PRECISE TESTING

FCC RADIO TEST REPORT
FCC ID: 2AC7RCAMIPPT08

Product： IP Pan and Tilt Wireless Camera
Trade Name：Night Owl
Model Name：CAM-IPPT-HDW

Prepared for

Henan Taide Electronic Technology CO., Ltd

16# Gong Ye San Road, Fengqiu Country, Xinxiang City, Henan Province

Prepared by

DongGuan Precise Testing Service Co.,Ltd.

Room 203-204, 2F, Xinye Building, No.67 Shijing, Guanzhang Road, Dongguan, China

TEST RESULT CERTIFICATION

Applicant's name ..... Henan Taide Electronic Technology CO., Ltd
Address ..... 16# Gong Ye San Road, Fengqiu Country, Xinxiang City, Henan Province

Manufacture's Name... Henan Taide Electronic Technology CO., Ltd
Address ..... 16# Gong Ye San Road, Fengqiu Country, Xinxiang City, Henan Province

Product description

Product name ..... IP Pan and Tilt Wireless Camera

Model and/or type reference ..... CAM-IPPT-HDW

Serial Model ..... N/A

In all, the original product and the alternative product are the same.

Standards ..... FCC Part15.247

Test procedure ..... ANSI C63.10-2003

This device described above has been tested by PTS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test .....

Date (s) of performance of tests ..... 22, Oct. 2014 ~ 27,Oct. 2014

Date of Issue ..... 27, Oct. 2014

Test Result..... **Pass**

Testing Engineer **:** Assistant

Technical Manager **:** Supervisor

Authorized Signatory **:** Jacky Ou / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.247 15.205(a) 15.209(a)	PASS
Conducted Emissions	15.207(a)	PASS
6dB 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
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

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3 General Information

3.1 General Description of E.U.T.

Product Name : IP Pan and Tilt Wireless Camera

Model No. : CAM-IPPT-HDW

Brand Name : Night Owl

Model Description : N/A

Operation Frequency : 2412MHz ~ 2462MHz, 2422MHz~2452MHz

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.)

Oscillator : 40MHz for RF module

Antenna Gain : 2dBi

3.2 Details of E.U.T.

Technical Data : (1)DC 5V, 2000mA by adapter
(2)AC 100-240V, 0.5A

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 Description of Support Units

No.	Equipment	Manufacturer	Model No.	Serial No.
1.	Notebook	LENOVO	X201i	75Y4408

3.5 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	3/9	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 .

The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Table 2 Tests Carried Out Under FCC part 15.207 & FCC part 15.209

Test Item	Test Mode
Conduction Emission, 0.15MHz to 30MHz	Communication

3.6 Test Facility

The test facility has a test site registered with the following organizations:

NTEK Testing Technology Co., Ltd
Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration No.:238937; IC Registration No.:9270A-1
CNAS Registration No.:L5516
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3.7 Test Location

All the tests were performed at:
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

4 Equipment Used during Test

4.1 Equipments List

Mains Terminal Disturbance Voltage (Conducted Emission)						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due Date**	Cal. Interval
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.17,2015	1 Y
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.17,2015	1 Y
3.	Cable	LARGE	RF300	-	Sep.17,2015	1 Y
3m Semi-anechoic Chamber for Radiation						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due Date**	
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.17,2015	1 Y
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.17,2015	1 Y
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2015	1 Y
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.17,2015	1 Y
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2015	1 Y
6	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.06,2015	1 Y
7	Coaxial Cable (above 1GHz)	Top	25MHz-18GHz	EW02014-7	Apr.19,2015	1 Y
8	Horn Antenna	EM	EM-AH-10180	2011071402	Apr.19,2015	1 Y
9	Power meter	Anritsu	ML2487A	6K00002472	Apr.19,2015	1 Y
10	Power sensor	Anritsu	Ml2491A	0033005	Apr.19,2015	1 Y

4.2 Measurement Uncertainty

Parameter	**Uncertainty**
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Temperature	± 1 °C
DC Source	±0.05%
Radiated Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Emissions test	3.64dB (150kHz~30MHz)

4.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

5 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	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) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.1 °C

Humidity: 52% RH

Atmospheric Pressure: 1013 mbar

EUT Operation:

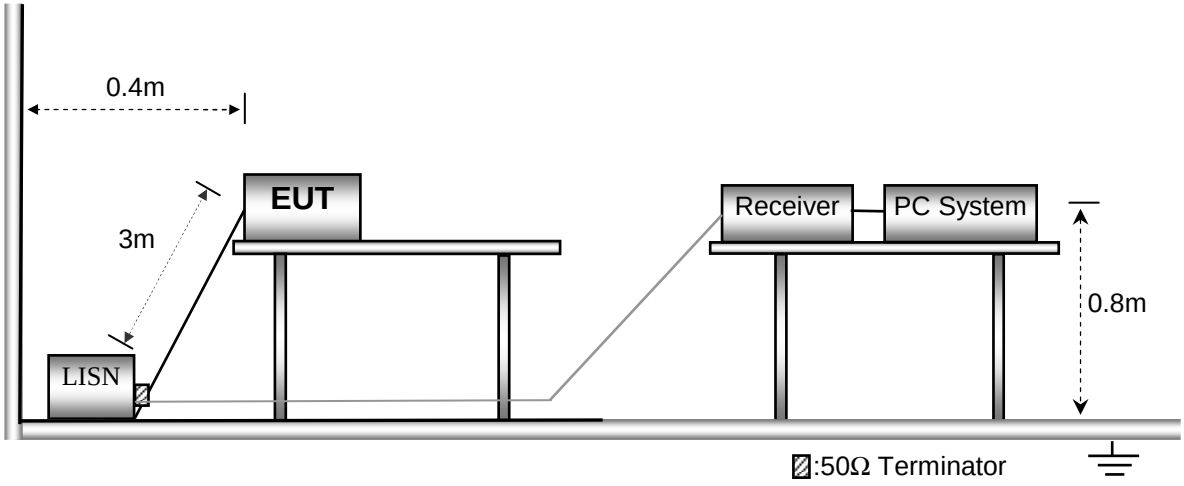
The pre-test was performed in Bluetooth linking, and the data were shown as follow.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

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.

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003.



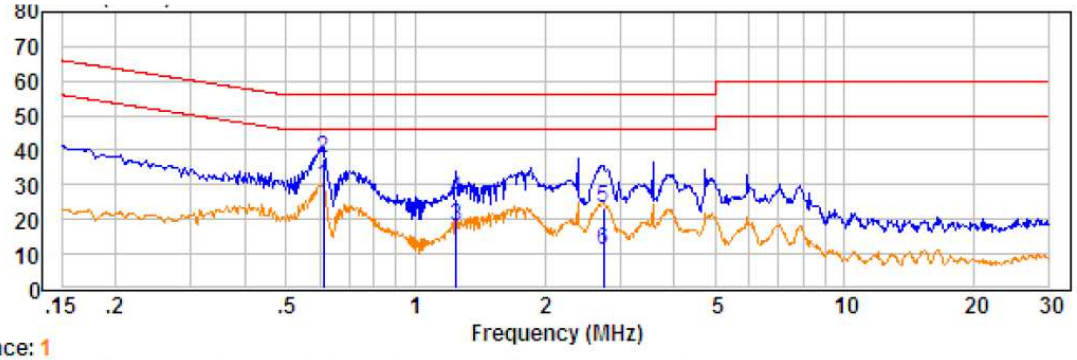
5.3 Measurement Description

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.

5.4 Conducted Emission Test Result

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

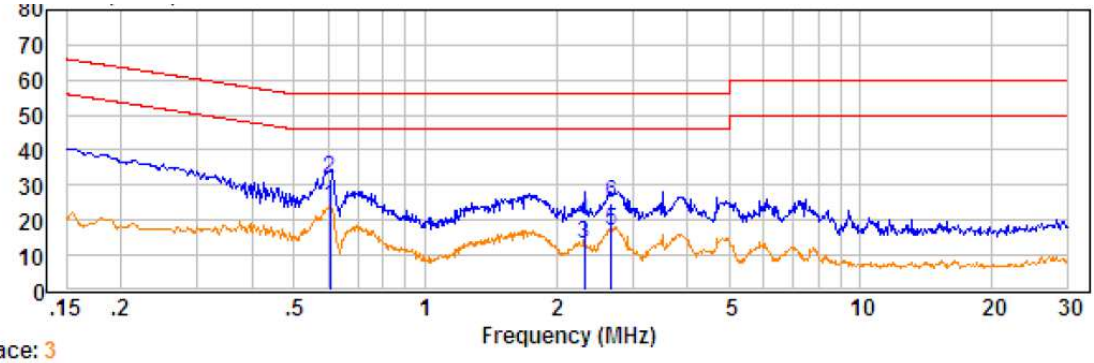
Live line:



Trace: 1

Freq MHz	Reading dBuV	Result dBuV/m	Limit	Over dBuV/m	Limit dB	Remark
0.61	18.68	29.93	46.00	-16.07	Average	LINE
0.61	26.62	37.87	56.00	-18.13	QP	LINE
1.24	6.83	18.11	46.00	-27.89	Average	LINE
1.24	14.59	25.87	56.00	-30.13	QP	LINE
2.75	12.16	23.47	46.00	-22.53	Average	LINE
2.75	0.00	11.31	56.00	-44.69	QP	LINE

Neutral line:



Trace: 3

Freq MHz	Reading dBuV	Result dBuV/m	Limit	Over dBuV/m	Limit dB	Remark
0.60	12.84	24.09	46.00	-21.91	Average	NEUTRAL
0.60	20.77	32.02	56.00	-23.98	QP	NEUTRAL
2.32	1.79	13.09	46.00	-32.91	Average	NEUTRAL
2.32	8.26	19.56	56.00	-36.44	QP	NEUTRAL
2.68	5.79	17.10	46.00	-28.90	Average	NEUTRAL
2.68	13.54	24.85	56.00	-31.15	QP	NEUTRAL

6 Spurious Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: DA 00-705

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	$20\log^{(500)}$

6.1 EUT Operation :

Operating Environment:

Temperature: 25.2°C

Humidity: 52% RH

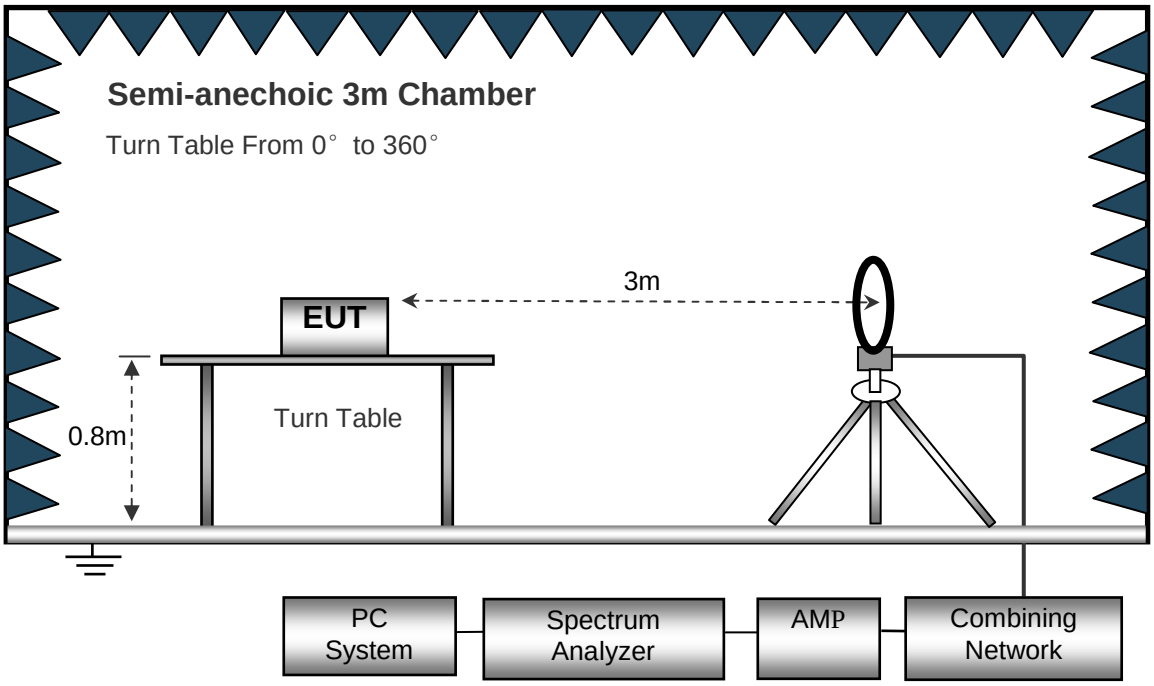
Atmospheric Pressure:1010 mbar

Operation Mode:

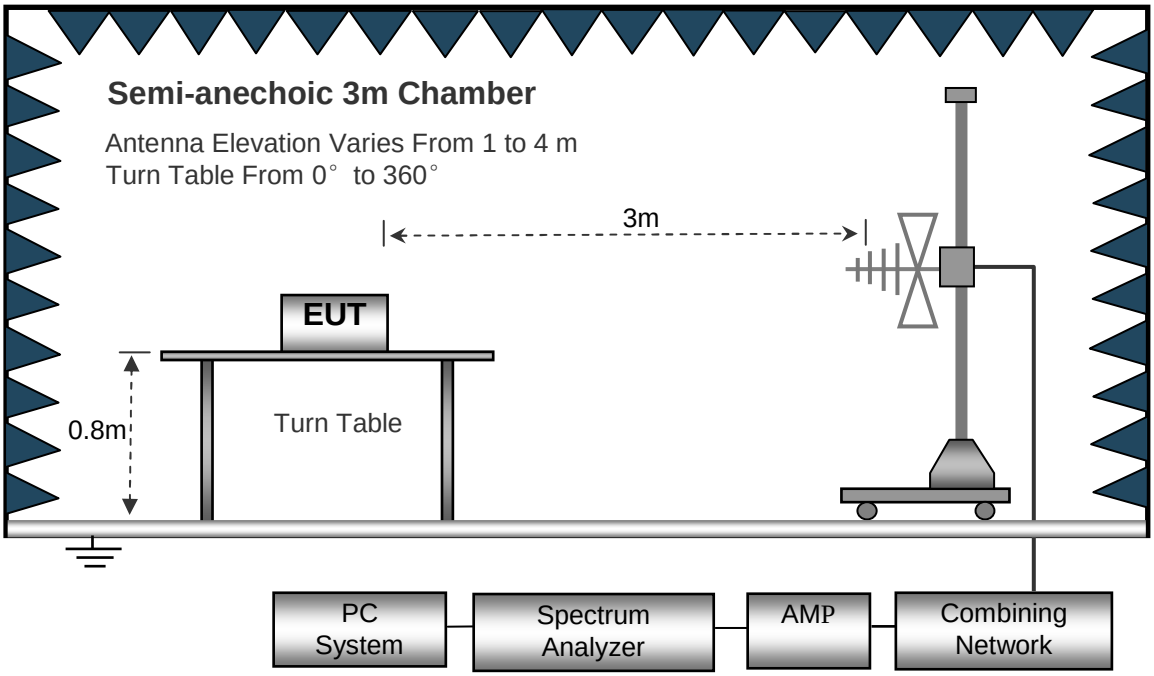
The EUT was tested in transmitting mode, and the data were shown as follow.

6.2 Test Setup

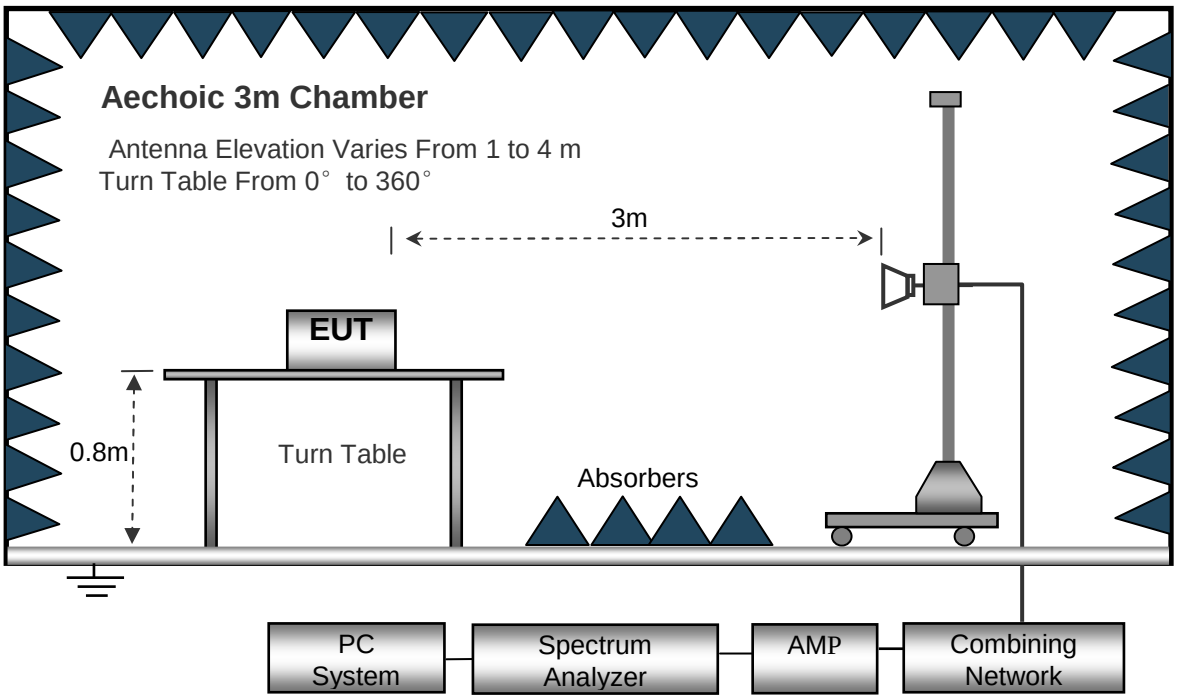
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



6.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 9kHz to 25000MHz.

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

6.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m 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

6.5 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

6.6 Summary of Test Results

Test Frequency : 32.768kHz ~ 30MHz

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

Test Frequency : 30MHz ~ 18GHz

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									
368.52	18.62	PK	344	1.5	H	20.52	39.14	46.00	-6.86
368.52	15.27	PK	251	1.1	V	20.52	35.79	46.00	-10.21
4824.00	56.74	PK	297	1.5	H	-2.36	54.38	74.00	-19.62
4824.00	50.51	Ave	297	1.5	H	-2.36	48.15	54.00	-5.85
7236.00	50.25	PK	269	1.9	H	-0.38	49.87	74.00	-24.13
7236.00	43.51	Ave	269	1.9	H	-0.38	43.13	54.00	-10.87
2322.75	46.89	PK	301	1.3	V	-13.19	33.70	74.00	-40.30
2322.75	38.04	Ave	301	1.3	V	-13.19	24.85	54.00	-29.15
2363.30	42.60	PK	62	1.8	H	-13.14	29.46	74.00	-44.54
2363.30	37.52	Ave	62	1.8	H	-13.14	24.38	54.00	-29.62
2492.09	43.03	PK	255	1.8	V	-13.08	29.95	74.00	-44.05
2492.09	38.93	Ave	255	1.8	V	-13.08	25.85	54.00	-28.15

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									
368.52	18.32	PK	179	1.6	H	20.52	38.84	46.00	-7.16
368.52	15.37	PK	305	1.0	V	20.52	35.89	46.00	-10.11
4874.00	55.68	PK	298	1.6	H	0.09	55.77	74.00	-18.23
4874.00	49.37	Ave	298	1.6	H	0.09	49.46	54.00	-4.54
7311.00	48.69	PK	79	1.2	H	3.01	51.70	74.00	-22.30
7311.00	42.57	Ave	79	1.2	H	3.01	45.58	54.00	-8.42
9748.00	45.63	PK	116	1.4	H	3.07	48.70	74.00	-25.30
9748.00	38.52	Ave	116	1.4	H	3.07	41.59	54.00	-12.41
2375.31	43.35	PK	194	1.2	V	-13.14	30.21	74.00	-43.79
2375.31	36.86	Ave	194	1.2	V	-13.14	23.72	54.00	-30.28
2492.50	43.32	PK	21	1.0	H	-13.08	30.24	74.00	-43.76
2492.50	37.98	Ave	21	1.0	H	-13.08	24.90	54.00	-29.10

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									
368.52	18.46	PK	130	1.6	H	20.52	38.98	46.00	-7.02
368.52	16.03	PK	113	1.9	V	20.52	36.55	46.00	-9.45
4924.00	51.31	PK	219	1.3	H	0.02	51.33	74.00	-22.67
4924.00	43.74	Ave	219	1.3	H	0.02	43.76	54.00	-10.24
7386.00	48.31	PK	132	1.7	H	2.58	50.89	74.00	-23.11
7386.00	39.50	Ave	132	1.7	H	2.58	42.08	54.00	-11.92
2324.49	45.99	PK	343	1.1	V	-13.19	32.80	74.00	-41.20
2324.49	38.48	Ave	343	1.1	V	-13.19	25.29	54.00	-28.71
2355.79	43.17	PK	93	2.0	H	-13.14	30.03	74.00	-43.97
2355.79	36.12	Ave	93	2.0	H	-13.14	22.98	54.00	-31.02
2487.07	43.87	PK	356	1.3	V	-13.08	30.79	74.00	-43.21
2487.07	38.56	Ave	356	1.3	V	-13.08	25.48	54.00	-28.52

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									
368.52	17.62	PK	165	1.9	H	22.85	40.47	46.00	-5.53
368.52	14.86	PK	90	1.6	V	22.85	37.71	46.00	-8.29
4824.00	58.51	PK	234	1.2	H	-2.36	56.15	74.00	-17.85
4824.00	47.32	Ave	234	1.2	H	-2.36	44.96	54.00	-9.04
7236.00	52.58	PK	240	1.0	H	-0.38	52.20	74.00	-21.80
7236.00	41.51	Ave	240	1.0	H	-0.38	41.13	54.00	-12.87
2325.00	46.59	PK	333	1.7	V	-13.19	33.40	74.00	-40.60
2325.00	38.52	Ave	333	1.7	V	-13.19	25.33	54.00	-28.67
2354.90	44.94	PK	263	1.5	H	-13.14	31.80	74.00	-42.20
2354.90	36.68	Ave	263	1.5	H	-13.14	23.54	54.00	-30.46
2499.62	44.37	PK	185	1.5	V	-13.08	31.29	74.00	-42.71
2499.62	37.98	Ave	185	1.5	V	-13.08	24.90	54.00	-29.10

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									
368.52	17.35	PK	355	1.7	H	22.85	40.20	46.00	-5.80
368.52	14.62	PK	169	1.8	V	22.85	37.47	46.00	-8.53
4874.00	58.36	PK	258	1.5	H	0.09	58.45	74.00	-15.55
4874.00	47.13	Ave	258	1.5	H	0.09	47.22	54.00	-6.78
7311.00	52.63	PK	26	1.2	H	3.01	55.64	74.00	-18.36
7311.00	40.89	Ave	26	1.2	H	3.01	43.90	54.00	-10.10
9748.00	45.63	PK	67	1.5	H	3.07	48.70	74.00	-25.30
9748.00	36.74	Ave	67	1.5	H	3.07	39.81	54.00	-14.19
2363.59	42.86	PK	68	1.0	V	-13.14	29.72	74.00	-44.28
2363.59	36.28	Ave	68	1.0	V	-13.14	23.14	54.00	-30.86
2488.61	42.56	PK	6	1.9	H	-13.08	29.48	74.00	-44.52
2488.61	36.15	Ave	6	1.9	H	-13.08	23.07	54.00	-30.93

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									
368.52	17.74	PK	299	1.7	H	22.85	40.59	46.00	-5.41
368.52	14.52	PK	278	1.2	V	22.85	37.37	46.00	-8.63
4924.00	59.02	PK	301	1.1	H	0.02	59.04	74.00	-14.96
4924.00	47.87	Ave	301	1.1	H	0.02	47.89	54.00	-6.11
7386.00	52.78	PK	137	1.1	H	2.58	55.36	74.00	-18.64
7386.00	41.52	Ave	137	1.1	H	2.58	44.10	54.00	-9.90
2336.31	46.76	PK	279	1.9	V	-13.19	33.57	74.00	-40.43
2336.31	37.48	Ave	279	1.9	V	-13.19	24.29	54.00	-29.71
2386.98	43.37	PK	180	2.0	H	-13.14	30.23	74.00	-43.77
2386.98	36.95	Ave	180	2.0	H	-13.14	23.81	54.00	-30.19
2492.94	45.00	PK	353	1.7	V	-13.08	31.92	74.00	-42.08
2492.94	36.07	Ave	353	1.7	V	-13.08	22.99	54.00	-31.01

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									
368.52	18.32	PK	25	1.6	H	20.56	38.88	46.00	-7.12
368.52	15.06	PK	92	1.6	V	20.56	35.62	46.00	-10.38
4824.00	57.86	PK	226	1.9	H	-2.36	55.50	74.00	-18.50
4824.00	46.32	Ave	226	1.9	H	-2.36	43.96	54.00	-10.04
7236.00	52.58	PK	300	1.9	H	-0.38	52.20	74.00	-21.80
7236.00	41.51	Ave	300	1.9	H	-0.38	41.13	54.00	-12.87
2316.63	46.43	PK	188	1.6	V	-13.19	33.24	74.00	-40.76
2316.63	39.03	Ave	188	1.6	V	-13.19	25.84	54.00	-28.16
2387.25	43.84	PK	88	1.5	H	-13.14	30.70	74.00	-43.30
2387.25	38.94	Ave	88	1.5	H	-13.14	25.80	54.00	-28.20
2494.40	44.35	PK	72	1.2	V	-13.08	31.27	74.00	-42.73
2494.40	37.55	Ave	72	1.2	V	-13.08	24.47	54.00	-29.53

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									
368.52	17.93	PK	150	1.1	H	20.56	38.49	46.00	-7.51
368.52	15.63	PK	360	2.0	V	20.56	36.19	46.00	-9.81
4874.00	57.62	PK	224	1.8	H	0.09	57.71	74.00	-16.29
4874.00	46.42	Ave	224	1.8	H	0.09	46.51	54.00	-7.49
7311.00	51.82	PK	116	1.1	H	3.01	54.83	74.00	-19.17
7311.00	40.08	Ave	116	1.1	H	3.01	43.09	54.00	-10.91
9748.00	44.63	PK	120	1.6	H	3.07	47.70	74.00	-26.30
9748.00	35.84	Ave	120	1.6	H	3.07	38.91	54.00	-15.09
2383.54	43.83	PK	301	1.9	V	-13.14	30.69	74.00	-43.31
2383.54	37.43	Ave	301	1.9	V	-13.14	24.29	54.00	-29.71
2498.72	43.53	PK	359	1.3	H	-13.08	30.45	74.00	-43.55
2498.72	36.35	Ave	359	1.3	H	-13.08	23.27	54.00	-30.73

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									
368.52	18.75	PK	28	1.7	H	20.56	39.31	46.00	-6.69
368.52	15.24	PK	152	1.3	V	20.56	35.80	46.00	-10.20
4924.00	58.21	PK	188	1.3	H	0.02	58.23	74.00	-15.77
4924.00	47.03	Ave	188	1.3	H	0.02	47.05	54.00	-6.95
7386.00	52.32	PK	98	2.0	H	2.58	54.90	74.00	-19.10
7386.00	41.18	Ave	98	2.0	H	2.58	43.76	54.00	-10.24
2327.64	45.32	PK	48	1.3	V	-13.19	32.13	74.00	-41.87
2327.64	39.26	Ave	48	1.3	V	-13.19	26.07	54.00	-27.93
2368.98	43.23	PK	273	1.6	H	-13.14	30.09	74.00	-43.91
2368.98	38.04	Ave	273	1.6	H	-13.14	24.90	54.00	-29.10
2499.84	42.79	PK	126	2.0	V	-13.08	29.71	74.00	-44.29
2499.84	37.32	Ave	126	2.0	V	-13.08	24.24	54.00	-29.76

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									
368.52	15.32	PK	320	1.9	H	25.30	40.62	46.00	-5.38
368.52	13.21	PK	238	1.3	V	25.30	38.51	46.00	-7.49
4844.00	57.62	PK	262	1.1	H	-2.15	55.47	74.00	-18.53
4844.00	46.32	Ave	262	1.1	H	-2.15	44.17	54.00	-9.83
7236.00	53.21	PK	312	1.7	H	-0.17	53.04	74.00	-20.96
7236.00	41.67	Ave	312	1.7	H	-0.17	41.50	54.00	-12.50
2327.15	46.43	PK	324	1.4	V	-13.19	33.24	74.00	-40.76
2327.15	39.51	Ave	324	1.4	V	-13.19	26.32	54.00	-27.68
2370.92	43.42	PK	76	1.5	H	-13.14	30.28	74.00	-43.72
2370.92	37.80	Ave	76	1.5	H	-13.14	24.66	54.00	-29.34
2493.54	42.48	PK	357	1.5	V	-13.08	29.40	74.00	-44.60
2493.54	38.21	Ave	357	1.5	V	-13.08	25.13	54.00	-28.87

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									
368.52	14.68	PK	292	1.5	H	25.30	39.98	46.00	-6.02
368.52	11.52	PK	12	1.9	V	25.30	36.82	46.00	-9.18
4874.00	58.02	PK	309	1.0	H	0.09	58.11	74.00	-15.89
4874.00	46.91	Ave	309	1.0	H	0.09	47.00	54.00	-7.00
7311.00	53.62	PK	243	2.0	H	3.01	56.63	74.00	-17.37
7311.00	42.17	Ave	243	2.0	H	3.01	45.18	54.00	-8.82
9748.00	44.63	PK	70	1.9	H	3.07	47.70	74.00	-26.30
9748.00	34.87	Ave	70	1.9	H	3.07	37.94	54.00	-16.06
2372.00	43.49	PK	12	1.4	V	-13.14	30.35	74.00	-43.65
2372.00	37.77	Ave	12	1.4	V	-13.14	24.63	54.00	-29.37
2486.76	43.16	PK	247	1.6	H	-13.08	30.08	74.00	-43.92
2486.76	38.36	Ave	247	1.6	H	-13.08	25.28	54.00	-28.72

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									
368.52	14.39	PK	136	1.8	H	25.30	39.69	46.00	-6.31
368.52	11.17	PK	35	1.1	V	25.30	36.47	46.00	-9.53
4904.00	58.46	PK	108	1.2	H	0.09	58.55	74.00	-15.45
4904.00	47.36	Ave	108	1.2	H	0.09	47.45	54.00	-6.55
7356.00	53.41	PK	113	1.7	H	2.58	55.99	74.00	-18.01
7356.00	42.38	Ave	113	1.7	H	2.58	44.96	54.00	-9.04
2313.33	45.32	PK	335	1.1	V	-13.19	32.13	74.00	-41.87
2313.33	39.38	Ave	335	1.1	V	-13.19	26.19	54.00	-27.81
2372.95	43.58	PK	12	1.7	H	-13.14	30.44	74.00	-43.56
2372.95	38.11	Ave	12	1.7	H	-13.14	24.97	54.00	-29.03
2490.42	44.18	PK	300	1.6	V	-13.08	31.10	74.00	-42.90
2490.42	38.42	Ave	300	1.6	V	-13.08	25.34	54.00	-28.66

Test Frequency: 18GHz~25GHz

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

7 Band Edge Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	KDB558074 D01
Test Mode:	Transmitting

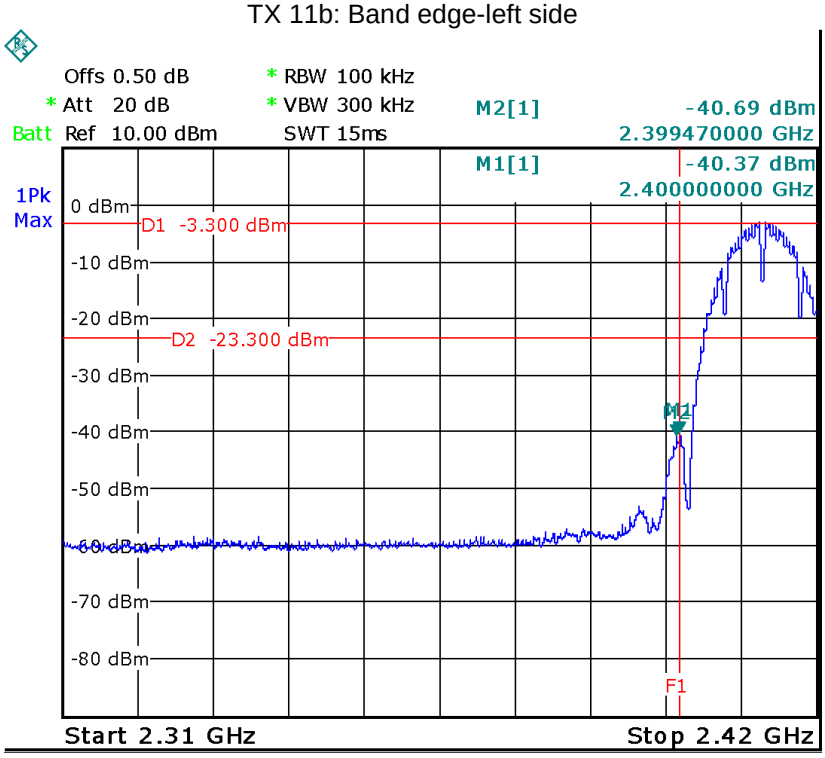
7.1 Test Procedure

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.

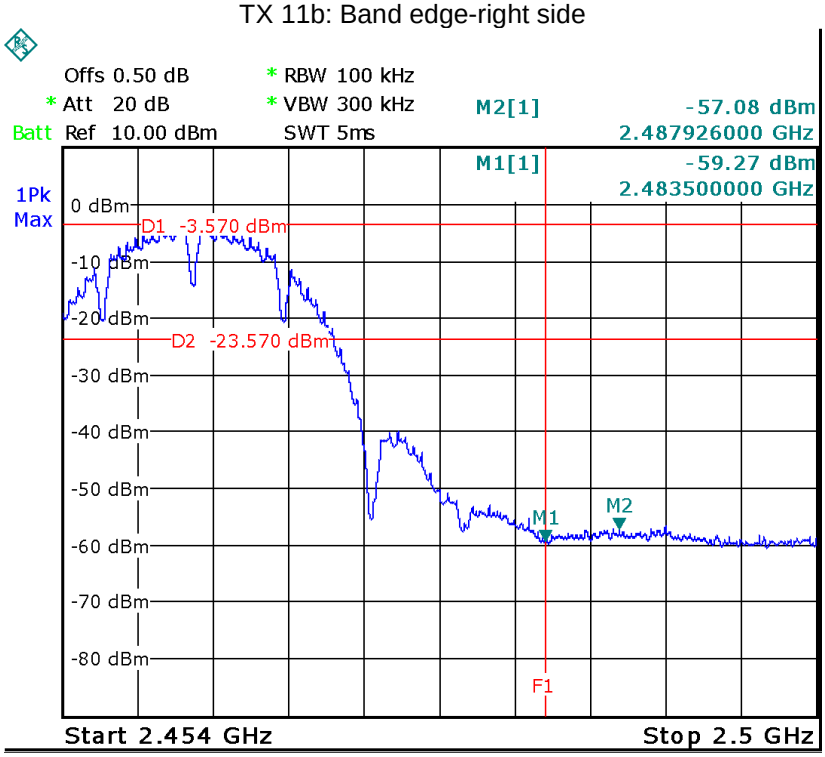
7.2 Test Result:

Test result plots shown as follows:

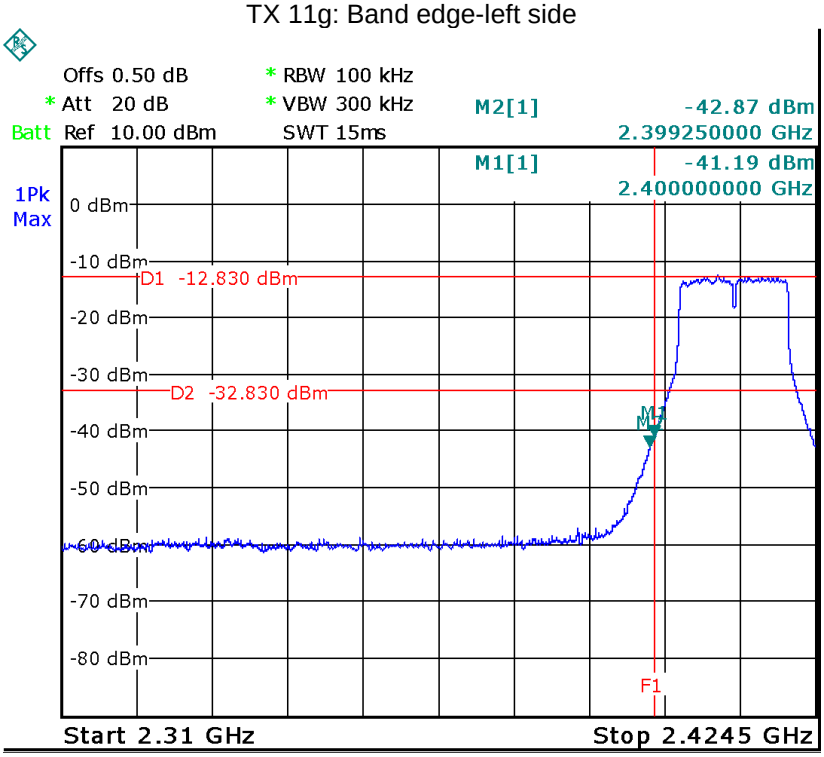
TX 11b: Band edge-left side



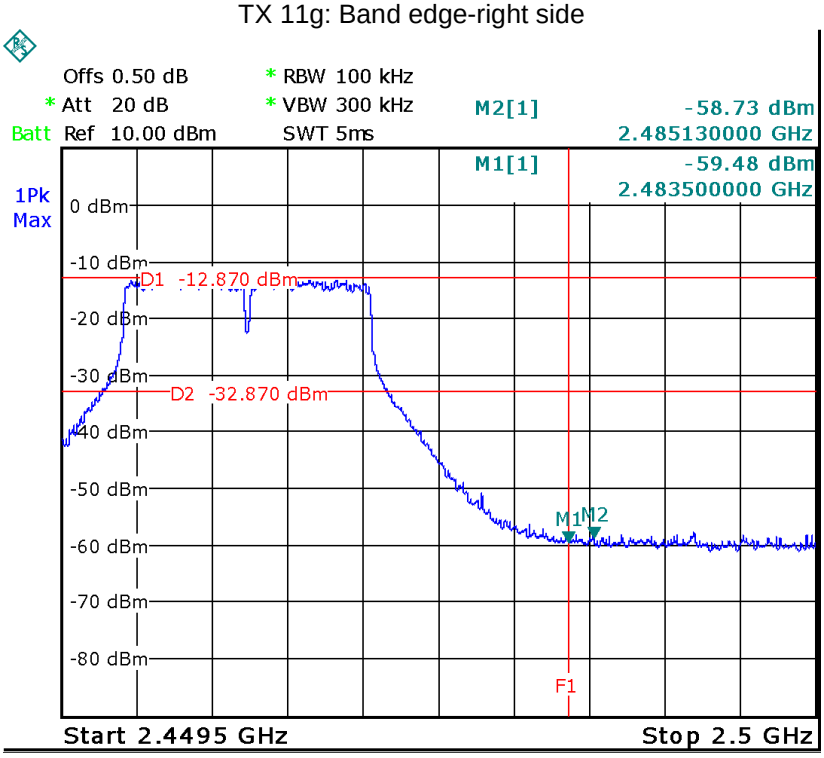
TX 11b: Band edge-right side



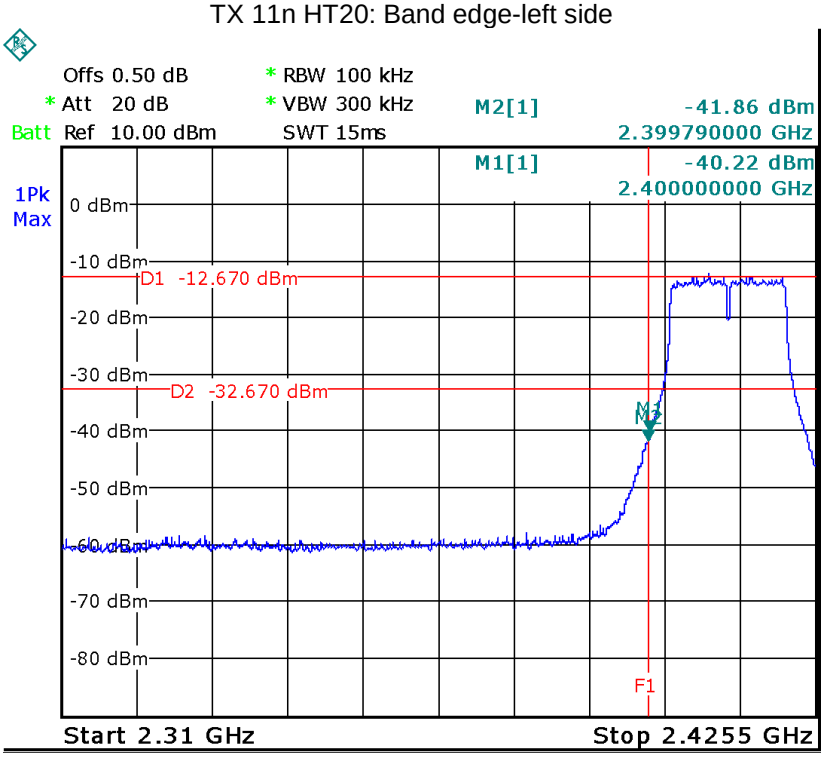
TX 11g: Band edge-left side



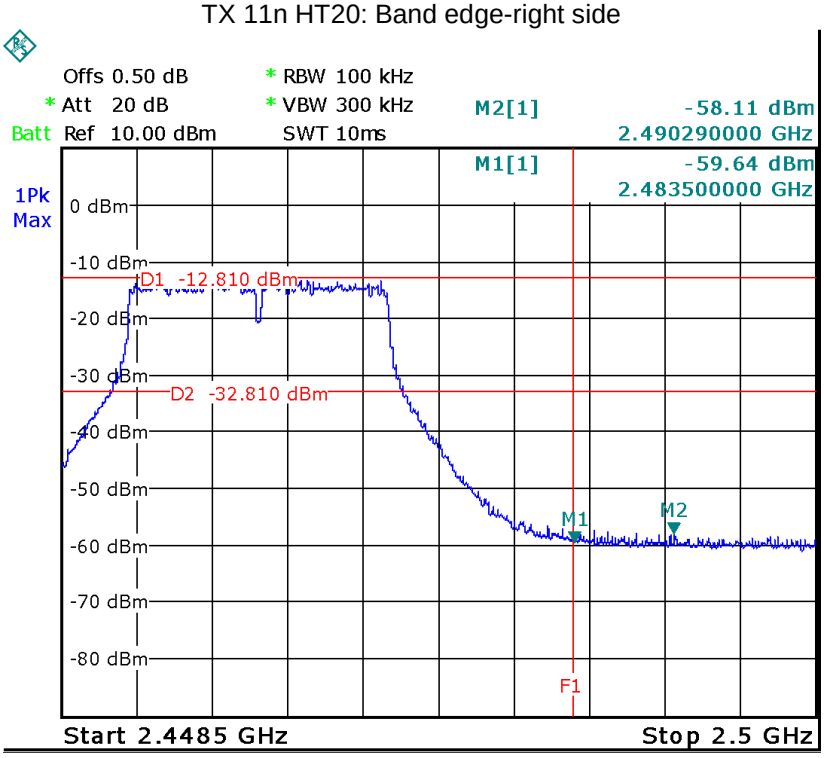
TX 11g: Band edge-right side



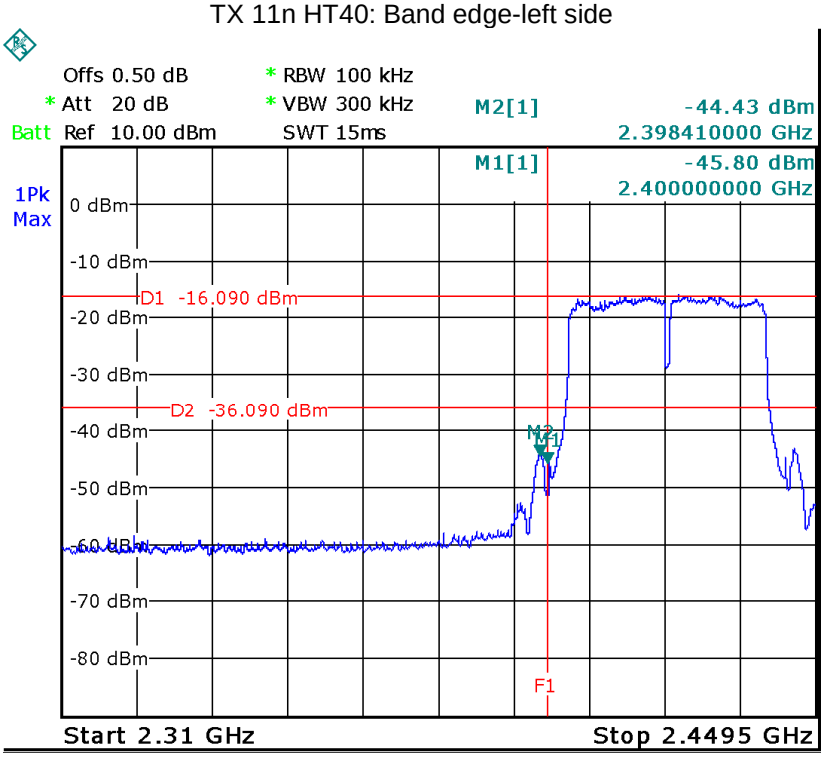
TX 11n HT20: Band edge-left side



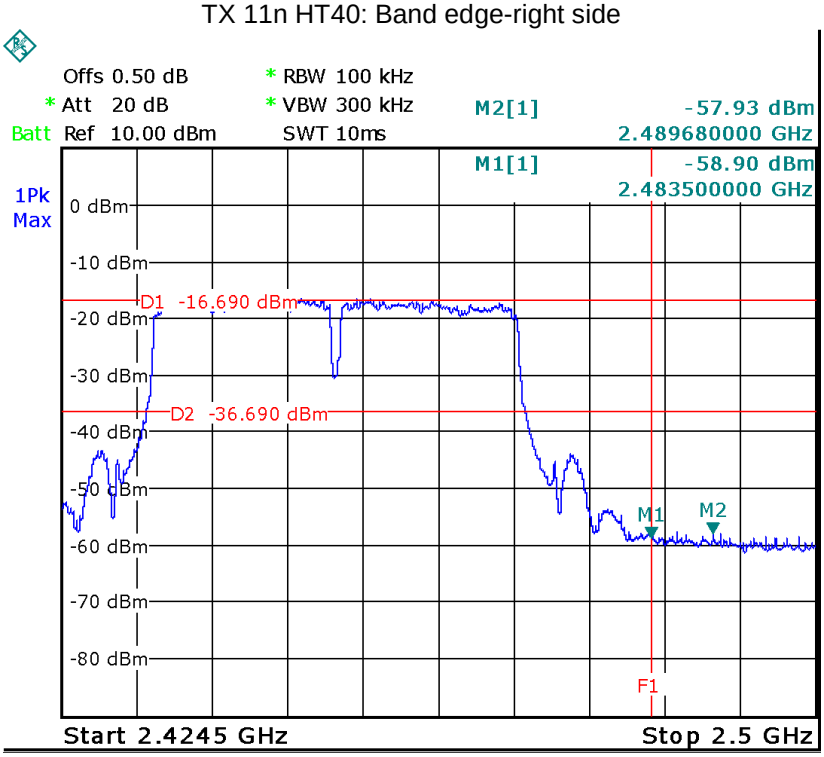
TX 11n HT20: Band edge-right side



TX 11n HT40: Band edge-left side



TX 11n HT40: Band edge-right side



8 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01

8.1 Test Procedure:

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

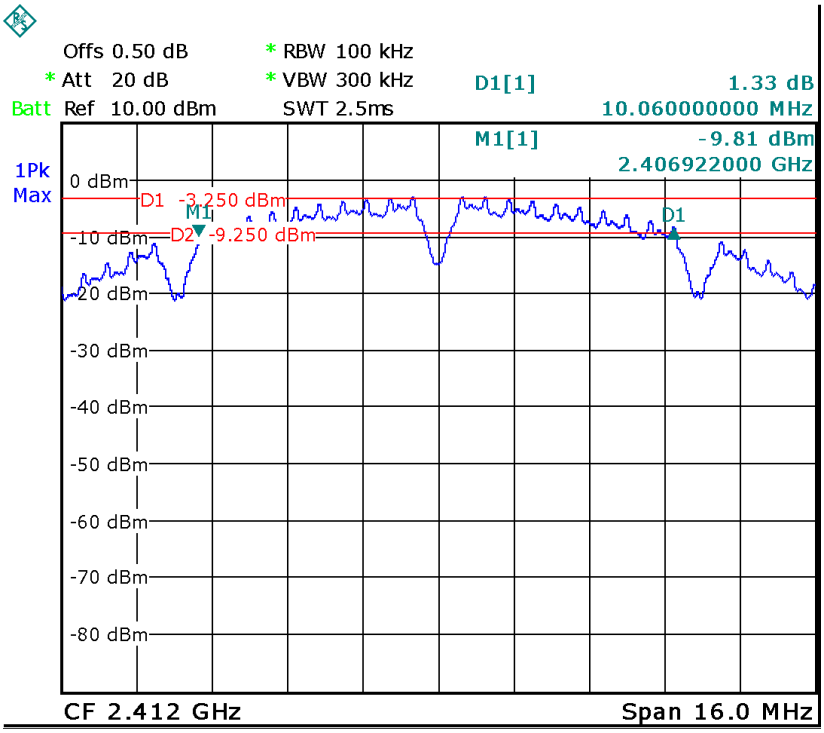
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

8.2 Test Result:

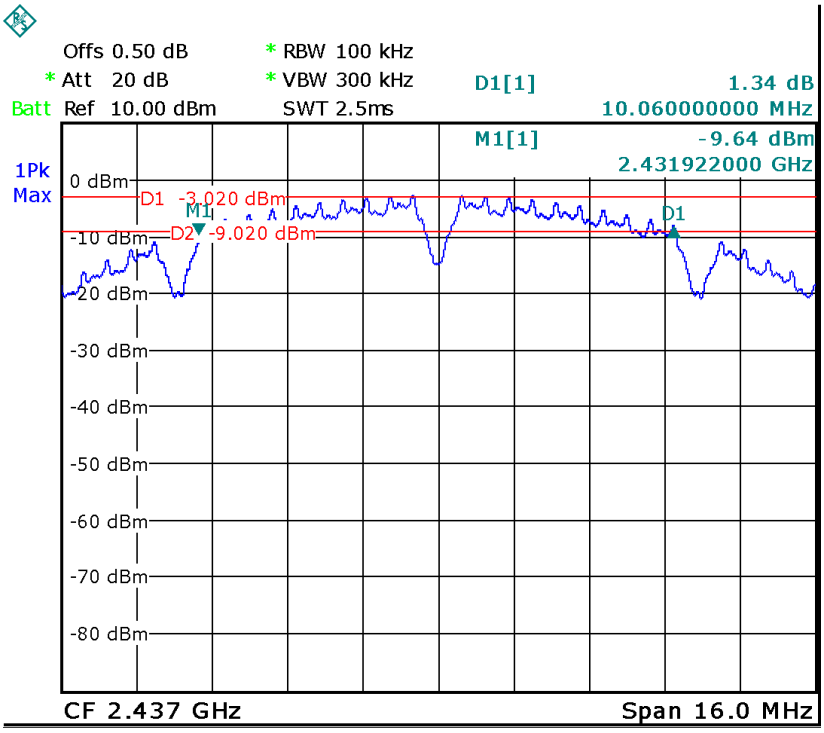
Operation mode	Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11
	10.06	10.06	10.06
TX 11g	Channel 1	Channel 6	Channel 11
	16.62	16.62	16.62
TX 11n HT20	Channel 1	Channel 6	Channel 11
	17.84	17.84	17.84
TX 11n HT40	Channel 3	Channel 6	Channel 9
	36.56	36.56	36.56

Test result plot as follows:

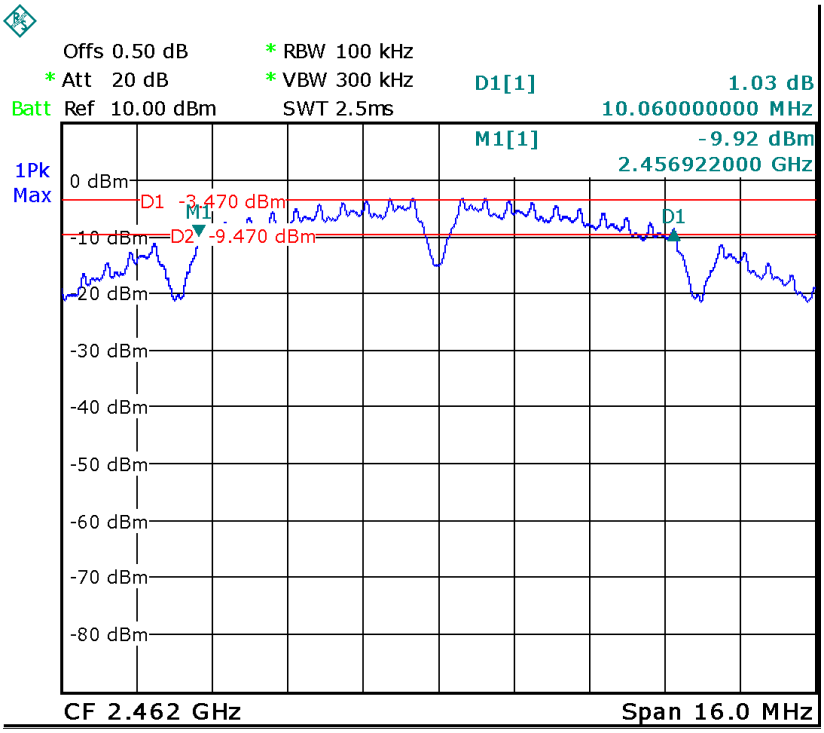
Mode: TX 11b channel 1



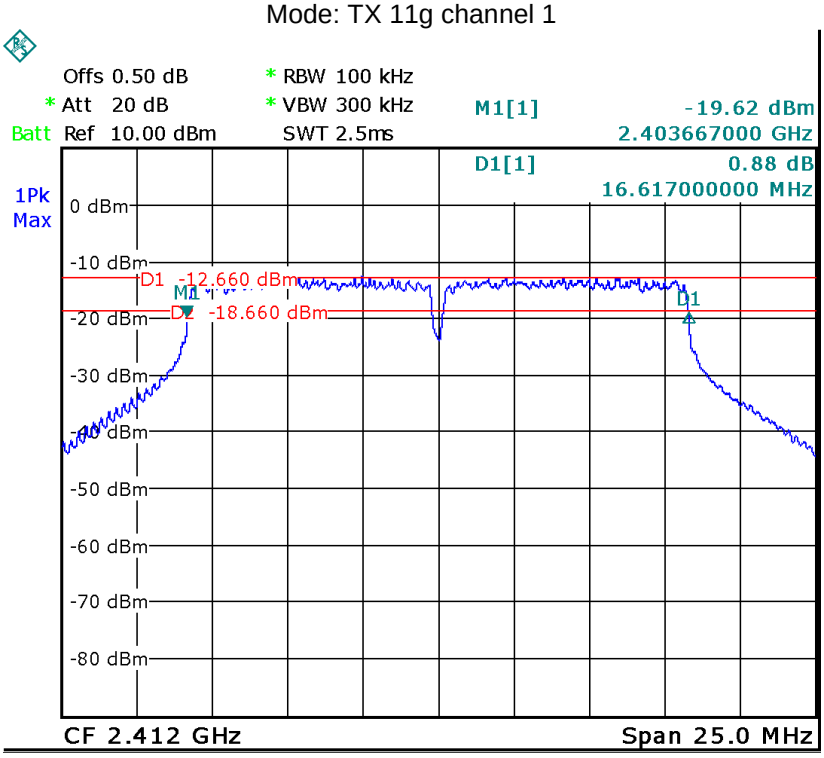
Mode: TX 11b channel 6



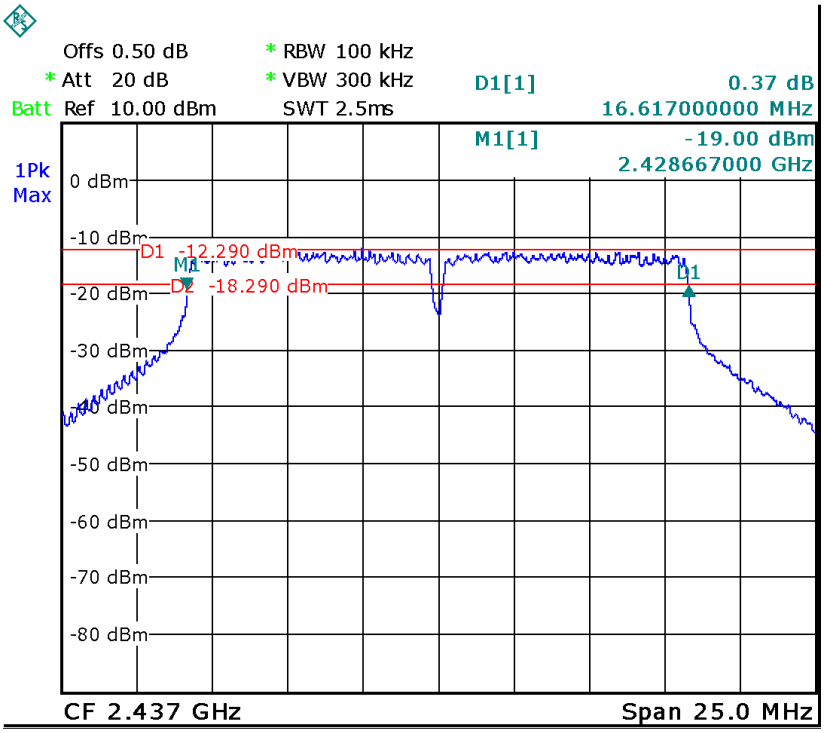
Mode: TX 11b channel 11



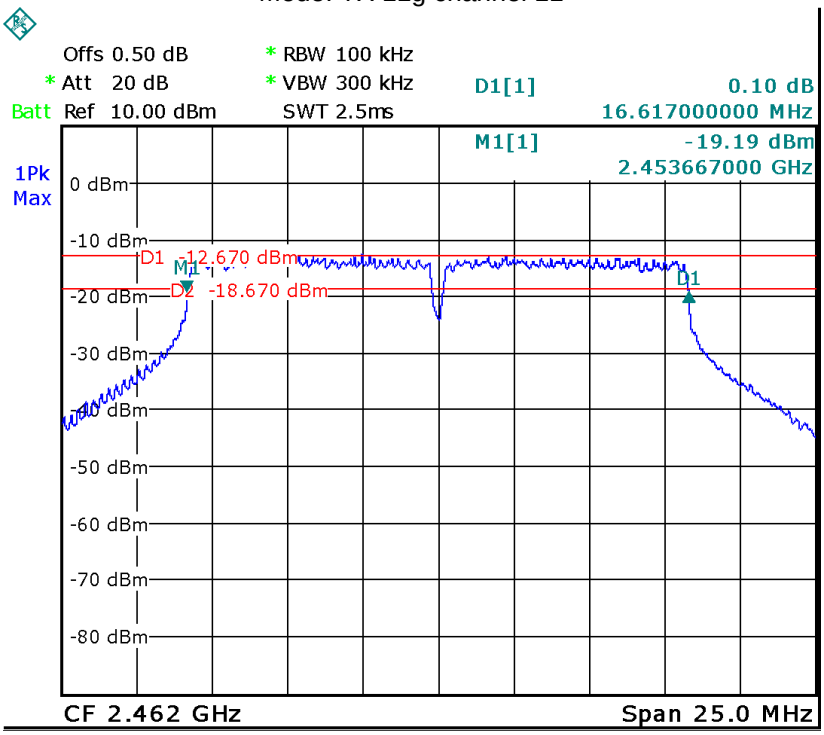
Mode: TX 11g channel 1



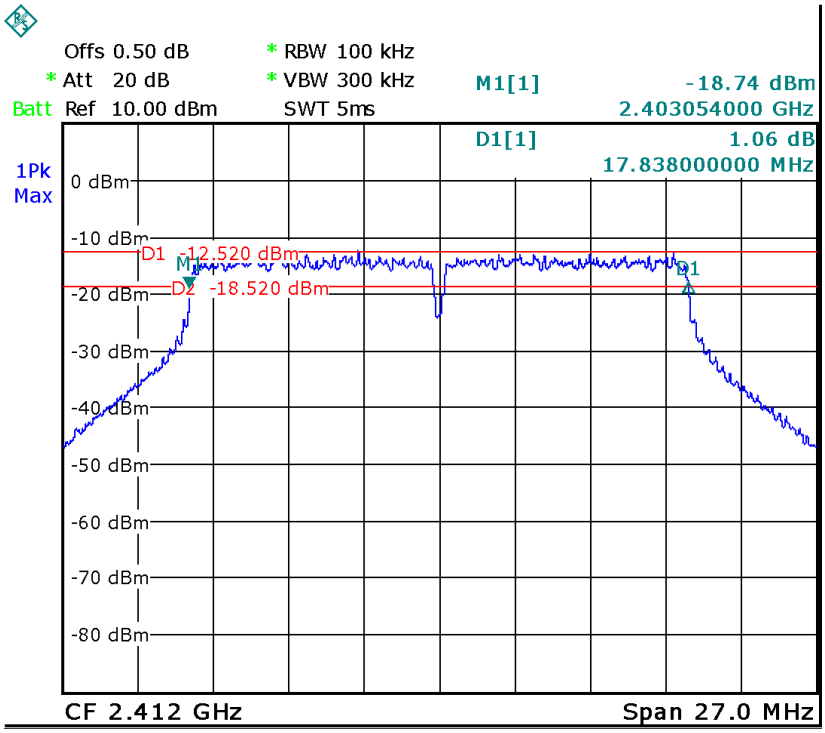
Mode: TX 11g channel 6



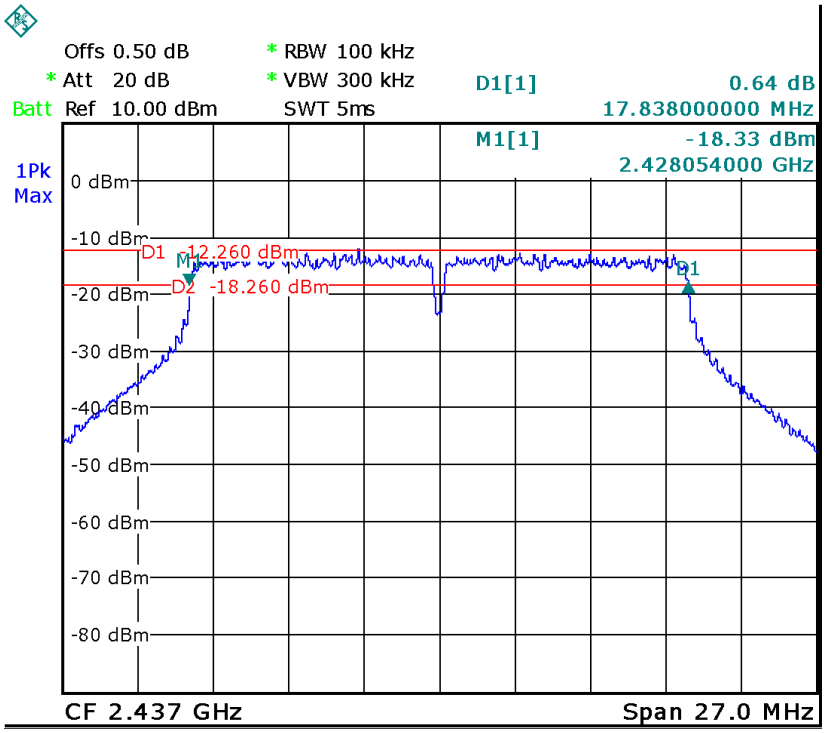
Mode: TX 11g channel 11



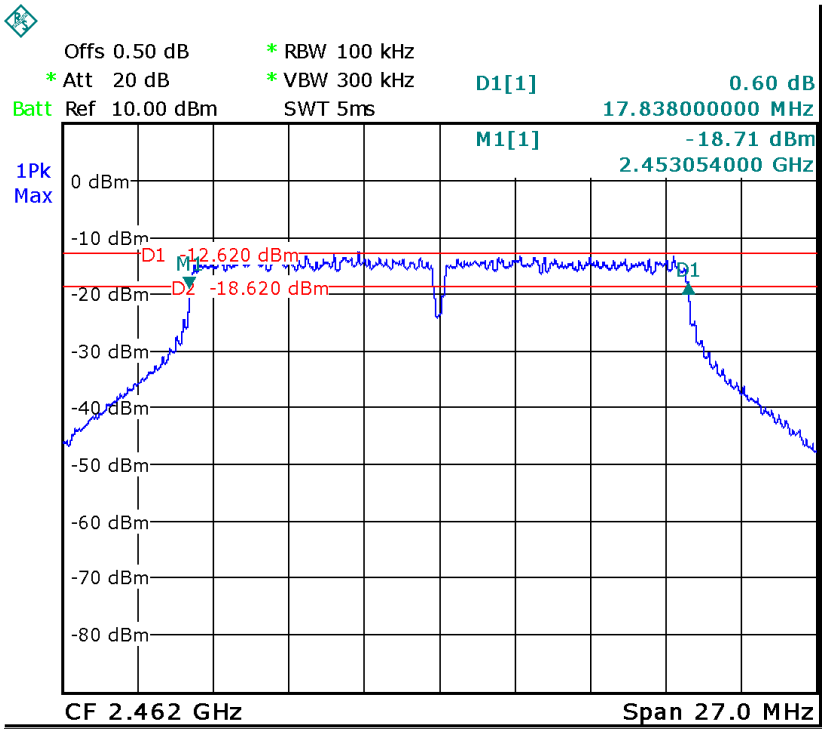
Mode: TX 11n HT20 channel 1



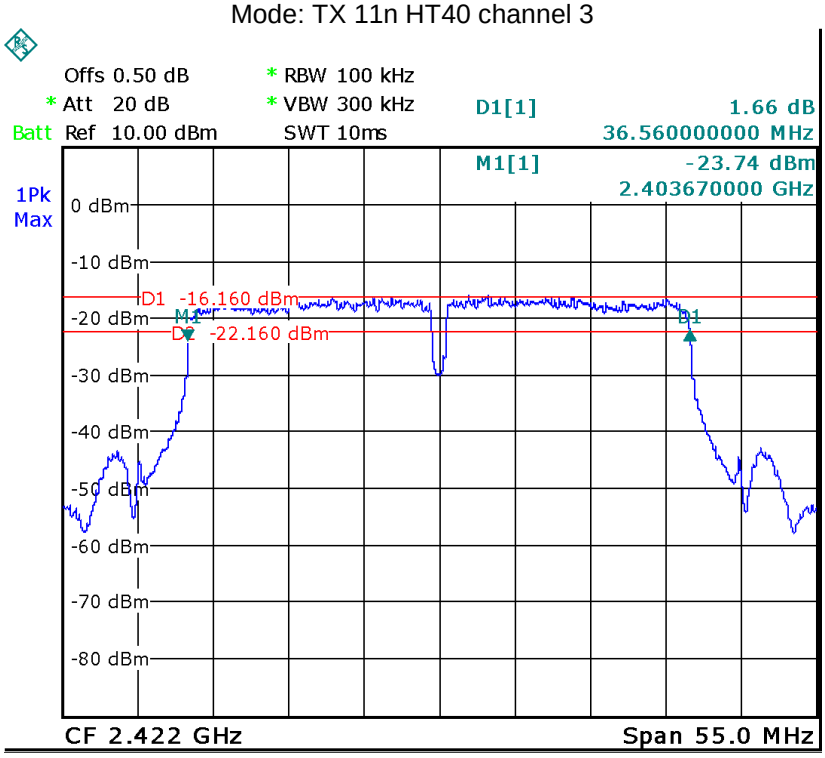
Mode: TX 11n HT20 channel 6



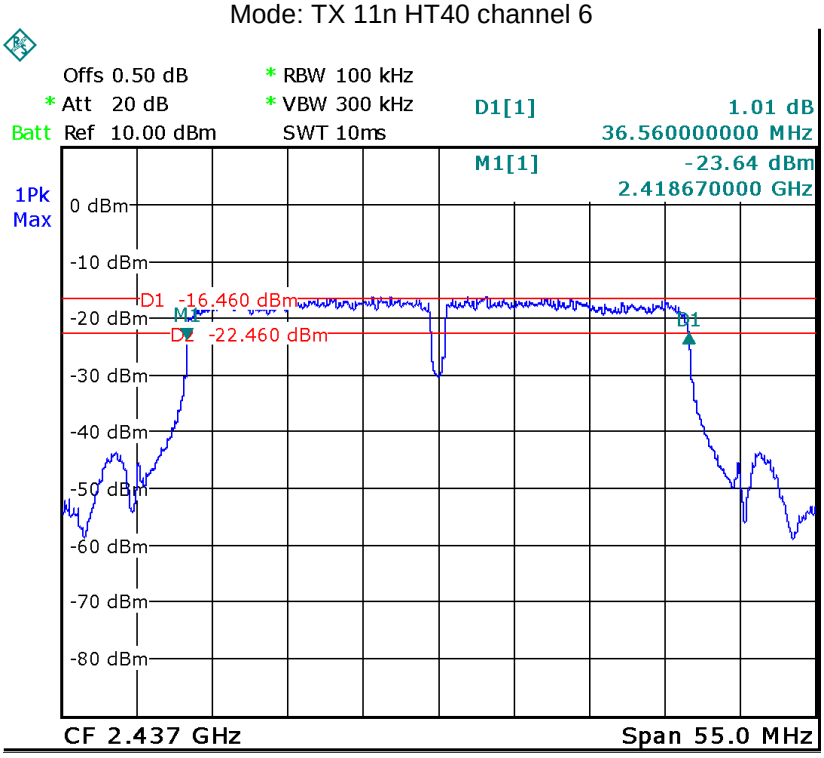
Mode: TX 11n HT20 channel 11



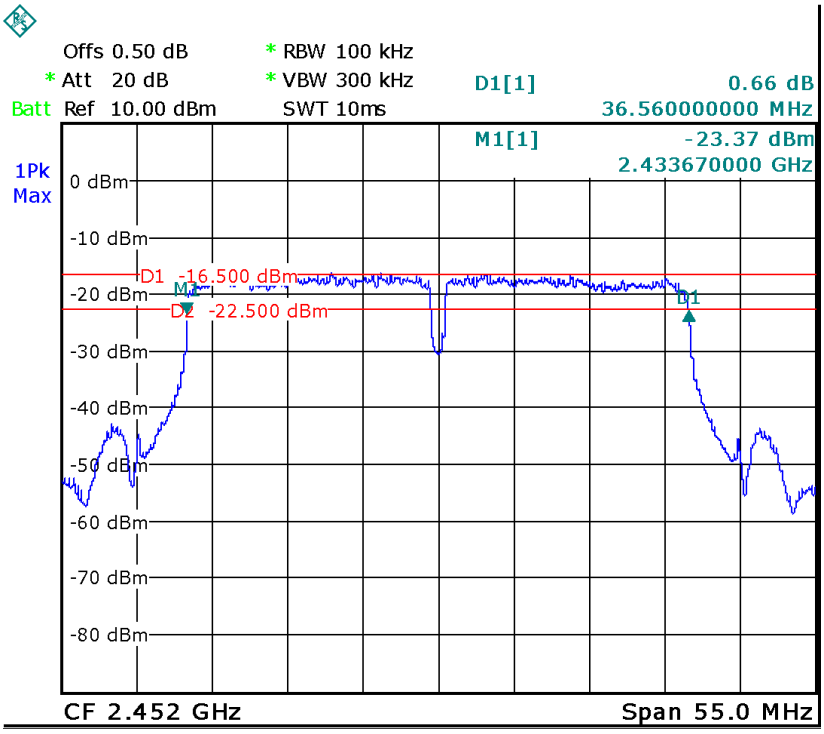
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



9 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

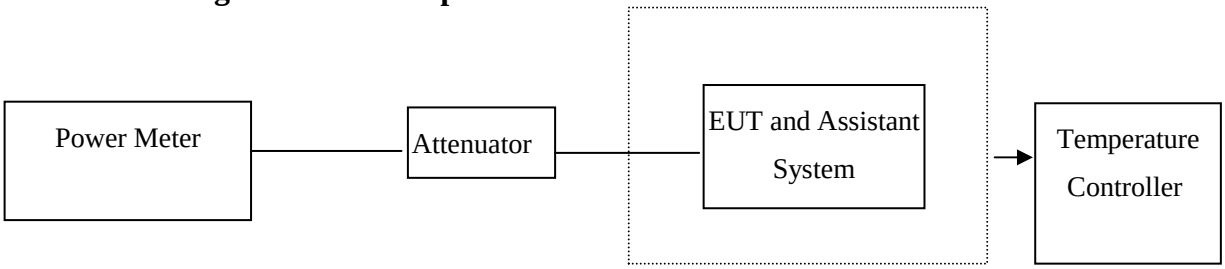
Test Method: KDB558074 D01

9.1 Test Procedure:

KDB558074 D01

1. The board band PK power meter and sensor are used for the output power measurement. The relevant VBW of power meter is higher than the DTS bandwidth of the EUT. If the duty cycle of test signal is not 100%, the trigger and gating function of power meter will be enabled to capture the transmission burst for the measured output power.

9.2 Block diagram of test setup



9.3 3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max Test Result:

Test mode :TX 11b		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.40	9.65	9.27
Limit: 1W/30dBm		
1W/30dBm		

Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.25	9.51	9.07
Limit		
1W/30dBm		

Test mode :TX 11n HT20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.33	9.55	9.18
Limit		

1W/30dBm

Test mode : TX 11n HT40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
9.58	9.57	9.37
Limit		
1W/30dBm		

10 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01

10.1 Test Procedure:

KDB558074 D01

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.

10.2 Test Result:

Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-23.45	-23.32	-23.77
Limit: 1W/30dBm		
8dBm per 3kHz		

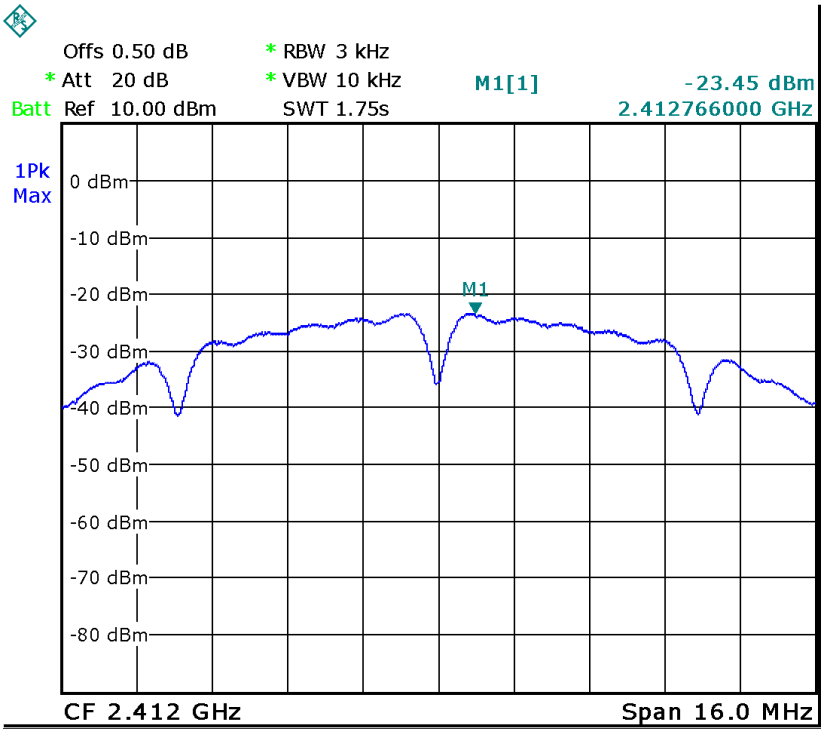
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-27.40	-27.07	-27.59
Limit		
8dBm per 3kHz		

Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-26.89	-26.59	-26.94
Limit		
8dBm per 3kHz		

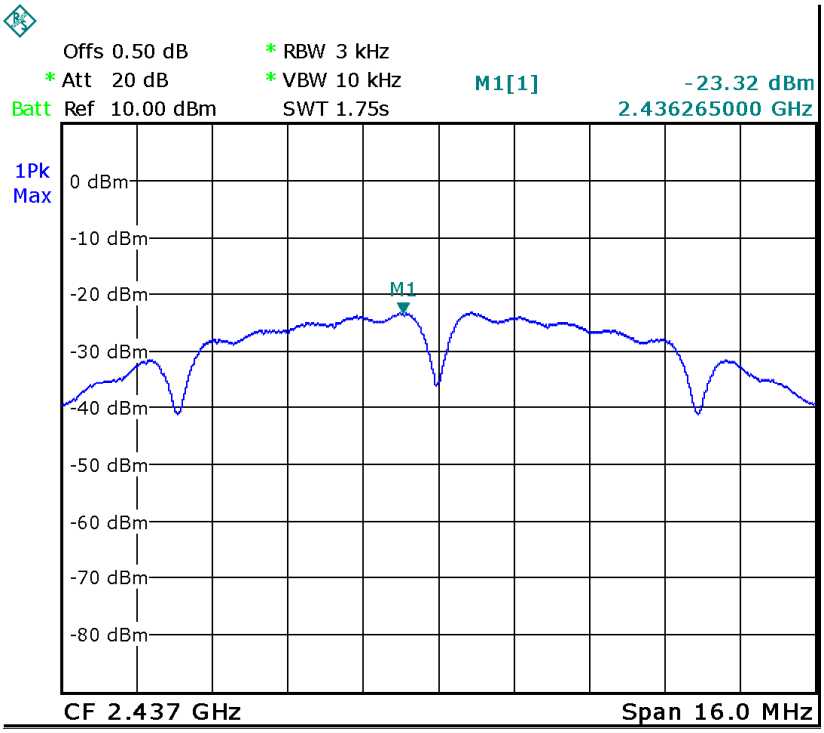
Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-29.11	-28.70	-29.28
Limit		
8dBm per 3kHz		

Test result plot as follows:

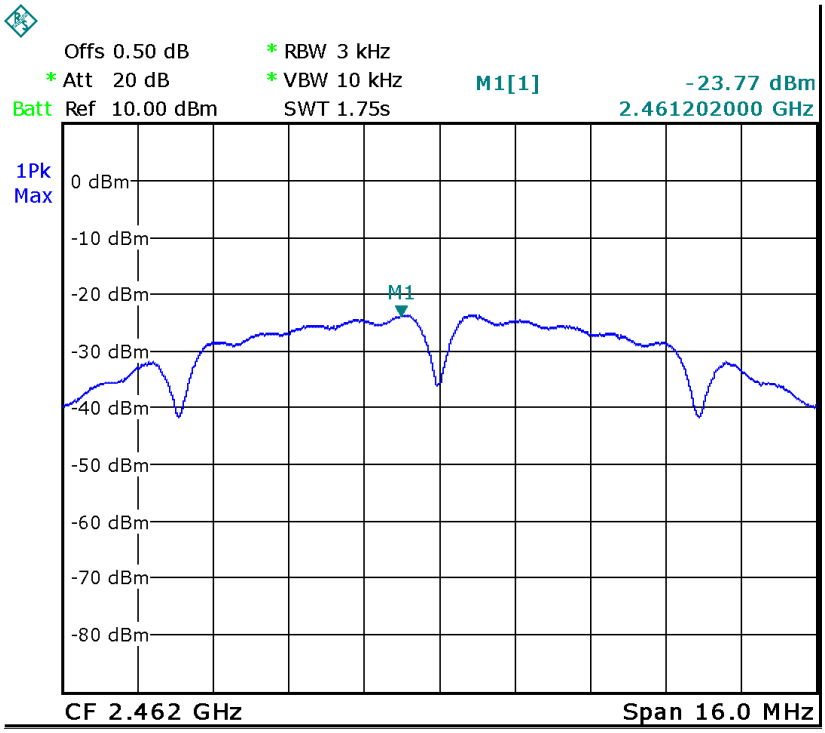
Mode: TX 11b channel 1



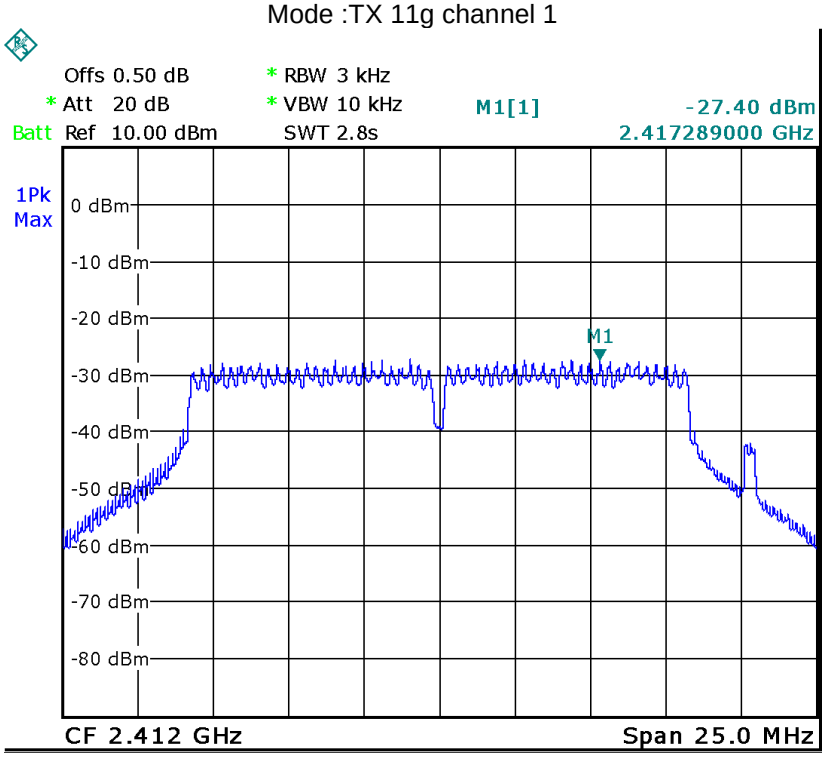
Mode: TX 11b channel 6



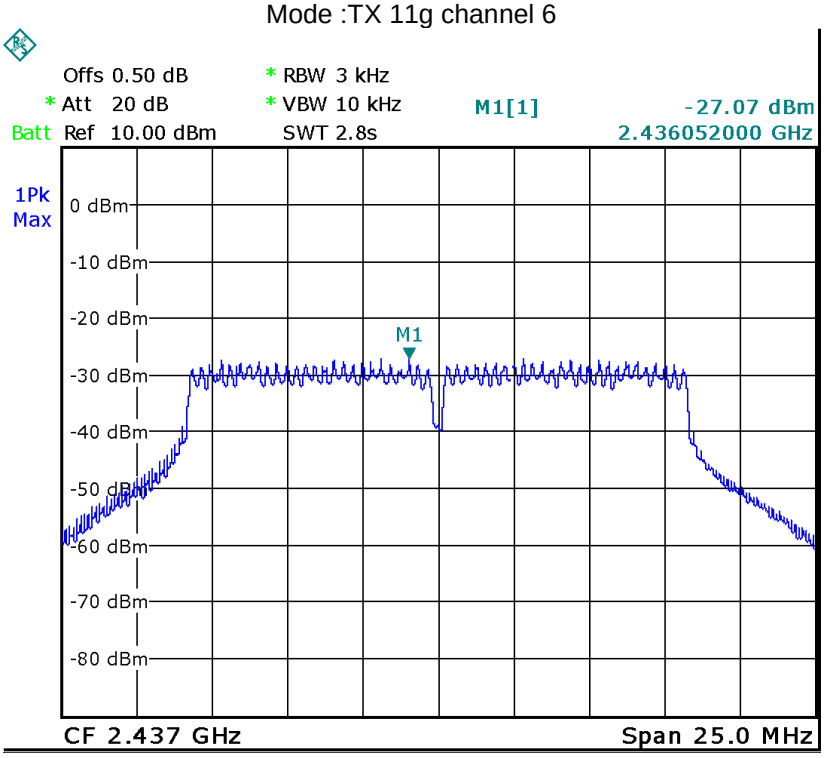
Mode: TX 11b channel 11



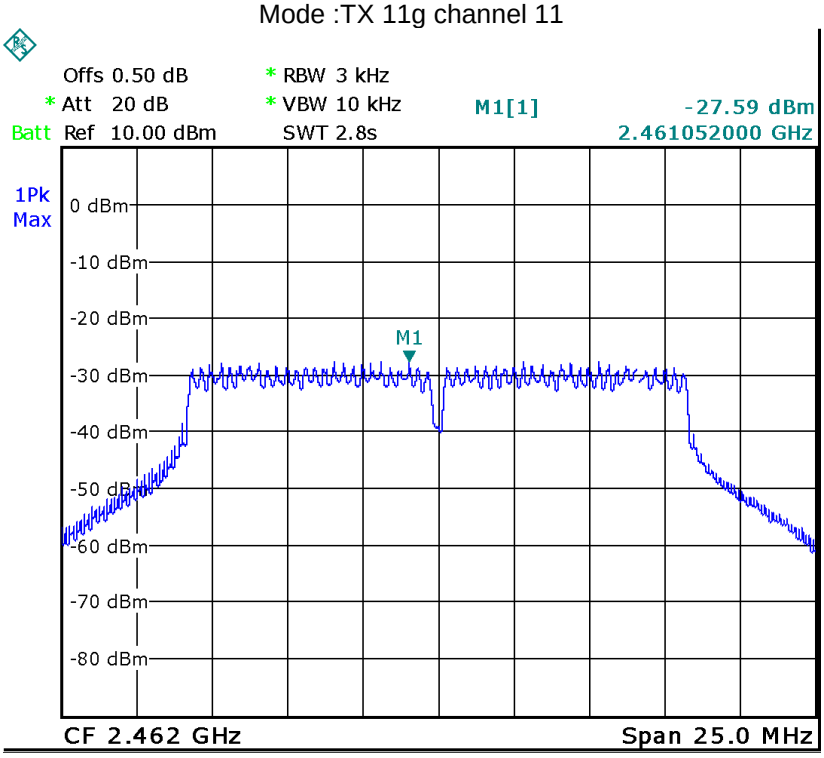
Mode :TX 11g channel 1



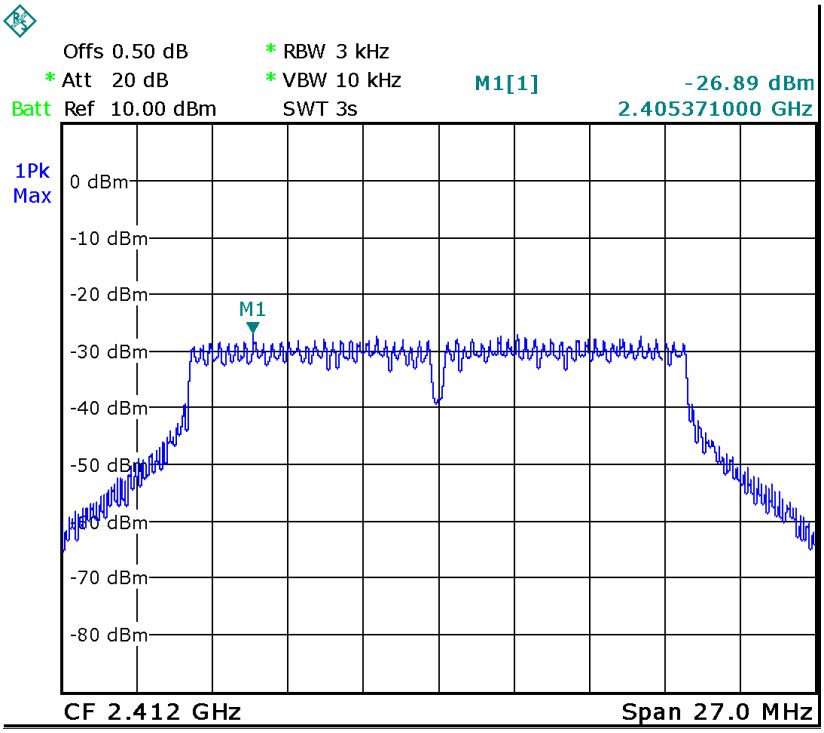
Mode :TX 11g channel 6



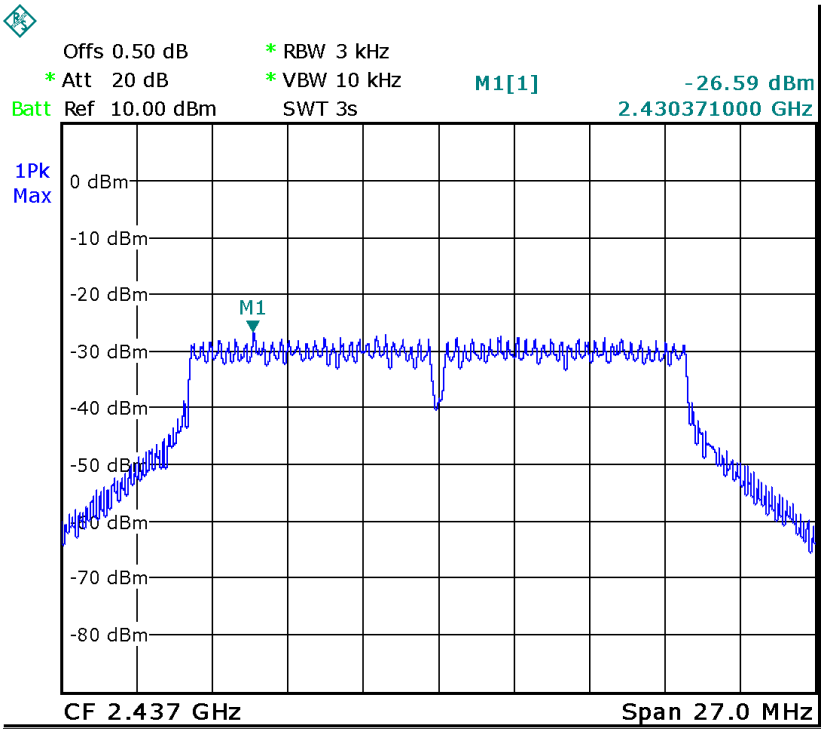
Mode :TX 11g channel 11



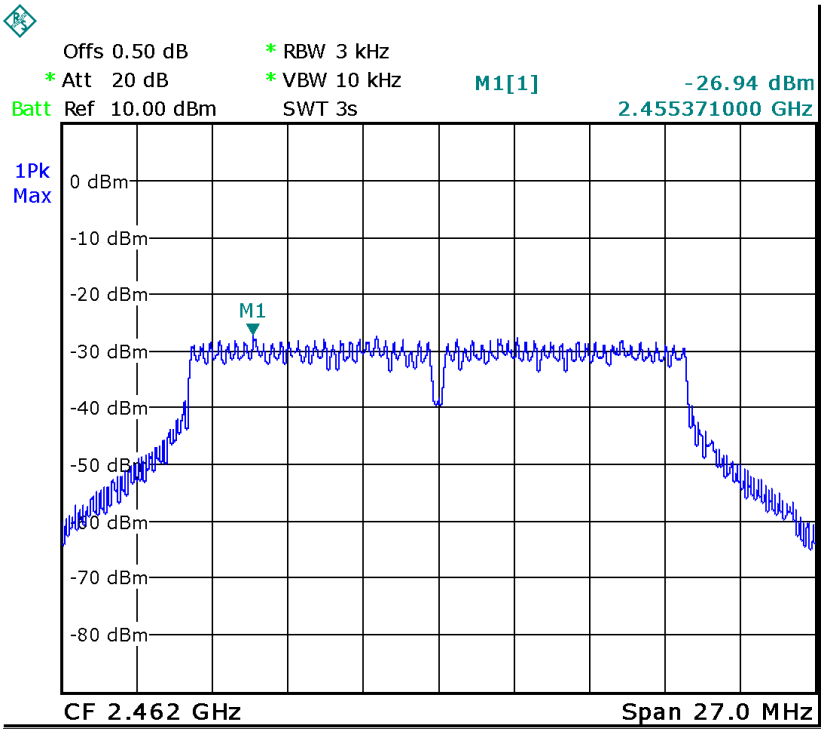
Mode: TX 11n HT20 channel 1



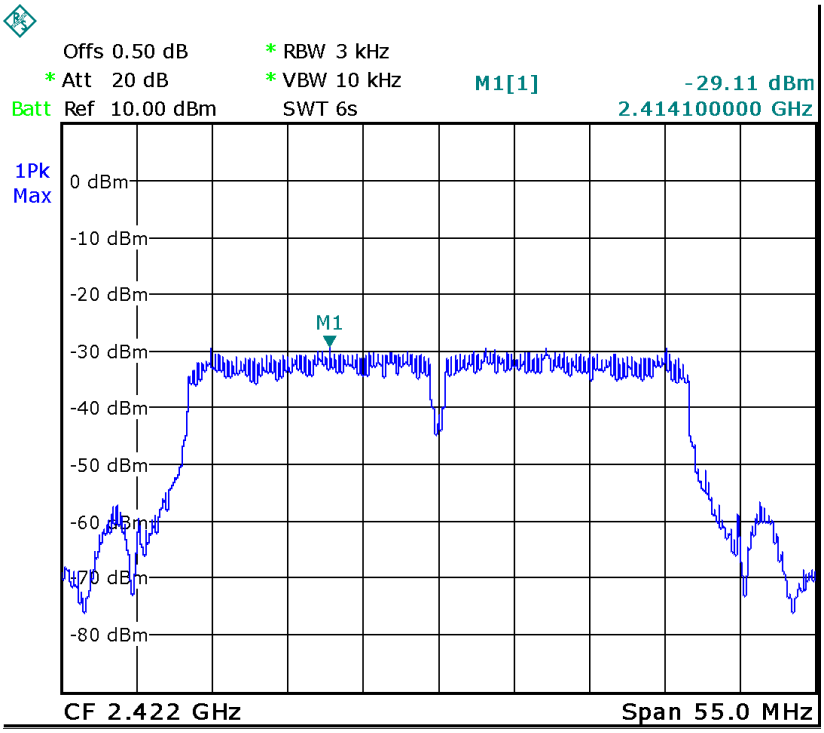
Mode: TX 11n HT20 channel 6



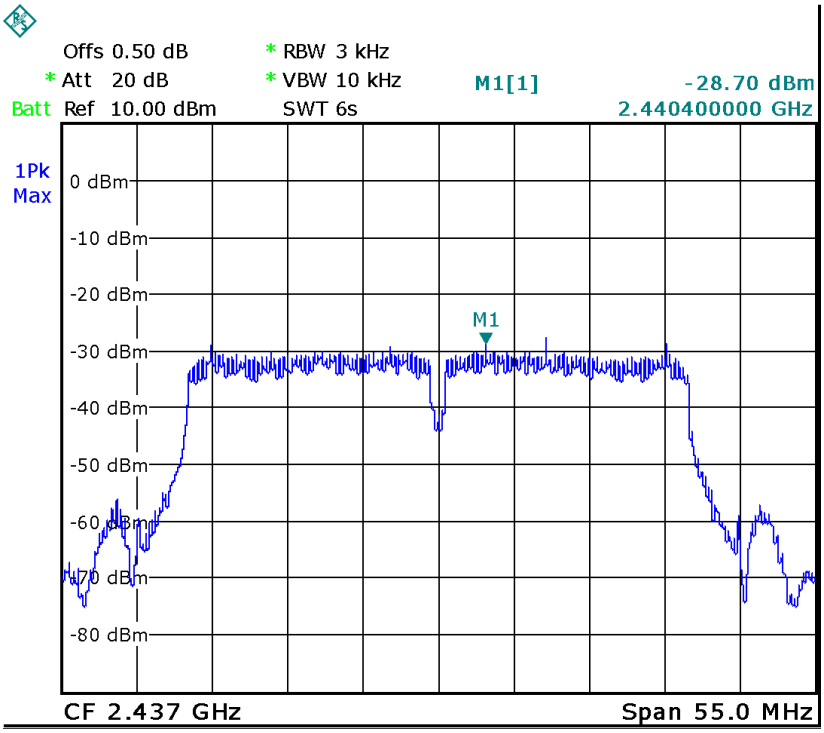
Mode: TX 11n HT20 channel 11



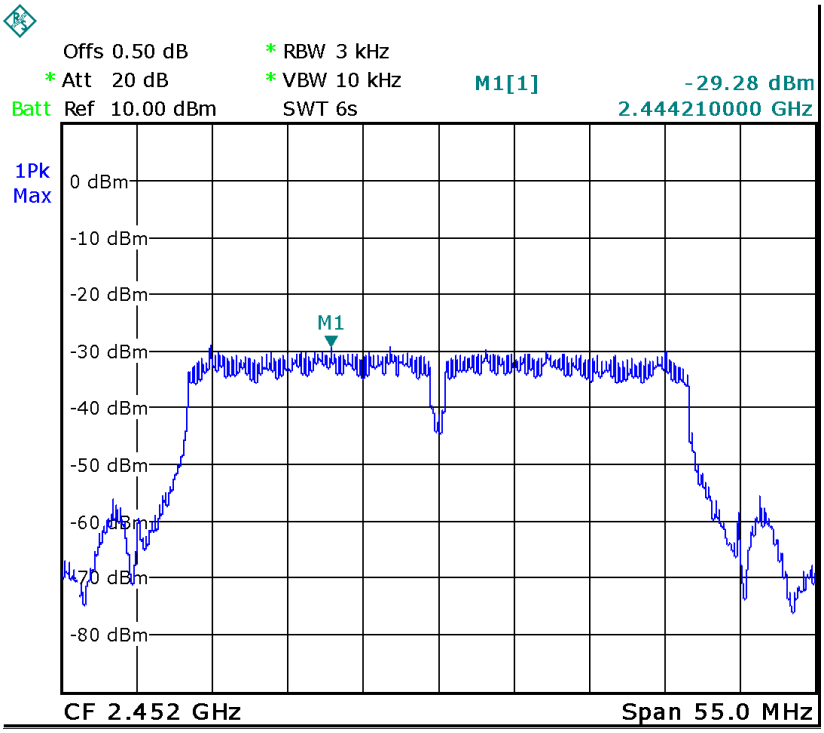
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



11 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a External antenna with RP-SMA connector (The whorl is non-standard, it only apply to this model), fulfil the requirement of this section

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