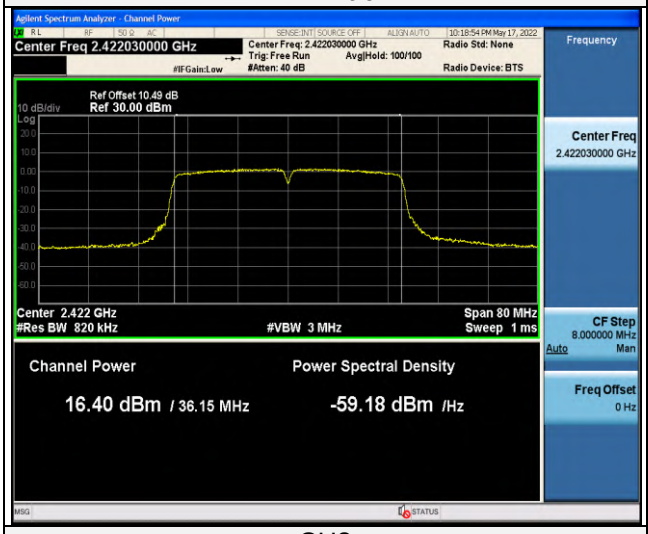	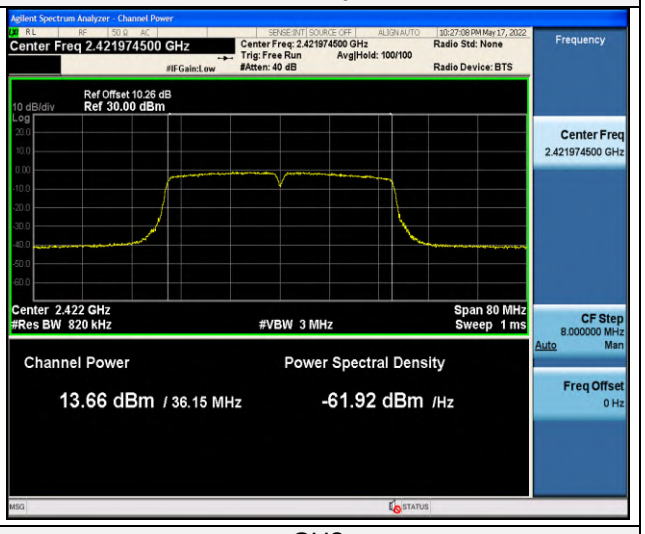
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	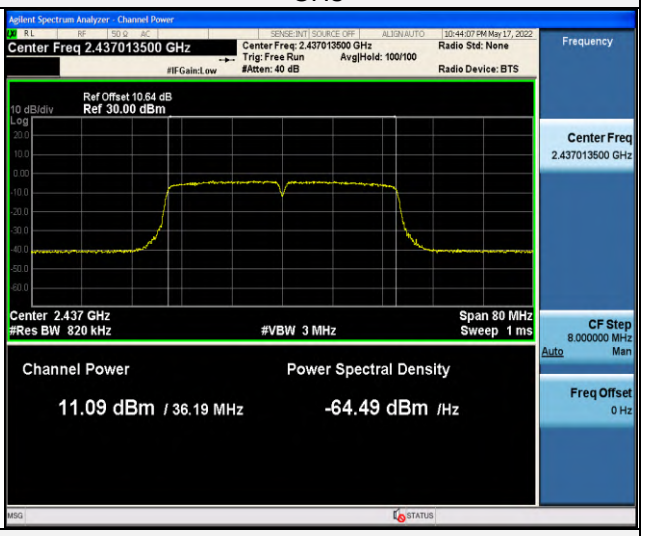
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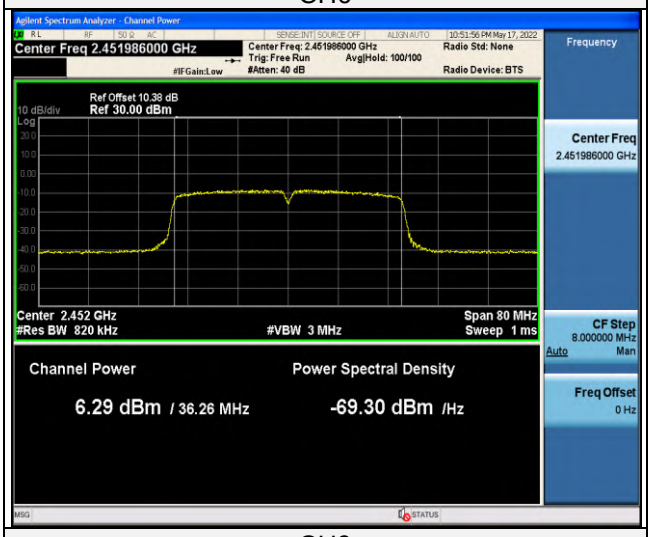
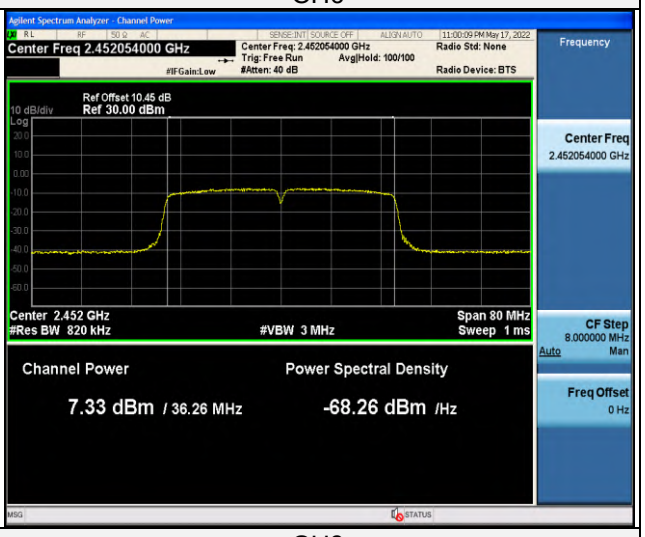
	
CH9	CH9

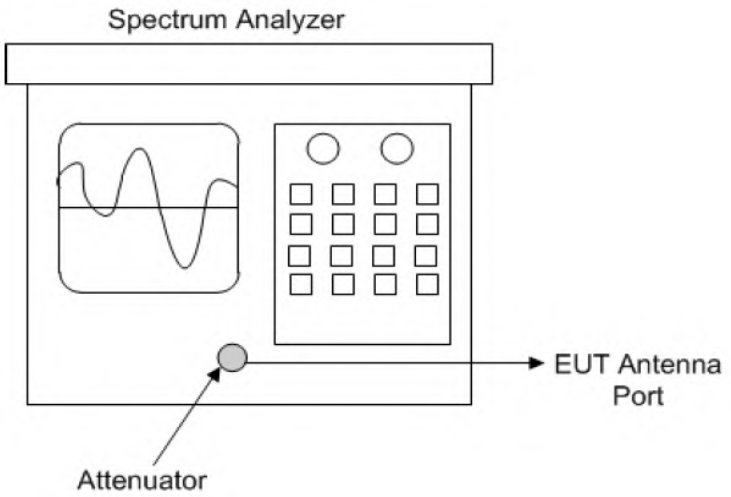
3.6 Power Spectral Density Measurement

3.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm/3kHz.

3.6.2 Test Setup

- DTS maximum power spectral density level in the fundamental emission Subclause 11.10 of ANSI C63.10 is applicable



Spectrum analyzer test configuration

3.6.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.6.4 Test Procedure

a. **Method AVGPSD-1 or method AVGPSD-1A (alternative)** shall be applied if either of the following conditions can be satisfied:
   1) The EUT transmits continuously (or with a D ≥98%).
   2) Sweep triggering can be implemented in such a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep is equal to or shorter than the duration I of each transmission from the EUT, and if those transmissions exhibit full power throughout these durations.

b. **Method AVGPSD-2 or method AVGPSD-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved. and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ±2%.

c. **Method AVGPSD-3 or method AVGPSD-3A (alternative)** shall be applied if the conditions of the preceding paragraphs a) and b) cannot be achieved.

Method AVGPSD-3:

Method AVGPSD-3 uses mms detection across ON and OFF times of the EUT with max hold. The following procedure is applicable when the EUT cannot be configured to transmit continuously (i.e. D<98%), when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level. and when the transmission duty cycle is not constant (i.e., duty cycle variations exceed ±2%),

SA Setting:

a. Set the instrument span to a minimum of 1.5 times the OBW.
b. Set sweep trigger to "free run."
c. Set the RBW = 3 kHz, VBW =10 kHz,
d. Detector = RMS (power averaging).
e. Sweep time = Auto couple,
f. Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
g. Use the peak marker function to determine the maximum PSD level

- If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

3.6.5 Deviation from Test Standard

No deviation.

3.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 Test Results

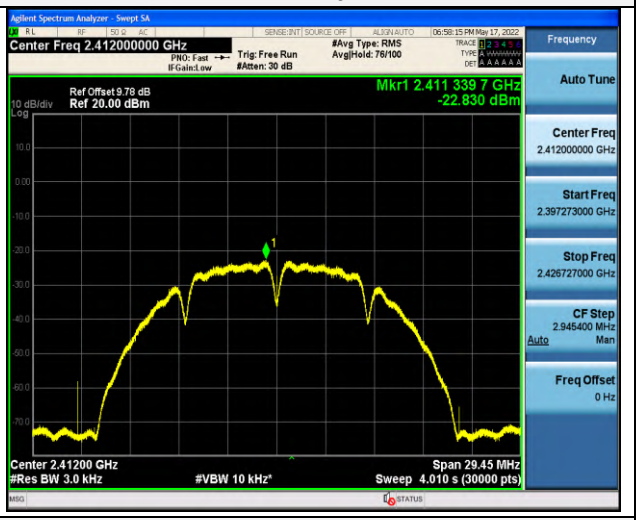
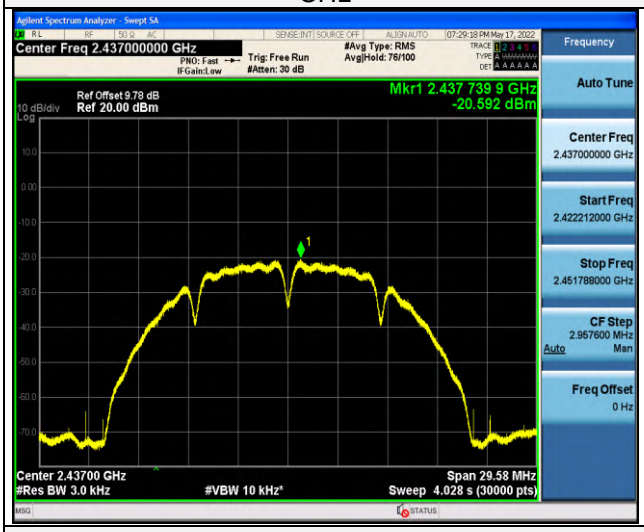
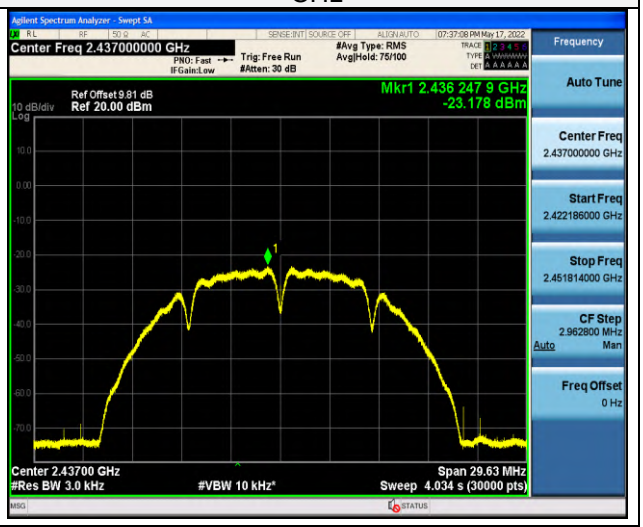
Test Mode	CH.	Fre. (MHz)	Max. PSD(dBm/3kHz)		Duty cycle Factor	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)
			ANT0	ANT1			
11b	1	2412	-19.89	-22.88	0.121	-18.00	8
	6	2437	-20.59	-23.18	0.121	-18.56	8
	11	2462	-17.7	-20.79	0.121	-15.84	8
11g	1	2412	-18.82	-20.12	0.439	-15.97	8
	6	2437	-19.79	-20.42	0.439	-16.64	8
	11	2462	-19.76	-21.29	0.439	-17.01	8
11n HT20	1	2412	-19.08	-20.54	0.220	-16.52	8
	6	2437	-20.45	-21.51	0.220	-17.72	8
	11	2462	-20.07	-22.04	0.220	-17.71	8
11n HT40	3	2422	-17.19	-19.54	0.830	-14.37	8
	6	2437	-20.29	-21.95	0.830	-17.20	8
	9	2452	-24.53	-24.78	0.830	-20.81	8

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 2.5dBi + 10log(2) = 5.51dBi < 6dBi , so the power density limit no need to reduce.

802.11b

TX Ant 0	TX Ant 1
	
CH1	CH1
	
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	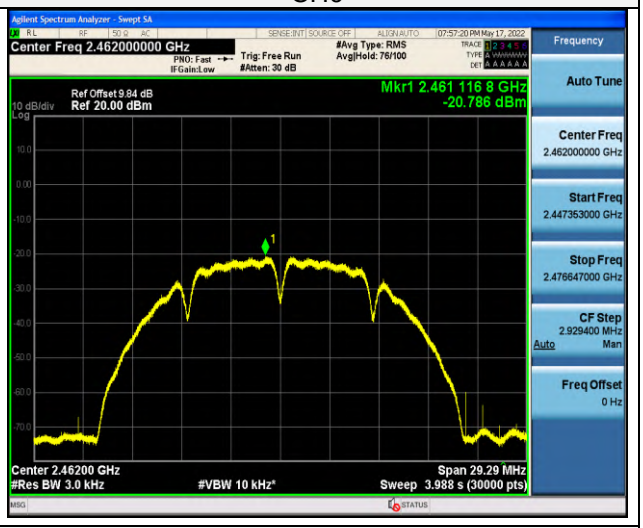
CH11	CH11

802.11g

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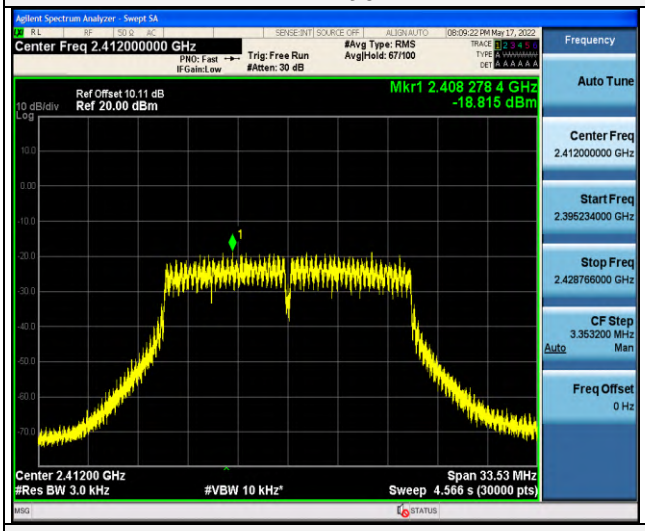	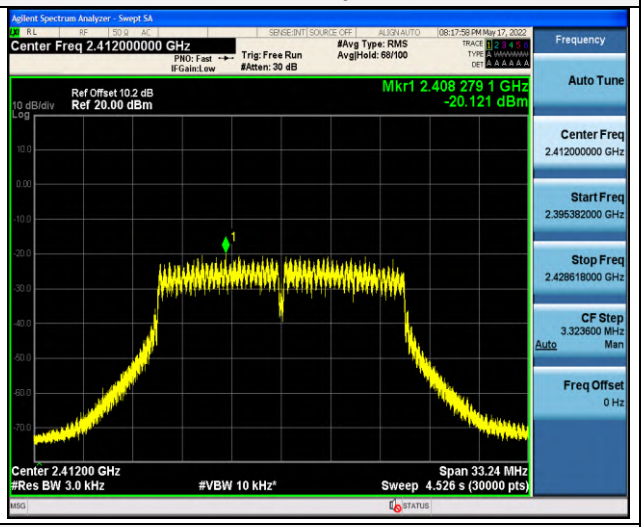
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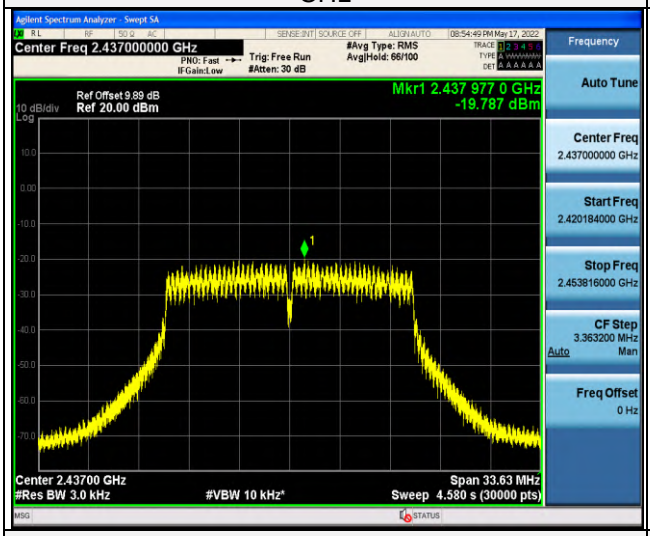	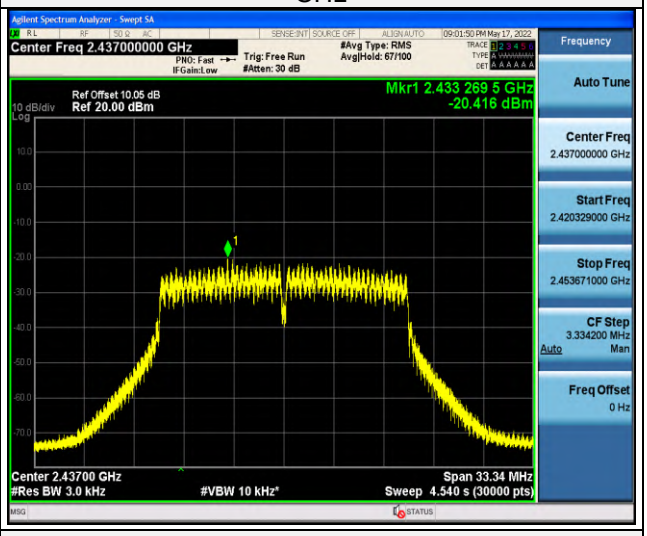
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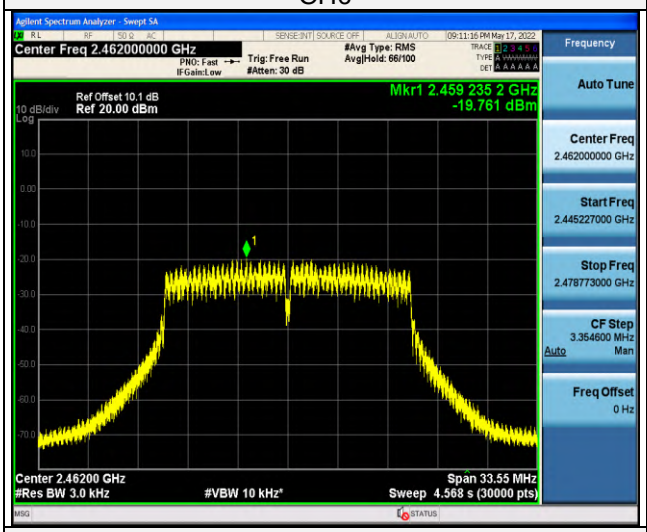	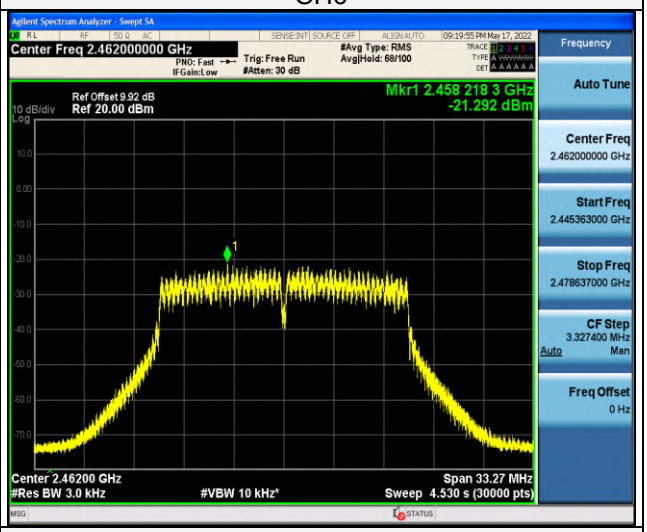
CH11	CH11