



TEST REPORT

Applicant: Guangdong Changing Technology Co.,Ltd.
Address of Applicant: 21 Yongsheng Road, Yonghe Street, Huangpu District, Guangzhou City, Guangdong Province, China
Manufacturer/Factory: Guangdong Changing Technology Co.,Ltd.
Address of Manufacturer: 21 Yongsheng Road, Yonghe Street, Huangpu District, Guangzhou City, Guangdong Province, China
Product Name: Smart Frame
Model No.: ZN-DF-F16S,ZN-DF-F10S,ZN-DF-F11S,ZN-DF-F12S,ZN-DF-F13S,ZN-DF-F14S,ZN-DF-F15S,ZN-DF-F17S,ZN-DF-F18S,ZN-DF-F22S,ZN-DF-F24S,ZN-DF-F27S,ZN-DF-F32S
Trade Mark: N/A
FCC ID: 2BKBA-FRAME
Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of Test: Aug.01, 2024-Aug.23, 2024
Date of report issued: Aug.24, 2024

Remark:

The results shown in this test report refer only to the sample(s) tested , this test report cannot be reproduced, except in full without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

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Report Revision History		
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1. Test Summary

Test Item	Section	Result	Test by
Antenna requirement	FCC part 15.203/15.247 (c)	Pass	/
AC Power Line Conducted Emission	FCC part 15.207	Pass	Carr Kang
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass	Yvan Fan
6dB Bandwidth	FCC part 15.247 (a)(2)	Pass	Yvan Fan
Power Spectral Density	FCC part 15.247 (e)	Pass	Yvan Fan
Band Edge	FCC part 15.247(d)	Pass	Yvan Fan
Spurious Emission	FCC part 15.205/15.209	Pass	Carr Kang

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013
3. Note: Compliance determination rules
 - 1).The Compliance determination of test results does not take into account measurement uncertainty. Measurement results are determined based on regulatory limitations or requirements specified by the applicant/manufacture. If measurement uncertainty is taken into account, the applicant/manufacture will bear all possible risks of non-compliance.
 - 2).The measurement uncertainty please refer to each test result in the "Measurement Uncertainty"

Measurement Uncertainty

Test Item	Uncertainty Criterion	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	±5%	±0.55%	(1)
RF output power, conducted	±1.5dB	±0.99dB	(1)
Power Spectral Density, conducted	±3dB	±0.61dB	(1)
Unwanted Emissions, conducted	±3dB	±0.64dB	(1)
AC Power Line Conducted Emission	±6dB	± 2.64 dB	(1)
Radiated emissions Below 1GHz	±6dB	±4.32 dB	(1)
Radiated emissions Above 1GHz	±6dB	±4.56dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

2. General Information

2.1 General Description of EUT

Product Name:	Smart Frame
Model No.:	ZN-DF-F16S,ZN-DF-F10S,ZN-DF-F11S,ZN-DF-F12S,ZN-DF-F13S,ZN-DF-F14S,ZN-DF-F15S,ZN-DF-F17S,ZN-DF-F18S,ZN-DF-F22S,ZN-DF-F24S,ZN-DF-F27S,ZN-DF-F32S
Test Model:	ZN-DF-F16S
Difference of model(s)	All the model are the same circuit and RF module, except the model names and colors
Hardware version:	N/A
Software version:	N/A
Sample(s) Status	Engineer sample
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11 802.11n(HT40):7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	FPC Antenna
Antenna gain:	1.94 dBi(Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)
Battery:	DC 3.8V 4000mAh
Power supply:	DC 5V
Adapter :	Model: BSY01J3050200UU Input:100-250V 50/60Hz Output:DC 5V 2A

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

Note:

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

Test channel	Frequency (MHz)	
	802.11b/802.11g/802.11n(HT20)	802.11n(HT40)
Lowest channel	2412MHz	2422MHz
Middle channel	2437MHz	2437MHz
Highest channel	2462MHz	2452MHz

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode EUT was test with maximum power control level.
<i>Remark: For battery operated equipment, the EUT was performed using a new DC 3.8V battery.</i>	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:				
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.				
Mode	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Data rate	1Mbps	6Mbps	6.5Mbps	13Mbps

2.3 Description of Support Units

No.	Description	Manufacturer	Model	Serial Number

2.4 Deviation from Standards

None.

2.5 Abnormalities from Standard Conditions

None.

2.6 Test Facility

Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
CNAS Registration Number:	L11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064

2.7 Test Location

All tests were performed at:	
Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	+86 755 85259392
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2.8 Additional Instructions

Test Software	ADB Special Command
Power level setup	Default

3. Test Instruments list

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100605	2024.3.12	2025.3.11
2	EMI Test Receiver	Rohde&schwarz	ESCI3	102696	2024.3.12	2025.3.11
3	Loop Antenna	schwarabeck	FMZB 1519 B	FMZB 1519 B	2024.3.19	2026.3.18
4	Broadband antenna	schwarabeck	VULB9168	1064	2024.3.19	2026.3.18
5	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2024.3.19	2026.3.18
6	amplifier	EMtrace	RP01A	50117	2024.3.12	2025.3.11
7	Artificial power network	schwarabeck	NSLK8127	8127483	2024.3.12	2025.3.11
8	Artificial power network	ETS	3186/2NM	1132	2024.3.12	2025.3.11
9	10dB attenuator	HUBER+SUHN ER	10dB	/	2024.3.12	2025.3.11
10	amplifier	Space-Dtronics	EWLAN0118G-P40	19113001	2024.3.12	2025.3.11
11	Filter	Xingbo	XBLBQ-GTA19	210410-3-1	2024.3.12	2025.3.11
12	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2024.3.12	2025.3.11
13	Power detector box	MWRFtest	MW100-PSB	MW201020JYT	2024.3.12	2025.3.11
14	Power meter	Rohde&Schwarz	NRP-Z11	1138.3004.02-117725-vh	2024.3.12	2025.3.11
15	amplifier	SKET	LNPA_1840-50 (18-40GHz)	SK2019040302	2024.3.12	2025.3.11
16	Horn antenna	schwarabeck	BBHA 9170	946	2024.3.19	2026.3.18
17	Spectrum analyzer	Rohde&schwarz	FSU40	1166.1660K43	2024.3.12	2025.3.11

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

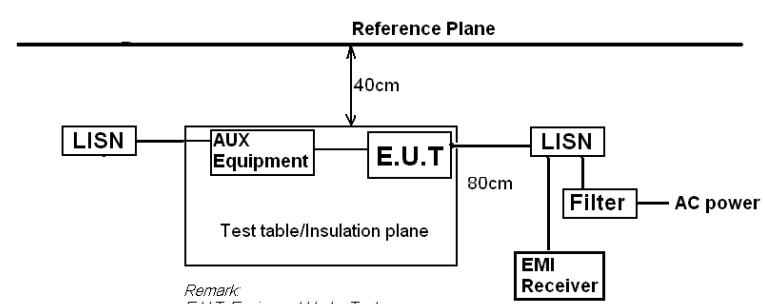
Software Name	Manufacturer	Model	Version
RF test software	MWRFtest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4. Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
<i>The antennas are FPC antenna, the best case gain of the antennas are 1.94 dBi, reference to the appendix II for details</i>	

4.2 Conducted Emissions

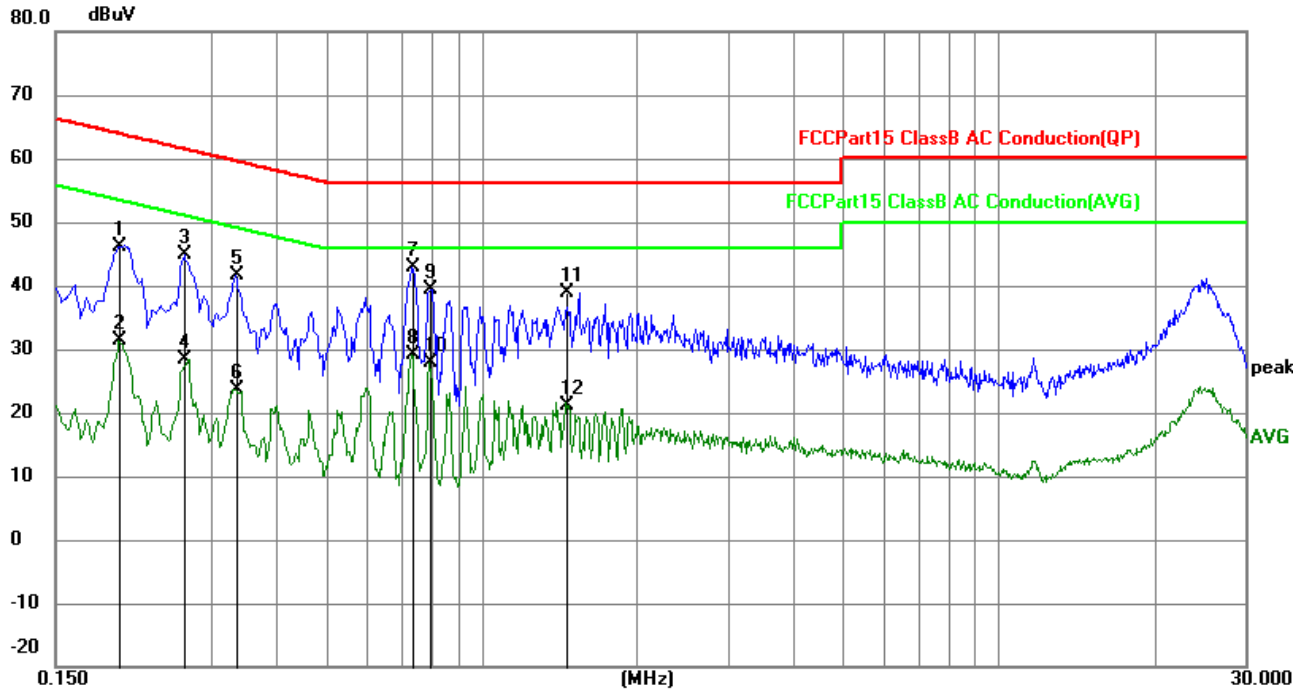
Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto						
Limit:	Frequency range (MHz)		Limit (dBuV)				
			Quasi-peak		Average		
	0.15-0.5		66 to 56*		56 to 46*		
	0.5-5		56		46		
	5-30		60		50		
* Decreases with the logarithm of the frequency.							
Test setup:	Reference Plane  Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.						
Test Instruments:	Refer to section 3.0 for details						
Test mode:	Refer to section 2.2 for details						
Test environment:	Temp.:	24.3°C	Humid.:	45%	Press.:	1012mbar	
Test voltage:	AC 120V						
Test results:	Pass						

Remark:

1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.
2. All mode have been tested, the report only shows the worst mode (802.11g 2462MHz)

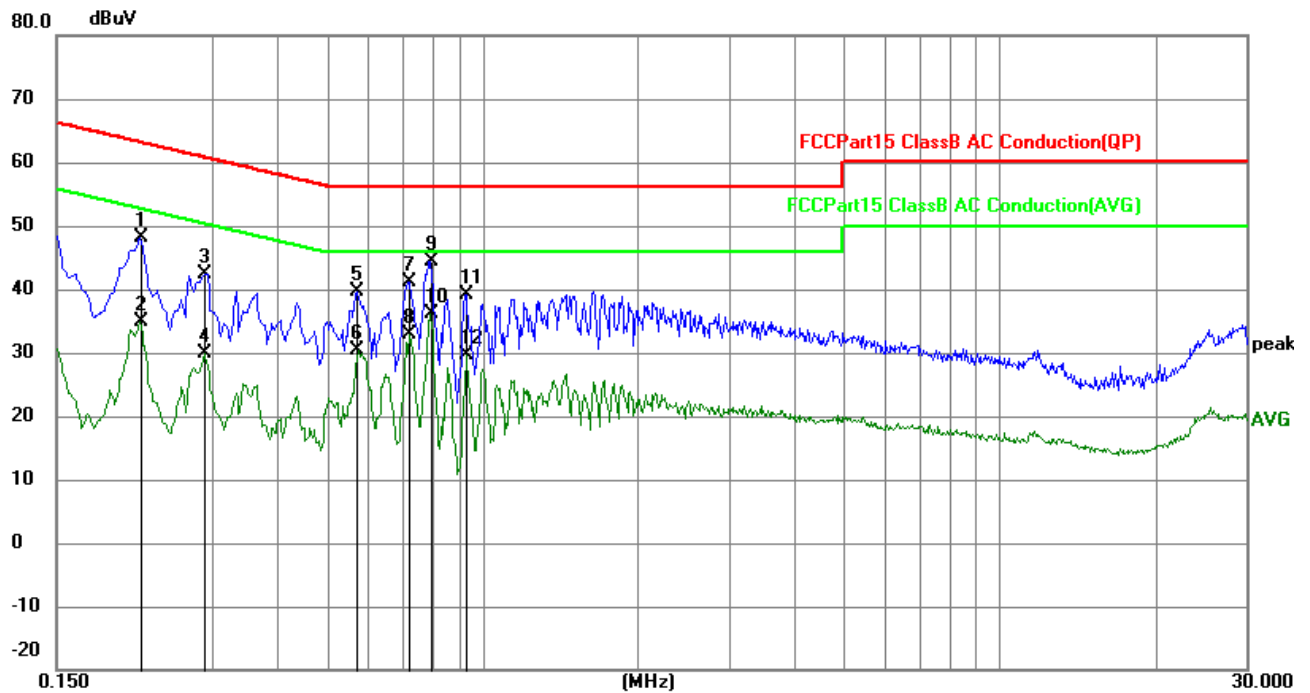
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1995	36.44	9.81	46.25	63.63	-17.38	QP
2	0.1995	21.49	9.81	31.30	53.63	-22.33	AVG
3	0.2670	35.00	9.83	44.83	61.21	-16.38	QP
4	0.2670	18.55	9.83	28.38	51.21	-22.83	AVG
5	0.3345	31.77	9.87	41.64	59.34	-17.70	QP
6	0.3345	13.73	9.87	23.60	49.34	-25.74	AVG
7	0.7350	32.94	9.94	42.88	56.00	-13.12	QP
8	0.7350	19.23	9.94	29.17	46.00	-16.83	AVG
9	0.7933	29.38	9.96	39.34	56.00	-16.66	QP
10	0.7933	17.91	9.96	27.87	46.00	-18.13	AVG
11	1.4637	28.90	9.90	38.80	56.00	-17.20	QP
12	1.4637	11.27	9.90	21.17	46.00	-24.83	AVG

Neutral:

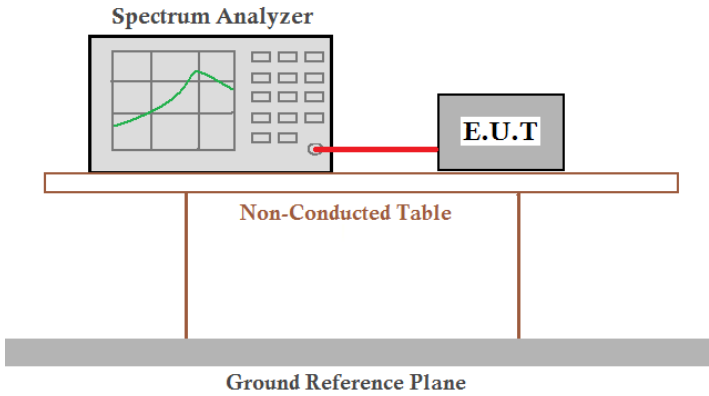


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2174	38.20	9.82	48.02	62.92	-14.90	QP
2	0.2174	25.03	9.82	34.85	52.92	-18.07	AVG
3	0.2893	32.64	9.84	42.48	60.54	-18.06	QP
4	0.2893	20.08	9.84	29.92	50.54	-20.62	AVG
5	0.5726	29.72	9.94	39.66	56.00	-16.34	QP
6	0.5726	20.42	9.94	30.36	46.00	-15.64	AVG
7	0.7214	31.30	9.94	41.24	56.00	-14.76	QP
8	0.7214	22.87	9.94	32.81	46.00	-13.19	AVG
9	0.7935	34.49	9.96	44.45	56.00	-11.55	QP
10	0.7935	26.08	9.96	36.04	46.00	-9.96	AVG
11	0.9284	29.21	9.96	39.17	56.00	-16.83	QP
12	0.9284	19.62	9.96	29.58	46.00	-16.42	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

4.3 Duty cycle

Test Method :	ANSI C63.10:2013	
Limit:	/	
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.2°C	Humid.: 52%RH
Test voltage:	DC 5V	
Test results:	Pass	

Measurement Result

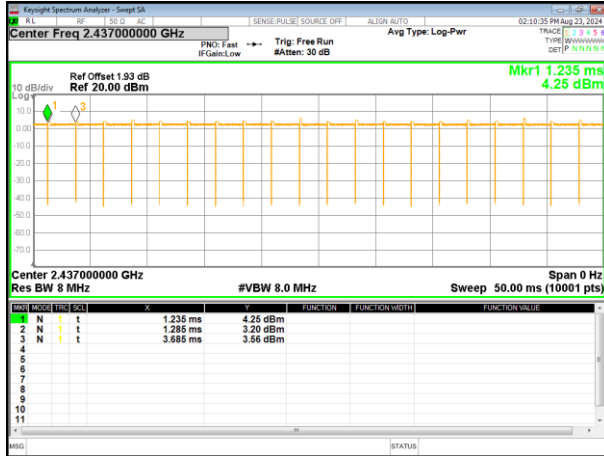
Mode	Duty cycle (%)	Correction Factor (dB)
802.11b	97.96	0.09
802.11g	96.96	0.13
802.11n20	95.58	0.20
802.11n40	89.93	0.46

Duty Cycle (%)=(TX on/TXon+TXoff)*100

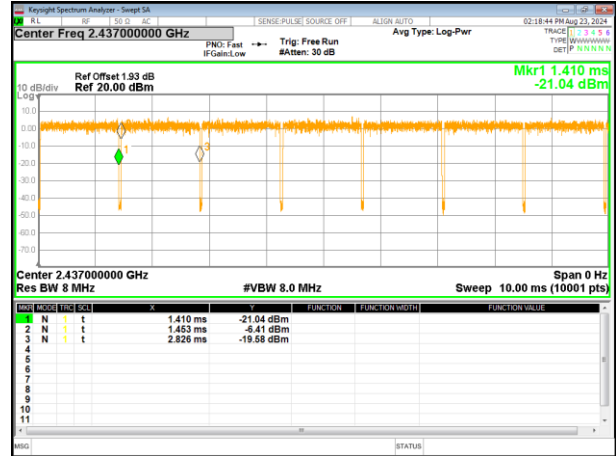
Correction Factor (dB)=10lg(1/ Duty Cycle (%))

Test plot as follows:

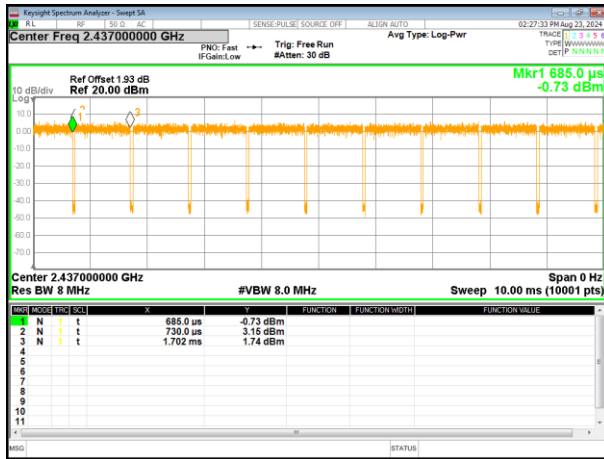
(802.11b) plot on channel 6



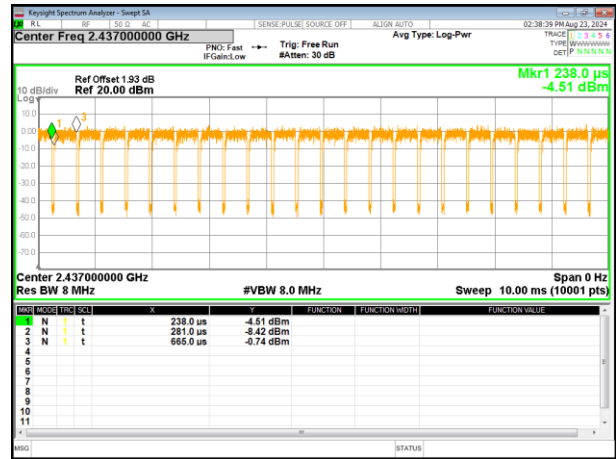
(802.11 g) plot on channel 6



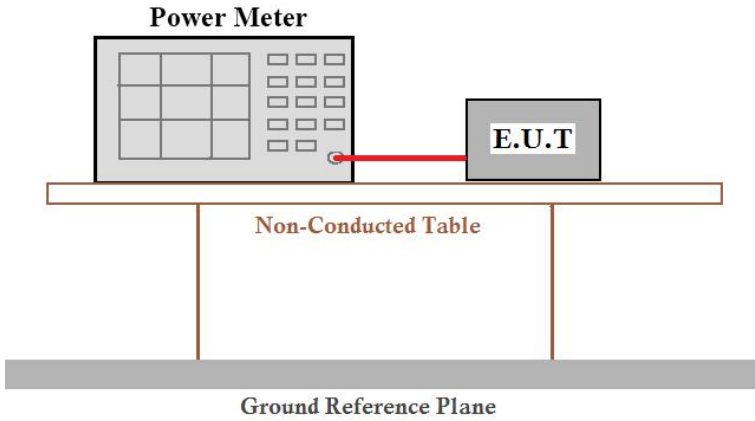
(802.11n20) plot on channel 6



(802.11 n40) plot on channel 6



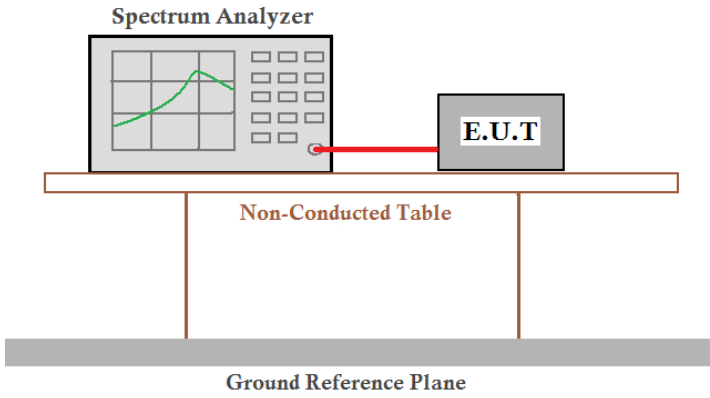
4.4 Conducted Peak Output Power

Test Requirement :	FCC Part15 C Section 15.247 (b)(3)	
Test Method :	KDB 558074 D01 15.247 Meas Guidance v05r02	
Limit:	30dBm	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.2°C	Humid.: 52%RH
Test voltage:	DC 5V	
Test results:	Pass	

Measurement Result

Test CH	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	6.19	6.69	6.62	7.60	30.00	Pass
Middle	6.60	7.24	7.02	7.72		
Highest	6.00	7.77	6.91	7.60		

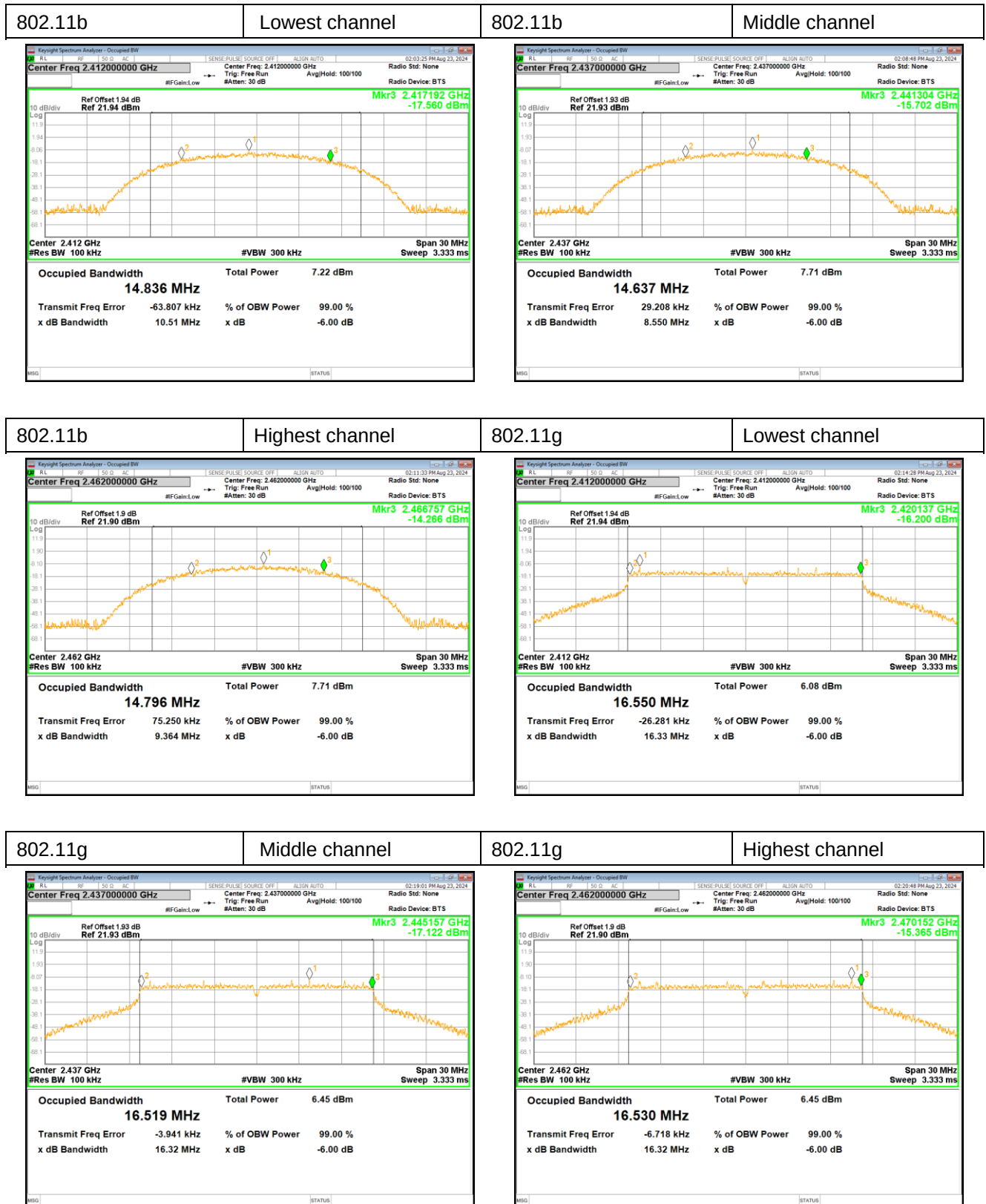
4.5 6dB Bandwidth

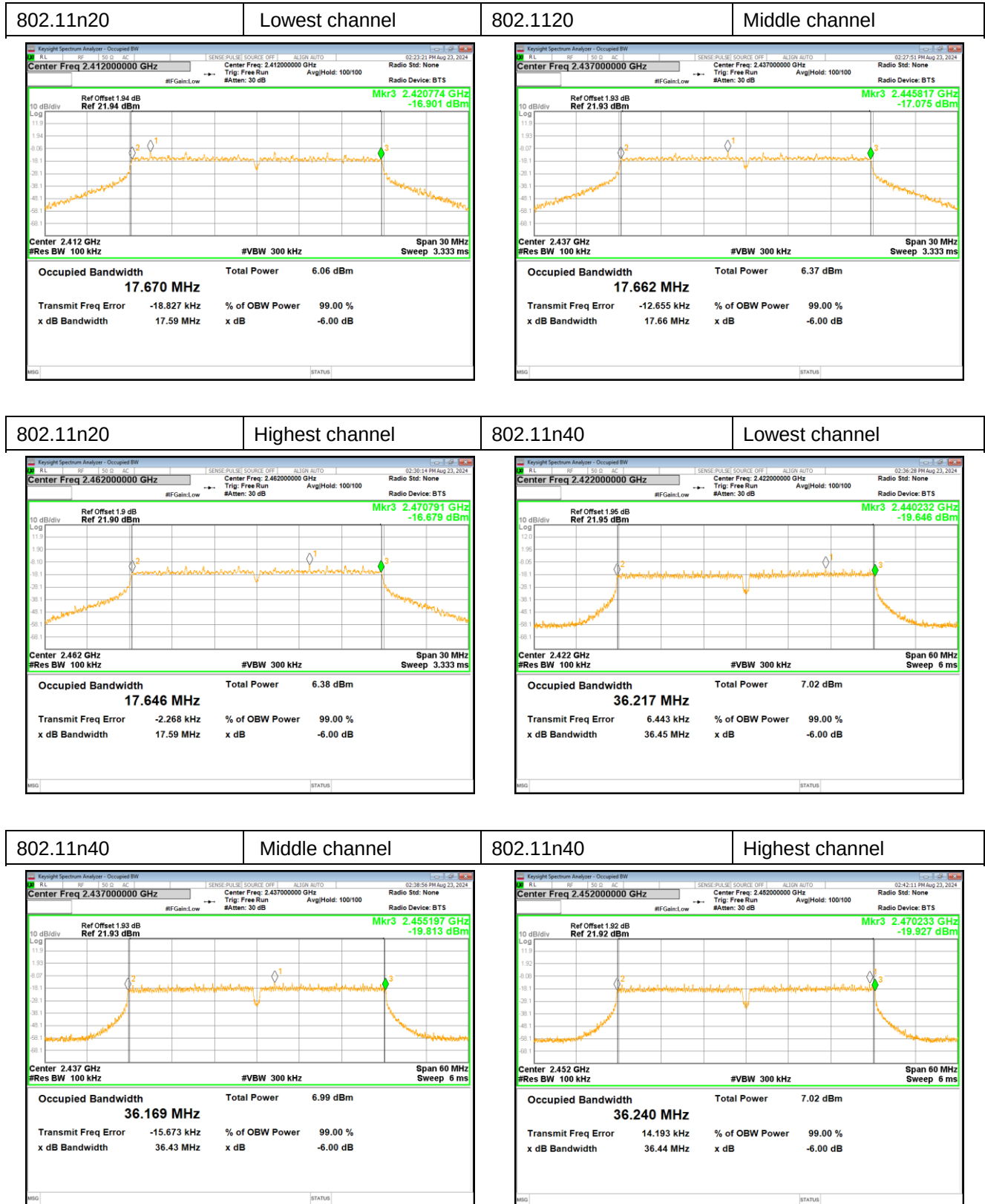
Test Requirement :	FCC Part15 C Section 15.247 (a)(2)	
Test Method :	KDB 558074 D01 15.247 Meas Guidance v05r02	
Limit:	>500KHz	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.2°C	Humid.: 52%RH
Test voltage:	DC 5V	
Test results:	Pass	

Measurement Result

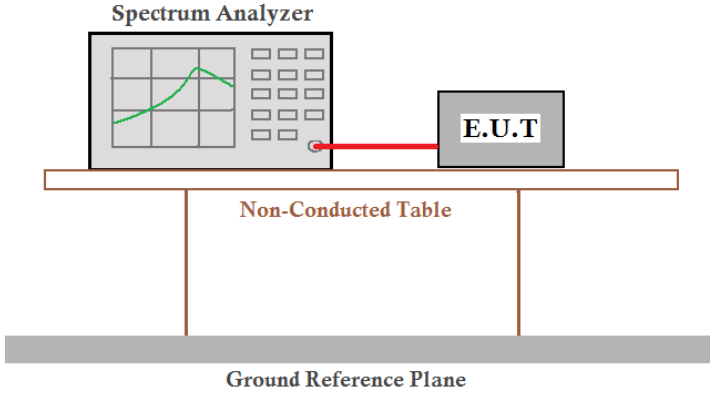
Test CH	6dB Bandwidth (MHz)				Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	10.510	16.33	17.59	36.45	>500	Pass
Middle	8.550	16.32	17.66	36.43		
Highest	9.364	16.32	17.59	36.44		

Test plot as follows:





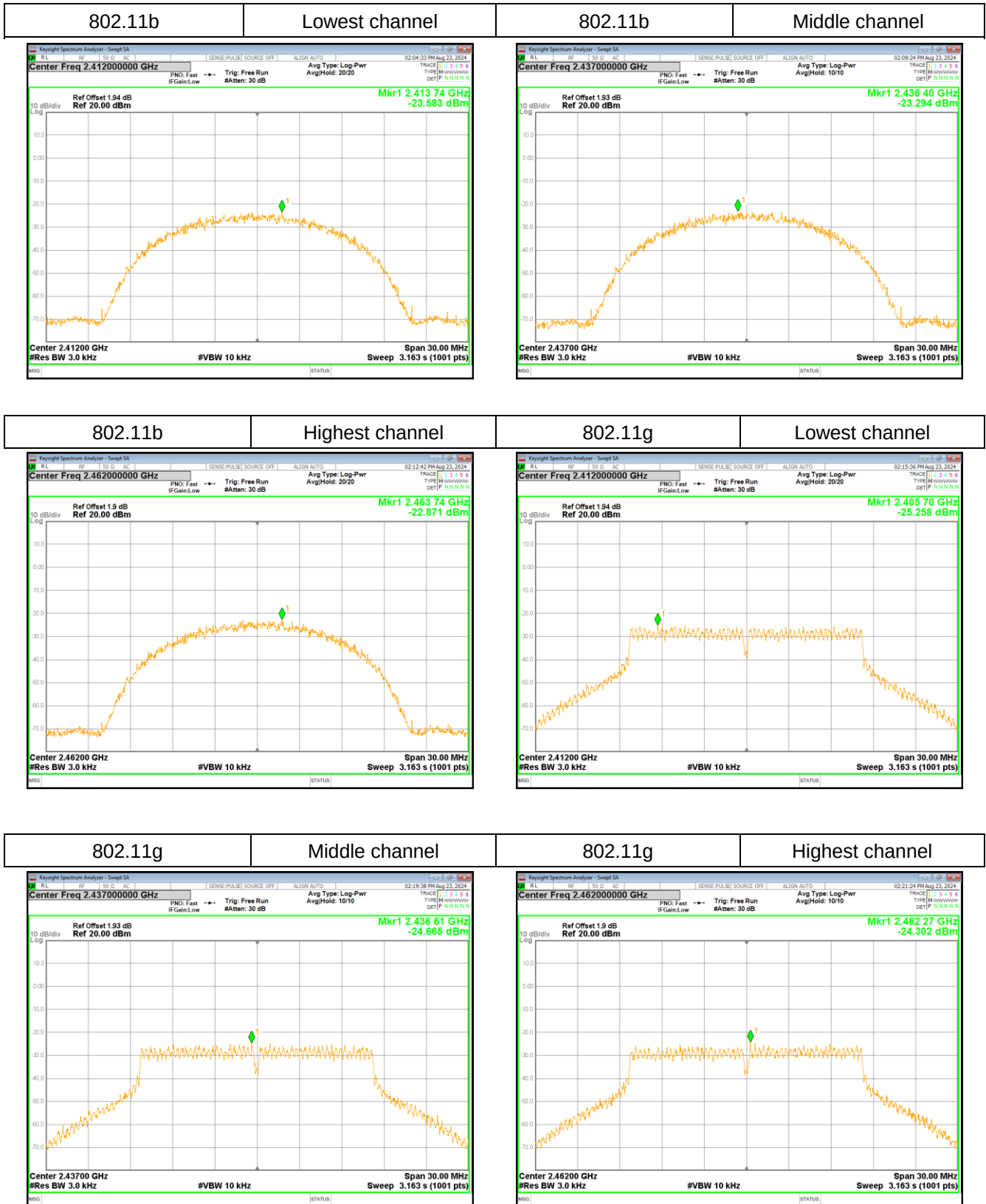
4.6 Power Spectral Density

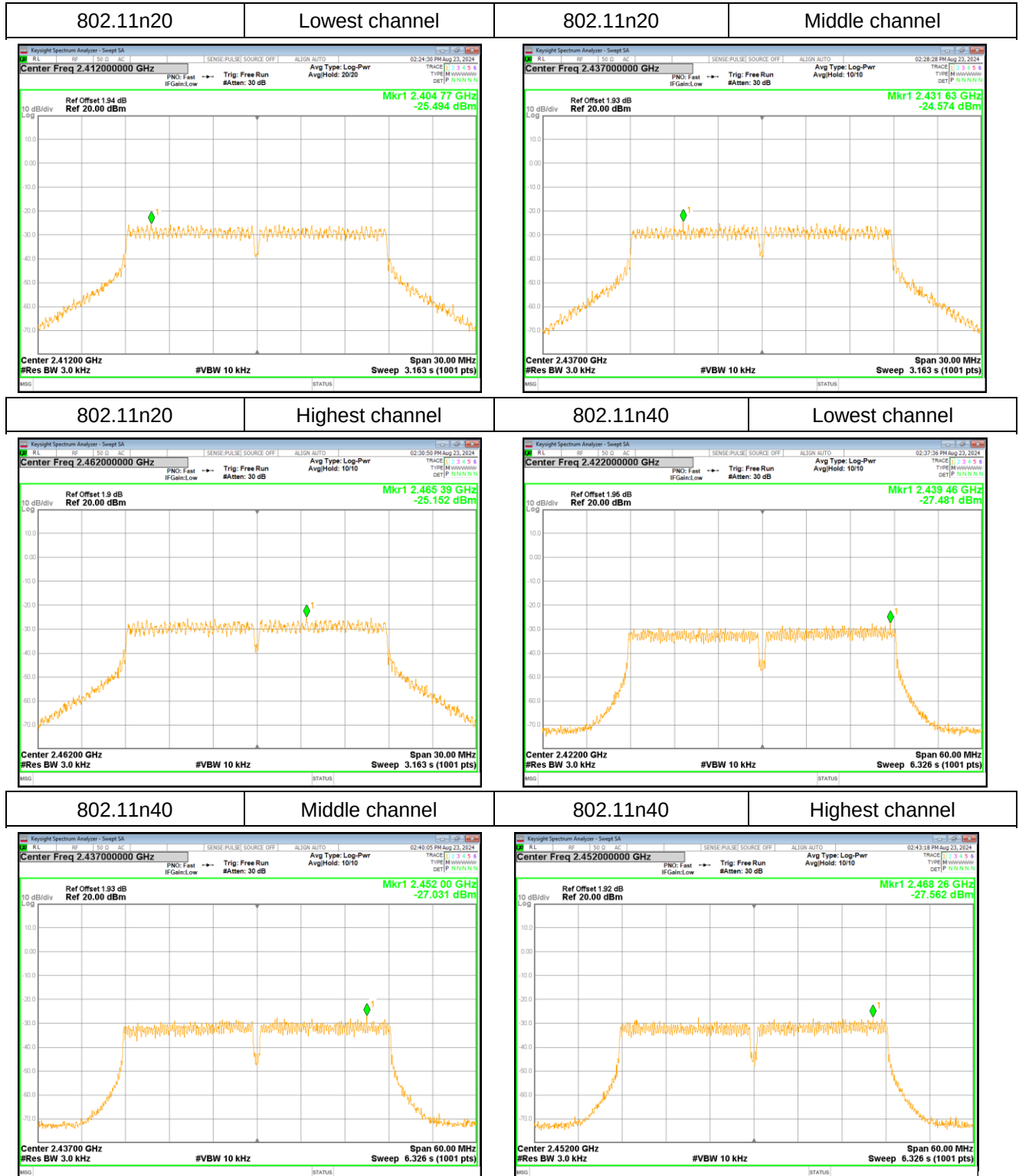
Test Requirement:	FCC Part15 C Section 15.247 (e)	
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02	
Limit:	8dBm/3kHz	
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.2°C	Humid.: 52%RH
Test voltage:	DC 5V	
Test results:	Pass	

Measurement Result

Test CH	Power Spectral Density (dBm/3kHz)				Limit (dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	-23.583	-25.258	-25.494	-27.481	8.00	Pass
Middle	-23.294	-24.665	-24.574	-27.031		
Highest	-22.871	-24.302	-25.152	-27.562		

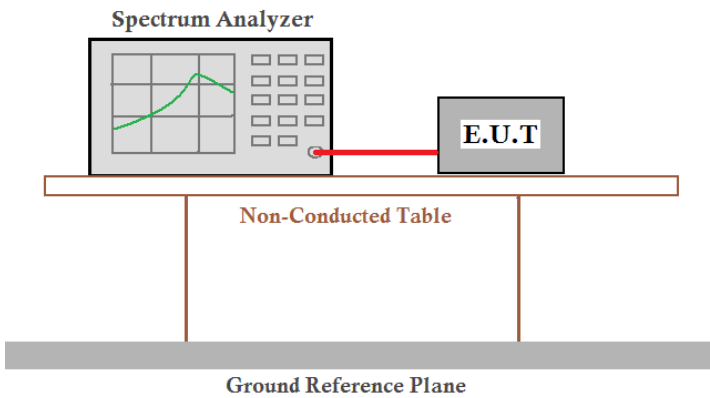
Test plot as follows:





4.7 Band edges

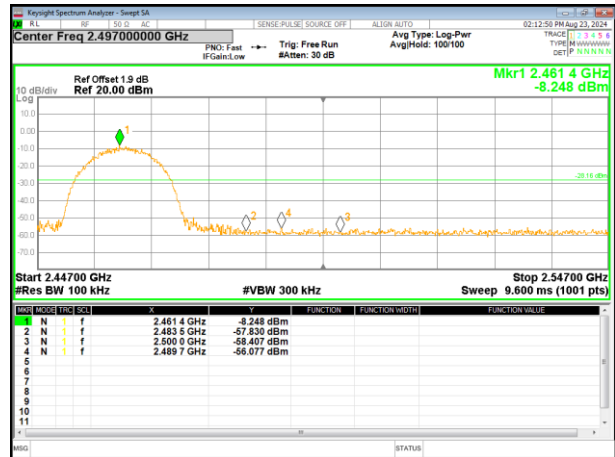
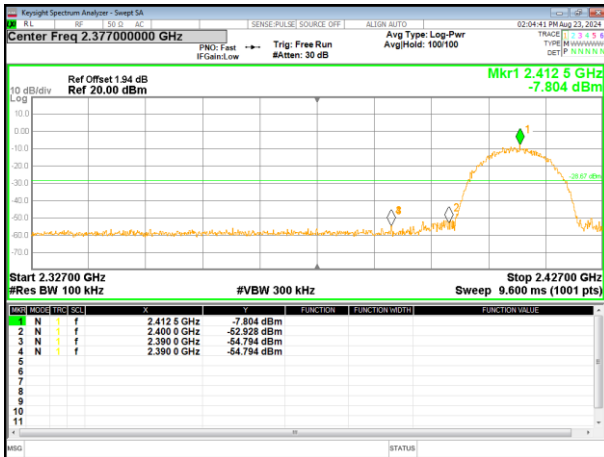
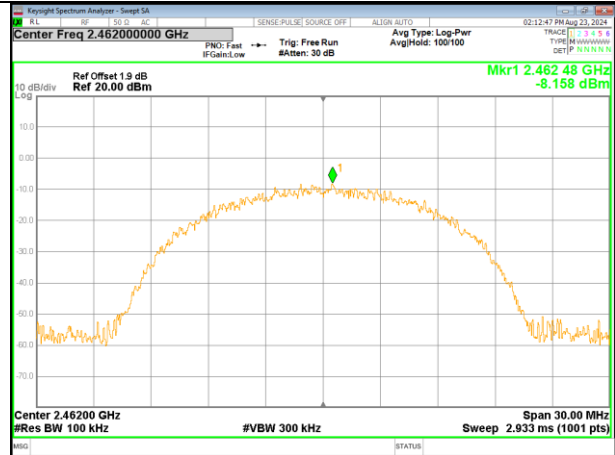
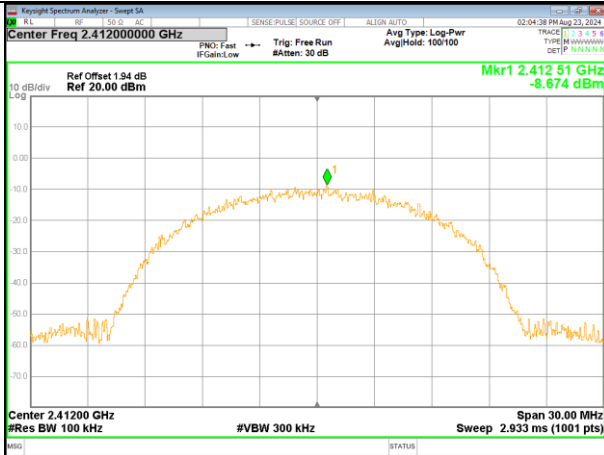
Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d), RSS-247 §5.2.b	
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02	
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.	
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.2°C	Humid.: 52%RH
Test voltage:	DC 5V	
Test results:	Pass	

Test plot as follows:

Test mode:

802.11b

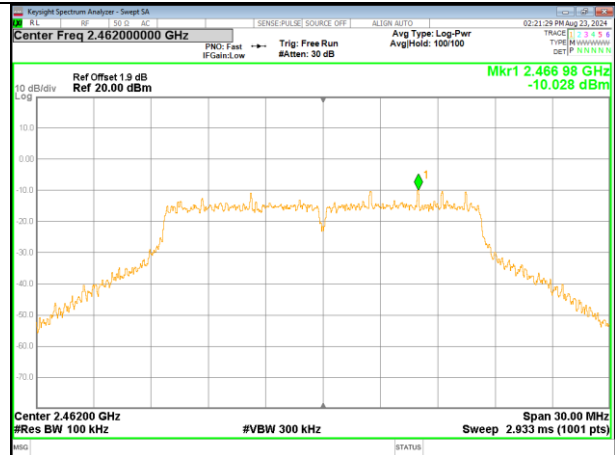
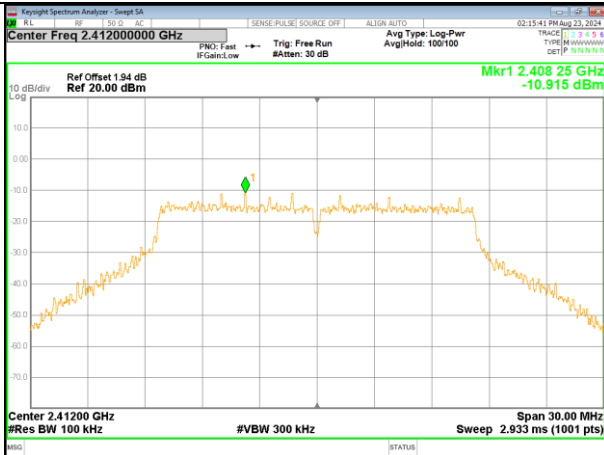


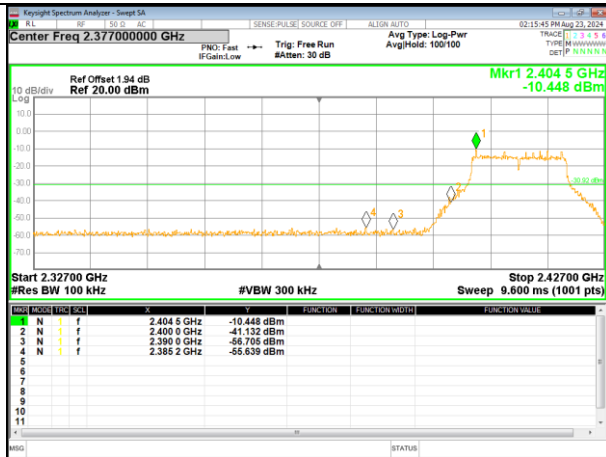
Lowest channel

Highest channel

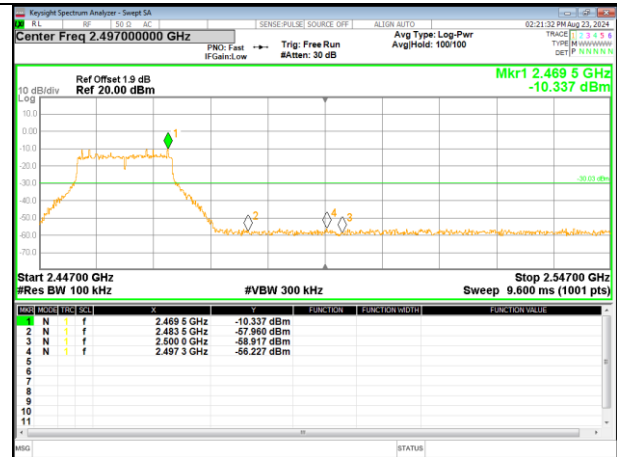
Test mode:

802.11g





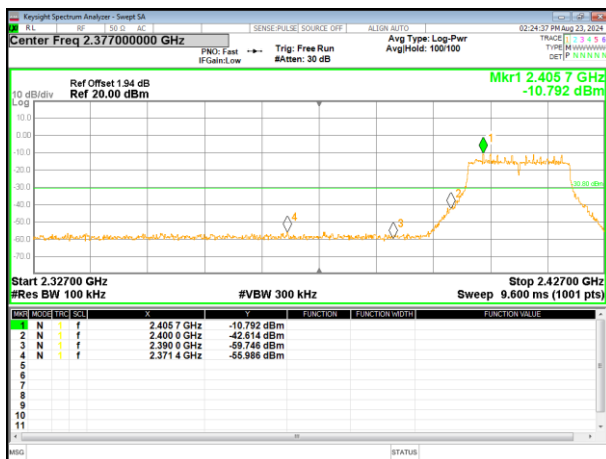
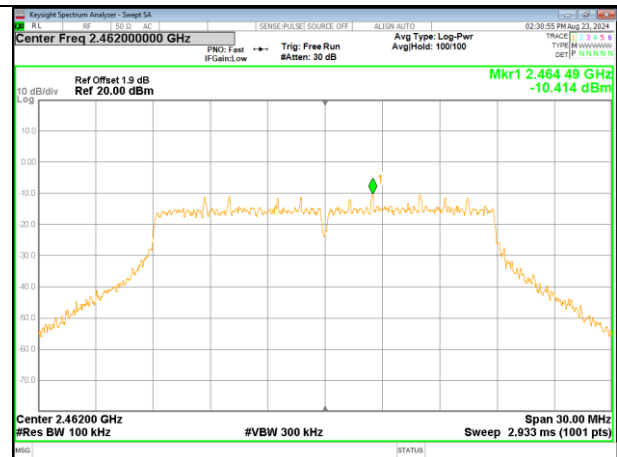
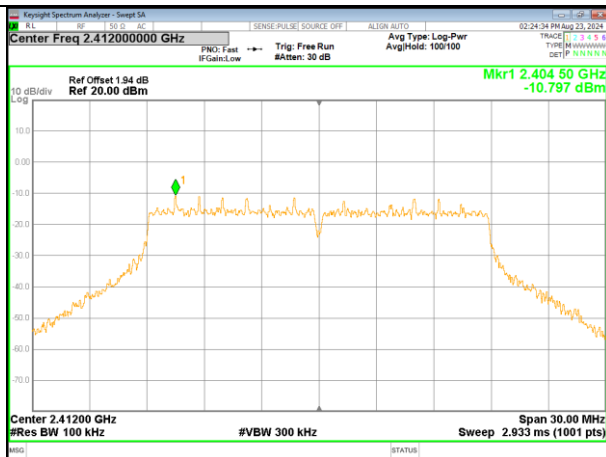
Lowest channel



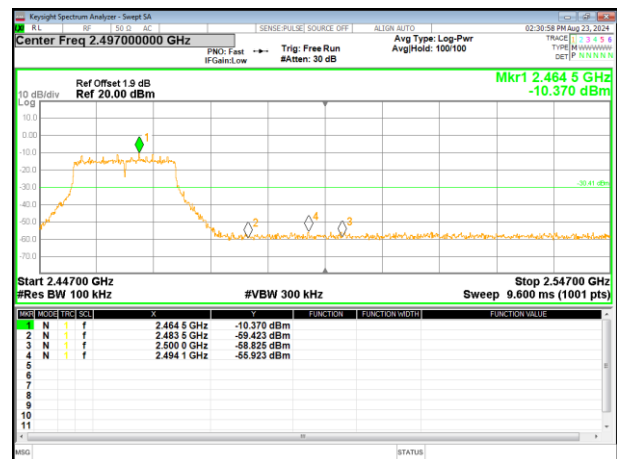
Highest channel

Test mode:

802.11n20



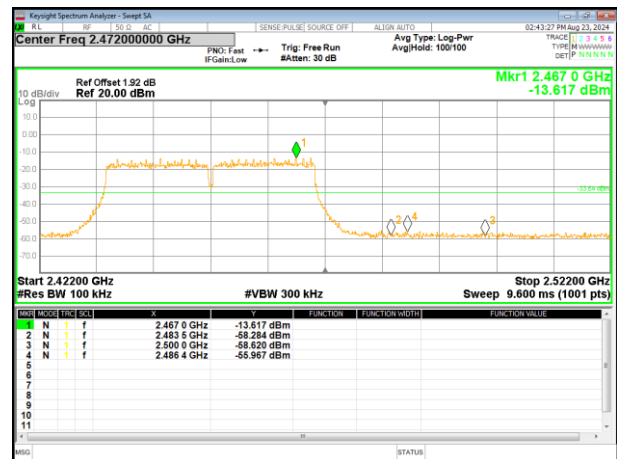
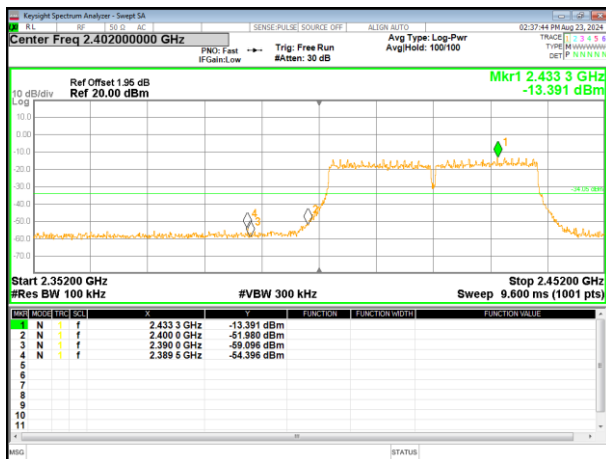
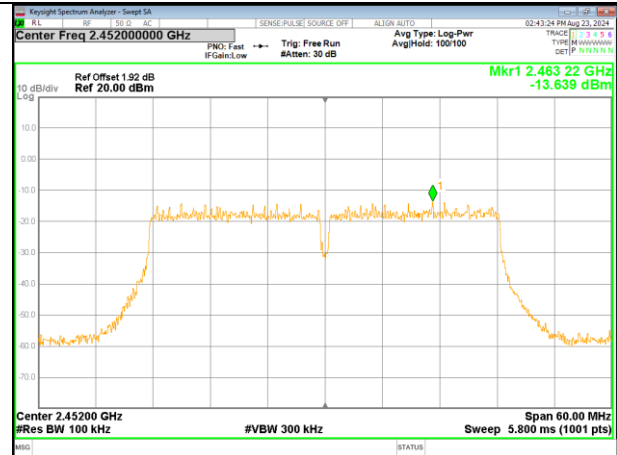
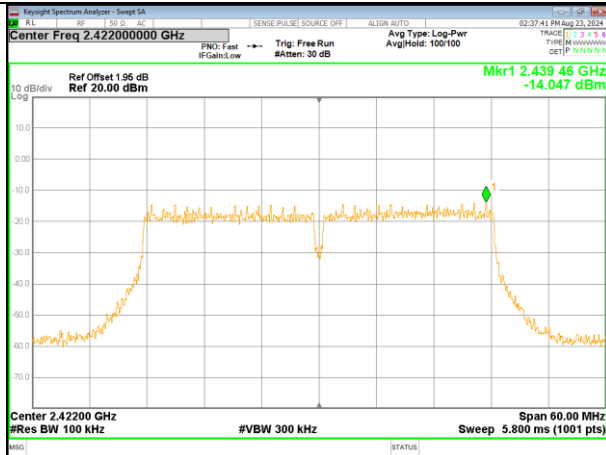
Lowest channel



Highest channel

Test mode:

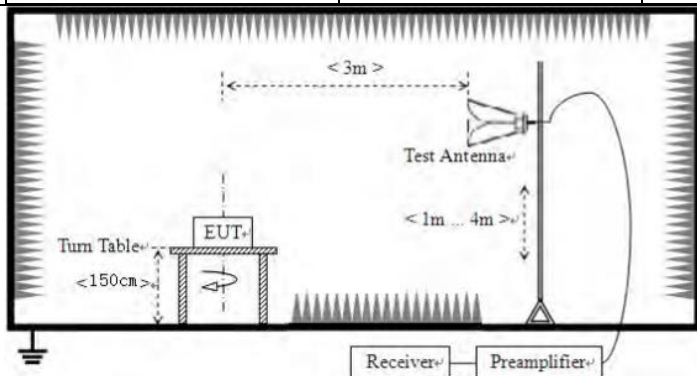
802.11n40



Lowest channel

Highest channel

Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Average	1MHz	3MHz	Average
Limit:	Frequency		Limit (dBuV/m @3m)		Value
	Above 1GHz		54.00		Average
			74.00		Peak
Test setup:					
Test Procedure:	1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.				
Test Instruments:	Refer to section 3.0 for details				
Test mode:	Refer to section 2.2 for details				
Test environment:	Temp.: 22.2°C		Humid.: 52%RH		
Test voltage:	DC 5V				
Test results:	Pass				

Measurement data:

Test mode:	802.11b	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	64.24	27.40	3.43	45.40	49.67	74.00	-24.33	Horizontal
2390.00	67.75	27.10	3.43	45.40	52.88	74.00	-21.12	Horizontal
2310.00	64.02	27.40	3.43	45.40	49.45	74.00	-24.55	Vertical
2390.00	67.23	27.10	3.43	45.40	52.36	74.00	-21.64	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	47.10	27.40	3.43	45.40	32.53	54.00	-21.47	Horizontal
2390.00	50.53	27.10	3.43	45.40	35.66	54.00	-18.34	Horizontal
2310.00	47.77	27.40	3.43	45.40	33.20	54.00	-20.80	Vertical
2390.00	50.87	27.10	3.43	45.40	36.00	54.00	-18.00	Vertical

Test mode:	802.11b	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	66.98	27.80	3.56	45.40	52.94	74.00	-21.06	Horizontal
2500.00	63.12	27.80	3.56	45.40	49.08	74.00	-24.92	Horizontal
2483.50	67.74	27.80	3.56	45.40	53.70	74.00	-20.30	Vertical
2500.00	63.75	27.80	3.56	45.40	49.71	74.00	-24.29	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	51.16	27.80	3.56	45.40	37.12	54.00	-16.88	Horizontal
2500.00	49.03	27.80	3.56	45.40	34.99	54.00	-19.01	Horizontal
2483.50	50.17	27.80	3.56	45.40	36.13	54.00	-17.87	Vertical
2500.00	48.97	27.80	3.56	45.40	34.93	54.00	-19.07	Vertical

Remarks:

1. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
2. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11g	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	69.49	27.40	3.43	45.40	54.92	74.00	-19.08	Horizontal
2390.00	70.90	27.10	3.43	45.40	56.03	74.00	-17.97	Horizontal
2310.00	69.27	27.40	3.43	45.40	54.70	74.00	-19.30	Vertical
2390.00	68.65	27.10	3.43	45.40	53.78	74.00	-20.22	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	49.44	27.40	3.43	45.40	34.87	54.00	-19.13	Horizontal
2390.00	50.91	27.10	3.43	45.40	36.04	54.00	-17.96	Horizontal
2310.00	50.25	27.40	3.43	45.40	35.68	54.00	-18.32	Vertical
2390.00	51.59	27.10	3.43	45.40	36.72	54.00	-17.28	Vertical

Test mode:	802.11g	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	65.84	27.80	3.56	45.40	51.80	74.00	-22.20	Horizontal
2500.00	61.97	27.80	3.56	45.40	47.93	74.00	-26.07	Horizontal
2483.50	66.13	27.80	3.56	45.40	52.09	74.00	-21.91	Vertical
2500.00	67.32	27.80	3.56	45.40	53.28	74.00	-20.72	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	49.21	27.80	3.56	45.40	35.17	54.00	-18.83	Horizontal
2500.00	45.31	27.80	3.56	45.40	31.27	54.00	-22.73	Horizontal
2483.50	48.97	27.80	3.56	45.40	34.93	54.00	-19.07	Vertical
2500.00	45.90	27.80	3.56	45.40	31.86	54.00	-22.14	Vertical

Remarks:

- The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT20)	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	63.83	27.40	3.43	45.40	49.26	74.00	-24.74	Horizontal
2390.00	66.47	27.10	3.43	45.40	51.60	74.00	-22.40	Horizontal
2310.00	63.89	27.40	3.43	45.40	49.32	74.00	-24.68	Vertical
2390.00	68.00	27.10	3.43	45.40	53.13	74.00	-20.87	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	45.06	27.40	3.43	45.40	30.49	54.00	-23.51	Horizontal
2390.00	49.39	27.10	3.43	45.40	34.52	54.00	-19.48	Horizontal
2310.00	44.48	27.40	3.43	45.40	29.91	54.00	-24.09	Vertical
2390.00	49.96	27.10	3.43	45.40	35.09	54.00	-18.91	Vertical

Test mode:	802.11n(HT20)	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	62.72	27.80	3.56	45.40	48.68	74.00	-25.32	Horizontal
2500.00	62.33	27.80	3.56	45.40	48.29	74.00	-25.71	Horizontal
2483.50	62.28	27.80	3.56	45.40	48.24	74.00	-25.76	Vertical
2500.00	64.43	27.80	3.56	45.40	50.39	74.00	-23.61	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	48.85	27.80	3.56	45.40	34.81	54.00	-19.19	Horizontal
2500.00	45.57	27.80	3.56	45.40	31.53	54.00	-22.47	Horizontal
2483.50	48.36	27.80	3.56	45.40	34.32	54.00	-19.68	Vertical
2500.00	45.23	27.80	3.56	45.40	31.19	54.00	-22.81	Vertical

Remarks:

- The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT40)	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	66.62	27.40	3.43	45.40	52.05	74.00	-21.95	Horizontal
2390.00	64.51	27.10	3.43	45.40	49.64	74.00	-24.36	Horizontal
2310.00	67.75	27.40	3.43	45.40	53.18	74.00	-20.82	Vertical
2390.00	66.34	27.10	3.43	45.40	51.47	74.00	-22.53	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	47.07	27.40	3.43	45.40	32.50	54.00	-21.50	Horizontal
2390.00	50.39	27.10	3.43	45.40	35.52	54.00	-18.48	Horizontal
2310.00	46.79	27.40	3.43	45.40	32.22	54.00	-21.78	Vertical
2390.00	51.04	27.10	3.43	45.40	36.17	54.00	-17.83	Vertical

Test mode:	802.11n(HT40)	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	66.72	27.80	3.56	45.40	52.68	74.00	-21.32	Horizontal
2500.00	62.97	27.80	3.56	45.40	48.93	74.00	-25.07	Horizontal
2483.50	66.51	27.80	3.56	45.40	52.47	74.00	-21.53	Vertical
2500.00	62.38	27.80	3.56	45.40	48.34	74.00	-25.66	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	48.21	27.80	3.56	45.40	34.17	54.00	-19.83	Horizontal
2500.00	45.11	27.80	3.56	45.40	31.07	54.00	-22.93	Horizontal
2483.50	49.08	27.80	3.56	45.40	35.04	54.00	-18.96	Vertical
2500.00	44.89	27.80	3.56	45.40	30.85	54.00	-23.15	Vertical

Remarks:

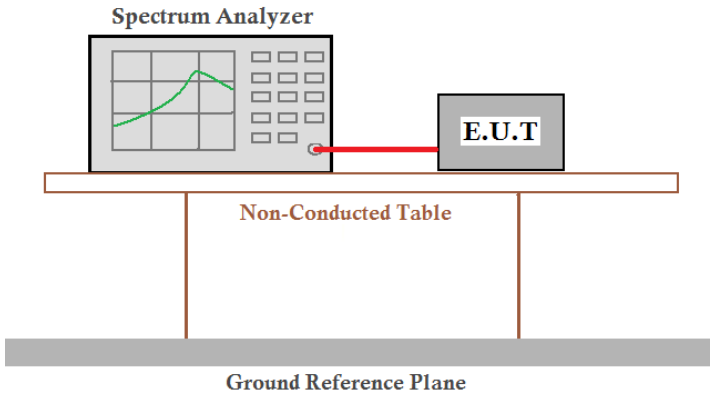
10. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

11. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

12. Emissions more than 20 dB below the limit do not need to be reported.

4.8 Spurious Emission

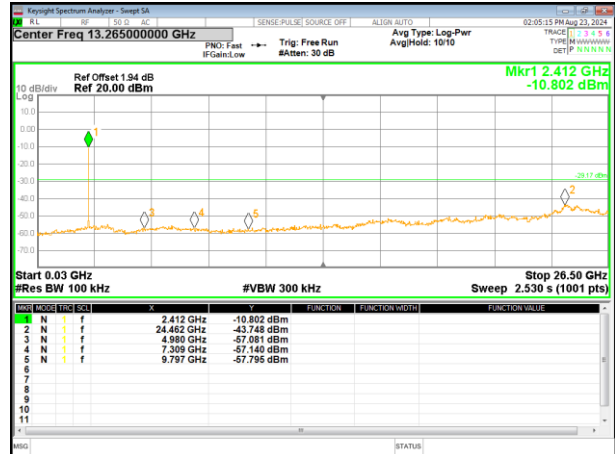
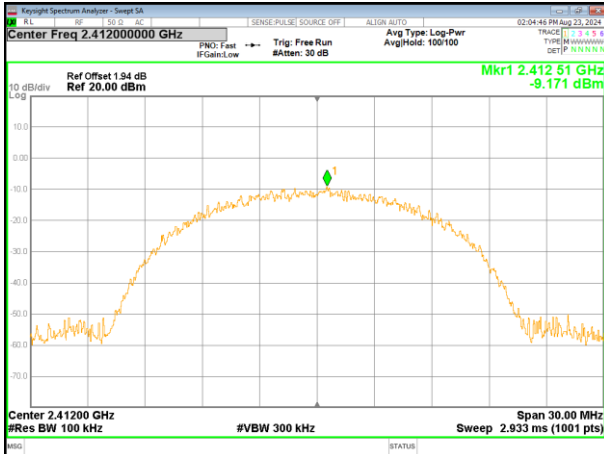
Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)	
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02	
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.	
Test setup:	 The diagram illustrates the test setup for conducted emission measurements. A Spectrum Analyzer is connected to the Equipment Under Test (E.U.T.) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane, which is represented by a thick grey bar at the bottom.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.2°C	Humid.: 52%RH
Test voltage:	DC 5V	
Test results:	Pass	

Test plot as follows:

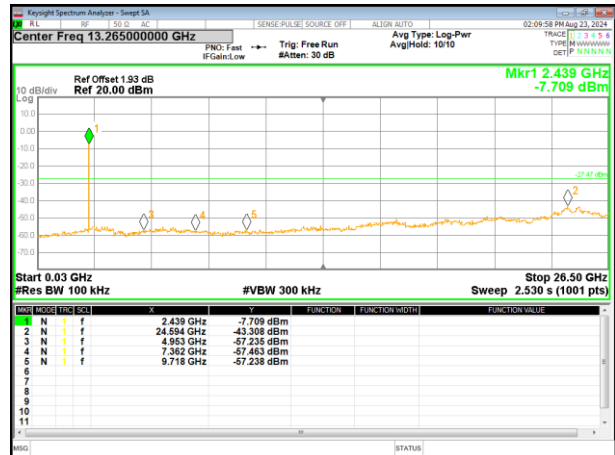
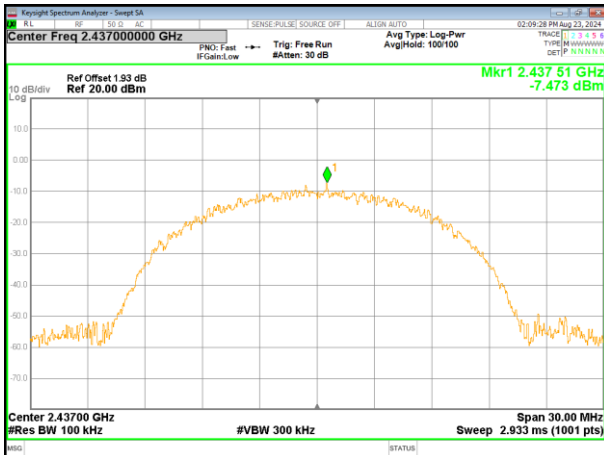
802.11b

Lowest channel



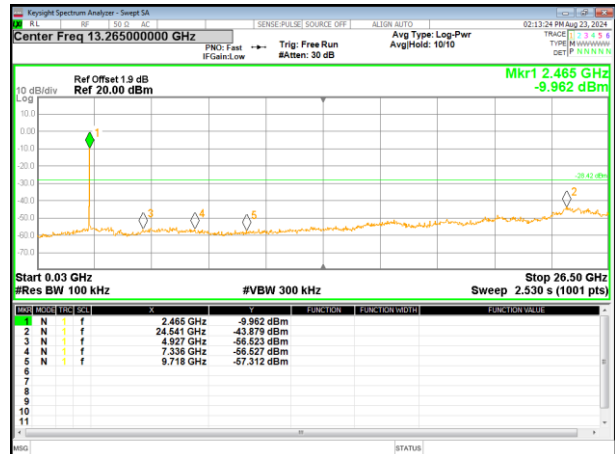
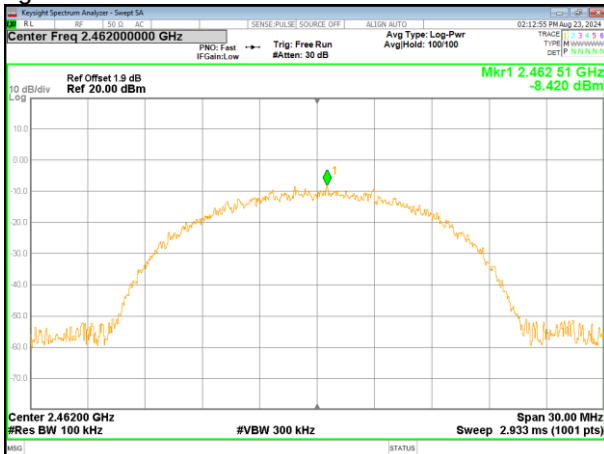
30MHz~25GHz

Middle channel



30MHz~25GHz

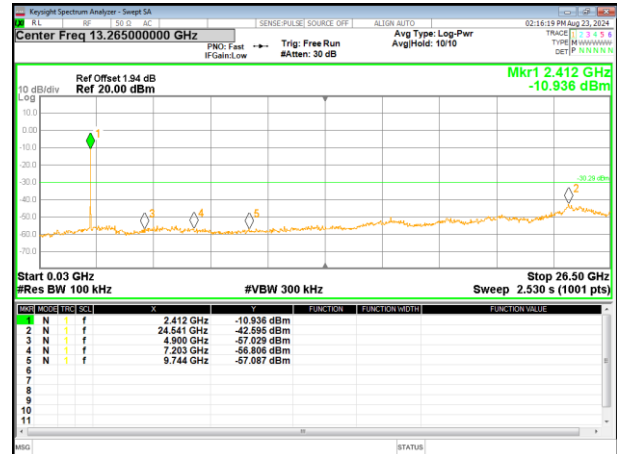
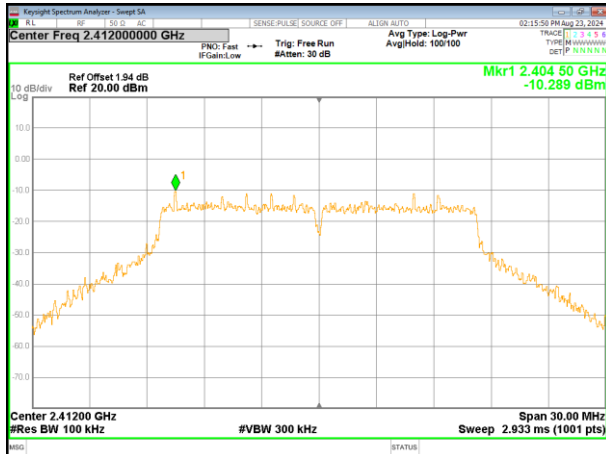
Highest channel



30MHz~25GHz

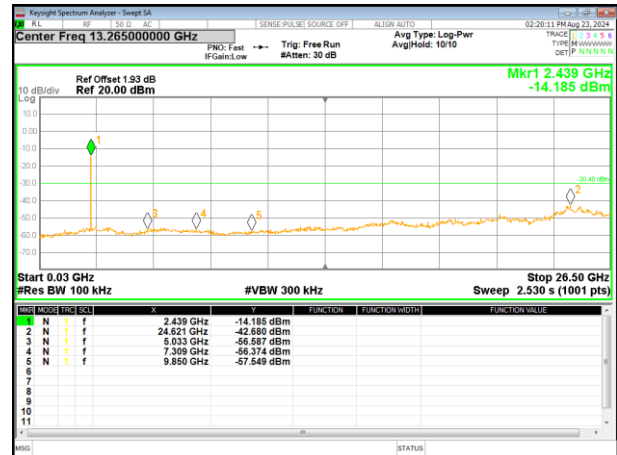
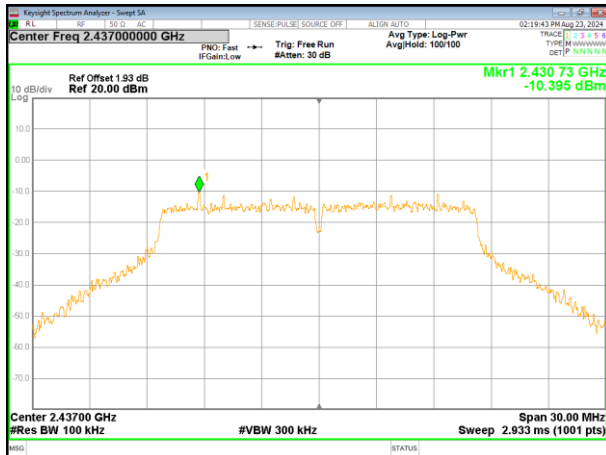
802.11g

Lowest channel



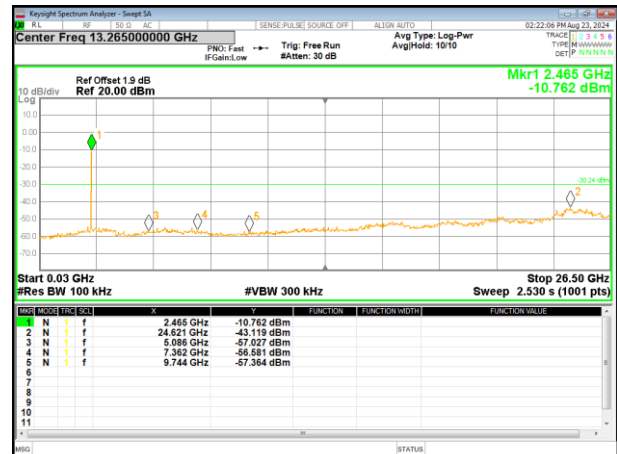
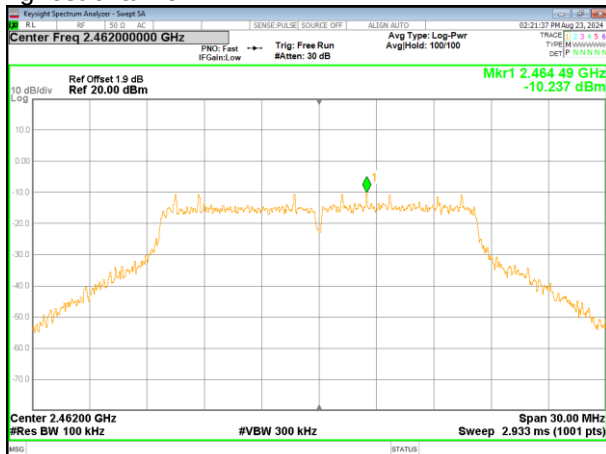
30MHz~25GHz

Middle channel



30MHz~25GHz

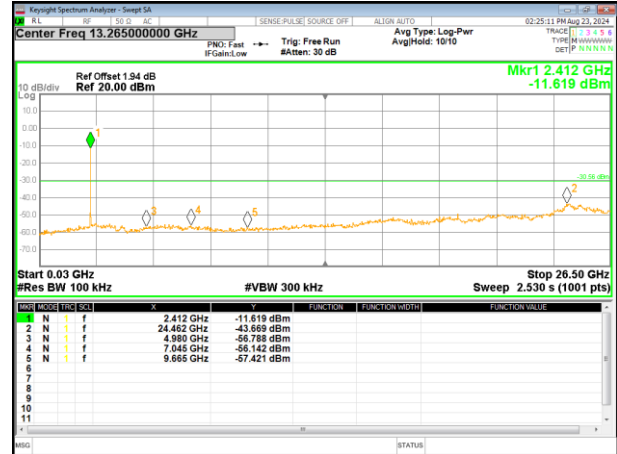
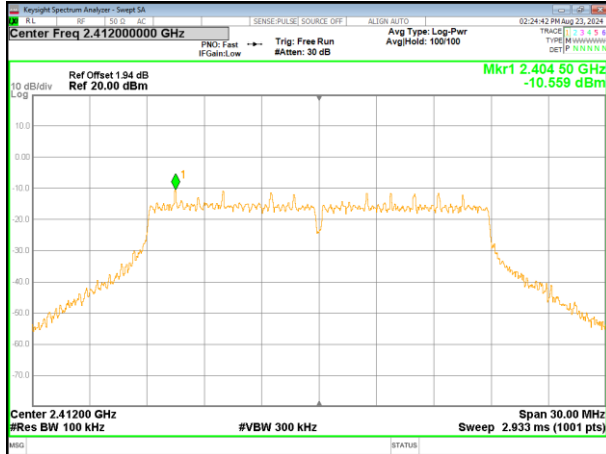
Highest channel



30MHz~25GHz

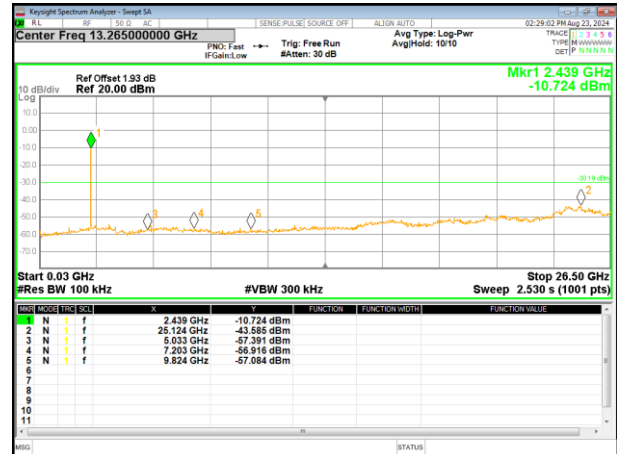
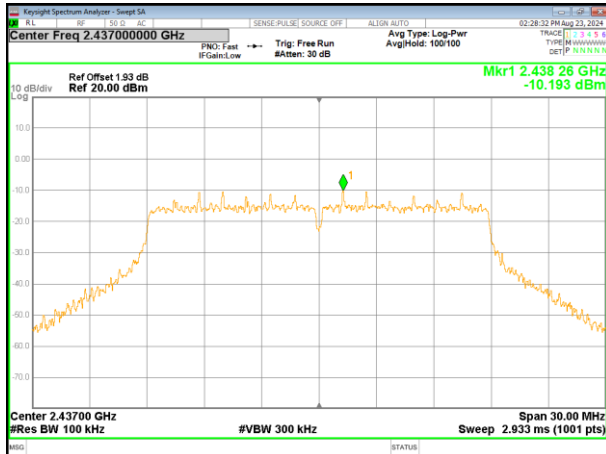
802.11n20

Lowest channel



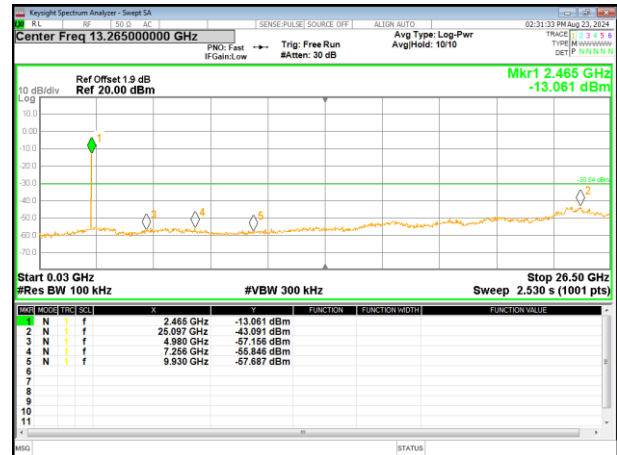
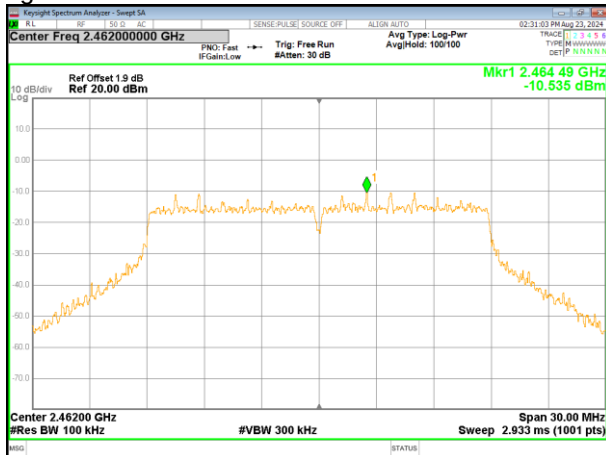
30MHz~25GHz

Middle channel



30MHz~25GHz

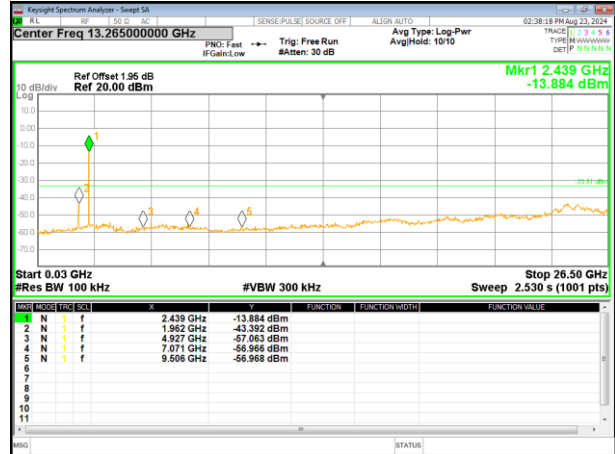
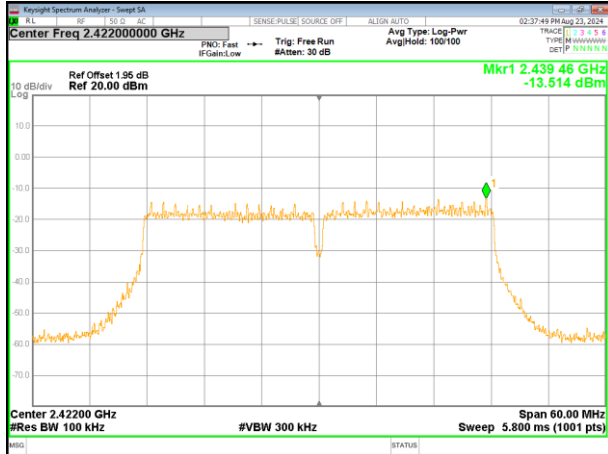
Highest channel



30MHz~25GHz

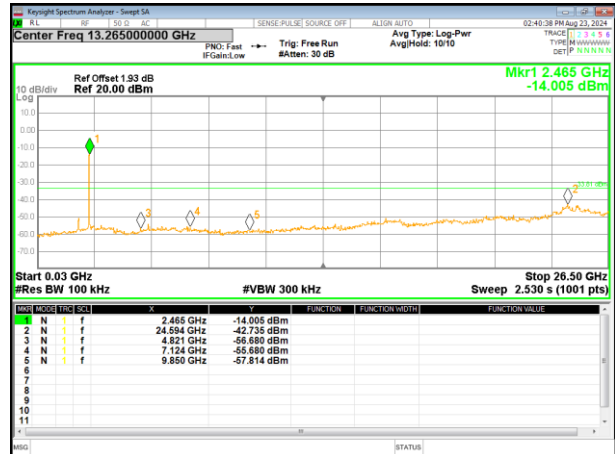
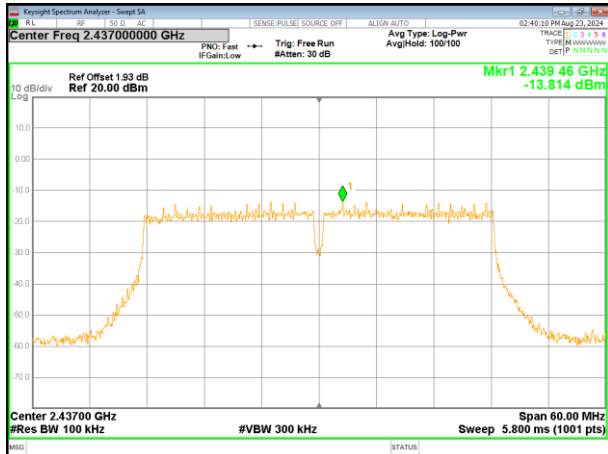
802.11n40

Lowest channel



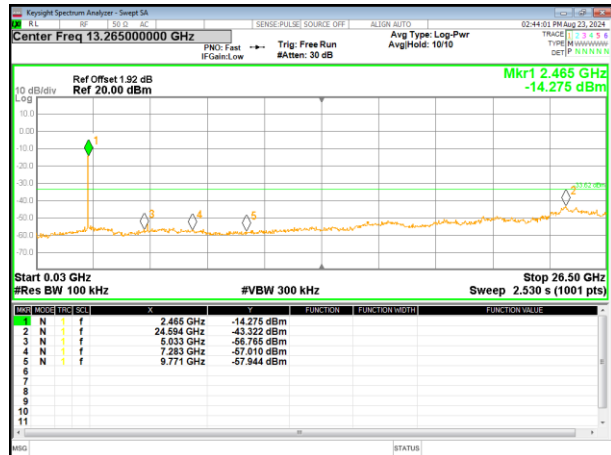
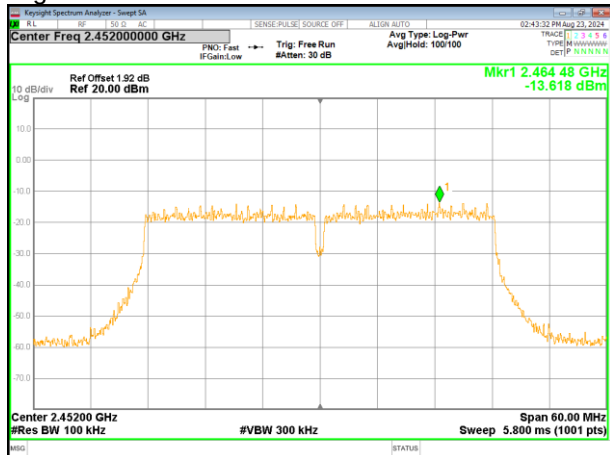
30MHz~25GHz

Middle channel



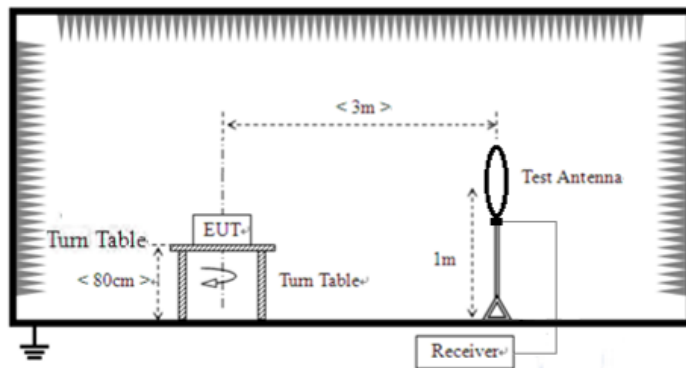
30MHz~25GHz

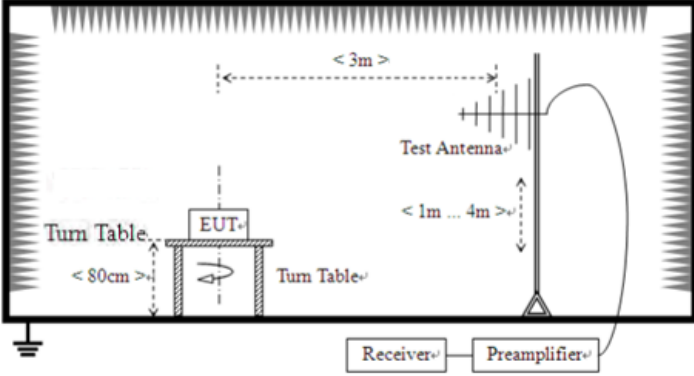
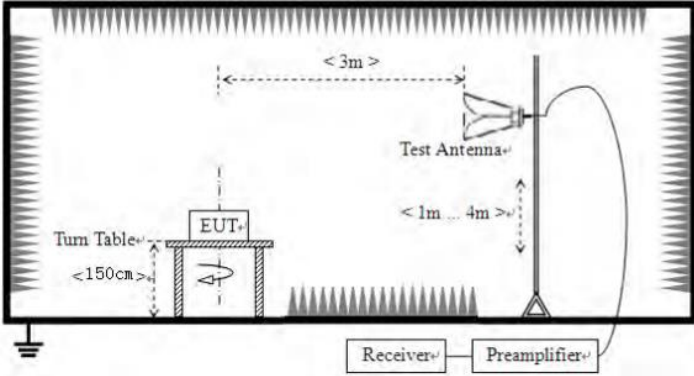
Highest channel



30MHz~25GHz

Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	300m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					
For radiated emissions from 30MHz to1GHz					

	 For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details



Test environment:	Temp.:	22.2 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	DC 5V					
Test results:	Pass					

Remarks:

- 1. The report only shows the worst mode.*
- 2. Pre-scan all kind of the place mode (X-axis, Y-(axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement data:

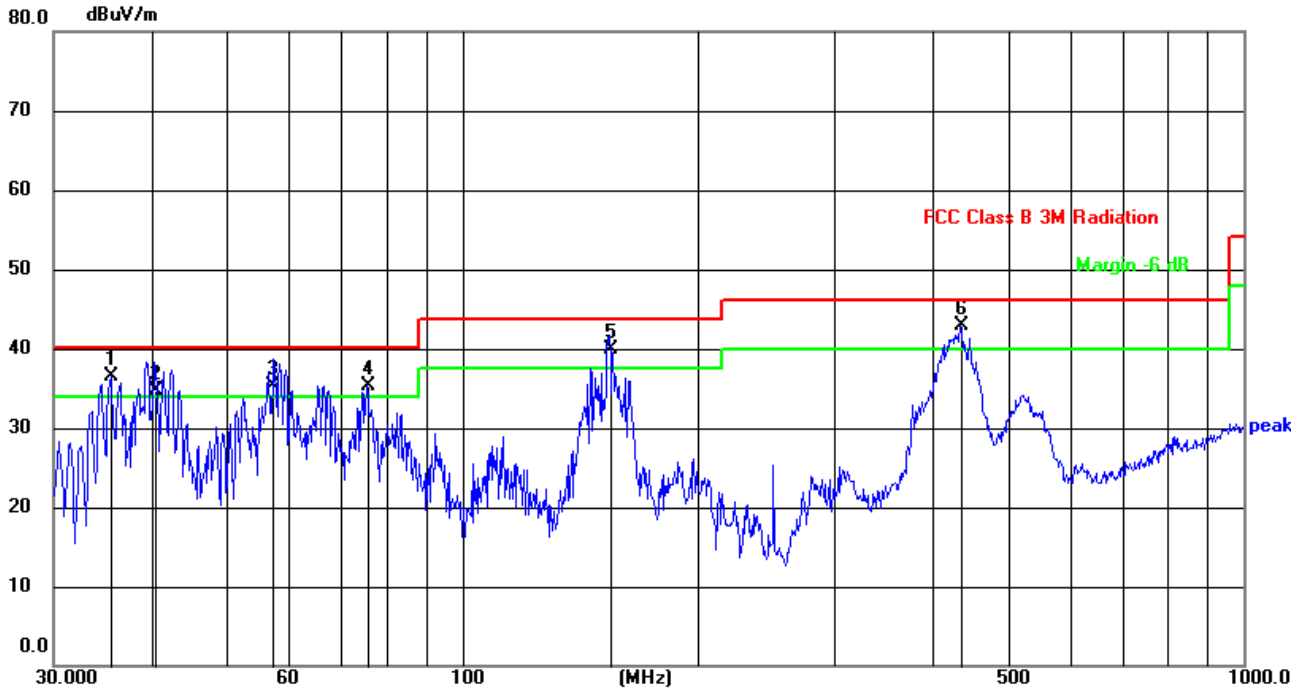
■ **9kHz~30MHz**

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

■ Below 1GHz

All mode has been tested, the report only shows the worst mode (80802.11g 2462MHz).

Vertical:



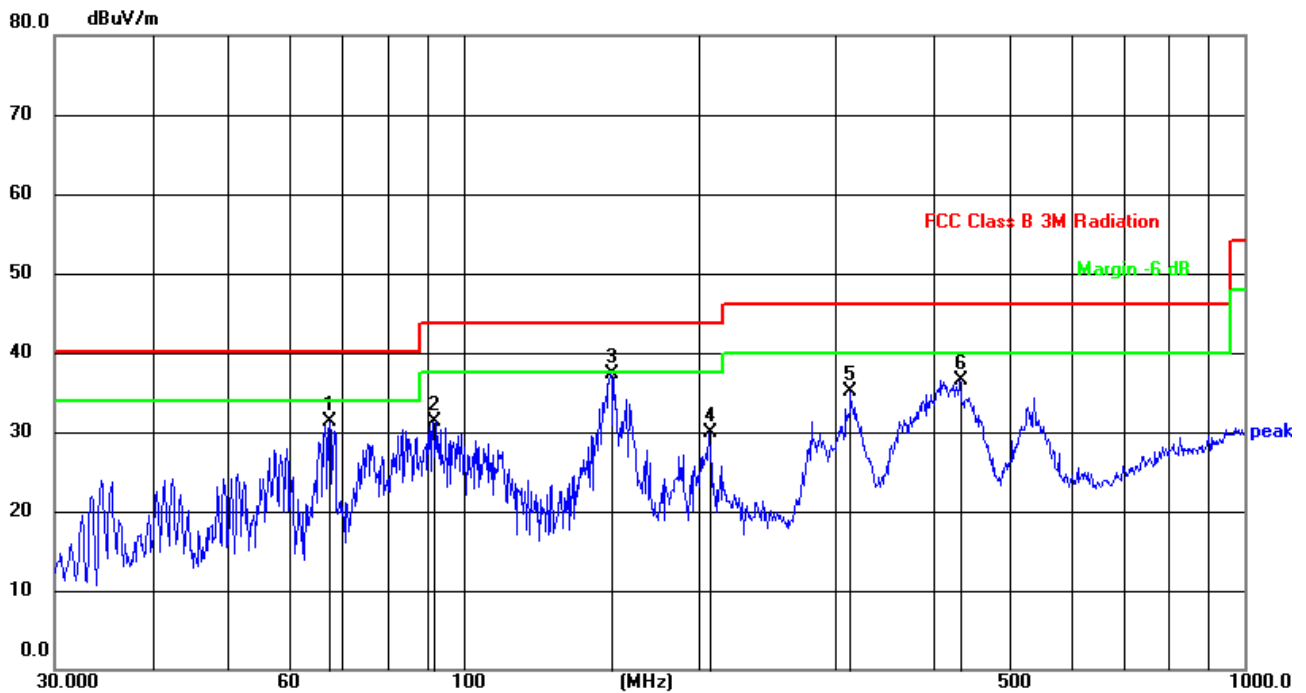
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.4993	58.08	-21.63	36.45	40.00	-3.55	QP
2	40.4172	55.68	-20.98	34.70	40.00	-5.30	QP
3	57.3923	57.75	-22.35	35.40	40.00	-4.60	QP
4	75.4464	60.55	-25.21	35.34	40.00	-4.66	QP
5	154.2786	60.54	-20.54	40.00	43.50	-3.50	QP
6	434.0651	58.89	-16.01	42.88	46.00	-3.12	QP

Remarks:

Level = Receiver Reading + Factor

Factor = Antenna Factor + Cable Factor - Preamplifier Factor

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	67.4382	55.11	-23.74	31.37	40.00	-8.63	QP
2	91.4949	56.71	-25.38	31.33	43.50	-12.17	QP
3	154.2786	57.92	-20.54	37.38	43.50	-6.12	QP
4	206.3976	53.44	-23.44	30.00	43.50	-13.50	QP
5	313.2760	54.88	-19.74	35.14	46.00	-10.86	QP
6	432.5457	52.56	-16.05	36.51	46.00	-9.49	QP

Remarks:

Level = Receiver Reading + Factor

Factor = Antenna Factor + Cable Factor - Preamplifier Factor

■ Above 1GHz

Test mode:	802.11b	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	58.61	32.10	5.96	45.50	51.17	74.00	22.83	Vertical
7236.00	54.48	36.60	6.93	45.60	52.41	74.00	21.59	Vertical
9648.00	54.79	38.60	8.02	46.20	55.21	74.00	18.79	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	57.71	32.10	5.96	45.50	50.27	74.00	23.73	Horizontal
7236.00	54.76	36.60	6.93	45.60	52.69	74.00	21.31	Horizontal
9648.00	53.21	38.60	8.02	46.20	53.63	74.00	20.37	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	44.00	32.10	5.96	45.50	36.56	54.00	17.44	Vertical
7236.00	40.59	36.60	6.93	45.60	38.52	54.00	15.48	Vertical
9648.00	40.58	38.60	8.02	46.20	41.00	54.00	13.00	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	41.99	32.10	5.96	45.50	34.55	54.00	19.45	Horizontal
7236.00	39.76	36.60	6.93	45.60	37.69	54.00	16.31	Horizontal
9648.00	40.65	38.60	8.02	46.20	41.07	54.00	12.93	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11b	Test channel:	Middle
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	53.68	32.40	5.96	45.50	46.54	74.00	27.46	Vertical
7311.00	52.76	36.60	6.93	45.60	50.69	74.00	23.31	Vertical
9748.00	53.98	38.00	8.02	46.20	53.80	74.00	20.20	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	54.63	32.40	5.96	45.50	47.49	74.00	26.51	Horizontal
7311.00	50.50	36.60	6.93	45.60	48.43	74.00	25.57	Horizontal
9748.00	53.10	38.00	8.02	46.20	52.92	74.00	21.08	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	43.21	32.40	5.96	45.50	36.07	54.00	17.93	Vertical
7311.00	39.64	36.60	6.93	45.60	37.57	54.00	16.43	Vertical
9748.00	42.25	38.00	8.02	46.20	42.07	54.00	11.93	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	42.78	32.40	5.96	45.50	35.64	54.00	18.36	Horizontal
7311.00	39.73	36.60	6.93	45.60	37.66	54.00	16.34	Horizontal
9748.00	40.20	38.00	8.02	46.20	40.02	54.00	13.98	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11b	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	56.60	32.80	5.96	45.70	49.66	74.00	24.35	Vertical
7386.00	52.12	36.40	6.93	45.80	49.65	74.00	24.35	Vertical
9848.00	53.45	38.20	8.02	46.20	53.47	74.00	20.53	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	57.83	32.80	5.96	45.70	50.89	74.00	23.11	Horizontal
7386.00	52.29	36.40	6.93	45.80	49.82	74.00	24.18	Horizontal
9848.00	52.33	38.20	8.02	46.20	52.35	74.00	21.65	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	45.82	32.80	5.96	45.70	38.88	54.00	15.12	Vertical
7386.00	42.44	36.40	6.93	45.80	39.97	54.00	14.03	Vertical
9848.00	41.97	38.20	8.02	46.20	41.99	54.00	12.01	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	43.88	32.80	5.96	45.70	36.94	54.00	17.06	Horizontal
7386.00	38.94	36.40	6.93	45.80	36.47	54.00	17.53	Horizontal
9848.00	39.95	38.20	8.02	46.20	39.97	54.00	14.03	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11g	Test channel:	lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	55.18	32.10	5.96	45.50	47.74	74.00	26.26	Vertical
7236.00	52.34	36.60	6.93	45.60	50.27	74.00	23.73	Vertical
9648.00	53.53	38.60	8.02	46.20	53.95	74.00	20.05	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	53.88	32.10	5.96	45.50	46.44	74.00	27.56	Horizontal
7236.00	52.15	36.60	6.93	45.60	50.08	74.00	23.92	Horizontal
9648.00	53.43	38.60	8.02	46.20	53.85	74.00	20.15	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	44.21	32.10	5.96	45.50	36.77	54.00	17.23	Vertical
7236.00	39.91	36.60	6.93	45.60	37.84	54.00	16.16	Vertical
9648.00	41.10	38.60	8.02	46.20	41.52	54.00	12.48	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	43.77	32.10	5.96	45.50	36.33	54.00	17.67	Horizontal
7236.00	39.95	36.60	6.93	45.60	37.88	54.00	16.12	Horizontal
9648.00	40.17	38.60	8.02	46.20	40.59	54.00	13.41	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11g	Test channel:	Middle
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	54.31	32.40	5.96	45.50	47.17	74.00	26.83	Vertical
7311.00	51.98	36.60	6.93	45.60	49.91	74.00	24.09	Vertical
9748.00	52.96	38.00	8.02	46.20	52.78	74.00	21.22	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	54.47	32.40	5.96	45.50	47.33	74.00	26.67	Horizontal
7311.00	51.90	36.60	6.93	45.60	49.83	74.00	24.17	Horizontal
9748.00	53.32	38.00	8.02	46.20	53.14	74.00	20.86	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	44.32	32.40	5.96	45.50	37.18	54.00	16.82	Vertical
7311.00	38.78	36.60	6.93	45.60	36.71	54.00	17.29	Vertical
9748.00	40.60	38.00	8.02	46.20	40.42	54.00	13.58	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	43.17	32.40	5.96	45.50	36.03	54.00	17.97	Horizontal
7311.00	39.66	36.60	6.93	45.60	37.59	54.00	16.41	Horizontal
9748.00	40.28	38.00	8.02	46.20	40.10	54.00	13.90	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11g	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	57.77	32.80	5.96	45.70	50.83	74.00	23.17	Vertical
7386.00	53.90	36.40	6.93	45.80	51.43	74.00	22.57	Vertical
9848.00	53.37	38.20	8.02	46.20	53.39	74.00	20.61	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	58.74	32.80	5.96	45.70	51.80	74.00	22.20	Horizontal
7386.00	52.32	36.40	6.93	45.80	49.85	74.00	24.15	Horizontal
9848.00	52.73	38.20	8.02	46.20	52.75	74.00	21.25	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	45.61	32.80	5.96	45.70	38.67	54.00	15.33	Vertical
7386.00	41.81	36.40	6.93	45.80	39.34	54.00	14.66	Vertical
9848.00	40.97	38.20	8.02	46.20	40.99	54.00	13.01	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	46.50	32.80	5.96	45.70	39.56	54.00	14.44	Horizontal
7386.00	40.10	36.40	6.93	45.80	37.63	54.00	16.37	Horizontal
9848.00	40.30	38.20	8.02	46.20	40.32	54.00	13.68	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT20)	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	57.26	32.10	5.96	45.50	49.82	74.00	24.18	Vertical
7236.00	54.07	36.60	6.93	45.60	52.00	74.00	22.00	Vertical
9648.00	51.80	38.60	8.02	46.20	52.22	74.00	21.78	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	56.45	32.10	5.96	45.50	49.01	74.00	24.99	Horizontal
7236.00	52.72	36.60	6.93	45.60	50.65	74.00	23.35	Horizontal
9648.00	51.15	38.60	8.02	46.20	51.57	74.00	22.43	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	44.91	32.10	5.96	45.50	37.47	54.00	16.53	Vertical
7236.00	37.34	36.60	6.93	45.60	35.27	54.00	18.73	Vertical
9648.00	39.13	38.60	8.02	46.20	39.55	54.00	14.45	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	42.14	32.10	5.96	45.50	34.70	54.00	19.30	Horizontal
7236.00	38.37	36.60	6.93	45.60	36.30	54.00	17.70	Horizontal
9648.00	38.45	38.60	8.02	46.20	38.87	54.00	15.13	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak, instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT20)	Test channel:	Middle
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	58.25	32.10	5.96	45.50	50.81	74.00	23.19	Vertical
7311.00	54.74	36.60	6.93	45.60	52.67	74.00	21.33	Vertical
9748.00	52.82	38.60	8.02	46.20	53.24	74.00	20.76	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	57.85	32.10	5.96	45.50	50.41	74.00	23.59	Horizontal
7311.00	52.64	36.60	6.93	45.60	50.57	74.00	23.43	Horizontal
9748.00	52.18	38.60	8.02	46.20	52.60	74.00	21.40	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	43.49	32.10	5.96	45.50	36.05	54.00	17.95	Vertical
7311.00	40.75	36.60	6.93	45.60	38.68	54.00	15.32	Vertical
9748.00	40.02	38.60	8.02	46.20	40.44	54.00	13.56	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	44.24	32.10	5.96	45.50	36.80	54.00	17.20	Horizontal
7311.00	37.82	36.60	6.93	45.60	35.75	54.00	18.25	Horizontal
9748.00	38.61	38.60	8.02	46.20	39.03	54.00	14.97	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT20)	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	62.30	32.10	5.96	45.50	54.86	74.00	19.14	Vertical
7386.00	55.88	36.60	6.93	45.60	53.81	74.00	20.19	Vertical
9848.00	56.67	38.60	8.02	46.20	57.09	74.00	16.91	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	56.94	32.80	5.96	45.70	50.00	74.00	24.00	Horizontal
7386.00	52.47	36.40	6.93	45.80	50.00	74.00	24.00	Horizontal
9848.00	51.70	38.20	8.02	46.20	51.72	74.00	22.29	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	44.34	32.80	5.96	45.70	37.40	54.00	16.60	Vertical
7386.00	38.09	36.40	6.93	45.80	35.62	54.00	18.38	Vertical
9848.00	39.89	38.20	8.02	46.20	39.91	54.00	14.09	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	44.34	32.80	5.96	45.70	37.40	54.00	16.60	Horizontal
7386.00	39.10	36.40	6.93	45.80	36.63	54.00	17.37	Horizontal
9848.00	36.62	38.20	8.02	46.20	36.64	54.00	17.36	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

- 1 Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 “*”, means this data is too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT40)	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	54.52	32.10	5.96	45.50	47.08	74.00	26.92	Vertical
7266.00	56.65	36.80	6.93	45.60	54.78	74.00	19.22	Vertical
9688.00	55.09	38.10	8.02	46.20	55.01	74.00	18.99	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4844.00	52.44	32.10	5.96	45.50	45.00	74.00	29.00	Horizontal
7266.00	55.60	36.80	6.93	45.60	53.73	74.00	20.27	Horizontal
9688.00	53.84	38.10	8.02	46.20	53.76	74.00	20.24	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	39.77	32.10	5.96	45.50	32.33	54.00	21.67	Vertical
7266.00	41.84	36.80	6.93	45.60	39.97	54.00	14.03	Vertical
9688.00	39.77	38.10	8.02	46.20	39.69	54.00	14.31	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4844.00	38.00	32.10	5.96	45.50	30.56	54.00	23.44	Horizontal
7266.00	41.12	36.80	6.93	45.60	39.25	54.00	14.75	Horizontal
9688.00	39.11	38.10	8.02	46.20	39.03	54.00	14.97	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

Test mode:	802.11n(HT40)	Test channel:	Middle
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	54.98	32.10	5.96	45.50	47.54	74.00	26.46	Vertical
7311.00	57.58	36.60	6.93	45.60	55.51	74.00	18.50	Vertical
9748.00	54.64	38.60	8.02	46.20	55.06	74.00	18.94	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	54.37	32.10	5.96	45.50	46.93	74.00	27.07	Horizontal
7311.00	56.05	36.60	6.93	45.60	53.98	74.00	20.02	Horizontal
9748.00	55.62	38.60	8.02	46.20	56.04	74.00	17.97	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	41.18	32.10	5.96	45.50	33.74	54.00	20.26	Vertical
7311.00	42.90	36.60	6.93	45.60	40.83	54.00	13.17	Vertical
9748.00	40.87	38.60	8.02	46.20	41.29	54.00	12.71	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	40.21	32.10	5.96	45.50	32.77	54.00	21.23	Horizontal
7311.00	42.94	36.60	6.93	45.60	40.87	54.00	13.13	Horizontal
9748.00	39.86	38.60	8.02	46.20	40.28	54.00	13.72	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“*” means this data is too weak, instrument of signal is unable to test.*
3. *Emissions more than 20 dB below the limit do not need to be reported.*



Test mode:	802.11n(HT40)	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	55.55	32.80	5.96	45.70	48.61	74.00	25.39	Vertical
7356.00	53.33	36.20	6.93	45.80	50.66	74.00	23.34	Vertical
9808.00	51.70	38.40	8.02	46.20	51.92	74.00	22.09	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4904.00	55.82	32.80	5.96	45.70	48.88	74.00	25.12	Horizontal
7356.00	54.02	36.20	6.93	45.80	51.35	74.00	22.65	Horizontal
9808.00	55.14	38.40	8.02	46.20	55.36	74.00	18.64	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	44.68	32.80	5.96	45.70	37.74	54.00	16.26	Vertical
7356.00	39.33	36.20	6.93	45.80	36.66	54.00	17.34	Vertical
9808.00	38.15	38.40	8.02	46.20	38.37	54.00	15.63	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4904.00	45.27	32.80	5.96	45.70	38.33	54.00	15.67	Horizontal
7356.00	39.77	36.20	6.93	45.80	37.10	54.00	16.90	Horizontal
9808.00	37.88	38.40	8.02	46.20	38.10	54.00	15.90	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 “*”, means this data is the too weak instrument of signal is unable to test.
3. Emissions more than 20 dB below the limit do not need to be reported.

5. Test Setup Photo

Reference to the **appendix I** for details.

6. EUT Constructional Details

Reference to the **appendix II** for details.

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