FCC Part 15, Subpart C

Test Report

FCC ID:	2AR2STAB8907RE
Applicant:	MMD Hong Kong Holding Limited
Address:	Unit 1006, 10th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong
Manufacturer:	MMD Hong Kong Holding Limited
Address:	Unit 1006, 10th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong
Product(s):	Soundbar speaker
Brand(s):	PHILIPS or
Test Model(s):	TAB8907
Series Model(s):	See section 2.1
Test Date:	Apr. 06, 2022 ~ Apr. 25, 2022
Issued Date:	May 11, 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
220218KH02-1-RF-US-03	Original Release	May 11, 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 (DoC). 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)	Soundbar speaker
Test Model(s)	TAB8907
Sample No.	HS220312-02-04; HS220312-02-05
Series Model(s)	TAB8907RE, TAB8907/10, TAB8907RE/10, TAB8907/37, TAB8907RE/37, TAB8907/98, TAB8907RE/98 TAB8907xx/yy(x=A-Z or blank, yy=00-99 or blank for country code)
Status of EUT	Engineering Prototype
Power Supply Rating	100-240V~, 50/60Hz, 45W
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	18.06dBm
Antenna Type	FPC Antenna
Max. Antenna Gain	2.48dBi
Antenna Connector	I-PEX
Accessory Device	N/A
Data Cable Supplied	AC Line: 150cm

Note:

1. Please refer to the EUT photo document (Reference No.: 220218KH02-1-01&-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. Model difference: These models are only different for model name for trade purpose.
4. These models have been testing and submitted at the same time with the FCC ID: 2AR2STAB8507RE, and these models all only difference for the AC power board, so this report evaluates AC-conducted emission & Radiated emission below 1GHz and copy the RF data from the 220218KH01-1-RF-US-03 report
5. The EUT incorporates SISO function. with 1 antenna transmission and 1 antenna reception.

Support mode	Frequency band	Transmit and receive mode	Transmit and Receive Chain
802.11b	2412~2462MHz	SISO	1TX/1RX
802.11g	2412~2462MHz	SISO	1TX/1RX
802.11n HT20	2412~2462MHz	SISO	1TX/1RX
802.11n HT40	2422~2452MHz	SISO	1TX/1RX

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	Default
	6	2437	Default
	11	2462	Default
802.11g	1	2412	Default
	6	2437	Default
	11	2462	Default
802.11 n20	1	2412	Default
	6	2437	Default
	11	2462	Default
802.11 n40	1	2422	Default
	6	2437	Default
	11	2452	Default

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, 50Hz
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	SISO	√	√	√

- 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

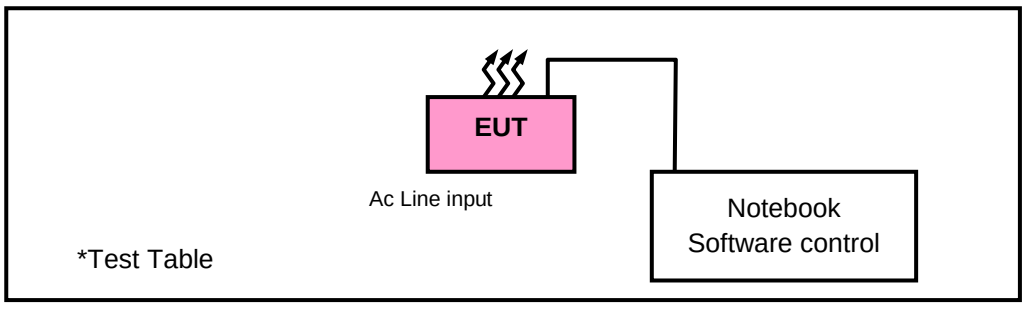
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

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

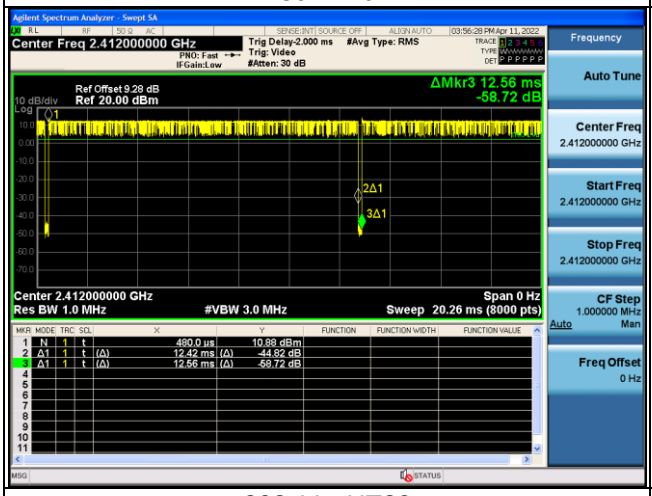
2.5 Configuration of System under Test



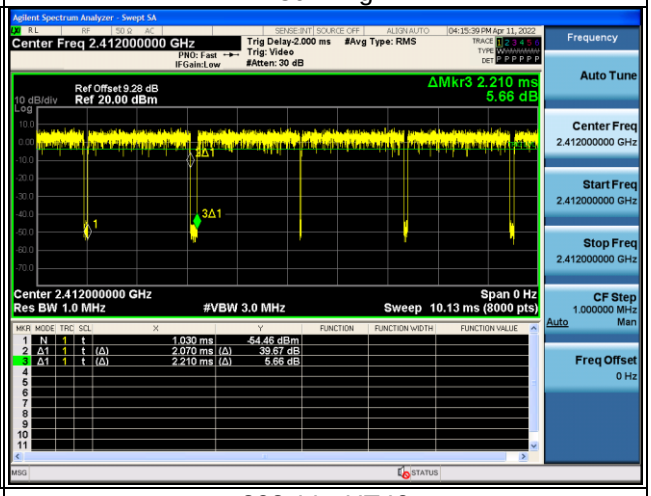
2.6 Duty Cycle of Test Signal

Test mode	Duty cycle (%)	Duty cycle factor=10*log (1/duty cycle) (dB)
802.11b	98.89%	0.049
802.11g	93.67%	0.284
802.11n HT20	91.87%	0.368
802.11n HT40	86.53%	0.628

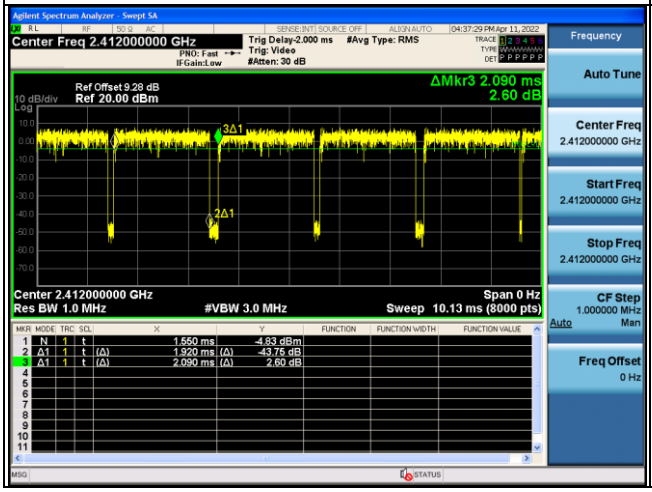
802.11b



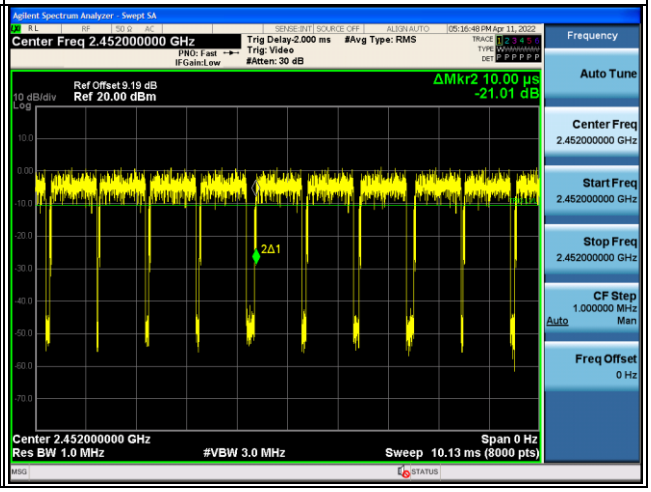
802.11g



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	45745	2023-04-10
Preamplifier	EMCI	EMC001340	980201	2022-04-15
Preamplifier	EMCI	EMC001340	980201	2023-04-15
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	2022-04-15
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.
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2023-01-13
Horn Antenna	Schwarzbeck	FSV-40N	101783	2023-01-13
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 12months (The Antenna and Chamber was 24 mounths) 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:

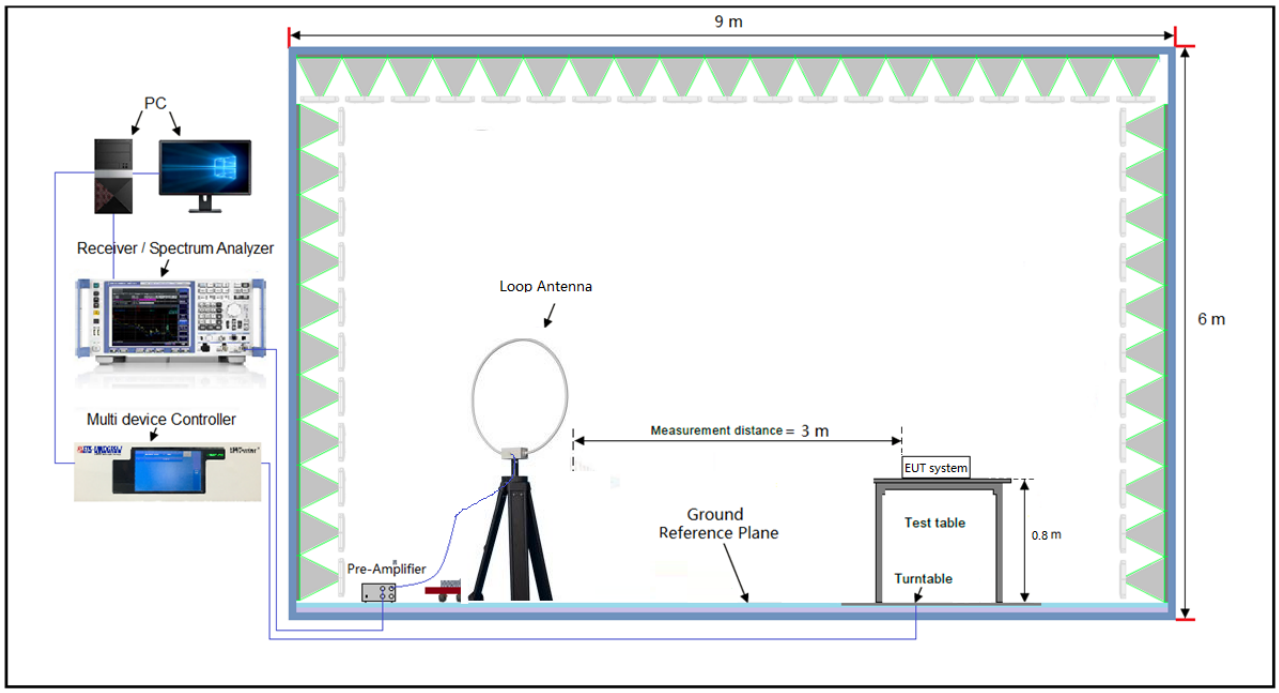
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth =3mHz for Peak detection (PK) at frequency above 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

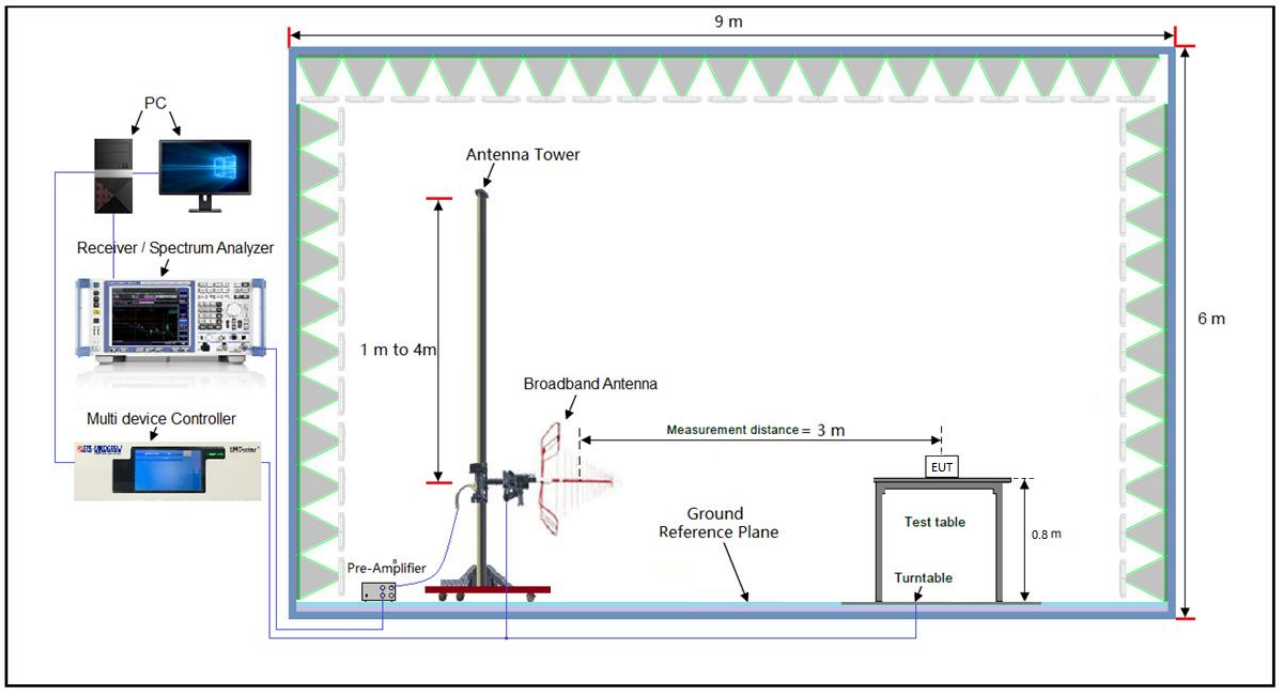
No deviation.

3.1.5 Test Setup

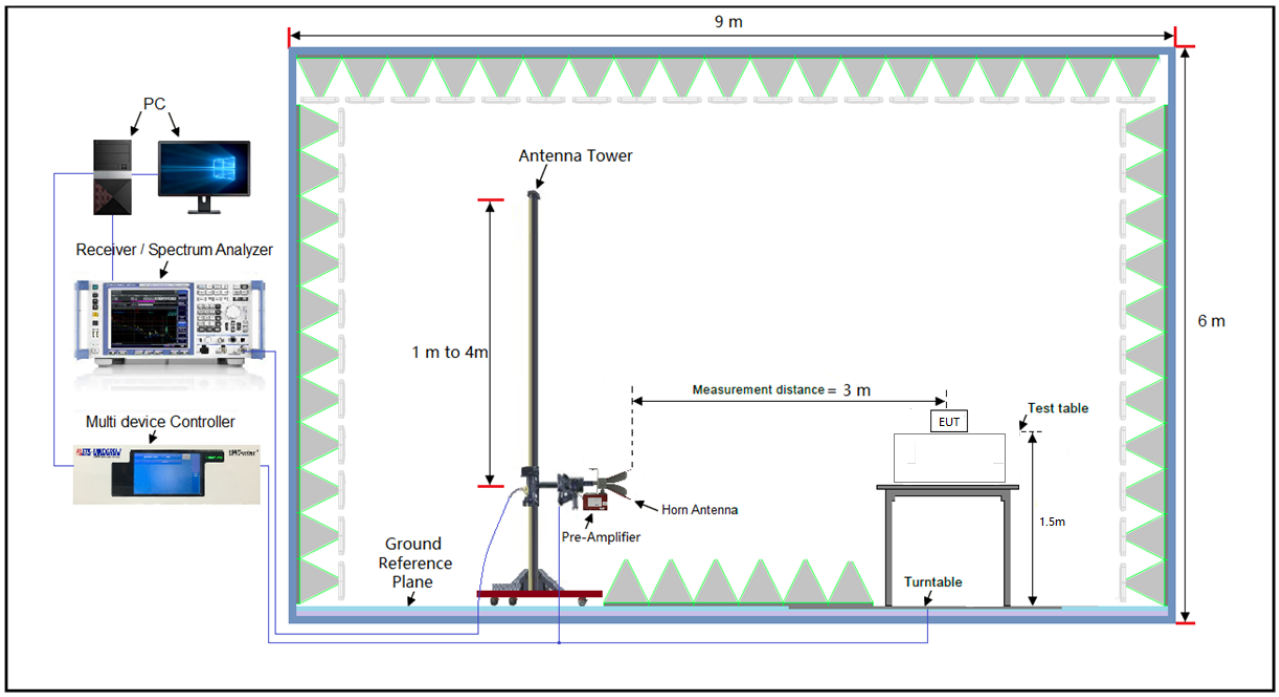
Radiated emission below 30MHz:



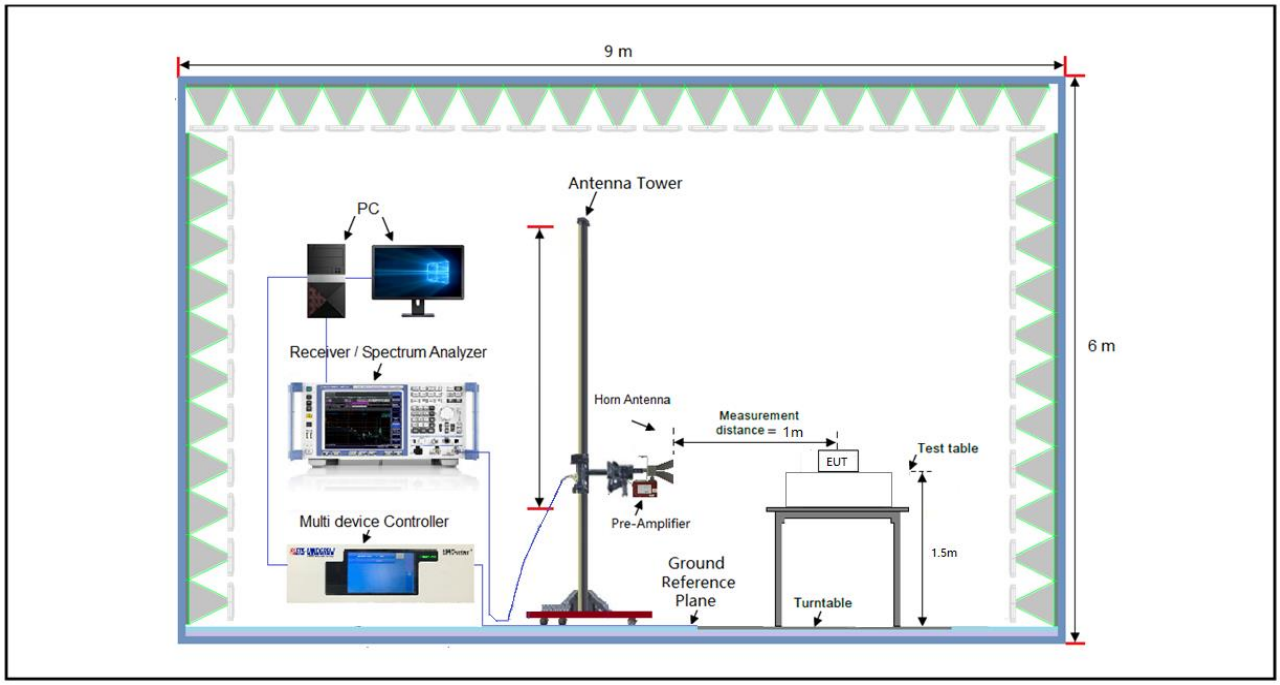
Frequency Range below 1GHz:



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

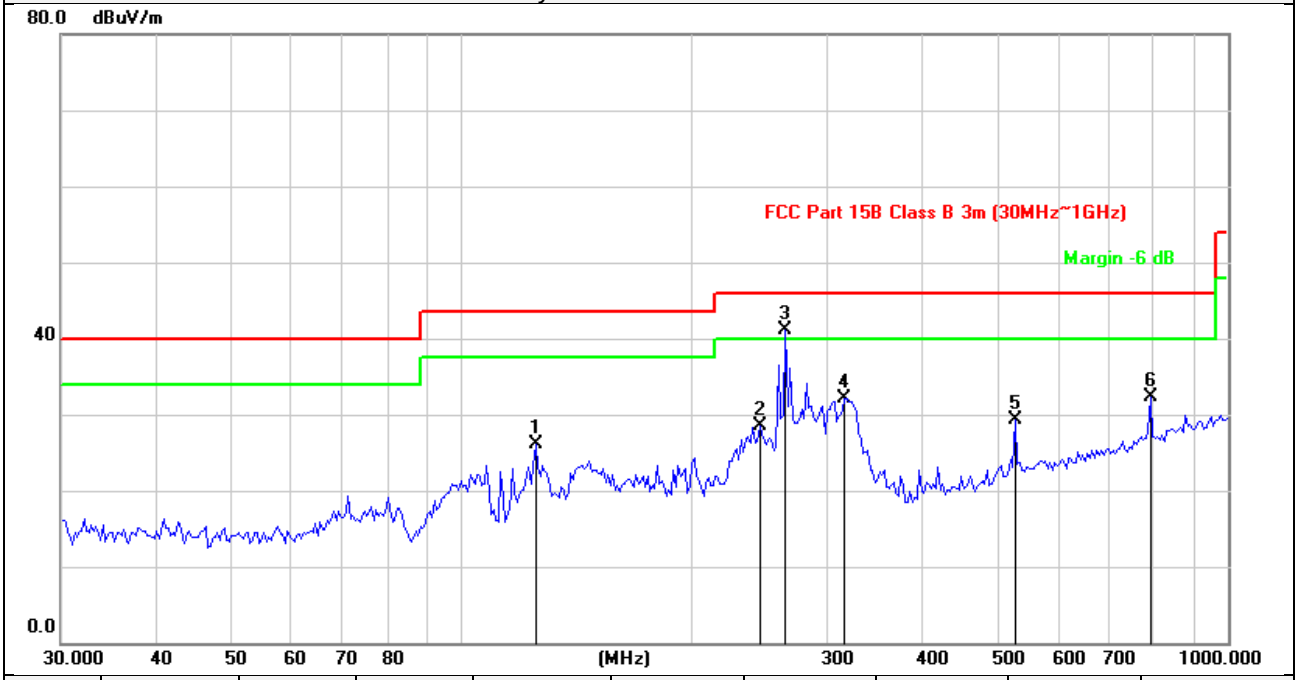
9kHz ~ 30MHz Data:

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



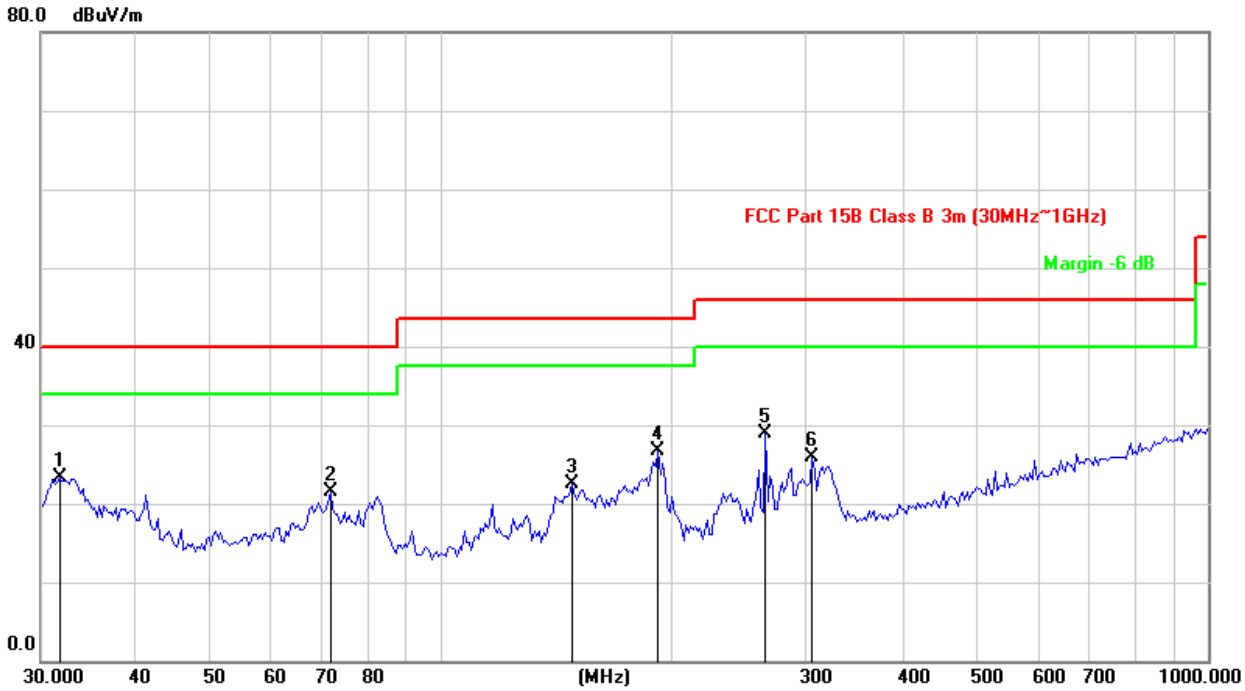
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	124.9249	41.89	-15.88	26.01	43.50	-17.49	peak	200	136
2	245.2606	43.88	-15.38	28.50	46.00	-17.50	peak	100	125
3	264.9709	56.10	-14.94	41.16	46.00	-4.84	peak	100	210
4	315.8601	45.91	-13.73	32.18	46.00	-13.82	peak	200	120
5	527.5707	37.84	-8.58	29.26	46.00	-16.74	peak	300	136
6	793.0281	35.54	-3.31	32.23	46.00	-13.77	peak	200	288

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	31.7348	40.08	-16.80	23.28	40.00	-16.72	peak	200	188
2	71.7054	38.59	-17.18	21.41	40.00	-18.59	peak	300	56
3	147.8747	37.14	-14.71	22.43	43.50	-21.07	peak	200	320
4	191.7841	42.64	-15.88	26.76	43.50	-16.74	peak	100	147
5	264.9709	43.91	-14.94	28.97	46.00	-17.03	peak	200	185
6	304.9548	40.06	-14.06	26.00	46.00	-20.00	peak	100	125

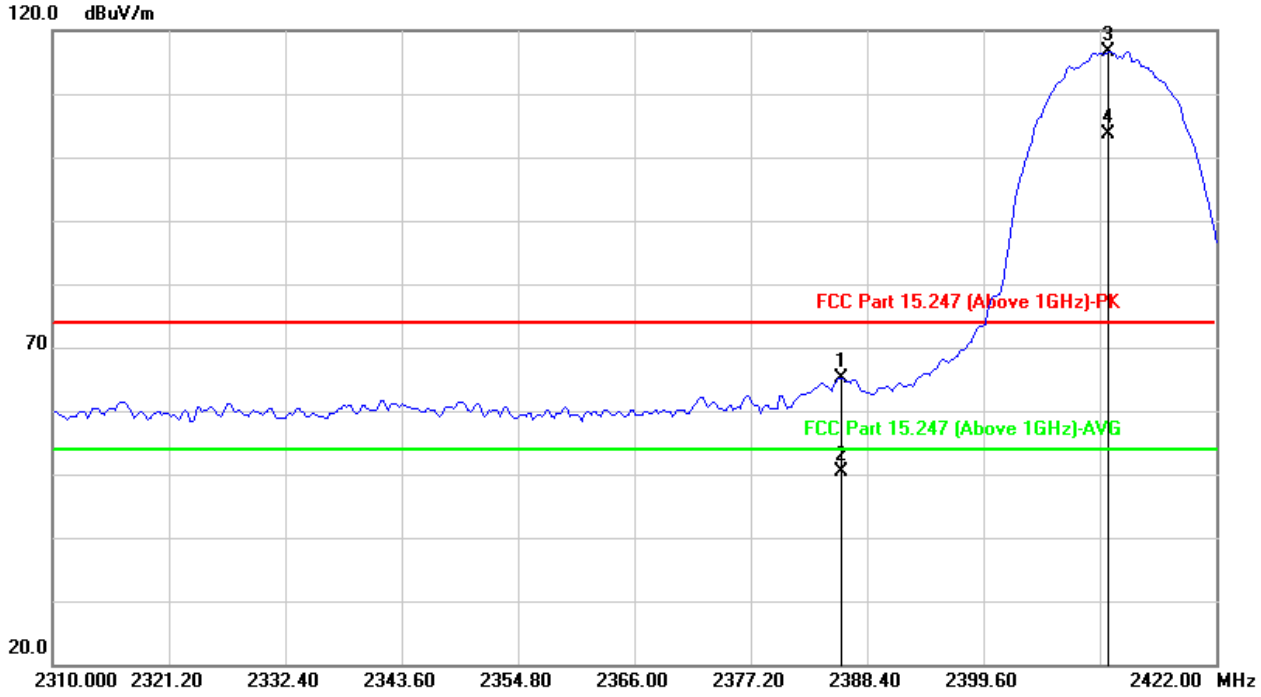
Remarks:

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



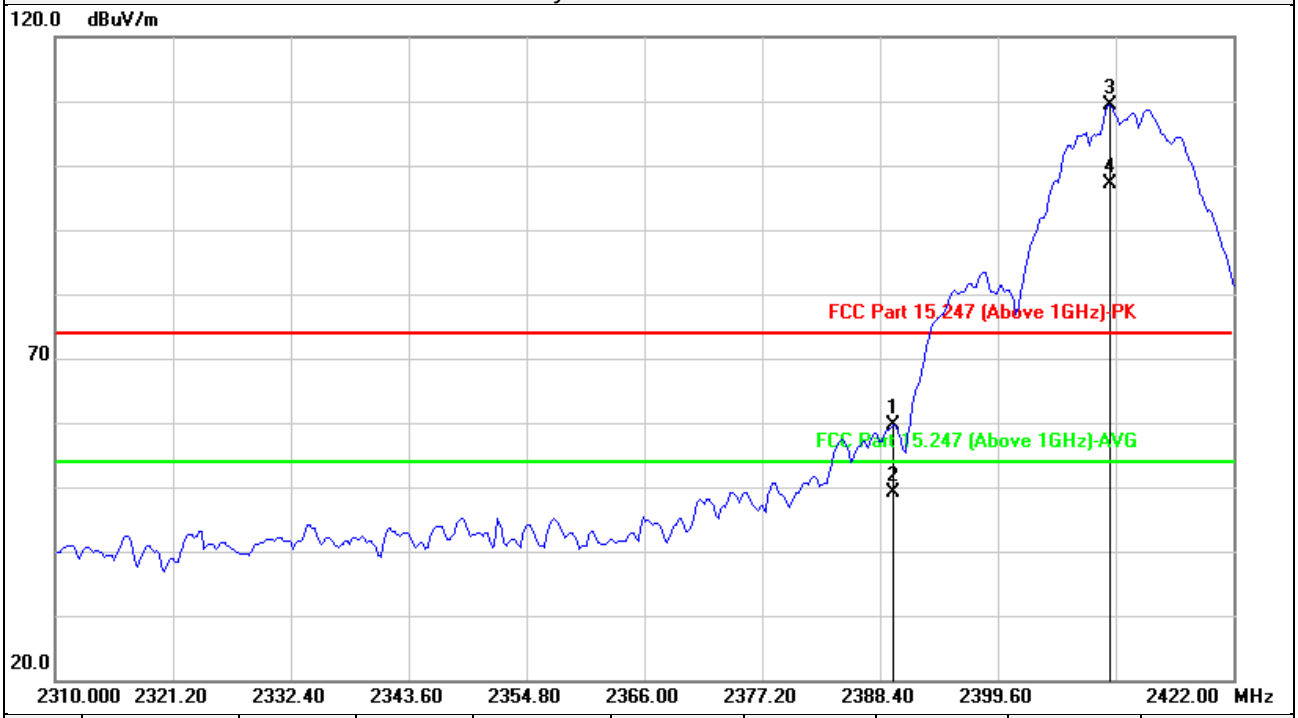
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2385.864	31.74	33.50	65.24	74.00	-8.76	peak	100	182
2	2385.864	16.81	33.50	50.31	54.00	-3.69	AVG	100	182
3	2411.675	83.09	33.56	116.65			peak	100	182
4	2411.675	70.15	33.56	103.71			AVG	100	182
5	4824.000	52.49	4.51	57.00	74.00	-17.00	peak	100	82
6	4824.000	38.64	4.51	43.15	54.00	-10.85	AVG	100	82
7	7236.000	47.22	9.13	56.35	74.00	-17.65	peak	100	344
8	7236.000	32.32	9.13	41.45	54.00	-12.55	AVG	100	344

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	2389.679	61.93	-2.39	59.54	74.00	-14.46	peak	234	126
2	2389.679	51.55	-2.39	49.16	54.00	-4.84	AVG	234	126
3	2410.329	111.79	-2.37	109.42			peak	234	126
4	2410.329	99.51	-2.37	97.14			AVG	234	126
5	4824.000	61.00	4.51	65.51	74.00	-8.49	peak	204	51
6	4824.000	45.98	4.51	50.49	54.00	-3.51	AVG	204	51
7	7236.000	44.79	9.13	53.92	74.00	-20.08	peak	100	321
8	7236.000	34.35	9.13	43.48	54.00	-10.52	AVG	100	321

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

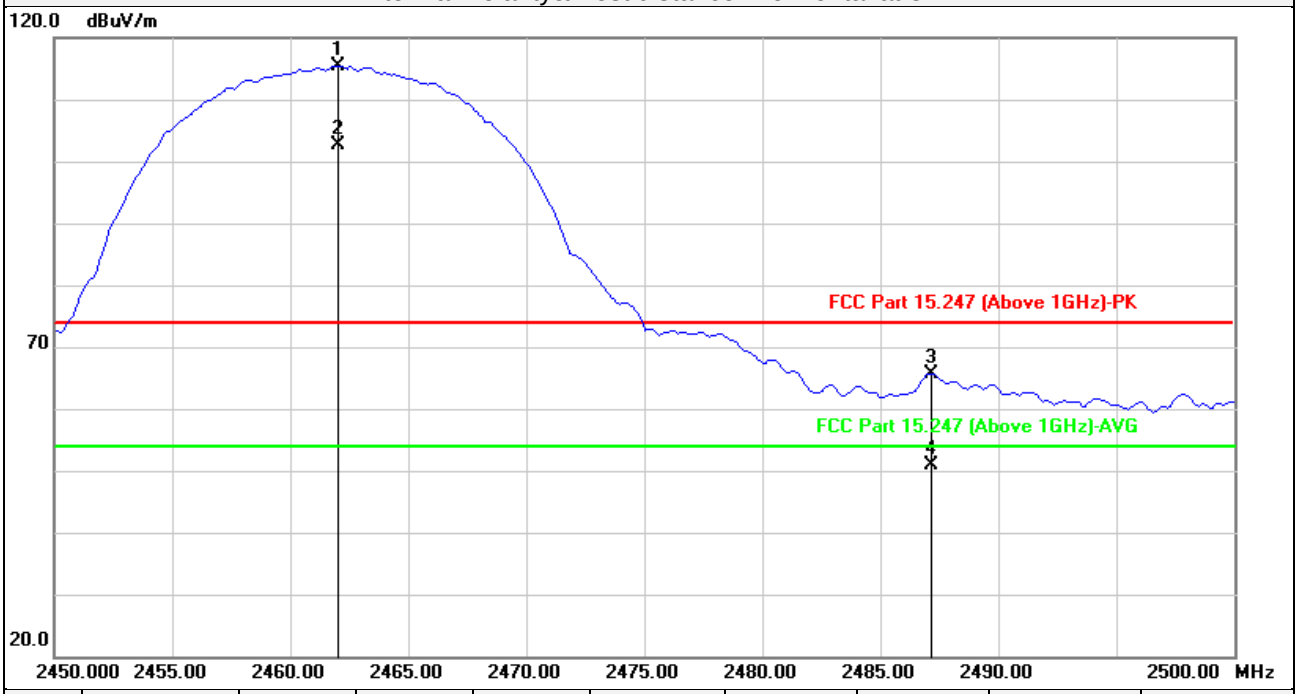
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	116.44	-1.27	115.17			peak	158	102
2	2437.000	103.58	-1.27	102.31			AVG	158	102
3	4874.000	52.30	4.64	56.94	74.00	-17.06	peak	100	133
4	4874.000	37.47	4.64	42.11	54.00	-11.89	AVG	100	133
5	7311.000	45.70	9.24	54.94	74.00	-19.06	peak	121	210
6	7311.000	33.12	9.24	42.36	54.00	-11.64	AVG	121	210
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	103.40	-1.27	102.13			peak	175	166
2	2437.000	97.75	-1.27	96.48			AVG	175	166
3	4874.000	53.49	4.64	58.13	74.00	-15.87	peak	151	215
4	4874.000	37.52	4.64	42.16	54.00	-11.84	AVG	151	215
5	7311.000	45.92	9.24	55.16	74.00	-18.84	peak	100	101
6	7311.000	31.40	9.24	40.64	54.00	-13.36	AVG	100	101

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



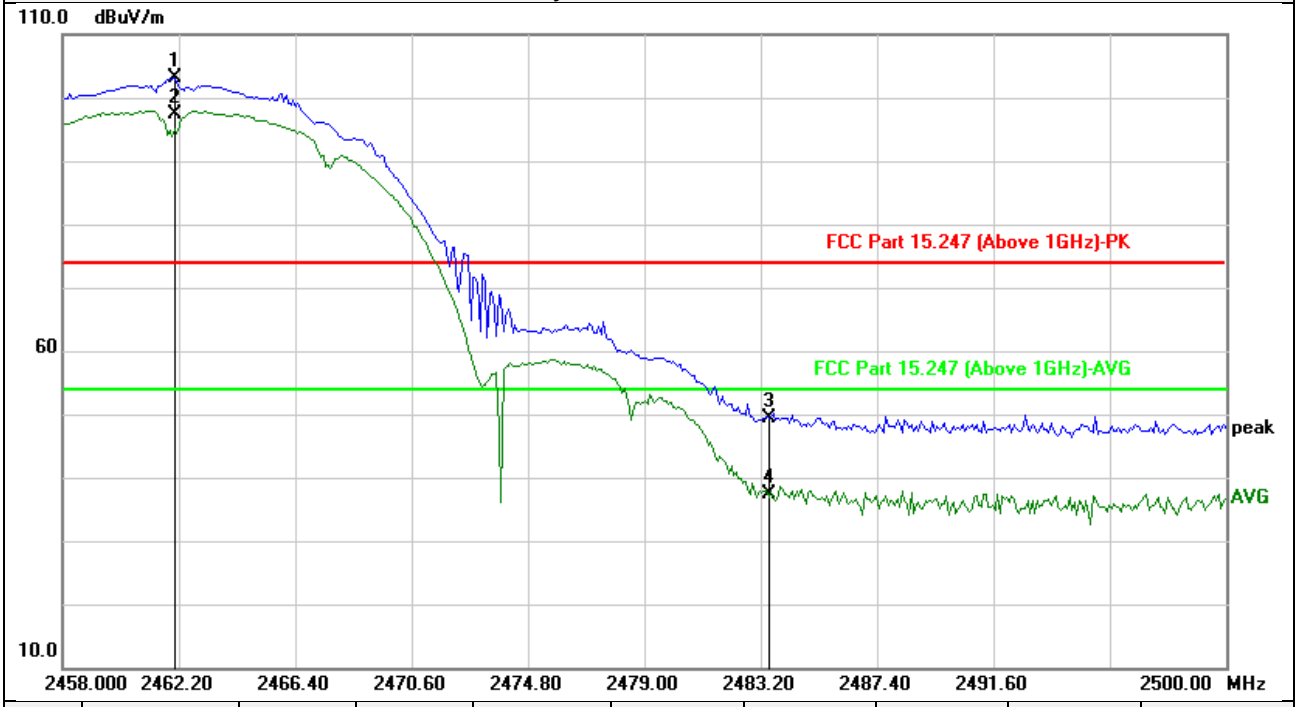
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2462.024	81.82	33.67	115.49			peak	157	183
2	2462.024	69.07	33.67	102.74			AVG	157	183
3	2487.174	31.97	33.74	65.71	74.00	-8.29	peak	157	183
4	2487.174	17.06	33.74	50.80	54.00	-3.20	AVG	157	183
5	4924.000	52.82	4.80	57.62	74.00	-16.38	peak	364	361
6	4924.000	38.62	4.80	43.42	54.00	-10.58	AVG	364	361
7	7386.000	45.73	9.33	55.06	74.00	-18.94	peak	100	226
8	7386.000	32.62	9.33	41.95	54.00	-12.05	AVG	100	226

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



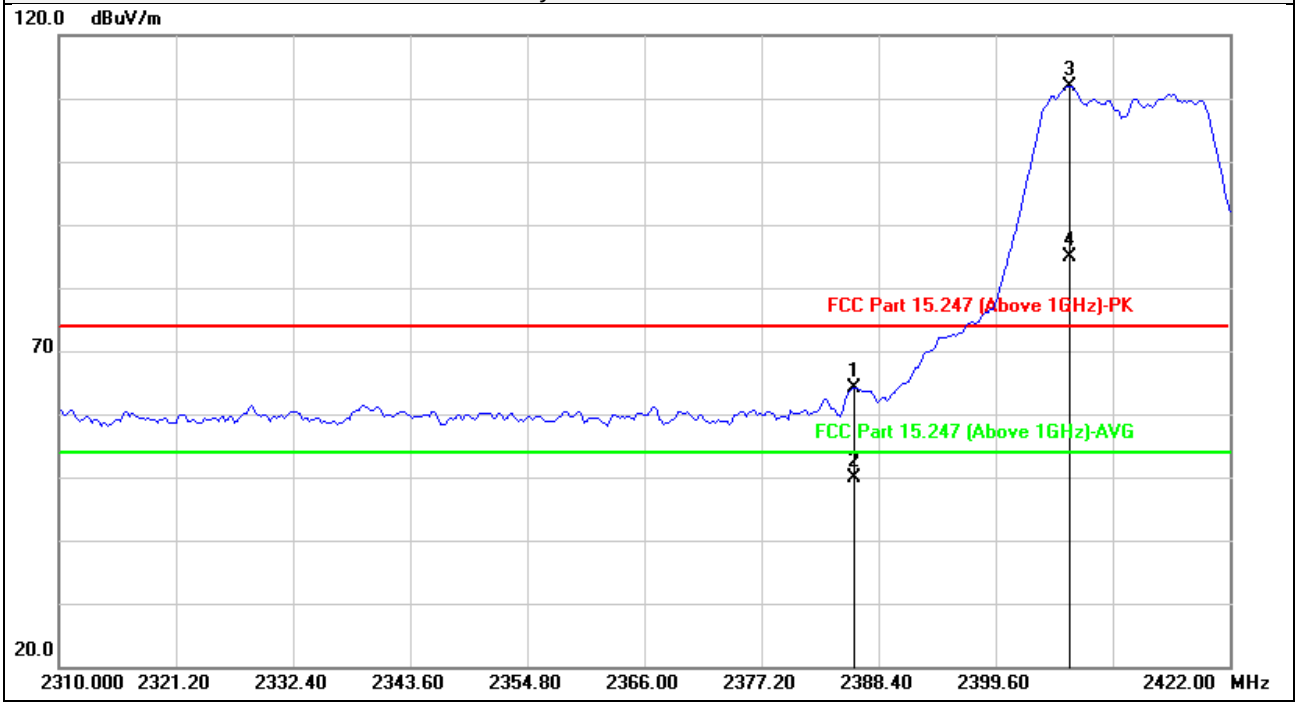
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2462.040	104.30	-1.27	103.03			peak	100	67
2	2462.040	98.58	-1.27	97.31			AVG	100	67
3	2483.500	50.60	-1.25	49.35	74.00	-24.65	peak	100	67
4	2483.500	38.73	-1.25	37.48	54.00	-16.52	AVG	100	67
5	4924.000	53.58	4.80	58.38	74.00	-15.62	peak	268	0
6	4924.000	39.84	4.80	44.64	54.00	-9.36	AVG	268	0
7	7386.000	45.81	9.33	55.14	74.00	-18.86	peak	100	106
8	7386.000	32.11	9.33	41.44	54.00	-12.56	AVG	100	106

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



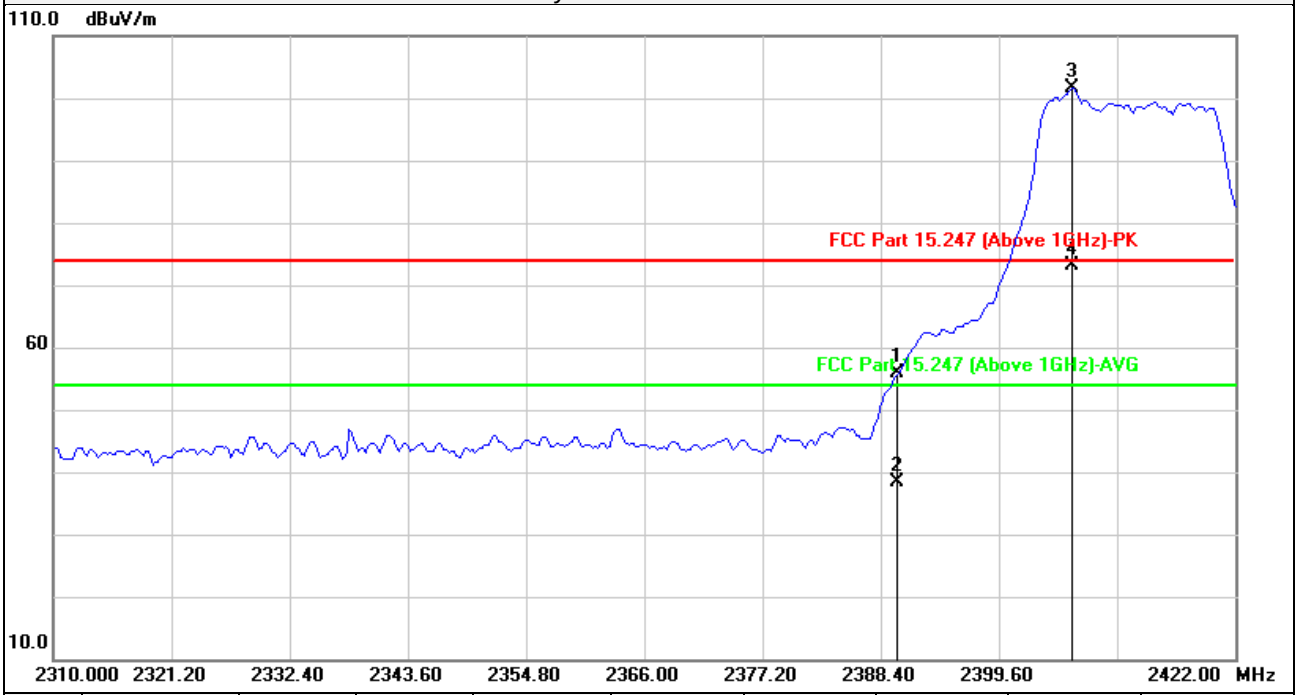
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2386.088	30.62	33.50	64.12	74.00	-9.88	peak	100	179
2	2386.088	16.27	33.50	49.77	54.00	-4.23	AVG	100	179
3	2406.738	78.41	33.55	111.96			peak	100	179
4	2406.738	51.37	33.55	84.92			AVG	100	179
5	4824.000	45.92	4.51	50.43	74.00	-23.57	peak	100	174
6	4824.000	33.14	4.51	37.65	54.00	-16.35	AVG	100	174
7	7236.000	44.79	9.13	53.92	74.00	-20.08	peak	100	320
8	7236.000	31.74	9.13	40.87	54.00	-13.13	AVG	100	320

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	2390.000	58.36	-2.40	55.96	74.00	-18.04	peak	100	131
2	2390.000	40.72	-2.40	38.32	54.00	-15.68	AVG	100	131
3	2406.513	103.99	-2.38	101.61			peak	100	131
4	2406.513	75.63	-2.38	73.25			AVG	100	131
5	4824.000	50.71	4.51	55.22	74.00	-18.78	peak	100	174
6	4824.000	36.58	4.51	41.09	54.00	-12.91	AVG	100	174
7	7236.000	44.11	9.13	53.24	74.00	-20.76	peak	100	284
8	7236.000	31.64	9.13	40.77	54.00	-13.23	AVG	100	284

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

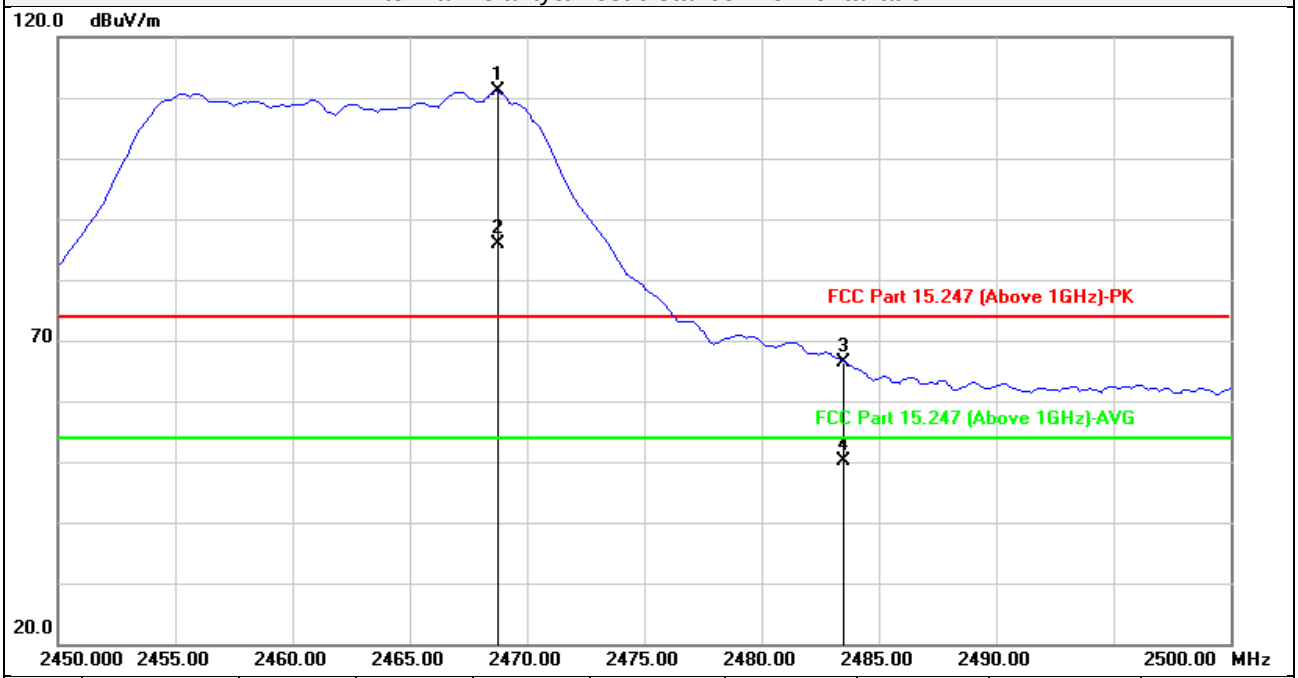
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	111.61	-1.27	110.34			peak	215	177
2	2437.000	84.94	-1.27	83.67			AVG	215	177
3	4874.000	54.50	4.64	59.14	74.00	-14.86	peak	203	166
4	4874.000	40.04	4.64	44.68	54.00	-9.32	AVG	203	166
5	7311.000	44.45	9.24	53.69	74.00	-20.31	peak	100	155
6	7311.000	33.90	9.24	43.14	54.00	-10.86	AVG	100	155
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	101.88	-1.27	100.61			peak	201	181
2	2437.000	73.58	-1.27	72.31			AVG	201	181
3	4874.000	53.02	4.64	57.66	74.00	-16.34	peak	217	147
4	4874.000	39.30	4.64	43.94	54.00	-10.06	AVG	217	147
5	7311.000	45.03	9.24	54.27	74.00	-19.73	peak	141	264
6	7311.000	32.95	9.24	42.19	54.00	-11.81	AVG	141	264

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



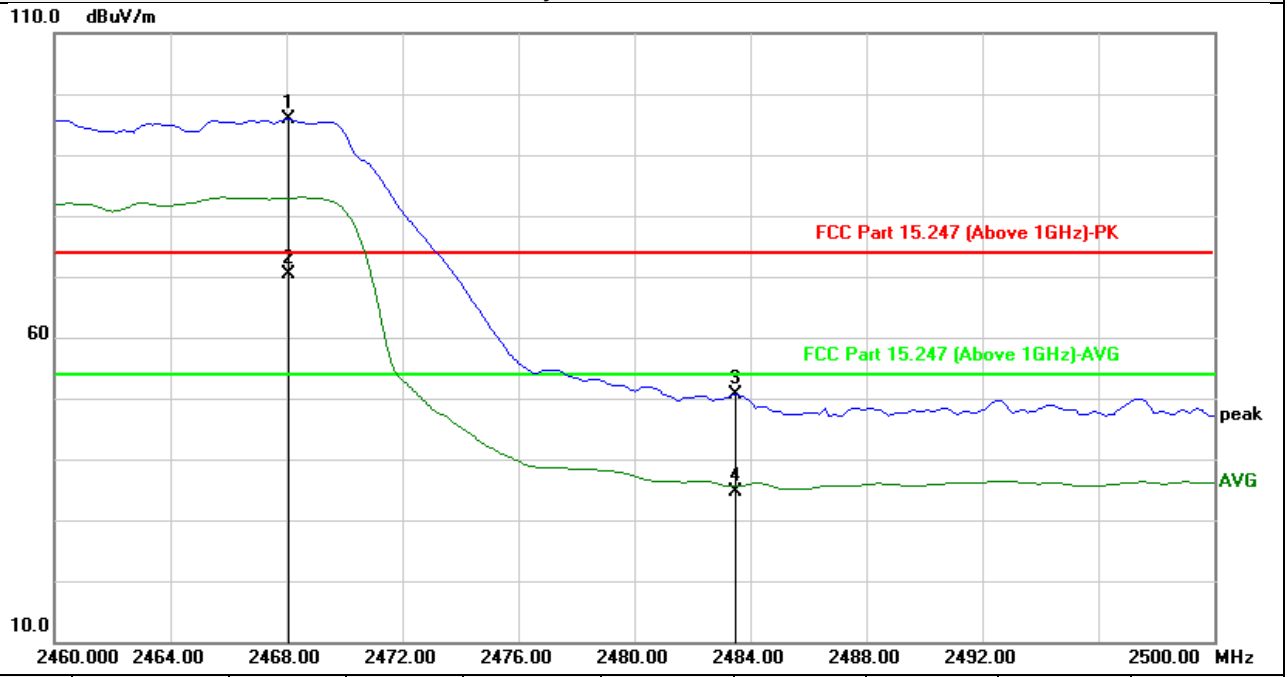
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2468.738	77.33	33.69	111.02			peak	100	185
2	2468.738	52.12	33.69	85.81			AVG	100	185
3	2483.500	32.71	33.73	66.44	74.00	-7.56	peak	100	185
4	2483.500	16.30	33.73	50.03	54.00	-3.97	AVG	100	185
5	4924.000	43.68	4.80	48.48	74.00	-25.52	peak	100	165
6	4924.000	31.48	4.80	36.28	54.00	-17.72	AVG	100	165
7	7386.000	44.69	9.33	54.02	74.00	-19.98	peak	100	171
8	7386.000	31.80	9.33	41.13	54.00	-12.87	AVG	100	171

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



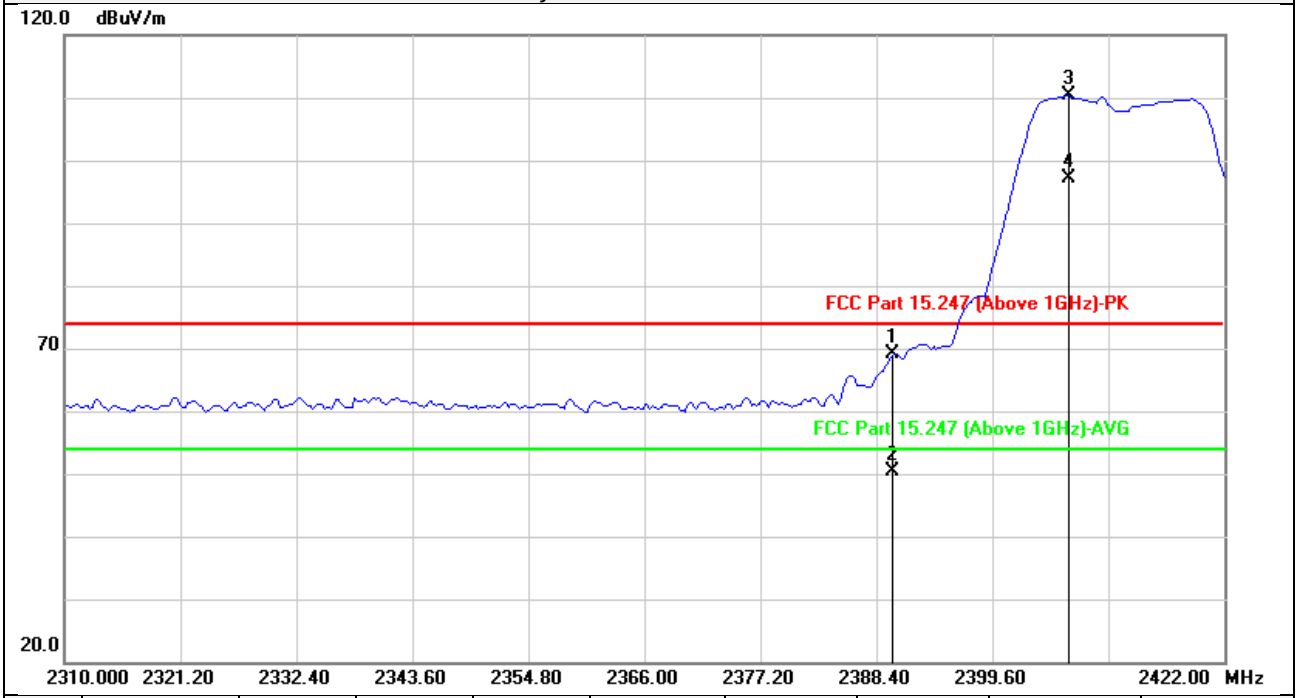
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2468.096	97.14	-1.26	95.88			peak	100	125
2	2468.096	71.65	-1.26	70.39			AVG	100	125
3	2483.500	51.78	-1.25	50.53	74.00	-23.47	peak	100	125
4	2483.500	36.00	-1.25	34.75	54.00	-19.25	AVG	100	125
5	4924.000	49.85	4.80	54.65	74.00	-19.35	peak	100	48
6	4924.000	35.43	4.80	40.23	54.00	-13.77	AVG	100	48
7	7386.000	45.58	9.33	54.91	74.00	-19.09	peak	100	147
8	7386.000	31.39	9.33	40.72	54.00	-13.28	AVG	100	147

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



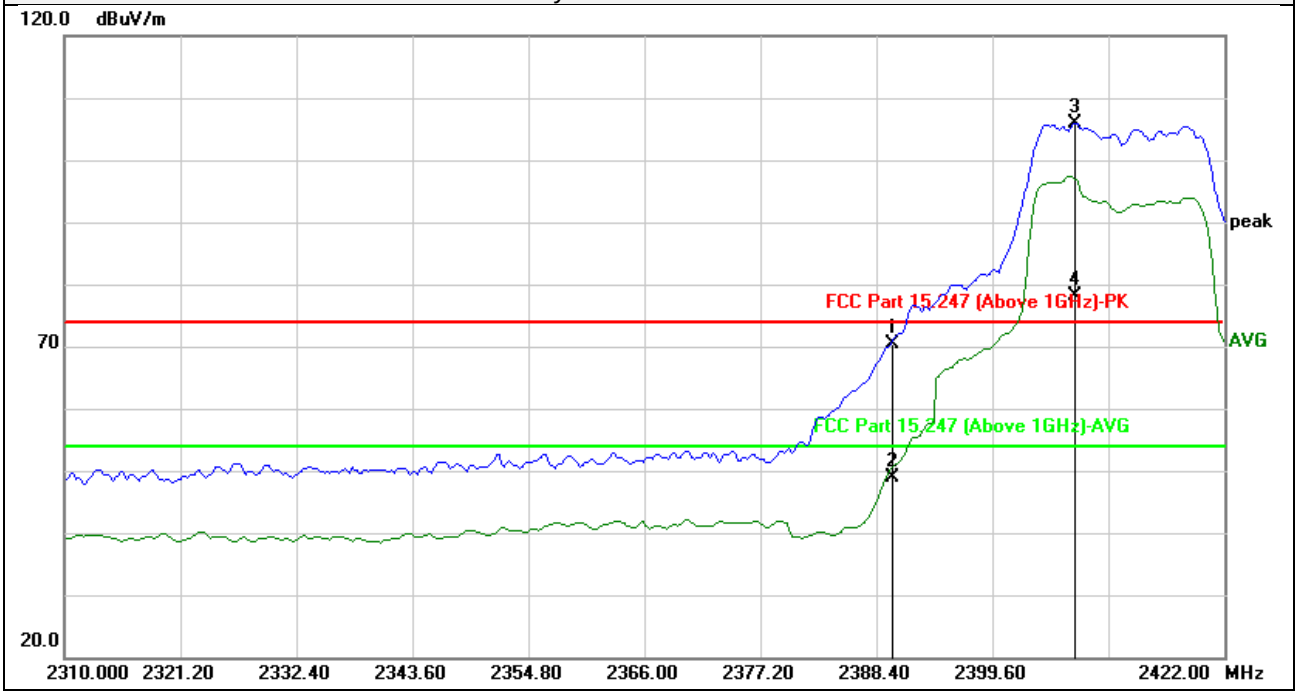
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2390.000	35.53	33.51	69.04	74.00	-4.96	peak	100	180
2	2390.000	16.90	33.51	50.41	54.00	-3.59	AVG	100	180
3	2406.962	76.75	33.55	110.30			peak	100	180
4	2406.962	63.49	33.55	97.04			AVG	100	180
5	4824.000	43.61	4.51	48.12	74.00	-25.88	peak	100	132
6	4824.000	31.44	4.51	35.95	54.00	-18.05	AVG	100	132
7	7236.000	44.26	9.13	53.39	74.00	-20.61	peak	100	246
8	7236.000	31.64	9.13	40.77	54.00	-13.23	AVG	100	246

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	2390.000	71.74	-1.30	70.44	74.00	-3.56	peak	100	122
2	2390.000	50.24	-1.30	48.94	54.00	-5.06	AVG	100	122
3	2407.635	107.21	-1.29	105.92			peak	100	122
4	2407.635	79.47	-1.29	78.18			AVG	100	122
5	4824.000	49.19	4.51	53.70	74.00	-20.30	peak	100	357
6	4824.000	35.73	4.51	40.24	54.00	-13.76	AVG	100	357
7	7236.000	44.71	9.13	53.84	74.00	-20.16	peak	100	201
8	7236.000	31.72	9.13	40.85	54.00	-13.15	AVG	100	201

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

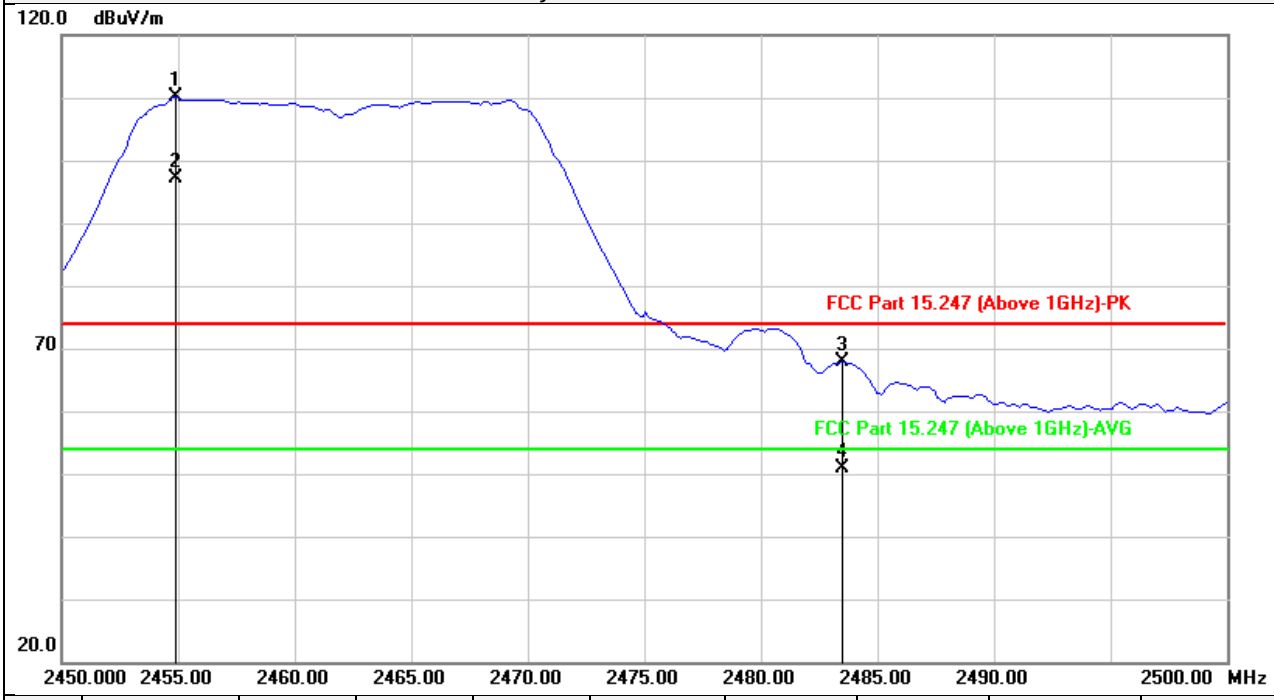
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	110.74	-1.27	109.47			peak	100	216
2	2437.000	78.69	-1.27	77.42			AVG	100	216
3	4874.000	53.50	4.64	58.14	74.00	-15.86	peak	100	184
4	4874.000	38.64	4.64	43.28	54.00	-10.72	AVG	100	184
5	7311.000	44.93	9.24	54.17	74.00	-19.83	peak	218	98
6	7311.000	33.37	9.24	42.61	54.00	-11.39	AVG	218	98
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	106.12	-1.27	104.85			peak	311	151
2	2437.000	77.62	-1.27	76.35			AVG	311	151
3	4874.000	53.04	4.64	57.68	74.00	-16.32	peak	216	124
4	4874.000	39.55	4.64	44.19	54.00	-9.81	AVG	216	124
5	7311.000	44.70	9.24	53.94	74.00	-20.06	peak	100	175
6	7311.000	34.89	9.24	44.13	54.00	-9.87	AVG	100	175

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



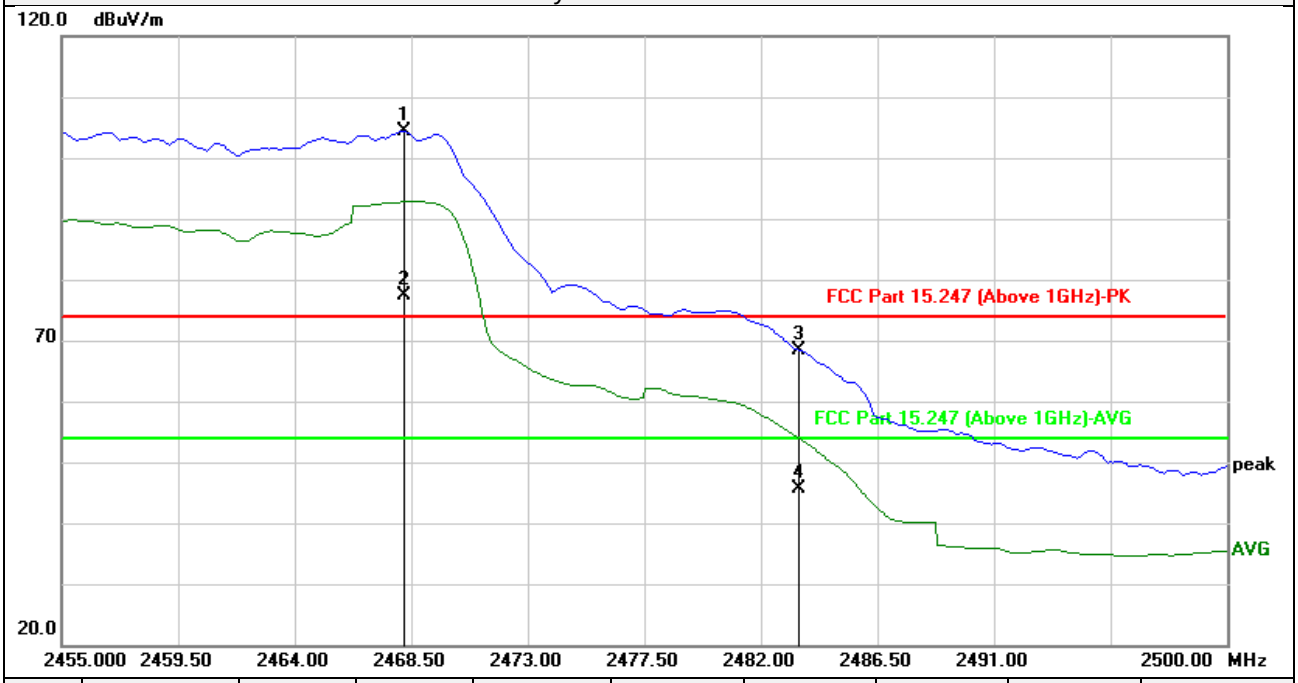
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2454.910	76.40	33.66	110.06			peak	161	182
2	2454.910	63.40	33.66	97.06			AVG	161	182
3	2483.500	34.03	33.73	67.76	74.00	-6.24	peak	161	182
4	2483.500	17.17	33.73	50.90	54.00	-3.10	AVG	161	182
5	4924.000	42.50	4.80	47.30	74.00	-26.70	peak	100	165
6	4924.000	31.33	4.80	36.13	54.00	-17.87	AVG	100	165
7	7386.000	43.75	9.33	53.08	74.00	-20.92	peak	100	211
8	7386.000	31.22	9.33	40.55	54.00	-13.45	AVG	100	211

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



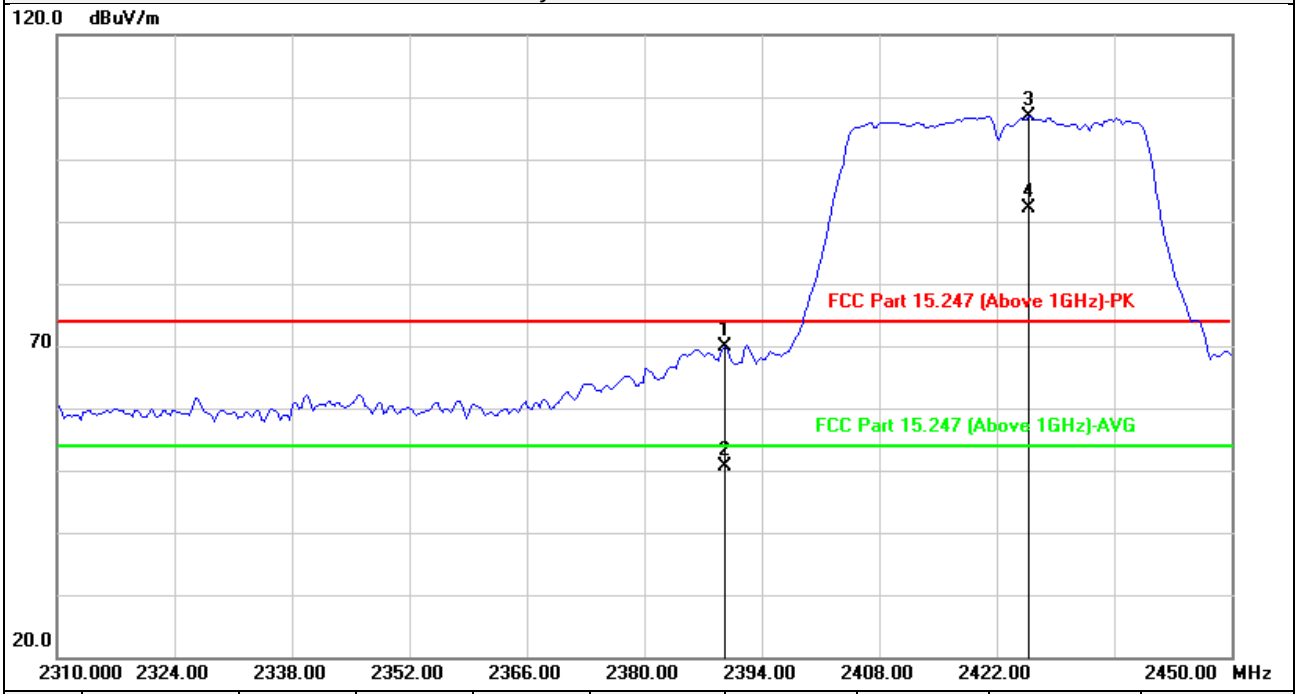
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2468.256	105.60	-1.26	104.34			peak	100	153
2	2468.256	78.68	-1.26	77.42			AVG	100	153
3	2483.500	69.53	-1.25	68.28	74.00	-5.72	peak	100	153
4	2483.500	47.00	-1.25	45.75	54.00	-8.25	AVG	100	153
5	4924.000	48.72	4.80	53.52	74.00	-20.48	peak	100	48
6	4924.000	36.50	4.80	41.30	54.00	-12.70	AVG	100	48
7	7386.000	43.99	9.33	53.32	74.00	-20.68	peak	100	208
8	7386.000	31.21	9.33	40.54	54.00	-13.46	AVG	100	208

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



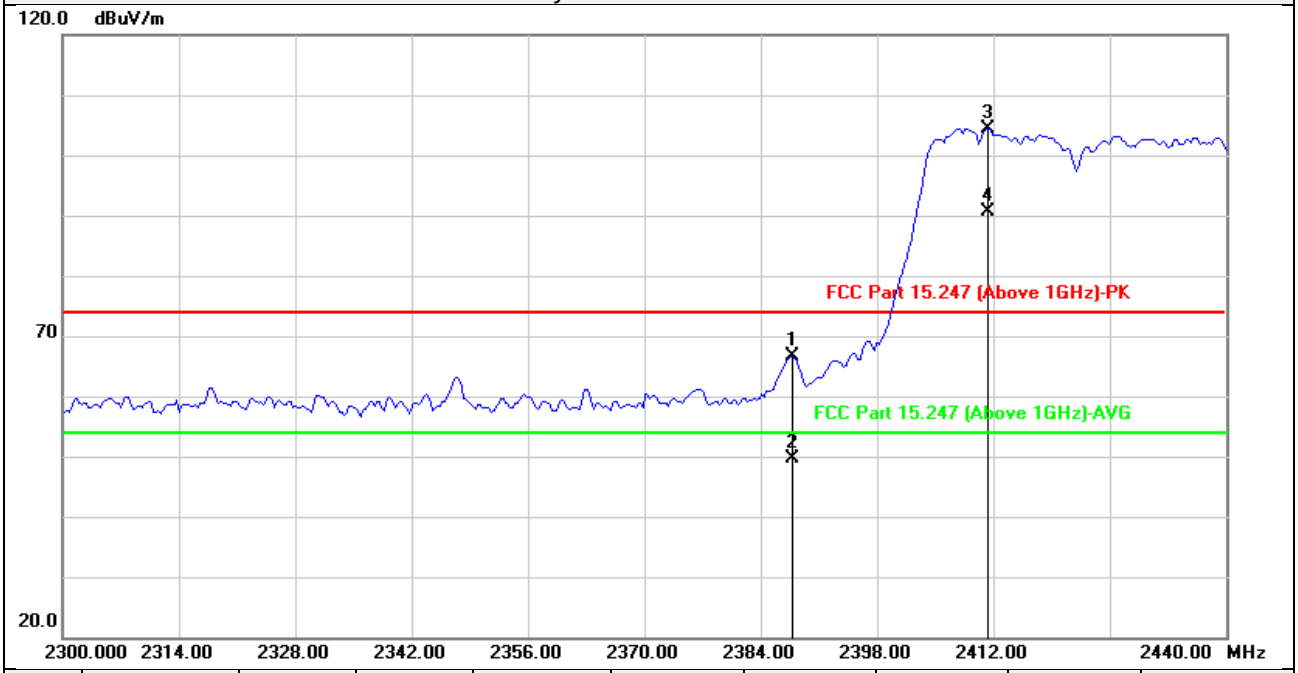
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2389.679	36.28	33.50	69.78	74.00	-4.22	peak	100	184
2	2389.679	17.02	33.50	50.52	54.00	-3.48	AVG	100	184
3	2425.872	73.37	33.59	106.96			peak	100	184
4	2425.872	58.52	33.59	92.11			AVG	100	184
5	4844.000	43.23	4.56	47.79	74.00	-26.21	peak	100	43
6	4844.000	32.10	4.56	36.66	54.00	-17.34	AVG	100	43
7	7266.000	42.14	9.16	51.30	74.00	-22.70	peak	100	164
8	7266.000	31.62	9.16	40.78	54.00	-13.22	AVG	100	164

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 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	2387.816	33.04	33.50	66.54	74.00	-7.46	peak	300	134
2	2387.816	16.18	33.50	49.68	54.00	-4.32	AVG	300	134
3	2411.383	70.81	33.56	104.37			peak	300	134
4	2411.383	57.04	33.56	90.60			AVG	300	134
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. 2412MHz: 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

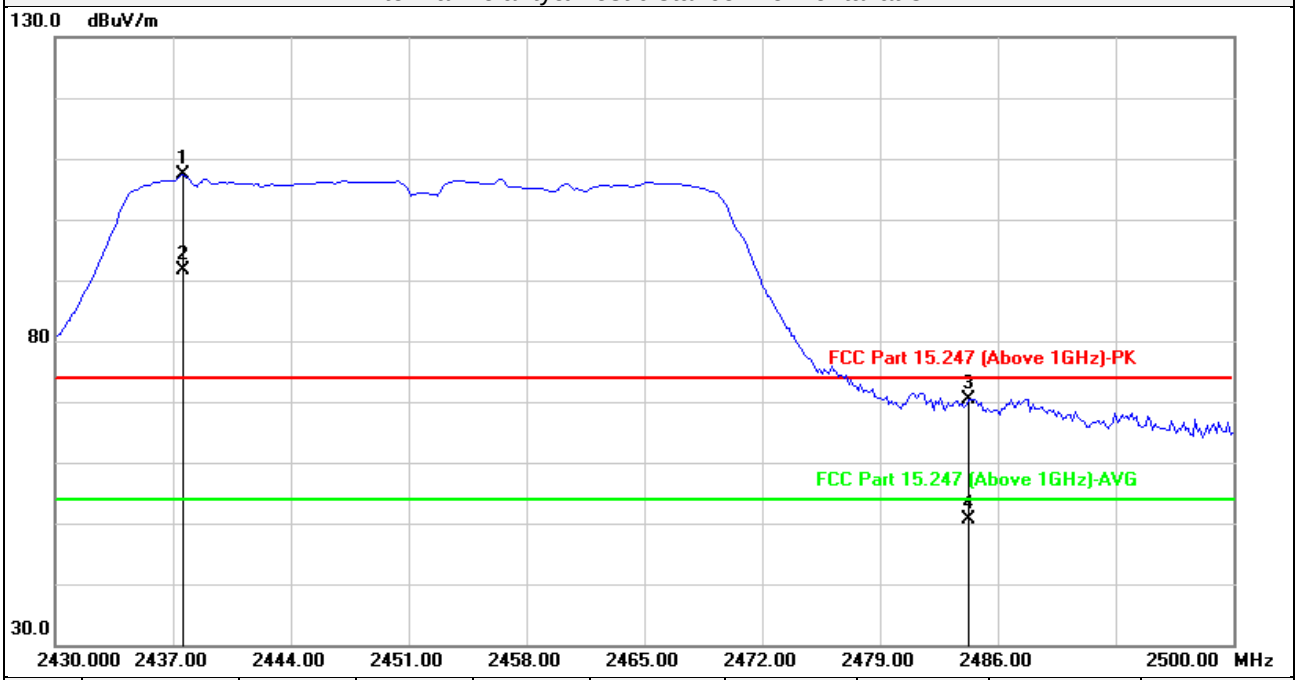
Antennal Polarity& Test Distance: Horizontal at 3m									
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.000	106.58	-1.27	105.31			peak	100	118
2	2437.000	92.52	-1.27	91.25			AVG	100	118
3	4874.000	54.08	4.64	58.72	74.00	-15.28	peak	174	269
4	4874.000	39.05	4.64	43.69	54.00	-10.31	AVG	174	269
5	7311.000	46.04	9.24	55.28	74.00	-18.72	peak	211	87
6	7311.000	34.71	9.24	43.95	54.00	-10.05	AVG	211	87
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	105.12	-1.27	103.85			peak	100	112
2	2437.000	91.01	-1.27	89.74			AVG	100	112
3	4874.000	52.50	4.64	57.14	74.00	-16.86	peak	148	266
4	4874.000	38.32	4.64	42.96	54.00	-11.04	AVG	148	266
5	7311.000	46.07	9.24	55.31	74.00	-18.69	peak	100	103
6	7311.000	32.77	9.24	42.01	54.00	-11.99	AVG	100	103

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



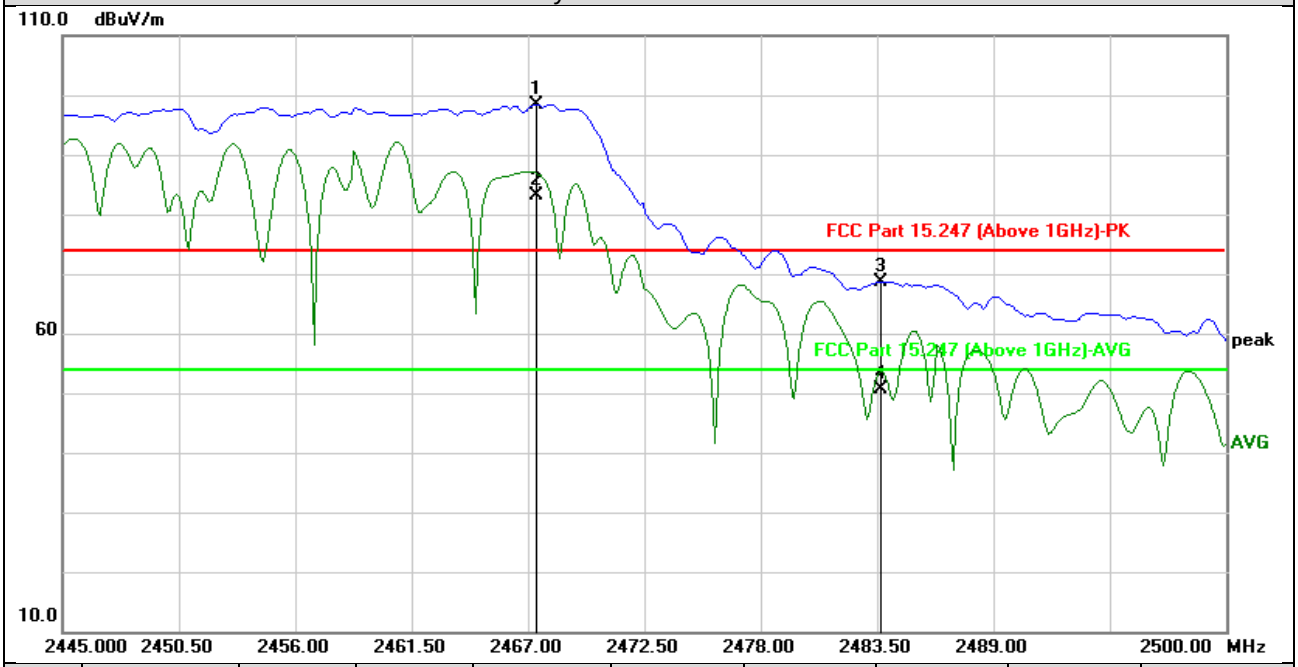
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	2437.575	73.65	33.62	107.27			peak	100	181
2	2437.575	58.13	33.62	91.75			AVG	100	181
3	2484.289	36.75	33.73	70.48	74.00	-3.52	peak	100	181
4	2484.289	17.02	33.73	50.75	54.00	-3.25	AVG	100	181
5	4904.000	42.32	4.75	47.07	74.00	-26.93	peak	100	348
6	4904.000	31.66	4.75	36.41	54.00	-17.59	AVG	100	348
7	7356.000	43.96	9.29	53.25	74.00	-20.75	peak	100	159
8	7356.000	31.55	9.29	40.84	54.00	-13.16	AVG	100	159

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	2467.375	99.61	-1.26	98.35			peak	100	123
2	2467.375	84.50	-1.26	83.24			AVG	100	123
3	2483.687	69.90	-1.25	68.65	74.00	-5.35	peak	100	123
4	2483.687	51.92	-1.25	50.67	54.00	-3.33	AVG	100	123
5	4904.000	47.42	4.75	52.17	74.00	-21.83	peak	100	48
6	4904.000	35.44	4.75	40.19	54.00	-13.81	AVG	100	48
7	7356.000	42.56	9.29	51.85	74.00	-22.15	peak	100	254
8	7356.000	31.43	9.29	40.72	54.00	-13.28	AVG	100	254

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
Hygrothermograph Yuhuaze	HTC-1	NA	2021/09/16
Digital Multimeter FLUKE	15B+	43512617WS	2021/09/16

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA.
2. The test was performed in Shielded Room 1.

3.2.3 Test Procedures

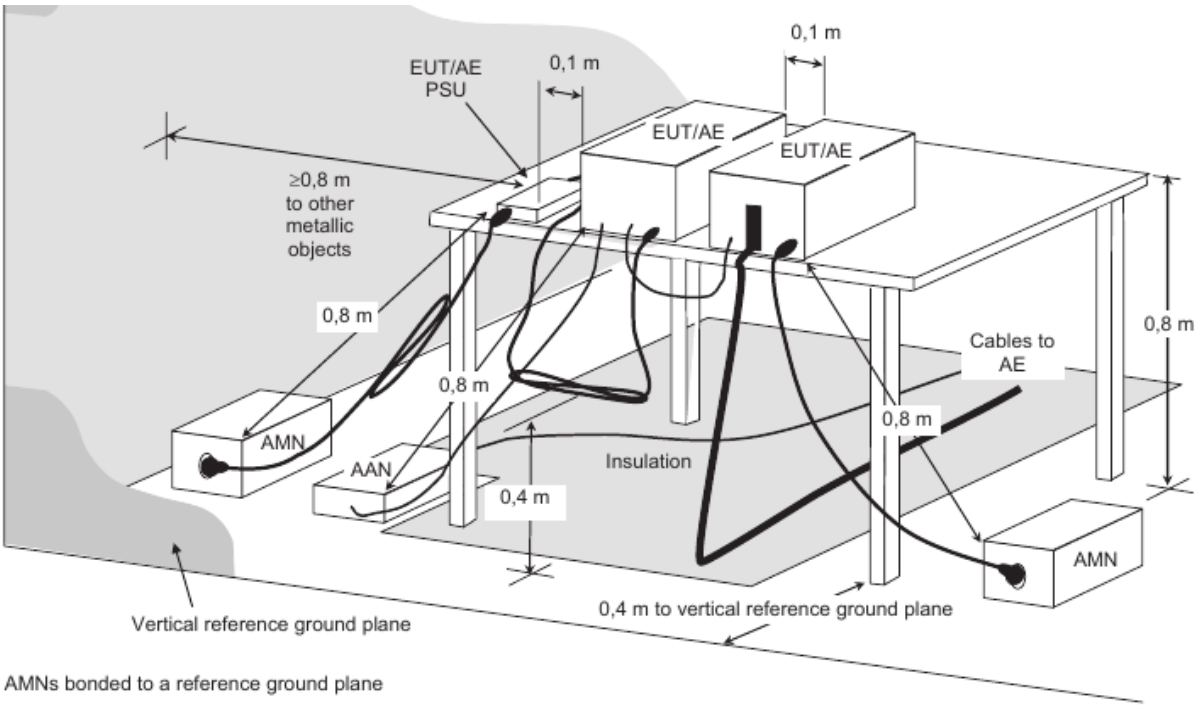
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance 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



AMNs bonded to a reference ground plane

3.2.6 EUT Operating Conditions

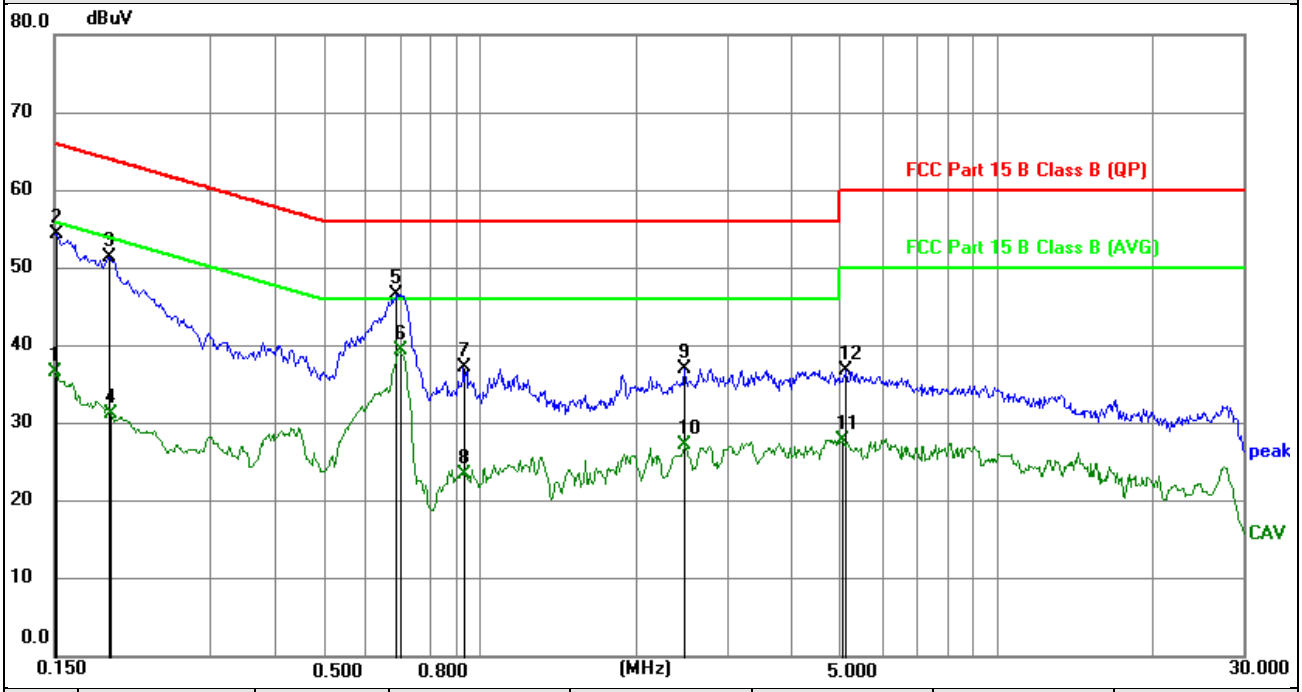
a. Placed the EUT on the testing table.

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)



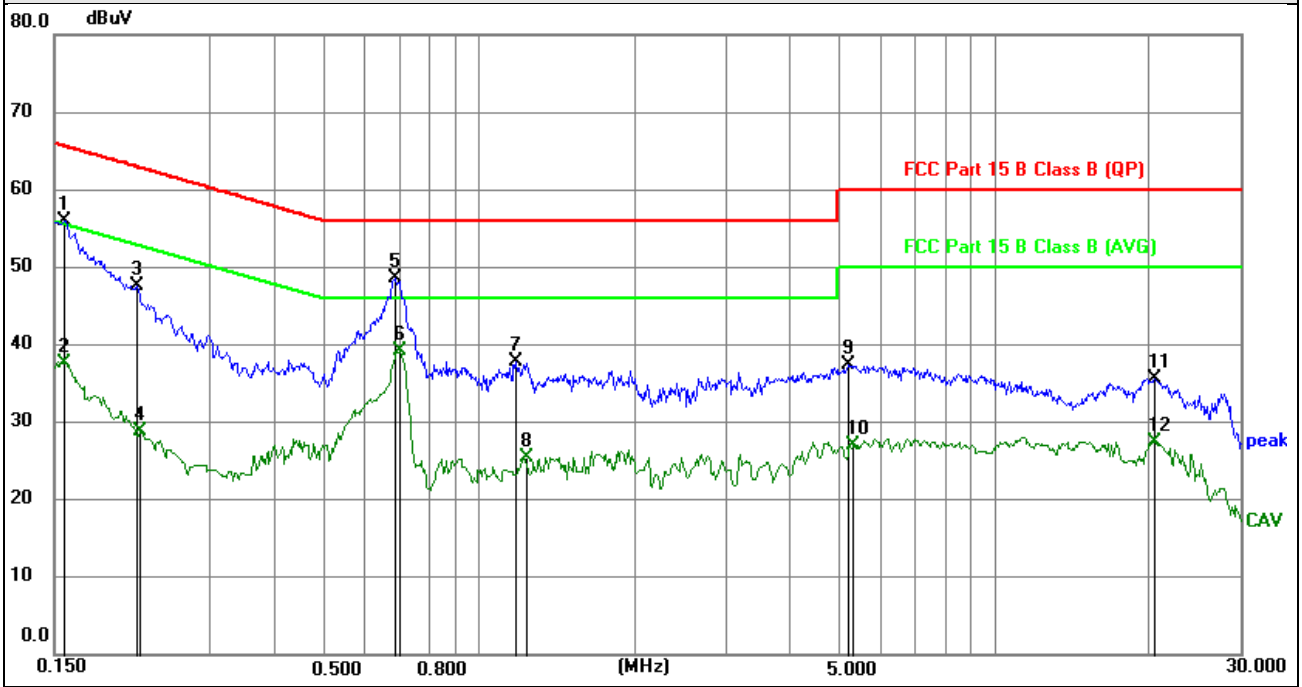
No	Frequency	Reading	Correction Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Detector
1	0.1500	26.49	10.19	36.68	56.00	-19.32	AVG
2	0.1514	44.14	10.18	54.32	65.92	-11.60	peak
3	0.1905	41.30	10.15	51.45	64.01	-12.56	peak
4	0.1922	21.04	10.15	31.19	53.94	-22.75	AVG
5	0.6922	36.57	10.10	46.67	56.00	-9.33	peak
6	0.7034	29.25	10.10	39.35	46.00	-6.65	AVG
7	0.9305	27.10	10.06	37.16	56.00	-18.84	peak
8	0.9305	13.46	10.06	23.52	46.00	-22.48	AVG
9	2.4876	26.96	10.10	37.06	56.00	-18.94	peak
10	2.4876	17.09	10.10	27.19	46.00	-18.81	AVG
11	5.0437	17.78	10.04	27.82	50.00	-22.18	AVG
12	5.1135	26.70	10.03	36.73	60.00	-23.27	peak

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	0.1567	45.75	10.17	55.92	65.64	-9.72	peak
2	0.1567	27.53	10.17	37.70	55.64	-17.94	AVG
3	0.2172	37.35	10.15	47.50	62.93	-15.43	peak
4	0.2197	18.71	10.15	28.86	52.83	-23.97	AVG
5	0.6922	38.48	10.10	48.58	56.00	-7.42	peak
6	0.7034	29.11	10.10	39.21	46.00	-6.79	AVG
7	1.1827	27.69	10.06	37.75	56.00	-18.25	peak
8	1.2319	15.28	10.06	25.34	46.00	-20.66	AVG
9	5.2439	27.33	10.03	37.36	60.00	-22.64	peak
10	5.3429	17.01	10.02	27.03	50.00	-22.97	AVG
11	20.4720	25.27	10.39	35.66	60.00	-24.34	peak
12	20.4720	17.02	10.39	27.41	50.00	-22.59	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.

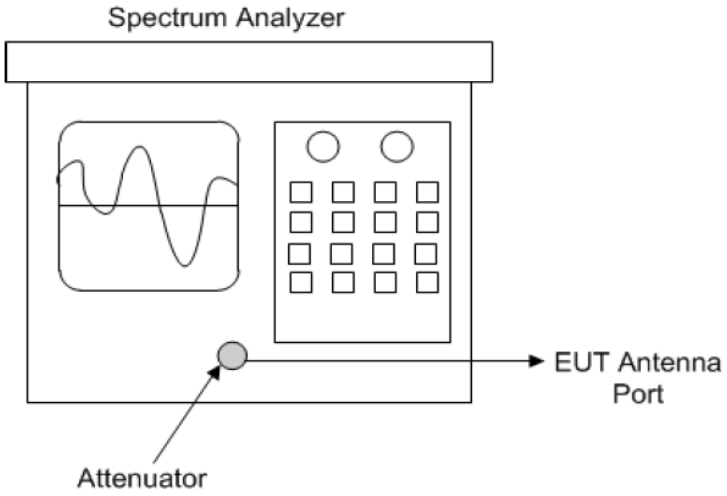
3.3 6dB Bandwidth Measurement

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

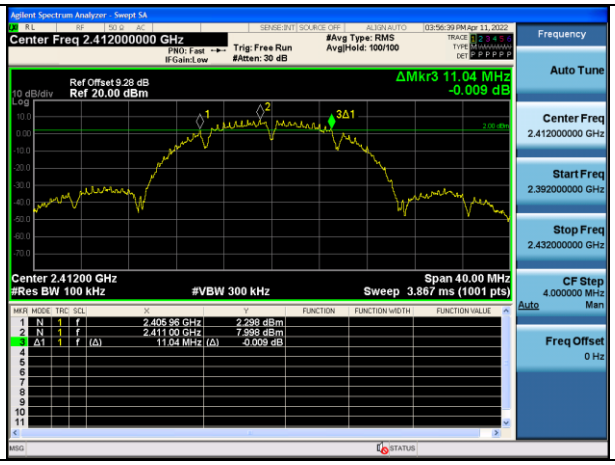
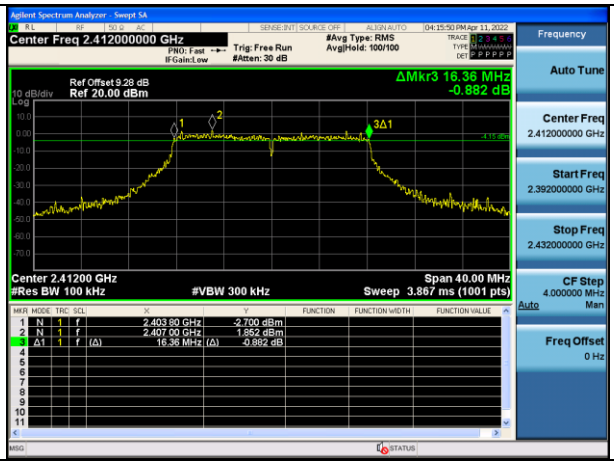
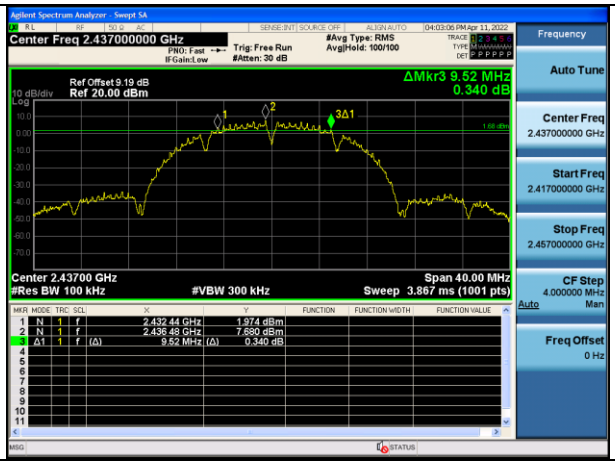
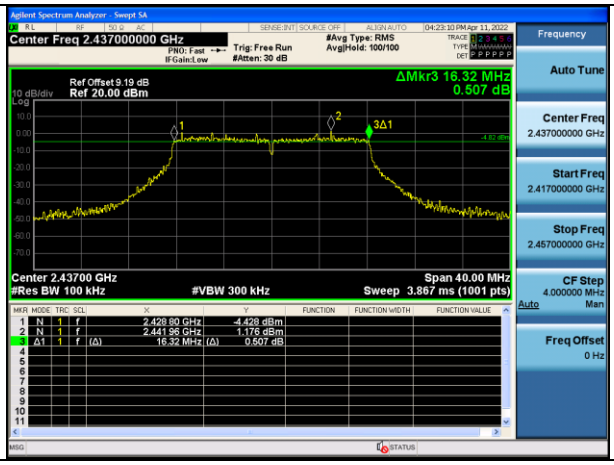
No deviation.

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
11b	1	2412	11.04	0.5	Pass
	6	2437	9.52	0.5	Pass
	11	2462	10.08	0.5	Pass
11g	1	2412	16.36	0.5	Pass
	6	2437	16.32	0.5	Pass
	11	2462	16.36	0.5	Pass
11n HT20	1	2412	17.24	0.5	Pass
	6	2437	17.24	0.5	Pass
	11	2462	17.08	0.5	Pass
11n HT40	3	2412	35.44	0.5	Pass
	6	2437	35.44	0.5	Pass
	9	2462	35.44	0.5	Pass

802.11b	802.11g
CH 1	CH 1
	
CH 6	CH 6
	
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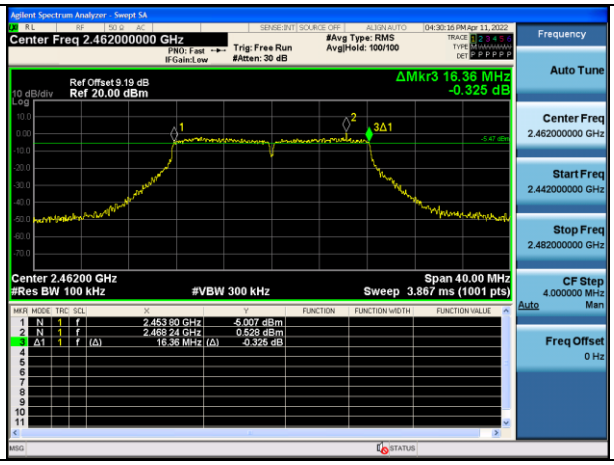
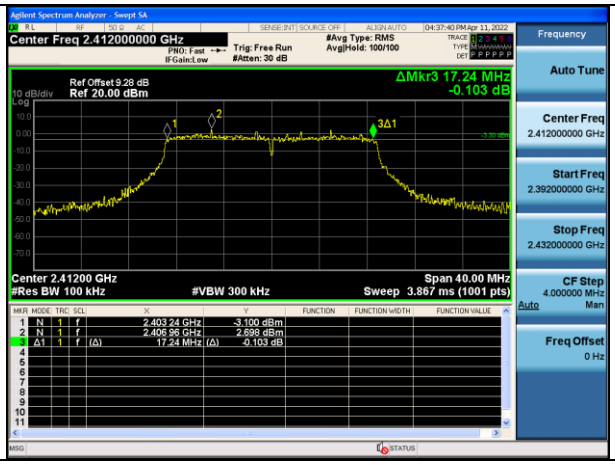
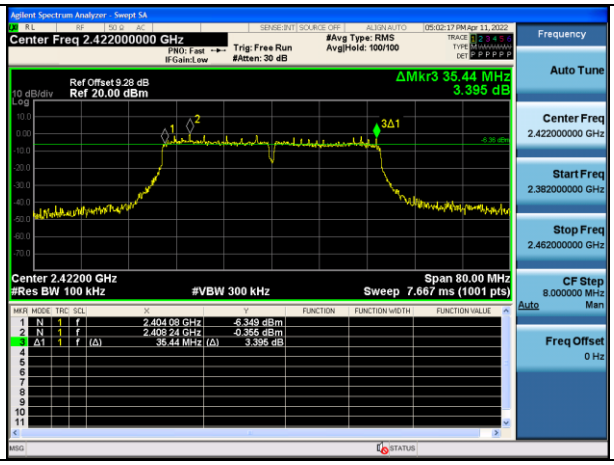
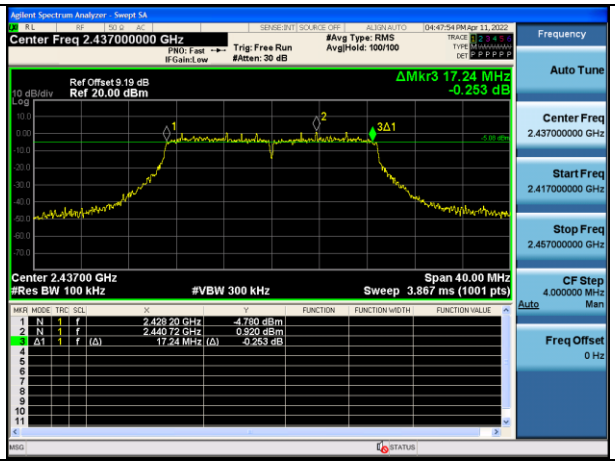
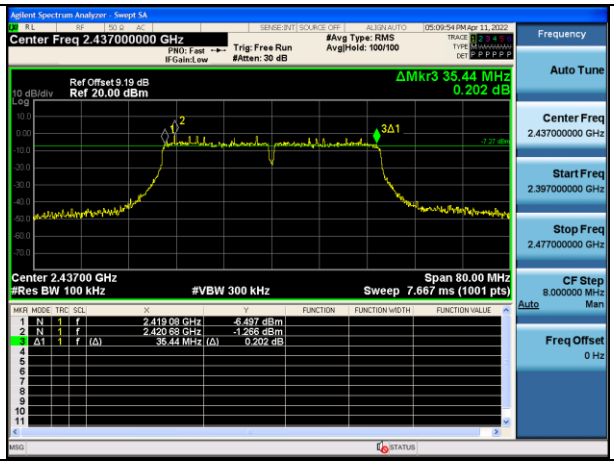
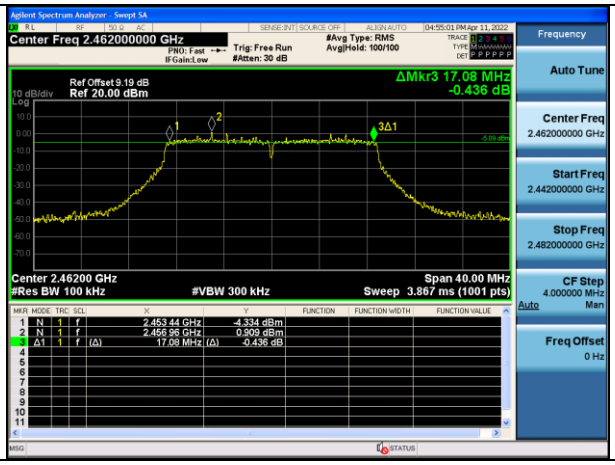
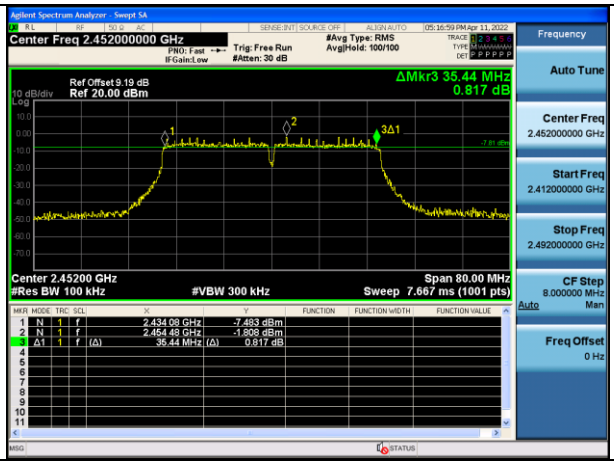
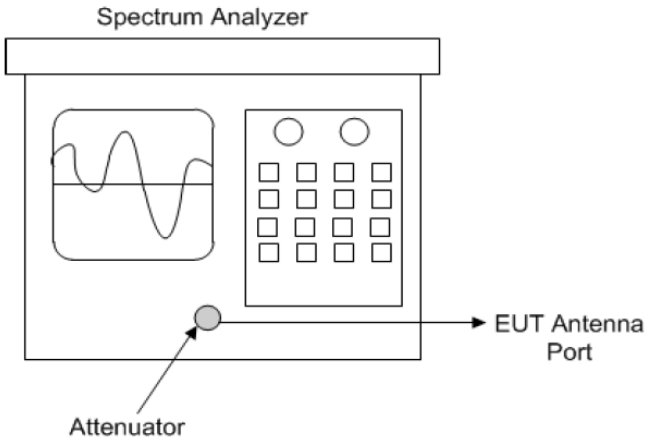
	

802.11n HT20	802.11n HT40
CH 1	CH 3
	
CH 6	CH 6
	
CH 11	CH 9
	

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

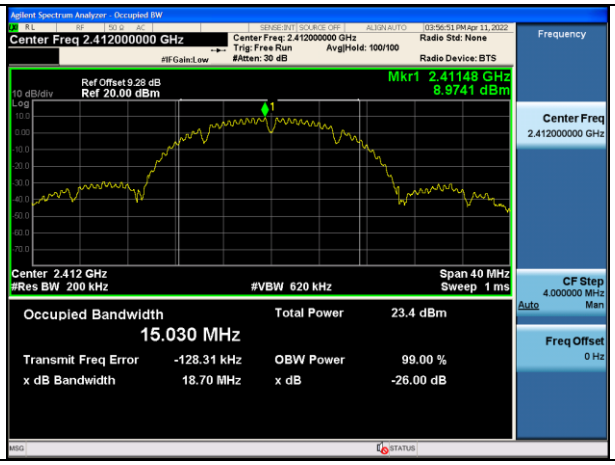
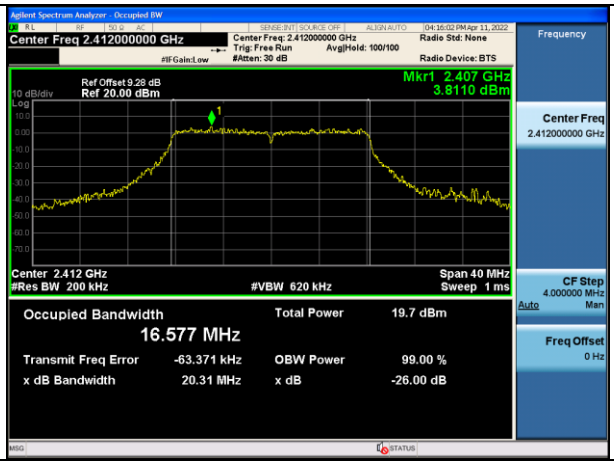
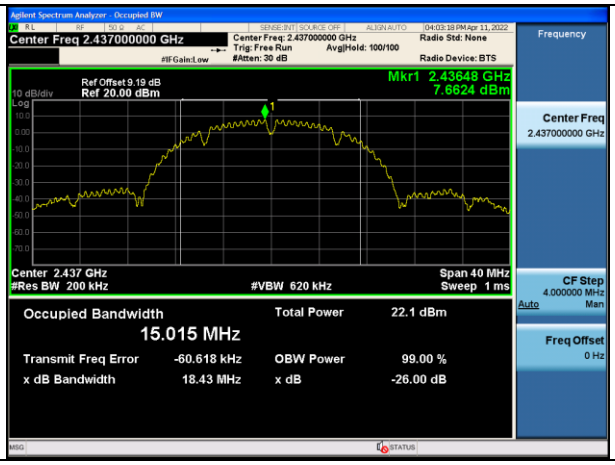
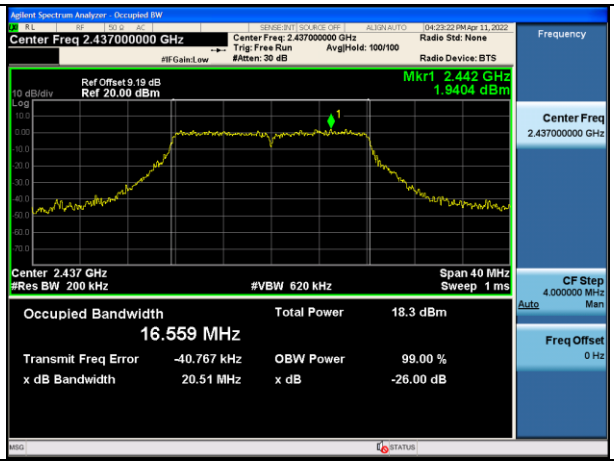
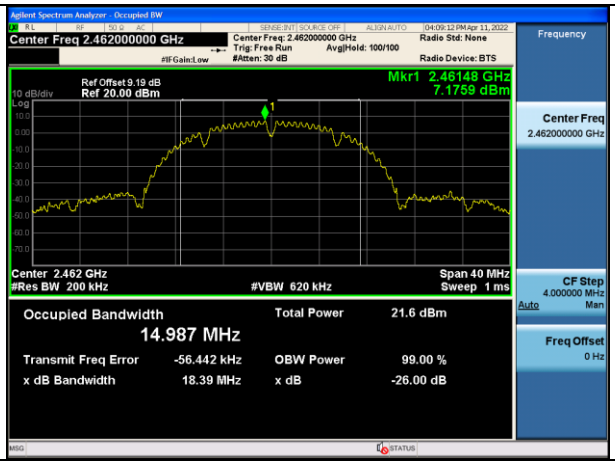
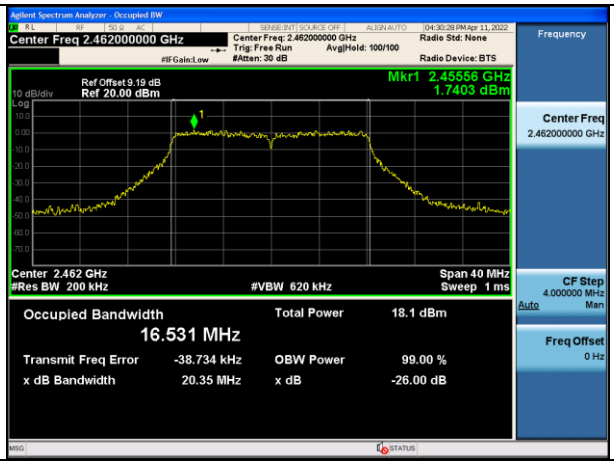
No deviation.

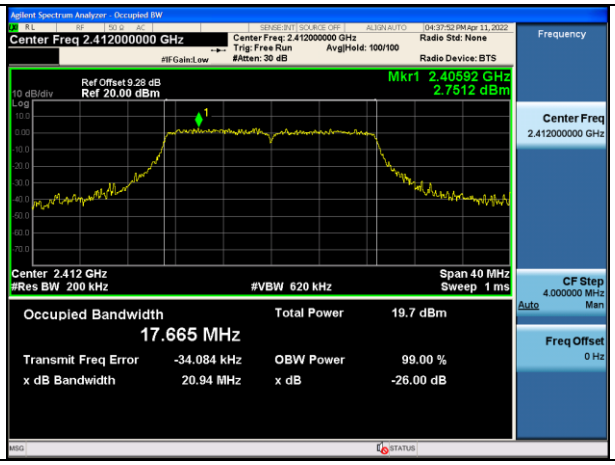
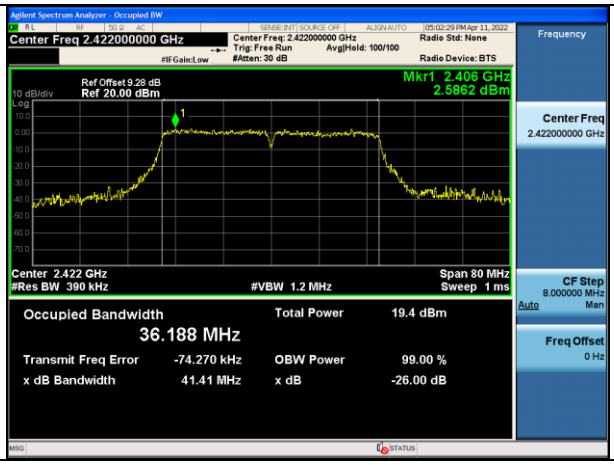
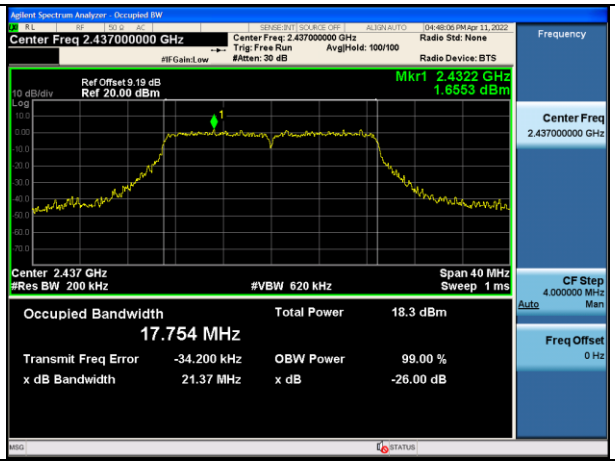
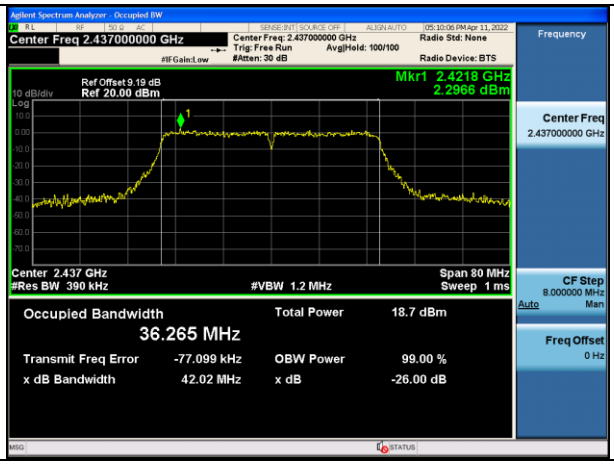
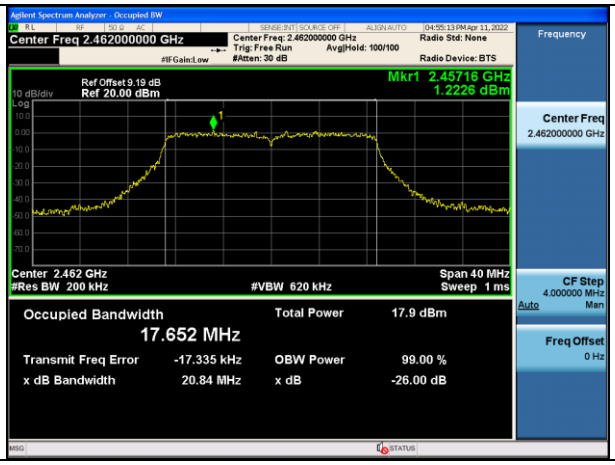
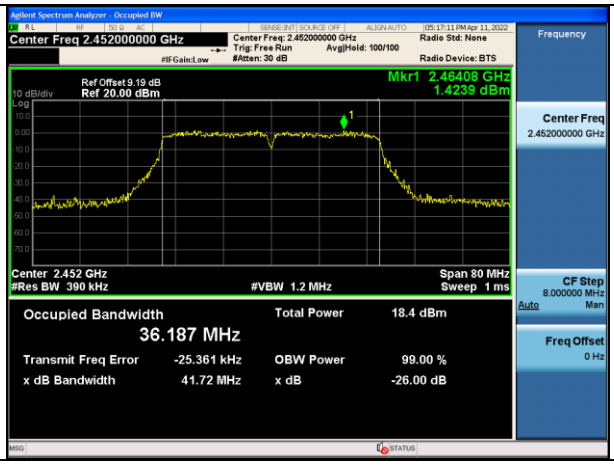
3.4.5 EUT Operating Conditions

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
11b	1	2412	15.030	Pass
	6	2437	15.015	Pass
	11	2462	14.987	Pass
11g	1	2412	16.557	Pass
	6	2437	16.559	Pass
	11	2462	16.531	Pass
11n HT20	1	2412	17.665	Pass
	6	2437	17.754	Pass
	11	2462	17.652	Pass
11n HT40	3	2412	36.188	Pass
	6	2437	36.265	Pass
	9	2462	36.187	Pass

802.11b	802.11g
CH 1	CH 1
	
CH 6	CH 6
	
CH 11	CH 11
	

802.11n HT20	802.11n HT40
CH 1	CH 3
	
CH 6	CH 6
	
CH 11	CH 9
	

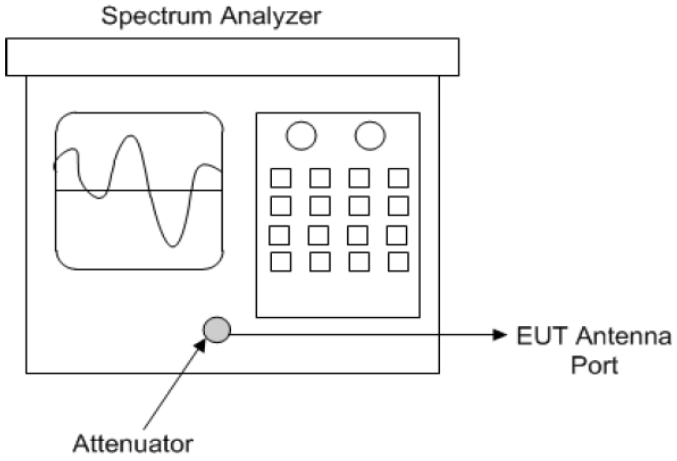
3.5 Conducted Output Power Measurement

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

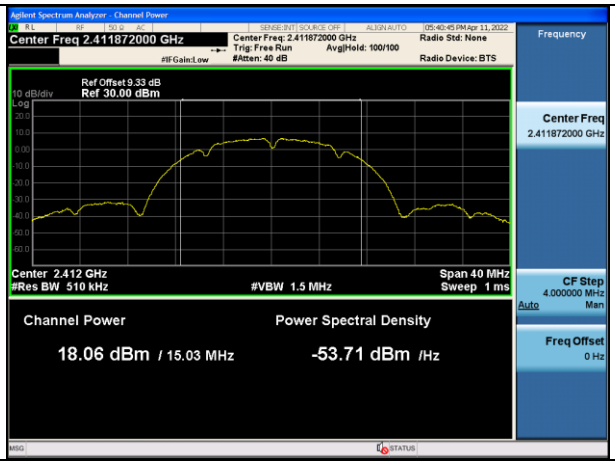
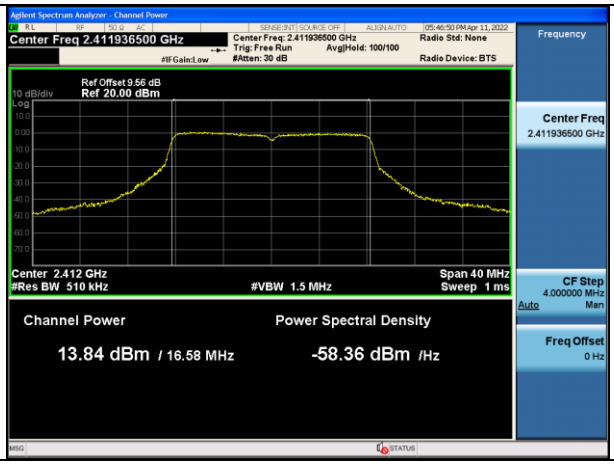
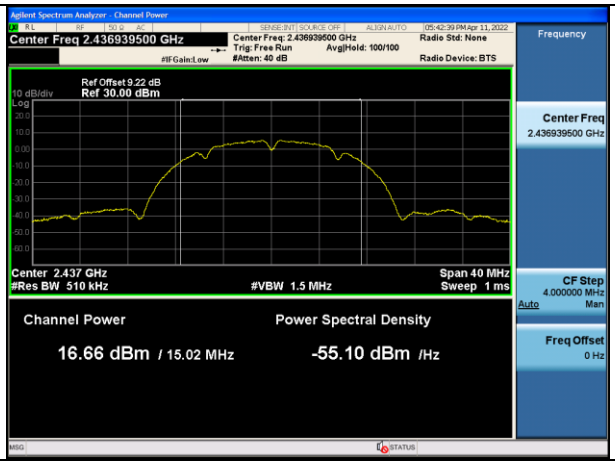
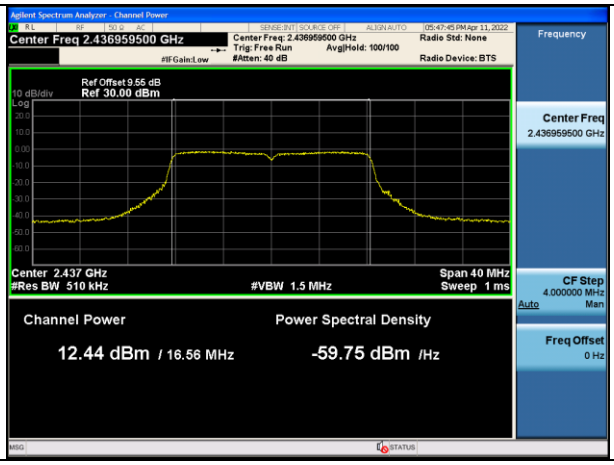
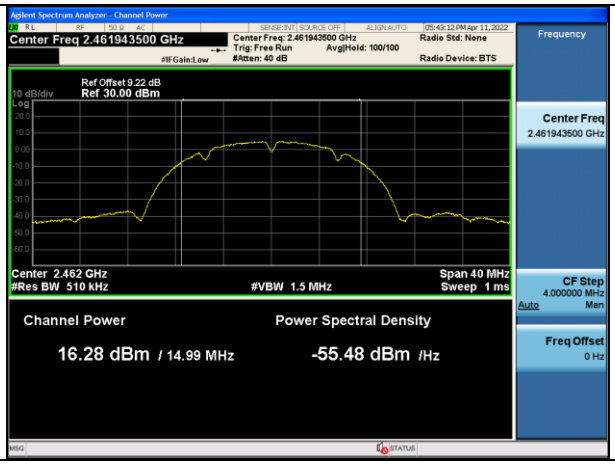
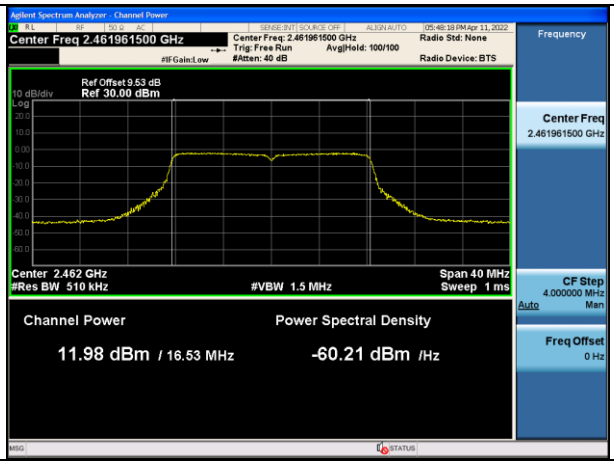
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

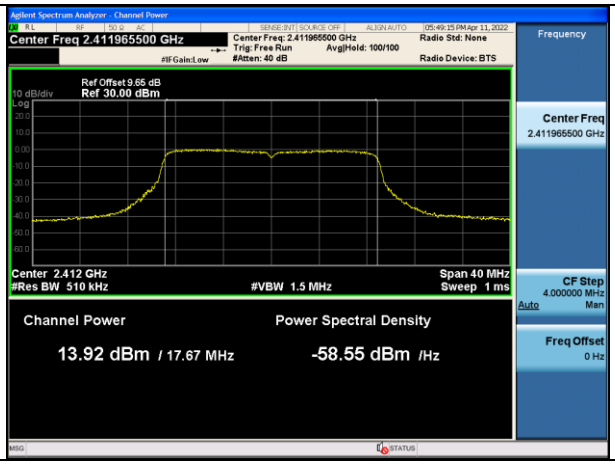
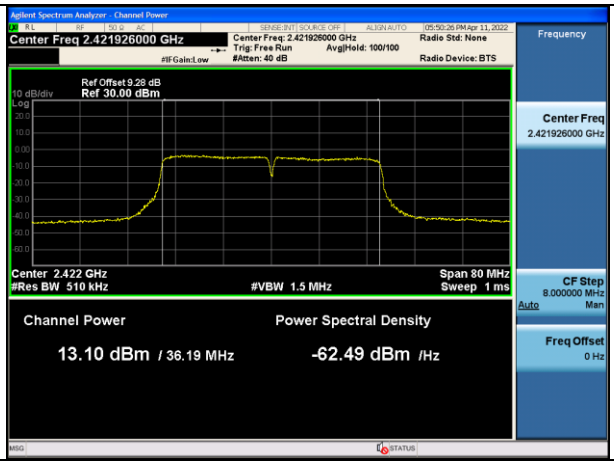
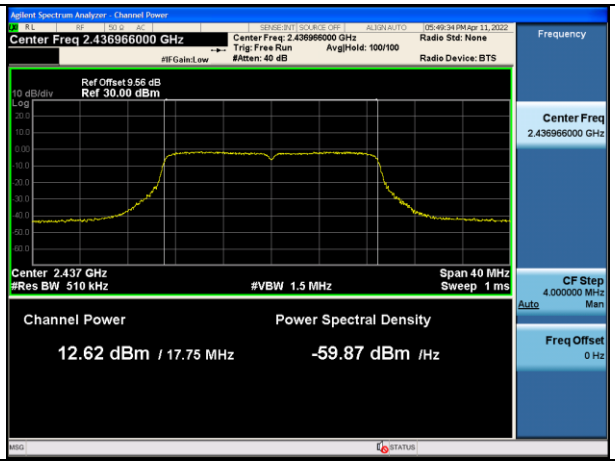
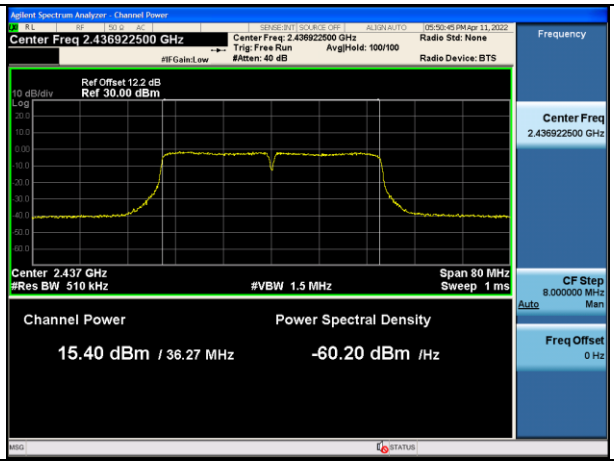
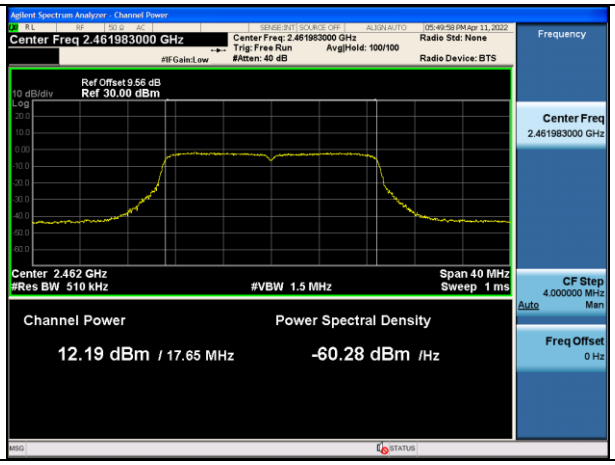
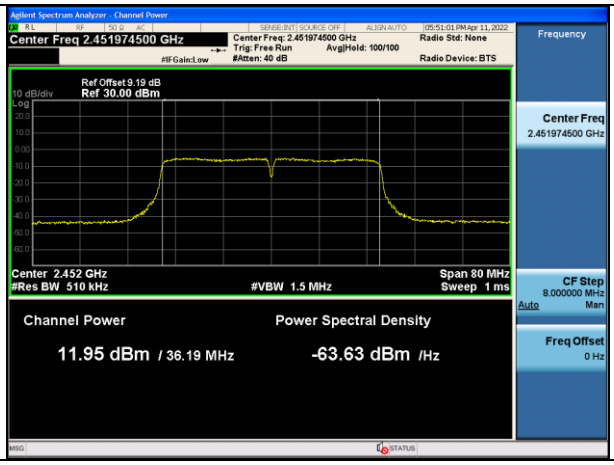
3.5.7 Test Results

Test Mode	CH.	Fre. (MHz)	Average Power (dBm)	Limit (dBm)
11b	1	2412	18.06	30
	6	2437	16.66	30
	11	2462	16.28	30
11g	1	2412	13.34	30
	6	2437	12.44	30
	11	2462	11.98	30
11n HT20	1	2412	13.92	30
	6	2437	12.62	30
	11	2462	12.19	30
11n HT40	3	2412	13.10	30
	6	2437	15.40	30
	9	2462	11.95	30

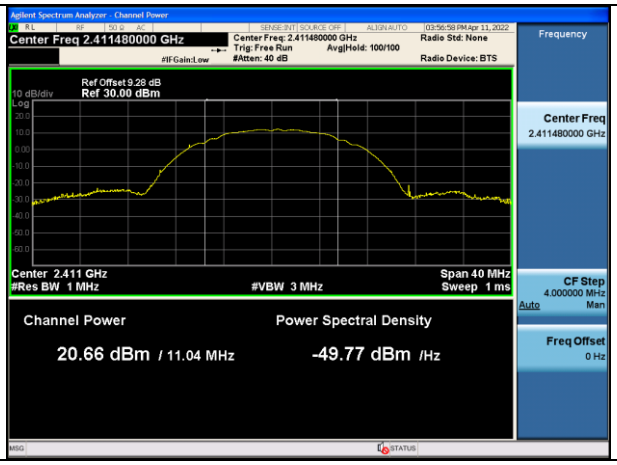
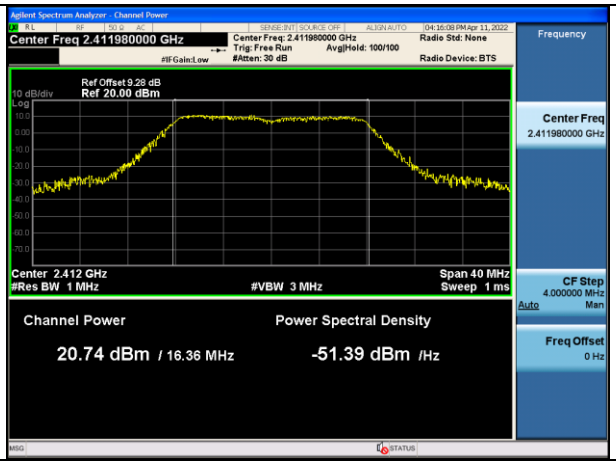
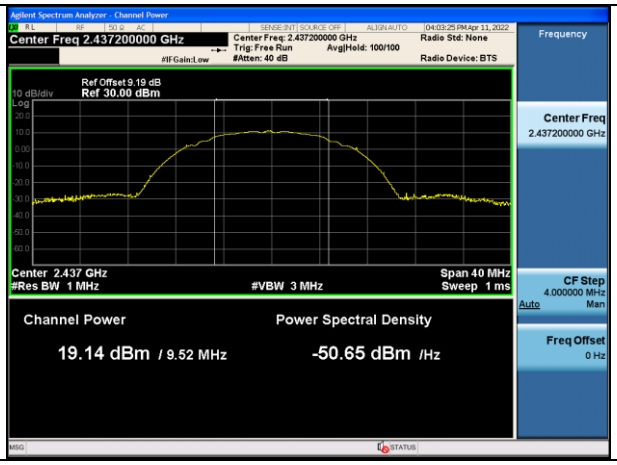
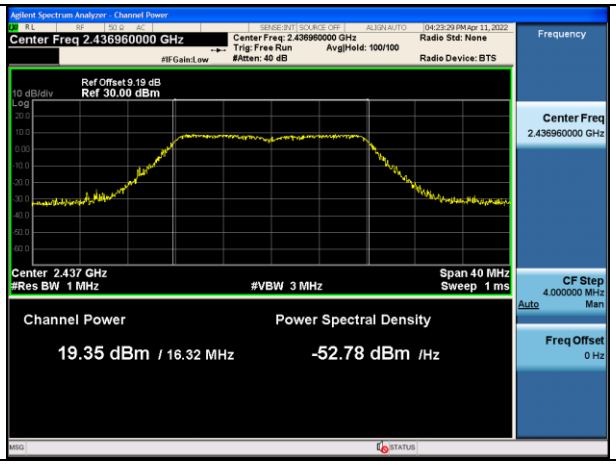
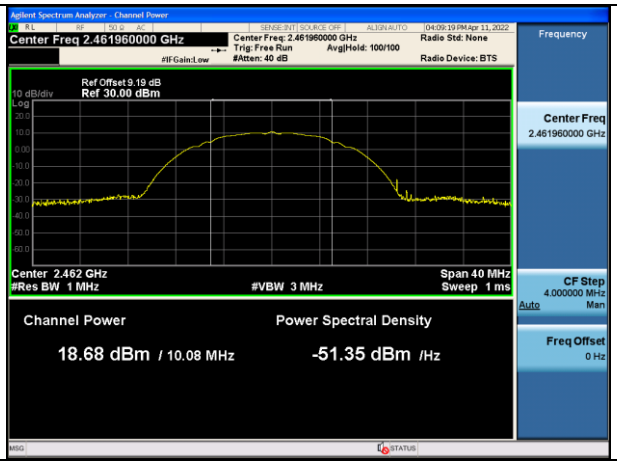
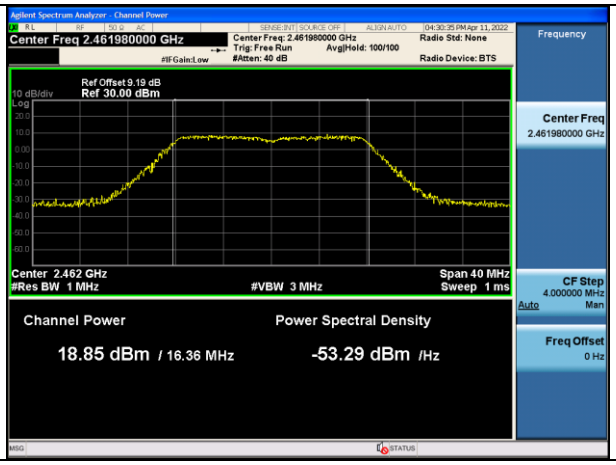
Test Mode	CH.	Fre. (MHz)	Peak Power (dBm)	Limit (dBm)
11b	1	2412	20.66	30
	6	2437	19.14	30
	11	2462	18.68	30
11g	1	2412	20.74	30
	6	2437	19.35	30
	11	2462	18.85	30
11n HT20	1	2412	20.67	30
	6	2437	19.33	30
	11	2462	18.82	30
11n HT40	3	2412	20.44	30
	6	2437	19.76	30
	9	2462	19.29	30

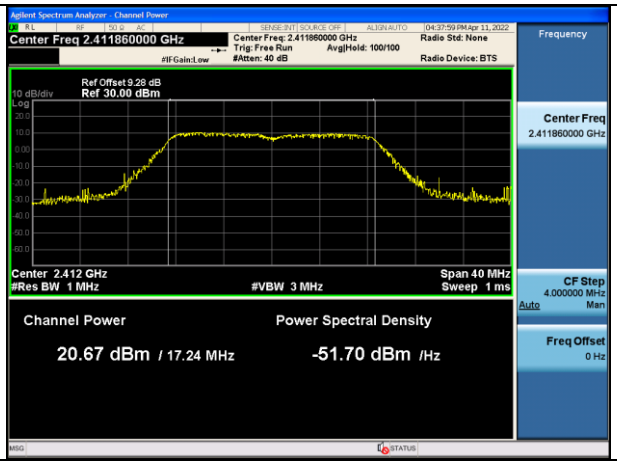
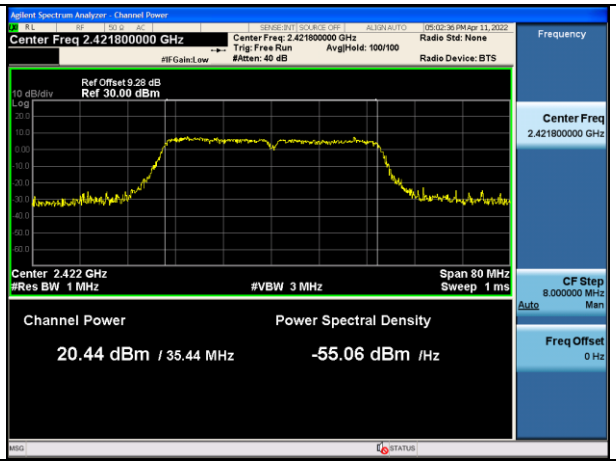
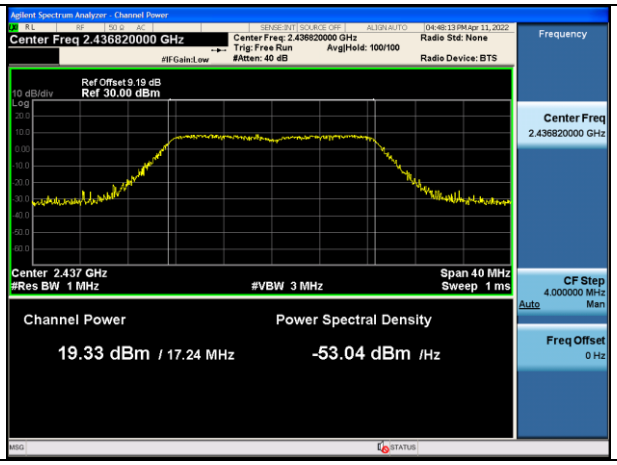
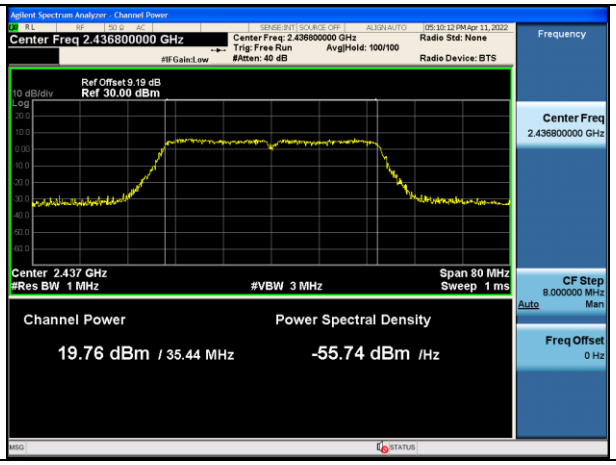
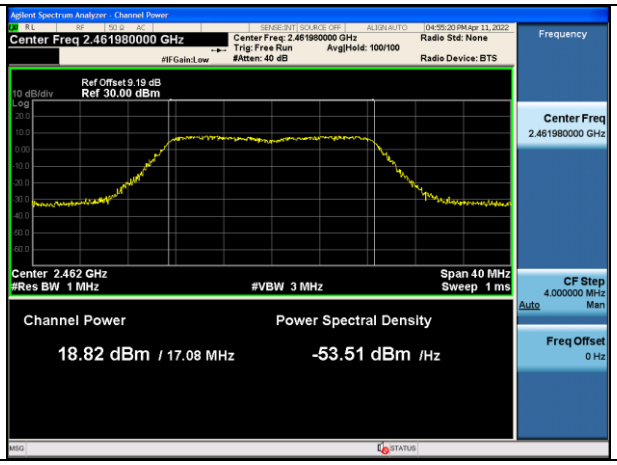
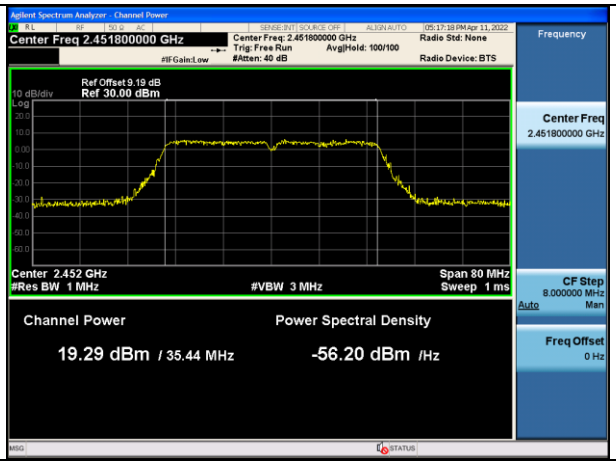
Average Power

802.11b	802.11g
CH 1	CH 1
	
CH 6	CH 6
	
CH 11	CH 11
	

802.11n HT20	802.11n HT40
CH 1	CH 3
	
CH 6	CH 6
	
CH 11	CH 9
	

Peak Power

802.11b	802.11g
CH 1	CH 1
	
CH 6	CH 6
	
CH 11	CH 11
	

802.11n HT20	802.11n HT40
CH 1	CH 3
	
CH 6	CH 6
	
CH 11	CH 9
	

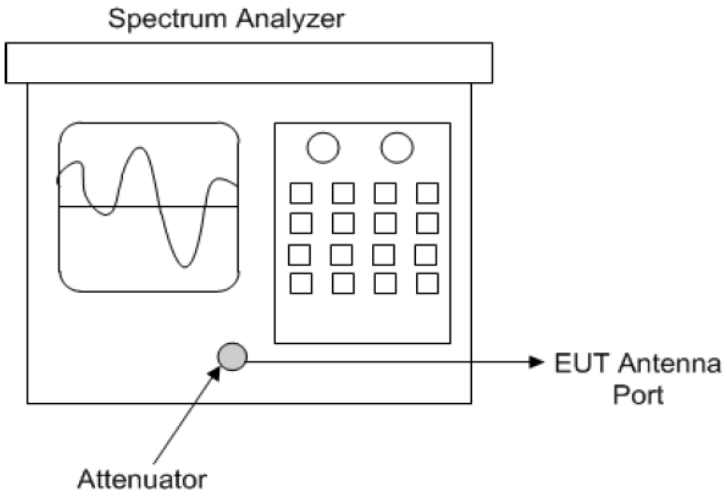
3.6 Power Spectral Density Measurement

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 OFE 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)	Duty cycle factor (dB)	Total PSD (dBm)	Limit (dBm)
11b	1	2412	-4.337	0.049	-4.288	8
	6	2437	-6.010	0.049	-5.961	8
	11	2462	-5.739	0.049	-5.69	8
11g	1	2412	-10.338	0.284	-10.054	8
	6	2437	-11.785	0.284	-11.501	8
	11	2462	-12.761	0.284	-12.477	8
11n HT20	1	2412	-11.978	0.368	-11.61	8
	6	2437	-13.054	0.368	-12.686	8
	11	2462	-13.081	0.368	-12.713	8
11n HT40	3	2412	-15.059	0.628	-14.431	8
	6	2437	-15.315	0.628	-14.687	8
	9	2462	-16.362	0.628	-15.734	8