

TEST REPORT

Reference No. : WTD20S05029615W001
FCC ID..... : WUI-BT57799
Applicant..... : Winplus Co., Ltd.
Address : Suites 6-11, 7th Floor, Corporation Park, 11 On La, Shatin, Hong Kong, China
Manufacturer : Winplus Co., Ltd.
Address : Suites 6-11, 7th Floor, Corporation Park, 11 On La, Shatin, Hong Kong, China
Product..... : MODULE OF APP LPBUC
Model(s)..... : BT57799
Standards..... : FCC CFR47 Part 15 Section 15.247:2019
Date of Receipt sample.. : 2020-06-02
Date of Test..... : 2020-06-03 to 2020-07-06
Date of Issue : 2020-07-07
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.

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2 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD20S05029615W001	2020-06-02	2020-06-03 to 2020-07-06	2020-07-07	Original	-	Valid

3 General Information

3.1 General Description of E.U.T.

Product: MODULE OF APP LPBUC

Model(s): BT57799

Model Description: N/A

Host Name: 1080P Solar Powered App View Backup Camera

Host Model(s): BT57799

Host Brand: Type S

Host Manufacturer: ADC Solutions Auto, LLC DBA Type S

Antenna installation of Host: Dipole Antenna

Operation Frequency: 802.11b/g/n HT20: 2412MHz ~ 2462MHz,
802.11n HT40: 2422MHz~2452MHz

Antenna installation: Dipole Antenna

Antenna Gain: 0 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.)

3.2 Details of E.U.T

Ratings: Input: DC 3.3V

3.3 Channel List

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	-

3.4 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
Bandwidth	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
Band Edge	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	3/9	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 .

4 Equipment Used during Test

4.1 Equipment's List

Conducted Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMI Test Receiver	R&S	ESCI	100947	2019-09-17	2020-09-16
2	LISN	R&S	ENV216	100115	2019-09-17	2020-09-16
3	Cable	Top	TYPE16(3.5M)	-	2019-09-17	2020-09-16
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	2020-04-20	2021-04-19
2	Broad-band Horn Antenna(1-18GHz)	SCHWARZBECK	BBHA 9120 D	667	2020-04-25	2021-04-24
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2020-04-20	2021-04-19
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2020-04-20	2021-04-19
5	Spectrum Analyzer	R&S	FSP40	100501	2019-11-13	2020-11-12
6	Broad-band Horn Antenna(18-40GHz)	SCHWARZBECK	BBHA 9170	335	2020-04-20	2021-04-19
7	Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	100472	2019-09-17	2020-09-16
8	Cable	Top	18-40GHz	-	2019-09-17	2020-09-16
9	Test Receiver	R&S	ESCI	101296	2020-04-20	2021-04-19
10	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2020-04-25	2021-04-24
11	Active Loop Antenna	Com-power	AL-130R	10160007	2020-04-25	2021-04-24
12	Amplifier	ANRITSU	MH648A	M43381	2020-04-20	2021-04-19
13	Cable	HUBER+SUHNER	CBL2	525178	2020-04-20	2021-04-19
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP40	100501	2019-11-13	2020-11-12
2	Coaxial Cable	Top	10Hz-30GHz	-	2019-09-12	2020-09-11
3	Antenna Connector*	Realacc	45RSm	-	2019-09-12	2020-09-11
4	DC Block	Gwave	GDCB-3G-N-SMA	140307001	2019-09-12	2020-09-11
***: 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.						

4.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
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)

4.3 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, Guangdong, China.

5 Test Facility

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.
ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

6 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.247 15.205(a) 15.209(a)	Pass
Conducted Emissions	15.207(a)	Pass
Bandwidth	15.247(a)(2)	Pass
Maximum Peak Output Power	15.247(b)(3),(4)	Pass
Power Spectral Density	15.247(e)	Pass
Band Edge	15.247(d)	Pass
Antenna Requirement	15.203	Pass
RF Exposure	1.1307(b)(1)	Pass
Note: Pass=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:

Frequency (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5.0	56	46
5. to 30	60	50

*Decreases with the logarithm of the frequency.

7.1 E.U.T. Operation

Operating Environment :

Temperature: 22.9 °C

Humidity: 54.2 % RH

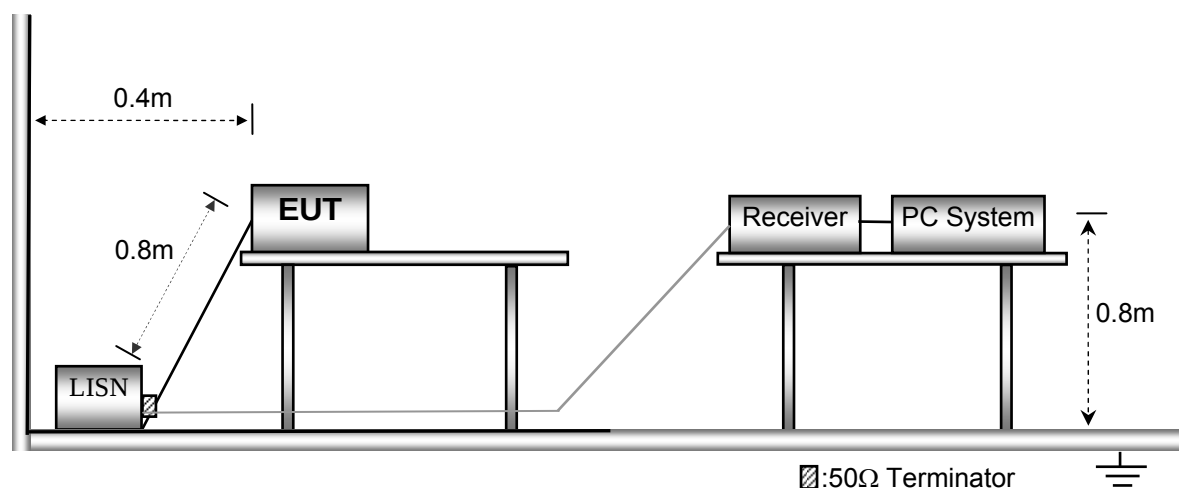
Atmospheric Pressure: 101.5kPa

EUT Operation :

The test was performed in Wi-Fi Transmitting mode, the worst test data (802.11b mode low channel) were shown in the report.

7.2 Test Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



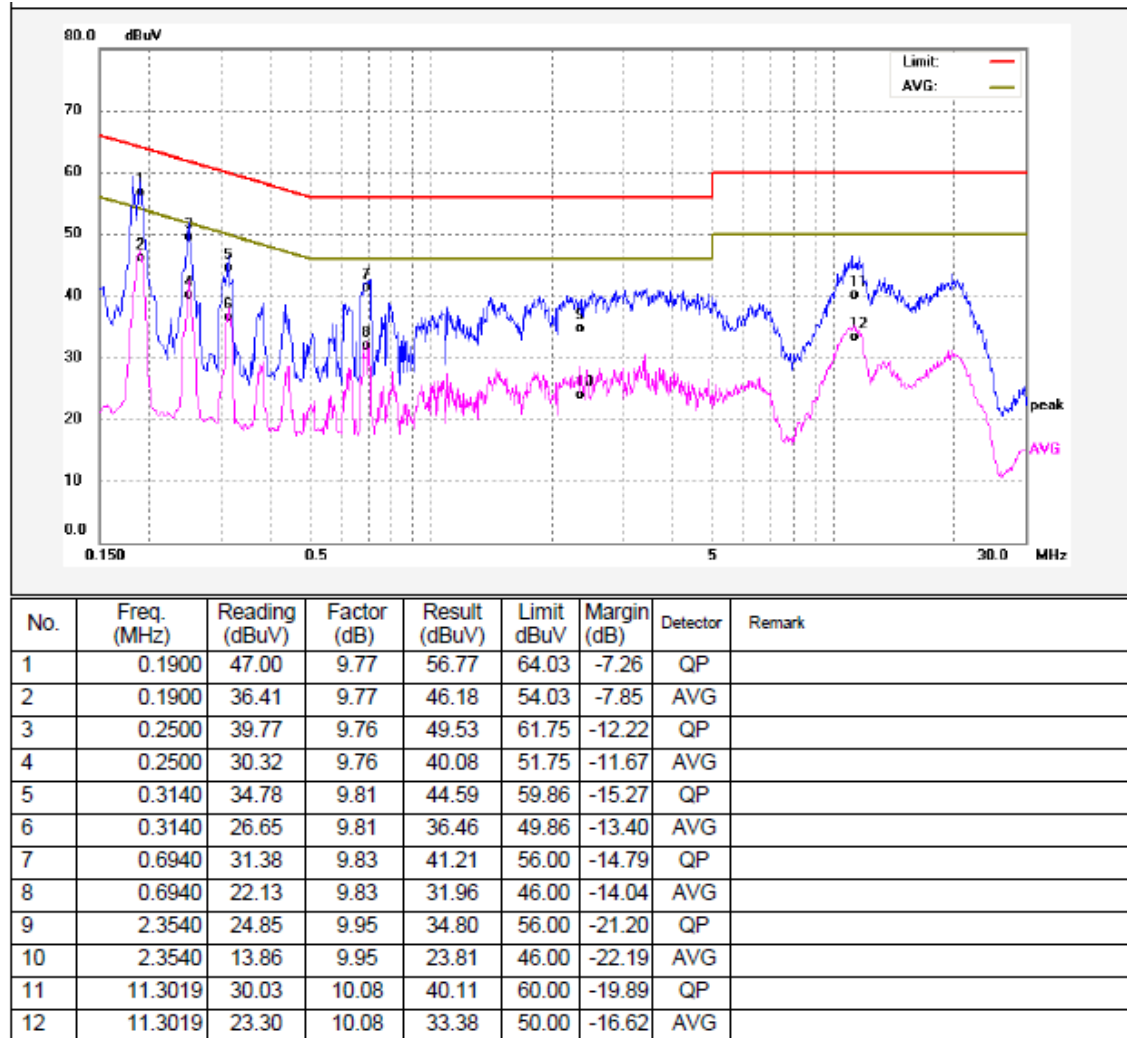
7.3 Measurement Description

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.

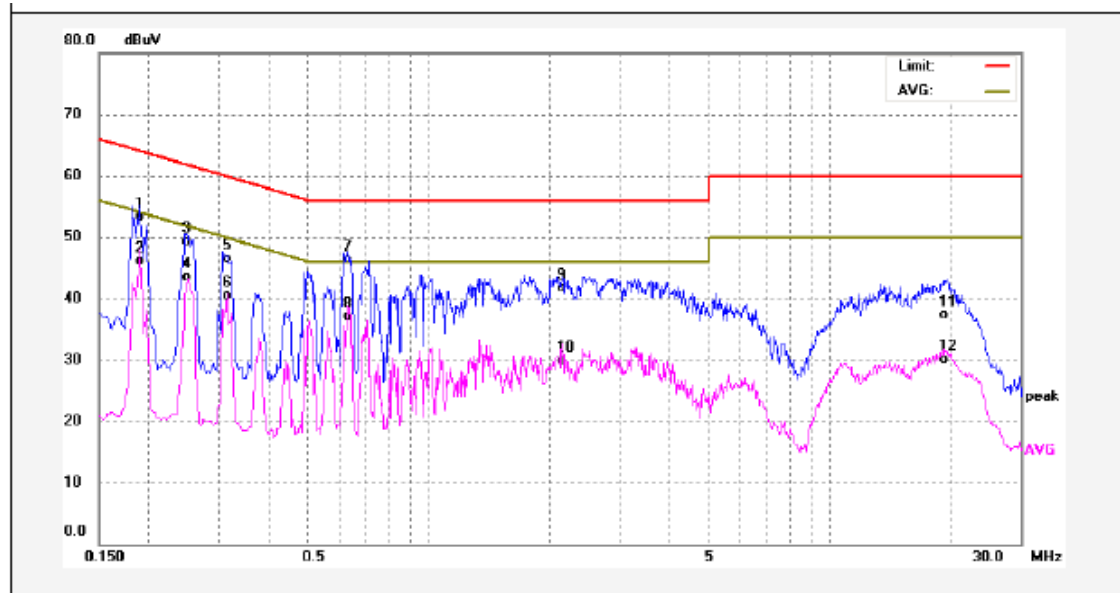
7.4 Conducted Emission Test Result

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

Live line:



Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1900	43.62	9.77	53.39	64.03	-10.64	QP	
2	0.1900	36.35	9.77	46.12	54.03	-7.91	AVG	
3	0.2500	39.58	9.76	49.34	61.75	-12.41	QP	
4	0.2500	33.78	9.76	43.54	51.75	-8.21	AVG	
5	0.3140	36.67	9.81	46.48	59.86	-13.38	QP	
6	0.3140	30.79	9.81	40.60	49.86	-9.26	AVG	
7	0.6300	36.39	9.84	46.23	56.00	-9.77	QP	
8	0.6300	27.23	9.84	37.07	46.00	-8.93	AVG	
9	2.1500	31.81	9.96	41.77	56.00	-14.23	QP	
10	2.1500	19.90	9.96	29.86	46.00	-16.14	AVG	
11	19.3460	27.08	10.27	37.35	60.00	-22.65	QP	
12	19.3460	19.92	10.27	30.19	50.00	-19.81	AVG	

8 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: 558074 D01 15.247 Meas Guidance v05r02

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: 23.4 °C

Humidity: 53.7 % RH

Atmospheric Pressure: 101.3kPa

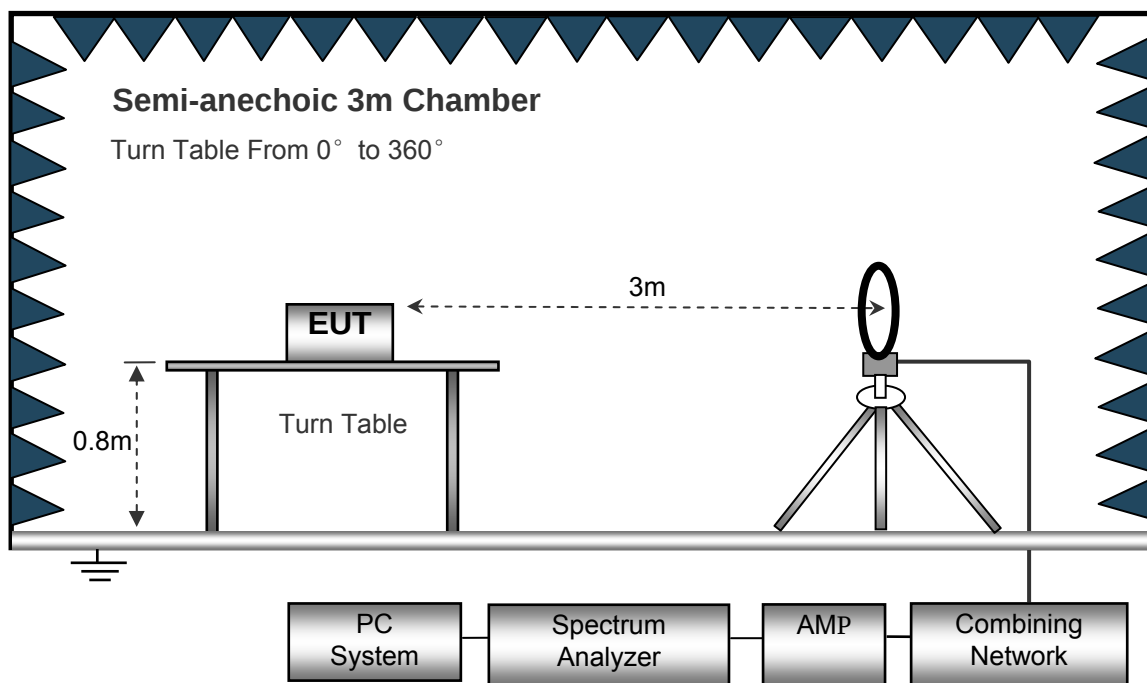
EUT Operation :

The test was performed in Wi-Fi Transmitting mode, the test data were shown in the report.

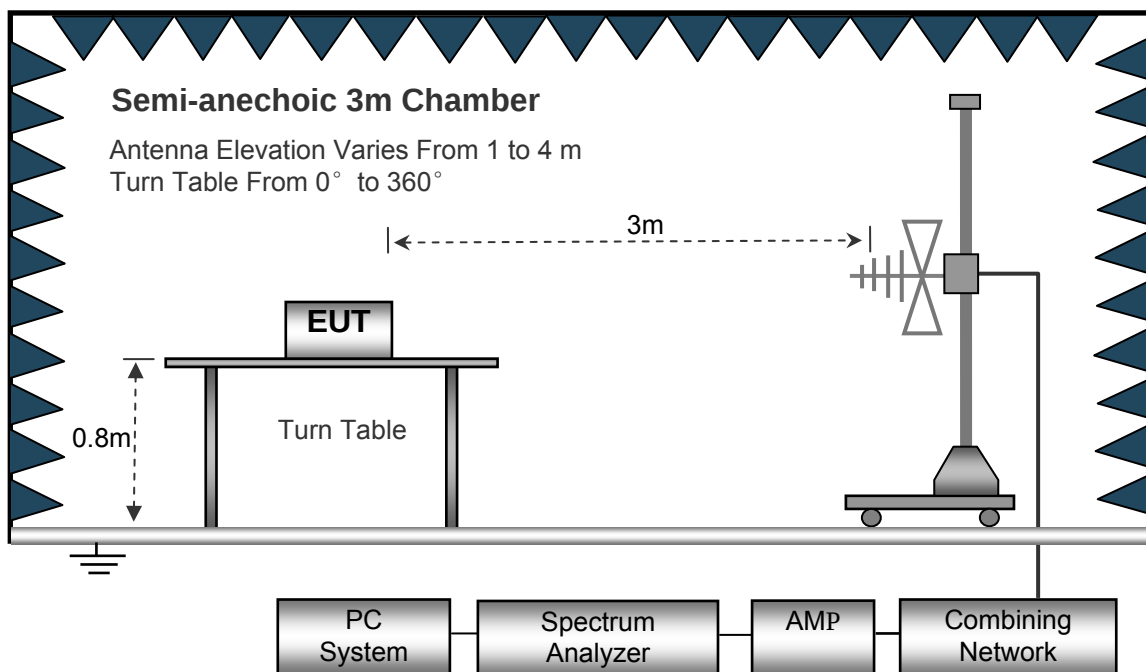
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10:2013.

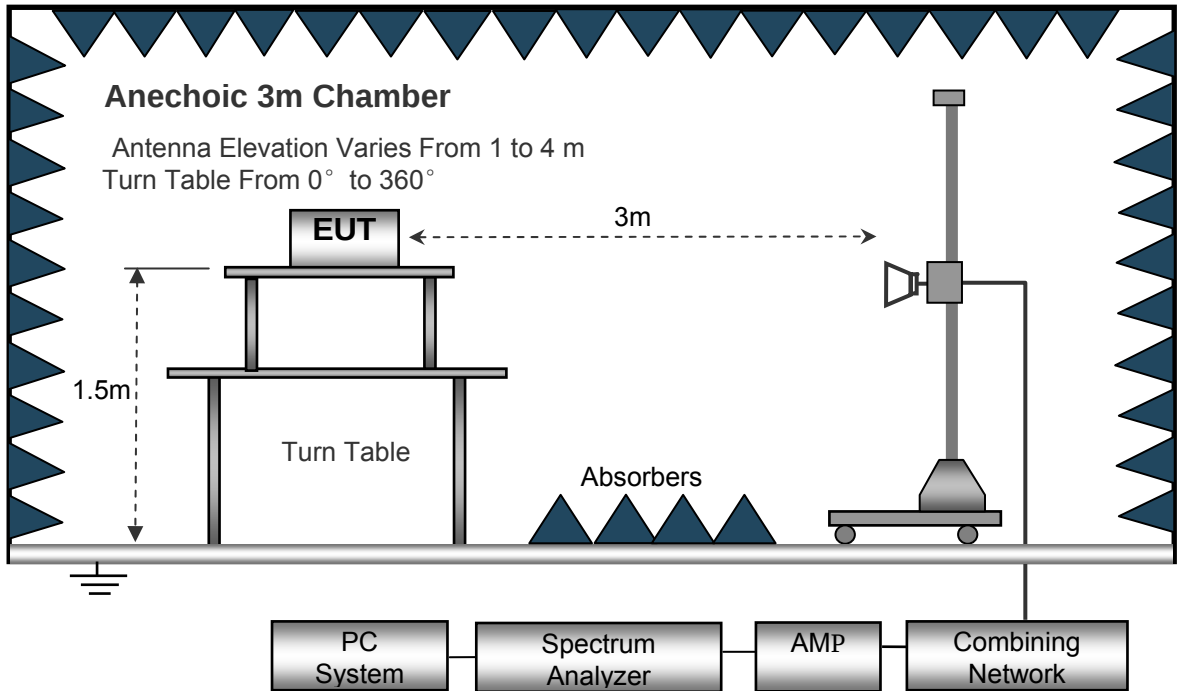
The test setup for emission measurement below 30MHz.



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
DetectorPK
Resolution Bandwidth.....100kHz
Video Bandwidth.....300kHz

Above 1GHz

Sweep Speed Auto
DetectorPK
Resolution Bandwidth.....1MHz
Video Bandwidth.....3MHz
DetectorAve.
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 above 1GHz, 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 during 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

8.6 Summary of Test Results

Test Frequency: 9 kHz ~ 25 GHz

Only the worst case mode and the worst frequency test data were recorded in the report, other frequency are attenuated more than 20 dB below the permissible value and not reported.

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
57.79	43.87	QP	250	1.2	H	-17.38	26.49	40.00	-13.51
57.79	52.62	QP	234	1.6	V	-17.38	35.24	40.00	-4.76
4824.00	50.65	PK	55	1.6	V	-1.06	49.59	74.00	-24.41
4824.00	45.21	Ave	55	1.6	V	-1.06	44.15	54.00	-9.85
7236.00	47.34	PK	70	1.6	H	1.33	48.67	74.00	-25.33
7236.00	41.88	Ave	70	1.6	H	1.33	43.21	54.00	-10.79
2338.45	45.07	PK	299	1.7	V	-13.19	31.88	74.00	-42.12
2338.45	38.88	Ave	299	1.7	V	-13.19	25.69	54.00	-28.31
2384.10	42.50	PK	295	1.3	H	-13.14	29.36	74.00	-44.64
2384.10	36.94	Ave	295	1.3	H	-13.14	23.80	54.00	-30.20
2487.38	44.38	PK	313	1.1	V	-13.08	31.30	74.00	-42.70
2487.38	38.33	Ave	313	1.1	V	-13.08	25.25	54.00	-28.75

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Middle Channel 2437MHz									
57.79	43.84	QP	289	1.8	H	-17.38	26.46	40.00	-13.54
57.79	51.25	QP	129	1.3	V	-17.38	33.87	40.00	-6.13
4874.00	51.63	PK	358	1.6	V	-0.62	51.01	74.00	-22.99
4874.00	43.73	Ave	358	1.6	V	-0.62	43.11	54.00	-10.89
7311.00	46.67	PK	345	1.2	H	2.21	48.88	74.00	-25.12
7311.00	41.06	Ave	345	1.2	H	2.21	43.27	54.00	-10.73
2347.73	46.34	PK	14	1.9	V	-13.19	33.15	74.00	-40.85
2347.73	38.16	Ave	14	1.9	V	-13.19	24.97	54.00	-29.03
2382.30	42.33	PK	237	1.5	H	-13.14	29.19	74.00	-44.81
2382.30	38.53	Ave	237	1.5	H	-13.14	25.39	54.00	-28.61
2499.00	43.02	PK	353	1.6	V	-13.08	29.94	74.00	-44.06
2499.00	36.80	Ave	353	1.6	V	-13.08	23.72	54.00	-30.28

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: High Channel 2462MHz									
57.79	42.43	QP	11	1.1	H	-17.38	25.05	40.00	-14.95
57.79	52.14	QP	94	1.6	V	-17.38	34.76	40.00	-5.24
4924.00	52.34	PK	55	1.4	V	-0.24	52.10	74.00	-21.90
4924.00	43.92	Ave	55	1.4	V	-0.24	43.68	54.00	-10.32
7386.00	47.67	PK	89	1.8	H	2.84	50.51	74.00	-23.49
7386.00	41.68	Ave	89	1.8	H	2.84	44.52	54.00	-9.48
2314.28	45.83	PK	225	1.9	V	-13.19	32.64	74.00	-41.36
2314.28	37.99	Ave	225	1.9	V	-13.19	24.80	54.00	-29.20
2350.87	44.60	PK	33	1.9	H	-13.14	31.46	74.00	-42.54
2350.87	38.24	Ave	33	1.9	H	-13.14	25.10	54.00	-28.90
2495.87	42.16	PK	118	1.0	V	-13.08	29.08	74.00	-44.92
2495.87	36.20	Ave	118	1.0	V	-13.08	23.12	54.00	-30.88

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11g: Low Channel 2412MHz									
57.79	43.72	QP	172	1.9	H	-17.38	26.34	40.00	-13.66
57.79	51.86	QP	184	1.2	V	-17.38	34.48	40.00	-5.52
4824.00	49.53	PK	157	1.2	V	-1.06	48.47	74.00	-25.53
4824.00	45.70	Ave	157	1.2	V	-1.06	44.64	54.00	-9.36
7236.00	48.61	PK	299	1.0	H	1.33	49.94	74.00	-24.06
7236.00	44.84	Ave	299	1.0	H	1.33	46.17	54.00	-7.83
2329.58	45.00	PK	29	1.7	V	-13.19	31.81	74.00	-42.19
2329.58	39.98	Ave	29	1.7	V	-13.19	26.79	54.00	-27.21
2351.22	42.16	PK	355	2.0	H	-13.14	29.02	74.00	-44.98
2351.22	37.64	Ave	355	2.0	H	-13.14	24.50	54.00	-29.50
2485.66	44.14	PK	2	1.2	V	-13.08	31.06	74.00	-42.94
2485.66	36.48	Ave	2	1.2	V	-13.08	23.40	54.00	-30.60

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11g: Middle Channel 2437MHz									
57.79	43.75	QP	195	1.2	H	-17.38	26.37	40.00	-13.63
57.79	52.34	QP	78	1.5	V	-17.38	34.96	40.00	-5.04
4874.00	48.84	PK	332	1.1	V	-0.62	48.22	74.00	-25.78
4874.00	44.60	Ave	332	1.1	V	-0.62	43.98	54.00	-10.02
7311.00	47.48	PK	221	1.9	H	2.21	49.69	74.00	-24.31
7311.00	43.63	Ave	221	1.9	H	2.21	45.84	54.00	-8.16
2349.10	46.77	PK	91	1.7	V	-13.19	33.58	74.00	-40.42
2349.10	37.59	Ave	91	1.7	V	-13.19	24.40	54.00	-29.60
2366.60	42.70	PK	124	2.0	H	-13.14	29.56	74.00	-44.44
2366.60	38.20	Ave	124	2.0	H	-13.14	25.06	54.00	-28.94
2486.69	44.43	PK	321	1.2	V	-13.08	31.35	74.00	-42.65
2486.69	37.74	Ave	321	1.2	V	-13.08	24.66	54.00	-29.34

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11g: High Channel 2462MHz									
57.79	44.71	QP	6	2.0	H	-17.38	27.33	40.00	-12.67
57.79	53.71	QP	21	1.6	V	-17.38	36.33	40.00	-3.67
4924.00	49.47	PK	329	1.6	V	-0.24	49.23	74.00	-24.77
4924.00	46.09	Ave	329	1.6	V	-0.24	45.85	54.00	-8.15
7386.00	48.87	PK	41	1.6	H	2.84	51.71	74.00	-22.29
7386.00	44.37	Ave	41	1.6	H	2.84	47.21	54.00	-6.79
2341.15	45.50	PK	106	1.3	V	-13.19	32.31	74.00	-41.69
2341.15	37.01	Ave	106	1.3	V	-13.19	23.82	54.00	-30.18
2358.56	44.68	PK	1	1.8	H	-13.14	31.54	74.00	-42.46
2358.56	36.55	Ave	1	1.8	H	-13.14	23.41	54.00	-30.59
2488.07	43.37	PK	315	1.2	V	-13.08	30.29	74.00	-43.71
2488.07	38.96	Ave	315	1.2	V	-13.08	25.88	54.00	-28.12

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
n20: Low Channel 2412MHz									
57.79	44.01	QP	238	1.6	H	-17.38	26.63	40.00	-13.37
57.79	52.57	QP	217	1.3	V	-17.38	35.19	40.00	-4.81
4824.00	49.60	PK	66	2.0	V	-1.06	48.54	74.00	-25.46
4824.00	45.18	Ave	66	2.0	V	-1.06	44.12	54.00	-9.88
7236.00	47.35	PK	220	1.3	H	1.33	48.68	74.00	-25.32
7236.00	42.54	Ave	220	1.3	H	1.33	43.87	54.00	-10.13
2343.18	46.61	PK	253	1.1	V	-13.19	33.42	74.00	-40.58
2343.18	39.25	Ave	253	1.1	V	-13.19	26.06	54.00	-27.94
2350.78	43.92	PK	360	1.8	H	-13.14	30.78	74.00	-43.22
2350.78	37.16	Ave	360	1.8	H	-13.14	24.02	54.00	-29.98
2491.29	42.42	PK	182	1.1	V	-13.08	29.34	74.00	-44.66
2491.29	38.18	Ave	182	1.1	V	-13.08	25.10	54.00	-28.90

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
n20: Middle Channel 2437MHz									
57.79	44.49	QP	346	1.4	H	-17.38	27.11	40.00	-12.89
57.79	53.67	QP	289	1.0	V	-17.38	36.29	40.00	-3.71
4874.00	50.72	PK	303	1.9	V	-0.62	50.10	74.00	-23.90
4874.00	45.00	Ave	303	1.9	V	-0.62	44.38	54.00	-9.62
7311.00	47.72	PK	285	2.0	H	2.21	49.93	74.00	-24.07
7311.00	41.29	Ave	285	2.0	H	2.21	43.50	54.00	-10.50
2347.90	45.30	PK	164	1.3	V	-13.19	32.11	74.00	-41.89
2347.90	38.97	Ave	164	1.3	V	-13.19	25.78	54.00	-28.22
2356.05	44.50	PK	299	1.4	H	-13.14	31.36	74.00	-42.64
2356.05	38.23	Ave	299	1.4	H	-13.14	25.09	54.00	-28.91
2497.28	44.78	PK	56	1.1	V	-13.08	31.70	74.00	-42.30
2497.28	38.26	Ave	56	1.1	V	-13.08	25.18	54.00	-28.82

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
n20: High Channel 2462MHz									
57.79	45.27	QP	30	1.6	H	-17.38	27.89	40.00	-12.11
57.79	52.37	QP	231	1.6	V	-17.38	34.99	40.00	-5.01
4924.00	50.03	PK	43	1.5	V	-0.24	49.79	74.00	-24.21
4924.00	44.74	Ave	43	1.5	V	-0.24	44.50	54.00	-9.50
7386.00	47.79	PK	107	2.0	H	2.84	50.63	74.00	-23.37
7386.00	42.43	Ave	107	2.0	H	2.84	45.27	54.00	-8.73
2316.67	46.99	PK	285	1.4	V	-13.19	33.80	74.00	-40.20
2316.67	38.73	Ave	285	1.4	V	-13.19	25.54	54.00	-28.46
2372.49	44.11	PK	327	2.0	H	-13.14	30.97	74.00	-43.03
2372.49	37.20	Ave	327	2.0	H	-13.14	24.06	54.00	-29.94
2497.74	42.01	PK	309	1.7	V	-13.08	28.93	74.00	-45.07
2497.74	37.17	Ave	309	1.7	V	-13.08	24.09	54.00	-29.91

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
n40: Low Channel 2422MHz									
57.79	44.68	QP	168	2.0	H	-17.38	27.30	40.00	-12.70
57.79	51.75	QP	138	1.2	V	-17.38	34.37	40.00	-5.63
4844.00	48.24	PK	196	1.9	V	-1.06	47.18	74.00	-26.82
4844.00	43.19	Ave	196	1.9	V	-1.06	42.13	54.00	-11.87
7266.00	45.34	PK	9	1.4	H	1.33	46.67	74.00	-27.33
7266.00	40.41	Ave	9	1.4	H	1.33	41.74	54.00	-12.26
2314.63	46.50	PK	88	1.4	V	-13.19	33.31	74.00	-40.69
2314.63	37.34	Ave	88	1.4	V	-13.19	24.15	54.00	-29.85
2366.16	43.58	PK	28	1.1	H	-13.14	30.44	74.00	-43.56
2366.16	36.11	Ave	28	1.1	H	-13.14	22.97	54.00	-31.03
2487.62	42.63	PK	264	1.9	V	-13.08	29.55	74.00	-44.45
2487.62	38.39	Ave	264	1.9	V	-13.08	25.31	54.00	-28.69

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
n40: Middle Channel 2437MHz									
57.79	44.18	QP	14	1.9	H	-17.38	26.80	40.00	-13.20
57.79	51.17	QP	156	1.5	V	-17.38	33.79	40.00	-6.21
4874.00	48.57	PK	129	1.5	V	-0.62	47.95	74.00	-26.05
4874.00	43.09	Ave	129	1.5	V	-0.62	42.47	54.00	-11.53
7311.00	45.30	PK	324	1.2	H	2.21	47.51	74.00	-26.49
7311.00	40.21	Ave	324	1.2	H	2.21	42.42	54.00	-11.58
2322.58	46.30	PK	188	1.0	V	-13.19	33.11	74.00	-40.89
2322.58	37.43	Ave	188	1.0	V	-13.19	24.24	54.00	-29.76
2368.17	43.24	PK	18	1.9	H	-13.14	30.10	74.00	-43.90
2368.17	37.48	Ave	18	1.9	H	-13.14	24.34	54.00	-29.66
2485.61	44.61	PK	53	1.8	V	-13.08	31.53	74.00	-42.47
2485.61	38.23	Ave	53	1.8	V	-13.08	25.15	54.00	-28.85

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
n40: High Channel 2452MHz									
57.79	43.23	QP	111	1.7	H	-17.38	25.85	40.00	-14.15
57.79	51.25	QP	251	2.0	V	-17.38	33.87	40.00	-6.13
4904.00	48.84	PK	319	1.2	V	-0.24	48.60	74.00	-25.40
4904.00	43.30	Ave	319	1.2	V	-0.24	43.06	54.00	-10.94
7356.00	46.29	PK	22	1.9	H	2.84	49.13	74.00	-24.87
7356.00	40.72	Ave	22	1.9	H	2.84	43.56	54.00	-10.44
2339.15	45.21	PK	169	1.7	V	-13.19	32.02	74.00	-41.98
2339.15	38.11	Ave	169	1.7	V	-13.19	24.92	54.00	-29.08
2351.38	44.73	PK	70	1.1	H	-13.14	31.59	74.00	-42.41
2351.38	36.46	Ave	70	1.1	H	-13.14	23.32	54.00	-30.68
2489.29	43.72	PK	132	1.3	V	-13.08	30.64	74.00	-43.36
2489.29	37.89	Ave	132	1.3	V	-13.08	24.81	54.00	-29.19

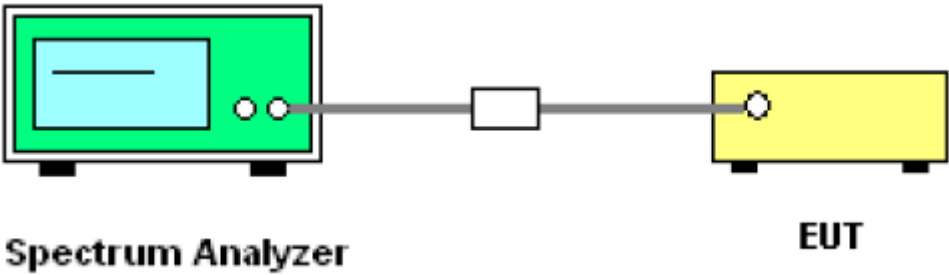
9 Band Edge Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 15.247 Meas Guidance v05r02, ANSI C63.10:2013
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

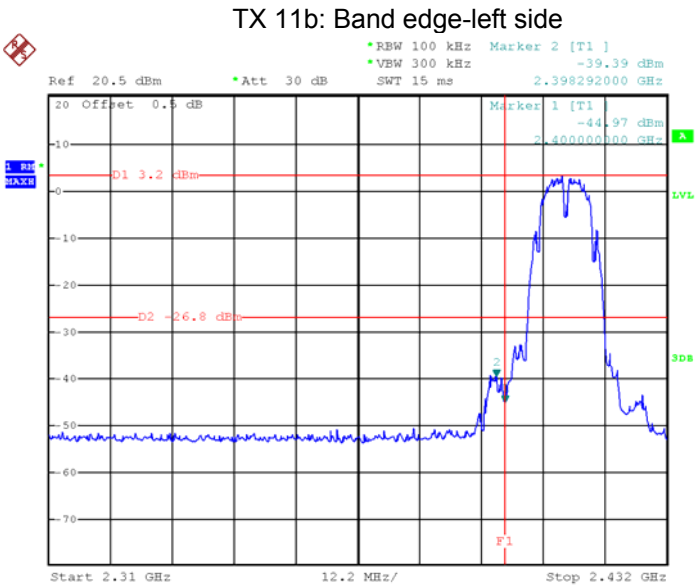
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then 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.

9.2 Test Setup

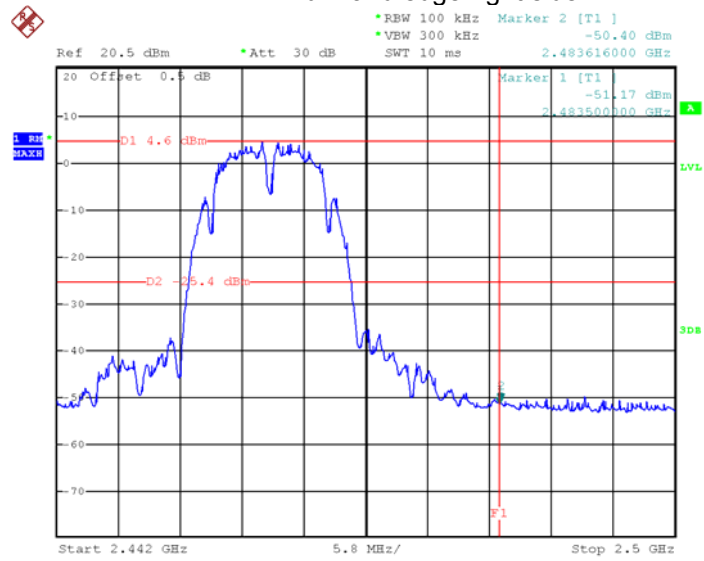


9.3 Test Result

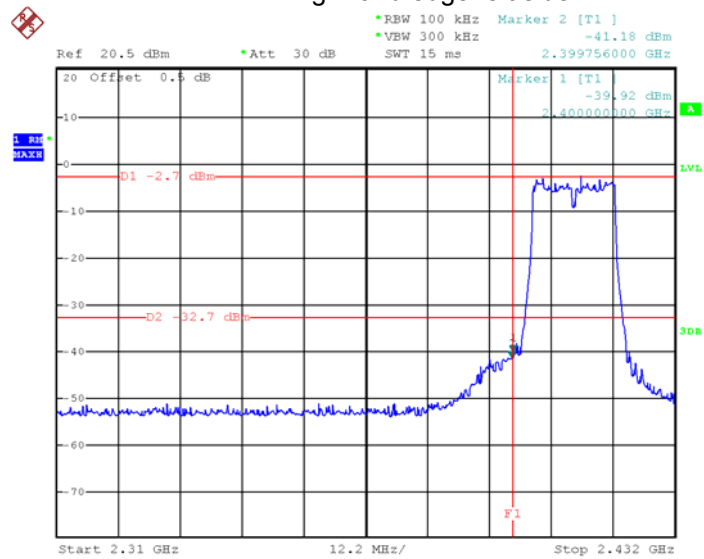
Test result plots shown as follows:



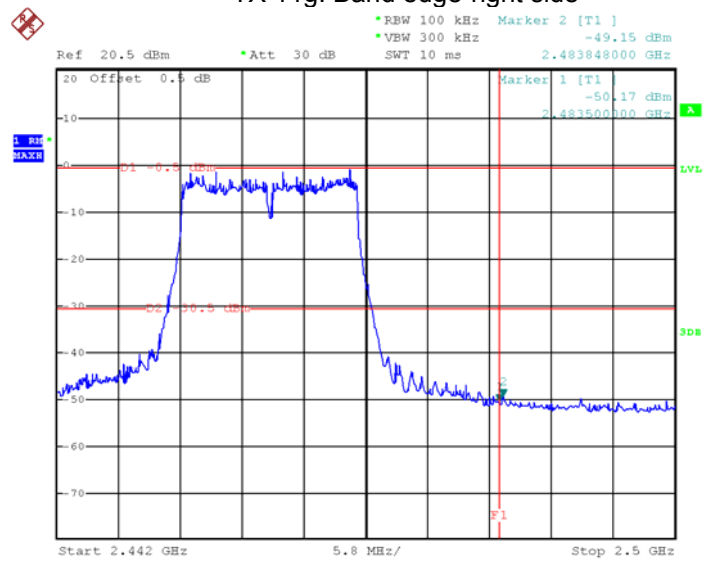
TX 11b: Band edge-right side



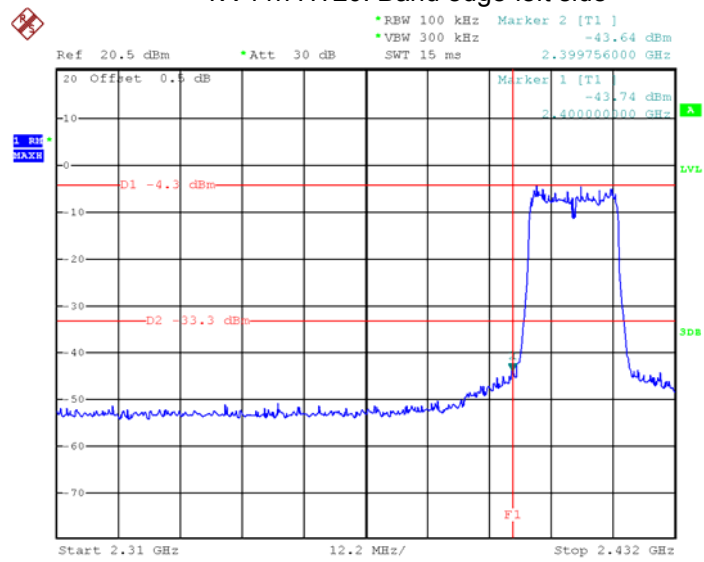
TX 11g: Band edge-left side

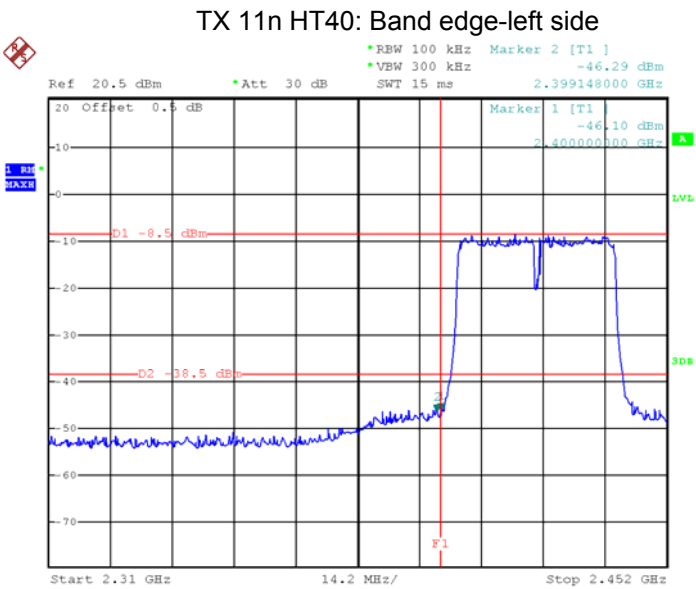
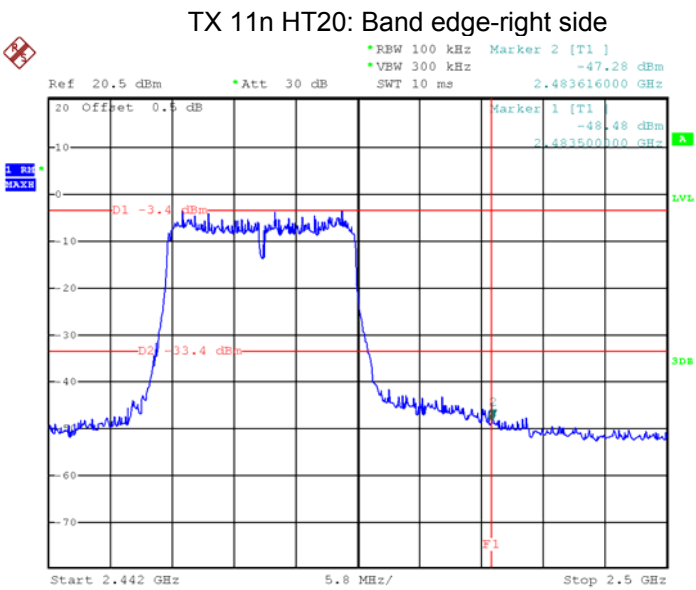


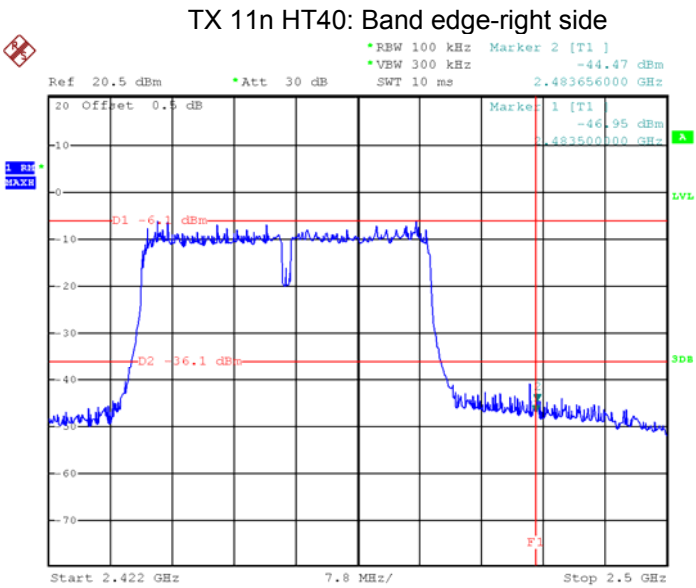
TX 11g: Band edge-right side



TX 11n HT20: Band edge-left side







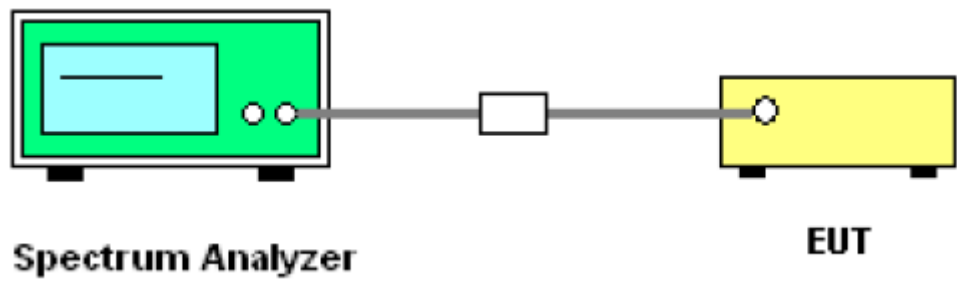
10 Conducted Spurious Emissions

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 15.247 Meas Guidance v05r02, ANSI C63.10:2013
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

10.1 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.

10.2 Test Setup

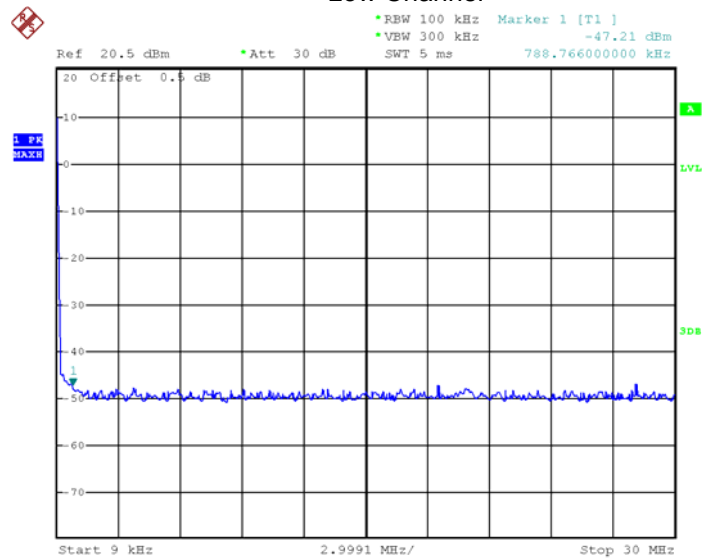


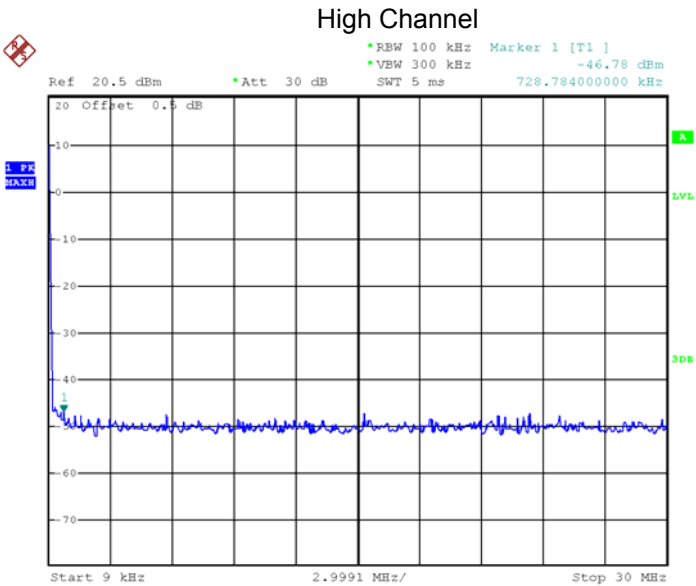
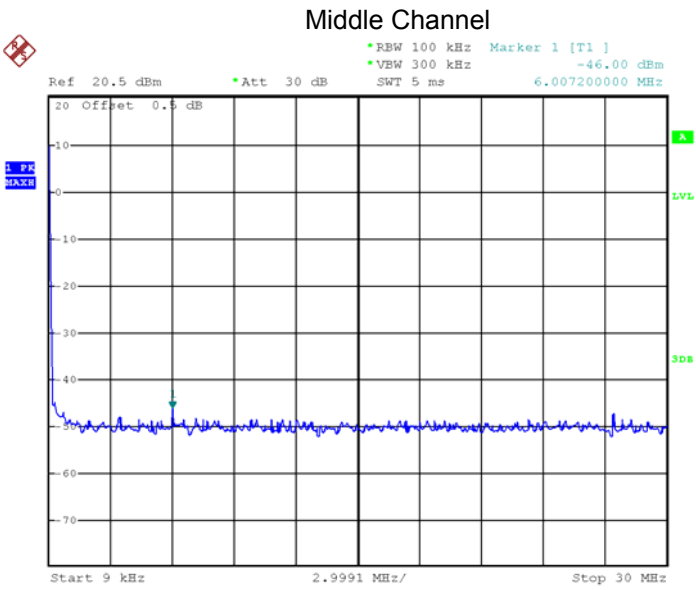
10.3 Test Result

9 KHz – 30MHz

802.11b

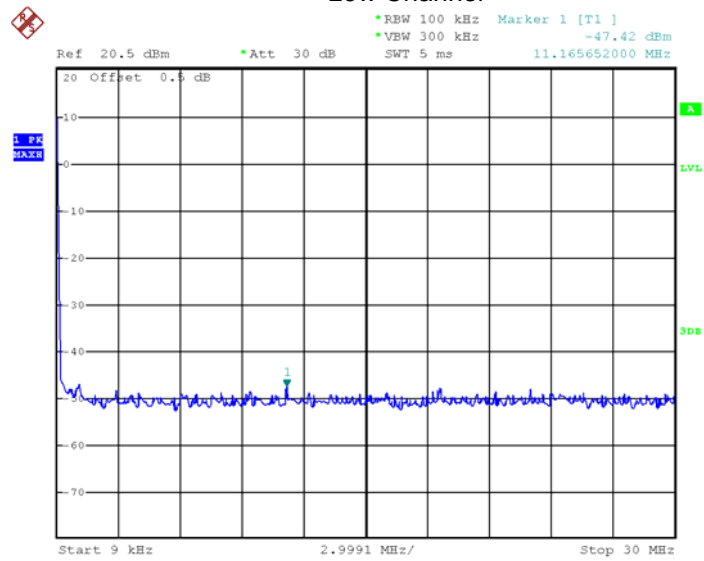
Low Channel



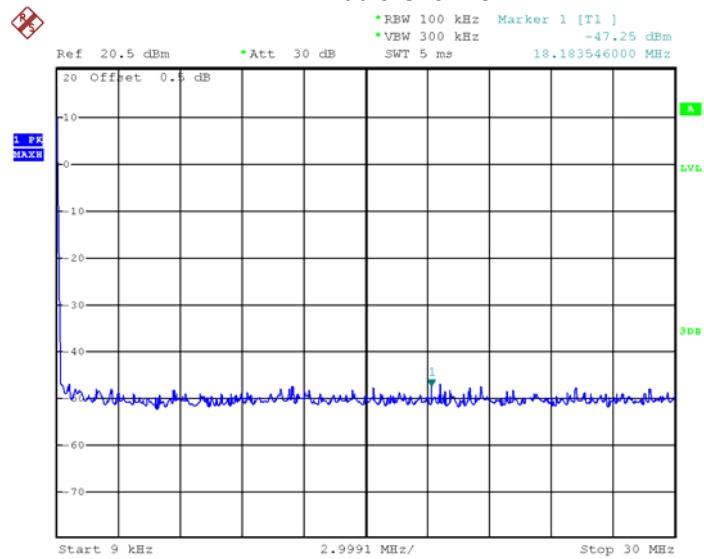


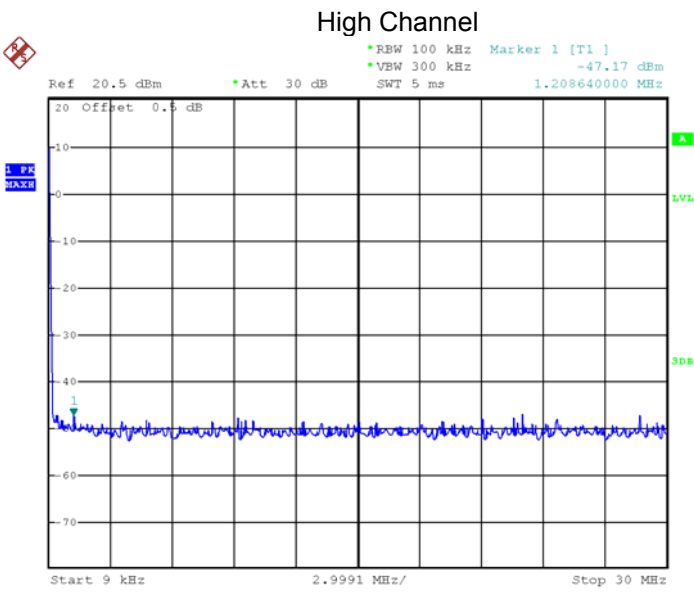
802.11g

Low Channel

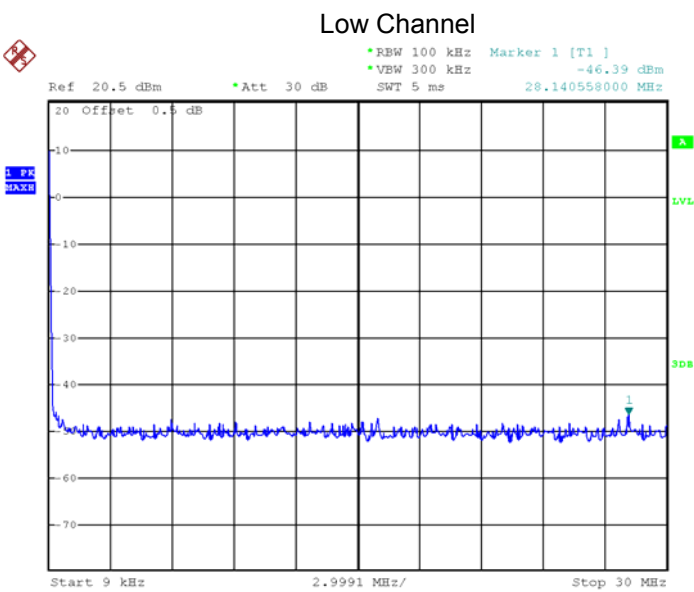


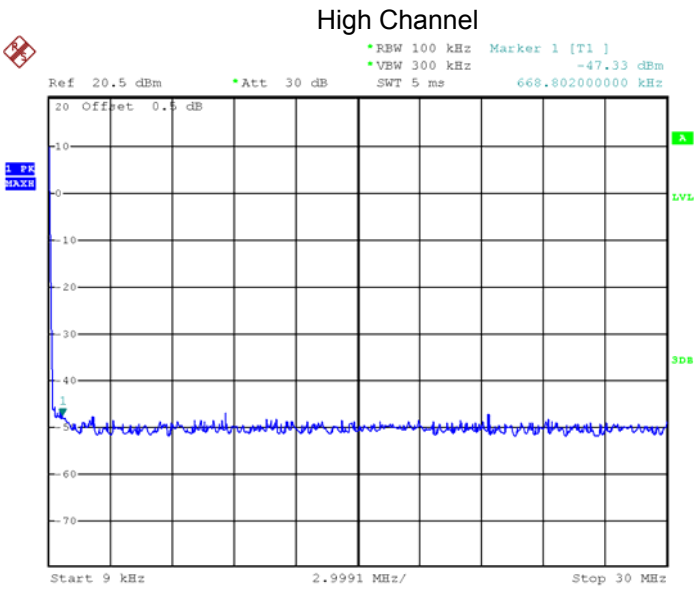
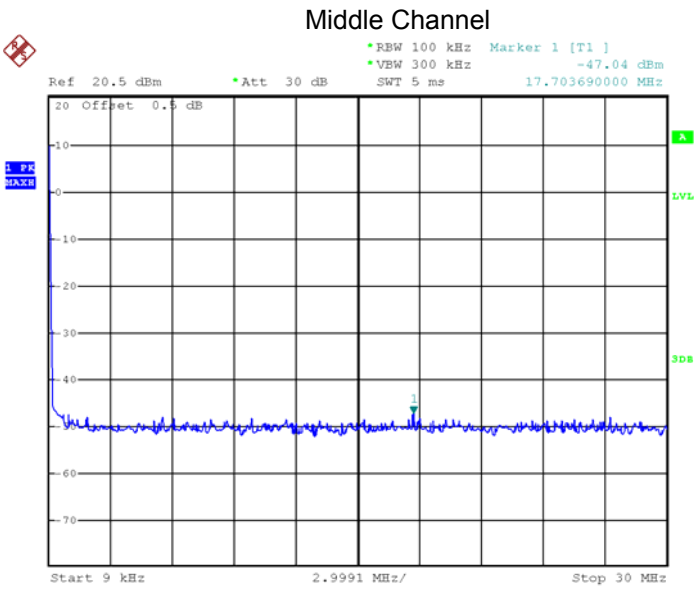
Middle Channel





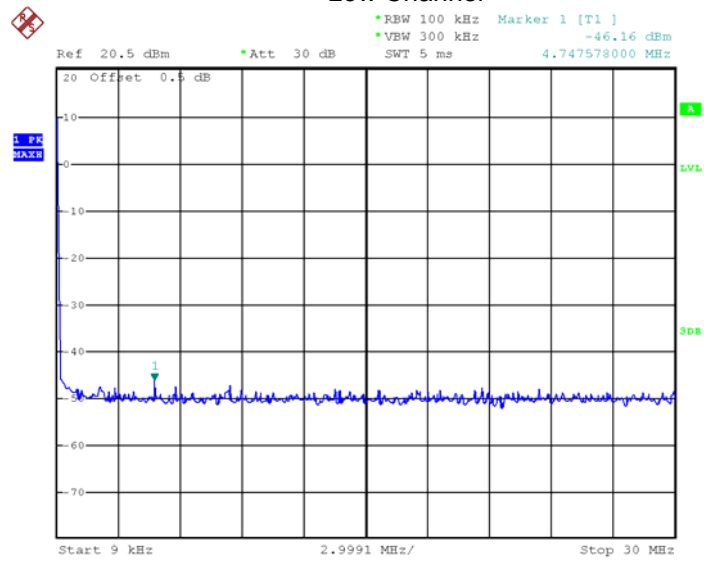
802.11n HT20



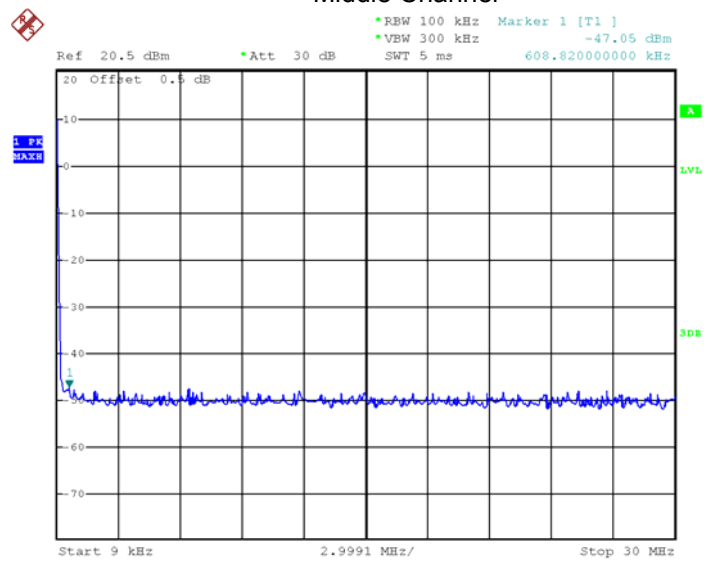


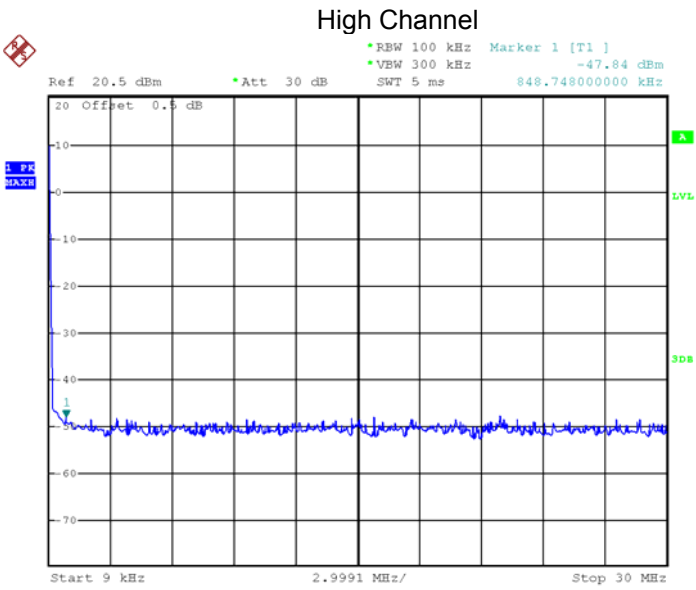
802.11n HT40

Low Channel



Middle Channel

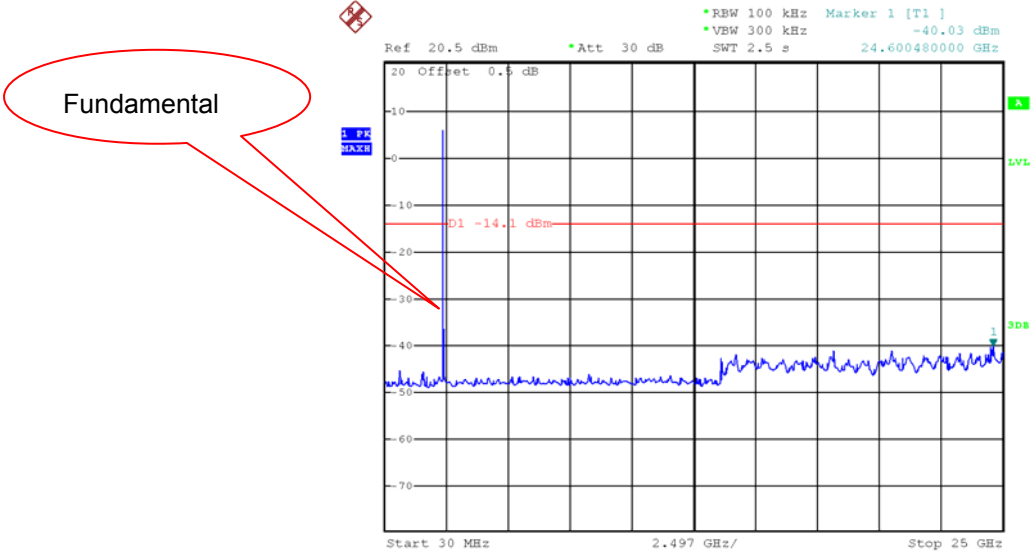


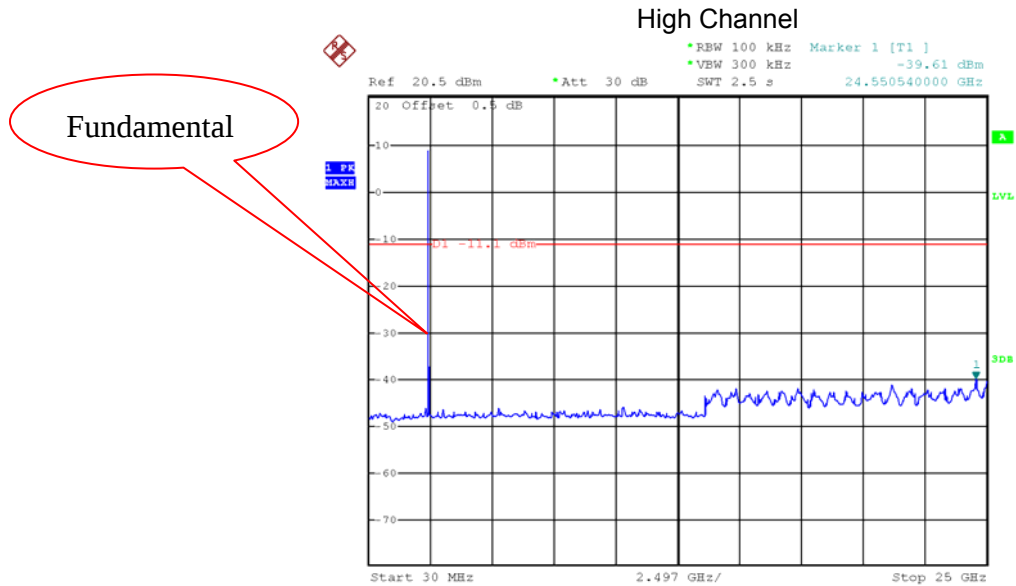
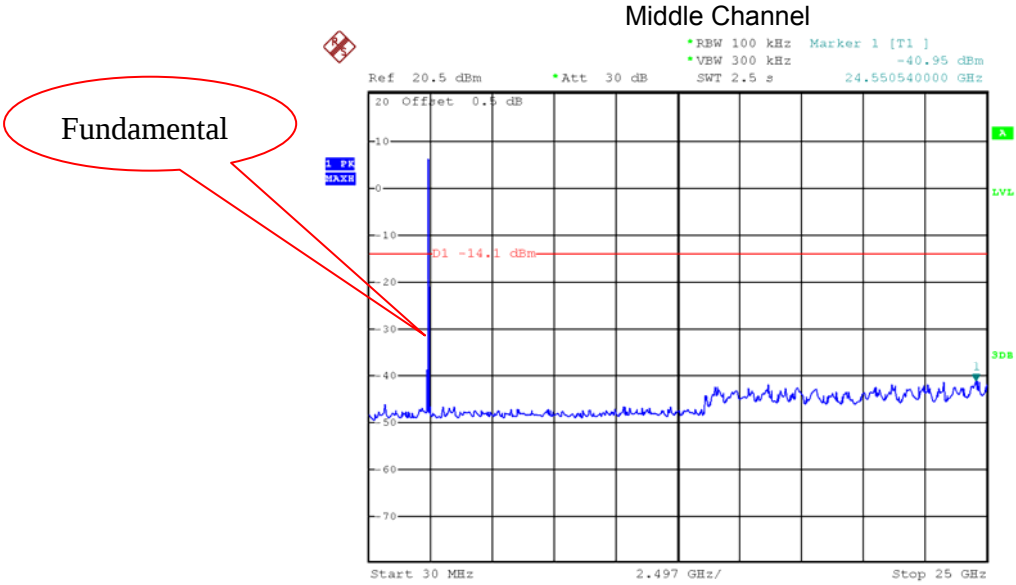


Above 30MHz

802.11b

Low Channel

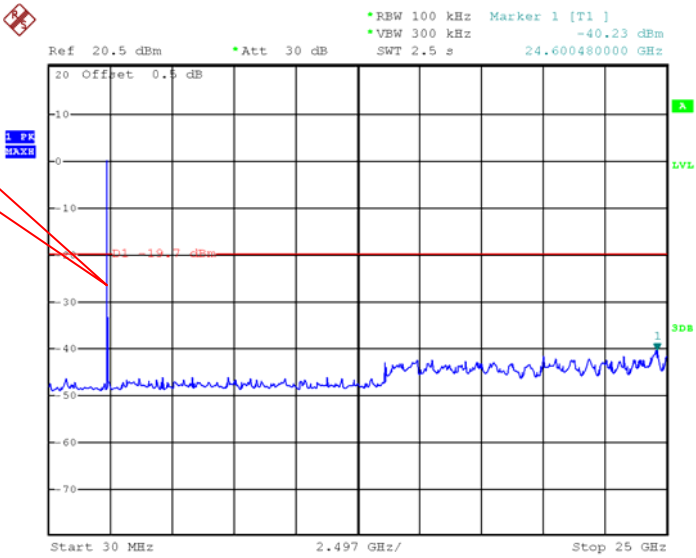




802.11g

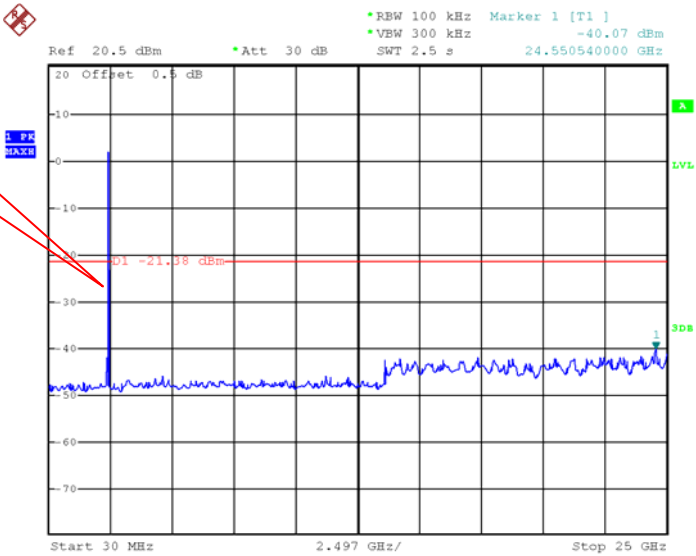
Low Channel

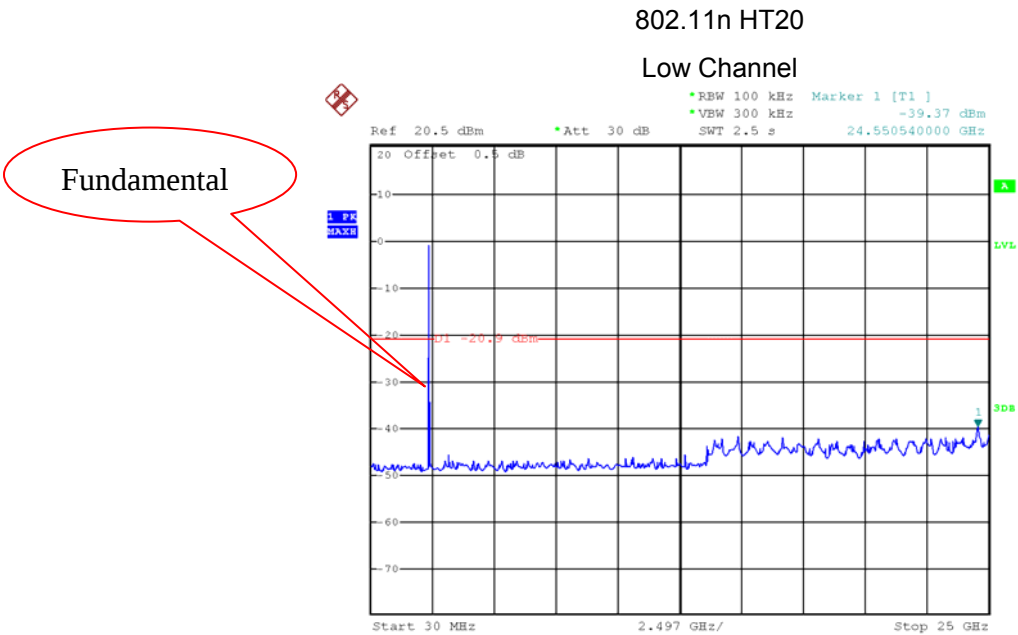
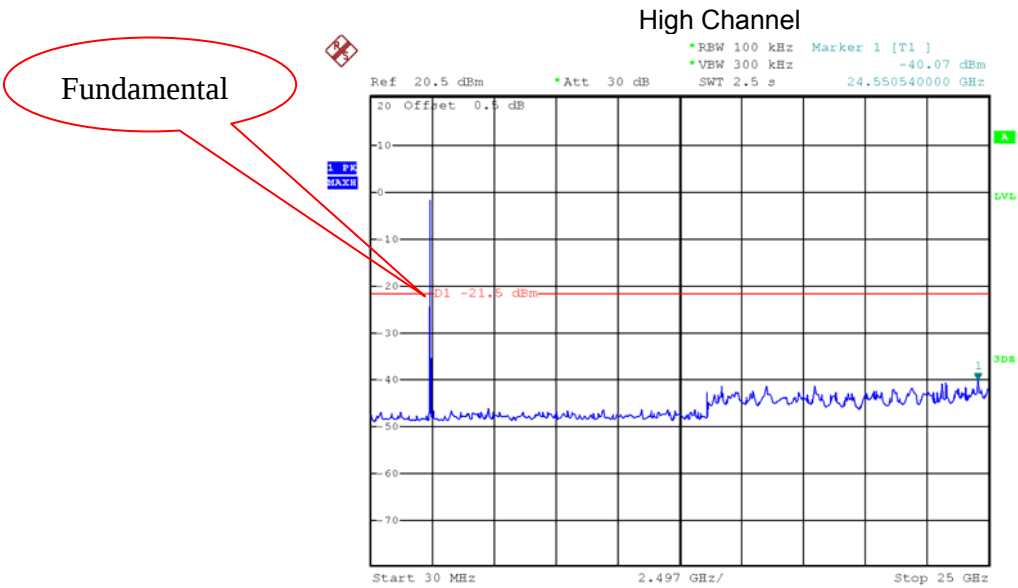
Fundamental

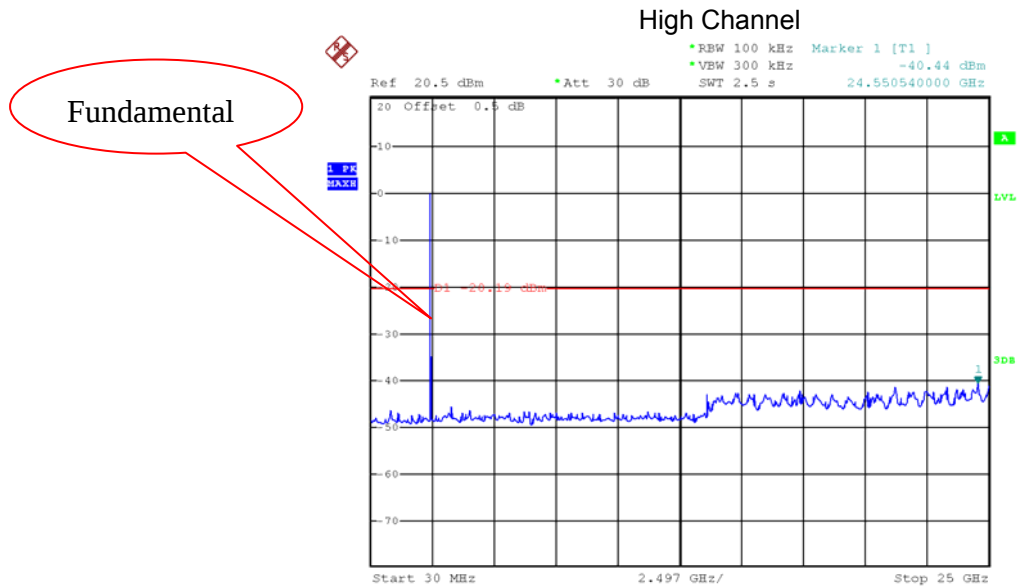
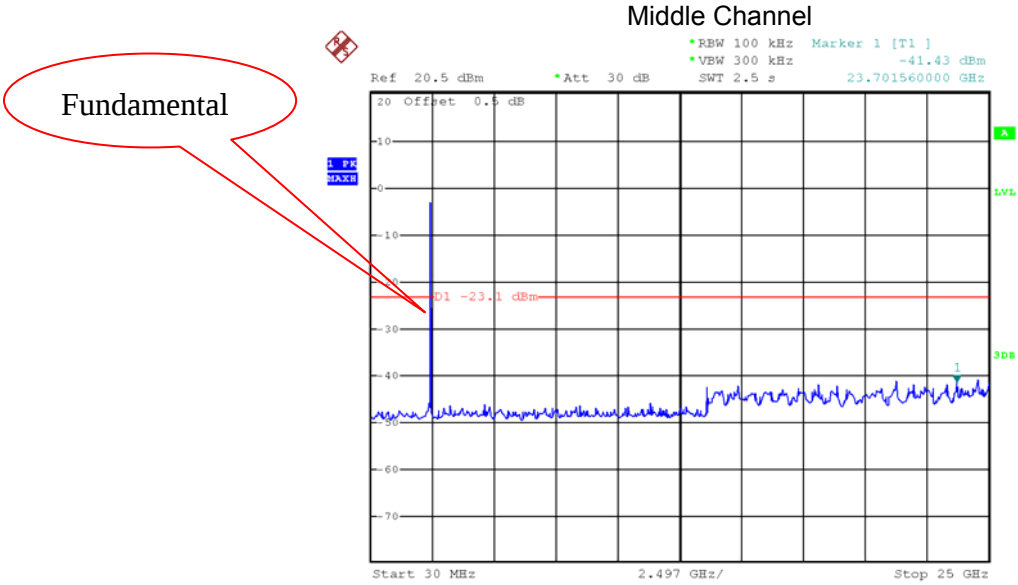


Middle Channel

Fundamental

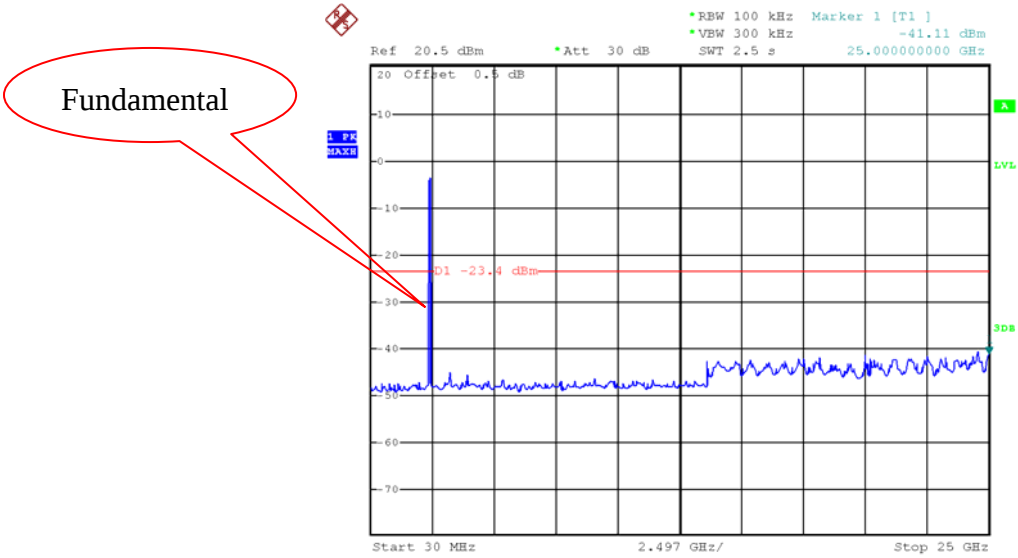




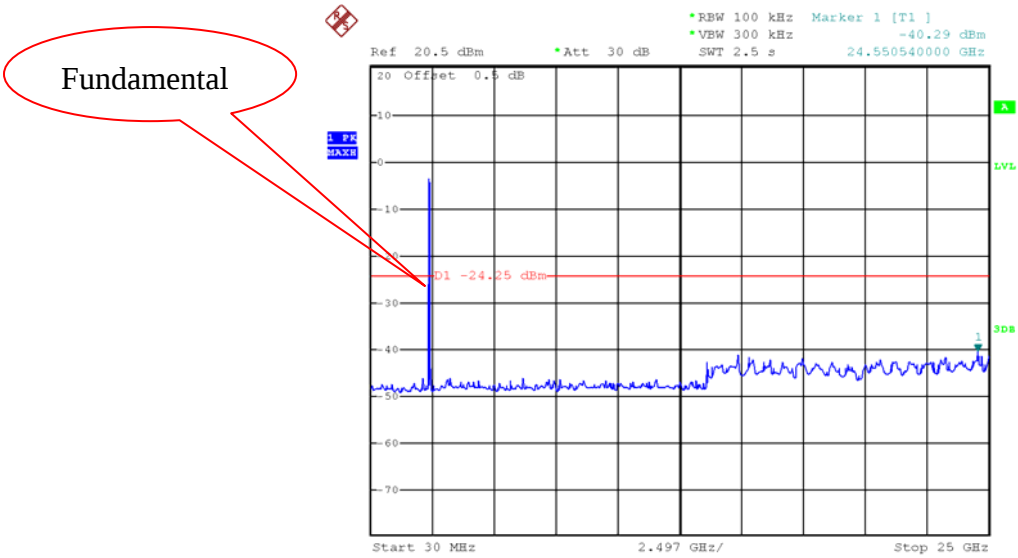


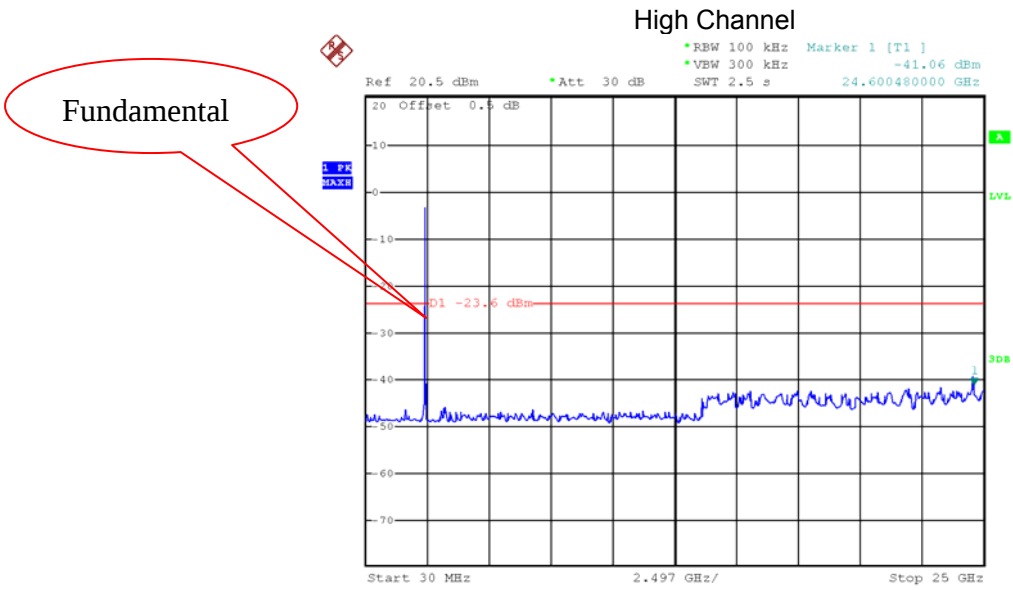
802.11n HT40

Low Channel



Middle Channel





11 Bandwidth Measurement

Test Requirement:

FCC CFR47 Part 15 Section 15.247

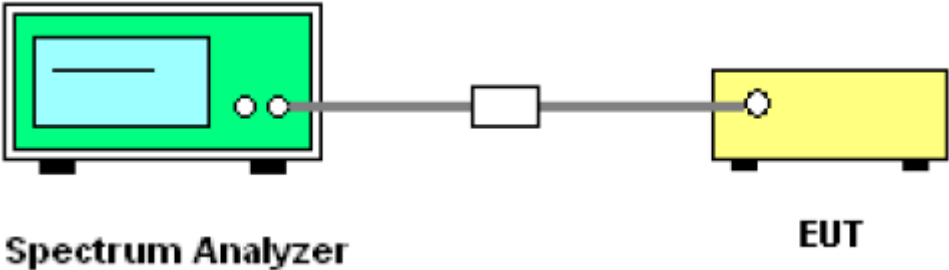
Test Method:

558074 D01 15.247 Meas Guidance v05r02, ANSI C63.10:2013

11.1 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/300kHz/1MHz, VBW = 300kHz/1MHz/3MHz

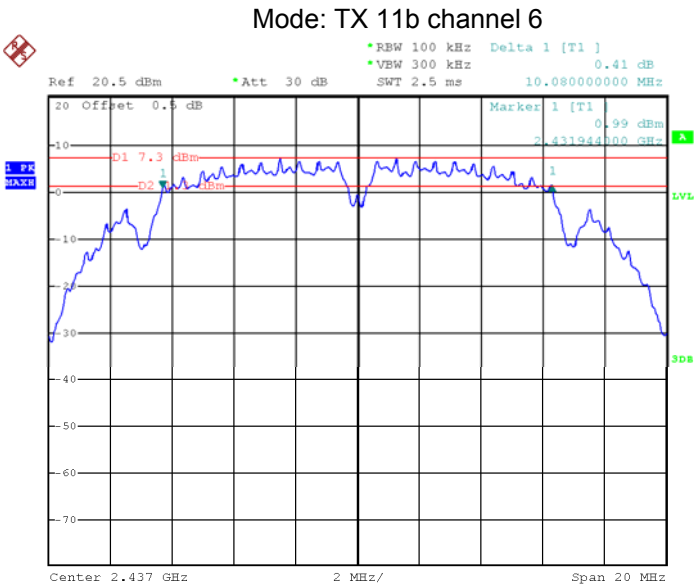
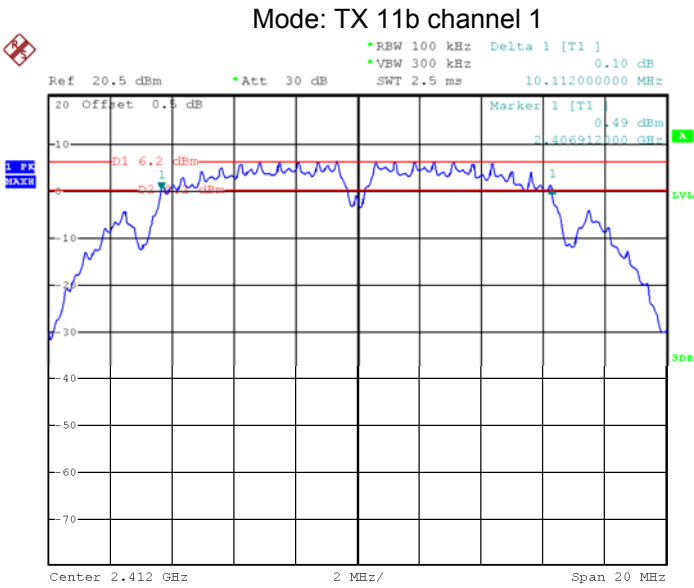
11.2 Test Setup

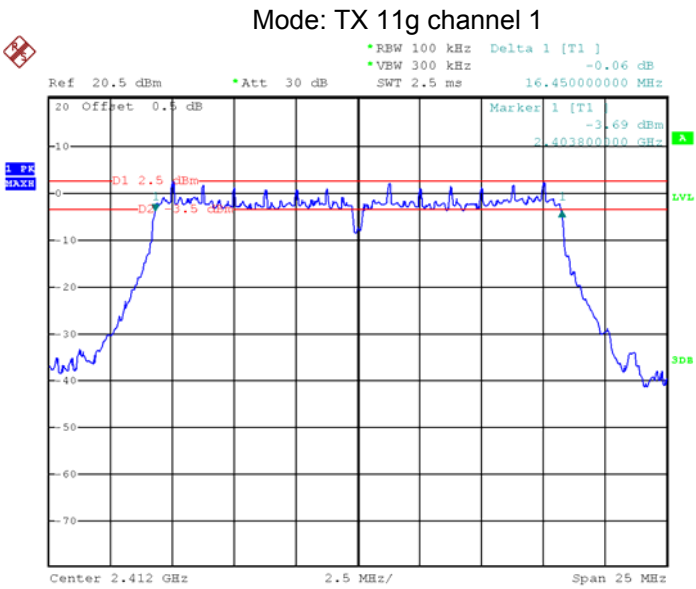
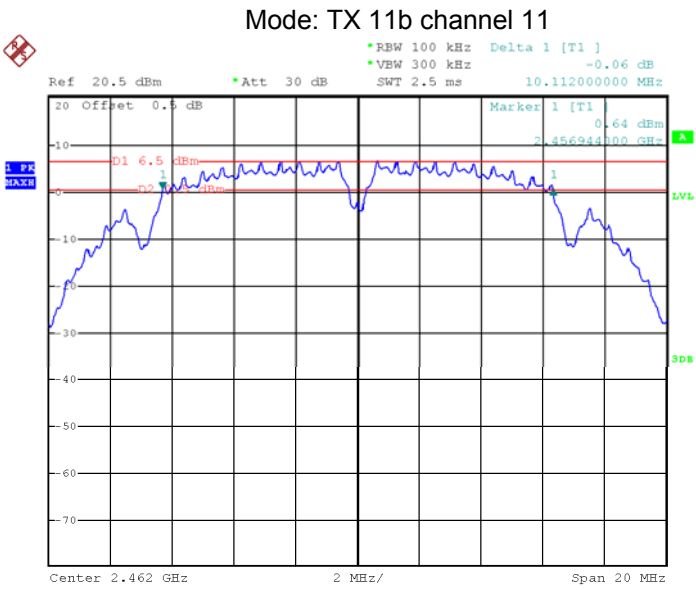


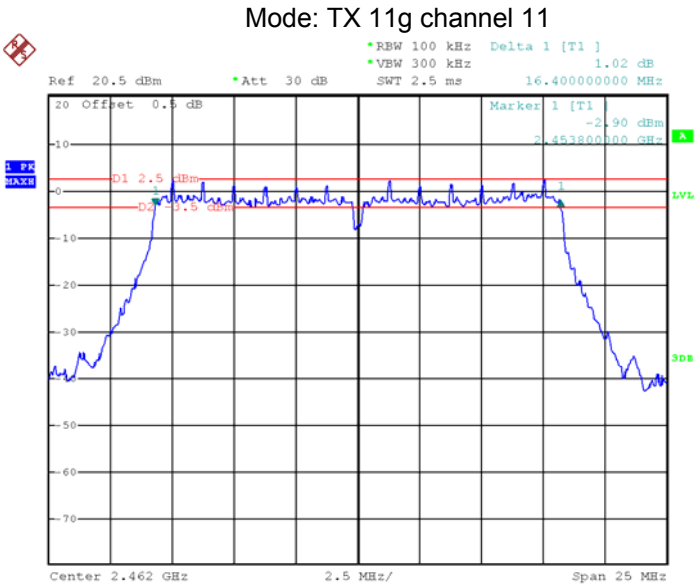
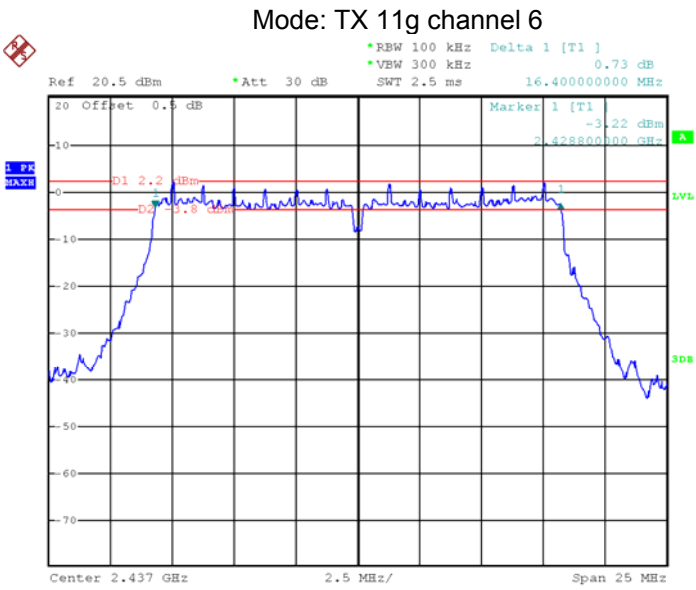
11.3 Test Result

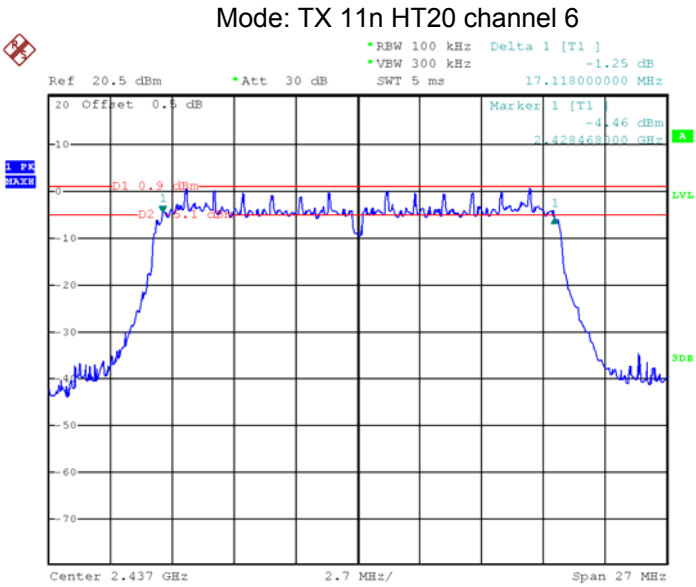
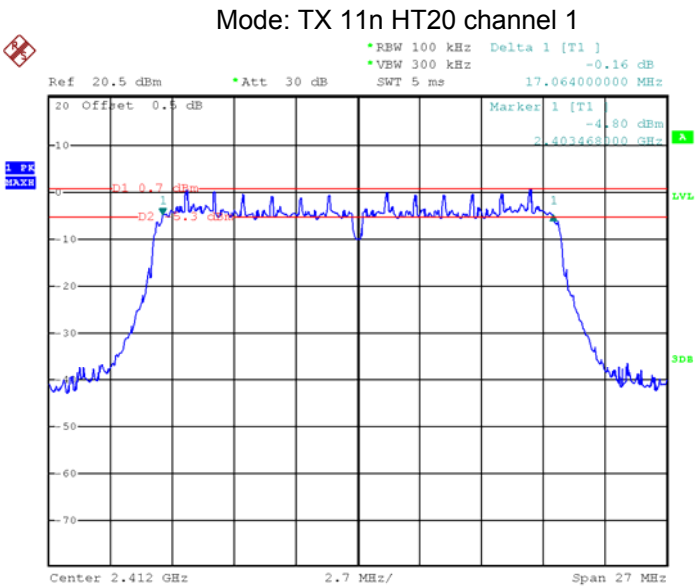
Operation mode	6dB Bandwidth (MHz)			99% Bandwidth (MHz)		
	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
TX 11b	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	10.112	10.080	10.112	12.320	12.160	12.320
TX 11g	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	16.450	16.400	16.400	16.500	16.500	16.450
TX 11n HT20	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	17.064	17.118	17.010	17.604	17.550	17.496
TX 11n HT40	Channel 3	Channel 6	Channel 9	Channel 3	Channel 6	Channel 9
	35.530	35.640	35.640	35.970	35.970	35.970

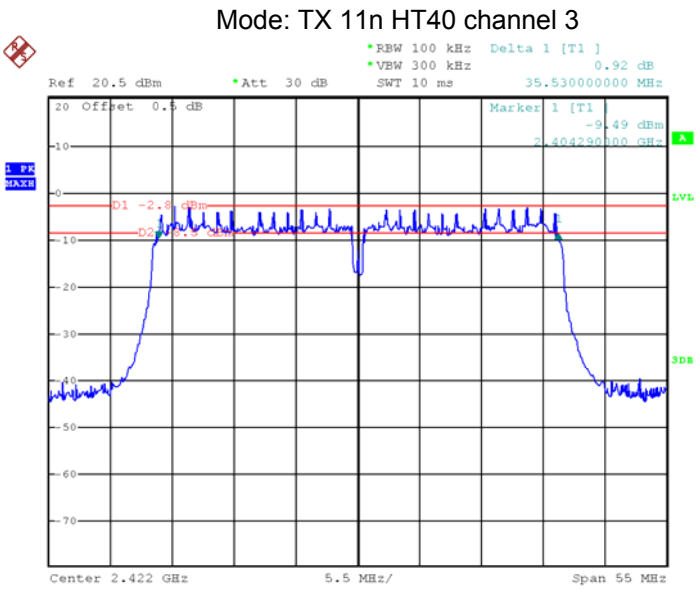
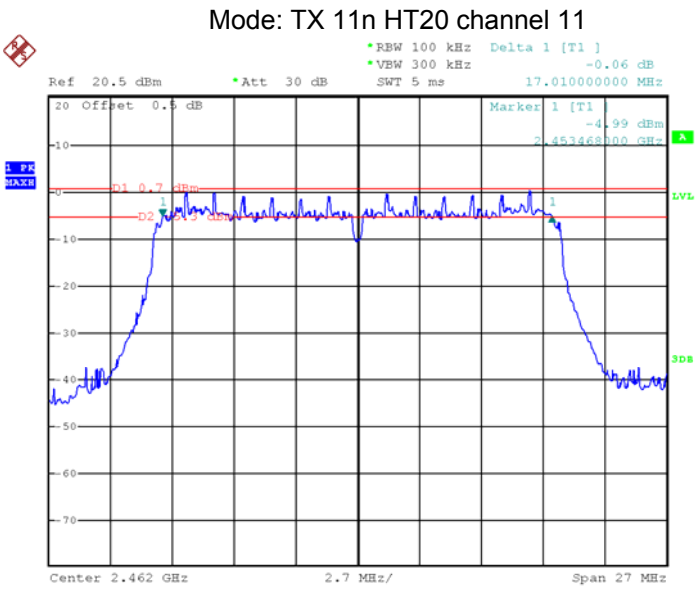
6dB Bandwidth Test result plot as follows:

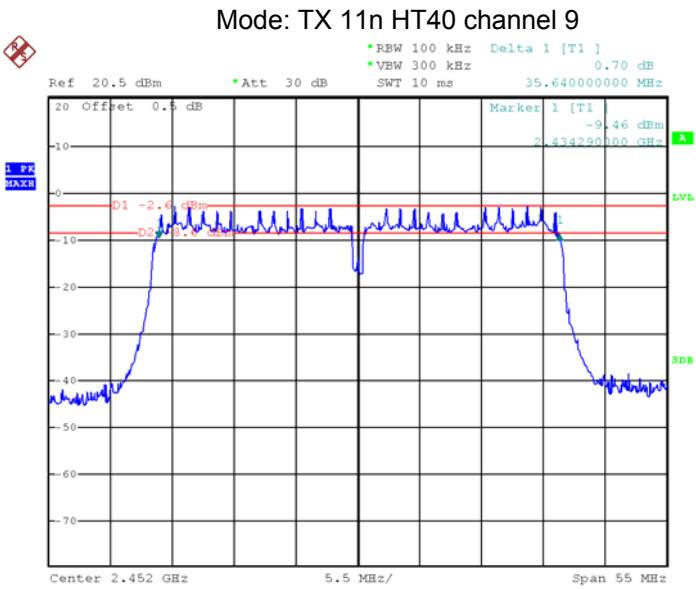
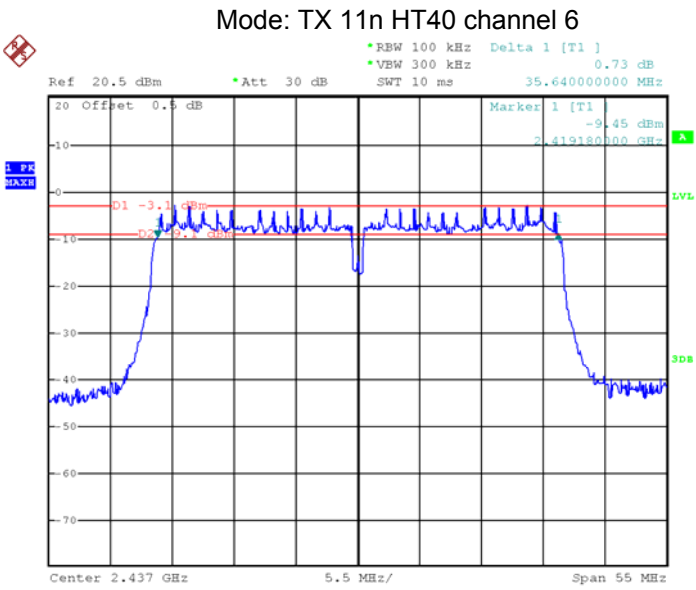




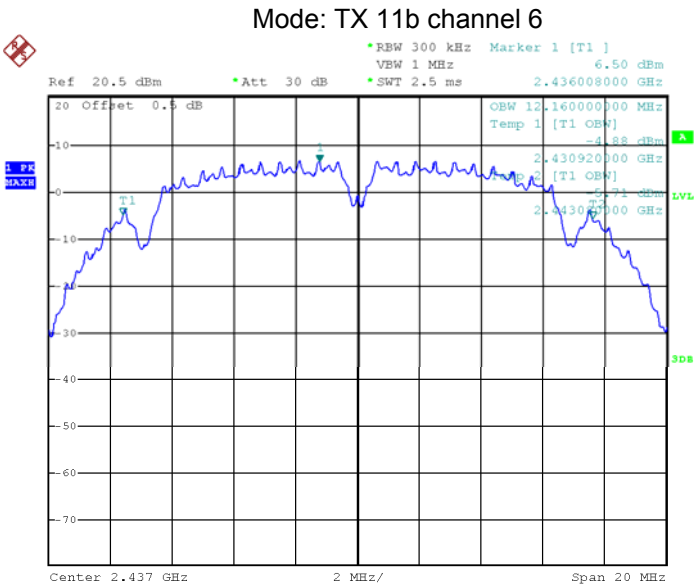
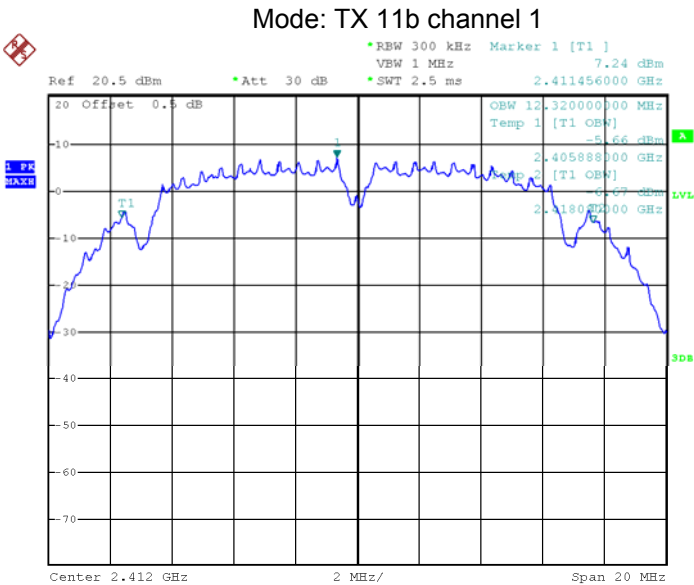


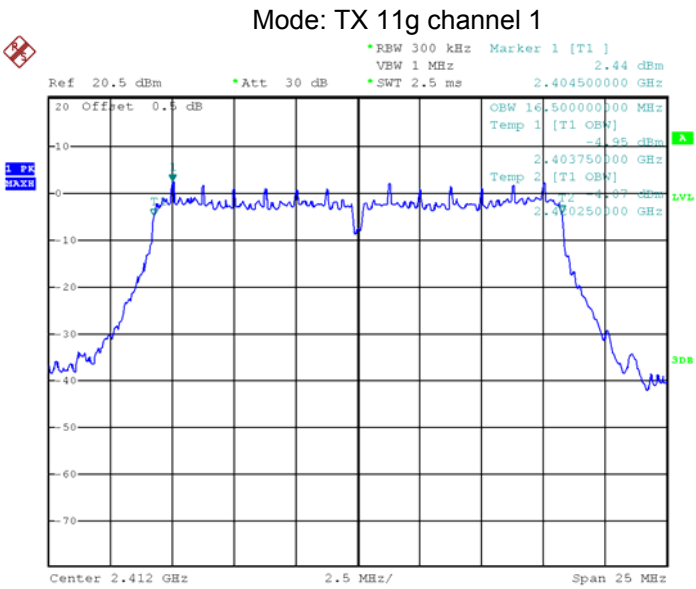
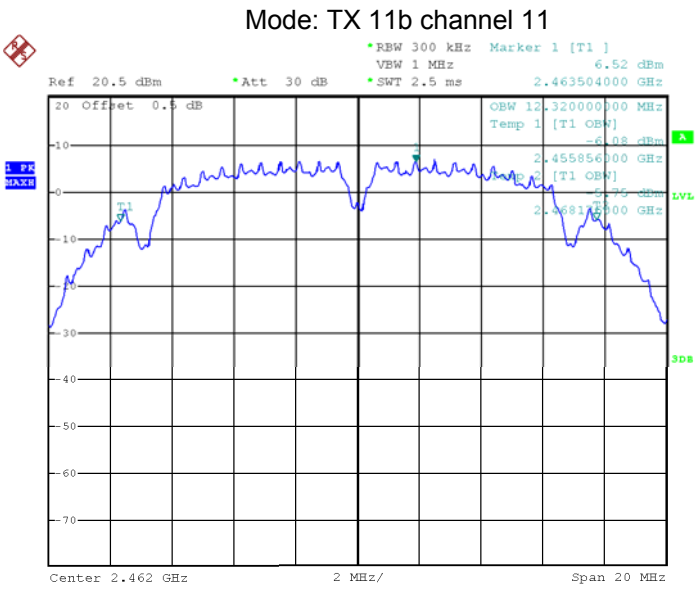


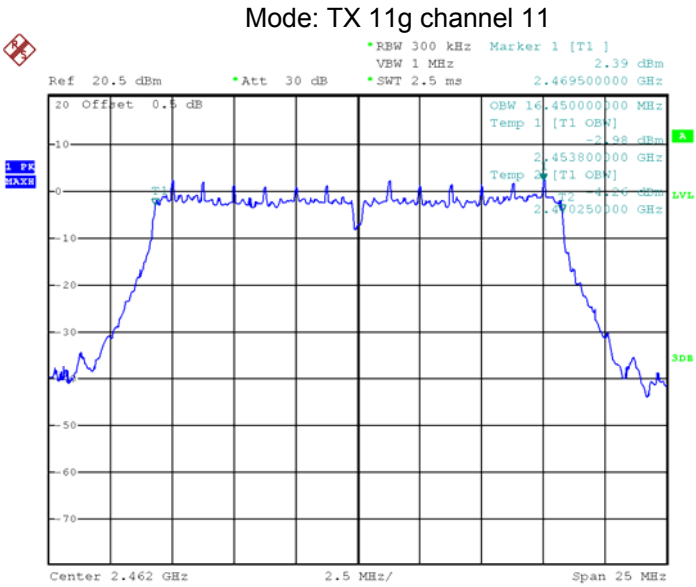
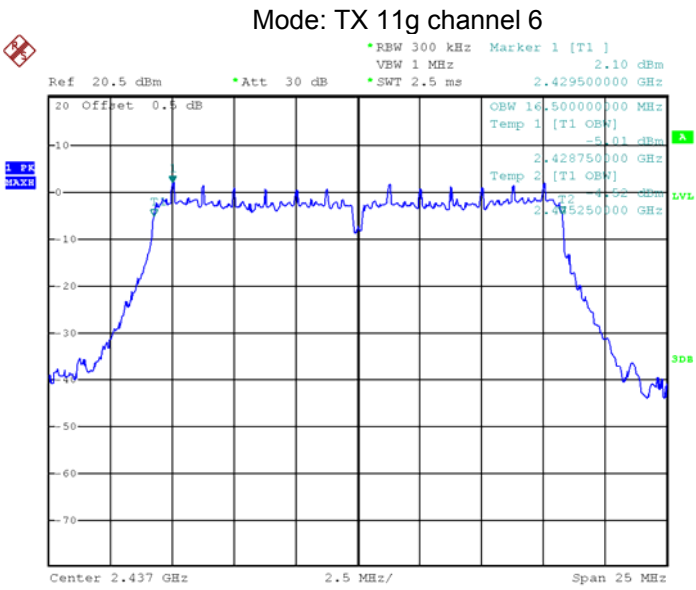


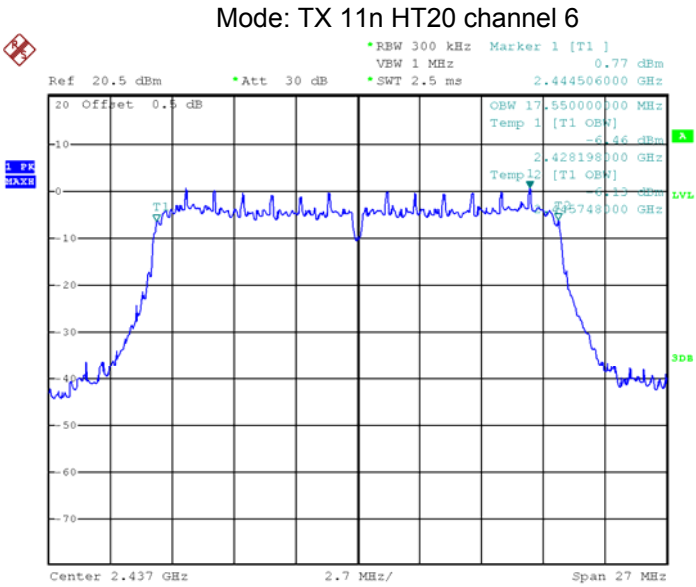
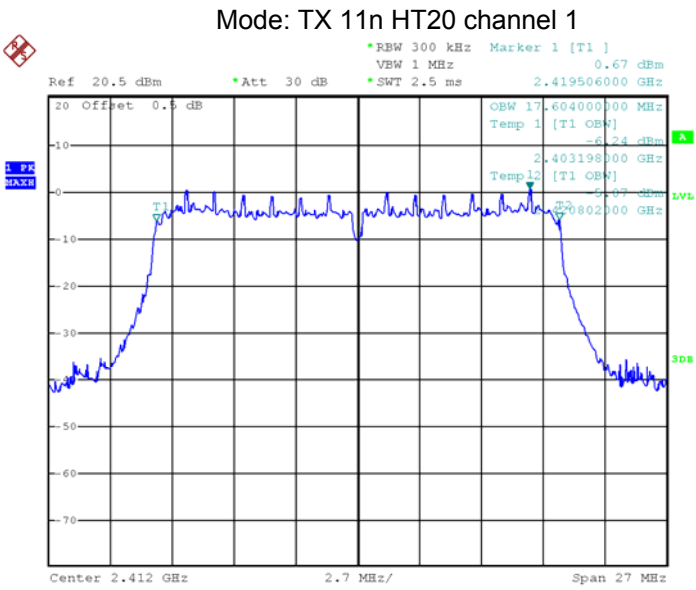


99% Bandwidth Test result plot as follows:

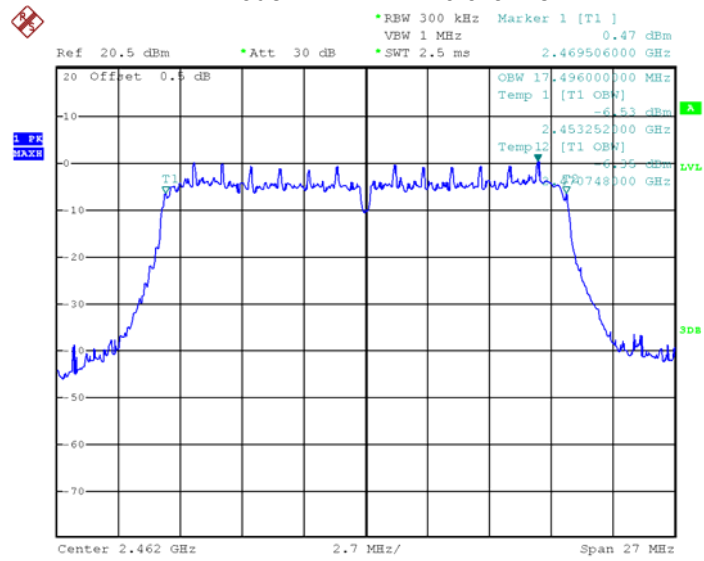




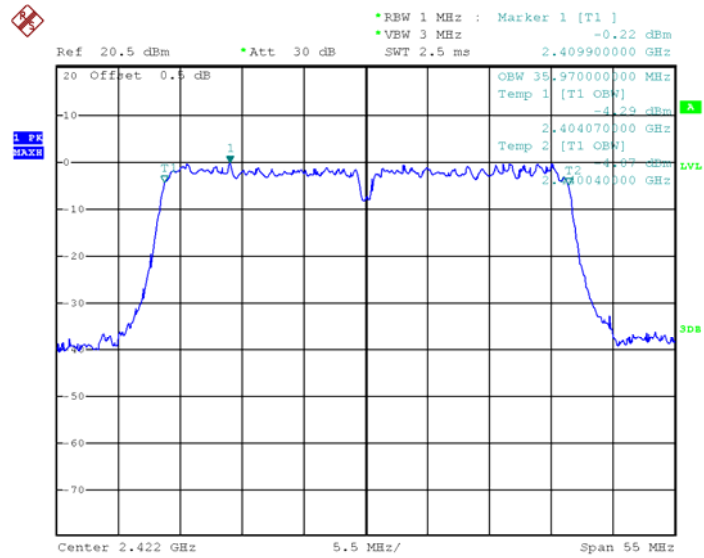




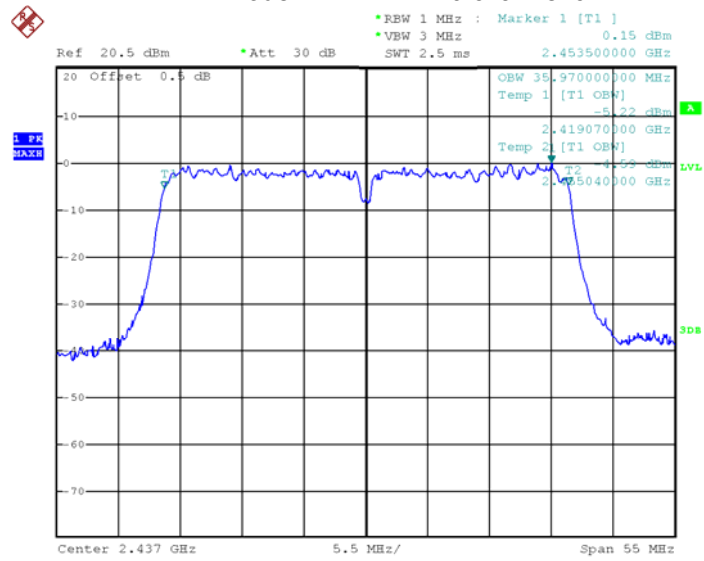
Mode: TX 11n HT20 channel 11



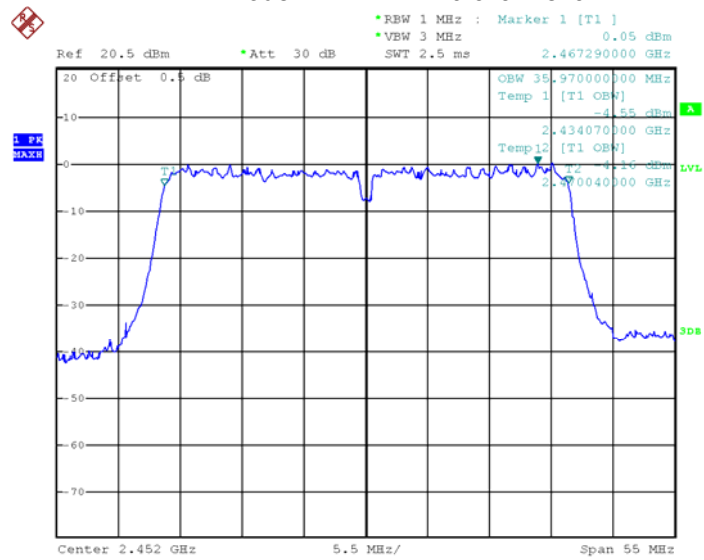
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



12 Maximum Peak output power

Test Requirement:

FCC CFR47 Part 15 Section 15.247

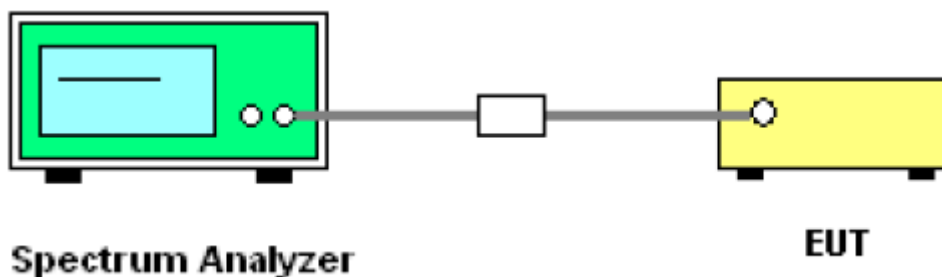
Test Method:

558074 D01 15.247 Meas Guidance v05r02, ANSI C63.10:2013

12.1 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 = 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.

12.2 Test Setup



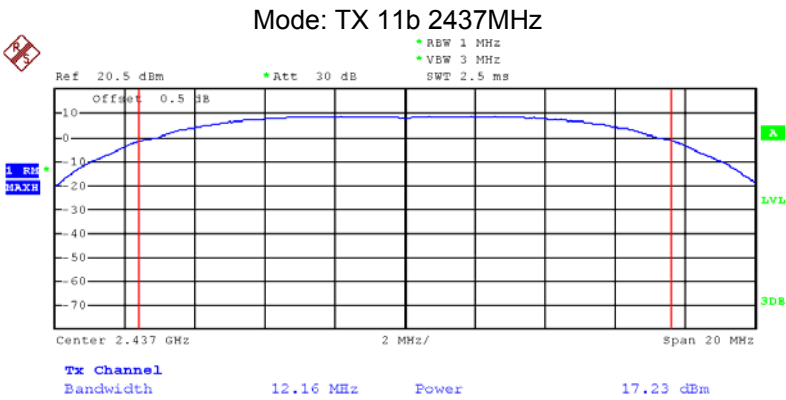
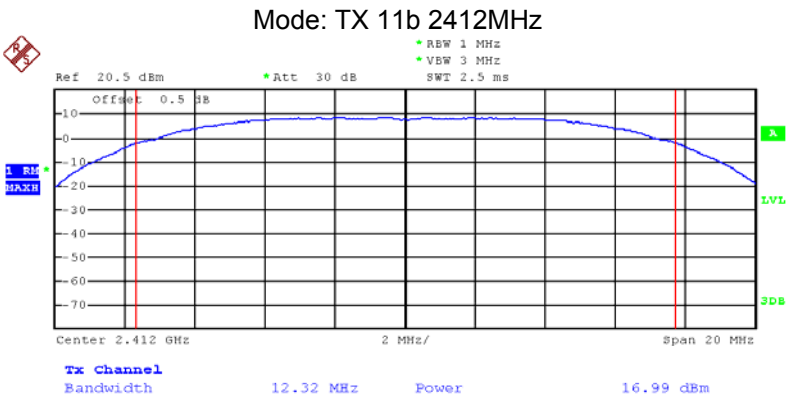
12.3 Test Result

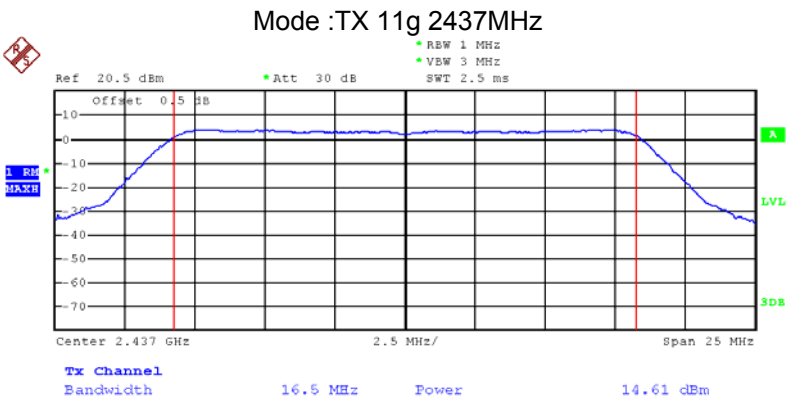
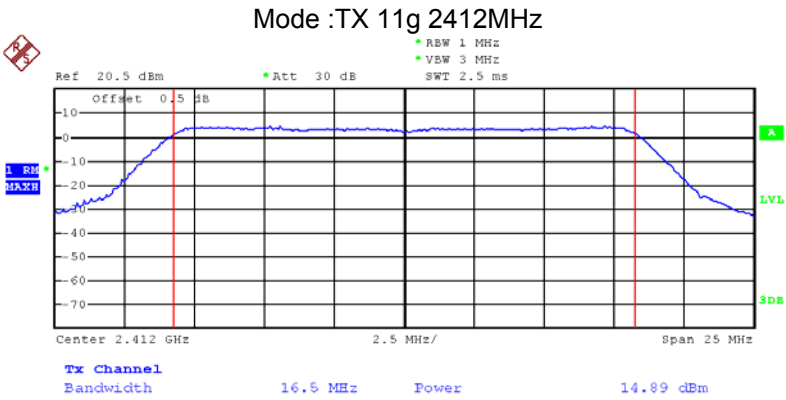
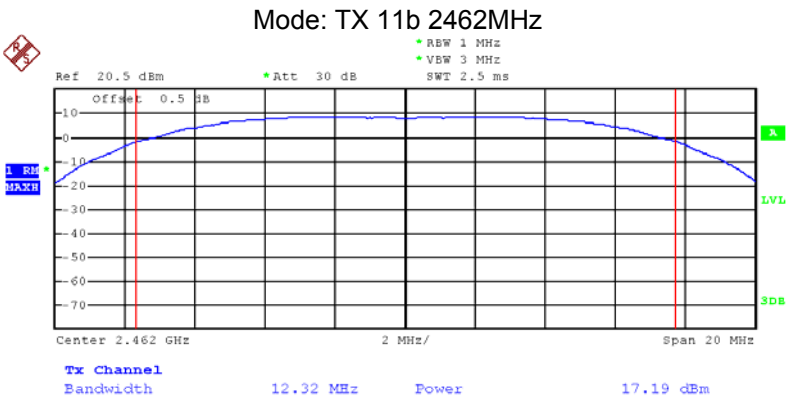
Test mode :TX 11b		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
16.99	17.23	17.19
Limit: 1W/30dBm		

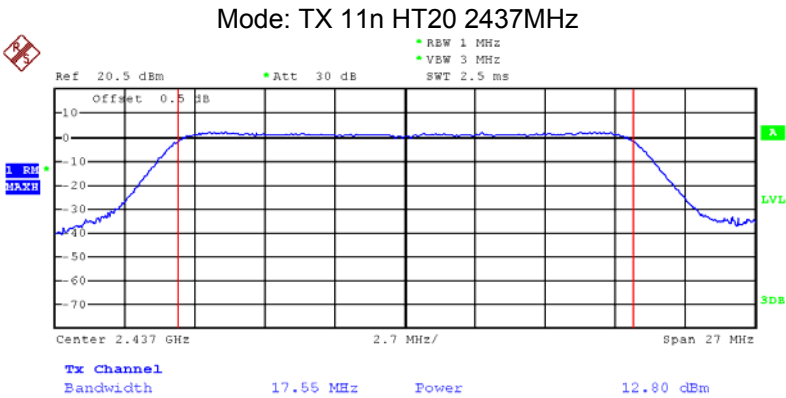
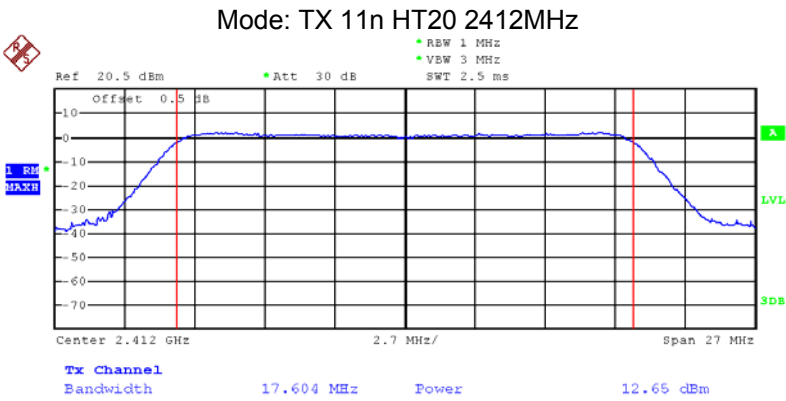
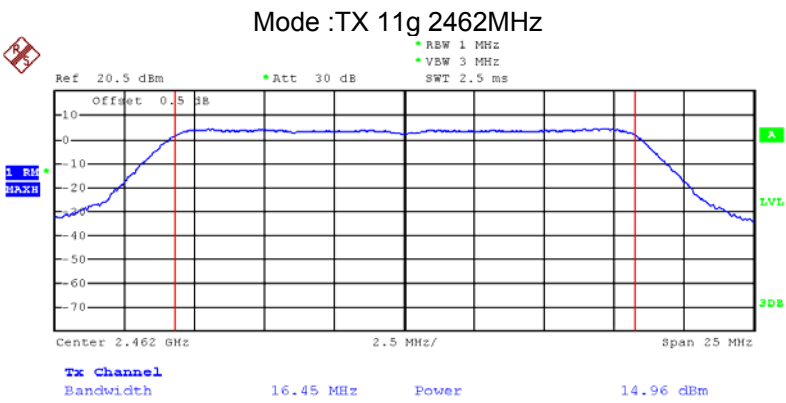
Test mode :TX 11g		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
14.89	14.61	14.96
Limit: 1W/30dBm		

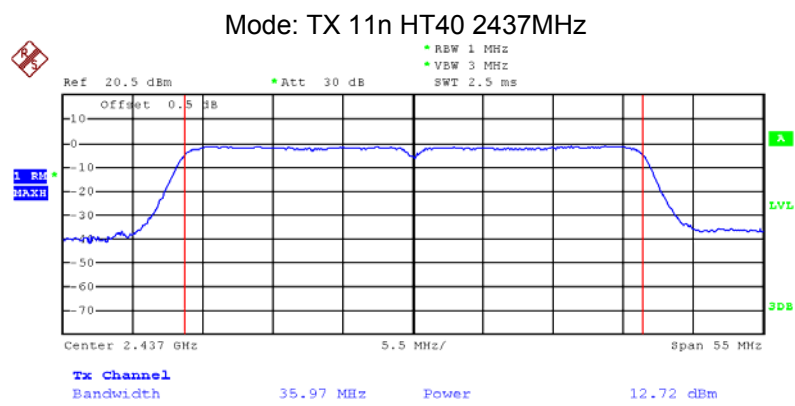
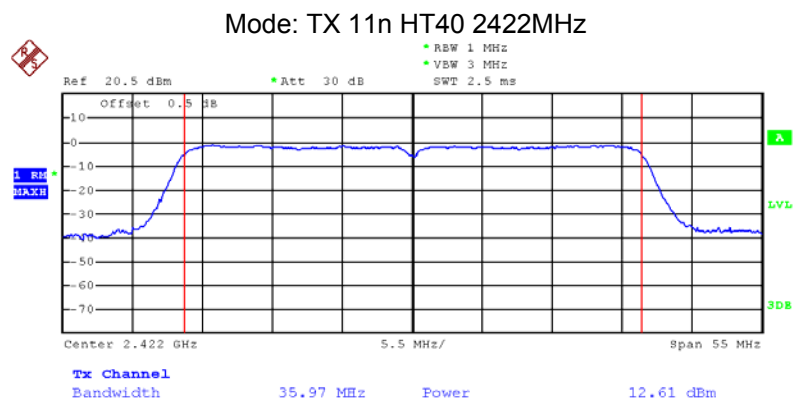
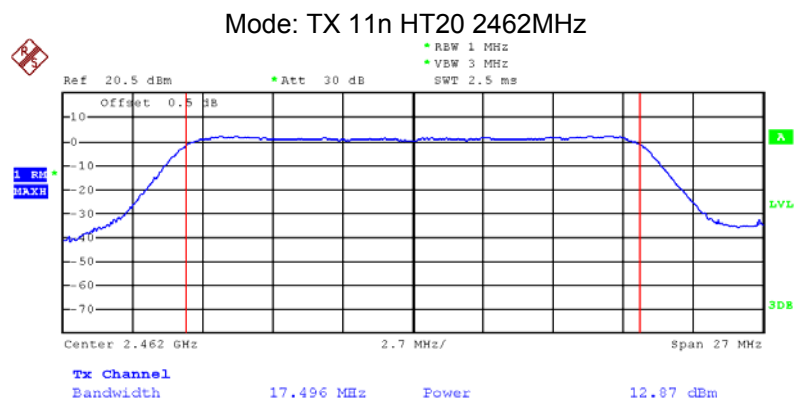
Test mode :TX 11n HT20		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
12.65	12.80	12.87
Limit: 1W/30dBm		

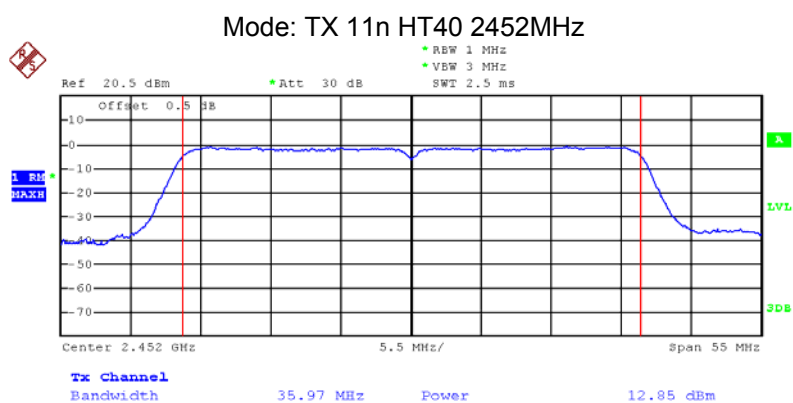
Test mode : TX 11n HT40		
Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
12.61	12.72	12.85
Limit: 1W/30dBm		











13 Power Spectral density

Test Requirement:

FCC CFR47 Part 15 Section 15.247

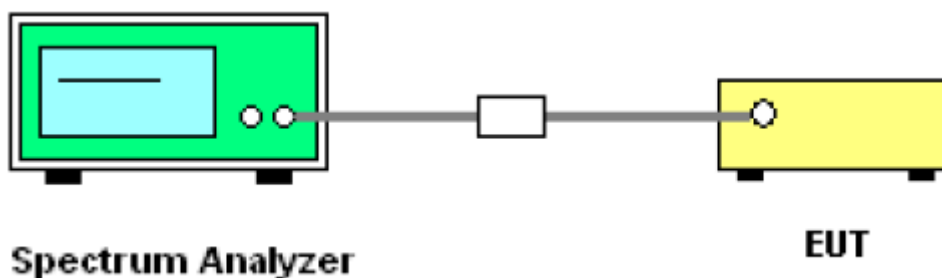
Test Method:

558074 D01 15.247 Meas Guidance v05r02, ANSI C63.10:2013

13.1 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 = 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.

13.2 Test Setup



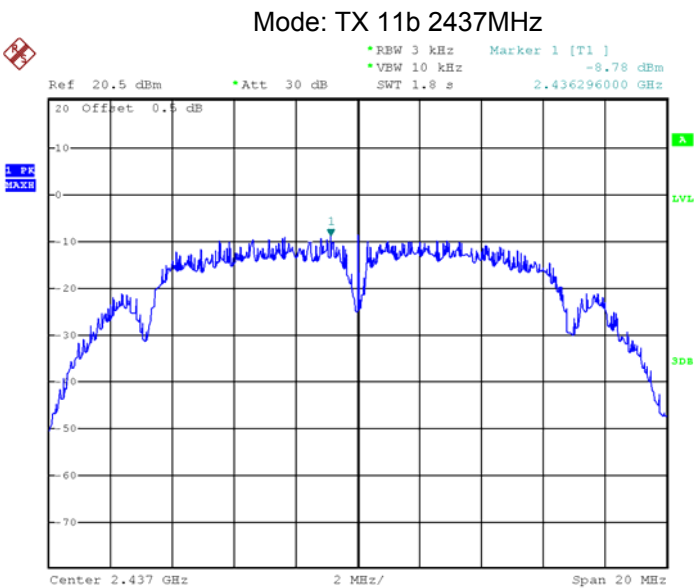
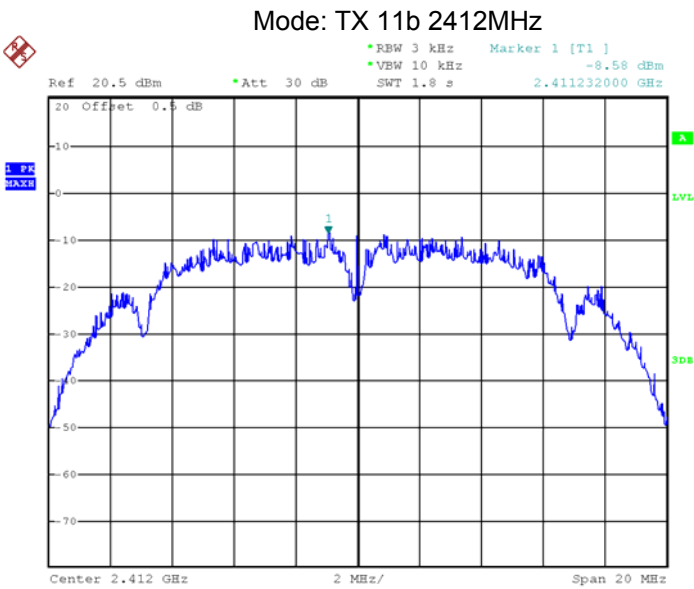
13.3 Test Result

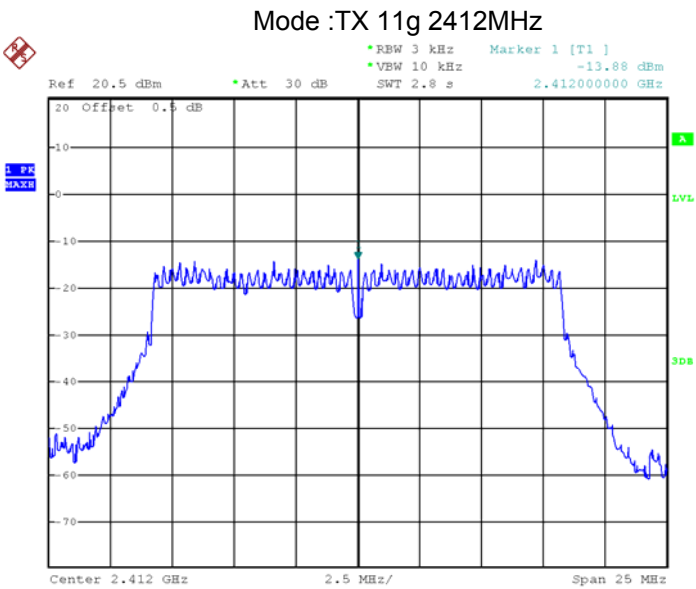
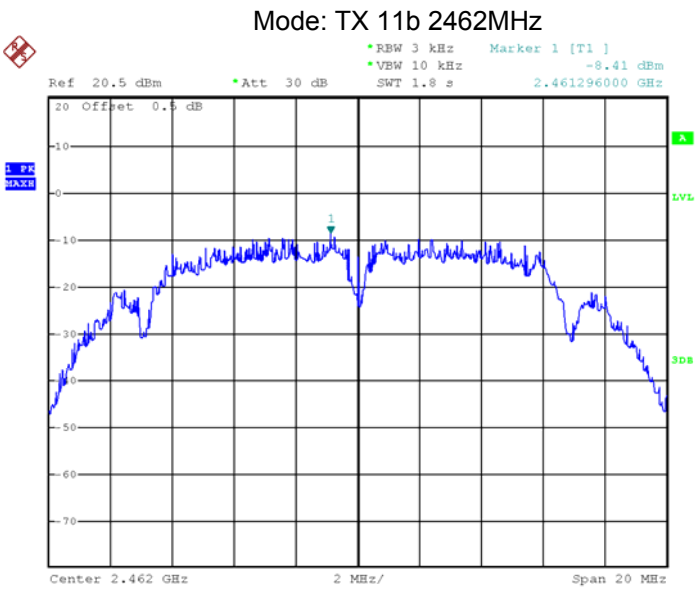
Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-8.58	-8.78	-8.41
Limit: 8dBm per 3kHz		

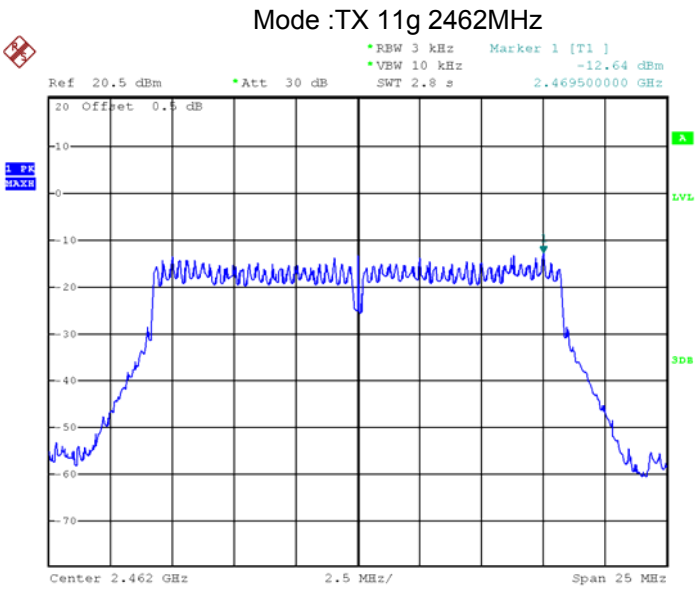
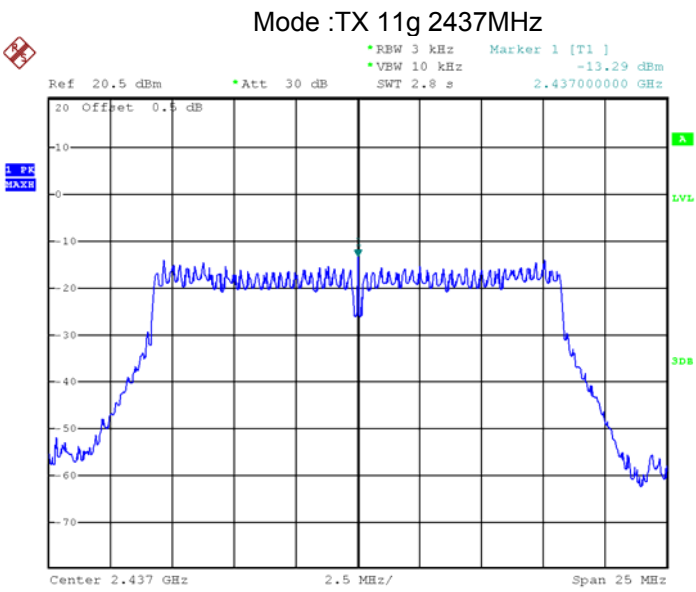
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-13.88	-13.29	-12.64
Limit: 8dBm per 3kHz		

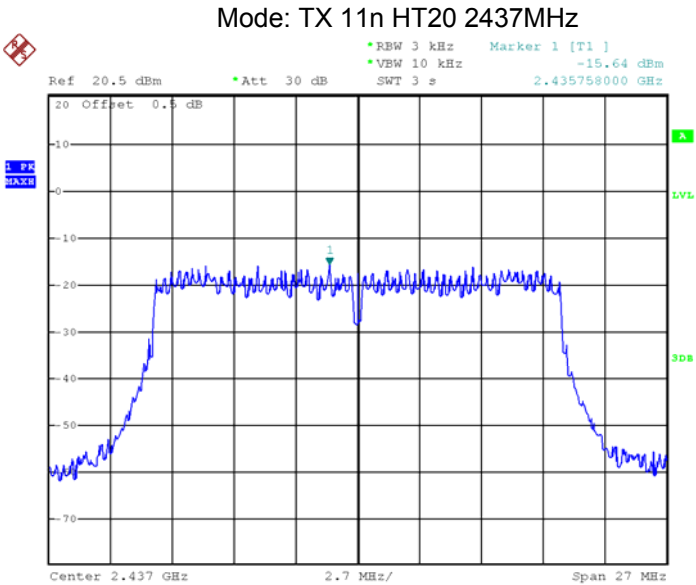
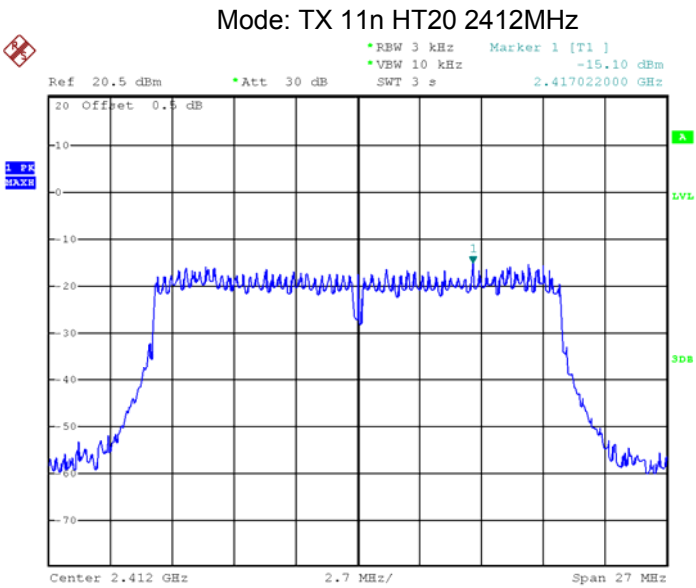
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-15.10	-15.64	-15.01
Limit: 8dBm per 3kHz		

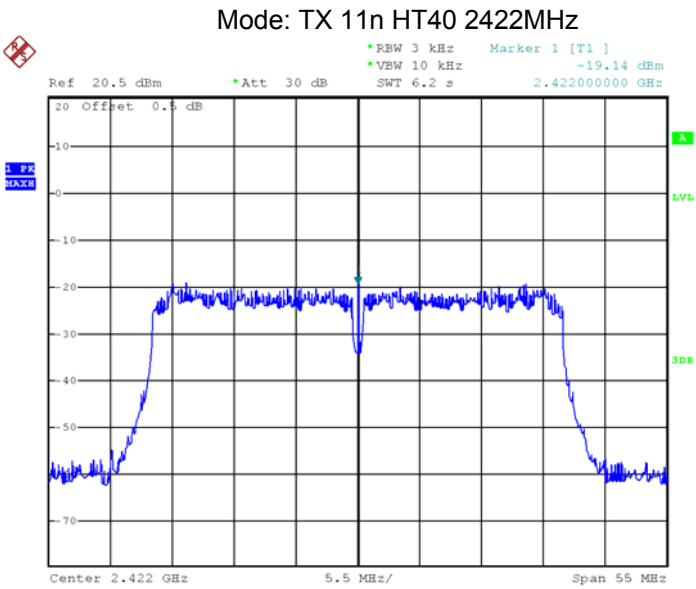
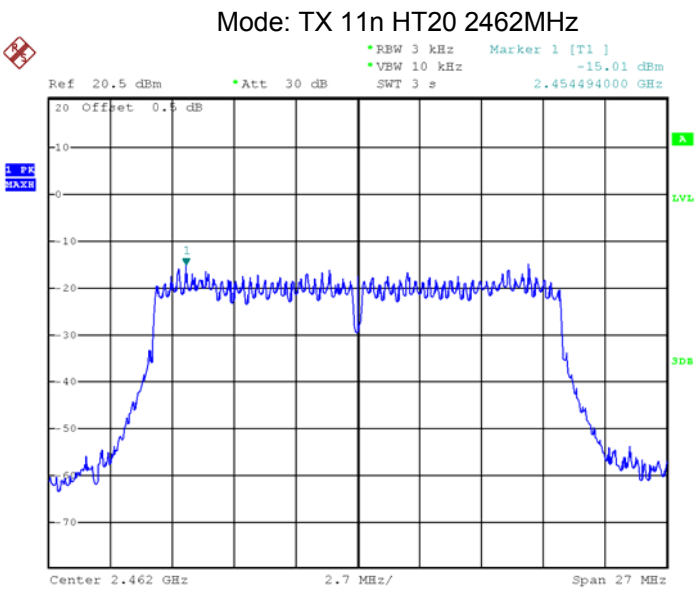
Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-19.14	-18.24	-17.78
Limit: 8dBm per 3kHz		

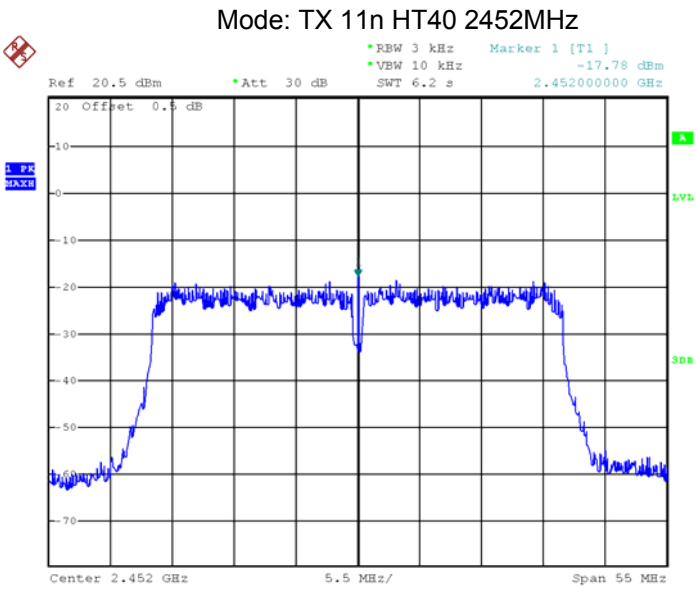
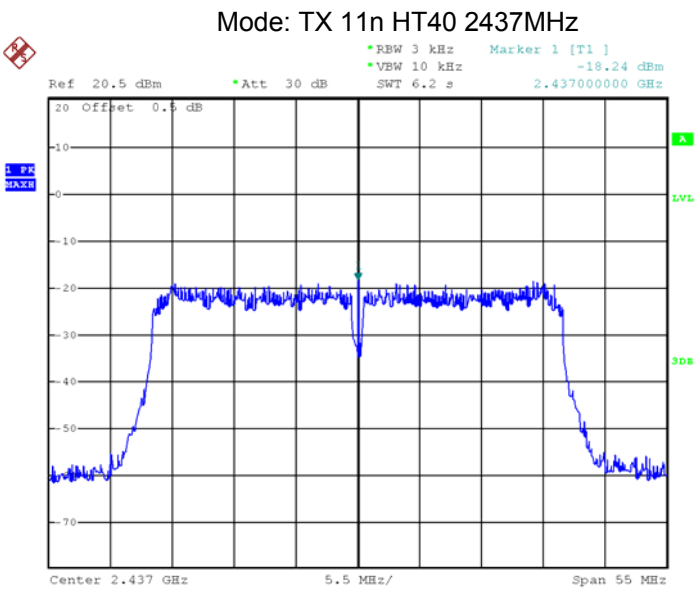












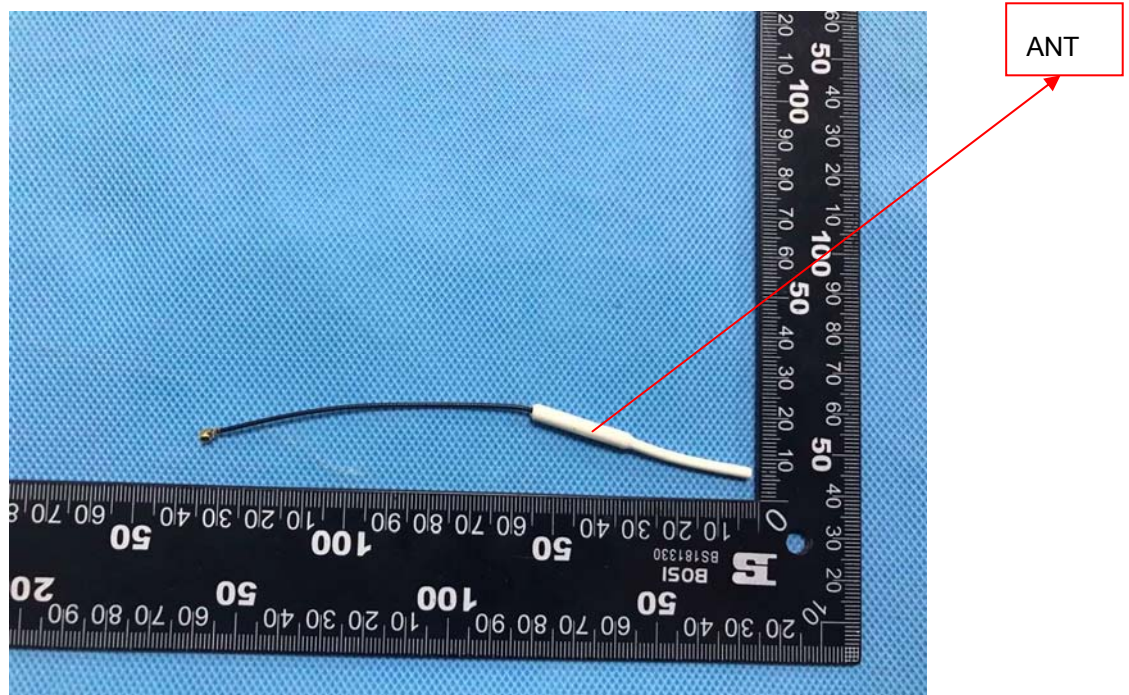
14 Antenna Requirement

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 has one Dipole Antenna, meets the requirements of FCC 15.203.



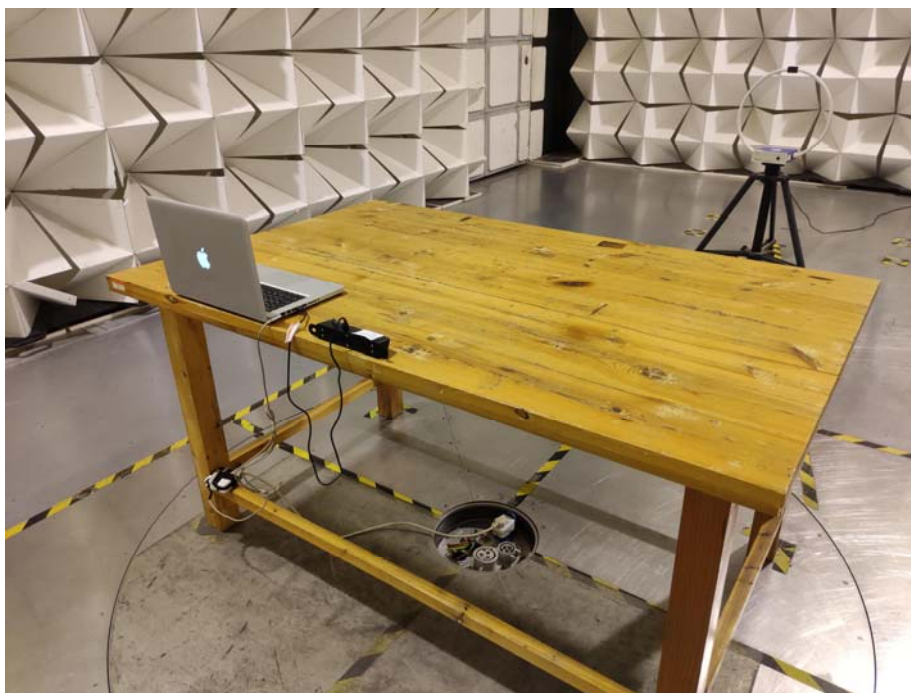
15 FCC ID: WUI-BT57799 RF Exposure Report

Note: Please refer to RF Exposure Report: WTD20S05029615W002.

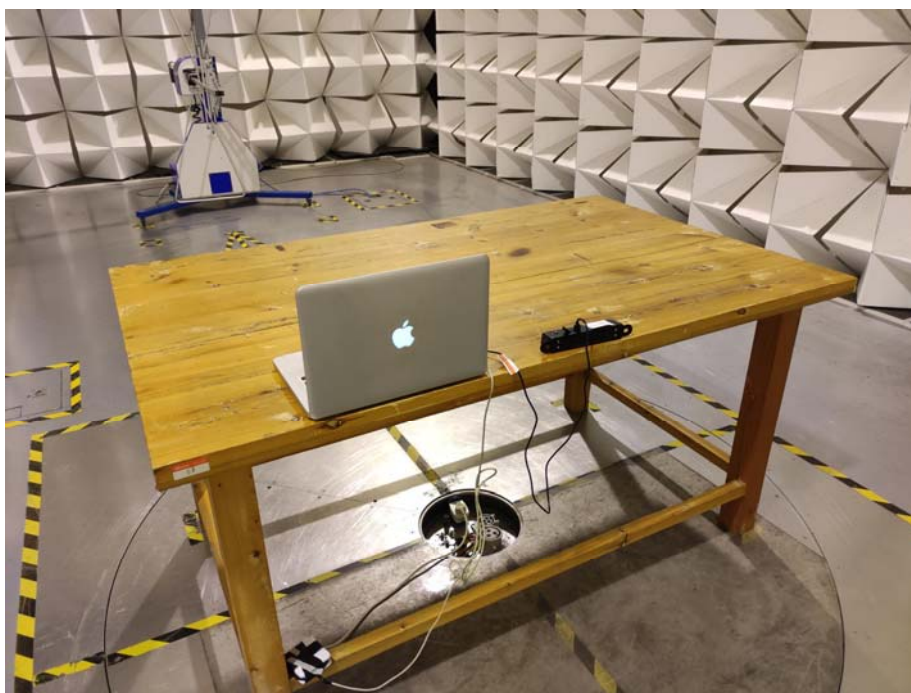
16 Photographs – Model BT57799 Test Setup

16.1 Radiated Emission

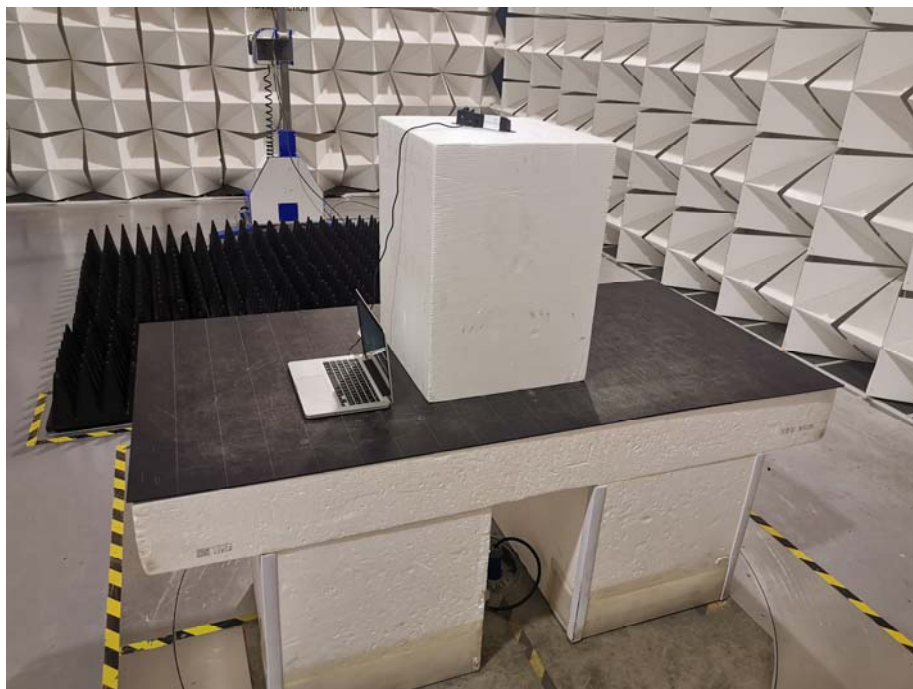
Test frequency 9kHz to 30MHz



Test frequency from 30MHz to 1GHz



Test frequency above 1GHz

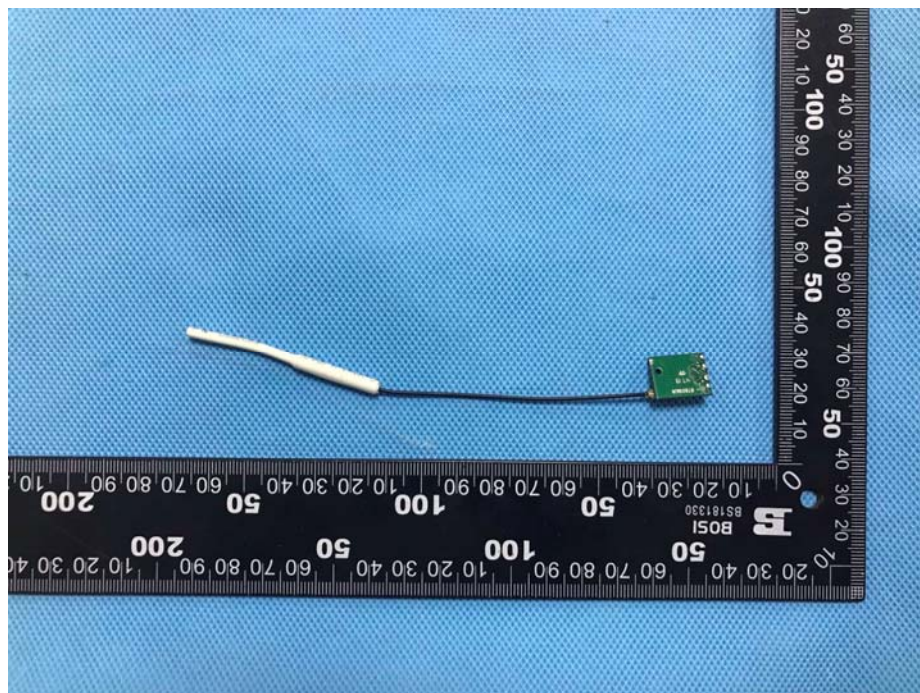
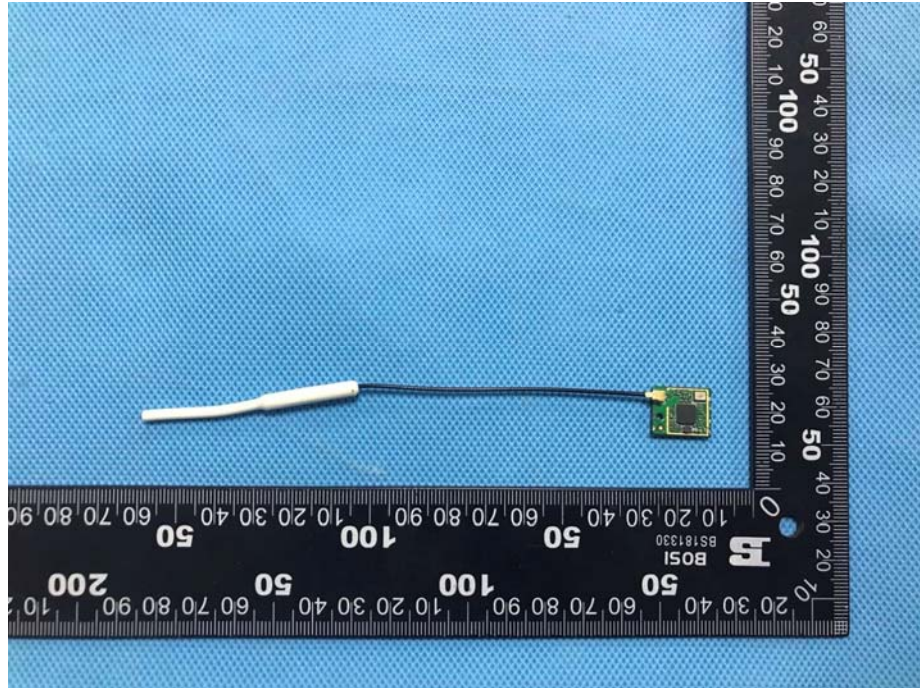


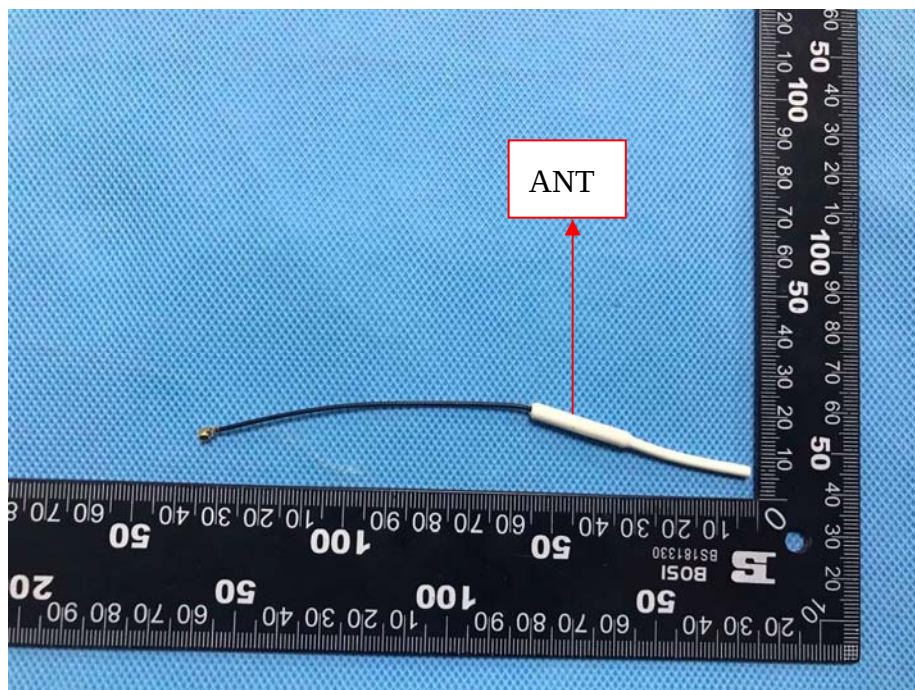
16.2 Conducted Emission



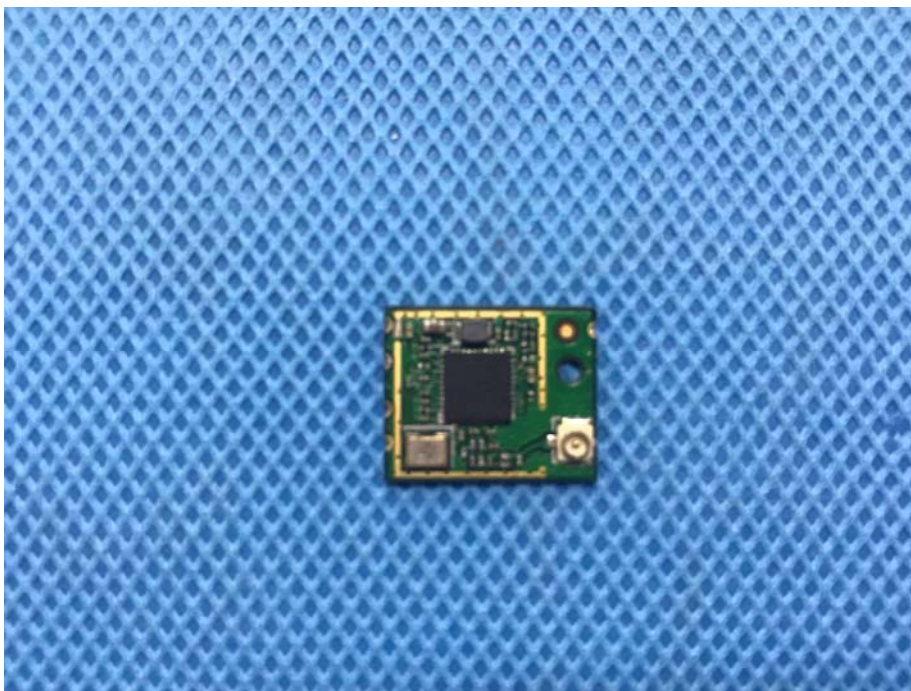
17 Photographs - Constructional Details

17.1 Model BT57799 External Photos of Module



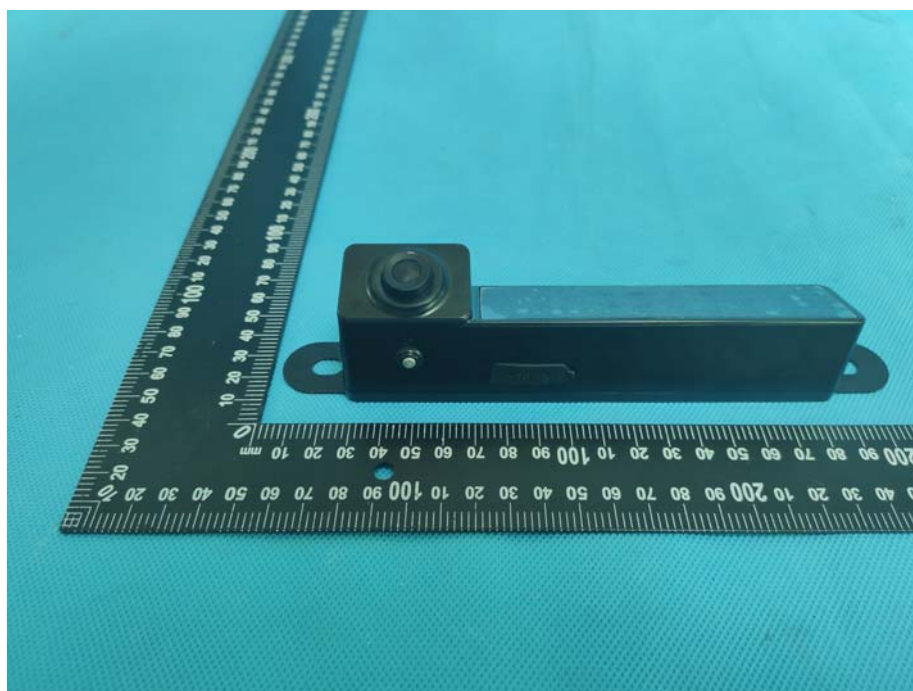


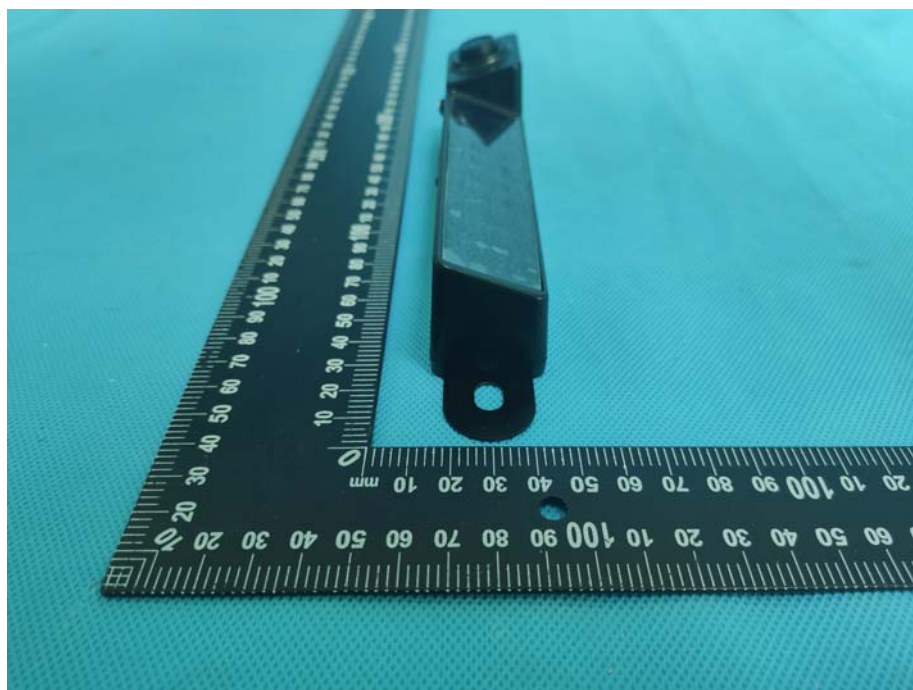
17.2 Model BT57799 Internal Photos of Module

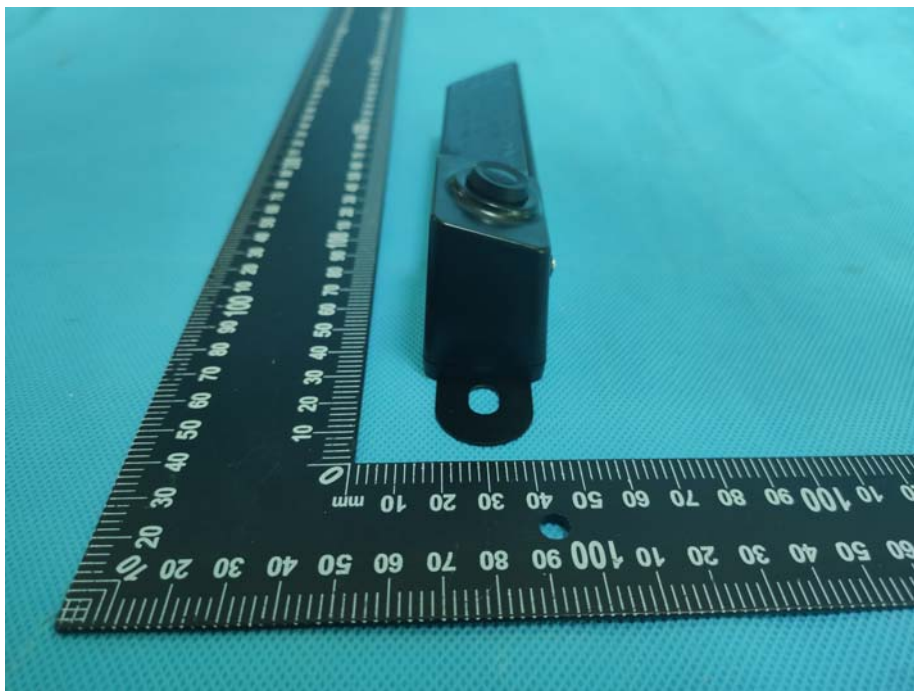


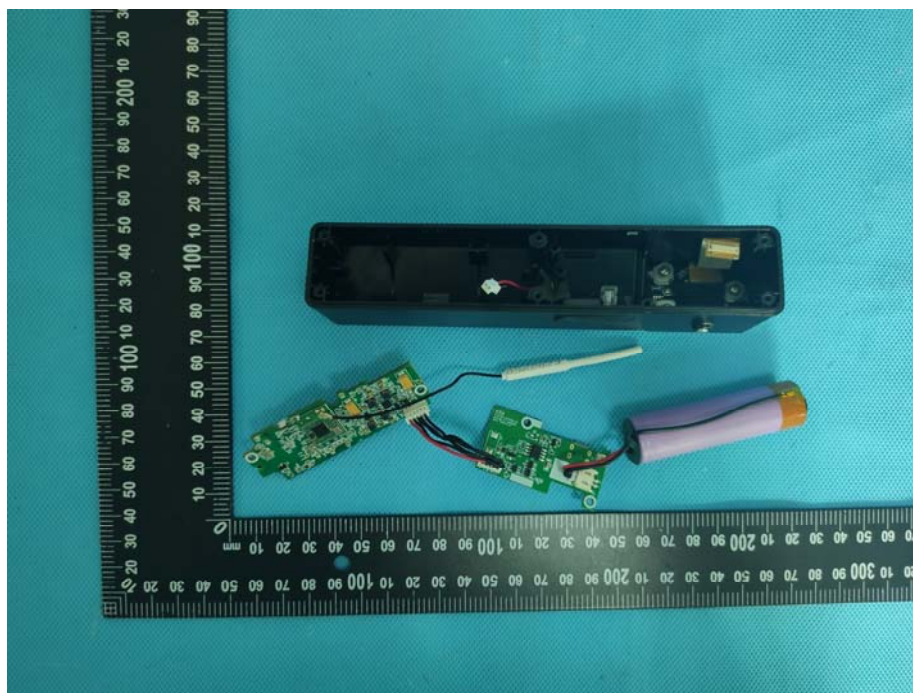
17.3 Photos of Host











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