TEST REPORT

Reference No.	:	WTN16S1064141-2E
FCC ID.....	:	2AI5MT8061Q
Applicant	:	CHUNGHSIN INTERNATIONAL ELECTRONICS CO.,LTD
Address	:	618 GONGREN WEST ROAD,JIAOJIANG AREA, TAIZHOU, China
Manufacturer	:	The same as above
Address	:	The same as above
Product Name	:	tablet
Model No.	:	TM800A620MBGP, TM800A620MBSP, TM800A620MPPM, TM800A620MPBM, TM800A620M
Standards.....	:	FCC CFR47 Part 15 C Section 15.247:2016
Date of Receipt sample.....	:	Oct. 31, 2016
Date of Test.....	:	Nov. 01 – 07. 2016
Date of Issue	:	Nov. 09, 2016
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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3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTN16S1064141-2E	Oct. 31, 2016	Nov. 01 – 07. 2016	Nov. 09, 2016	original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product Name:	tablet
Model No.:	TM800A620MBGP, TM800A620MBSP, TM800A620MPPM, TM800A620MPBM, TM800A620M
Model Difference:	Only the color of the bottom plate is different. The model TM800A620MPBM is the tested sample.
Operation Frequency:	2402MHz ~ 2480MHz, separated by 2MHz,40 channels in total for BT 2412MHz-2462MHz for Wi-Fi
The Lowest Oscillator:	32.768KHz
Antenna Type:	Internal Intergrated Antenna
Antenna Gain:	2.0 dBi
Type of modulation:	GFSK,Pi/4 DQPSK,8DPSK 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.

Technical Data:	INPUT : DC 5.0V, 2.0A by Adapter, DC 3.7V, 3500mAh by Battery (Adapter Input: 100-240V~, 50/60Hz, 0.3A, Output: DC 5.0V ⎓ 2.0A, Model: BSY012U050200U U1USB)

4.3 Channel List

BLE mode

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	1	2404	2	2406	3	2408
4	2410	5	2412	6	2414	7	2416
8	2418	9	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	19	2440
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2462	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	39	2480

Wi-Fi mode

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
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	3/6/9	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

Table 2 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	BT BLE	1 Mbps	0/19/39	TX
Power Spectral Density	BT BLE	1 Mbps	0/19/39	TX
6dB Bandwidth	BT BLE	1 Mbps	0/19/39	TX
Band Edge	BT BLE	1 Mbps	0/19/39	TX
Transmitter Spurious Emissions	BT BLE	1 Mbps	0/19/39	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 .

4.5 Test Facility

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

- **IC – Registration No.: 7760A-1**

  Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A-1, October 15, 2015.

- **FCC Test Site 1#– Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2016	Sep.14,2017
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Oct.17, 2016	Oct.16, 2017
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.09, 2016	Apr.08, 2017
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.12, 2016	Sep.11, 2017
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.09, 2016	Apr.08, 2017
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.09, 2016	Apr.08, 2017
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.13, 2016	Apr.12, 2017
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.13, 2016	Apr.12, 2017
Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.12, 2016	Sep.11, 2017
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.12, 2016	Sep.11, 2017
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.12, 2016	Sep.11, 2017
4.	Cable	LARGE	RF300	-	Sep.12, 2016	Sep.11, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Apr.13, 2016	Apr.12, 2017
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.09, 2016	Apr.08, 2017
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Apr.13, 2016	Apr.12, 2017
4	Cable	HUBER+SUHNER	CBL2	525178	Apr.13, 2016	Apr.12, 2017
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2016	Sep.14,2017
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2016	Sep.14,2017
3.	Signal Analyzer	Agilent	N9010A	MY50520207	Sep.15,2016	Sep.14,2017

	(9k~26.5GHz)					

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 CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.247 15.205(a) 15.209(a)	C
Conducted Emissions	15.207(a)	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:

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	60
5 to 30	60	50

7.1 E.U.T. Operation

Operating Environment **:**

Temperature: 21.5 °C

Humidity: 51.9 % RH

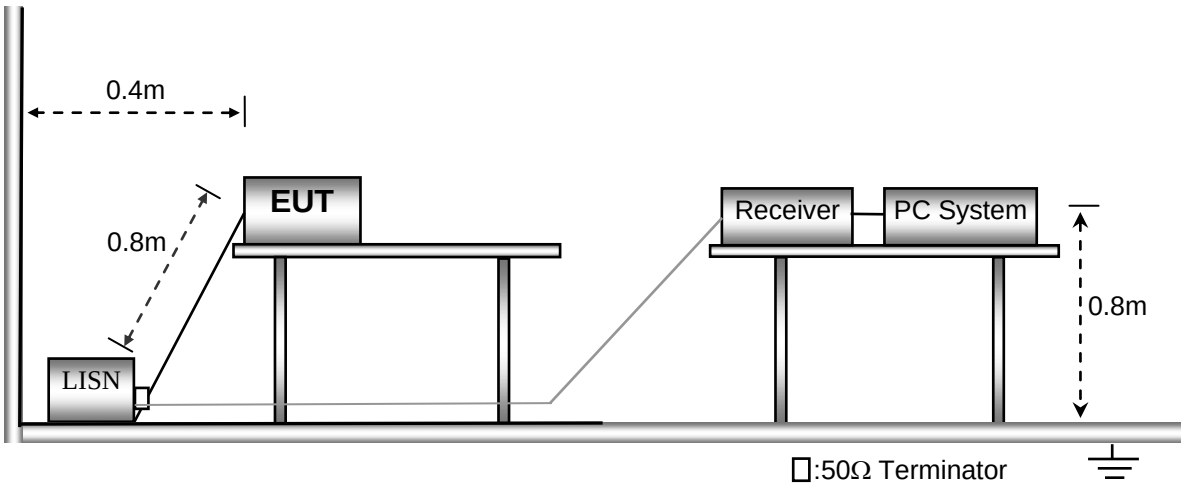
Atmospheric Pressure: 101.2kPa

EUT Operation **:**

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

7.2 EUT Setup

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

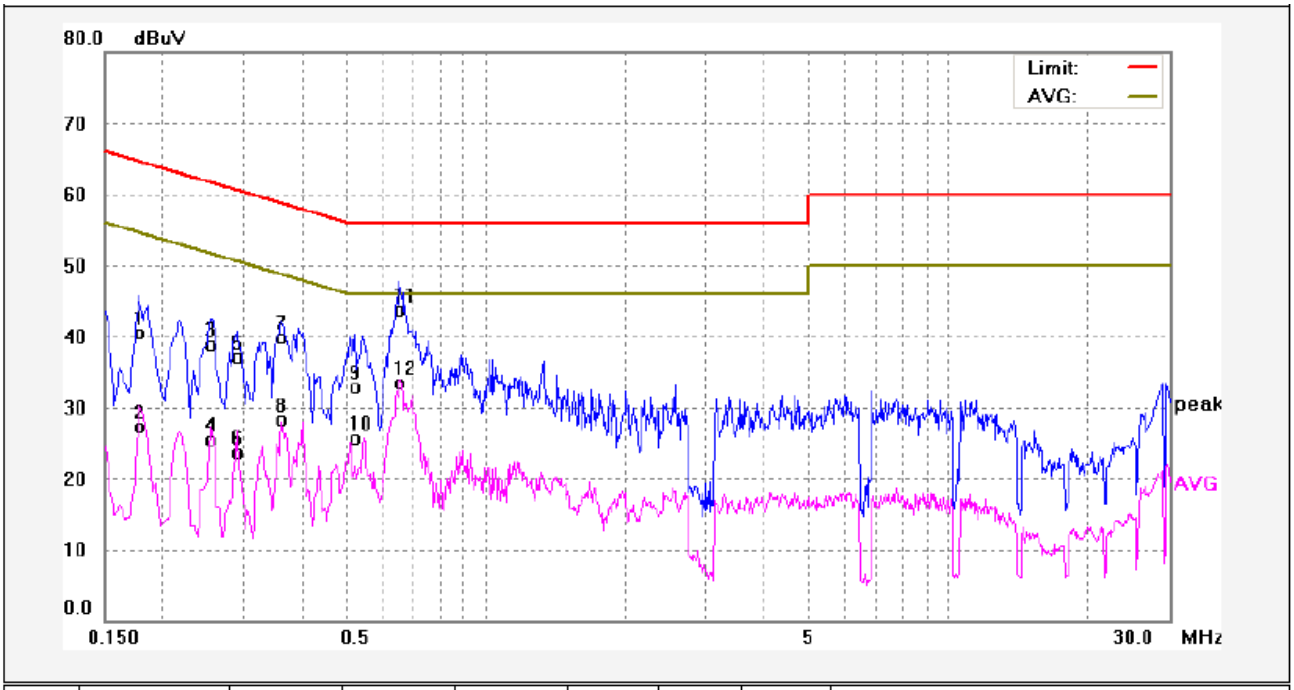


7.3 Measurement Description

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.

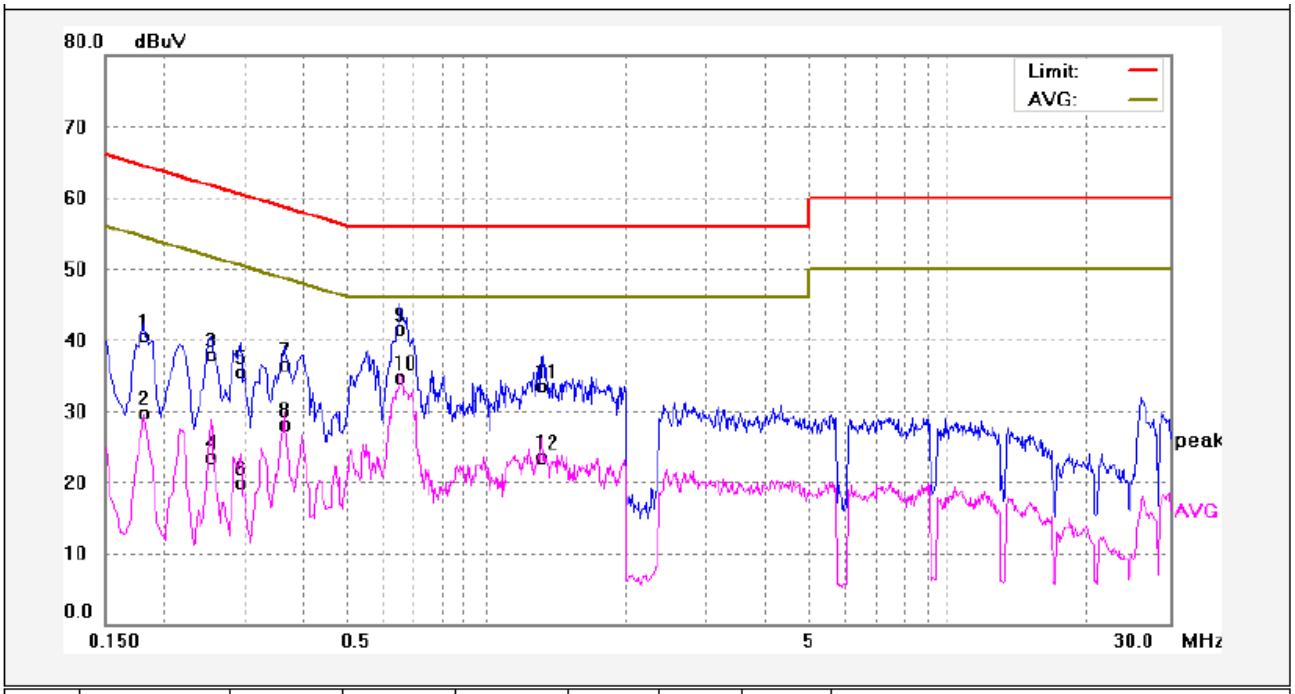
7.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1780	30.71	9.75	40.46	64.57	-24.11	QP	
2	0.1780	17.56	9.75	27.31	54.57	-27.26	AVG	
3	0.2540	29.15	9.74	38.89	61.62	-22.73	QP	
4	0.2540	15.82	9.74	25.56	51.62	-26.06	AVG	
5	0.2900	27.32	9.75	37.07	60.52	-23.45	QP	
6	0.2900	13.87	9.75	23.62	50.52	-26.90	AVG	
7	0.3620	30.07	9.75	39.82	58.68	-18.86	QP	
8	0.3620	18.60	9.75	28.35	48.68	-20.33	AVG	
9	0.5220	23.14	9.76	32.90	56.00	-23.10	QP	
10	0.5220	15.92	9.76	25.68	46.00	-20.32	AVG	
11	0.6540	33.93	9.77	43.70	56.00	-12.30	QP	
12	0.6540	23.75	9.77	33.52	46.00	-12.48	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1819	30.74	9.75	40.49	64.39	-23.90	QP	
2	0.1819	20.00	9.75	29.75	54.39	-24.64	AVG	
3	0.2540	28.14	9.74	37.88	61.62	-23.74	QP	
4	0.2540	13.78	9.74	23.52	51.62	-28.10	AVG	
5	0.2940	25.73	9.75	35.48	60.41	-24.93	QP	
6	0.2940	10.21	9.75	19.96	50.41	-30.45	AVG	
7	0.3660	26.66	9.75	36.41	58.59	-22.18	QP	
8	0.3660	18.31	9.75	28.06	48.59	-20.53	AVG	
9	0.6540	31.66	9.77	41.43	56.00	-14.57	QP	
10	0.6540	24.93	9.77	34.70	46.00	-11.30	AVG	
11	1.3260	23.64	9.82	33.46	56.00	-22.54	QP	
12	1.3260	13.65	9.82	23.47	46.00	-22.53	AVG	

8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.10:2013;ANSI C63. 4:2014

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

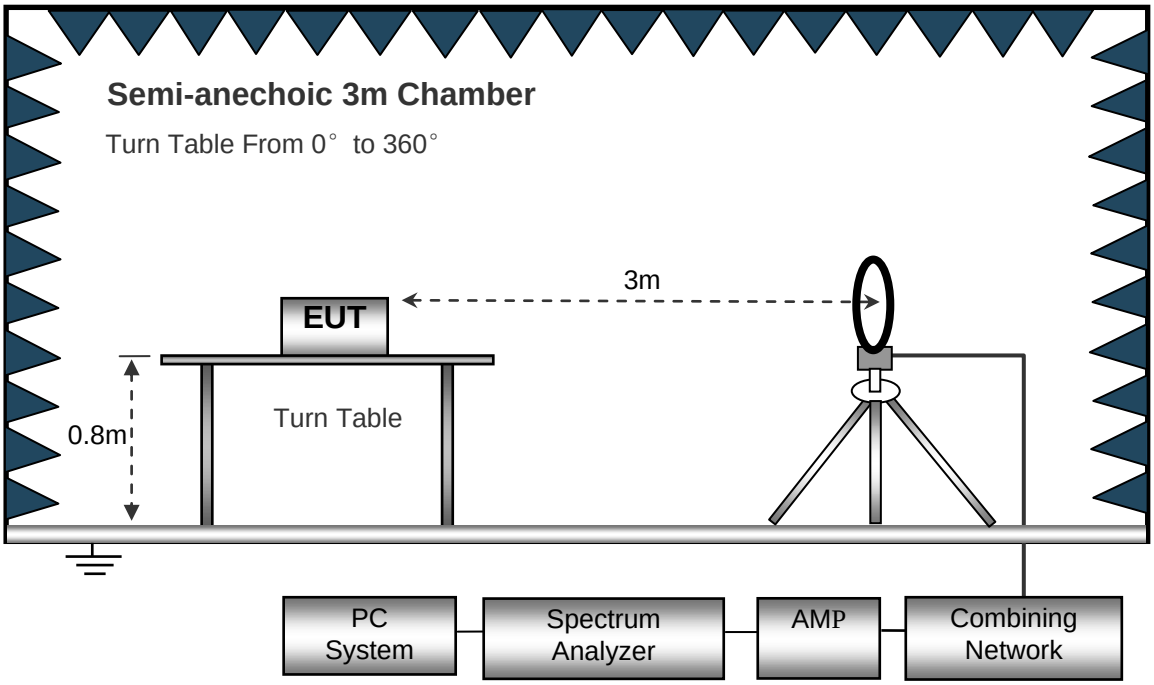
EUT Operation **:**

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

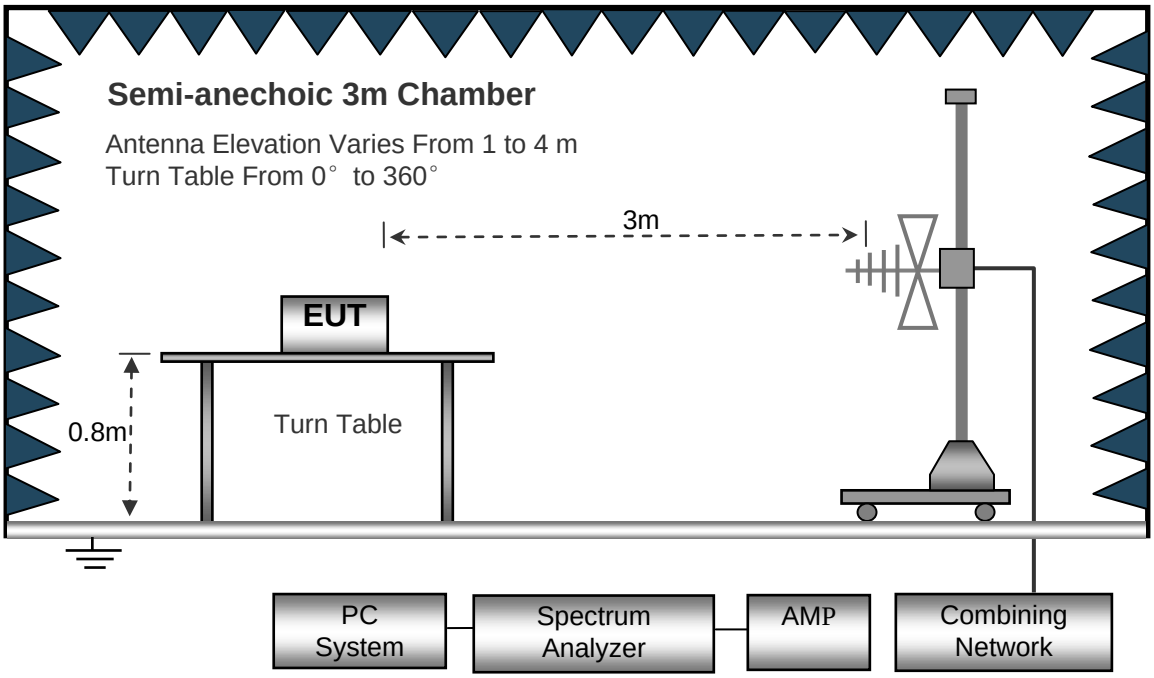
8.2 Test Setup

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

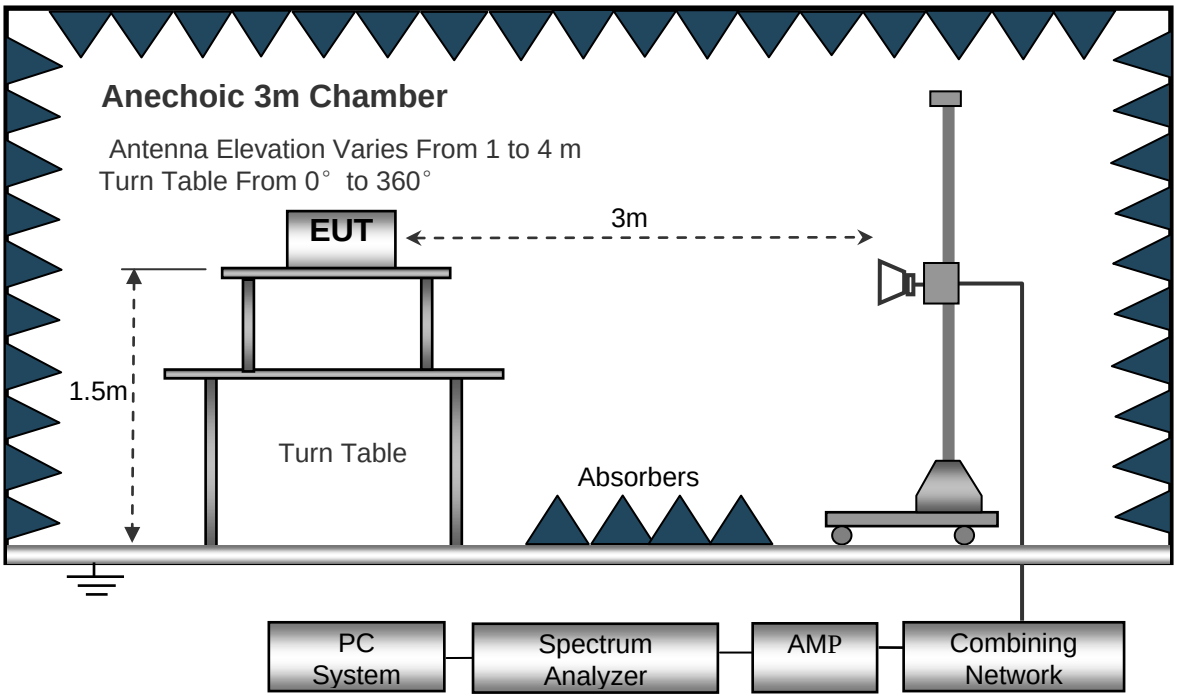
The test setup for emission measurement below 30MHz.



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
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. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
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 tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8.5 Summary of Test Results

Test Frequency: 32.768KHz to 30MHz

Frequency (MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
	dBμV @3m	PK/QP	dB/m	dB	dBμV/m @300m	dBμV/m @300m	dB
10.335	22.57	QP	19.90	40.00	2.47	29.54	-27.07

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									
224.59	41.24	QP	291.59	1.66	H	-11.62	29.62	46.00	-16.38
224.59	37.57	QP	164.95	1.30	V	-11.62	25.95	46.00	-20.05
4824.00	50.69	PK	330.23	1.04	V	-1.06	49.63	74.00	-24.37
4824.00	46.93	Ave	330.23	1.04	V	-1.06	45.87	54.00	-8.13
7236.00	41.05	PK	16.10	1.50	H	1.33	42.38	74.00	-31.62
7236.00	42.68	Ave	16.10	1.50	H	1.33	44.01	54.00	-9.99
2327.02	46.73	PK	113.17	1.67	V	-13.19	33.54	74.00	-40.46
2327.02	39.26	Ave	113.17	1.67	V	-13.19	26.07	54.00	-27.93
2377.12	44.09	PK	203.30	1.57	H	-13.14	30.95	74.00	-43.05
2377.12	37.67	Ave	203.30	1.57	H	-13.14	24.53	54.00	-29.47
2493.46	43.53	PK	99.71	1.78	V	-13.08	30.45	74.00	-43.55
2493.46	38.15	Ave	99.71	1.78	V	-13.08	25.07	54.00	-28.93

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)
11b: Middle Channel 2437MHz									
224.59	42.72	QP	297.03	1.32	H	-11.62	31.10	46.00	-14.90
224.59	37.20	QP	351.38	1.51	V	-11.62	25.58	46.00	-20.42
4874.00	52.10	PK	255.32	1.11	V	-0.62	51.48	74.00	-22.52
4874.00	46.69	Ave	255.32	1.11	V	-0.62	46.07	54.00	-7.93
7311.00	40.72	PK	120.10	1.75	H	2.21	42.93	74.00	-31.07
7311.00	41.47	Ave	120.10	1.75	H	2.21	43.68	54.00	-10.32
2340.45	46.71	PK	182.26	1.84	V	-13.19	33.52	74.00	-40.48
2340.45	37.80	Ave	182.26	1.84	V	-13.19	24.61	54.00	-29.39
2359.64	44.55	PK	2.55	1.12	H	-13.14	31.41	74.00	-42.59
2359.64	38.11	Ave	2.55	1.12	H	-13.14	24.97	54.00	-29.03
2495.85	42.19	PK	18.22	1.68	V	-13.08	29.11	74.00	-44.89
2495.85	36.28	Ave	18.22	1.68	V	-13.08	23.20	54.00	-30.80

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									
224.59	42.69	QP	161.78	1.93	H	-11.62	31.07	46.00	-14.93
224.59	36.00	QP	196.27	1.33	V	-11.62	24.38	46.00	-21.62
4924.00	52.12	PK	302.25	1.22	V	-0.24	51.88	74.00	-22.12
4924.00	46.17	Ave	302.25	1.22	V	-0.24	45.93	54.00	-8.07
7386.00	39.40	PK	127.63	1.11	H	2.84	42.24	74.00	-31.76
7386.00	40.16	Ave	127.63	1.11	H	2.84	43.00	54.00	-11.00
2342.25	45.06	PK	237.05	1.57	V	-13.19	31.87	74.00	-42.13
2342.25	37.93	Ave	237.05	1.57	V	-13.19	24.74	54.00	-29.26
2369.63	43.15	PK	337.36	1.07	H	-13.14	30.01	74.00	-43.99
2369.63	37.43	Ave	337.36	1.07	H	-13.14	24.29	54.00	-29.71
2484.10	44.81	PK	148.22	1.12	V	-13.08	31.73	74.00	-42.27
2484.10	37.84	Ave	148.22	1.12	V	-13.08	24.76	54.00	-29.24

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									
224.59	41.72	QP	139.79	1.68	H	-11.62	30.10	46.00	-15.90
224.59	35.58	QP	98.95	1.16	V	-11.62	23.96	46.00	-22.04
4824.00	53.53	PK	272.70	1.96	V	-1.06	52.47	74.00	-21.53
4824.00	47.57	Ave	272.70	1.96	V	-1.06	46.51	54.00	-7.49
7236.00	38.28	PK	327.37	1.45	H	1.33	39.61	74.00	-34.39
7236.00	41.14	Ave	327.37	1.45	H	1.33	42.47	54.00	-11.53
2332.64	46.36	PK	162.49	1.99	V	-13.19	33.17	74.00	-40.83
2332.64	37.10	Ave	162.49	1.99	V	-13.19	23.91	54.00	-30.09
2382.60	43.16	PK	333.35	1.96	H	-13.14	30.02	74.00	-43.98
2382.60	37.26	Ave	333.35	1.96	H	-13.14	24.12	54.00	-29.88
2492.56	43.86	PK	294.46	1.82	V	-13.08	30.78	74.00	-43.22
2492.56	38.60	Ave	294.46	1.82	V	-13.08	25.52	54.00	-28.48

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									
224.59	41.75	QP	174.77	1.41	H	-11.62	30.13	46.00	-15.87
224.59	34.28	QP	291.15	1.95	V	-11.62	22.66	46.00	-23.34
4874.00	52.89	PK	148.99	1.64	V	-0.62	52.27	74.00	-21.73
4874.00	48.97	Ave	148.99	1.64	V	-0.62	48.35	54.00	-5.65
7311.00	38.46	PK	178.57	1.79	H	2.21	40.67	74.00	-33.33
7311.00	39.98	Ave	178.57	1.79	H	2.21	42.19	54.00	-11.81
2320.10	46.70	PK	24.95	1.85	V	-13.19	33.51	74.00	-40.49
2320.10	37.13	Ave	24.95	1.85	V	-13.19	23.94	54.00	-30.06
2362.19	44.82	PK	258.84	1.05	H	-13.14	31.68	74.00	-42.32
2362.19	38.87	Ave	258.84	1.05	H	-13.14	25.73	54.00	-28.27
2496.69	43.25	PK	12.94	1.09	V	-13.08	30.17	74.00	-43.83
2496.69	37.38	Ave	12.94	1.09	V	-13.08	24.30	54.00	-29.70

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									
224.59	42.34	QP	63.09	1.44	H	-11.62	30.72	46.00	-15.28
224.59	35.61	QP	162.36	1.45	V	-11.62	23.99	46.00	-22.01
4924.00	53.47	PK	318.50	1.16	V	-0.24	53.23	74.00	-20.77
4924.00	48.96	Ave	318.50	1.16	V	-0.24	48.72	54.00	-5.28
7386.00	37.77	PK	145.78	1.27	H	2.84	40.61	74.00	-33.39
7386.00	41.13	Ave	145.78	1.27	H	2.84	43.97	54.00	-10.03
2327.17	46.39	PK	74.38	1.51	V	-13.19	33.20	74.00	-40.80
2327.17	37.14	Ave	74.38	1.51	V	-13.19	23.95	54.00	-30.05
2384.81	44.61	PK	299.54	1.35	H	-13.14	31.47	74.00	-42.53
2384.81	36.84	Ave	299.54	1.35	H	-13.14	23.70	54.00	-30.30
2497.22	42.05	PK	322.22	1.32	V	-13.08	28.97	74.00	-45.03
2497.22	36.05	Ave	322.22	1.32	V	-13.08	22.97	54.00	-31.03

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									
224.59	43.41	QP	147.85	1.76	H	-11.62	31.79	46.00	-14.21
224.59	36.27	QP	144.89	1.64	V	-11.62	24.65	46.00	-21.35
4824.00	54.63	PK	20.95	1.04	V	-1.06	53.57	74.00	-20.43
4824.00	47.75	Ave	20.95	1.04	V	-1.06	46.69	54.00	-7.31
7236.00	36.45	PK	279.91	1.91	H	1.33	37.78	74.00	-36.22
7236.00	40.30	Ave	279.91	1.91	H	1.33	41.63	54.00	-12.37
2310.31	46.25	PK	275.61	1.76	V	-13.19	33.06	74.00	-40.94
2310.31	38.21	Ave	275.61	1.76	V	-13.19	25.02	54.00	-28.98
2364.25	43.30	PK	305.39	1.26	H	-13.14	30.16	74.00	-43.84
2364.25	37.11	Ave	305.39	1.26	H	-13.14	23.97	54.00	-30.03
2495.00	43.11	PK	273.46	1.40	V	-13.08	30.03	74.00	-43.97
2495.00	36.76	Ave	273.46	1.40	V	-13.08	23.68	54.00	-30.32

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									
224.59	44.16	QP	154.87	1.77	H	-11.62	32.54	46.00	-13.46
224.59	37.36	QP	240.97	1.71	V	-11.62	25.74	46.00	-20.26
4874.00	55.08	PK	118.98	2.00	V	-0.62	54.46	74.00	-19.54
4874.00	47.59	Ave	118.98	2.00	V	-0.62	46.97	54.00	-7.03
7311.00	37.27	PK	93.12	1.56	H	2.21	39.48	74.00	-34.52
7311.00	39.40	Ave	93.12	1.56	H	2.21	41.61	54.00	-12.39
2327.66	46.01	PK	54.23	1.80	V	-13.19	32.82	74.00	-41.18
2327.66	37.91	Ave	54.23	1.80	V	-13.19	24.72	54.00	-29.28
2377.12	43.42	PK	88.00	1.55	H	-13.14	30.28	74.00	-43.72
2377.12	38.92	Ave	88.00	1.55	H	-13.14	25.78	54.00	-28.22
2493.10	44.52	PK	217.93	1.57	V	-13.08	31.44	74.00	-42.56
2493.10	36.35	Ave	217.93	1.57	V	-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									
224.59	45.01	QP	144.08	1.28	H	-11.62	33.39	46.00	-12.61
224.59	38.38	QP	104.35	1.36	V	-11.62	26.76	46.00	-19.24
4924.00	54.69	PK	169.80	1.78	V	-0.24	54.45	74.00	-19.55
4924.00	46.69	Ave	169.80	1.78	V	-0.24	46.45	54.00	-7.55
7386.00	37.84	PK	262.80	1.93	H	2.84	40.68	74.00	-33.32
7386.00	38.20	Ave	262.80	1.93	H	2.84	41.04	54.00	-12.96
2330.88	45.35	PK	222.74	1.53	V	-13.19	32.16	74.00	-41.84
2330.88	39.21	Ave	222.74	1.53	V	-13.19	26.02	54.00	-27.98
2366.91	42.57	PK	46.06	1.05	H	-13.14	29.43	74.00	-44.57
2366.91	38.33	Ave	46.06	1.05	H	-13.14	25.19	54.00	-28.81
2486.20	42.51	PK	246.75	1.60	V	-13.08	29.43	74.00	-44.57
2486.20	37.53	Ave	246.75	1.60	V	-13.08	24.45	54.00	-29.55

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)
802.11n(HT40) low channel 2422MHz									
224.59	44.95	QP	147.60	1.28	H	-11.62	33.33	46.00	-12.67
224.59	37.96	QP	317.97	1.22	V	-11.62	26.34	46.00	-19.66
4844.00	52.57	PK	37.46	1.23	V	-1.06	51.51	74.00	-22.49
4844.00	45.46	Ave	37.46	1.23	V	-1.06	44.40	54.00	-9.60
7266.00	36.00	PK	119.65	1.08	H	1.33	37.33	74.00	-36.67
7266.00	35.21	Ave	119.65	1.08	H	1.33	36.54	54.00	-17.46
2332.00	45.78	PK	113.43	1.61	V	-13.19	32.59	74.00	-41.41
2332.00	37.19	Ave	113.43	1.61	V	-13.19	24.00	54.00	-30.00
2353.82	43.62	PK	266.81	1.83	H	-13.14	30.48	74.00	-43.52
2353.82	36.39	Ave	266.81	1.83	H	-13.14	23.25	54.00	-30.75
2498.12	43.10	PK	36.79	1.77	V	-13.08	30.02	74.00	-43.98
2498.12	36.00	Ave	36.79	1.77	V	-13.08	22.92	54.00	-31.08

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)
802.11n(HT40) middle channel 2437MHz									
224.59	45.71	QP	198.09	1.12	H	-11.62	34.09	46.00	-11.91
224.59	38.94	QP	13.95	1.19	V	-11.62	27.32	46.00	-18.68
4874.00	52.85	PK	287.19	1.97	V	-0.62	52.23	74.00	-21.77
4874.00	45.41	Ave	287.19	1.97	V	-0.62	44.79	54.00	-9.21
7311.00	36.43	PK	318.43	1.17	H	2.21	38.64	74.00	-35.36
7311.00	35.96	Ave	318.43	1.17	H	2.21	38.17	54.00	-15.83
2339.90	46.36	PK	192.47	1.18	V	-13.19	33.17	74.00	-40.83
2339.90	38.90	Ave	192.47	1.18	V	-13.19	25.71	54.00	-28.29
2381.83	44.62	PK	342.31	1.48	H	-13.14	31.48	74.00	-42.52
2381.83	38.05	Ave	342.31	1.48	H	-13.14	24.91	54.00	-29.09
2493.42	43.81	PK	62.00	1.50	V	-13.08	30.73	74.00	-43.27
2493.42	38.40	Ave	62.00	1.50	V	-13.08	25.32	54.00	-28.68

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)
802.11n(HT40) High channel 2452MHz									
224.59	46.46	QP	296.35	1.74	H	-11.62	34.84	46.00	-11.16
224.59	39.82	QP	310.68	1.89	V	-11.62	28.20	46.00	-17.80
4904.00	52.90	PK	35.17	1.21	V	-0.24	52.66	74.00	-21.34
4904.00	45.84	Ave	35.17	1.21	V	-0.24	45.60	54.00	-8.40
7356.00	35.96	PK	86.58	1.32	H	2.84	38.80	74.00	-35.20
7356.00	36.74	Ave	86.58	1.32	H	2.84	39.58	54.00	-14.42
2343.63	46.50	PK	56.61	1.33	V	-13.19	33.31	74.00	-40.69
2343.63	38.88	Ave	56.61	1.33	V	-13.19	25.69	54.00	-28.31
2370.30	42.25	PK	258.10	1.64	H	-13.14	29.11	74.00	-44.89
2370.30	37.75	Ave	258.10	1.64	H	-13.14	24.61	54.00	-29.39
2487.91	43.70	PK	132.63	1.90	V	-13.08	30.62	74.00	-43.38
2487.91	38.82	Ave	132.63	1.90	V	-13.08	25.74	54.00	-28.26

Test Frequency: 18GHz to 25GHz

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

9 Band Edge Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 DTS Meas Guidance v03r05
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

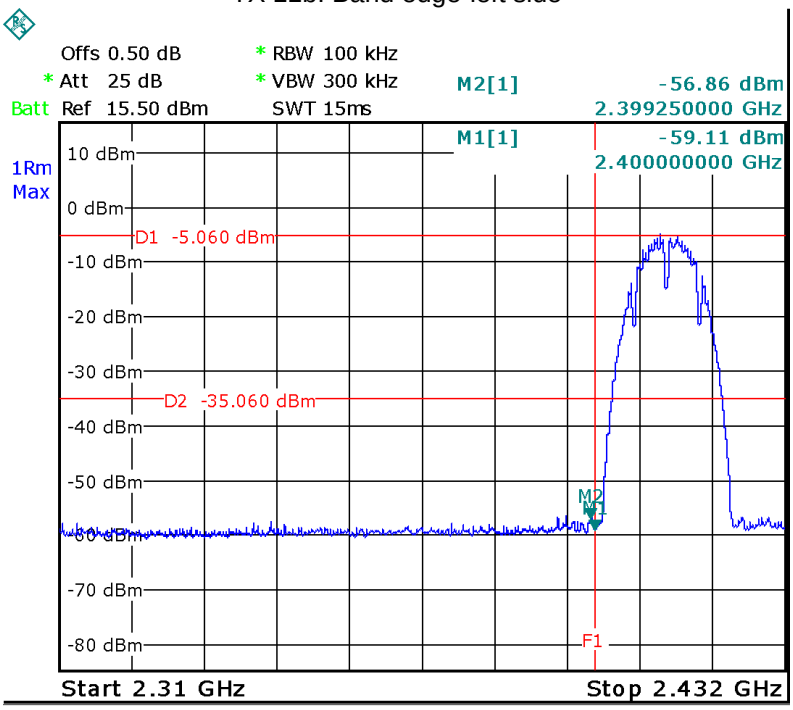
9.1 Test Produce

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.

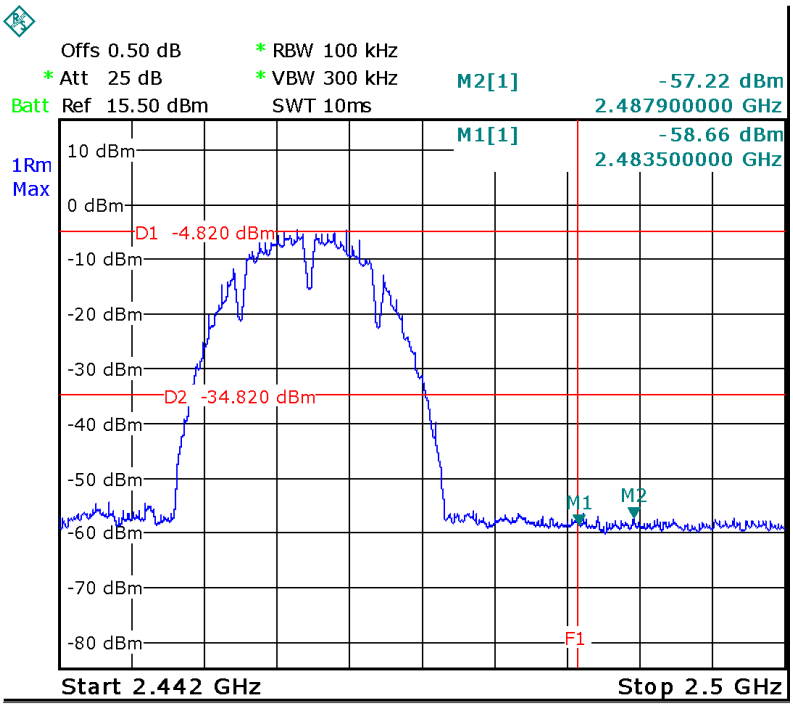
9.2 Test Result

Test result plots shown as follows:

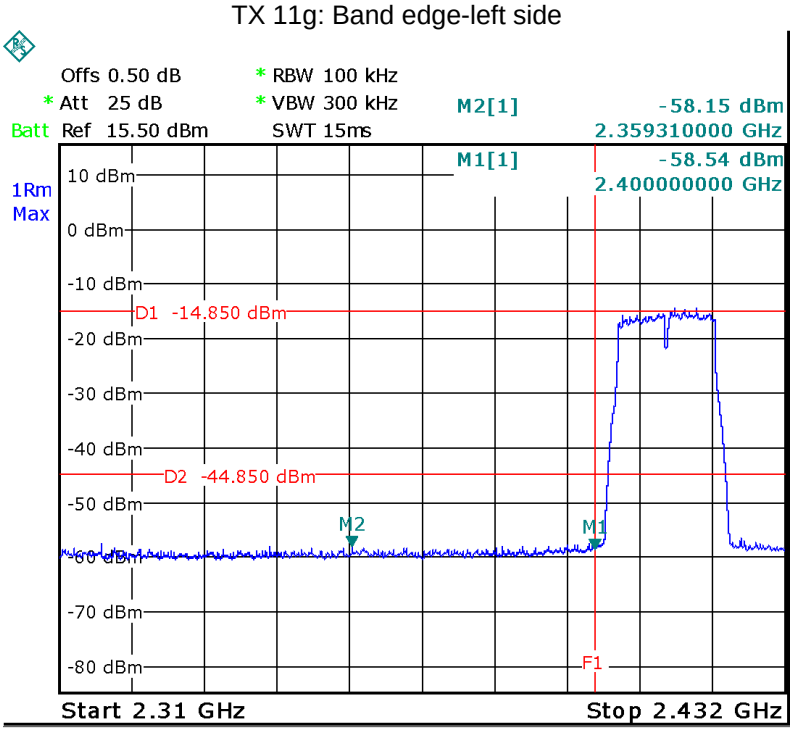
TX 11b: Band edge-left side



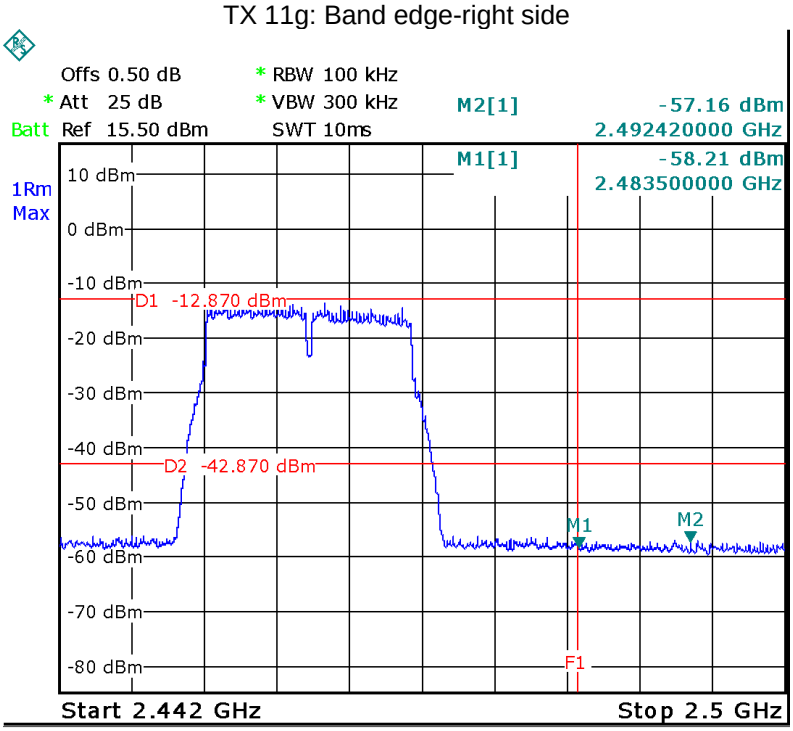
TX 11b: Band edge-right side



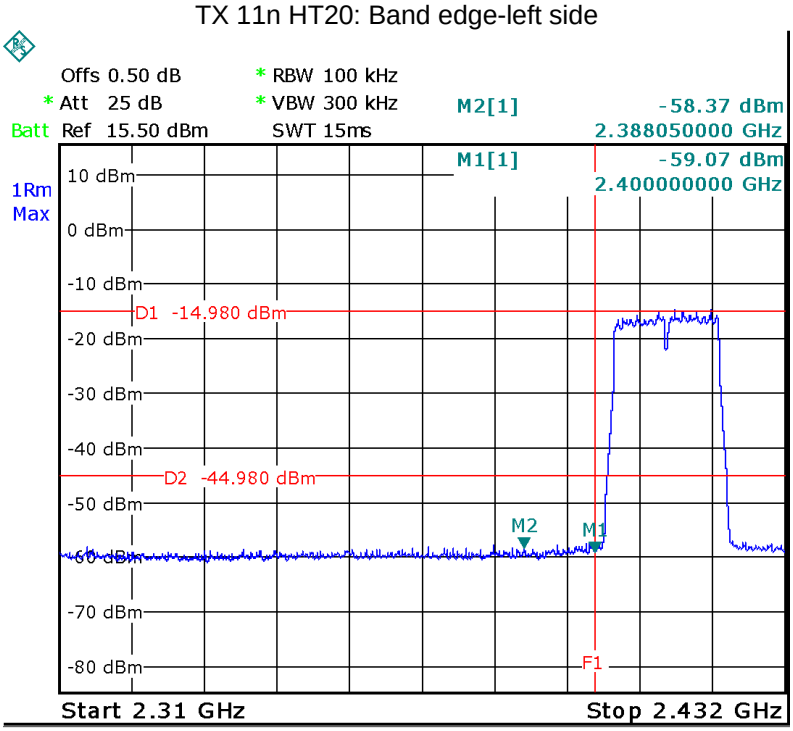
TX 11g: Band edge-left side



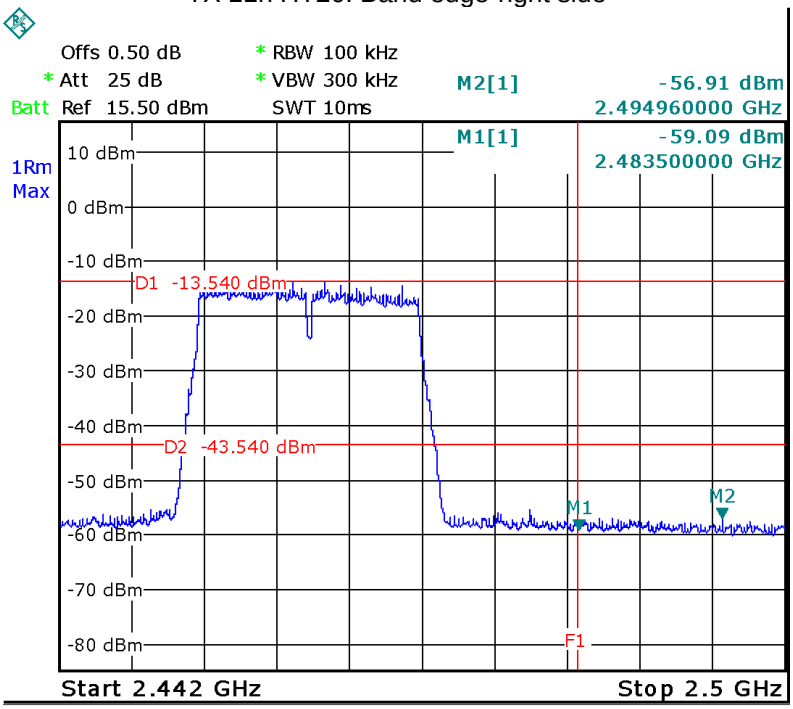
TX 11g: Band edge-right side



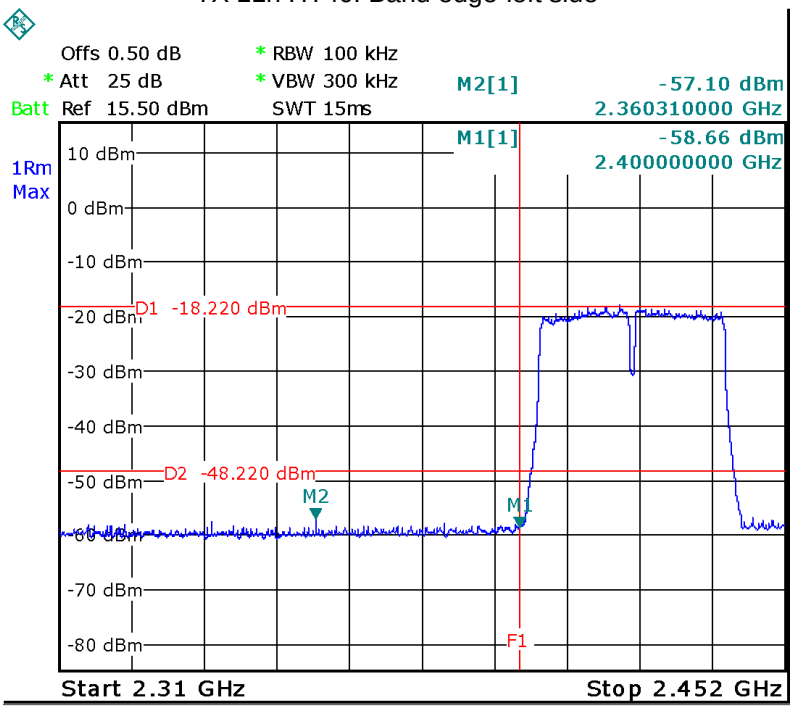
TX 11n HT20: Band edge-left side



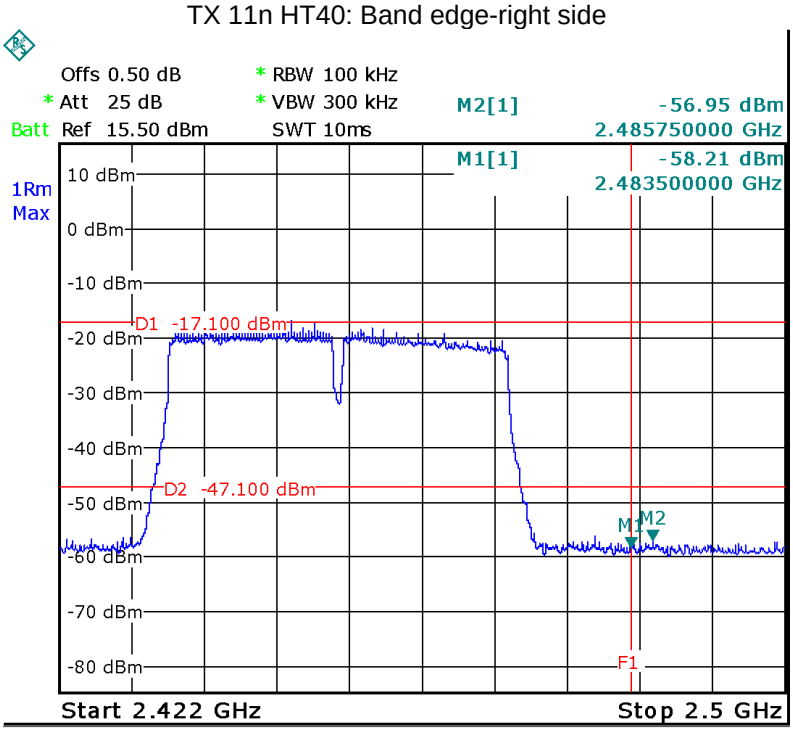
TX 11n HT20: Band edge-right side



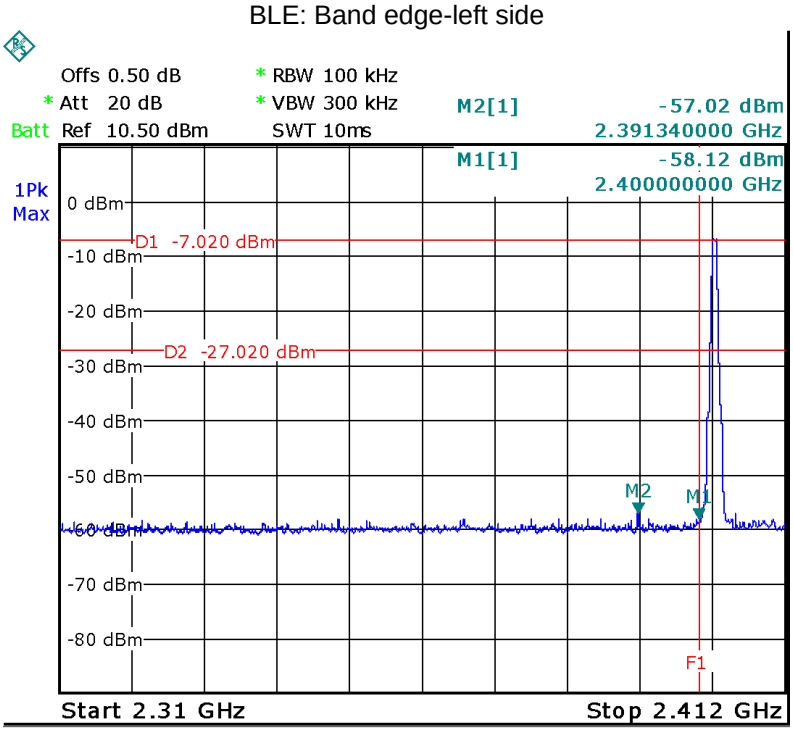
TX 11n HT40: Band edge-left side



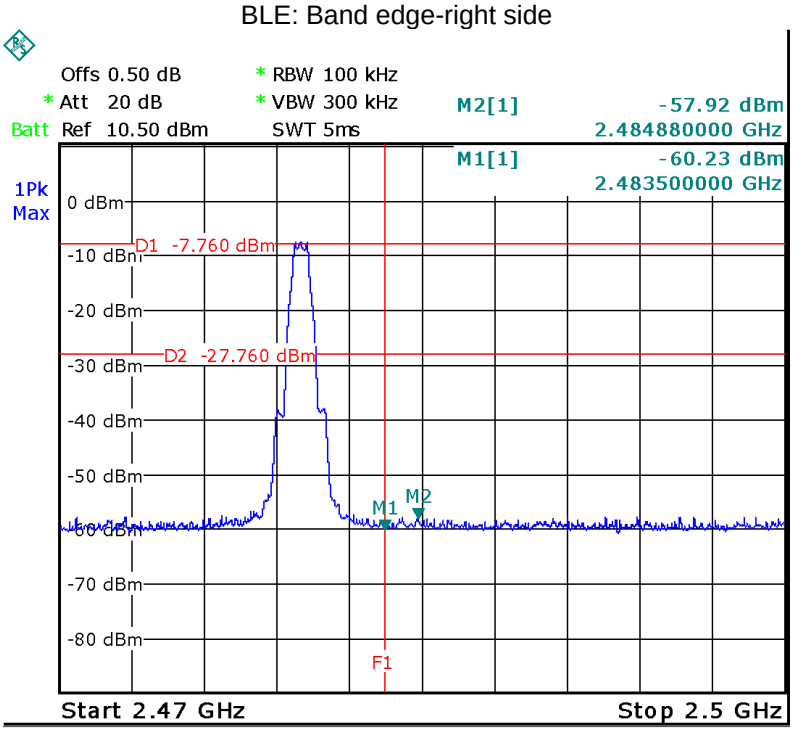
TX 11n HT40: Band edge-right side



BLE: Band edge-left side



BLE: Band edge-right side



10 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r05

10.1 Test Procedure:

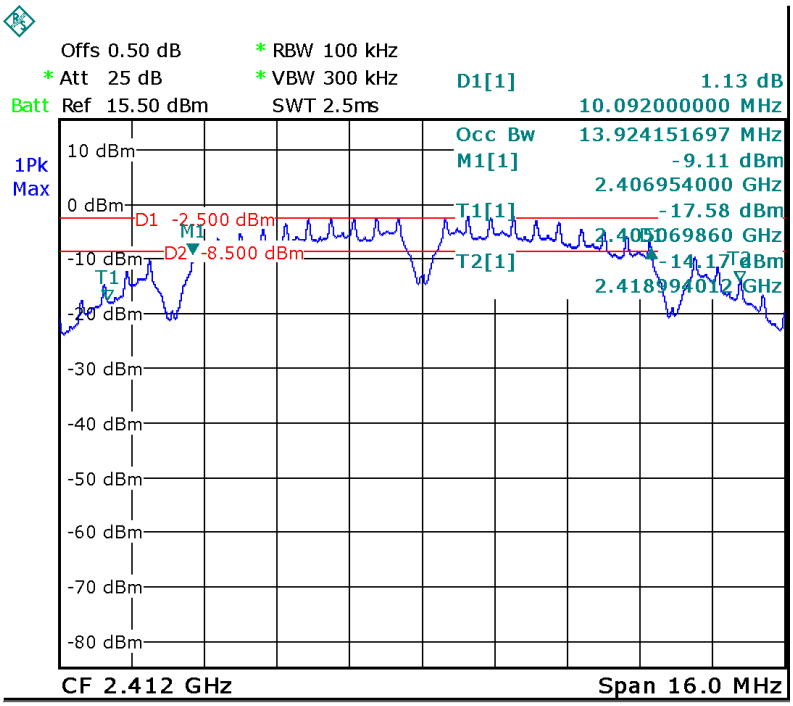
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

10.2 Test Result:

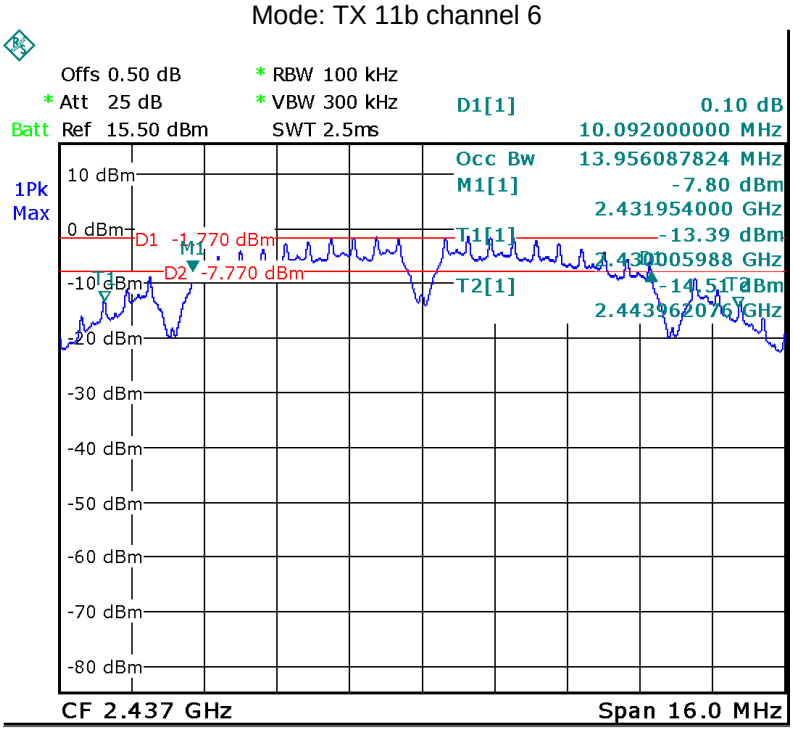
Operation mode	Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11
	10.092	10.092	10.092
TX 11g	Channel 1	Channel 6	Channel 11
	16.367	16.367	16.367
TX 11n HT20	Channel 1	Channel 6	Channel 11
	17.623	17.623	17.623
TX 11n HT40	Channel 3	Channel 6	Channel 9
	36.010	36.010	36.010
BT BLE	Channel 1	Channel 6	Channel 11
	0.701	0.701	0.701

Test result plot as follows:

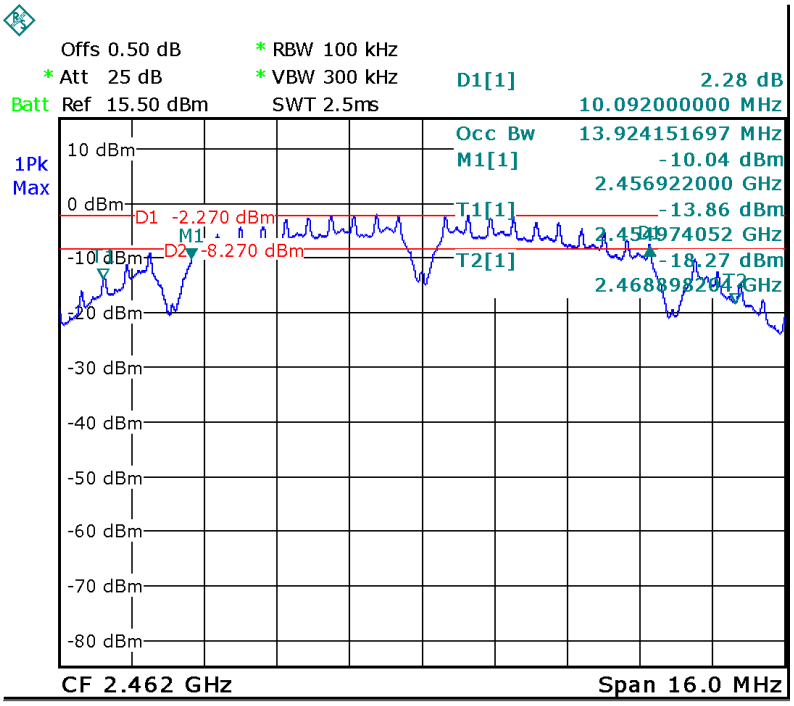
Mode: TX 11b channel 1



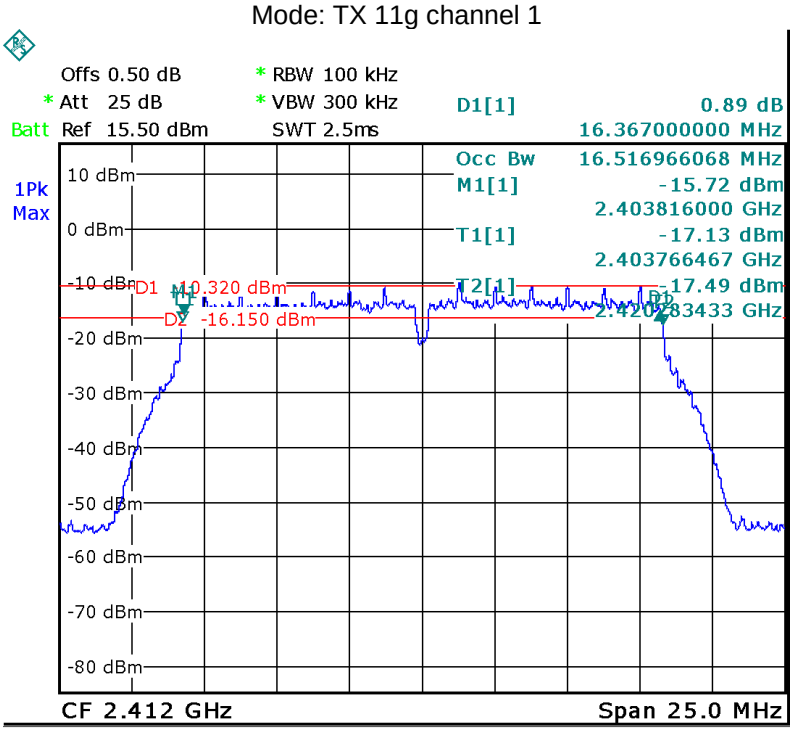
Mode: TX 11b channel 6



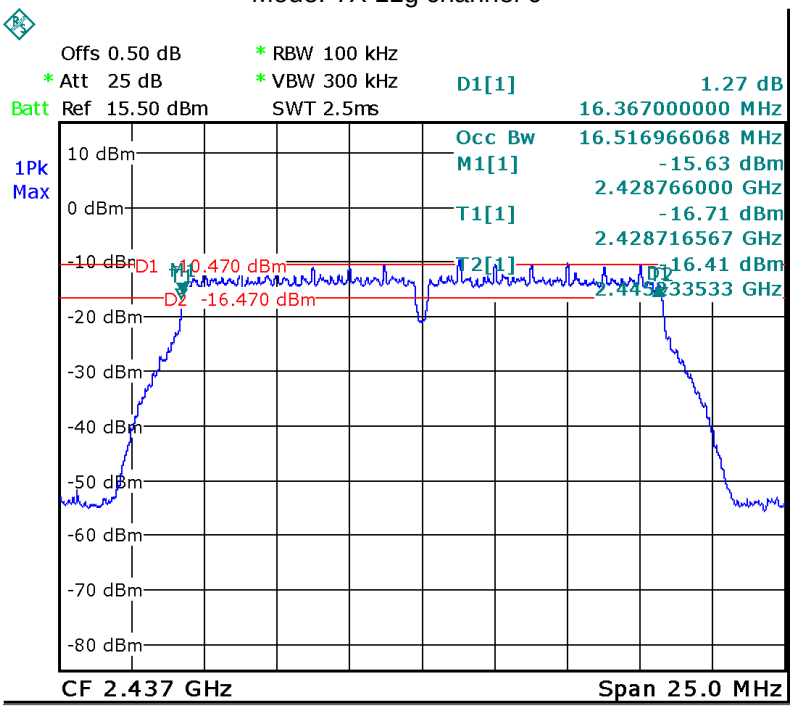
Mode: TX 11b channel 11



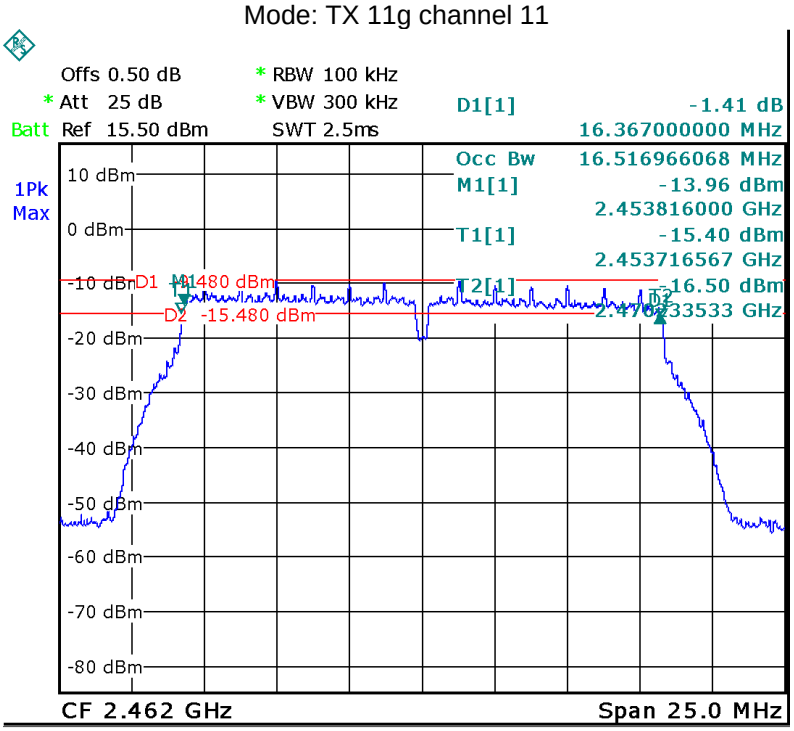
Mode: TX 11g channel 1



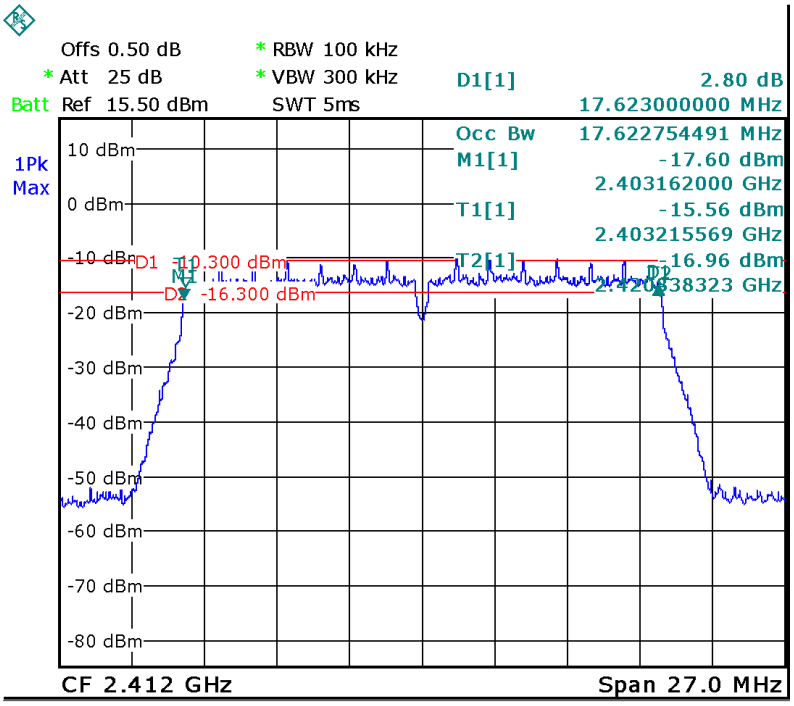
Mode: TX 11g channel 6



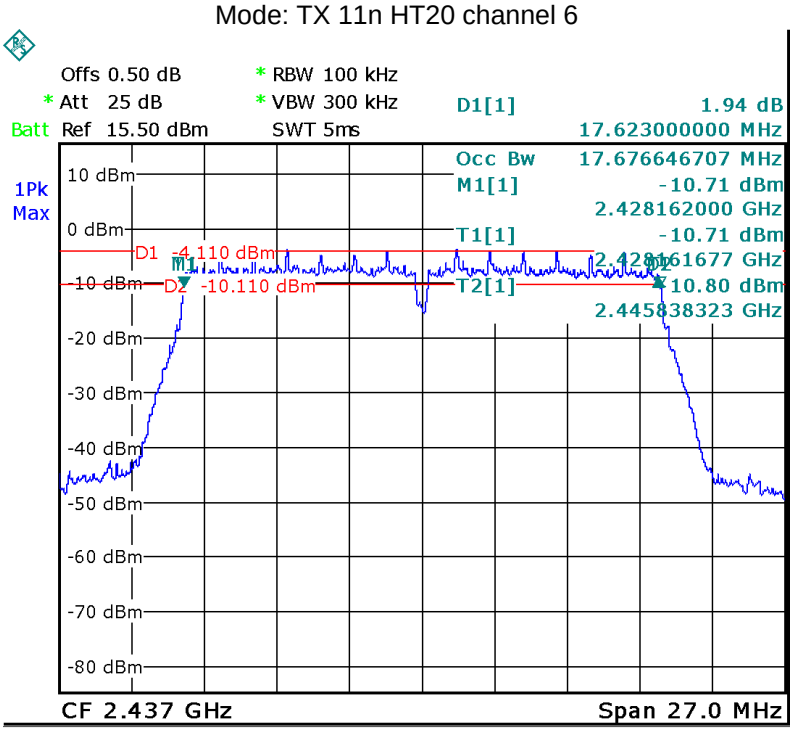
Mode: TX 11g channel 11



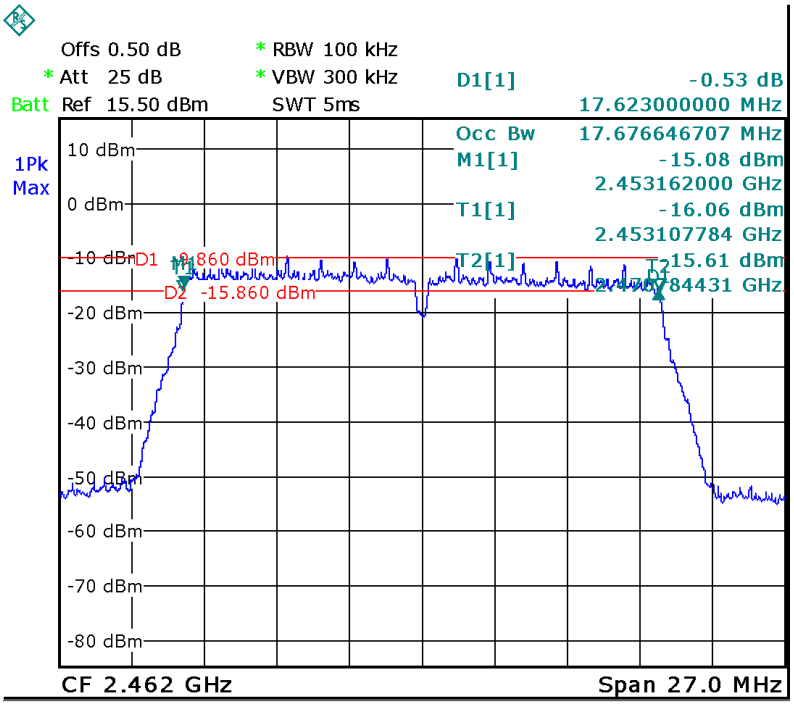
Mode: TX 11n HT20 channel 1



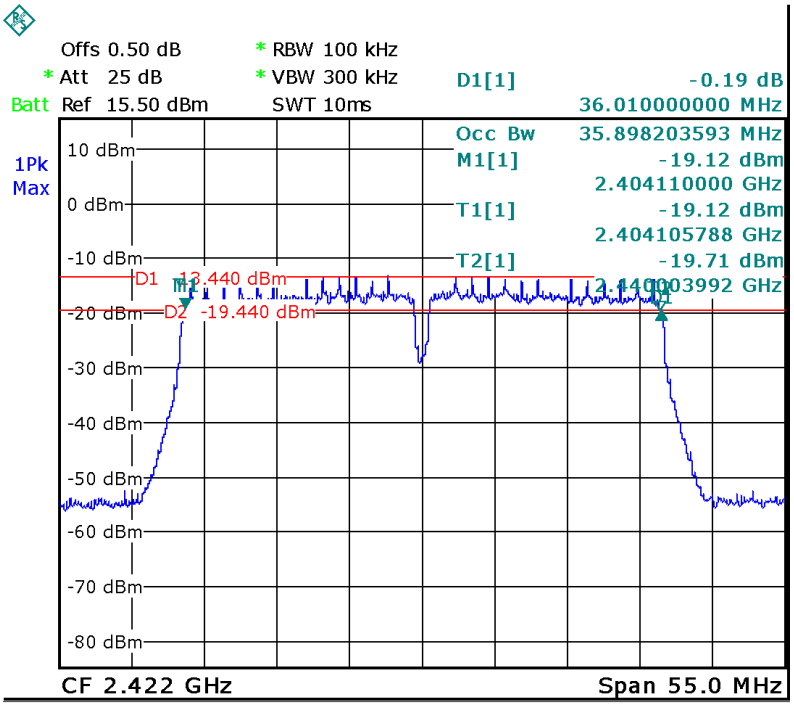
Mode: TX 11n HT20 channel 6



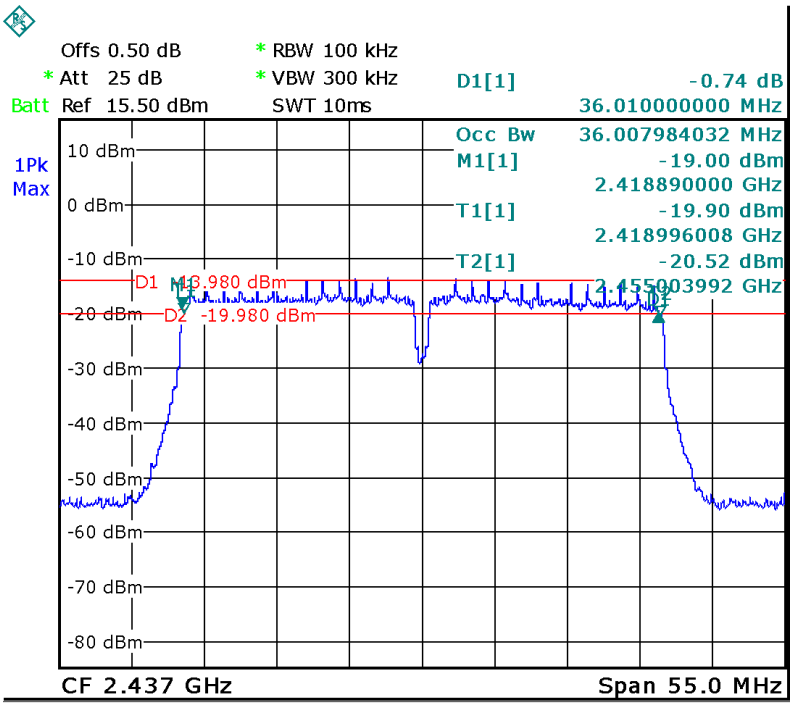
Mode: TX 11n HT20 channel 11



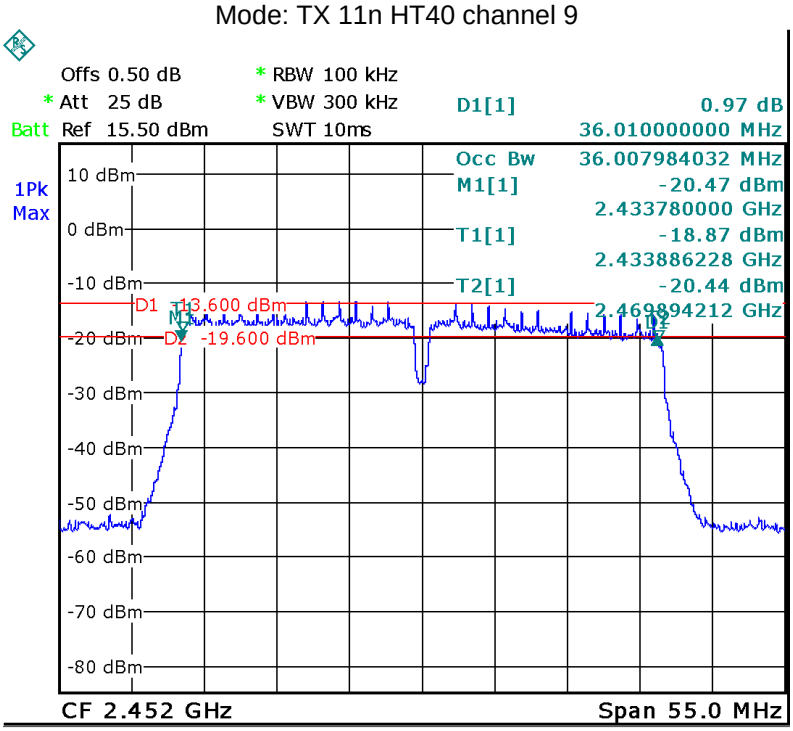
Mode: TX 11n HT40 channel 3



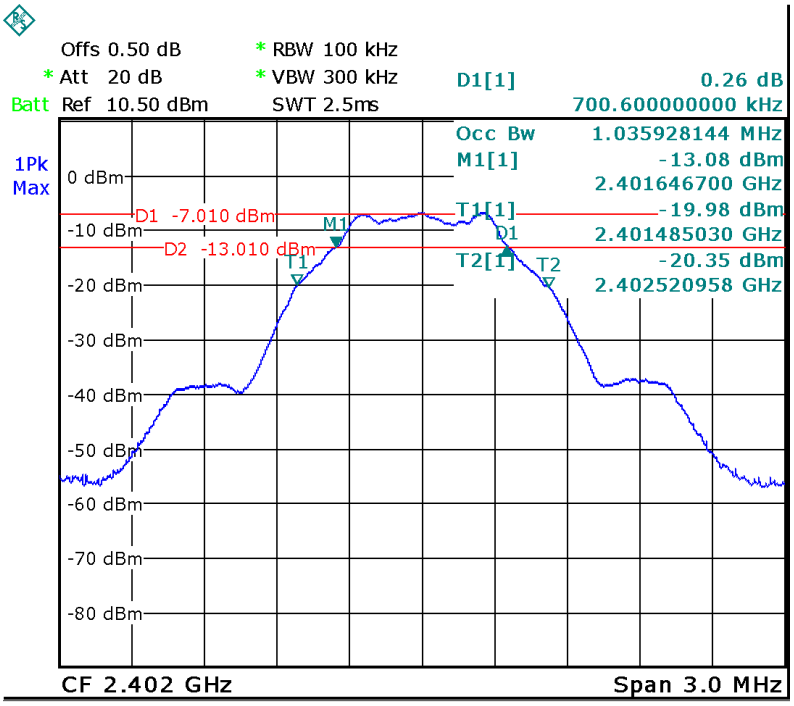
Mode: TX 11n HT40 channel 6



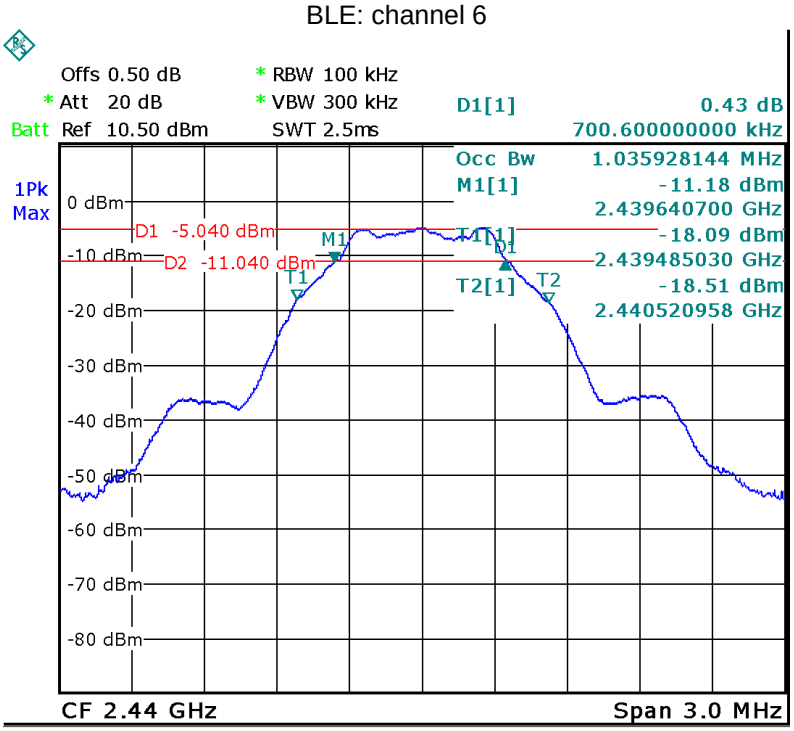
Mode: TX 11n HT40 channel 9



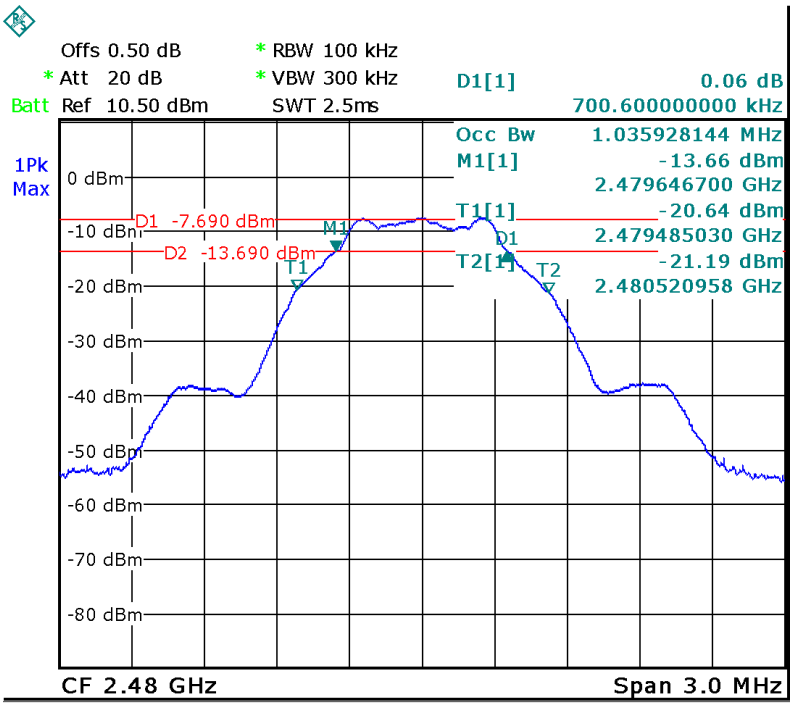
BLE: channel 1



BLE: channel 6



BLE: channel 11



11 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r05

11.1 Test Procedure:

KDB558074 D01 v03r05

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 = Peak, 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:

Test mode :TX 11b		
Maximum Peak Output Power (dBm)		
channel 1	channel 6	channel 11
9.17	9.22	9.18
Limit: 1W/30dBm		

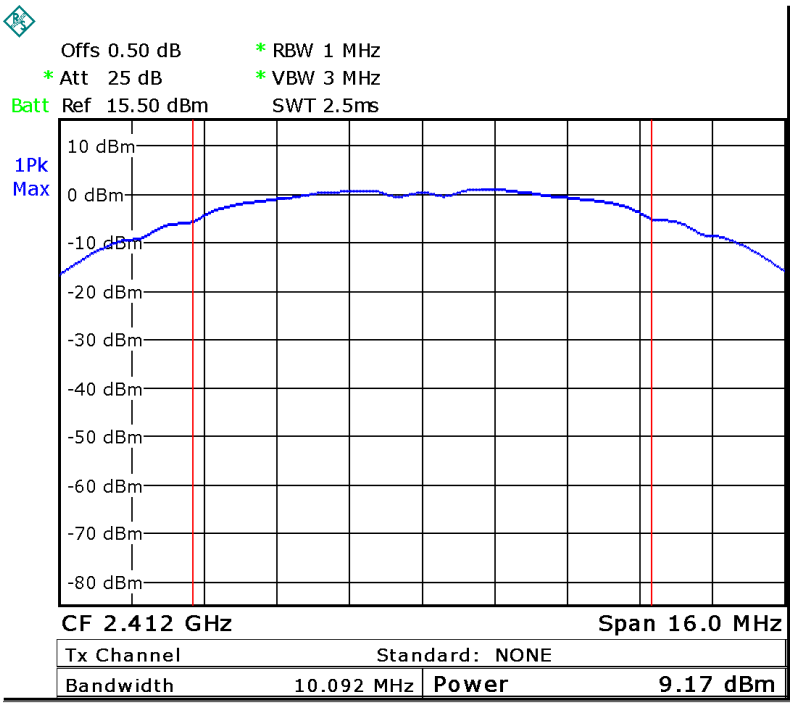
Test mode :TX 11g		
Maximum Peak Output Power (dBm)		
channel 1	channel 6	channel 11
9.07	9.05	9.42
Limit: 1W/30dBm		

Test mode :TX 11n HT20		
Maximum Peak Output Power (dBm)		
channel 1	channel 6	channel 11
9.11	9.09	9.33
Limit: 1W/30dBm		

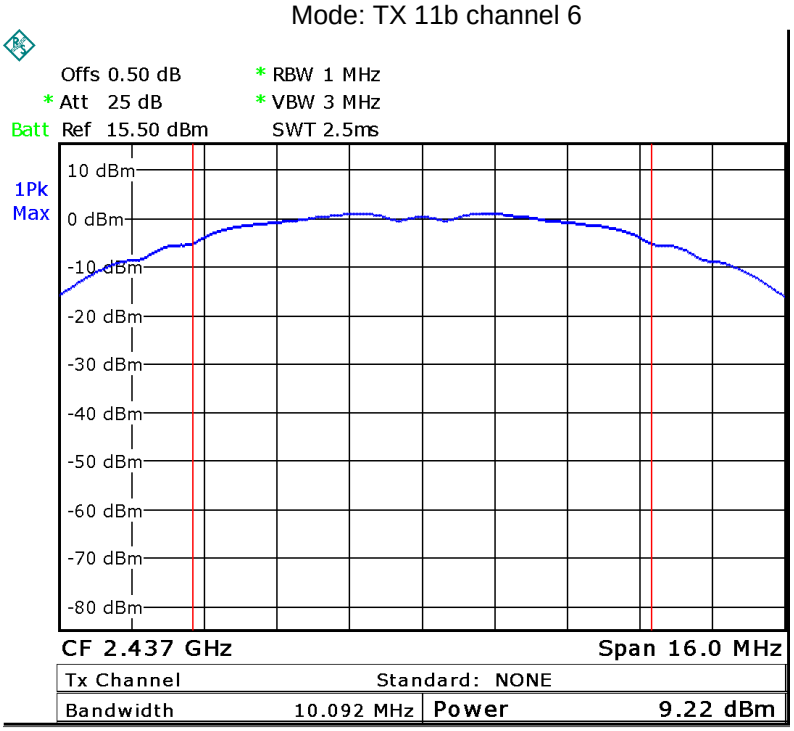
Test mode :TX 11n HT40		
Maximum Peak Output Power (dBm)		
channel 3	channel 6	channel 9
9.46	9.03	9.13
Limit: 1W/30dBm		

Test mode : BLE		
Maximum Peak Output Power (dBm)		
channel 0	channel 19	channel 39
-6.02	-4.13	-6.75
Limit: 1W/30dBm		

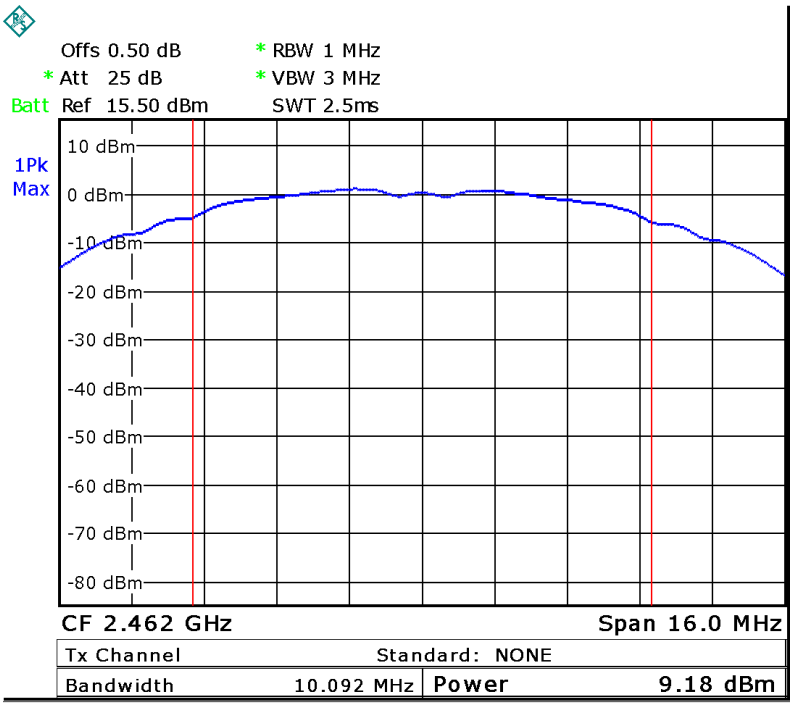
Mode: TX 11b channel 1



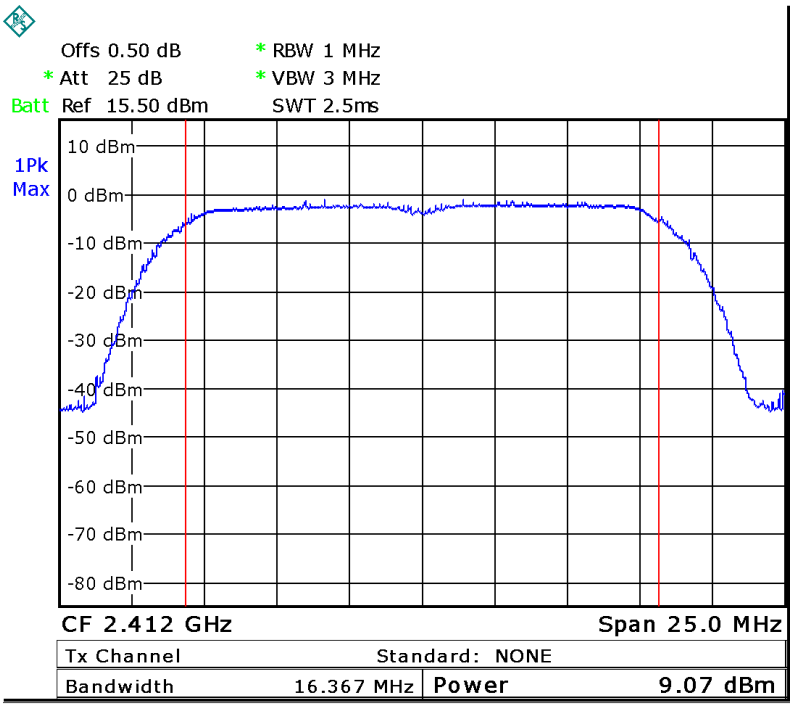
Mode: TX 11b channel 6



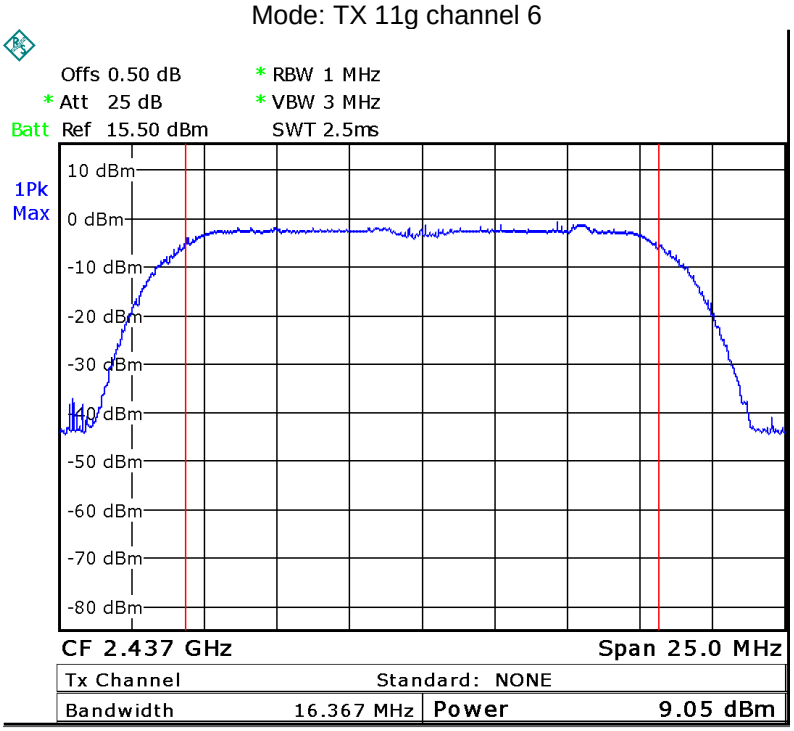
Mode: TX 11b channel 11



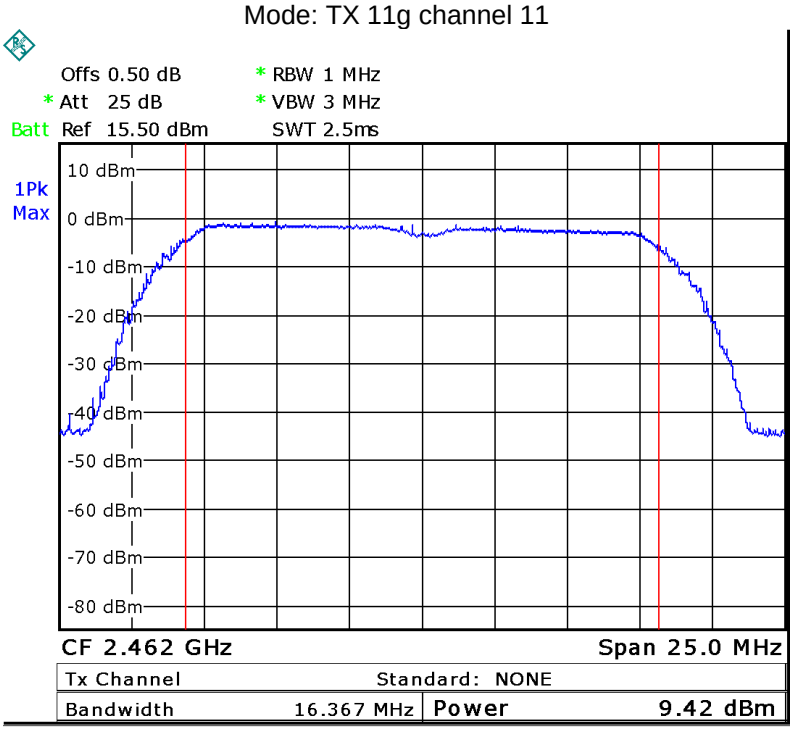
Mode: TX 11g channel 1



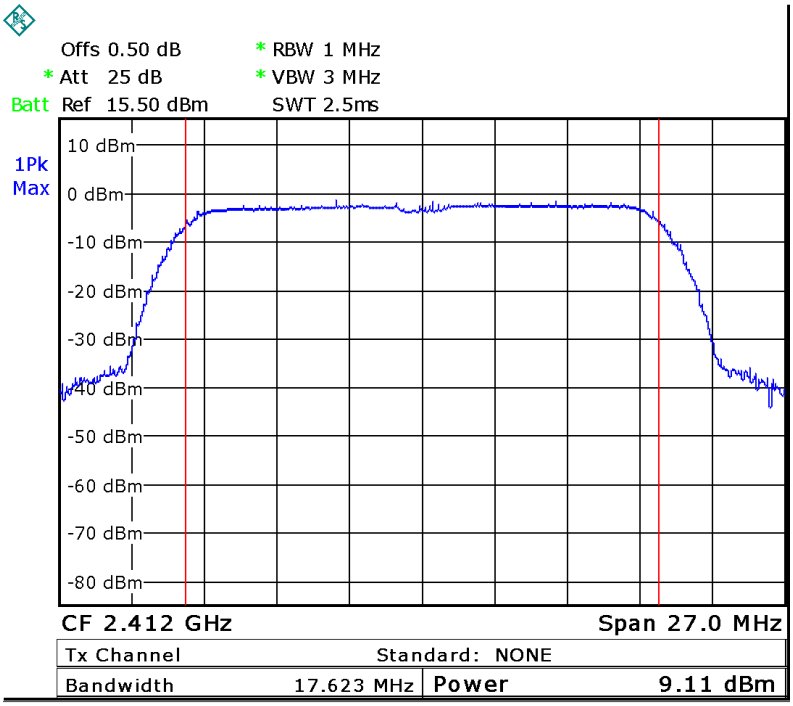
Mode: TX 11g channel 6



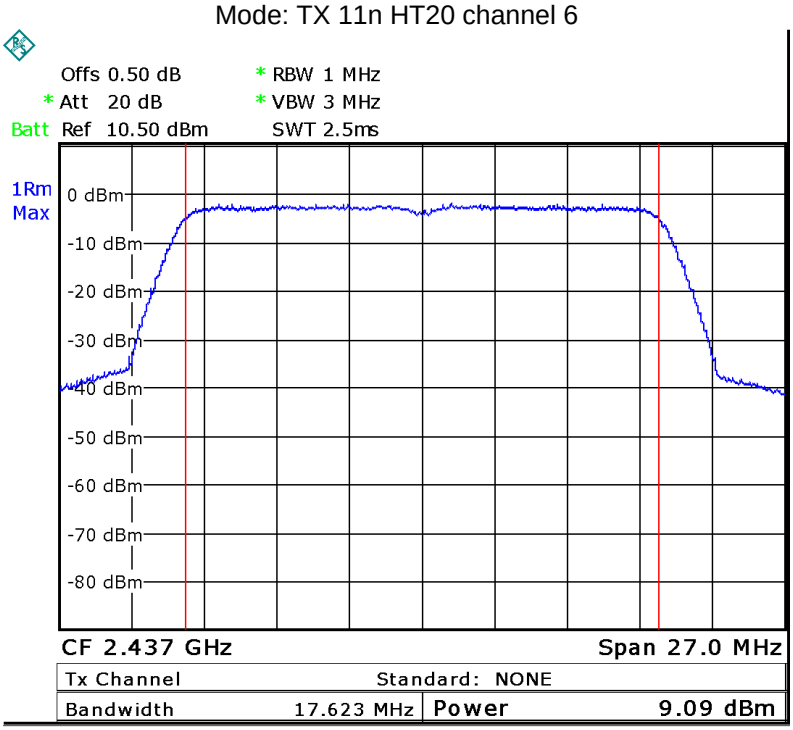
Mode: TX 11g channel 11



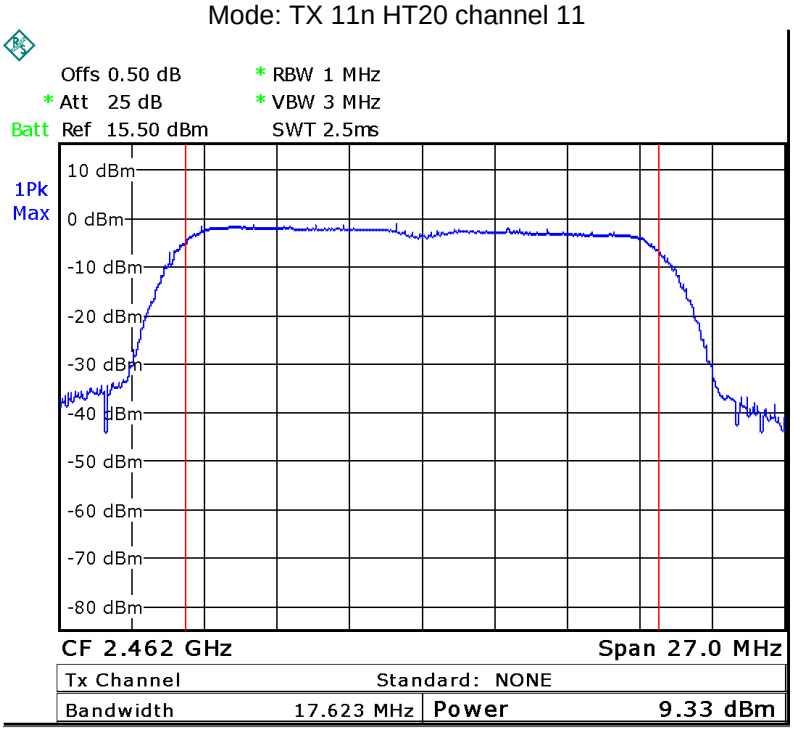
Mode: TX 11n HT20 channel 1



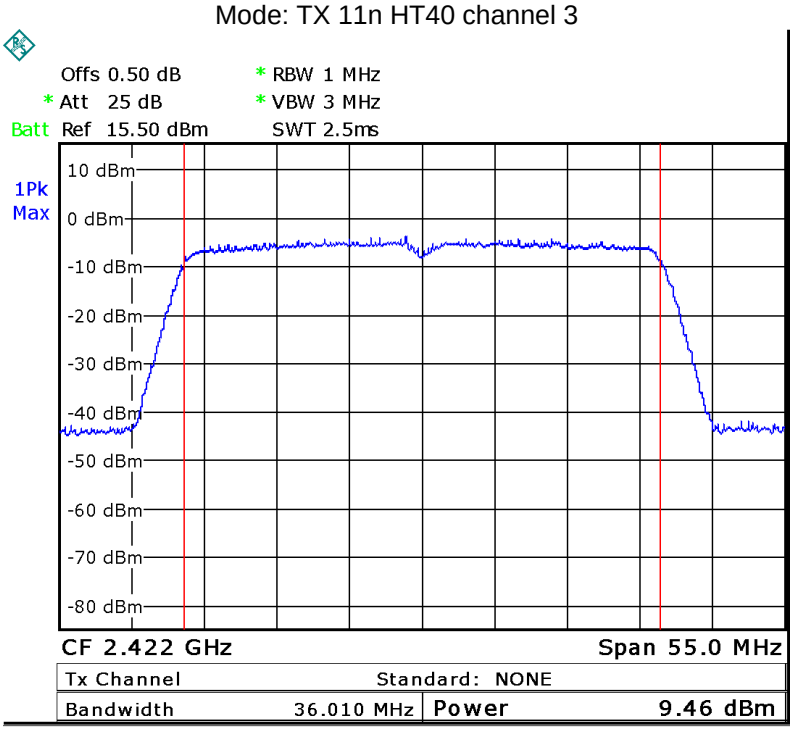
Mode: TX 11n HT20 channel 6



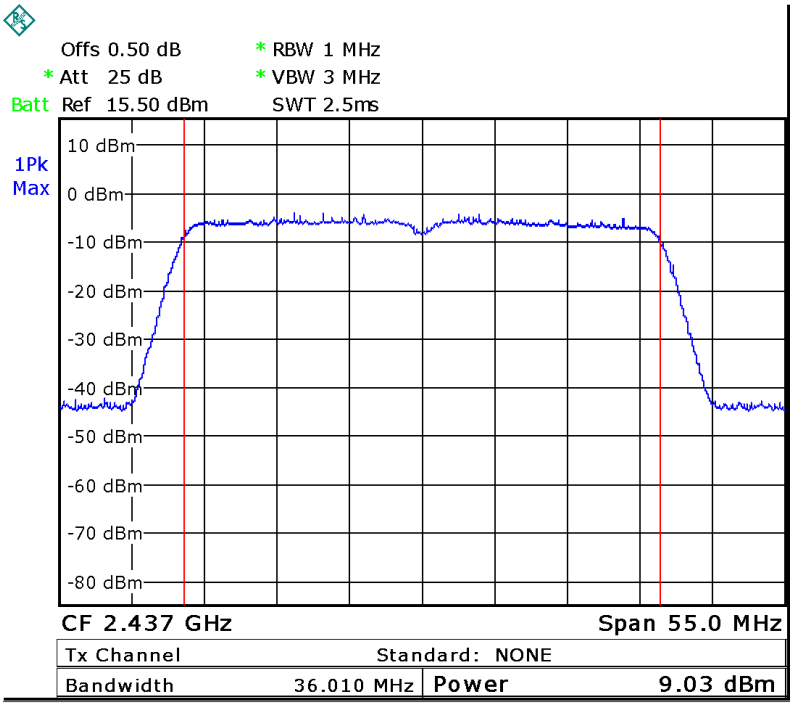
Mode: TX 11n HT20 channel 11



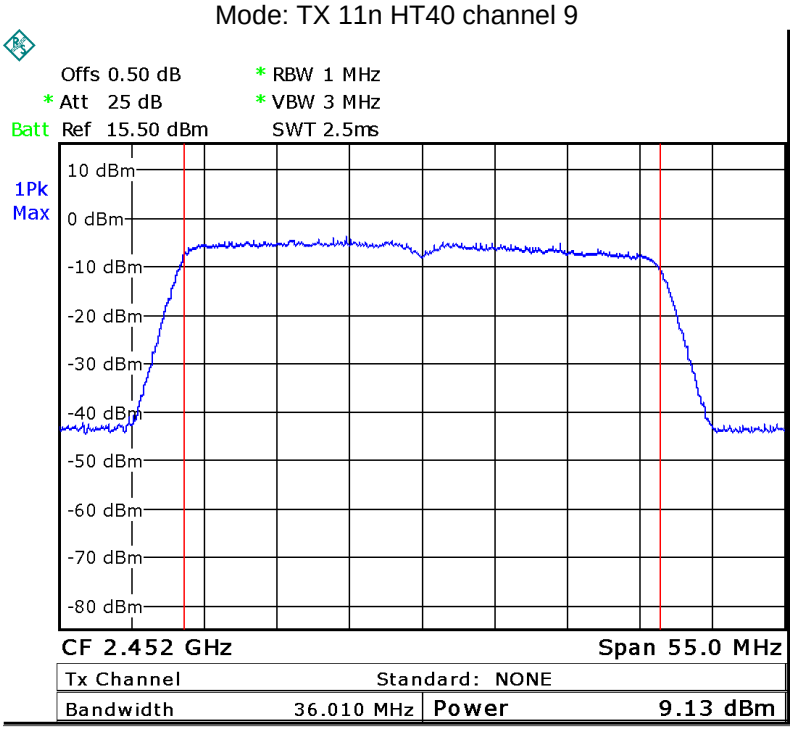
Mode: TX 11n HT40 channel 3



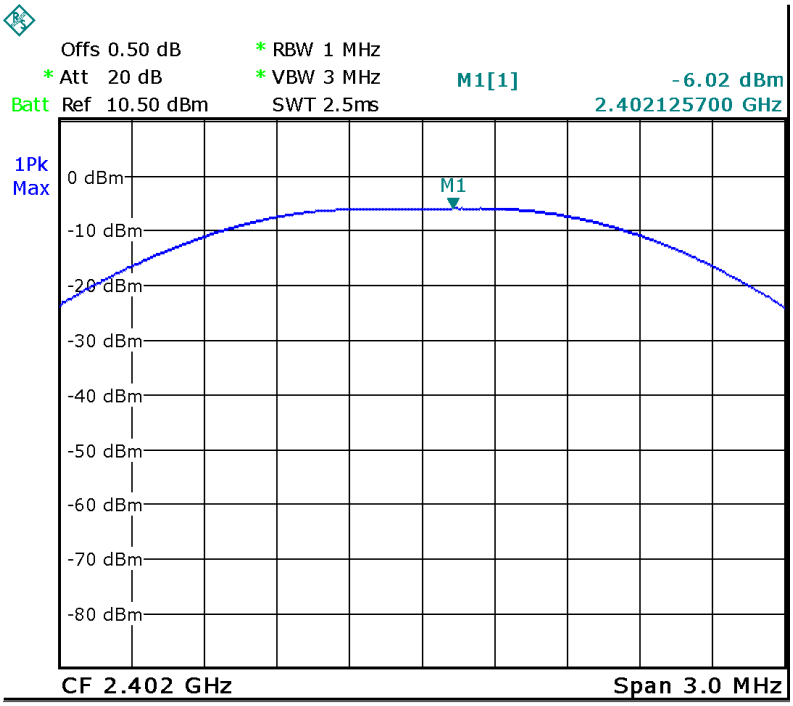
Mode: TX 11n HT40 channel 6



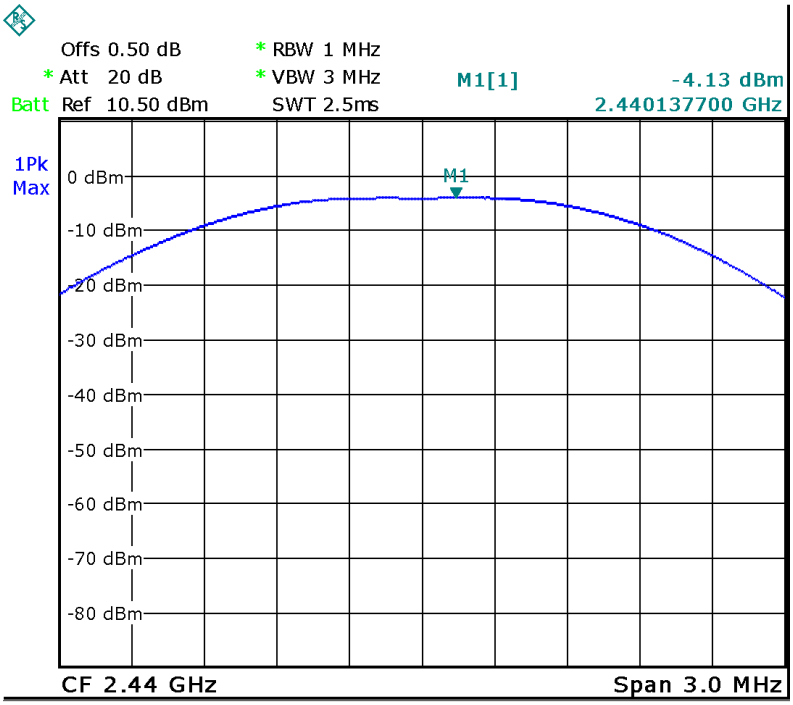
Mode: TX 11n HT40 channel 9



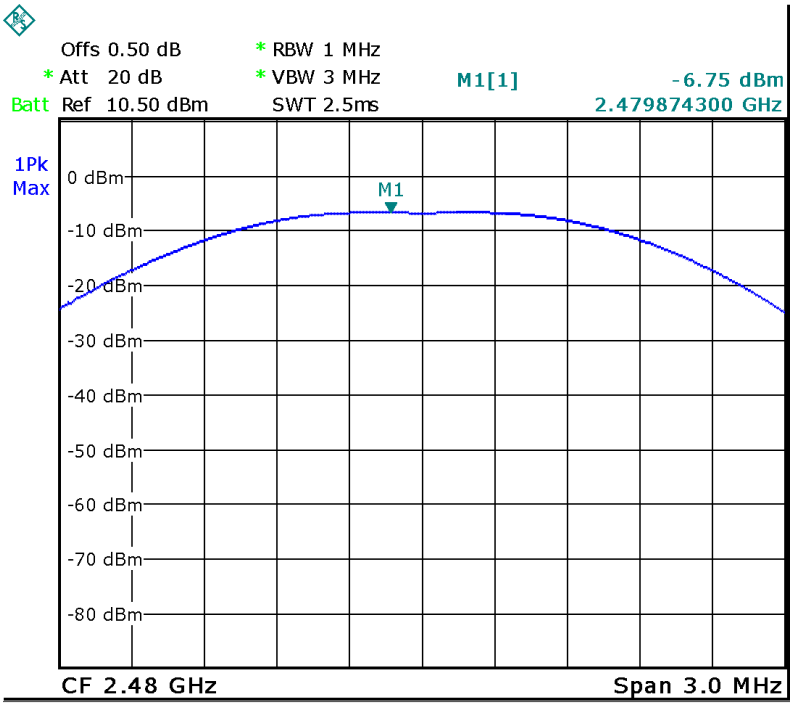
BLE: channel 0



BLE: channel 19



BLE: channel 39



12 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r05

12.1 Test Procedure:

KDB558074 D01 v03r05

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)		
channel 1	channel 6	channel 11
-16.06	-16.44	-16.18
Limit: 8dBm per 3kHz		

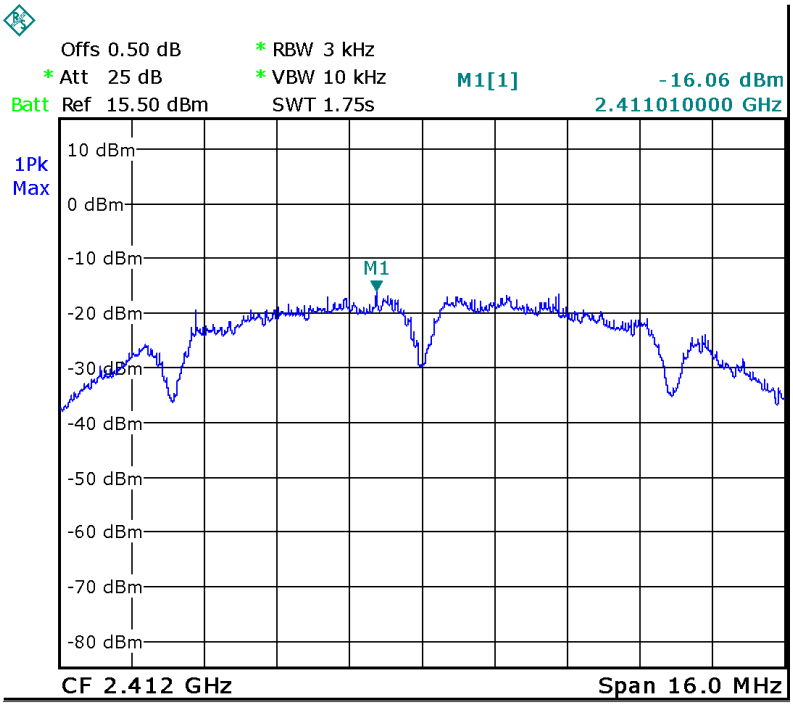
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
channel 1	channel 6	channel 11
-24.11	-23.83	-23.75
Limit: 8dBm per 3kHz		

Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
channel 1	channel 6	channel 11
-23.23	-18.12	-23.84
Limit: 8dBm per 3kHz		

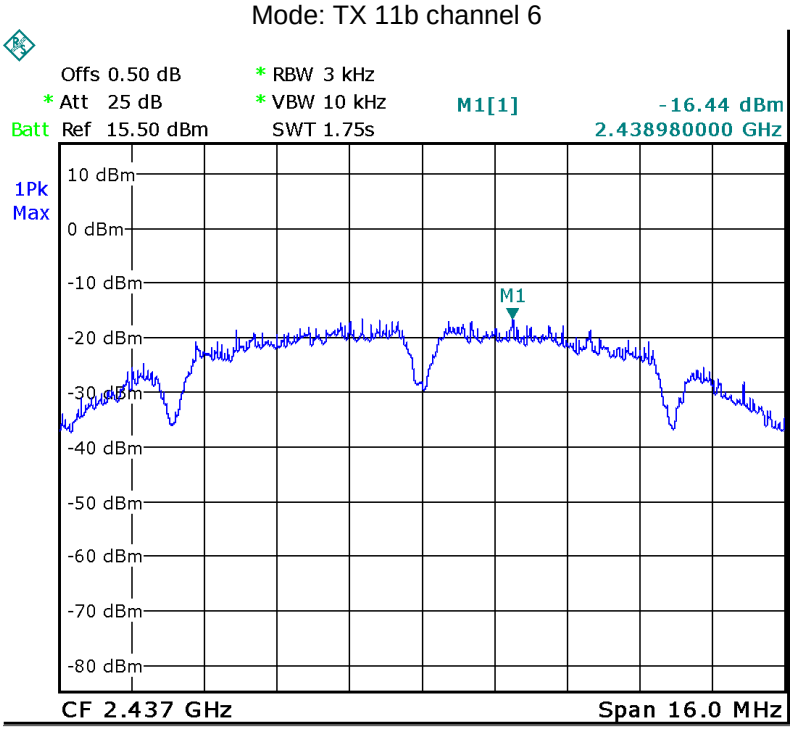
Test mode :TX 11n HT40		
Power Spectral (dBm per 3kHz)		
channel 3	channel 6	channel 9
-27.77	-28.31	-27.77
Limit: 8dBm per 3kHz		

Test mode :BLE		
Power Spectral (dBm per 3kHz)		
channel 0	channel 19	Channel 39
-21.85	-19.72	-22.34
Limit: 8dBm per 3kHz		

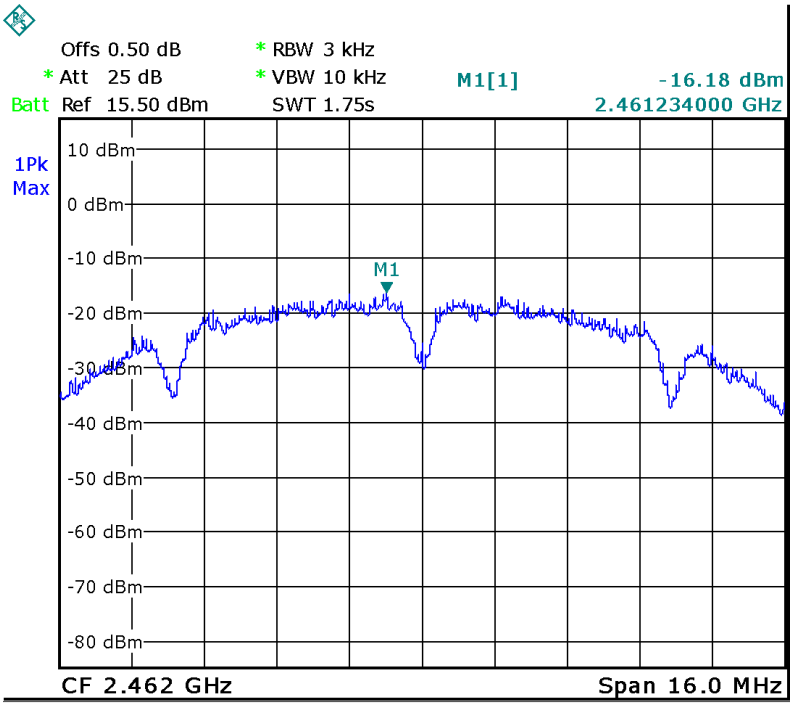
Mode: TX 11b channel 1



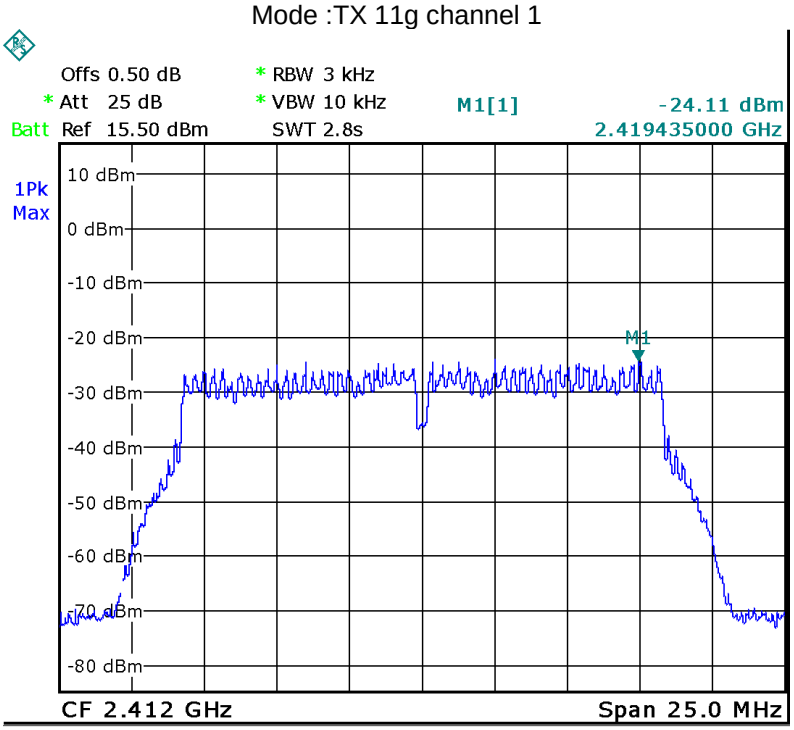
Mode: TX 11b channel 6



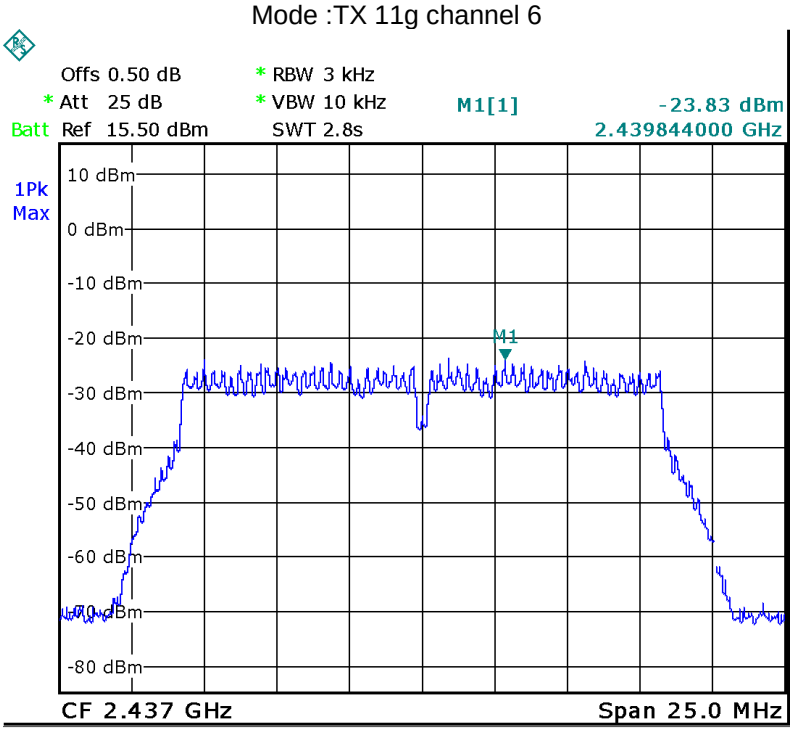
Mode: TX 11b channel 11



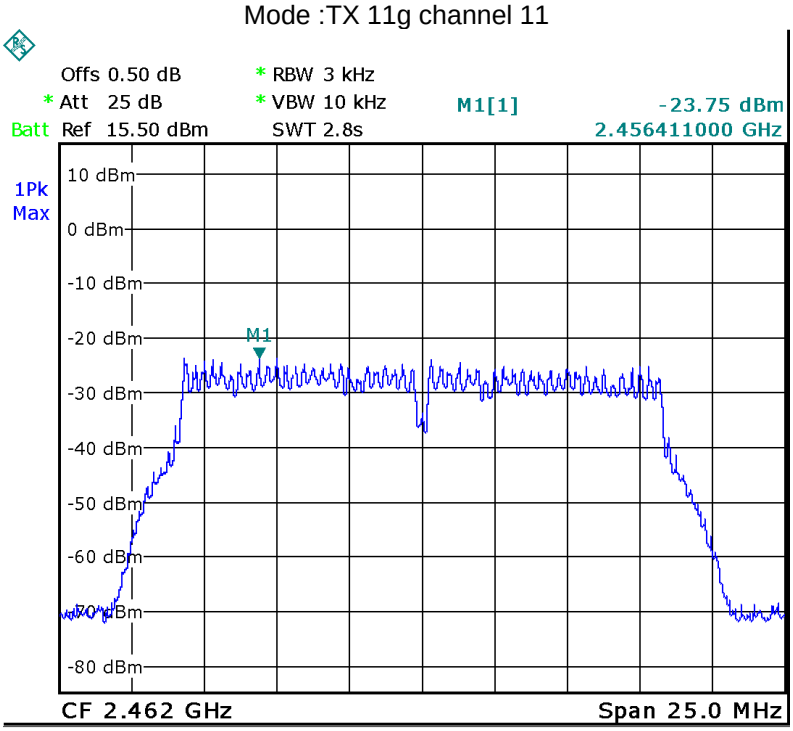
Mode :TX 11g channel 1



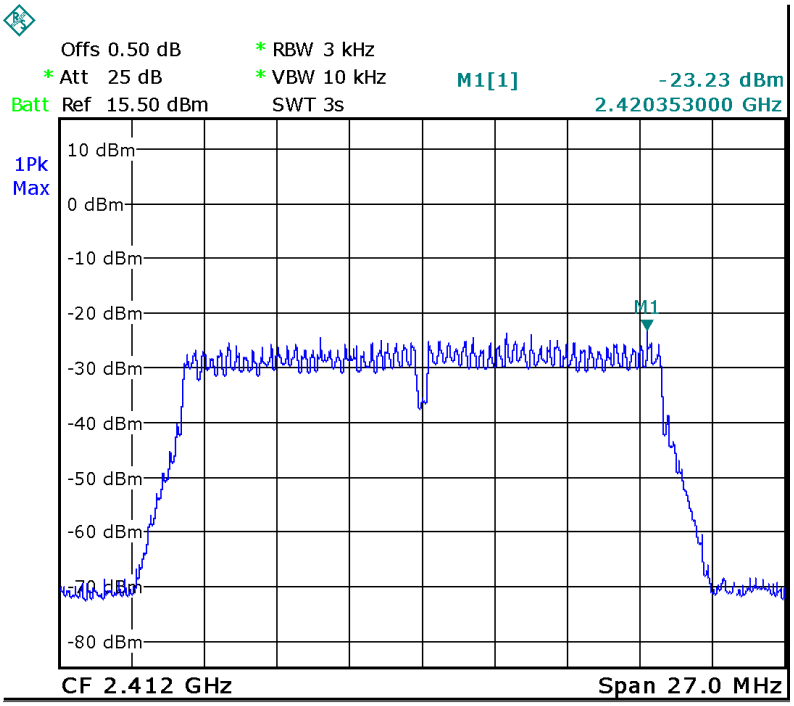
Mode :TX 11g channel 6



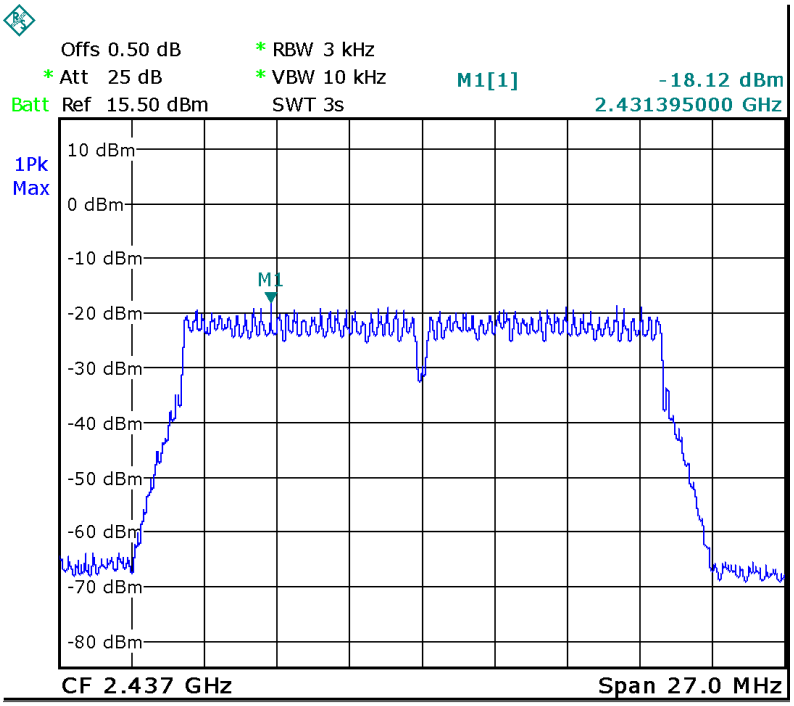
Mode :TX 11g channel 11



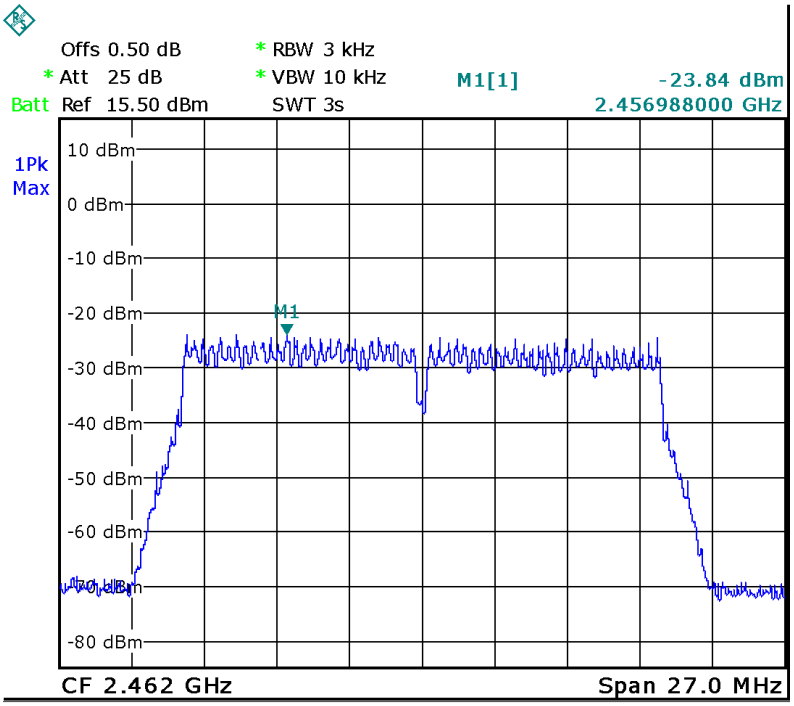
Mode: TX 11n HT20 channel 1



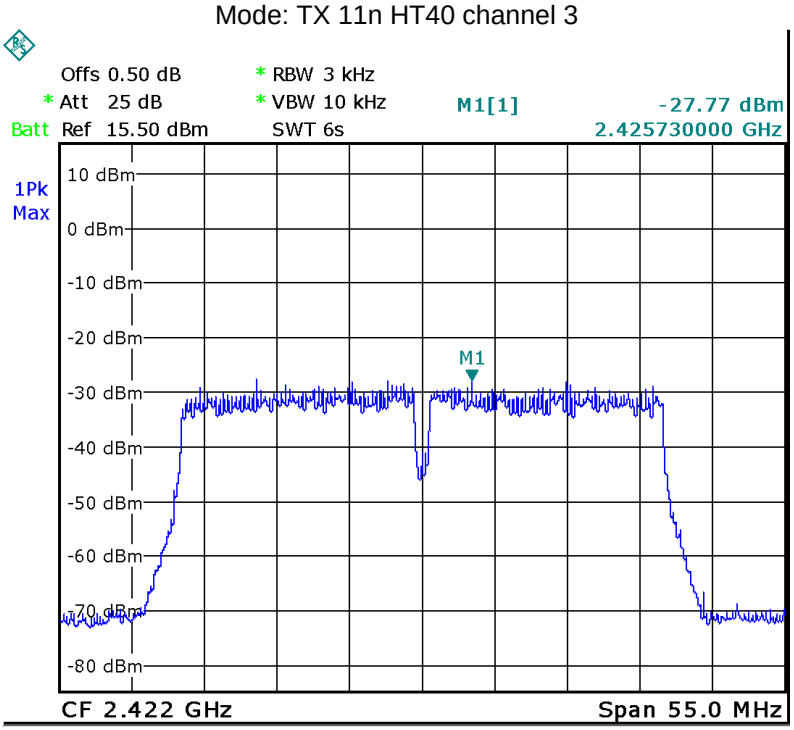
Mode: TX 11n HT20 channel 6



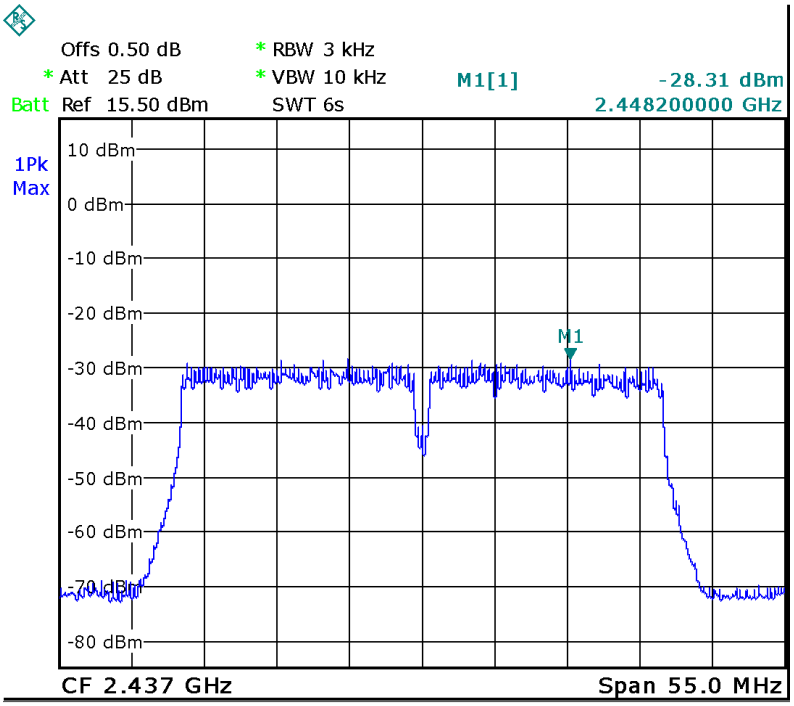
Mode: TX 11n HT20 channel 11



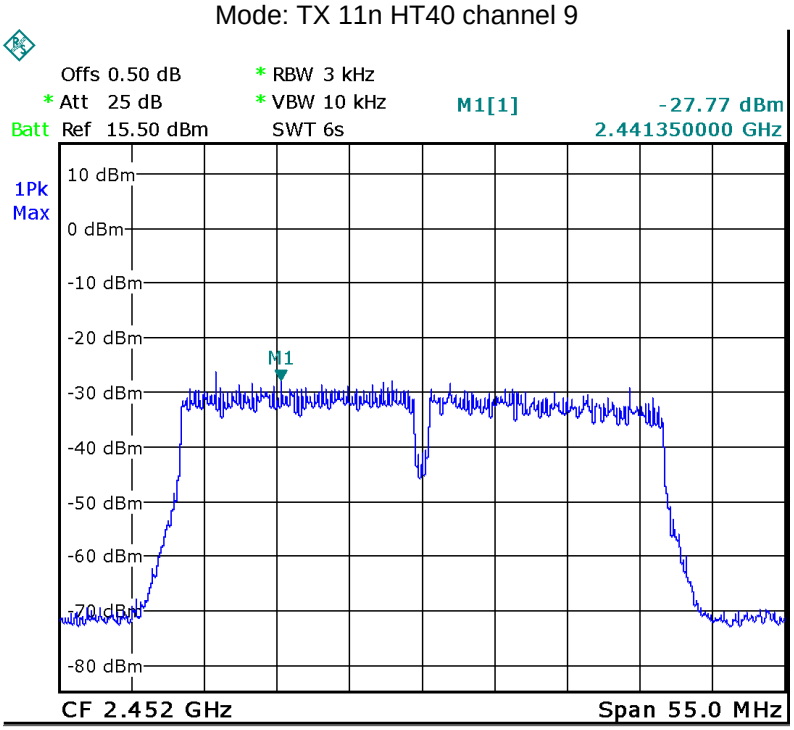
Mode: TX 11n HT40 channel 3



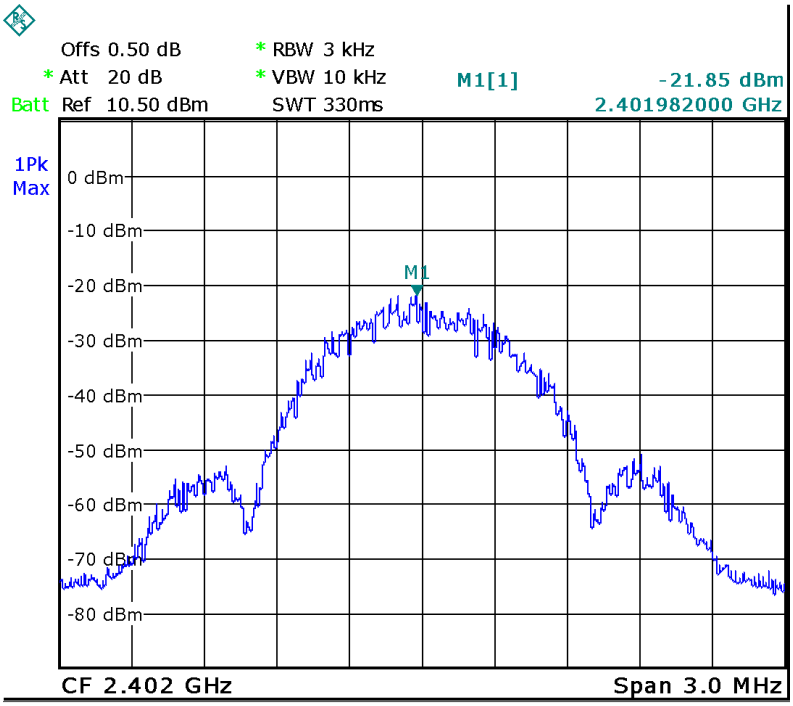
Mode: TX 11n HT40 channel 6



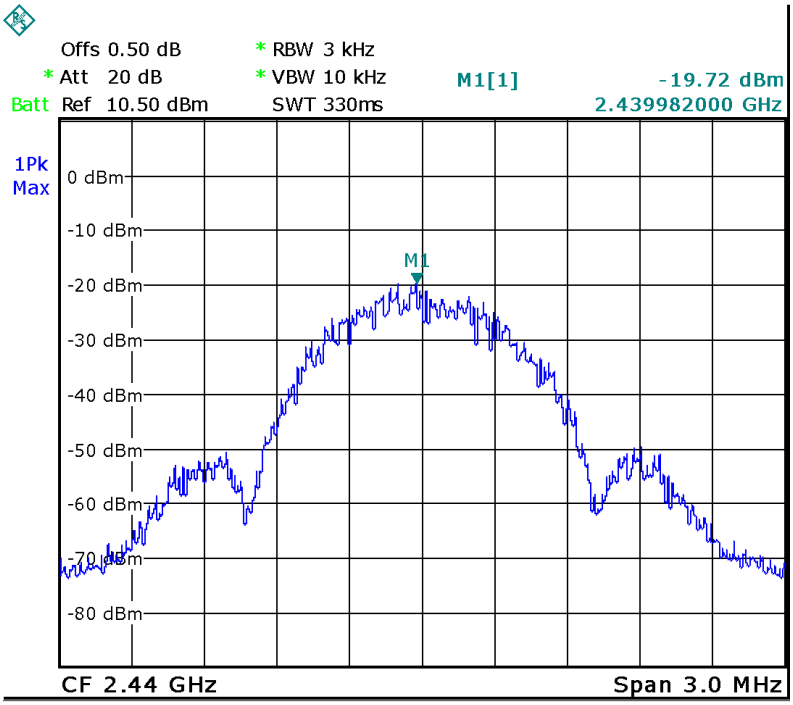
Mode: TX 11n HT40 channel 9



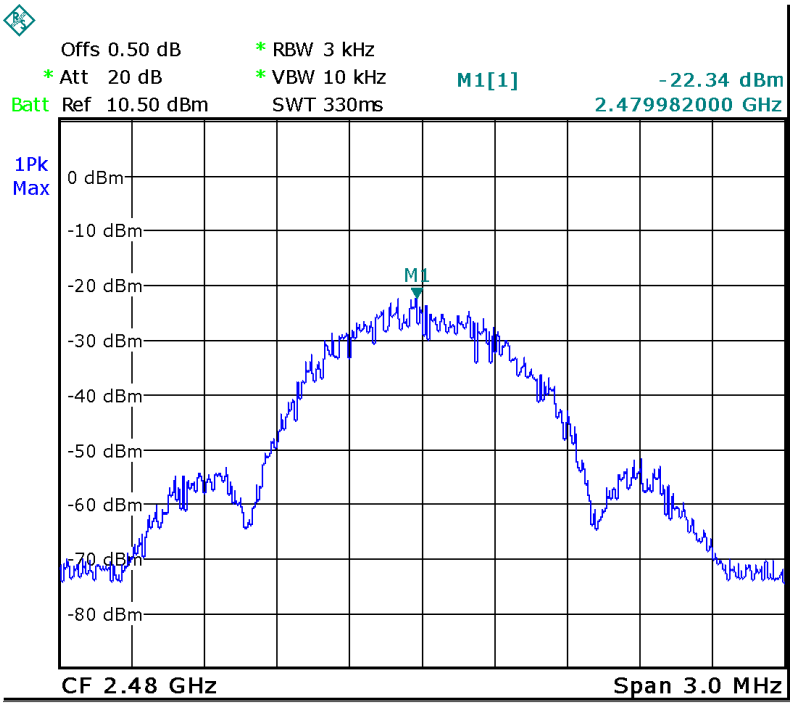
BLE: channel 0



BLE: channel 19



BLE: channel 39



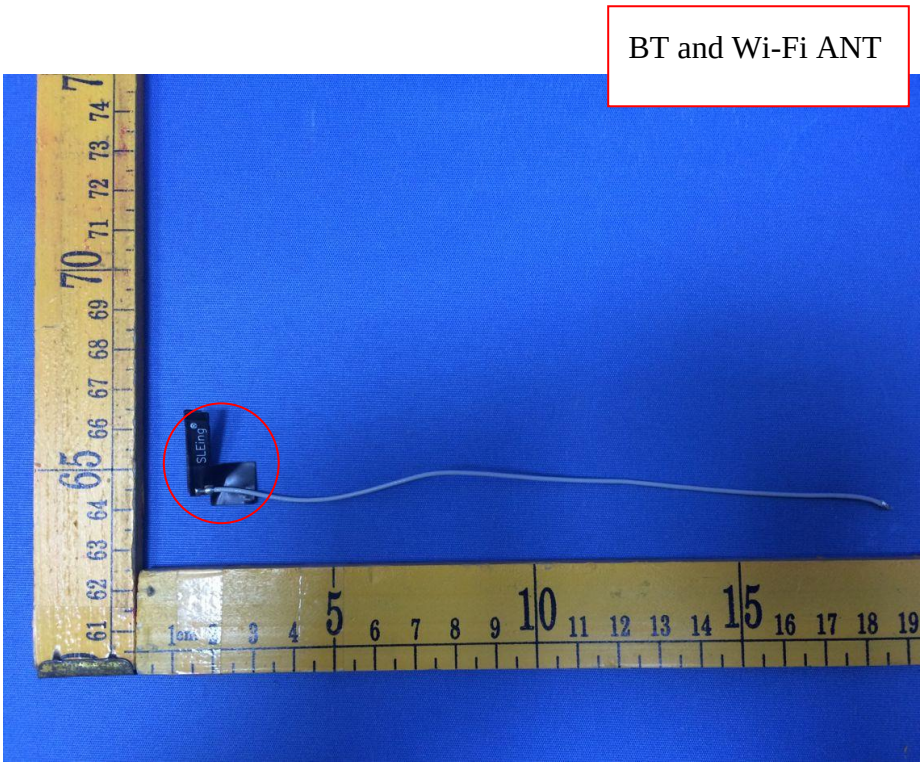
13 Antenna Requirement

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 has one Internal Intergrated Antenna, the gain is 2.0 dBi. meets the requirements of FCC 15.203.



14 RF Exposure

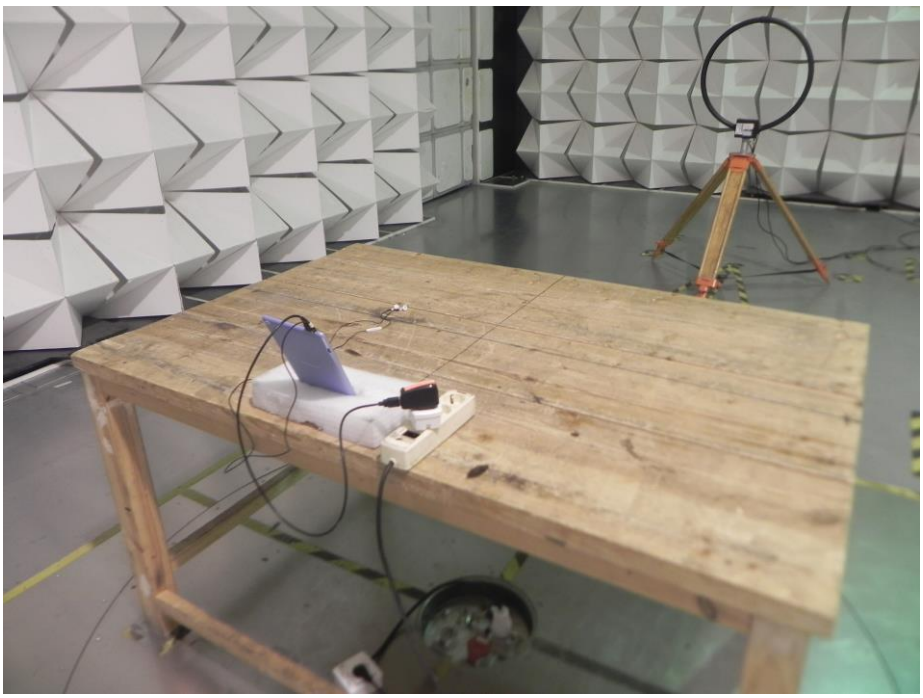
Please refer to WTN16S1064141-4E RF Exposure Test Report

15 Photographs – Model TM800A620MPBM Test Setup

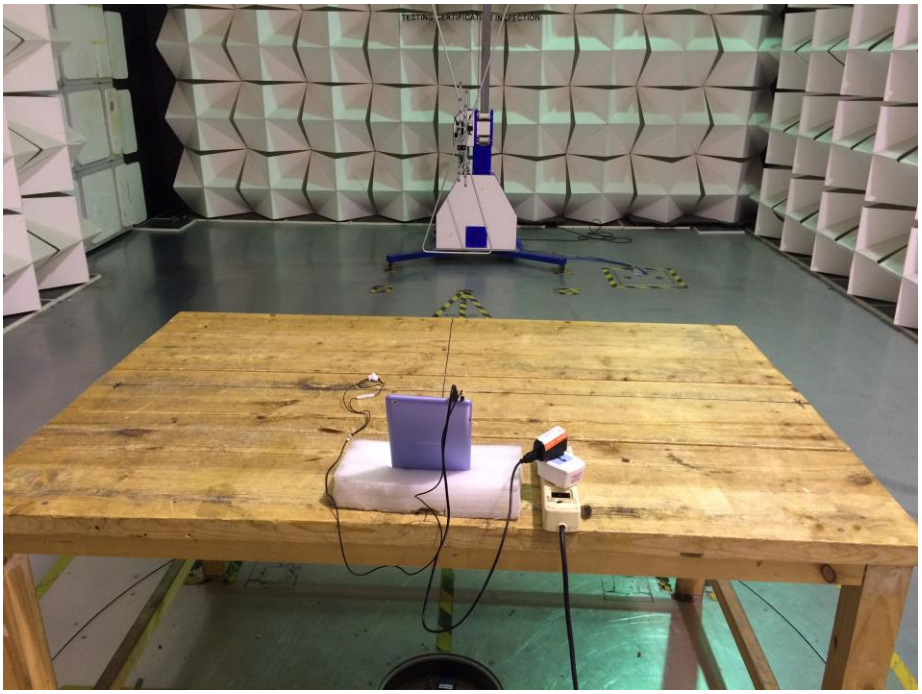
15.1 Photograph – Conducted Emission Test Setup at Test Site 1#

15.2 Photograph – Radiation Spurious Emission Test Setup

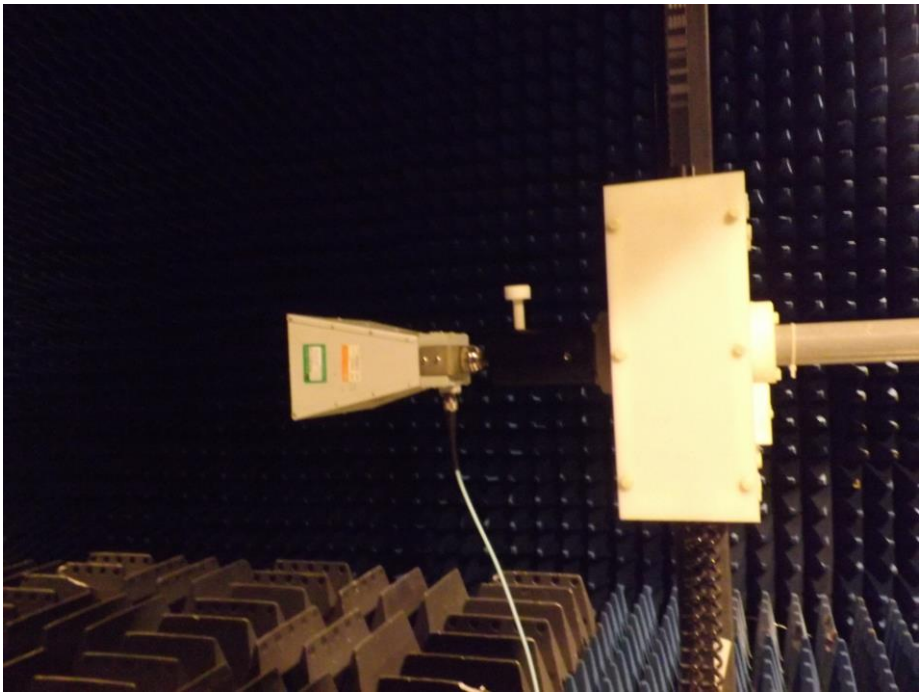
Test frequency 32.768KHz to 30MHz at Test Site 2#

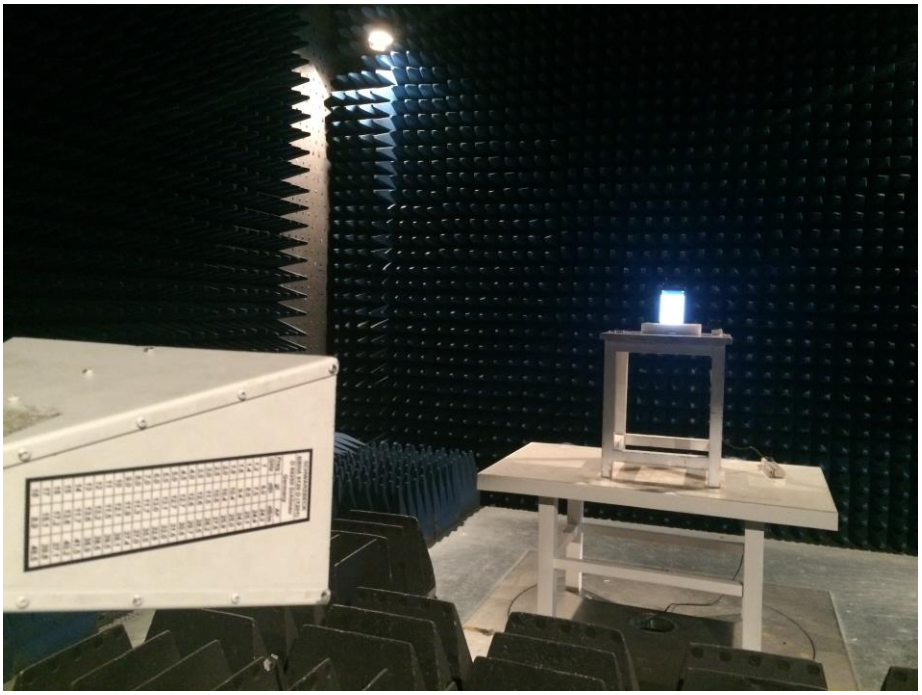


Test frequency from 30MHz to 1GHz at Test Site 2#



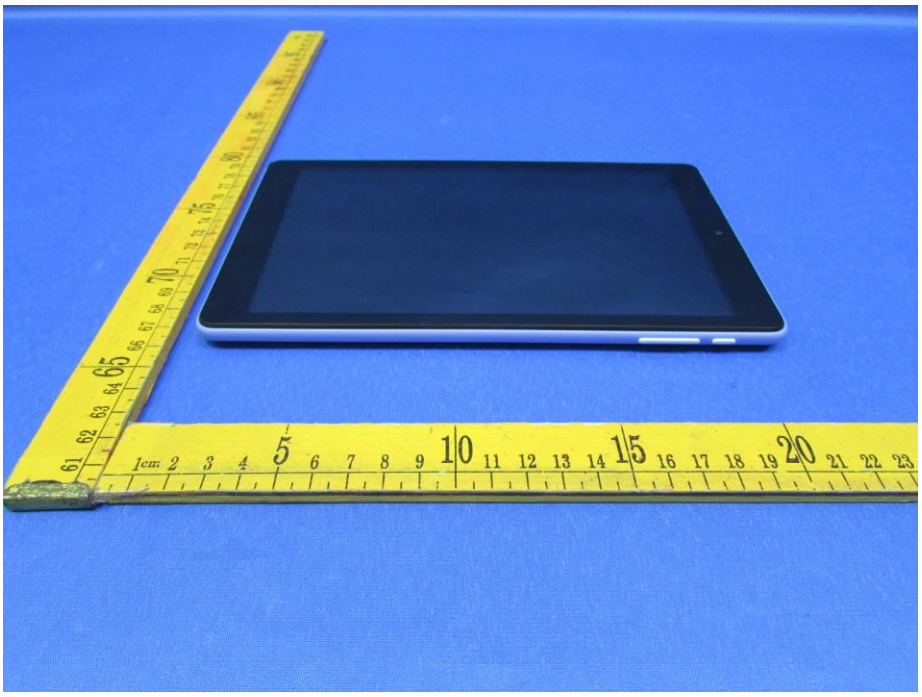
Test frequency 1GHz to 25GHz at Test Site 1#

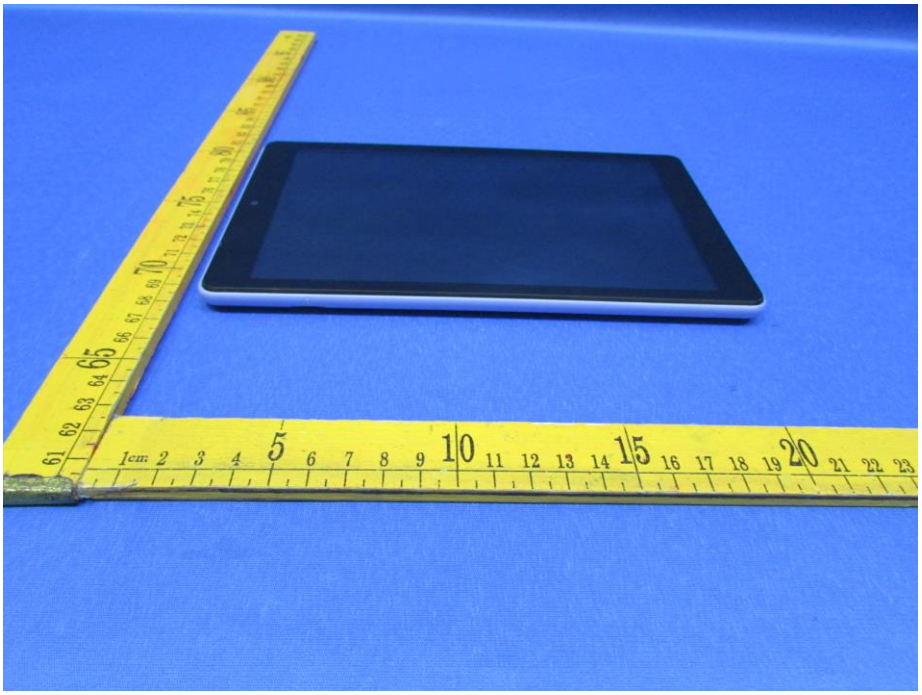


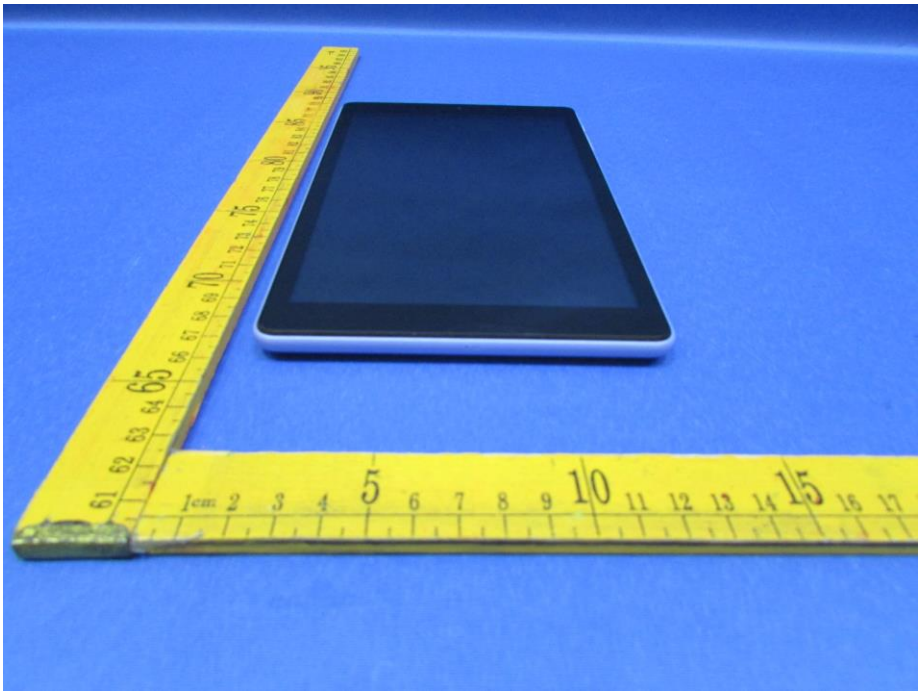


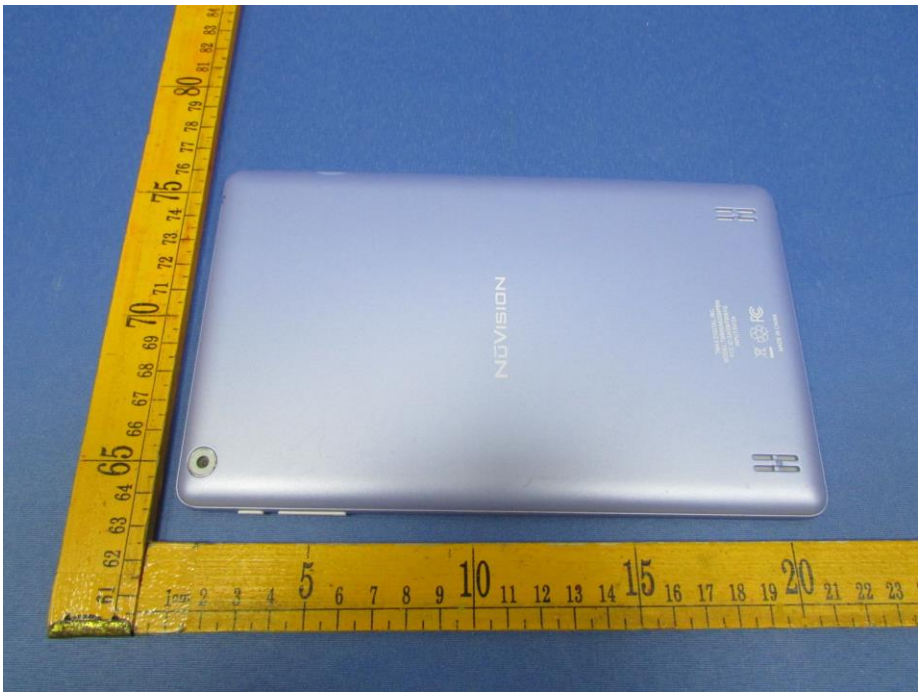
16 Photographs - Constructional Details

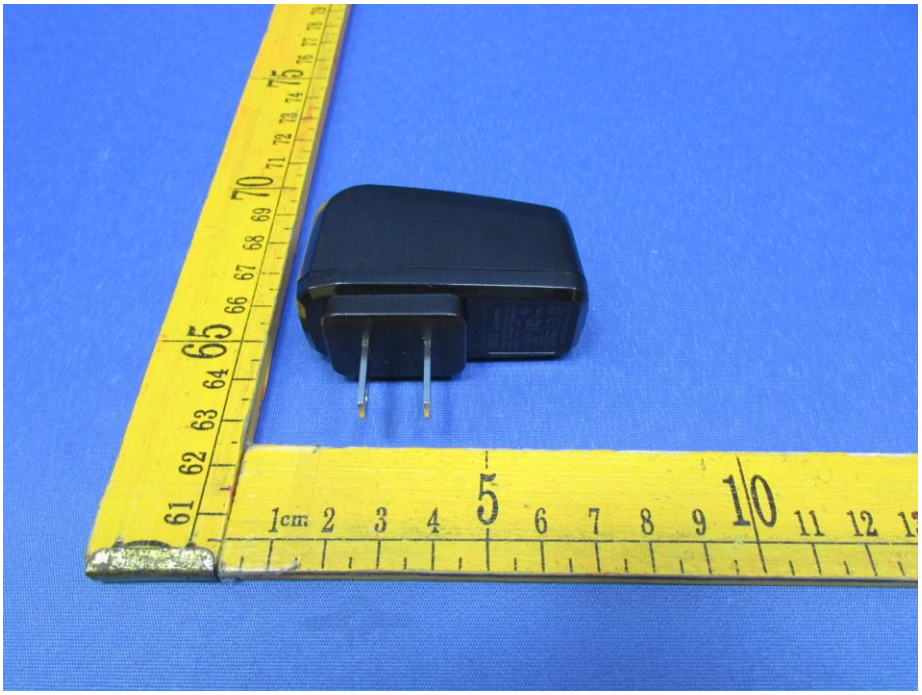
16.1 Model TM800A620MPBM– External Photos





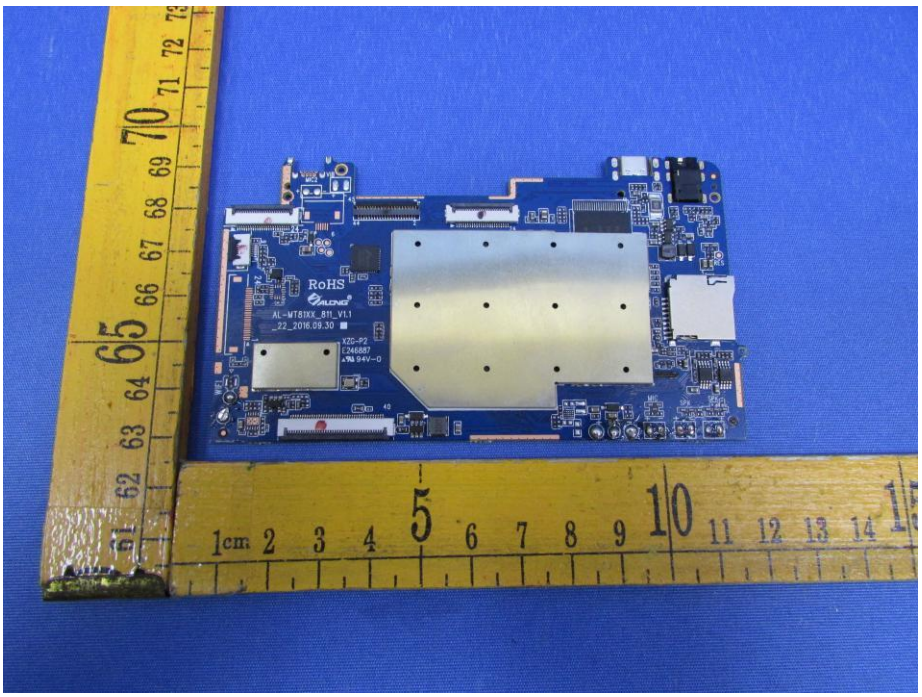


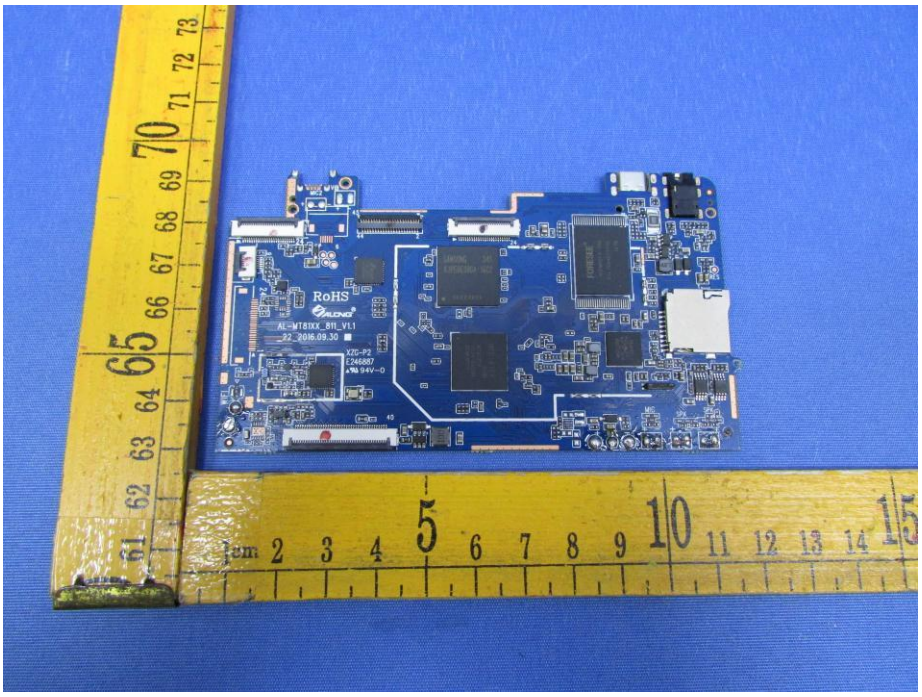

NoVision

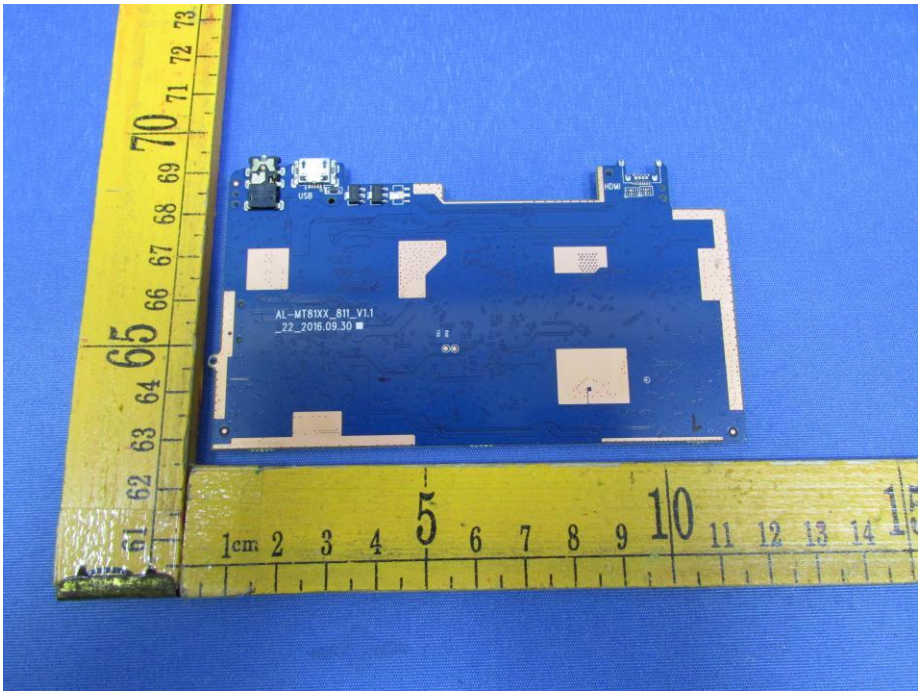


BSY AC ADAPTER
MODEL:BSY012U050200U U1USB
INPUT: 100-240V~, 50/60Hz,0.3A
OUTPUT:5.0V ⎓ 2.0A
FC
LPS

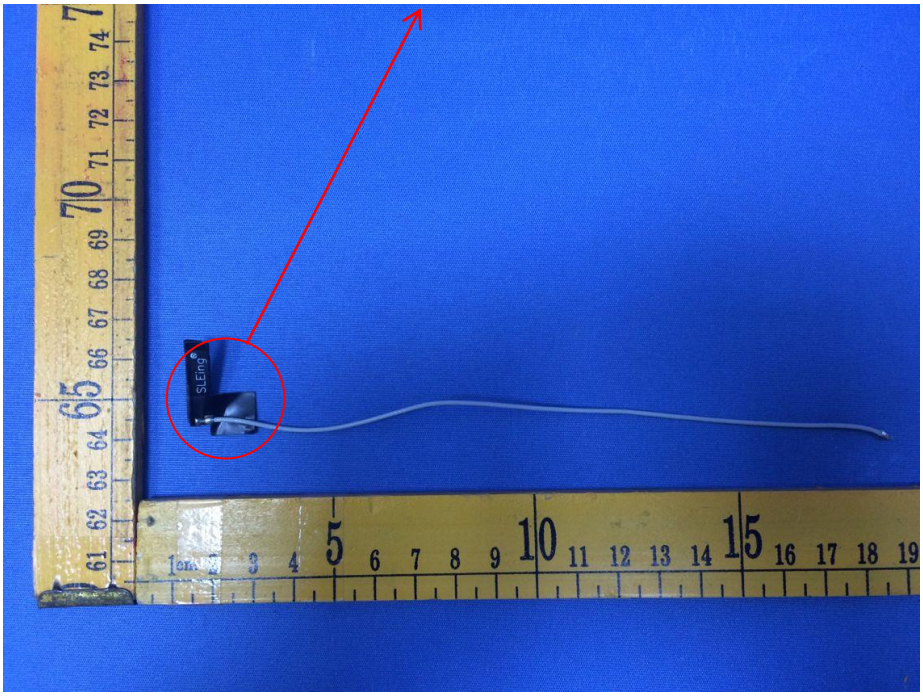
16.2 Model TM800A620MPBM– Internal Photos

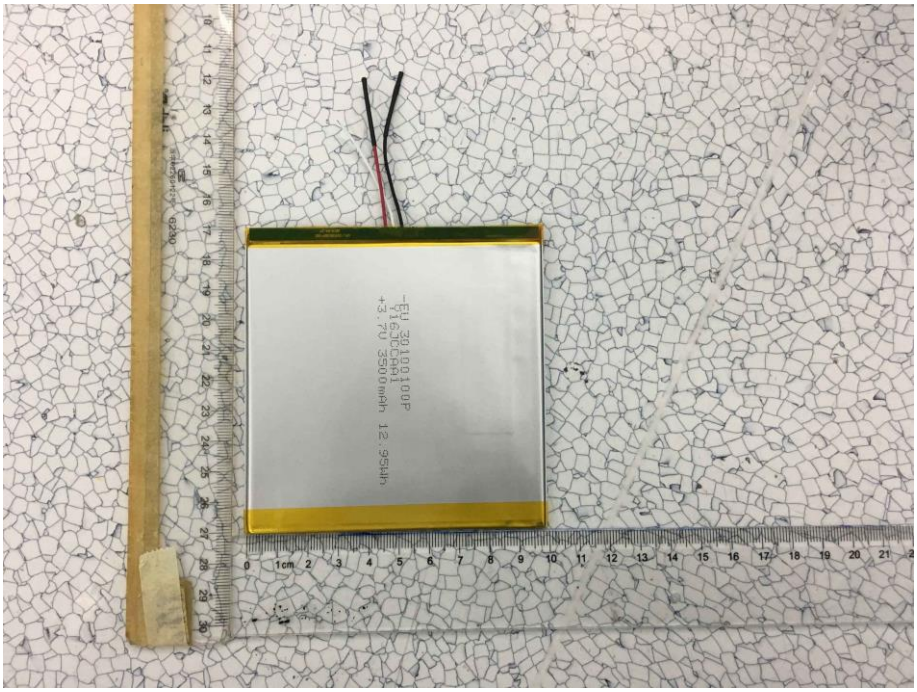


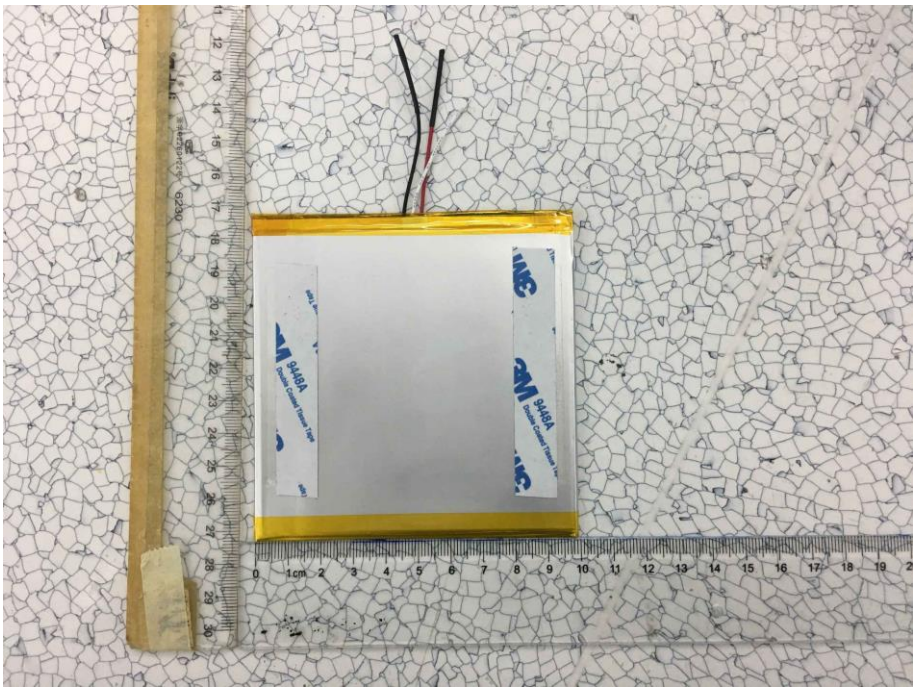

RoHS
AL-MT81XX_811_V1.1
_22_2016.09.30


USB
HDMI
AL-MT81XX_811_V1.1
_22_2016.09.30

BT and Wi-Fi ANT







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