TEST REPORT

Reference No.	:	WTS19S01000191W-1
FCC ID	:	2ARZX-D550
Applicant	:	Shenzhen Proscenic Technology Co., Ltd
Address	:	Room 502 Jinshun Bulding A block, No 287 Ruyi Road, Ailian Community, Longgang District, Shenzhen, China
Manufacturer	:	RuiXin Plastics &Electronics(ShenZhen) Co., Ltd
Address	:	Huang Pu Road, Shang Liao Village, Sha Jing Town, Bao An district, Shen Zhen City 518125 Guang Dong Province China
Product	:	Robot Vacuum Cleaner
Model(s)	:	LDS D550
Standards	:	FCC CFR47 Part 15 C Section 15.247: 2018
Date of Receipt sample	:	2018-12-24
Date of Test	:	2018-12-24 to 2019-01-24
Date of Issue	:	2019-01-24
Test Result	:	**Pass**

Remarks:
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:
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Tested by: Robin.Zhou

Robin Zhou / Test Engineer

Approved by: Philo Zhong

Philo Zhong / Manager

2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation, the certification number is 4243.01) of USA, CNAS (China National Accreditation Service for Conformity Assessment, the registration number is L3110) of China.Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), ISED Canada (Innovation, Science and Economic Development Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.

Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

2.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Country/Region	Scope Covered By	Scope	Note
USA	ISO/IEC 17025	FCC ID \ SDoC(VOC/DOC)	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		WPC	-
Thailand		NTC	-
Singapore		IDA	-
Note: 1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476. 2. ISED Canada Registration No.: CN0013.			

B.TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of …	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd.	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

3 Contents

2. Revision History

Test report #	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS19S01000191W-1	2018-12-24	2018-12-24 to 2019-01-24	2019-01-24	original	-	Valid

4 General Information

4.1 General Description of E.U.T

Product:	Robot Vacuum Cleaner
Model(s).:	LDS D550, LDS D500, Cocosmart 880T, Cocosmart 880L, GT320, Cocosmart 860T, Cocosmart 800T, Cocosmart 820T, Cocosmart 920T, Cocosmart 930T, Cocosmart 960T, Cocosmart 960L, Cocosmart 970T, Cocosmart 980T, Cocosmart 980L, Cocosmart 990T, LDS R2, LDS R5, LDS R9, LDS R11, LDS M6, LDS M7, LDS M8, LDS M9, LDS M10, LDS D580, LDS D590, LDS D660, LDS D720, GT330, GT350, GT400, GT430, GT490, GT500, GT520, GT560, GT600, GT630, GT680, GT700, GT750, GT780, Pro 300, Pro 500, Pro 600, Pro 700, 811GB, 911SE, Viper 520, Viper 570, Viper 580
Model difference:	Only the model name and color are different. The model LDS D550 is the tested sample.
Operation Frequency:	802.11b/g/n HT20: 2412MHz ~ 2462MHz 802.11n HT40: 2422MHz~2452MHz
Antenna installation:	Integrated Antenna
Antenna Gain:	1.4 dBi
Type of modulation:	IEEE 802.11b (CCK/QPSK/BPSK,11Mbps max.) IEEE 802.11g (BPSK/QPSK/16QAM/64QAM,54Mbps max.) IEEE 802.11n (BPSK/QPSK/16QAM/64QAM,HT20:72Mbps max., HT40:150Mbps max.)

4.2 Details of E.U.T

Ratings	14.4V for battery; adapter GQ12-240060-AG Input: 100-240V 50/60Hz 0.4A Max Input: 24V⎓600mA

4.3 Channel List

WIFI

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	12	-

4.4 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
Power Spectral Density	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
Frequency Range	802.11b	11 Mbps	1/11	TX
	802.11g	54 Mbps	1/11	TX
	802.11n HT20	108 Mbps	1/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
Transmitter Spurious Emissions	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX

Note :Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product.

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions Test Site						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMI Test Receiver	R&S	ESCI	100947	2018-09-15	2019-09-14
2	LISN	R&S	ENV216	100115	2018-09-15	2019-09-14
3	Cable	Top	TYPE16(3.5M)	-	2018-09-15	2019-09-14
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP30	100091	2018-04-20	2019-04-19
2	Broad-band Horn Antenna(1-18GHz)	SCHWARZBECK	BBHA 9120 D	667	2018-05-18	2019-05-17
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2018-04-07	2019-04-06
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2018-04-07	2019-04-06
5	Spectrum Analyzer	R&S	FSP40	100501	2018-11-13	2019-11-12
6	Broad-band Horn Antenna(18-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170651	2018-05-18	2019-05-17
7	Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	100472	2018-05-18	2019-05-17
8	Signal Generater	R&S	SMP22	100102	2018-09-15	2019-09-14
9	Cable	Top	18-40GHz	-	2018-09-15	2019-09-14
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2018.04.20	2019.04.19
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2018.04.19	2019.04.18
3	Active Loop Antenna	Com-power	AL-130R	10160007	2018-04-17	2019-04-16
4	Amplifier	ANRITSU	MH648A	M43381	2018-04-20	2019-04-19
5	Cable	HUBER+SUHNER	CBL2	525178	2018-04-20	2019-04-19
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	Spectrum Analyzer	R&S	FSP30	100091	2018-04-20	2019-04-19
2.	Coaxial Cable	Top	10Hz-30GHz	-	2018-09-12	2019-09-11
3	Antenna Connector*	Realacc	45RSm	-	2018-09-12	2019-09-11

4	DC Block	Gwave	GDCB-3G-N-SMA	140307001	2018-09-12	2019-09-11
"*": The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

5.2 Measurement Uncertainty

Parameter	**Uncertainty**
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (30M~1000MHz)
	± 5.47 dB (1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave,Tianhe District, Guangzhou, Guang dong, China.

6 Test Summary

Test Items	Test Requirement	Result
Spurious Radiated Emissions	15.247 15.205(a) 15.209(a)	C
Conducted Emissions	15.207(a)	C
Conducted Spurious Emissions	15.247	C
Bandwidth	15.247(a)(2)	C
Maximum Peak Output Power	15.247(b)(3),(4)	C
Power Spectral Density	15.247(e)	C
Band Edge	15.247(d)	C
Antenna Requirement	15.203	C
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	C
Note: C=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

7 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

7.1 E.U.T. Operation

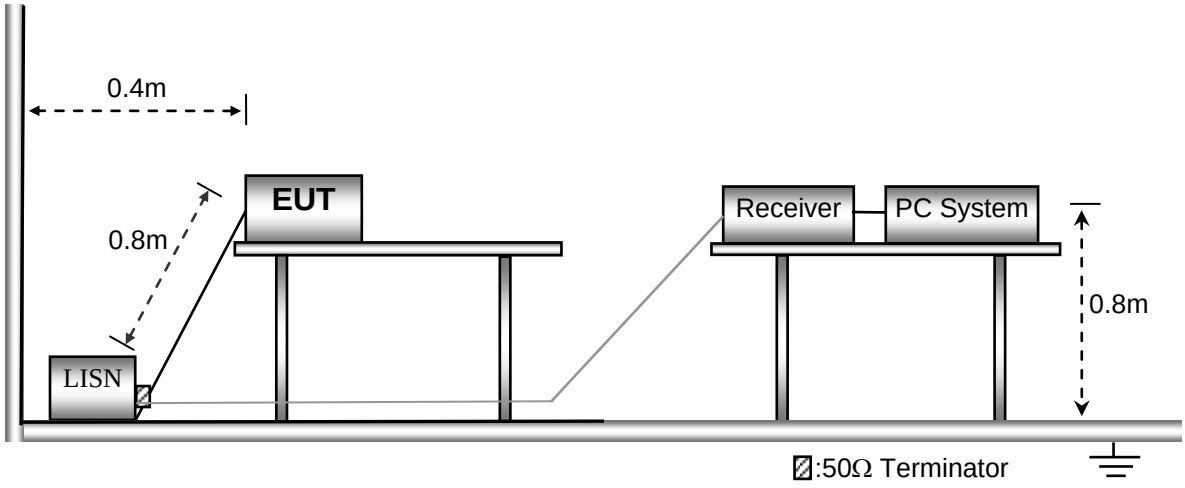
Operating Environment **:**

Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa
EUT Operation **:**	Refer to section 4.4

The test was performed in Transmitting mode, Only the worst case 802.11b mode were record in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10.



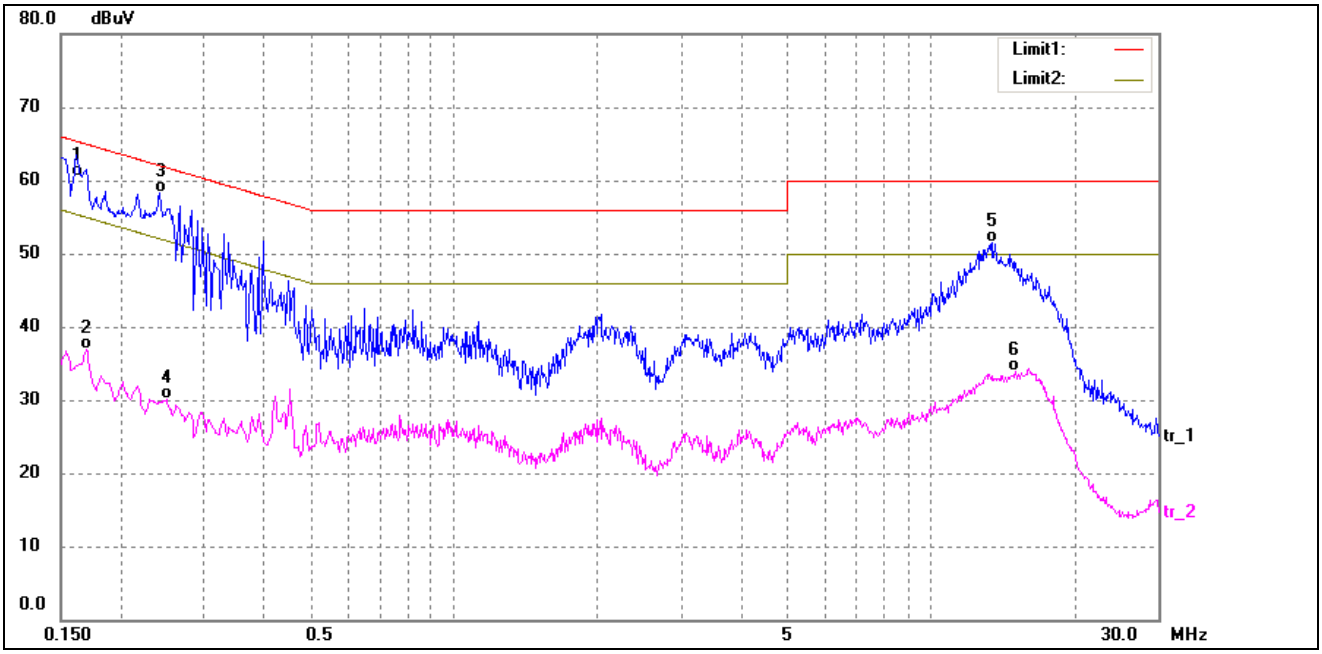
7.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

7.4 Conducted Emission Test Result

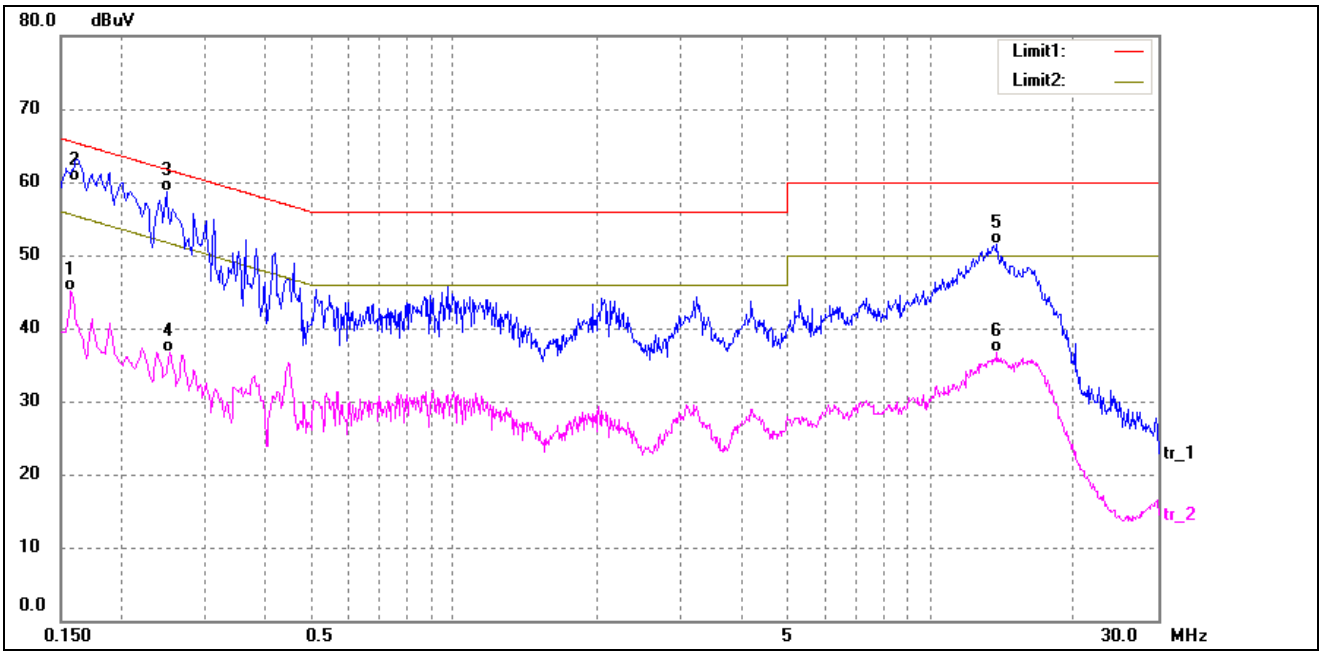
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	50.37	10.10	60.47	65.36	-4.89	QP
2	0.1700	26.87	10.11	36.98	54.96	-17.98	AVG
3*	0.2420	48.19	10.15	58.34	62.03	-3.69	QP
4	0.2500	19.86	10.16	30.02	51.76	-21.74	AVG
5	13.5100	40.51	11.00	51.51	60.00	-8.49	QP
6	15.1380	22.89	11.03	33.92	50.00	-16.08	AVG

Neutral line:



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	34.95	10.10	45.05	55.57	-10.52	AVG
2	0.1620	50.06	10.10	60.16	65.36	-5.20	QP
3*	0.2500	48.53	10.16	58.69	61.76	-3.07	QP
4	0.2540	26.54	10.16	36.70	51.63	-14.93	AVG
5	13.7780	40.54	11.01	51.55	60.00	-8.45	QP
6	13.7780	25.70	11.01	36.71	50.00	-13.29	AVG

8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

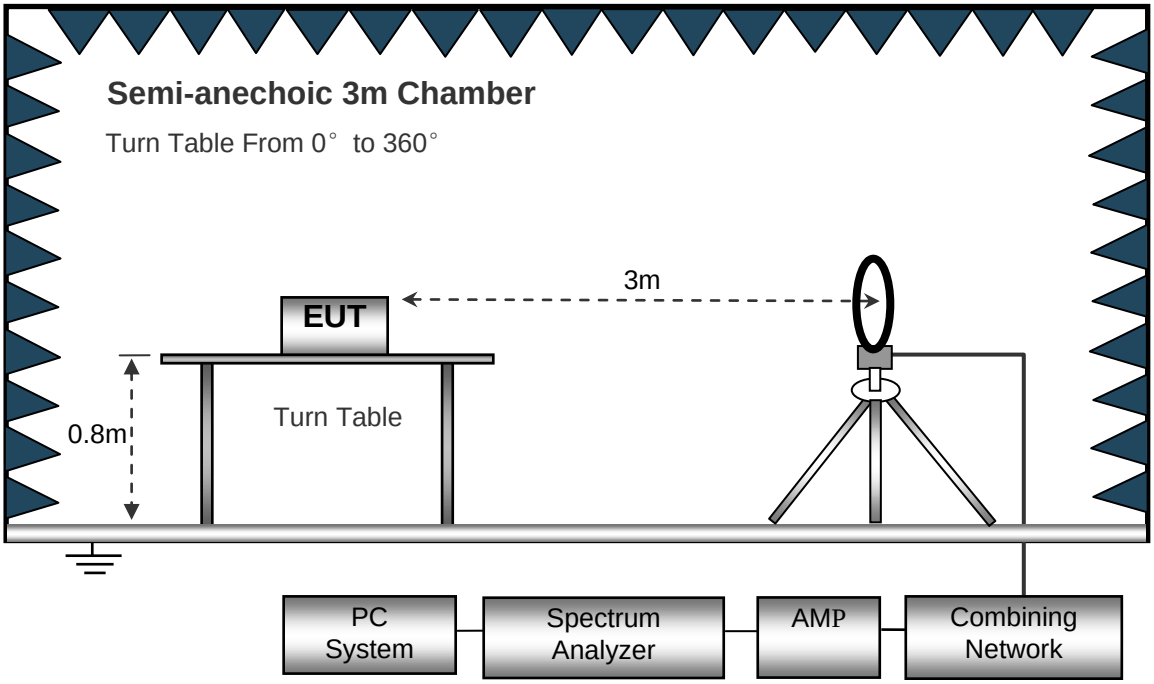
EUT Operation **:** Refer to section 4.4

The test was performed in transmitting mode, the test data were shown in the report.

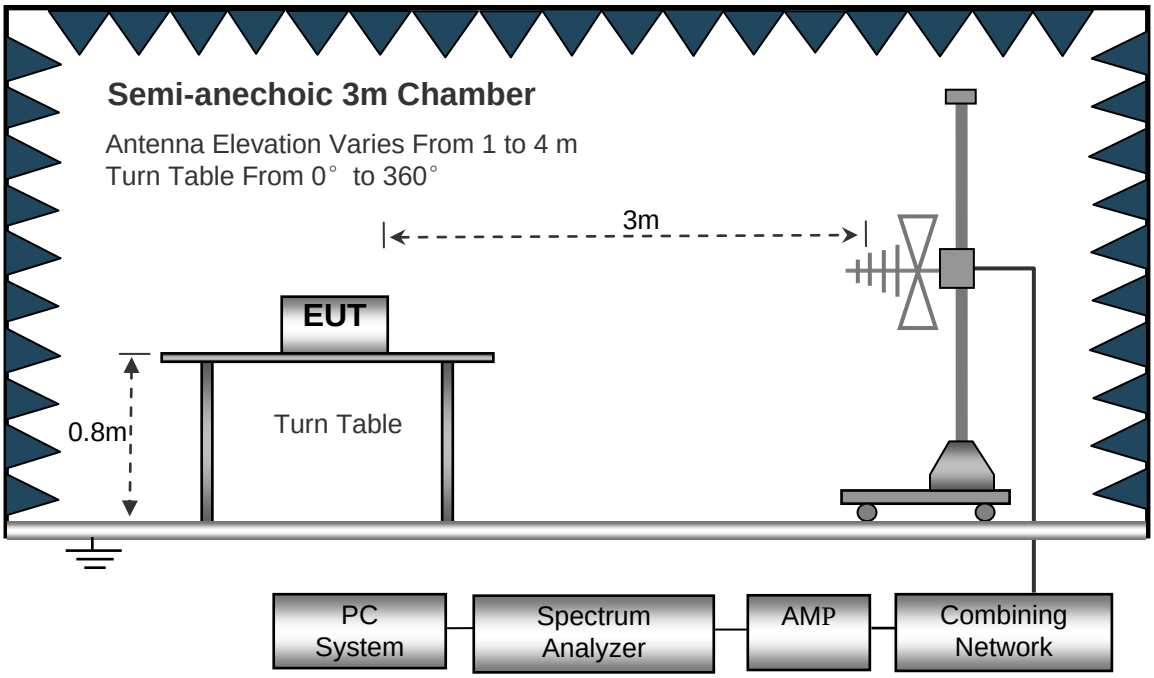
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

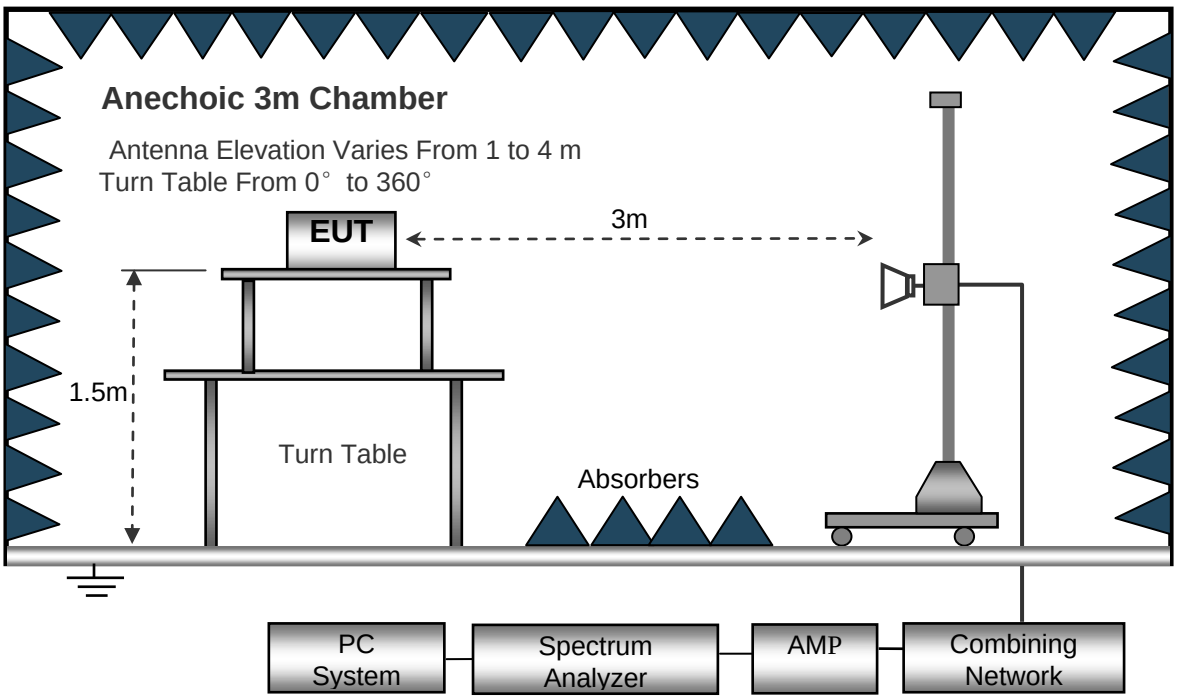
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane; For above1GHz, the EUT is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used druing radiated emissions above 1GHz measurement.

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

8.6 Summary of Test Results

Test Frequency: 9kHz ~ 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency 30MHz ~ 1000MHz

Worst case at 802.11b low channel

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark	Polarity
1	45.3755	34.94	-8.06	26.88	40.00	-13.12	355	100	peak	Horizontal
2	138.8735	42.58	-17.63	24.95	43.50	-18.55	98	10	peak	Horizontal
3	295.1469	35.90	-9.43	26.47	46.00	-19.53	134	100	peak	Horizontal
4	986.0717	30.09	3.82	33.91	54.00	-20.09	117	100	peak	Horizontal

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark	Polarity
1	45.6948	35.34	-8.07	27.27	40.00	-12.73	262	100	peak	Vertical
2	92.4624	35.08	-15.45	19.63	43.50	-23.87	91	100	peak	Vertical
3	375.9385	32.30	-7.98	24.32	46.00	-21.68	190	100	peak	Vertical
4	986.0717	30.23	3.82	34.05	54.00	-19.95	121	100	peak	Vertical

.

The measurements were more than 20 dB below the limit and not reported.

Test Frequency : 1GHz ~ 18GHz

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2412MHz							
4824.000	61.99	-3.86	58.13	74	-15.87	H	PK
4824.000	41.09	-3.86	37.23	54	-16.77	H	AV
7236.000	54.48	1.1	55.58	74	-18.42	H	PK
7236.000	38.48	1.1	39.58	54	-14.42	H	AV
4824.000	61.84	-3.86	57.98	74	-16.02	V	PK
4824.000	43.42	-3.86	39.56	54	-14.44	V	AV
7236.000	52.45	1.1	53.55	74	-20.45	V	PK
7236.000	40.68	1.1	41.78	54	-12.22	V	AV
Middle Channel-2437MHz							
4874.000	59.65	-3.74	55.91	74	-18.09	H	PK
4874.000	43.63	-3.74	39.89	54	-14.11	H	AV
7311.000	52.77	1.47	54.24	74	-19.76	H	PK
7311.000	40.27	1.47	41.74	54	-12.26	H	AV
4874.000	59.97	-3.74	56.23	74	-17.77	V	PK
4874.000	42.6	-3.74	38.86	54	-15.14	V	AV
7311.000	54.98	1.47	56.45	74	-17.55	V	PK
7311.000	39.42	1.47	40.89	54	-13.11	V	AV
High Channel-2462MHz							
4924.000	60.35	-3.63	56.72	74	-17.28	H	PK
4924.000	41.49	-3.63	37.86	54	-16.14	H	AV
7386.000	52.5	1.62	54.12	74	-19.88	H	PK
7386.000	40.34	1.62	41.96	54	-12.04	H	AV
4924.000	58.99	-3.63	55.36	74	-18.64	V	PK
4924.000	42.54	-3.63	38.91	54	-15.09	V	AV
7386.000	54.71	1.62	56.33	74	-17.67	V	PK
7386.000	41	1.62	42.62	54	-11.38	V	AV

Test Frequency: 18GHz~25GHz

The measurements were more than 20 dB below the limit and not recorded.

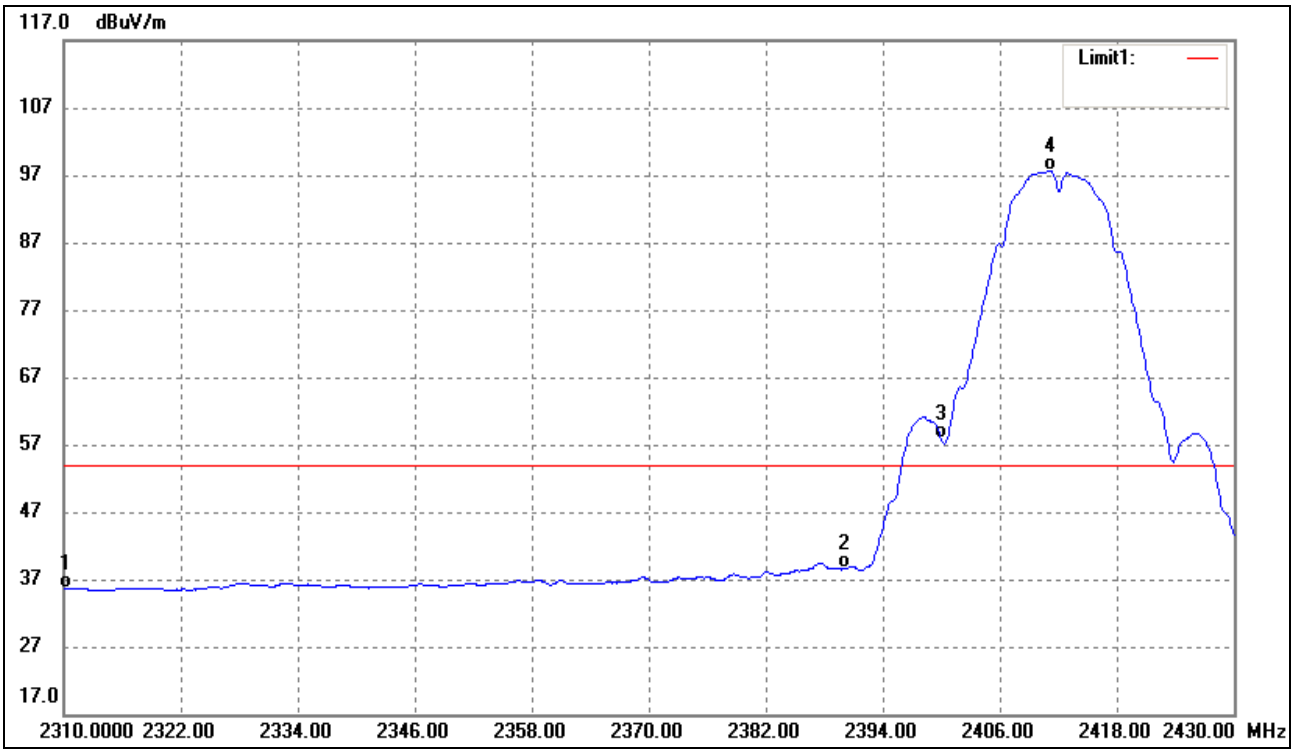
9 Band Edge Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 15.247 Meas Guidance v05
Test Limit:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode:	Transmitting

9.1 Test Produce

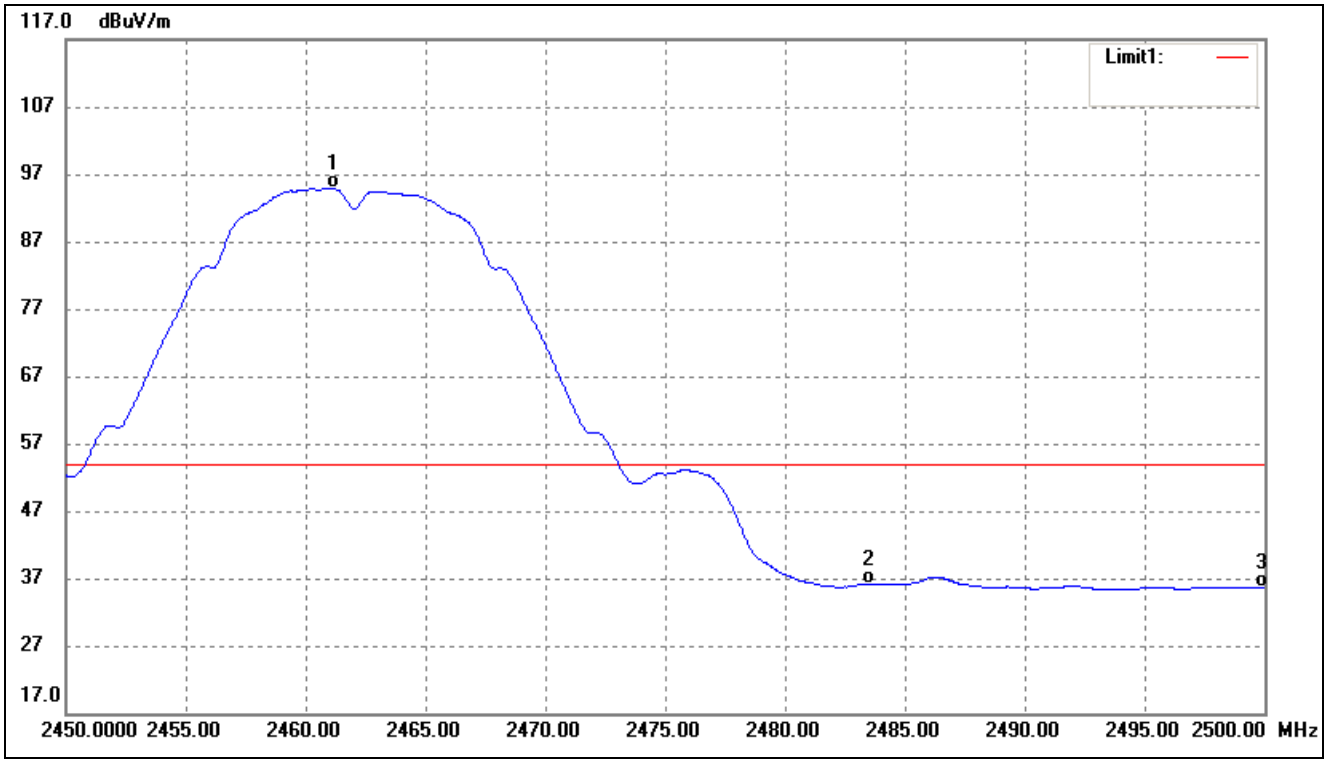
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

802.11b_11Mbps			
Test Channel	Low	Polarity:	Vertical(worst case)



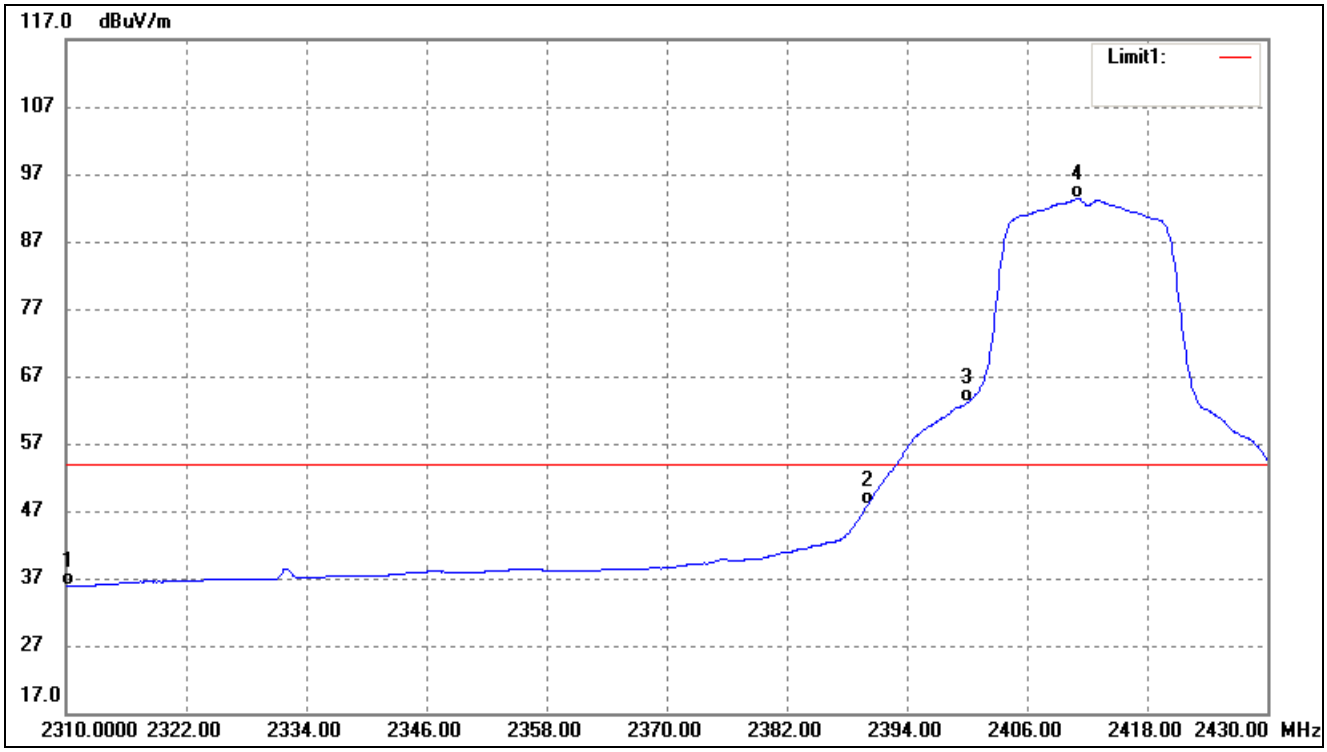
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	43.43	-7.78	35.65	54.00	-18.35	Average Detector
	2310.000	55.11	-7.78	47.33	74.00	-26.67	Peak Detector
2	2390.000	45.85	-7.32	38.53	54.00	-15.47	Average Detector
	2390.000	57.01	-7.32	49.69	74.00	-24.31	Peak Detector
3	2400.000	65.11	-7.26	57.85	Delta=39.76dBc		Average Detector
4	2411.160	104.79	-7.19	97.60			Average Detector

802.11b_11Mbps			
Test Channel	High	Polarity:	Vertical(worst case)



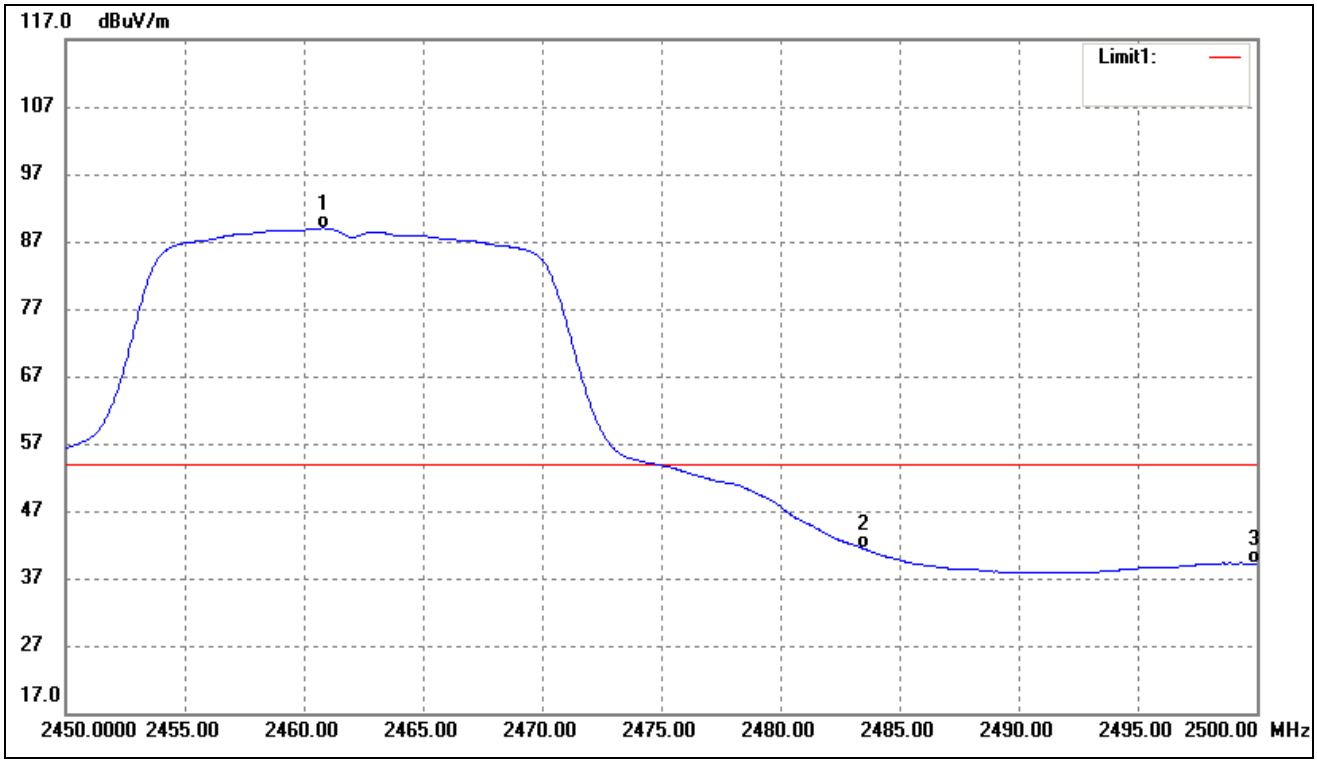
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.150	101.73	-6.90	94.83	/	/	Average Detector
	2460.550	106.37	-6.90	99.47	/	/	Peak Detector
2	2483.500	42.80	-6.77	36.03	54.00	-17.97	Average Detector
	2483.500	54.25	-6.77	47.48	74.00	-26.52	Peak Detector
3	2500.000	42.30	-6.67	35.63	54.00	-18.37	Average Detector
	2500.000	53.00	-6.67	46.33	74.00	-27.67	Peak Detector

802.11g_54Mbps			
Test Channel	Low	Polarity:	Vertical(worst case)



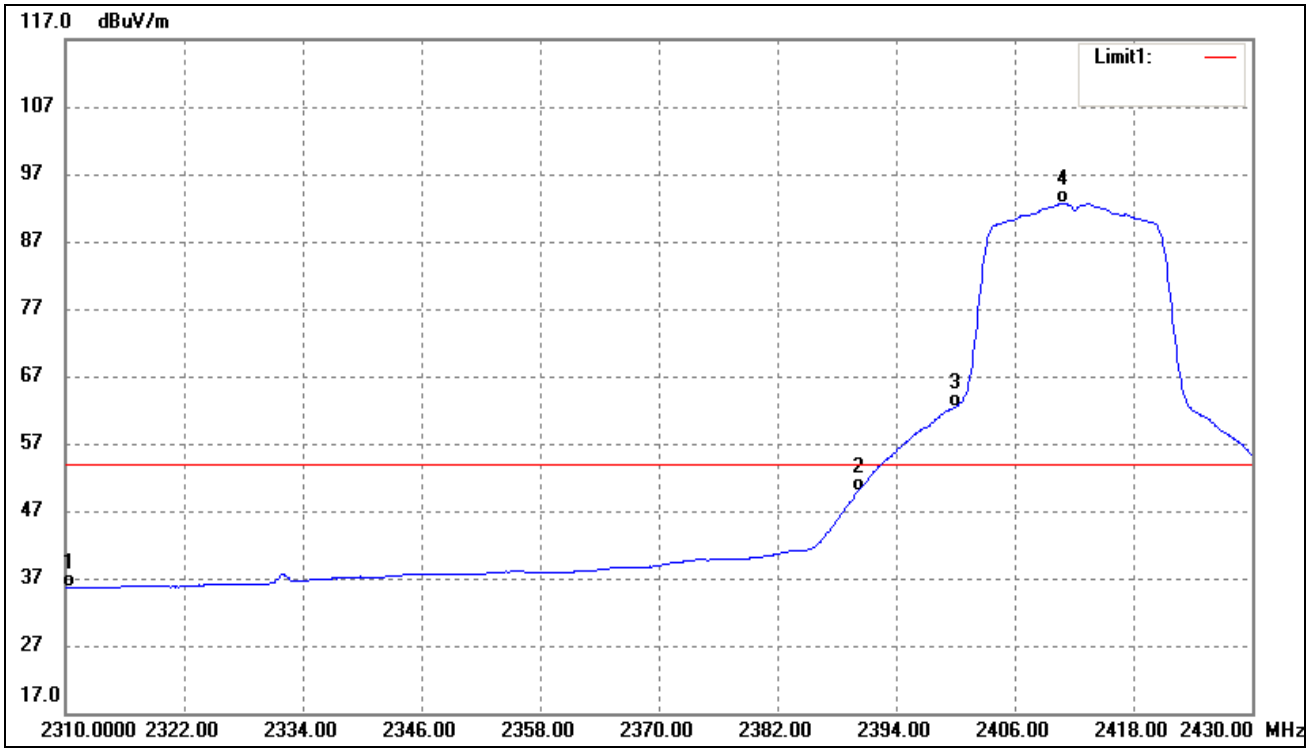
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	43.58	-7.78	35.80	54.00	-18.20	Average Detector
	2310.000	55.03	-7.78	47.25	74.00	-26.75	Peak Detector
2	2390.000	55.15	-7.32	47.83	54.00	-6.17	Average Detector
	2390.000	72.14	-7.32	64.82	74.00	-9.18	Peak Detector
3	2400.000	70.35	-7.26	63.09	Delta=30.26dBc		Average Detector
4	2411.040	100.54	-7.19	93.35			Average Detector

802.11g_54Mbps			
Test Channel	High	Polarity:	Vertical(worst case)



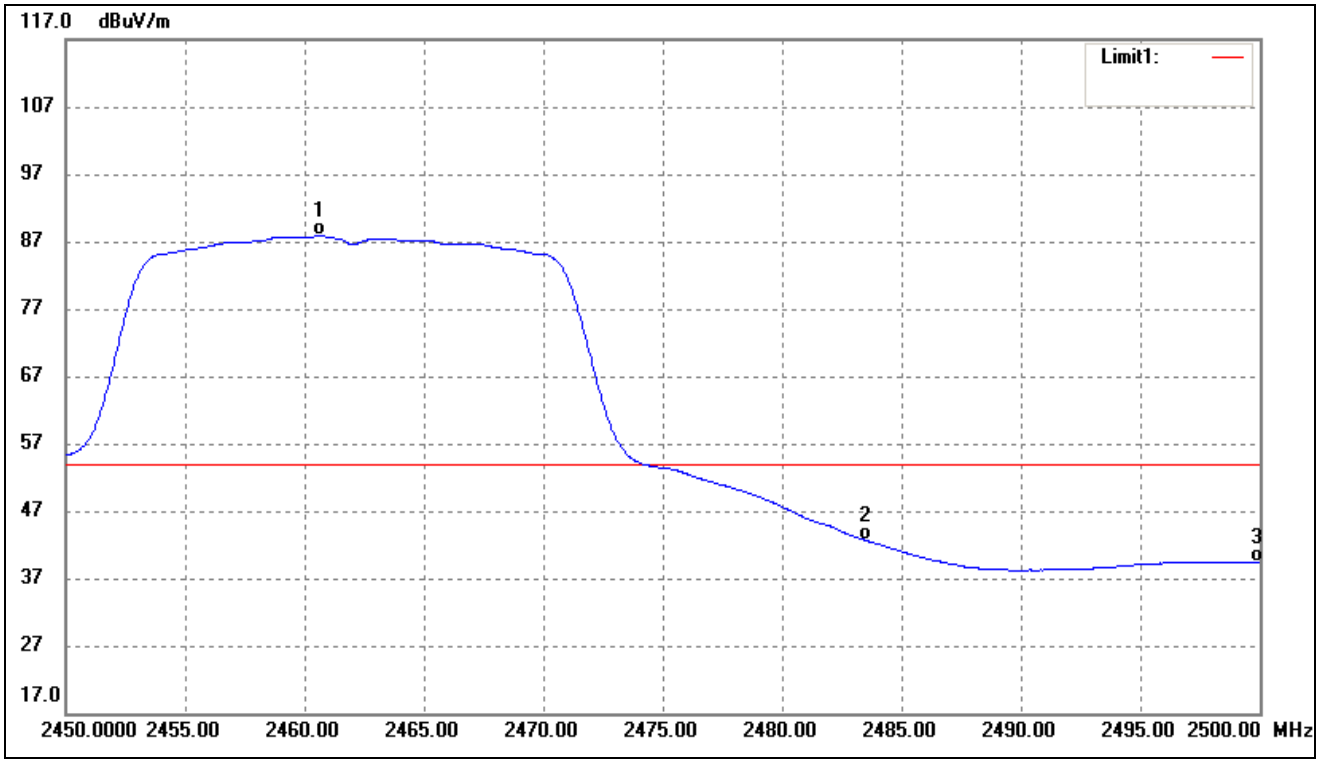
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.800	95.90	-6.90	89.00	/	/	Average Detector
	2460.600	105.10	-6.90	98.20	/	/	Peak Detector
2	2483.500	48.17	-6.77	41.40	54.00	-12.60	Average Detector
	2483.500	62.08	-6.77	55.31	74.00	-18.69	Peak Detector
3	2500.000	45.85	-6.67	39.18	54.00	-14.82	Average Detector
	2500.000	57.11	-6.67	50.44	74.00	-23.56	Peak Detector

802.11n-HT20_MCS7			
Test Channel	Low	Polarity:	Vertical(worst case)



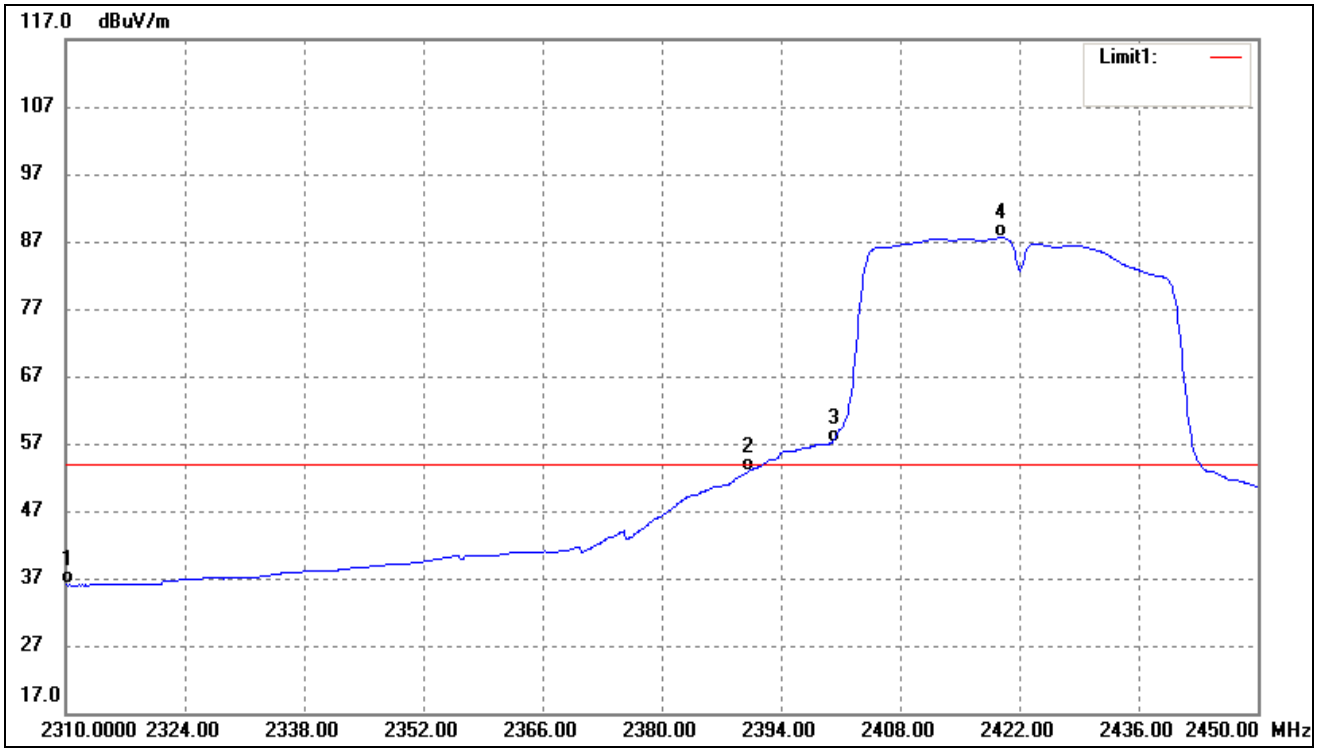
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	43.32	-7.78	35.54	54.00	-18.46	Average Detector
	2310.000	55.00	-7.78	47.22	74.00	-26.78	Peak Detector
2	2390.000	57.09	-7.32	49.77	54.00	-4.23	Average Detector
	2390.000	77.65	-7.32	70.33	74.00	-3.67	Peak Detector
3	2400.000	69.73	-7.26	62.47	Delta=30.25dBc		Average Detector
4	2410.800	99.91	-7.19	92.72			Average Detector

802.11n-HT20_MCS7			
Test Channel	High	Polarity:	Vertical(worst case)



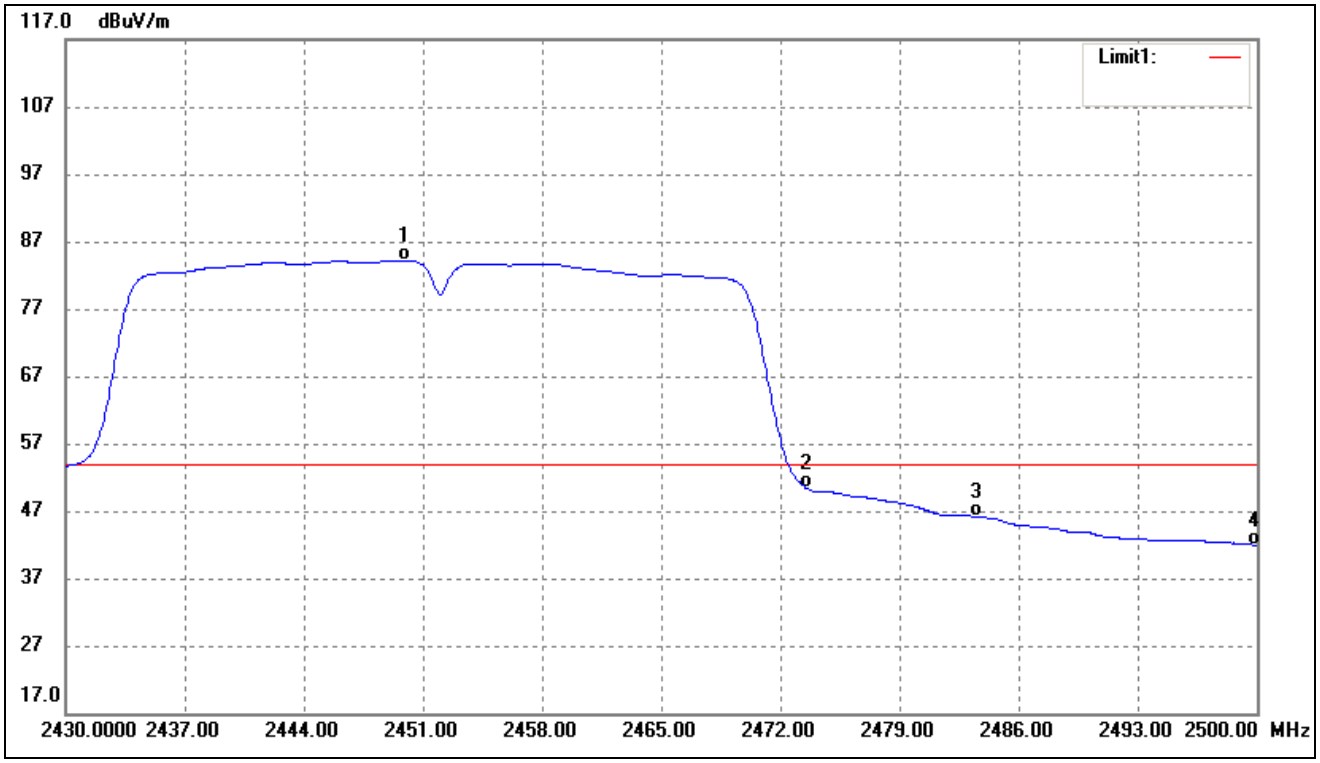
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.600	94.72	-6.90	87.82	/	/	Average Detector
	2460.750	103.94	-6.90	97.04	/	/	Peak Detector
2	2483.500	49.41	-6.77	42.64	54.00	-11.36	Average Detector
	2483.500	66.15	-6.77	59.38	74.00	-14.62	Peak Detector
3	2500.000	46.06	-6.67	39.39	54.00	-14.61	Average Detector
	2500.000	58.23	-6.67	51.56	74.00	-22.44	Peak Detector

802.11n-HT40_MCS7			
Test Channel	Low	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	43.83	-7.78	36.05	54.00	-17.95	Average Detector
	2310.000	55.19	-7.78	47.41	74.00	-26.59	Peak Detector
2	2390.000	60.13	-7.32	52.81	54.00	-1.19	Average Detector
	2390.000	74.54	-7.32	67.22	74.00	-6.78	Peak Detector
3	2400.000	64.37	-7.26	57.11	Delta=30.44dBc		Average Detector
4	2419.900	94.69	-7.14	87.55			Average Detector

802.11n-HT40_MCS7			
Test Channel	High	Polarity:	Vertical(worst case)

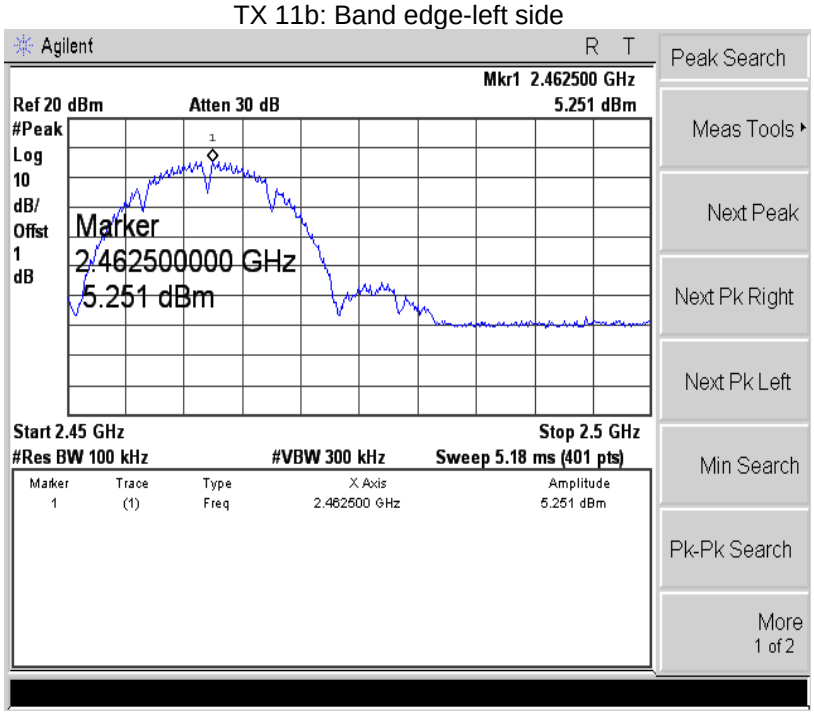


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2449.880	91.18	-6.96	84.22	/	/	Average Detector
	2449.460	102.07	-6.96	95.11	/	/	Peak Detector
2	2473.540	57.21	-6.83	50.38	54.00	-3.62	Average Detector
	2483.500	65.50	-6.77	58.73	74.00	-15.27	Peak Detector
3	2483.500	52.90	-6.77	46.13	54.00	-7.87	Average Detector
	2500.000	60.81	-6.67	54.14	74.00	-19.86	Peak Detector
4	2500.000	48.53	-6.67	41.86	54.00	-12.14	Average Detector

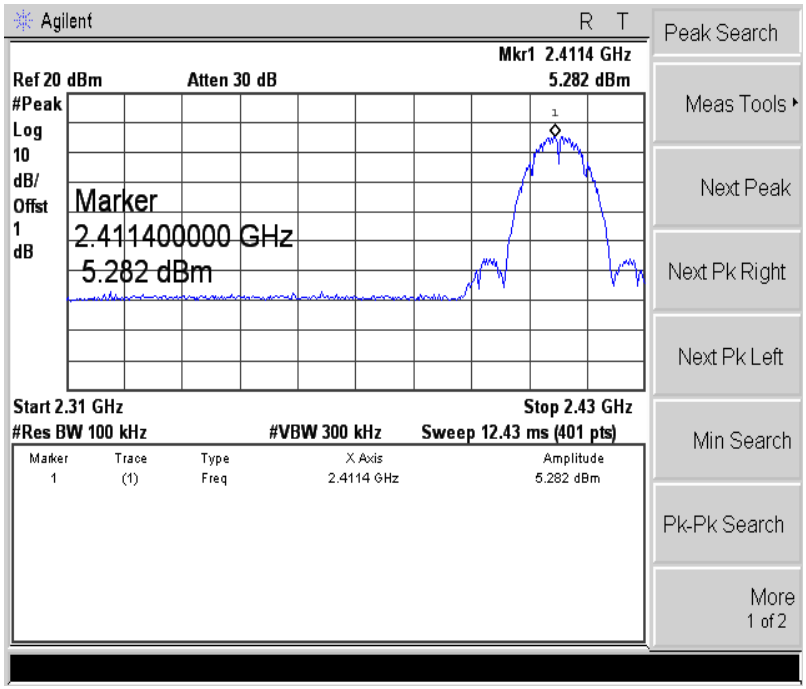
9.2 Test Result

Test result plots shown as follows:

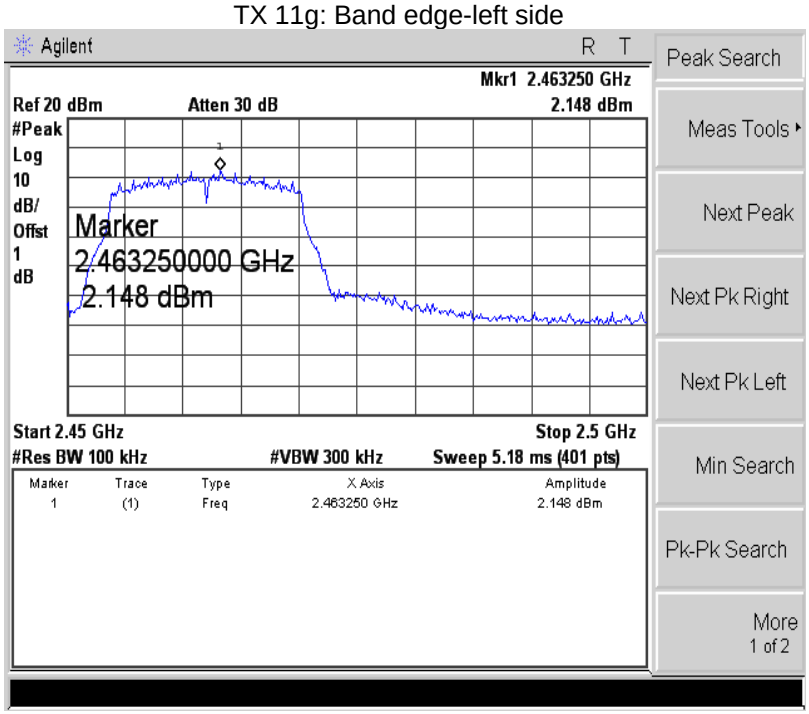
TX 11b: Band edge-left side



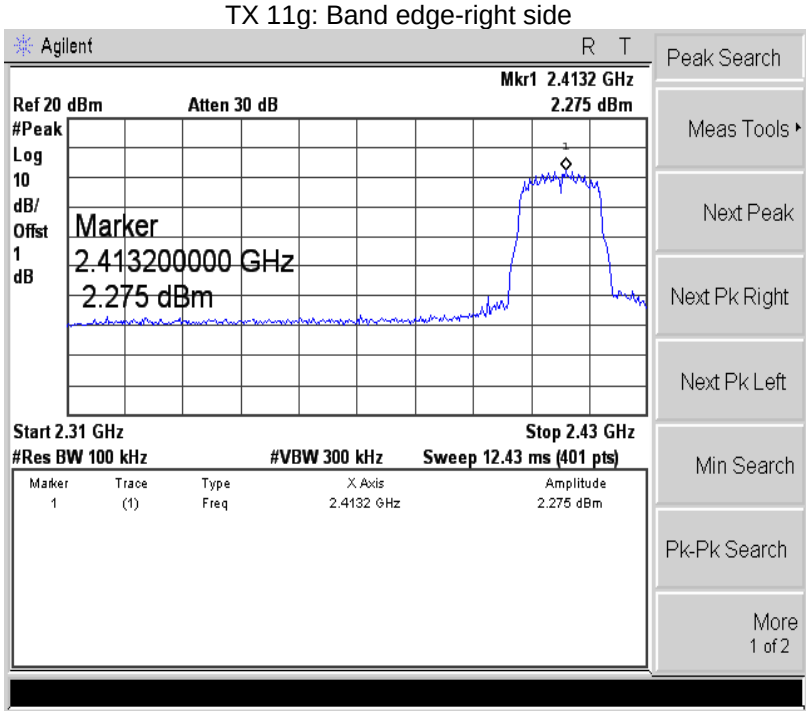
TX 11b: Band edge-right side



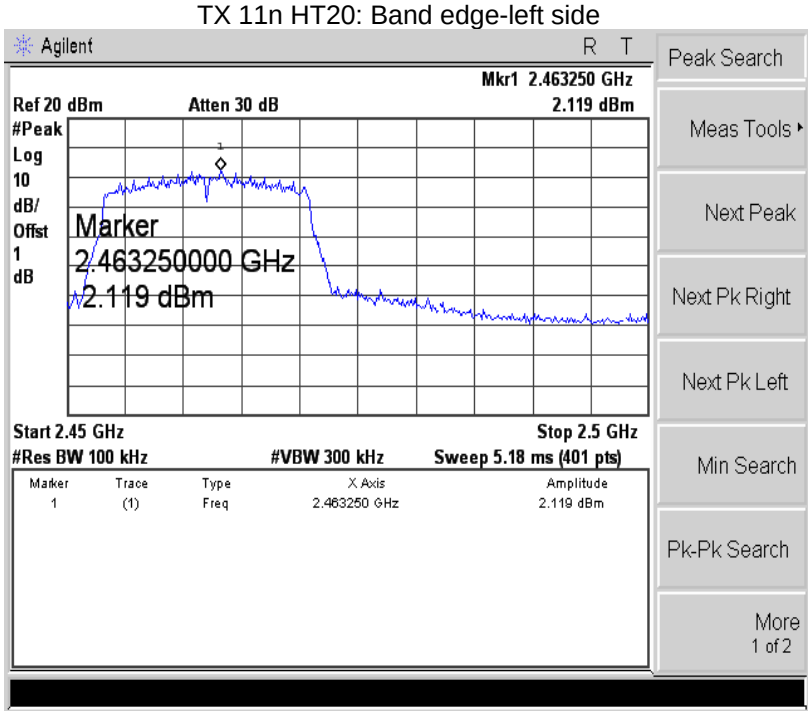
TX 11g: Band edge-left side



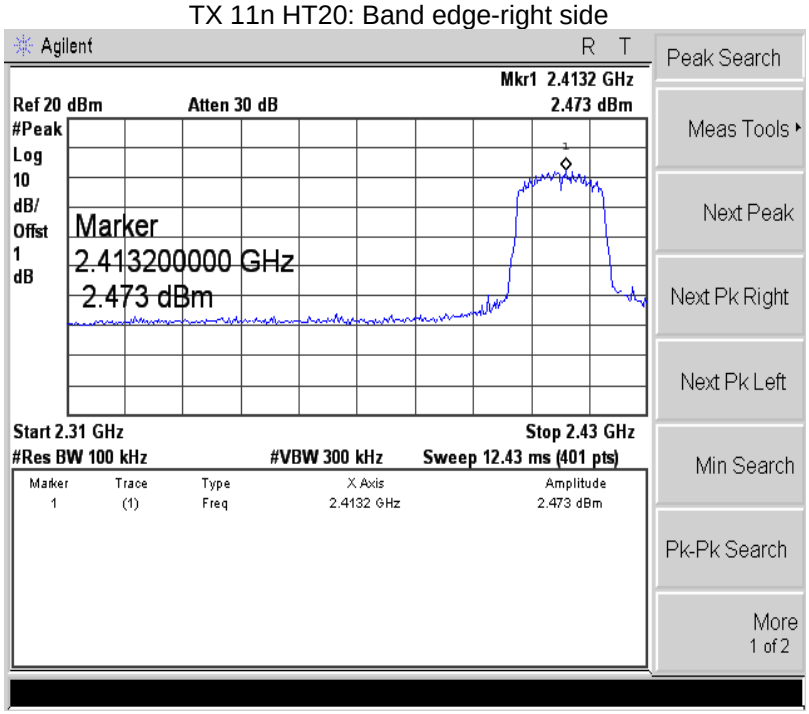
TX 11g: Band edge-right side



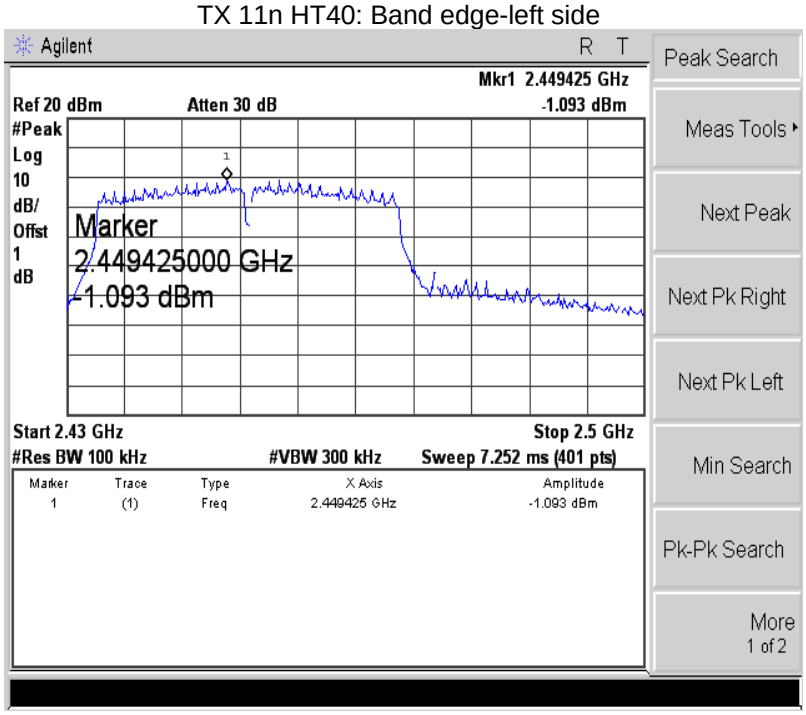
TX 11n HT20: Band edge-left side



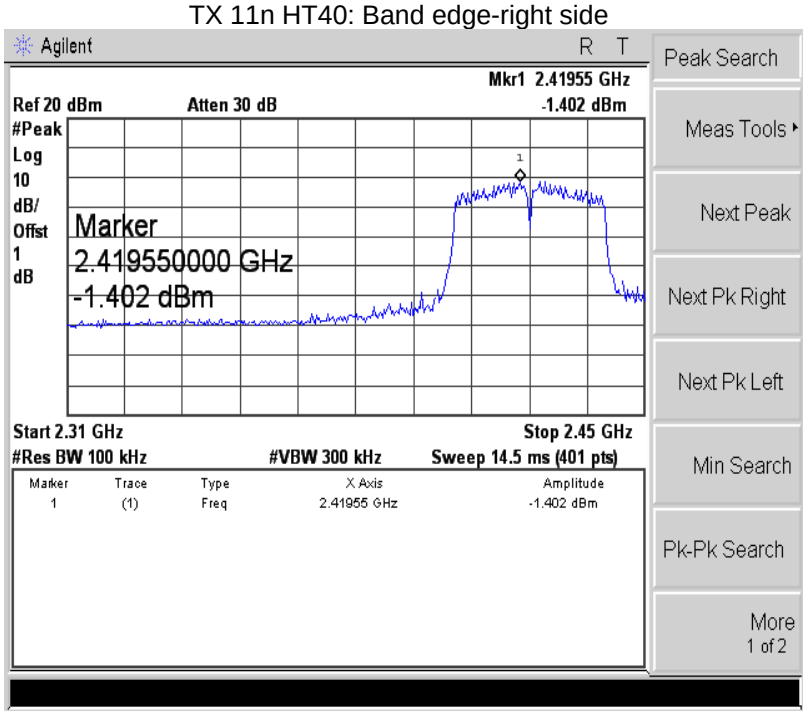
TX 11n HT20: Band edge-right side



TX 11n HT40: Band edge-left side



TX 11n HT40: Band edge-right side



10 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05

10.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

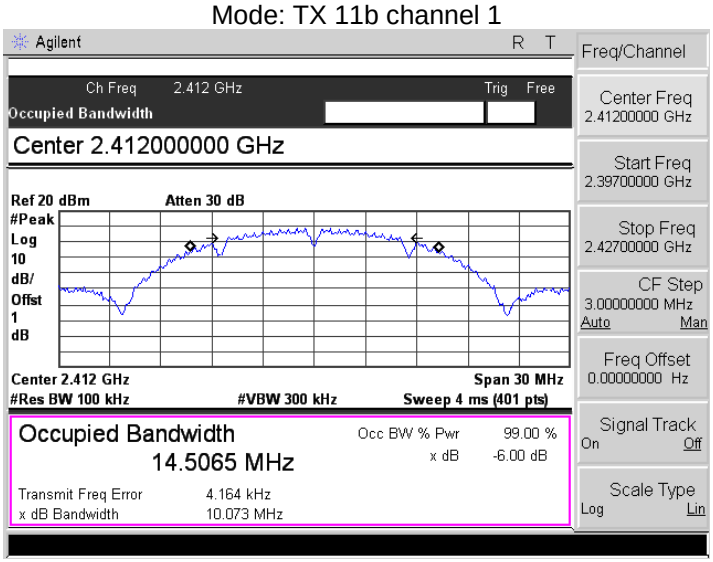
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

10.2 Test Result:

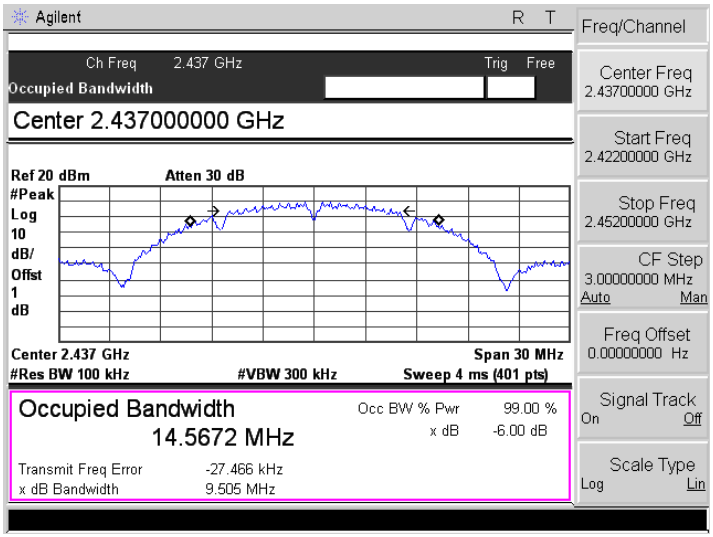
WiFi:

Operation mode	6dB Bandwidth (MHz)			99% Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	10.073	9.505	9.640	14.5065	14.5672	14.4365
TX 11g	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	15.148	13.879	15.177	16.2997	16.3088	16.2840
TX 11n HT20	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	15.181	15.228	15.181	17.4922	17.4019	17.4887
TX 11n HT40	Channel 3	Channel 6	Channel 9	Channel 3	Channel 6	Channel 9
	35.207	35.187	35.254	35.6437	35.7456	35.7159

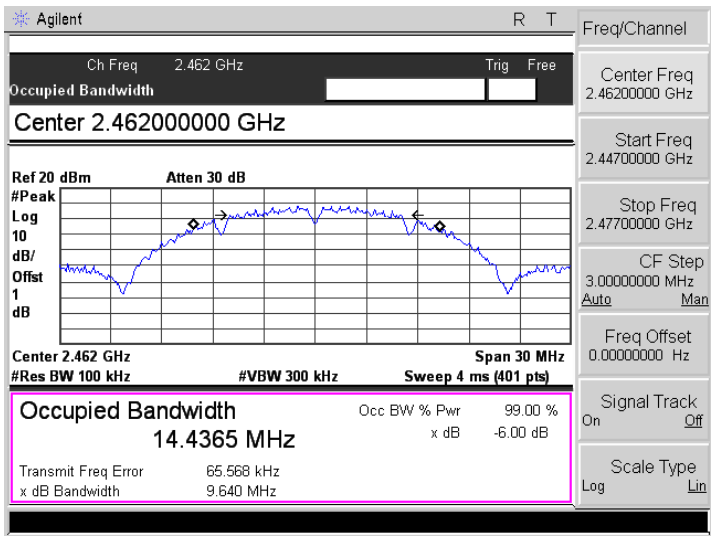
Mode: TX 11b channel 1



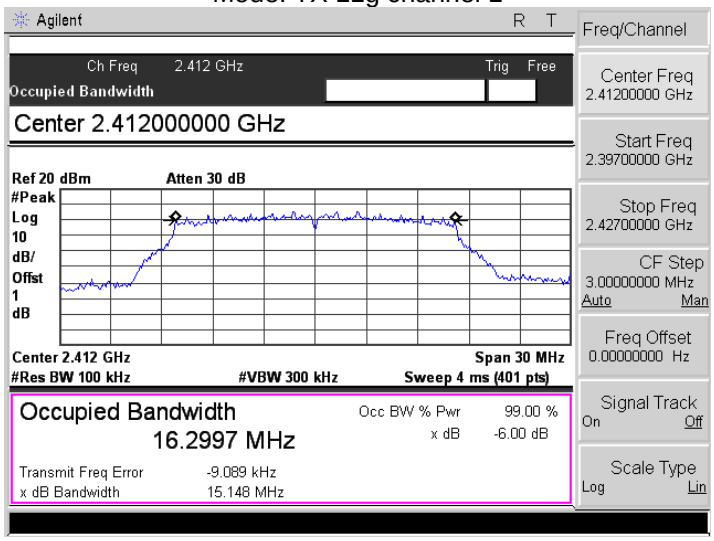
Mode: TX 11b channel 6



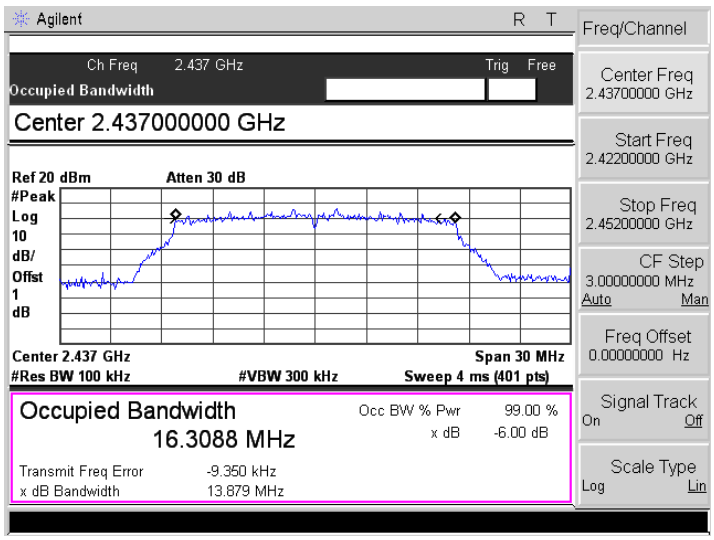
Mode: TX 11b channel 11



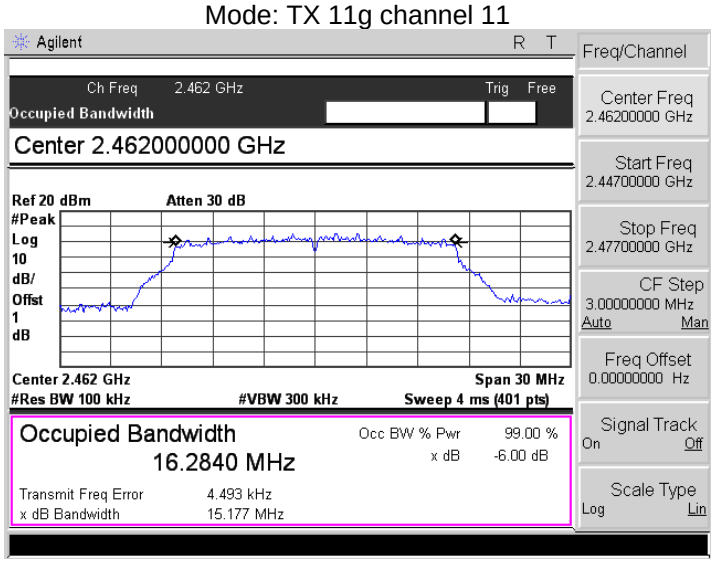
Mode: TX 11g channel 1



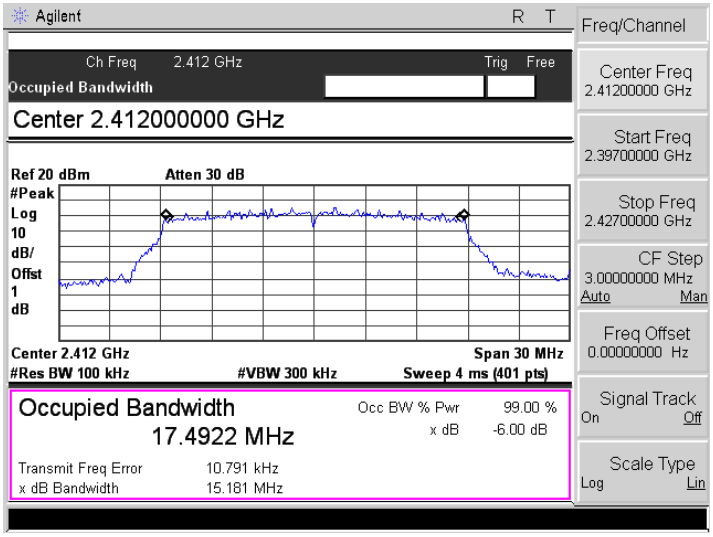
Mode: TX 11g channel 6



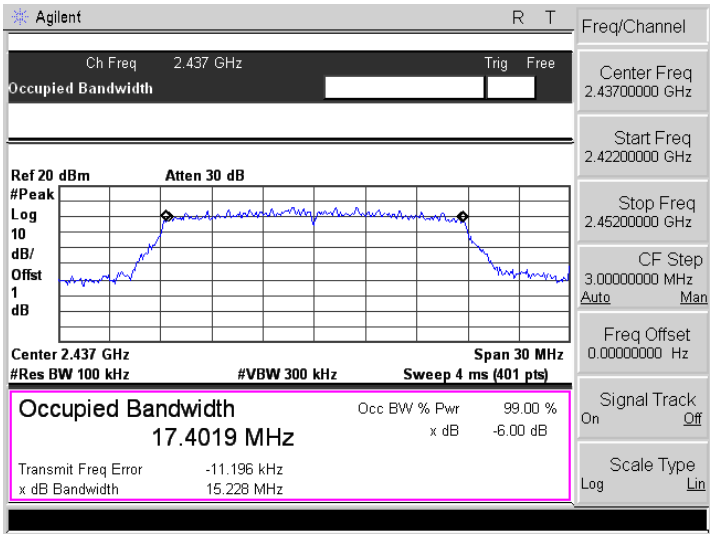
Mode: TX 11g channel 11



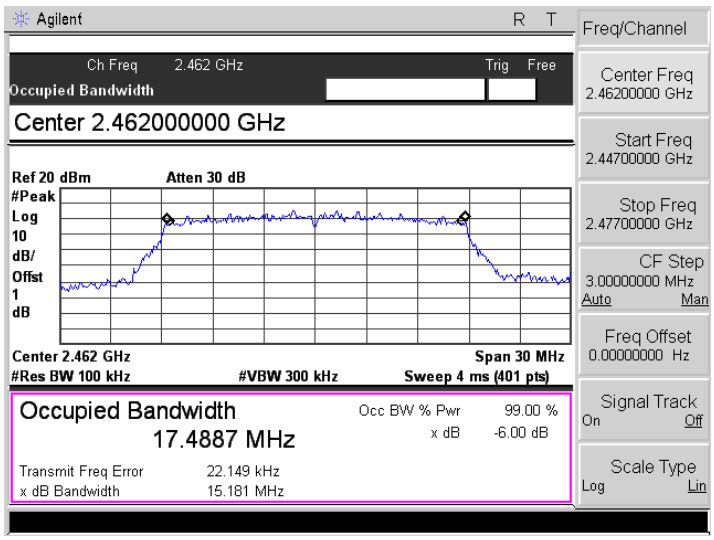
Mode: TX 11n HT20 channel 1



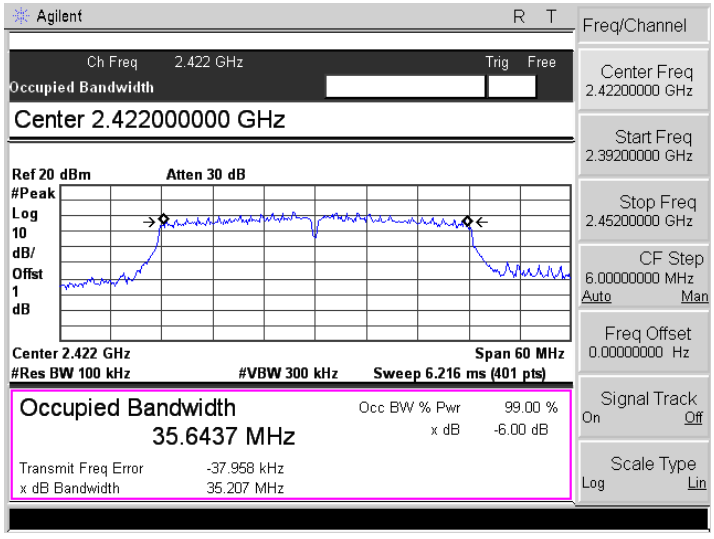
Mode: TX 11n HT20 channel 6



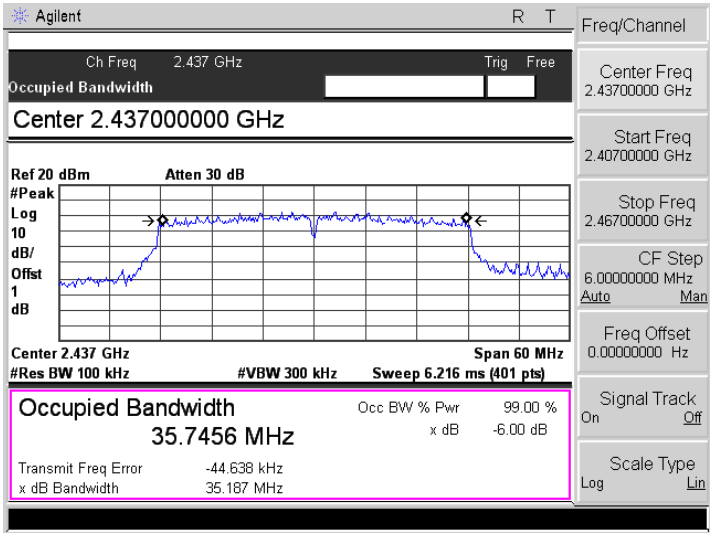
Mode: TX 11n HT20 channel 11



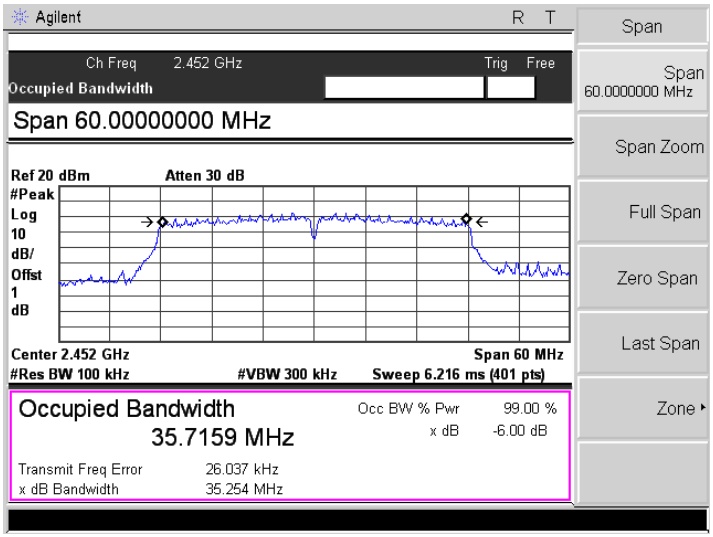
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



11 Maximum Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05

11.1 Test Procedure:

558074 D01 DTS Meas Guidance V05

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function =RMS, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

11.2 Test Result:

WiFi

Test mode :TX 11b		
Maximum Average Output Power (dBm)		
2412MHz	2437MHz	2462MHz
16.34	14.75	14.19
Limit: 1W/30dBm		
Test mode :TX 11g		
Maximum Average Output Power (dBm)		
2412MHz	2437MHz	2462MHz
16.07	13.33	12.26
Limit: 1W/30dBm		
Test mode :TX 11n HT20		
Maximum Average Output Power (dBm)		
2412MHz	2437MHz	2462MHz
15.89	13.37	12.93
Limit: 1W/30dBm		
Test mode :TX 11n HT40		
Maximum Average Output Power (dBm)		
2422MHz	2437MHz	2452MHz
15.74	10.84	10.63
Limit: 1W/30dBm		

12 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05

12.1 Test Procedure:

558074 D01 15.247 Meas Guidance v05

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

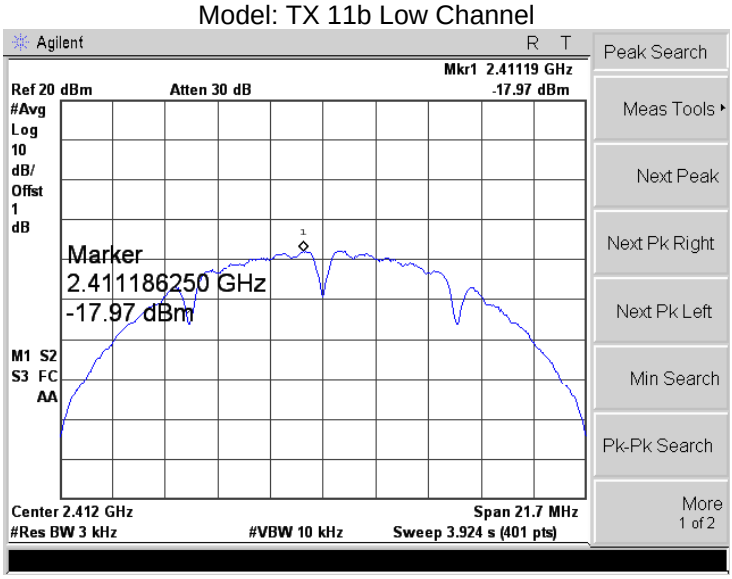
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

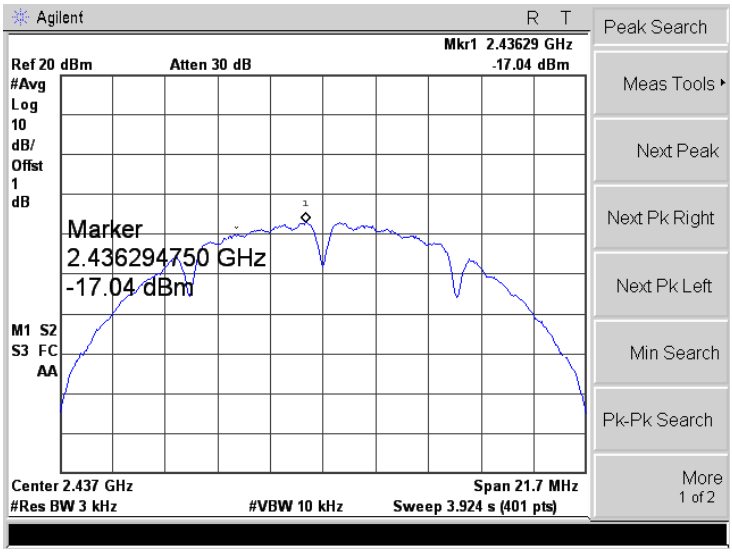
12.2 Test Result:

Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-17.97	-17.04	-17.88
Limit: 8dBm per 3kHz		
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-19.27	-18.93	-19.32
Limit: 8dBm per 3kHz		
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-23.05	-22.27	-23.30
Limit: 8dBm per 3kHz		
Test mode :TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-27.22	-26.29	-26.89
Limit: 8dBm per 3kHz		

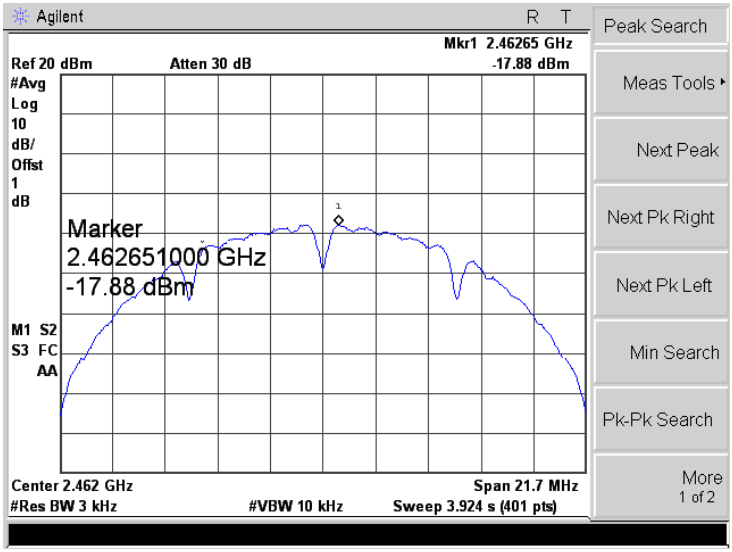
Model: TX 11b Low Channel



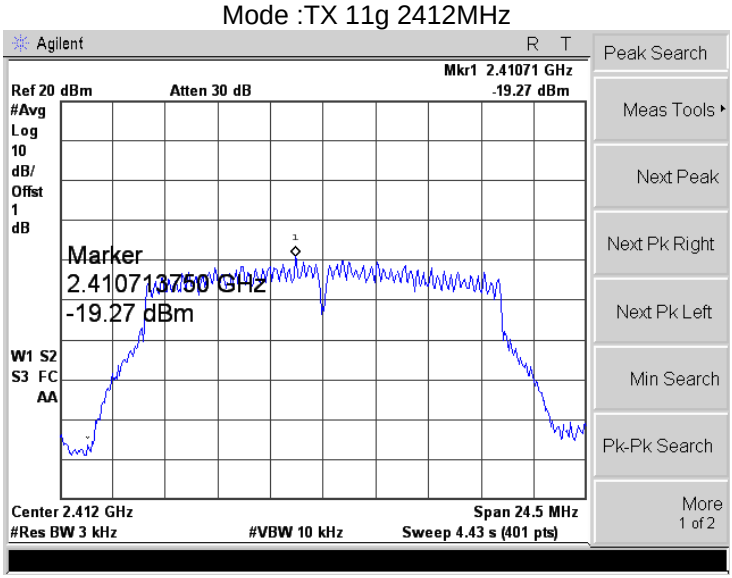
Model: TX 11b Middle channel



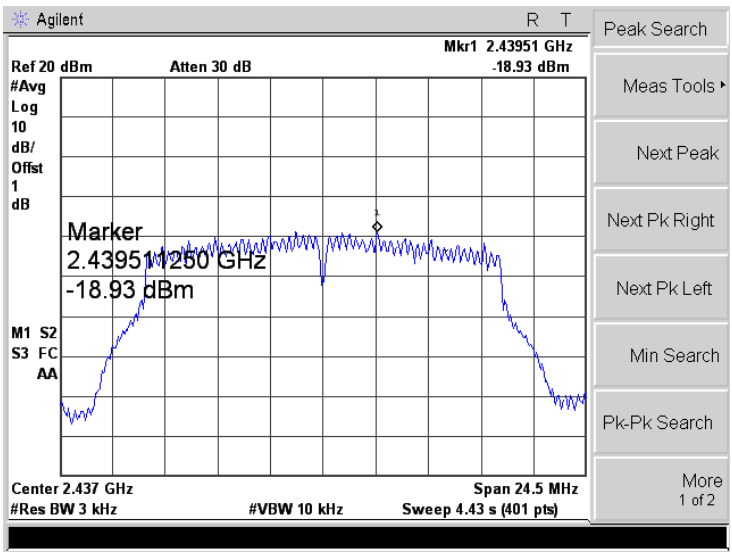
Model: TX 11b High channel



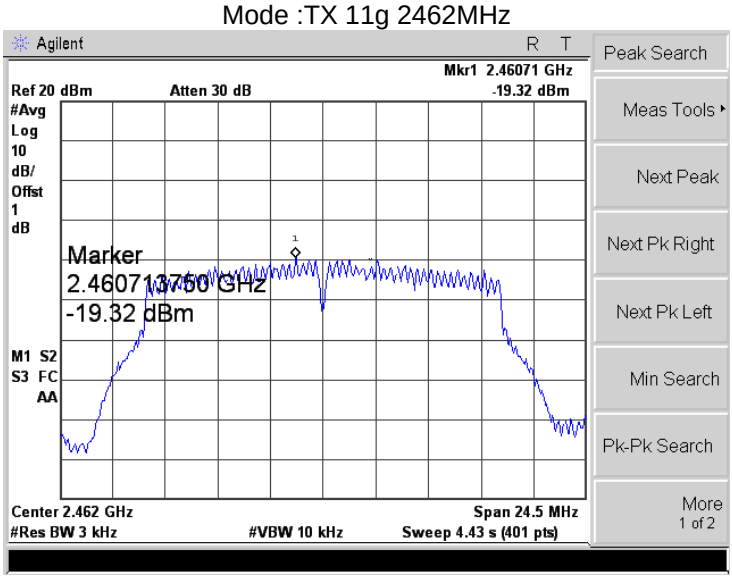
Mode :TX 11g 2412MHz



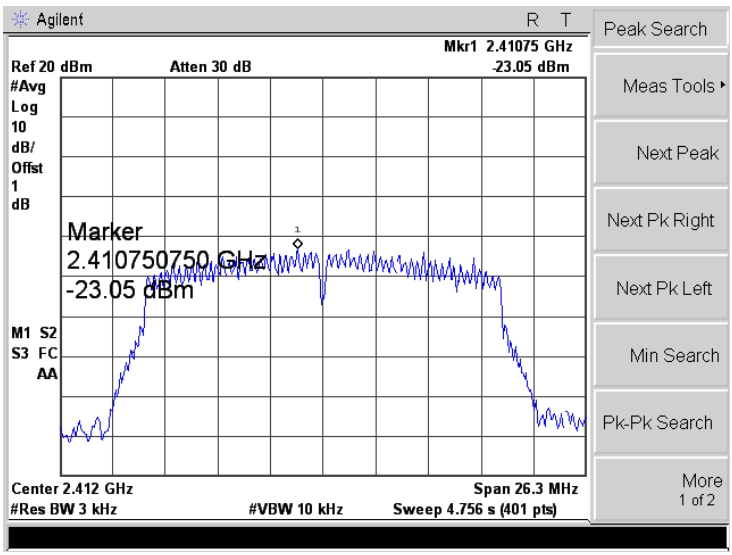
Mode :TX 11g 2437MHz



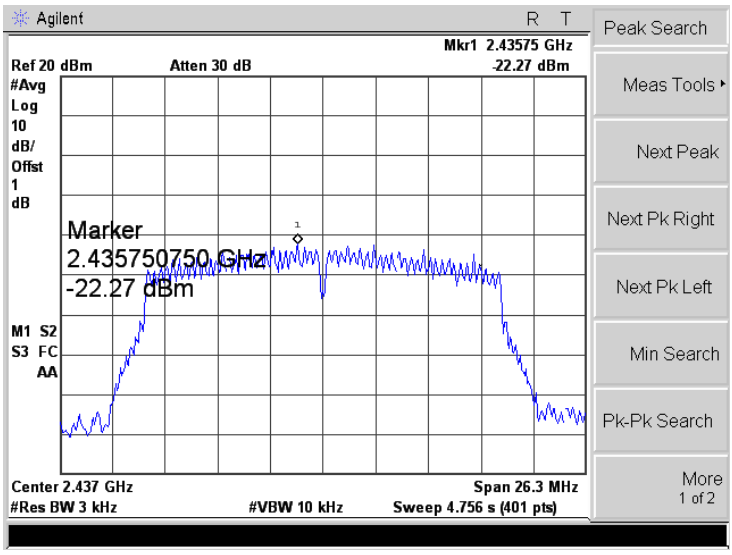
Mode :TX 11g 2462MHz



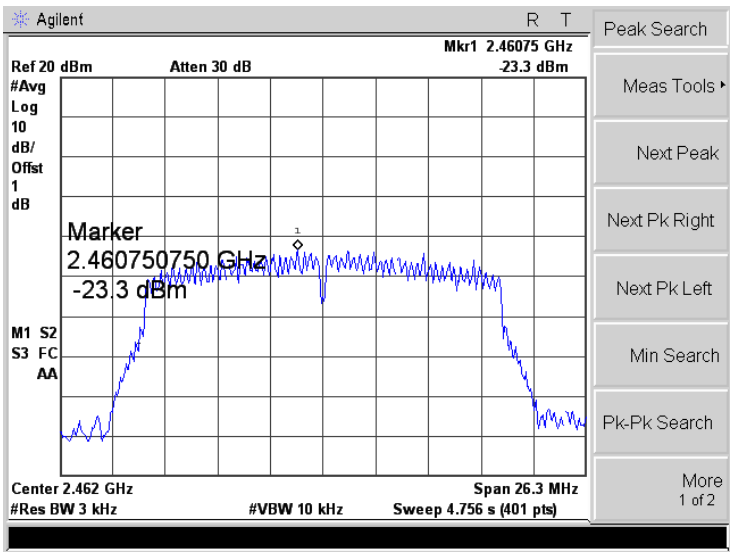
Mode: TX 11n HT20 2412MHz



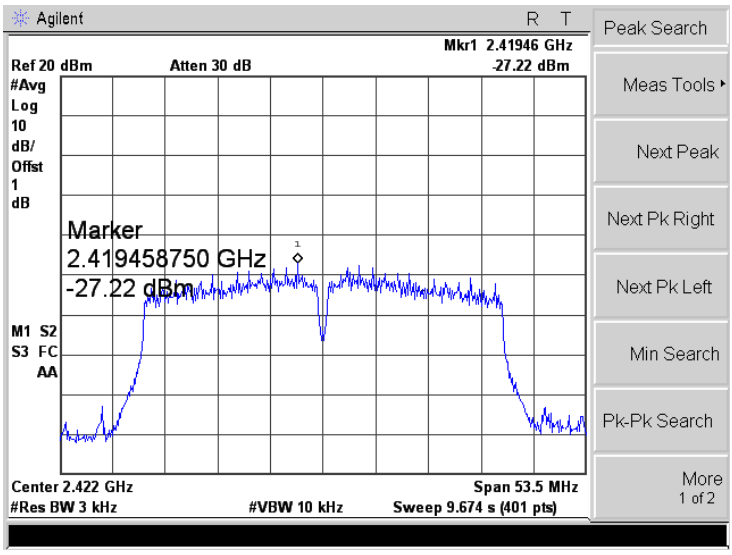
Mode: TX 11n HT20 2437MHz



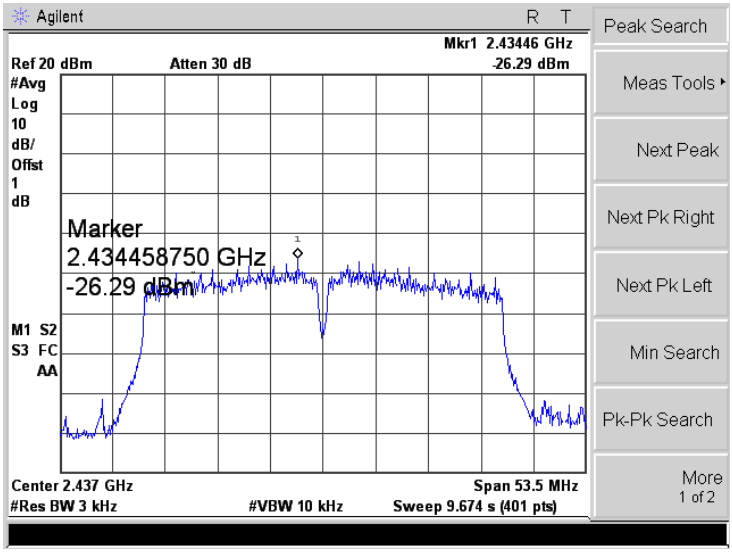
Mode: TX 11n HT20 2462MHz



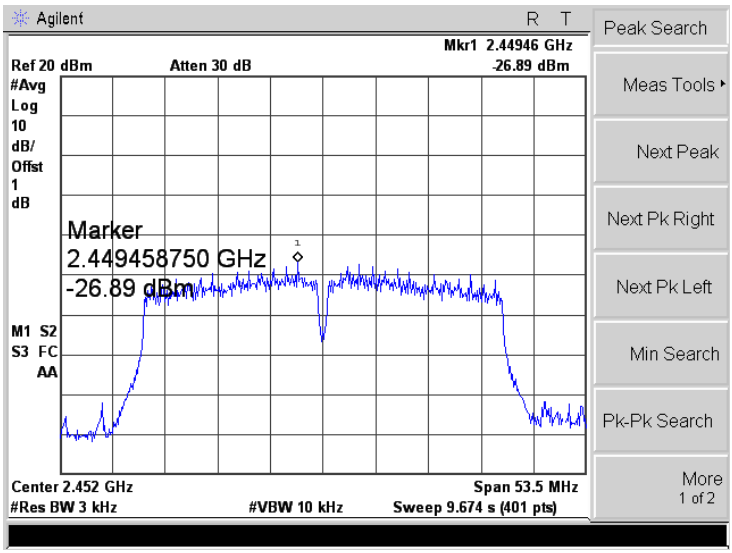
Mode: TX 11n HT40 2422MHz



Mode: TX 11n HT40 2437MHz



Mode: TX 11n HT40 2452MHz



13 Antenna Requirement

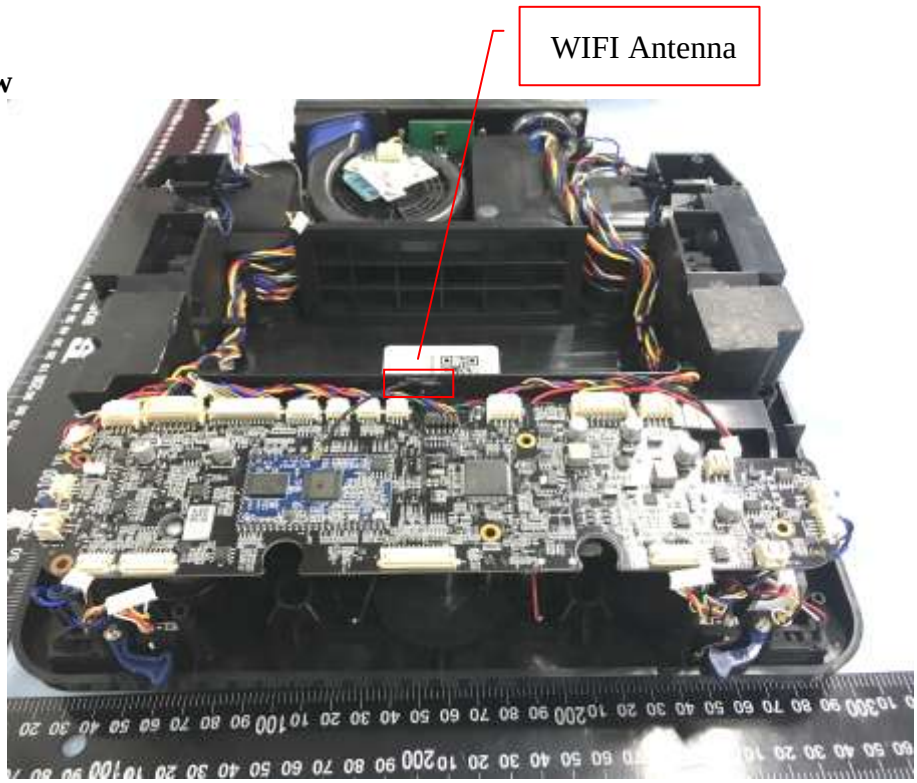
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Result:

The EUT have oneIntegrated Antenna, meets the requirements of FCC 15.203.

Antenna View



14 FCC ID: 2ARZX-D550 RF Exposure Report

Note: Please refer to RF Exposure Report: WTS19S01000191W-2.

15 Photographs - Model LDS D550 Test Setup Photos

Note: Please refer to Photos: WTS19S01000191W.

16 Photographs - Constructional Details

16.1 Model LDS D550 - External Photos

Note: Please refer to Photos: WTS19S01000191W.

16.2 Model LDS D550 - Internal Photos

Note: Please refer to Photos: WTS19S01000191W.

======End of Report======